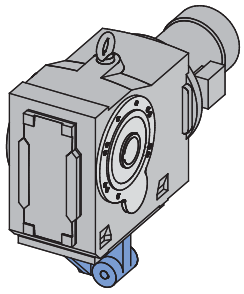
# 90.1 HELICAL-BEVEL SHAFT-MOUNT WITH BOTTOM MOUNT TORQUE ARM (K)



### 1. Torque arm (K)

The preferred method of installing a shaft-mounted reducer is to support the weight of the gear unit or gearmotor assembly from the driven solid machine shaft. A torque arm is required in order to restrain the gearbox, react to the load torque, and keep the gear unit from spinning around the shaft.

Table 1 (Page 2) provides a list of Torque-Arm (K) part numbers available for the 90.1 Series Helical-Bevel gear units. The Torque Arm (K) is secured to the base of the reducer. On most sizes there is an integral resilient rubber bushing located at the fastening hole-end of the torque arm. On the larger sizes, rubber buffers are used in conjunction with the torque arm and when properly used they are applied in tandem, on either side of the torque arm lug.



*IMPORTANT NOTE*

When ordering the Torque Arm (K) one can specify which side of the reducer to mount the fastening hole that bolts to the machine support bracket. Consult the appropriate NORD catalog for specific Torque Arm (K) mounting options and ordering guidelines.

### 2. Purpose of the rubber bushing or rubber buffers

Regardless if the Torque Arm (K) is supplied with the integral rubber bushing or whether separate rubber buffers are required, the bushing/buffers help isolate and absorb all the load forces present in the system and increase the reducer's service life by reducing cumulative torsional shock loads.

- The primary load force acts in the direction of driven shaft rotation, reacts the load torque of the reducer, and prevents the gearbox from spinning on the shaft.
- Additional forces present themselves in the direction opposite of the shaft rotation, due to the typical slight out-of-round condition present in the machine shaft. This condition is the reason most shaft mounted-reducers have a slight shaft-wobble, which is normal.

*HARMFUL SITUATION*

Always make sure that the Torque Arm (K) is used in conjunction with the required rubber bushing/s. Failure to do so will not properly cushion the reducer and can result in excessive binding, bearing stress, and damage to the reducer.

### 3. Machine support

The user must supply a suitably strong and rigid mating machine support that provides load bearing capacity on both sides of the machine support bracket.

*WARNING*

It is the responsibility of the machine builder to design a support bracket of adequate strength and rigidity, and supply an appropriate tightening bolt assembly. Failure to do so may result in injury caused from a damaged or broken torque-reaction assembly.

### 4. Installation of the right-angle reducer with torque arm (K)

A. Make sure the Torque-Arm (K) is mounted so that the machine fastening hole is on the correct side of the reducer.
   - The torque-arm can be repositioned on the as-received unit by removing the fixing screws, re-position the torque-arm in the correct location, and re-securing the fixing screws to the proper tightening torque, as indicated in Table 2 (Page 2).
   - If the torque-arm was shipped loose, position the torque-arm in the correct location on the gear unit, and secure the torque-arm with the proper fixing screws & tightening torque, as indicated in Table 2 (Page 2).

B. Install the right-angle hollow bore reducer onto the machine shaft. Line up the hole in the reducer's torque-arm with the hole in the machine's support bracket ,and temporarily hold the reducer in place

C. Properly secure the gear unit assembly to the driven shaft in an axial direction.

D. Apply thread locking compound to the end of the fixing bolt, then place the fastening bolt through the rigid machine support bracket and reducer torque-arm and loosely secure the nut onto the end of the bolt.

E. If the torque arm has an integral rubber bushing follow step F and skip steps G-H. If the torque arm uses rubber buffers skip forward to steps G-H.

F. Tighten the fixing bolt to the proper tightening torque as indicated in Table 2 (Page 2).

G. Install the rubber buffers on either side of the gear unit's torque-arm lug and place the fixing bolt through the rubber buffers and torque-arm lug and into the rigid machine support bracket.

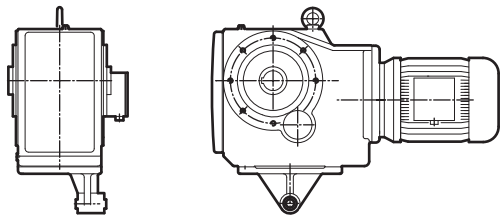
H. Tighten the fixing bolt and nut lightly snug, until all the free-play is eliminated from the rubber buffer assembly. Then snug the fixing bolt assembly by tightening an additional ¼ to ½ turn.

*WARNING*

To prevent damage to the rubber buffers, avoid over-tightening.

# 90.1 HELICAL-BEVEL SHAFT-MOUNT WITH BOTTOM MOUNT TORQUE ARM (K)

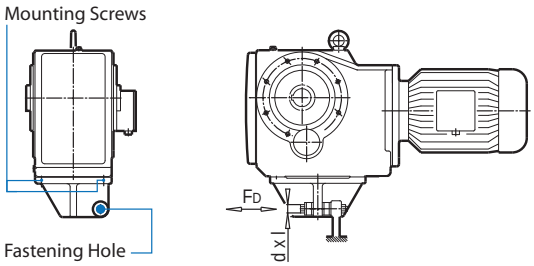
**Torque Arm (K) with integrated bushing**



**Available for Sizes SK9012.1 - SK9072.1**

- For most all 90.1 series Helical-Bevel gear units, an optional tear-drop shaped side -mounted torque arm (D) is available. See user manual U10600.

**Torque Arm (K) with rubber buffer**




**Available for Sizes SK9082.1 - SK90906.1**

- A metric fixing bolt is preferred for fastening the torque arm (K) to the machine support bracket.

| Type | Torque Arm P/N | Reducer Hardware Hex Head Cap Screws + Lock Washer | Mounting Screw P/N | Lock Washer P/N | Rubber Buffer P/N | Fastening Hole In [mm] | Fastening Bolt Size | Bolt d x l [metric] | FD lb [N] | SFD inch [mm] |
|---|---|---|---|---|---|---|---|---|---|---|
| SK9012.1...K<br>SK9013.1...K | 68190600 | M10 X 30 + A10 (Qty 3 Ea.) | 22010300 | 28560106 | N/A | 0.41 [10.5] | M10 | N/A | N/A | N/A |
| SK9016.1...K<br>SK9017.1...K | 68190600 | M10 X 30 + A10 (Qty 3 Ea.) | 22010300 | 28560106 | N/A | 0.41 [10.5] | M10 | N/A | N/A | N/A |
| SK9022.1...K<br>SK9023.1...K | 68290610 | M12 X 35 + A12 (Qty 3 Ea.) | 22012350 | 28560126 | N/A | 0.65 [16.5] | M16 | N/A | N/A | N/A |
| SK9032.1...K<br>SK9033.1...K | 68390610 | M12 X 35 + A12 (Qty 3 Ea.) | 22012350 | 28560126 | N/A | 0.65 [16.5] | M16 | N/A | N/A | N/A |
| SK9042.1...K<br>SK9043.1...K | 68490610 | M16 X 40 + A16 (Qty 3 Ea.) | 22016400 | 28560166 | N/A | 0.98 [25] | M24 | N/A | N/A | N/A |
| SK9052.1...K<br>SK9053.1...K | 68590620 | M16 X 40 + A16 (Qty 3 Ea.) | 22016450 | 28560166 | N/A | 0.98 [25] | M24 | N/A | N/A | N/A |
| SK9072.1...K | 68690620 | M24 X 60 + A24 (Qty 4 Ea.) | 22024060 | 28560246 | N/A | 0.98 [25] | M24 | N/A | N/A | N/A |
| SK9082.1...K<br>SK9082.1...SHK | 68819010 | M24 x 65 + A24 (Qty 4 Ea.) | 22024650 | 22024650 | 29610000 | 1.22 [31] | M30 | M30 x 260 | 5300 [23.64] | 0.53 [13.5] |
| SK9086.1...K<br>SK9086.1...SHK | 68819010 | M24 x 65 + A24 (Qty 4 Ea.) | 22024650 | 22024650 | 29610000 | 1.22 [31] | M30 | M30 x 260 | 6900 [30.77] | 0.69 [17.6] |
| SK9092.1...SHK | 68919010 | M36 x 90 + A36 (Qty 4 Ea.) | 22036900 | 28560366 | 29610000 | 1.22 [31] | M30 | M30 x 260 | 10300 [45.71] | 1.03 [26.2] |
| SK9096.1...SHK | 69019000 | M42 x 120 + A42 (Qty 4 Ea.) | 22042120 | 28560426 | 29621800 | 1.93 [49] | M48 | M48 x 550 | 12,500 [55.56] | 1.06 [27.0] |

# HELICAL & BEVEL REDUCER LUBRICATION

## 1. Importance of proper lubrication

Proper gearbox lubrication is essential in order to reduce friction, heat, and component wear. Lubricants reduce heat and wear by inserting a protective "fluid boundary" between mating parts and preventing direct metal to metal contact. Lubricants also help prevent corrosion and oxidation, minimize foam, improve heat transfer, optimize reducer efficiency, absorb shock loads and reduce noise.

Most NORD reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position.

## 2. Standard oil type

The following tables indicate the standard oil fill type used. Please see user manual U11000 for more specific information and for optional helical and bevel gear lubricants:

| Serviceable Gear Units | |
|---|---|
| Helical In-line | Standard Oil Fill: ISO VG 220, Mineral Oil |
| Clincher Parallel-Shaft | |
| Right-Angle Bevel | |
| NORDBLOC® Series In-line | |
| NORDBLOC®.1 Series In-line | |
| Standard Series In-line | |

*IMPORTANT NOTE*

For shipping purposes, the following large Clincher™ gear units are supplied without oil:
• Clincher™ Sizes SK11282, SK11382 and SK12382

| Maintenance-free / Lubricated For Life Gear Units | |
|---|---|
| Clincher™ sizes SK0182NB, SK0282NB & SK1382NB | Standard Oil Fill: ISO VG220 SHC/PAO Synthetic Oil |
| NORDBLOC® Sizes SK172, SK272, SK371F, SK372, SK373, SK320 | |

*IMPORTANT NOTE*

Maintenance-free units are supplied as sealed units with no vent-plug. Consult NORD prior to ordering if interested in ordering any of the above sizes as serviceable gear units.

*IMPORTANT NOTE*

Consult the sticker adjacent to the fill plug to determine the type of lubricant installed at the factory. Some units have special lubricants designed to operate in certain environments or intended to extend the service life or service temperature range of the lubricant. If in doubt about which lubricant is needed for a certain application, please contact NORD Gear.

## 3. Lubrication replacement

If the gear unit is filled with mineral oil, the lubricant should be replaced at least after every 10,000 operating hours or after every two years. If the gear unit is filled with synthetic oil, the lubricant should be replaced at least after every 20,000 operating hours or after every four years. Often gear reducers are exposed to extreme ambient conditions, hostile environments, wet conditions, or dirty and dusty operating areas. Especially in these situations, it is important to establish a condition-based oil service interval.

## 4. Oil viscosity

Viscosity, or the oil's resistance to shear under load, is often considered the single most important property of any gear oil.

- Often one will consider making a viscosity correction to the oil to improve the performance when operating the gear unit at low temperature or high temperature.
- In cases of extreme load conditions, gear pairs and antifriction bearings may be more susceptible to sliding or scuffing wear. In these operating conditions, it may also be beneficial to consider an increased lubrication viscosity and/or a lubrication with improved antiwear additive packages.

*IMPORTANT NOTE*

The user should consult with their primary lubrication supplier before considering changes in oil type or viscosity.

## 5. Maximum oil sump temperature limit

To prevent reducer overheating, the reducer's maximum oil sump temperature limit must not be exceeded for prolonged periods of operation (up to 3 hours continuous operation depending upon reducer size).

| Oil Type | Maximum Oil Temperature Limit | |
|---|---|---|
| | NORD | AGMA 9005-D94 |
| Mineral | 80-85°C (176-185°F) | 95°C (203°F) |
| Synthetic | 105°C (220°F) | 107°C (225°F) |

*IMPORTANT NOTE*

***Use caution when specifying gear reducers for high temperature service.*** If there is concern about exceeding the allowable safe operating temperatures, please consult NORD to discuss alternatives.

### 6. The importance of routine oil analysis

Routine oil analysis, sound lubrication practices, and good tracking of oil performance trends will help establish proper lubrication maintenance and change-out intervals. To maximize equipment reliability, NORD Gear generally recommends a condition-based lubrication maintenance program. One may take exceptions to this general recommendation on sealed-for-life or maintenance-free gear units or smaller and less costly gear units. In these instances, the replacement cost of the gear unit is often small compared to the costs associated with this type of oil analysis program.

**STOP** *HARMFUL SITUATION* **STOP**

NORD suggests replacing the gear oil if oil analysis indicates any of the following:

- Viscosity has changed by approximately 10% or more.
- Debris particles (silicon, dust, dirt or sand) exceed 25 ppm.
- Iron content exceeds 150-200 ppm.
- Water content is greater than 0.05% (500 ppm).
- The total acid number (TAN) tests indicate a significant level of oxidative break-down of the oil, and a critical reduction in performance; If the TAN number measured changes by more than 5% over the new oil, then an oil change would be recommended.

### 7. Mounting position and oil fill quantity

All NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. ***For additional information, please see the seperate mounting position diagrams and the corresponding oil fill quantity tables for the specified gear unit.***

The gearbox nametag will indicate the mounting position that was provided. ***For mounting orientations other than shown in the mounting position charts, please consult NORD Gear.***

**STOP** *HARMFUL SITUATION* **STOP**

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil-level plug and drain or add additional oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

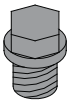
### 8. Oil plug locations

All gear units are assembled with the oil fill-level, oil-drain and vent plugs installed in their proper locations, according to the specified mounting position. All standard plugs are metric and utilize sealing gaskets between the head of the plug and the reducer housing.

### 9. Drain and fill-level plugs

All reducer drain plugs are metric socket head cap screws. For easier identification, it is NORD's standard practice to provide a hex-head screw for the fill-level plug. For ease of draining the used oil from the gear reducer, use the socket head screw located at the lowest part of the gearbox.

Drain Plug



Fill Level Plug

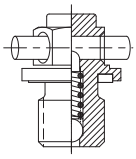
### 10. Vent plug locations

Reducer venting allows for air pressure differences that occur during operation, between the inner space of the reducer and the atmosphere, while ensuring leak-free operation. The AUTOVENT™ is standard for all vented gear units, unless otherwise noted.

**AUTOVENT™** - The AUTOVENT™ helps prevent bearing and gear damage by behaving like a check valve to block the entry of foreign material (water, dust, corrosives, etc.). The breather opens at approximately 2-3 psi during operation and closes tightly as the gearbox cools. This option is perfect for humid conditions and wash-down environments, helping to maintain proper oil cleanliness, and reducing foaming and oxidation. NORD may choose to offer one of two style options as shown in Figure 1. The Type 2 AUTOVENT™ comes closed upon delivery with a transportation sealing plug (see Warning).

**Figure 1 AUTOVENT™ Types**

Type 1

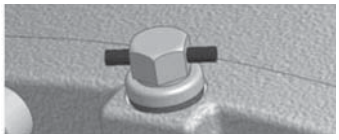


Type 2 with transportation plug

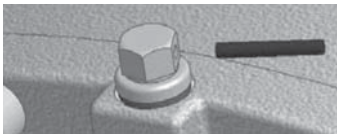
**Open Vent** - An optional open vent can be supplied by NORD. The open vent comes closed upon delivery with a transportation sealing plug (see Warning).

⚠ *WARNING* ⚠

To prevent build-up of excessive pressure, sealed vents must be activated as shown prior to gear unit start up.



Sealed vent



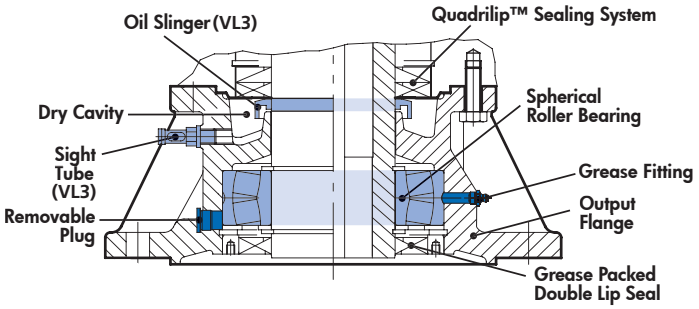
Activated vent

**Filtered Vent** - NORD may offer an optional filtered vent, which allows gases to permeate, but does not allow dust and debris to pass through the vent.

# VL2 & VL3
# EXTENDED BEARING LUBRICATION

### 1. VL2 – Spread Bearing Design

NORD offers reinforced output shaft bearings with increased bearing distance. The lower bearing is a oversized, double row spherical bearing, which absorbs high overhung and thrust loads while providing a longer bearing service life. The spherical roller bearing is especially useful in compensating for alignment errors in long agitator shafts. The VL2 spread bearing design is commonly used for shredders, mixers, overhead conveyors or applications requiring increased bearing load carrying capacities. Included with the VL2 design is a grease fitting for the lower bearing and a removable plug to allow excess grease to purge from the bearing cavity.




### 2. VL3 – Spread Bearing Design with Oil Safe Dry Cavity

The VL3 dry cavity design adds additional oil leak protective measures to the VL2 spread bearing design. NORD's Quadralip™ sealing system prevents oil from leaking from the gearbox into the VL2 flange. If in any case oil does leak past the Quadralip™ seals, it would flow down to the oil slinger mounted onto the shaft. As the shaft rotates, the oil will sling off into the dry cavity. A sight tube is provided for dry cavity inspection. At the bottom of the spread bearing flange is greased packed, double lip seal.

### 3. Service Guidelines for the Extended Bearing Flange

The spherical roller bearing on the extended bearing housing should be re-greased with 0.75 to 1.0 ounces (20-25 grams) of grease after every 2,500 hours of service or at least every 6 months. Prior to re-greasing the screw plug located opposite to the grease nipple should be unscrewed. After re-greasing the screw plug must be reinstalled and tightened. The extended bearing is factory assembled with the proper amount and type of grease. The type of grease supplied depends upon the type of oil specified at time of order.

**Bearing Grease Options**

| Reducer Oil Type | Grease Type | Thickener Type | NLGI Grade | Ambient Temperature Range | Manufacture Brand / Type |
|---|---|---|---|---|---|
| Mineral | Standard | Li-Complex | NLGI 2 | -30 to 60 °C (-22 to 140 °F) | Mobil Grease XHP222 |
| Synthetic | High-Temperature | Polyurea | NLGI 2 | -25 to 80 °C (-13 to 176 °F) | Mobil / Polyrex EP 2 |
| Food-Grade | Food-Grade | Al-Complex | NLGI 2 | -25 to 40 °C (-13 to 104 °F) | Mobil / FM222 |

STOP *HARMFUL SITUATION* STOP

Grease compatibility depends upon the type of thickener or soap complex used, the base oil type suspended within the thickener, and the type of additives used. The user should check with the lubrication supplier before making substitutions in brand and type in order to assure compatibility and to avoid causing possible damage to the extended bearing.

# HELICAL-WORM REDUCER LUBRICATION

## 1. Importance of proper lubrication

Proper gearbox lubrication is essential in order to reduce friction, heat, and component wear. Lubricants reduce heat and wear by inserting a protective "fluid boundary" between mating parts and preventing direct metal to metal contact. Lubricants also help prevent corrosion and oxidation, minimize foam, improve heat transfer, optimize reducer efficiency, absorb shock loads and reduce noise.

NORD helical-worm reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position.

## 2. Standard oil type

NORD helical worm gear reducers are filled with ISO VG 680 synthetic-hydrocarbon/polyalphaolefin (SHC/PAO) worm gear oil.

- SHC/PAO worm gear oils have good high and low temperature stability, are compatible with most paint and seal types, and are miscible with mineral oils.
- SHC/PAO worm gear oils also contain a small amount of organic ester and other antiwear (AW) packages to offer improved lubrication conditions, especially in the worm mesh, where a sideways sliding motion prevails.

Please see user manual U11020 for more specific information and for optional helical worm lubricants.

**HARMFUL SITUATION**

In worm gears avoid using extreme pressure (EP) gear oils containing sulfur-phosphorous chemistries; these additives can react adversely with bronze worm gears, and accelerate wear.

**IMPORTANT NOTE**

Consult the sticker adjacent to the fill plug to determine the type of lubricant installed at the factory. Some units have special lubricants designed to operate in certain environments or intended to extend the service life or service temperature range of the lubricant. If in doubt about which lubricant is needed for a certain application, please contact NORD Gear.

## 3. Lubrication replacement

The helical-worm gear oil should be replaced at least after every 20,000 operating hours or after every four years. Often gear reducers are exposed to extreme ambient conditions, hostile environments, wet conditions, or dirty and dusty operating areas. Especially in these situations, it is important to establish a condition-based oil service interval.

## 4. Efficiency

Helical worm gears reach efficiencies up to 92% and are generally much more efficient than worm-only gear units. However, it is important to consider the following, when using worm gears.

- Worm gears reach their peak rated efficiency, after they undergo a natural run-in process (up to 25 hours operating time at maximum rated load). Catalog published power and torque figures are based upon the rated efficiency after the run-in is complete.
- Worm gears have naturally lower startup efficiencies compared to operating efficiencies. As input speed increases the enhanced hydrodynamic effects of the oil result in less tooth friction and increased worm gear efficiency.

**IMPORTANT NOTE**

***Worm gear reducers applied in cold temperature service***, may require increased motor power for the following reasons:

- Lower operating temperatures, cause lubrication viscosity to increase in both the gearbox and in the moving areas of the driven machine.
- Worm-gears have naturally lower start-up efficiencies compared to operating efficiencies.
- In extreme cases, one might need to consider increasing the motor power and lowering the oil viscosity

## 5. Oil Viscosity

Viscosity, or the oil's resistance to shear under load, is often considered the single most important property of any gear oil.

- Often one will consider making a viscosity correction to the oil to improve the performance when operating the gear unit at low temperature or high temperature.
- In cases of extreme load conditions, gear pairs and antifriction bearings may be more susceptible to sliding or scuffing wear. In these operating conditions, it may also be beneficial to consider an increased lubrication viscosity and/or a lubrication with improved antiwear additive packages.

**IMPORTANT NOTE**

The user should consult with their primary lubrication supplier before considering changes in oil type or viscosity.

## 6. Maximum oil sump temperature limit

To prevent reducer overheating, the reducer's maximum oil sump temperature limit must not be exceeded for prolonged periods of operation (up to 3 hours continuous operation depending upon reducer size).

| Oil Type | Maximum Oil Temperature Limit | |
|---|---|---|
| | NORD | AGMA 9005-D94 |
| Synthetic | 105°C (220°F) | 107°C (225°F) |

**IMPORTANT NOTE**

***Use caution when specifying gear reducers for high temperature service.*** If there is concern about exceeding the allowable safe operating temperatures, please consult NORD to discuss alternatives.

# HELICAL-WORM REDUCER LUBRICATION

### 7. The importance of routine oil analysis

Routine oil analysis, sound lubrication practices, and good tracking of oil performance trends will help establish proper lubrication maintenance and change-out intervals. To maximize equipment reliability, NORD Gear generally recommends a condition-based lubrication maintenance program. One may take exceptions to this general recommendation on sealed-for-life or maintenance-free gear units or smaller and less costly gear units. In these instances, the replacement cost of the gear unit is often small compared to the costs associated with this type of oil analysis program.

**STOP** *HARMFUL SITUATION* **STOP**

NORD suggests replacing the gear oil if oil analysis indicates any of the following:

- Viscosity has changed by approximately 10% or more.
- Debris particles (silicon, dust, dirt or sand) exceed 25 ppm.
- Iron content exceeds 150-200 ppm.
- Water content is greater than 0.05% (500 ppm).
- The total acid number (TAN) tests indicate a significant level of oxidative break-down of the oil, and a critical reduction in performance; If the TAN number measured changes by more than 5% over the new oil, then an oil change would be recommended.

### 8. Mounting position and oil fill quantity

All NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. ***For additional information, please see the seperate mounting position diagrams and the corresponding oil fill quantity tables for the specified gear unit.***

The gearbox nametag will indicate the mounting position that was provided. ***For mounting orientations other than shown in the mounting position charts, please consult NORD Gear.***

**STOP** *HARMFUL SITUATION* **STOP**

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil-level plug and drain or add additional oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

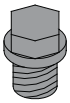
### 9. Oil plug locations

All gear units are assembled with the oil fill-level, oil-drain and vent plugs installed in their proper locations, according to the specified mounting position. All standard plugs are metric and utilize sealing gaskets between the head of the plug and the reducer housing.

### 10. Drain and fill-level plugs

All reducer drain plugs are metric socket head cap screws. For easier identification, it is NORD's standard practice to provide a hex-head screw for the fill-level plug. For ease of draining the used oil from the gear reducer, use the socket head screw located at the lowest part of the gearbox.

Drain Plug



Fill Level Plug

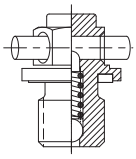
### 11. Vent plug locations

Reducer venting allows for air pressure differences that occur during operation, between the inner space of the reducer and the atmosphere, while ensuring leak-free operation. The AUTOVENT™ is standard for all vented gear units, unless otherwise noted.

**AUTOVENT™** - The AUTOVENT™ helps prevent bearing and gear damage by behaving like a check valve to block the entry of foreign material (water, dust, corrosives, etc.). The breather opens at approximately 2-3 psi during operation and closes tightly as the gearbox cools. This option is perfect for humid conditions and wash-down environments, helping to maintain proper oil cleanliness, and reducing foaming and oxidation. NORD may choose to offer one of two style options as shown in Figure 1. The Type 2 AUTOVENT™ comes closed upon delivery with a transportation sealing plug (see Warning).

**Figure 1 AUTOVENT™ Types**

Type 1

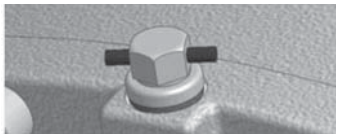


Type 2 with transportation plug

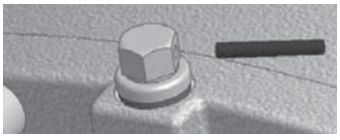
**Open Vent** - An optional open vent can be supplied by NORD. The open vent comes closed upon delivery with a transportation sealing plug (see Warning).

⚠ *WARNING* ⚠

To prevent build-up of excessive pressure, sealed vents must be activated as shown prior to gear unit start up.



Sealed vent



Activated vent

**Filtered Vent** - NORD may offer an optional filtered vent, which allows gases to permeate, but does not allow dust and debris to pass through the vent.

# MINICASE® (SM SERIES) WORM GEAR LUBRICATION GUIDELINES



### 1. Importance of proper gearbox lubrication

Proper gearbox lubrication is essential in order to reduce friction, heat, and component wear. Lubricants reduce heat and wear by inserting a protective "fluid boundary" between mating parts and preventing direct metal to metal contact. Lubricants also help prevent corrosion and oxidation, minimize foam, improve heat transfer, optimize reducer efficiency, absorb shock loads and reduce noise.

### 2. Maintenance free design

MINICASE® (SM series) worm gear reducers are designed to be maintenance-free and are supplied completely sealed. They are factory oil-filled with a pre-determined oil fill amount in accordance to the specified reducer size and mounting position. The synthetic lubrication used is suitable for the life of the product so the MINICASE™ is inherently maintenance free.

### 3. Standard oil type

The standard factory oil fill for MINICASE® (SM) worm gear reducers is ISO viscosity VG synthetic hydrocarbon/polyalphaolefin (SHC/PAO oil) food grade oil suitable for NSF-H1 incidental contact and is a factory stocked lubricant. Food grade oil suitable for NSF-H1 incidental contact is a factory stocked option.

See user manual U11040 for specific information and for optional MINICASE® (SM) worm lubrication types and options.

**HARMFUL SITUATION**

In worm gears avoid using extreme pressure (EP) gear oils containing sulfur-phosphorous chemistries; these additives can react adversely with bronze worm gears, and accelerate wear.

### 4. Efficiency

It is important to consider the following, when using worm gears.

- Worm gears reach their peak rated efficiency, after they undergo a natural run-in process (up to 25 hours operating time at maximum rated load). Catalog published power and torque figures are based upon the rated efficiency after the run-in is complete.
- Worm gears have naturally lower startup efficiencies compared to operating efficiencies. As input speed increases the enhanced hydrodynamic effects of the oil result in less tooth friction and increased worm gear efficiency.

**IMPORTANT NOTE**

***Worm gear reducers applied in cold temperature service***, may require increased motor power for the following reasons:

- Lower operating temperatures, cause lubrication viscosity to increase in both the gearbox and in the moving areas of the driven machine.
- Worm-gears have naturally lower start-up efficiencies compared to operating efficiencies.
- In extreme cases, one might need to consider increasing the motor power and/or lowering the oil viscosity.

### 5. Maximum oil sump temperature limit

To prevent reducer overheating, the reducer's maximum oil sump temperature limit must not be exceeded for prolonged periods of operation (up to 3 hours continuous operation depending upon reducer size).

| Oil Type | Maximum Oil Temperature Limit | |
|---|---|---|
| | NORD | AGMA 9005-D94 |
| Synthetic | 105°C (220°F) | 107°C (225°F) |

**IMPORTANT NOTE**

***Use caution when specifying gear reducers for high temperature service.*** If there is concern about exceeding the allowable safe operating temperatures, please consult NORD to discuss alternatives.

# MINICASE® (SM SERIES) WORM GEAR LUBRICATION GUIDELINES

### 6. Oil Viscosity

The viscosity rating determines the operating oil's resistance to shear under load conditions. Some important viscosity considerations include the following:

- Lightly loaded gears require lower viscosity oils than highly loaded gears.
- Lower viscosity will provide thin oil film, lower friction, higher mechanical efficiency, and better heat removal conditions.
- Higher viscosity will provide thicker oil film, and better resistance to sliding wear, scuffing wear, and galling at high pressure.
- Higher operating temperatures will cause a reduction in viscosity and lower operating temperatures, cause an increase in viscosity or a thickening of the oil.

The standard oil-fill is considered acceptable for most applications. In certain situations an oil viscosity change may be beneficial.

- If the gear unit is exposed to frequent high load conditions. A higher viscosity oil will have a higher film thickness offering better overall resistance to oil shear, sliding wear and scuffing wear in gears and roller element bearings.
- An oil viscosity correction or lubrication change may improve the overall performance when operating the gear unit at very low or high ambient temperature conditions.

*IMPORTANT NOTE*

The user should consult with their primary lubrication supplier before considering changes in oil type or viscosity.

### 7. Viscosity Index

Viscosity index helps quantify the rate of oil viscosity change with respect to temperature changes. Oils with a reasonably high viscosity index tend to be more stable in a changing temperature environment. The ability of an oil to maintain a small viscosity differential over the operating range of the gearbox provides a more consistent lubricating film and better wear performance.

Synthetic oils typically have a higher viscosity index than mineral oils and polyglycol oils tend to have an exceptionally high viscosity index compared to other synthetic oils like polyalphaolefin or ester based products.

# MINICASE® (SMI/SMID) WORM GEAR LUBRICATION GUIDELINES



## 1. Importance of proper gearbox lubrication

Proper gearbox lubrication is essential in order to reduce friction, heat, and component wear. Lubricants reduce heat and wear by inserting a protective "fluid boundary" between mating parts and preventing direct metal to metal contact. Lubricants also help prevent corrosion and oxidation, minimize foam, improve heat transfer, optimize reducer efficiency, absorb shock loads and reduce noise.

## 2. Factory Oil-Filled / Maintence-Free

NORD modular worm gear units are inherently maintence-free, factory oil filled, and supplied with a high-quality, long-life, synthetic oil which is intend to be suitable for the life of the gear unit.

MINICASE® (SMI/SMID) worm gear units are assembled at the factory from stocked component parts. They are filled at time of assembly in accordance to the specified reducer mounting position. See user manuals U13150 and U13250 for more info.

## 3. Standard Oil Types

MINICASE® (SMI/SMID) worm gear units are factory filled with synthetic poly glycol oil. Food-grade polyglycol oil is optional. The specific oil type and viscosity grade are displayed on the reducer nameplate. See user manual 11050 for specific MINICASE® (SMI/SMID) worm lubrication types and options.

**STOP** *HARMFUL SITUATION* **STOP**

In worm gears avoid using extreme pressure (EP) gear oils containing sulfur-phosphorous chemistries; these additives can react adversely with bronze worm gears, and accelerate wear.

## 4. Efficiency

It is important to consider the following, when ordering worm gears.

- Worm gears reach their peak rated efficiency, after they undergo a natural run-in process (up to 25 hours operating time at maximum rated load). Catalog published power and torque figures are based upon the rated efficiency after the run-in is complete.
- Worm gears have naturally lower startup efficiencies compared to operating efficiencies. As input speed increases the enhanced hydrodynamic effects of the oil result in less tooth friction and increased worm gear efficiency.

*IMPORTANT NOTE*

***Worm gear reducers applied in cold temperature service***, may require increased motor power for the following reasons:

- Lower operating temperatures, cause lubrication viscosity to increase in both the gearbox and in the moving areas of the driven machine.
- Worm-gears have naturally lower start-up efficiencies compared to operating efficiencies.
- In extreme cases, one might need to consider increasing the motor power and lowering the oil viscosity

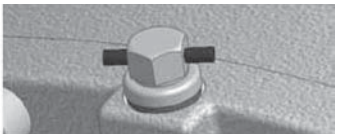
## 5. Optional Vent Kits

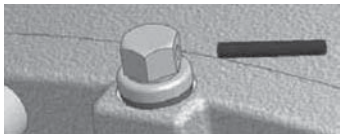
MINICASE® (SMI/SMID) worm gear units are designed to operate sealed or vented. As a standard the modular worm gear units are factory oil filled and supplied with oil plugs in the housing, making vent plugs optional. See user manual U14750.

NORD can supply an AUTOVENT™ or an open vent with each gear unit size. If a vent is desired the type must be specified at the time of order. Reducer vents are sealed with a transportation plug that must be removed prior to gear unit start-up.

| Type | Transportation Seal | Installation | Part Number |
|---|---|---|---|
| **AUTOVENT™** | Included | Factory or Field site | 66093510 |
| **Open Vent** | None | Field Only | 60693500 |
| **Open Vent** | Included | Factory or Field site | 22008004 (vent)<br>25308120 (gasket) |

**Unless noted by a seperate part number, vent kits include the housing gasket**





***WARNING***

To prevent build-up of excessive pressure, sealed vents must be activated as shown prior to gear unit start-up.

## 6. AUTOVENT™

The AUTOVENT™ helps prevent bearing and gear damage by behaving like a check valve to block the entry of foreign material (water, dust, corrosives, etc.). The breather opens at approximately 2-3 psi during operation and closes tightly as the gearbox cools. This option is perfect for humid conditions and wash-down environments, helping to maintain proper oil cleanliness, while reducing foaming and oxidation.

## 7. Open Vent

A typical gearbox industry open vent option can also be supplied by NORD. This option allows free exchange of air and does not build-up any back pressure inside the gear unit. This option is ideal for many operating conditions where the geared product is used in relatively clean and moisture-free environment.

### 8. When to Use a Sealed or a Vented Unit

There are many conditions that should be considered when deciding whether to use a sealed or vented unit.

1. If the duty cycle is intermittent, the run times are short, and any build-up of internal pressure or temperature is relatively low, the sealed unit option may be used.
2. If running continuous and under moderate to high load conditions, worm gears can generate higher operating temperatures and a build-up of internal pressure. In these instances a vent is strongly recommended. Consult NORD if operation at high load conditions is required.
3. If running continuous at 4-pole electric motor speeds (1800 rpm at 60 Hz) or higher, then a vent option is usually recommended. Consult NORD if operation at higher speeds is required.
4. Radial shaft seals produce a hydrodynamic pumping action to help push lubricant back into the gear unit, causing a small amount of ingested air and a small pressure increase (1-2 psi) that does not normally require a reducer vent; however when combined with continuous operation under high load (Condition 2), additional operating pressures will result and a vent should be used.
5. When the environment is contaminated with water, dirt, or other objects that may be ingested into the breather, increased wear of bearings, gearing, and lubrication breakdown can result. In these instances the sealed option or an AUTOVENT™ should be considered.

### 9. Maximum Oil Sump Temperature Limit

To prevent reducer overheating, the reducer's maximum oil-sump temperature limit must not be exceeded for prolonged periods of operation.

| Oil Type | Maximum Oil Temperature Limit | |
|---|---|---|
| | NORD | AGMA 9005-D94 |
| Synthetic | 105°C (220°F) | 107°C (225°F) |

**IMPORTANT NOTE**

Use caution when specifying gear reducers for high temperature service. If there is concern about exceeding the safe operating temperature limit, please consult NORD to discuss alternatives.

### 10. Oil Viscosity

The viscosity rating determines the operating oil's resistance to shear under load conditions. Some important viscosity considerations include the following:

- Lightly loaded gears require lower viscosity oils than highly loaded gears.
- Lower viscosity will provide thin oil film, lower friction, higher mechanical efficiency, and better heat removal conditions.
- Higher viscosity will provide thicker oil film, and a better resistance to sliding wear, scuffing wear, and galling at high pressure.
- Higher operating temperatures will cause a reduc-tion in viscosity and lower operating temperatures, cause an increase in viscosity or a thickening of the oil.

The standard oil-fill is considered acceptable for most applications. In certain situations an oil viscosity change may be beneficial.

- If the gear unit is exposed to frequent high load conditions. A higher viscosity oil will have a higher film thickness offering better overall resistance to oil shear, sliding wear and scuffing wear in gears and roller element bearings.
- An oil viscosity correction or lubrication change may improve the overall performance when operating the gear unit at very low or high ambient temperature conditions.

**IMPORTANT NOTE**

The user should consult with their primary lubrication supplier before considering changes in oil type or viscosity.

### 11. Viscosity Index

Viscosity index helps quantify the rate of oil viscosity change with respect to temperature changes. Oils with a reasonably high viscosity index tend to be more stable in a changing temperature environment. The ability of an oil to maintain a small viscosity differential over the operating range of the gearbox provides a more consistent lubricating film and better wear performance.

Synthetic oils typically have a higher viscosity index than mineral oils and polyglycol oils tend to have an exceptionally high viscosity index compared to other synthetic oils like polyalphaolefin or ester based products.

# FLEXBLOC™ (SI/SID SERIES) WORM GEAR LUBRICATION GUIDELINES



## 1. Importance of Proper Lubrication

Proper gearbox lubrication is essential in order to reduce friction, heat, and component wear. Lubricants reduce heat and wear by inserting a protective "fluid boundary" between mating parts and preventing direct metal to metal contact. Lubricants also help prevent corrosion and oxidation, minimize foam, improve heat transfer, optimize reducer efficiency, absorb shock loads and reduce noise.

## 2. Factory Oil-Filled / Maintence-Free

NORD modular worm gear units are inherently maintence-free, factory oil filled, and supplied with a high-quality, long-life, synthetic oil which is intend to be suitable for the life of the gear unit.

FLEXBLOC™ SI worm gear units are filled at time of assembly to a universal oil fill, allowing for many mounting position possibilities. See user manual U13300.

## 3. Standard oil type

FLEXBLOC™ (SI/SID) worm gear units are factory filled with synthetic poly glycol oil. Food-grade polyglycol oil is optional. The specific oil type and viscosity grade are displayed on the reducer nameplate. See user manual 11060 for specific FLEXBLOC™ (SI/SID) worm lubrication types and options.

**STOP** *HARMFUL SITUATION* **STOP**

In worm gears avoid using extreme pressure (EP) gear oils containing sulfur-phosphorous chemistries; these additives can react adversely with bronze worm gears, and accelerate wear.

## 4. Efficiency

It is important to consider the following, when ordering worm gears.

- Worm gears reach their peak rated efficiency, after they undergo a natural run-in process (up to 25 hours operating time at maximum rated load). Catalog published power and torque figures are based upon the rated efficiency after the run-in is complete.
- Worm gears have naturally lower startup efficiencies compared to operating efficiencies. As input speed increases the enhanced hydrodynamic effects of the oil result in less tooth friction and increased worm gear efficiency.

*IMPORTANT NOTE*

***Worm gear reducers applied in cold temperature service***, may require increased motor power for the following reasons:

- Lower operating temperatures, cause lubrication viscosity to increase in both the gearbox and in the moving areas of the driven machine.
- Worm-gears have naturally lower start-up efficiencies compared to operating efficiencies.
- In extreme cases, one might need to consider increasing the motor power and lowering the oil viscosity

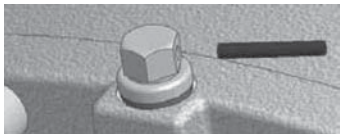
## 5. Optional Vent Kits

FLEXBLOC™ (SI) worm gear units are designed to operate sealed or vented. As a standard the modular worm gear units are factory oil filled and supplied with oil plugs in the housing, making vent plugs optional. See user manual U14800 for vent locations.

NORD can supply an AUTOVENT™ or an open vent with each gear unit size. If a vent is desired the type must be specified at the time of order. Reducer vents are sealed with a transportation plug that must be removed prior to gear unit start-up.

| Type | Transportation Seal | Installation | Part Number |
|---|---|---|---|
| **AUTOVENT™** | Included | Factory or Field site | 66093510 |
| **Open Vent** | None | Field Only | 60693500 |
| **Open Vent** | Included | Factory or Field site | 22008004 (vent)<br>25308120 (gasket) |

**Unless noted by a seperate part number, vent kits include the housing gasket**



**WARNING**

To prevent build-up of excessive pressure, sealed vents must be activated as shown prior to gear unit start-up.

## 6. AUTOVENT™

The AUTOVENT™ helps prevent bearing and gear damage by behaving like a check valve to block the entry of foreign material (water, dust, corrosives, etc.). The breather opens at approximately 2-3 psi during operation and closes tightly as the gearbox cools. This option is perfect for humid conditions and wash-down environments, helping to maintain proper oil cleanliness, while reducing foaming and oxidation.

## 7. Open Vent

A typical gearbox industry open vent option can also be supplied by NORD. This option allows free exchange of air and does not build-up any back pressure inside the gear unit. This option is ideal for many operating conditions where the geared product is used in relatively clean and moisture-free environment.

# FLEXBLOC™ (SI/SID SERIES) WORM GEAR LUBRICATION GUIDELINES

### 8. When to Use a Sealed or a Vented Unit

There are many conditions that should be considered when deciding whether to use a sealed or vented unit.

1. If the duty cycle is intermittent, the run times are short, and any build-up of internal pressure or temperature is relatively low, the sealed unit option may be used.
2. If running continuous and under moderate to high load conditions, worm gears can generate higher operating temperatures and a build-up of internal pressure. In these instances a vent is strongly recommended. Consult NORD if operation at high load conditions is required.
3. If running continuous at 4-pole electric motor speeds (1800 rpm at 60 Hz) or higher, then a vent option is usually recommended. Consult NORD if operation at higher speeds is required.
4. Radial shaft seals produce a hydrodynamic pumping action to help push lubricant back into the gear unit, causing a small amount of ingested air and a small pressure increase (1-2 psi) that does not normally require a reducer vent; however when combined with continuous operation under high load (Condition 2), additional operating pressures will result and a vent should be used.
5. When the environment is contaminated with water, dirt, or other objects that may be ingested into the breather, increased wear of bearings, gearing, and lubrication breakdown can result. In these instances the sealed option or an AUTOVENT™ should be considered.

### 9. Maximum Oil Sump Temperature Limit

To prevent reducer overheating, the reducer's maximum oil-sump temperature limit must not be exceeded for prolonged periods of operation.

| Oil Type | Maximum Oil Temperature Limit | |
|---|---|---|
| | NORD | AGMA 9005-D94 |
| Synthetic | 105°C (220°F) | 107°C (225°F) |

**IMPORTANT NOTE**

Use caution when specifying gear reducers for high temperature service. If there is concern about exceeding the allowable safe operating temperatures, please consult NORD to discuss alternatives.

### 10. Oil Viscosity

The viscosity rating determines the operating oil's resistance to shear under load conditions. Some important viscosity considerations include the following:

- Lightly loaded gears require lower viscosity oils than highly loaded gears.
- Lower viscosity will provide thin oil film, lower friction, higher mechanical efficiency, and better heat removal conditions.
- Higher viscosity will provide thicker oil film, and better resistance to sliding wear, scuffing wear, and galling at high pressure.
- Higher operating temperatures will cause a reduction in viscosity and lower operating temperatures, cause an increase in viscosity or a thickening of the oil.

The standard oil-fill is considered acceptable for most applications. In certain situations an oil viscosity change may be beneficial.

- If the gear unit is exposed to frequent high load conditions. A higher viscosity oil will have a higher film thickness offering better overall resistance to oil shear, sliding wear and scuffing wear in gears and roller element bearings.
- An oil viscosity correction or lubrication change may improve the overall performance when operating the gear unit at very low or high ambient temperature conditions.

**IMPORTANT NOTE**

The user should consult with their primary lubrication supplier before considering changes in oil type or viscosity.

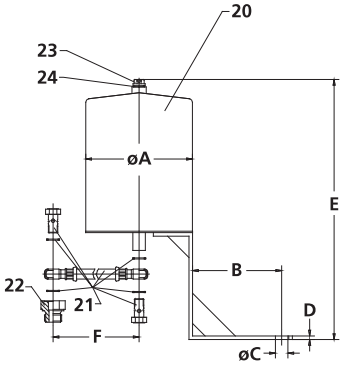
### 11. Viscosity Index

Viscosity index helps quantify the rate of oil viscosity change with respect to temperature changes. Oils with a reasonably high viscosity index tend to be more stable in a changing temperature environment. The ability of an oil to maintain a small viscosity differential over the operating range of the gearbox provides a more consistent lubricating film and better wear performance.

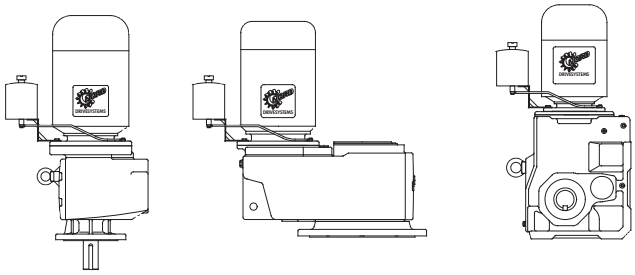
Synthetic oils typically have a higher viscosity index than mineral oils and polyglycol oils tend to have an exceptionally high viscosity index compared to other synthetic oils like polyalphaolefin or ester based products.

## Installation Instructions

Sometimes NORD requires the use of an oil expansion chamber when the motor or reducer input is mounted vertically. Consult your NORD catalog for additional information and application considerations.




1. Secure the gear reducer in the proper mounting position for the application and remove the vent plug from the gear reducer. The hose assembly kit (21) will be fitted to the reducer using the housing port provided.
2. When using the larger 2.7 and 5.4 liter chambers, screw the adapter fitting (22) into the reducer housing port. Use all sealing gaskets provided.
3. Mount the overflow tank (20) at the highest location from the reducer, as permitted by the hose assembly kit (21). Typical mounting configurations are represented below. Use one of the input cover's mounting bolts, to mount the chamber support leg to the reducer.



4. Be sure to use the proper fittings. Assemble one end of the vent-hose assembly (21) to bottom of the chamber and one-end to the reducer.
5. Secure the vent-plug (23) and gasket (24) that is supplied with the kit to the top of the expansion chamber.

STOP *HARMFUL SITUATION* STOP

Remove the protective "rubber element" from the supplied vent prior to use so that an open-vent is formed on top of the overflow tank. Avoid using a pressurized AUTOVENT™ breather on the overflow tank since this may create an undesired pressure-vacuum in the overflow tank.

## Expansion Chamber Kit Dimensions & Parts List

**Kit Part Number: 28390390 - 0.7 Liter Oil Expansion Chamber**

| Kit P/N | Ø A | B | Ø C | D | E | F | Units |
|---|---|---|---|---|---|---|---|
| 28390390 (0.7 Liter) | 3.94 | 1.97 | 0.53 | 0.20 | 8.50 | 19.69 | inch |
| | 100 | 50 | 13.5 | 5 | 216 | 500 | mm |

| Item | Part Number | Description |
|---|---|---|
| 20 | 28300390 | Overflow Tank - 0.7 Liter |
| 21 | 28310020 | Flexible Vent Hose Assembly - Includes: Hose, metal gaskets & 2 Hollow Bolts (1 Bolt. - M12 X 1.5 and 1 Pc. - G1/4) |
| 22 | None | Adapter Fitting |
| 23 | 22012004 | Normal Style Vent Plug (M12 X 1.5, DIN 910) |
| 24 | 25312150 | Vent Plug Gasket (12 X 15.5 X 1.5) |

**Kit Part Number: 28390400 - 2.7 Liter Oil Expansion Chamber**

| Kit P/N | Ø A | B | Ø C | D | E | F | Units |
|---|---|---|---|---|---|---|---|
| 28390400 (2.7 Liter) | 5.91 | 4.92 | 0.69 | 0.20 | 15.22 | 27.56 | inch |
| | 150 | 125 | 17.5 | 5 | 386.5 | 700 | mm |

| Item | Part Number | Description |
|---|---|---|
| 20 | 28300400 | Overflow Tank - 2.7 Liter |
| 21 | 28310030 | Flexible Vent Hose Assy - Includes: Hose, metal gaskets & 2 Hollow Bolts (2 Pcs. - G1/4) |
| 22 | 22024030 | Adapter Fitting (M24 X 1.5 to G1/4) |
| 23 | 22012004 | Normal Style Vent Plug (M12 X 1.5, DIN 910) |
| 24 | 25312150 | Vent Plug Gasket (12 X 15.5 X 1.5) |

**Kit Part Number: 28390410 - 5.4 Liter Oil Expansion Chamber**

| Kit P/N | Ø A | B | Ø C | D | E | F | Units |
|---|---|---|---|---|---|---|---|
| 28390410 (5.4 Liter) | 7.09 | 3.54 | 0.69 | 0.20 | 15.18 | 31.50 | inch |
| | 180 | 90 | 17.5 | 5 | 385.5 | 800 | mm |

| Item | Part Number | Description |
|---|---|---|
| 20 | 28300410 | Overflow Tank - 5.4 Liter |
| 21 | 28310040 | Flexible Vent Hose Assy - Includes: Hose, metal gaskets & 2 Hollow Bolts (2 Pcs. - G1/4) |
| 22 | 22030030 | Adapter Fitting (M30 X 1.5 to G1/4) |
| 23 | 22012004 | Normal Style Vent Plug (M12 X 1.5, DIN 910) |
| 24 | 25312150 | Vent Plug Gasket (12 X 15.5 X 1.5) |

**Please see page 2 for gearbox compatability**

**Expansion Chamber Compatability Chart**

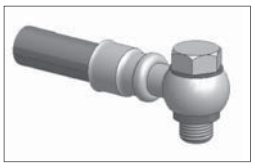
| Helical In-line | NORDBLOC™ | NORDBLOC.1™ | Clincher™ | Helical-Bevel | Part Number | [lb] |
|---|---|---|---|---|---|---|
| SK 42/43<br>SK 52/53<br>SK 63 | SK472/473<br>SK572/573<br>SK672/673<br>SK772/773<br>SK872/873<br>SK972/973 | SK572.1/573.1*<br>SK672.1/673.1* | SK 4282/4382<br>SK 5282/5382<br>SK 6382 | SK 9042.1/9043.1<br>SK 9052.1/9053.1 | 28390390 | 11.0 |
| SK 62<br>SK 72/73 | | | SK 6282<br>SK 7282/7382 | SK 9072.1<br>SK 9082.1 | 28390400 | 13.2 |
| SK 82/83<br>SK 92/93<br>SK 102/103 | | | SK 8282/8382 | SK 9086.1<br>SK 9092.1<br>SK 9096.1 | 28390410 | 15.4 |

* Need to additionally order part #28390380 which is sub-assembly shown below.

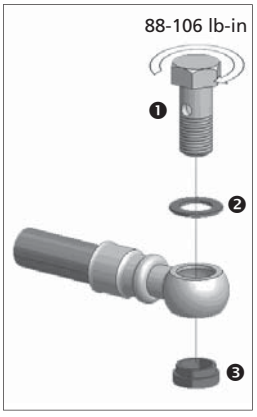
**Sub-Assembly P/N 28390380 for NORDBLOC®.1 gear units with M10x1 air vent.**

| ❶ | ❷ | ❸ | ❹ |
|---|---|---|---|
|  |  |  |  |
| 1x DIN 7643<br>M10x1<br>283 00380 | 1x DIN 7603A Cu<br>10x16x1<br>253 10166 | 1x Ring<br>10x14x5<br>283 00370 | 1xDIN<br>9021 ø8,4<br>227 10840 |

**Assembly of the expansion unit at the gear unit. Types SK 572.1/573.1, SK 672.1/673.1**

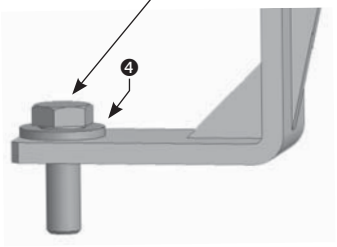


Vent Hose Sub-Assembly

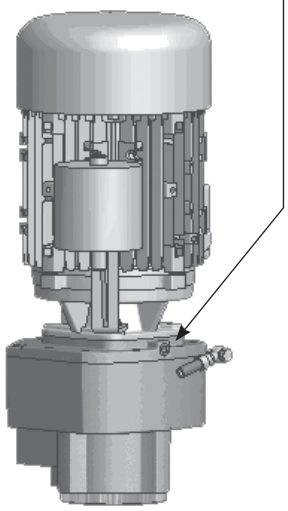



❹ For motor sizes 63, 71, 80, 90, 100 & 112

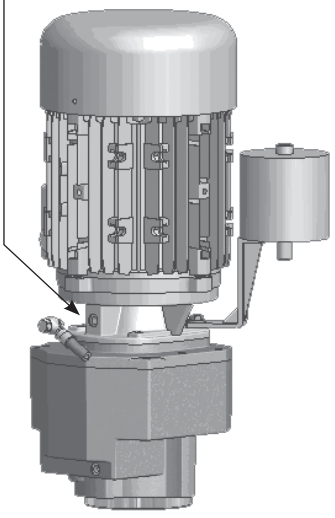
• Motor attachment bolt




Motor Sizes 63, 71 & 80:
Assembly vent-hose to port as shown.



Motor Sizes 90,100 & 112:
Assembly vent-hose to port as shown.



# HELICAL & BEVEL REDUCER LUBRICATION TYPES



## Lubrication Tables – Helical and Bevel Gear Units

**Standard Oil Lubricants**

| ISO Viscosity | Oil Type | Ambient Temperature Range | Manufacturer Brand/Type | Notes |
|---|---|---|---|---|
| VG220 | MIN-EP | 0 to 40°C (32 to 104°) | Mobilgear 600XP220 | ♦❶ |
| | PAO | -35 to 60°C (-31 to 140°F) | Mobil SHC630 | ♦❷ |
| | FG | -5 to 40°C (23 to 104°F) | Fuchs FM220 | ♦ |

**Optional Oil Lubricants**

| ISO Viscosity | Oil Type | Ambient Temperature Range | Manufacturer Brand/Type | Notes |
|---|---|---|---|---|
| VG460 | PAO | -35 to 80°C (-31 to 176°F) | Mobil SHC 634 | - |
| | FG-PAO | -35 to 80°C (-31 to 176°F) | Mobil SHC Cibus 460 | - |
| VG220 | FG-PAO | -35 to 60°C (-31 to 140°F) | Mobil SHC Cibus 220 | - |
| VG150 | PAO | -35 to 25°C (-31 to 77°F) | Mobil SHC629 | - |

**Grease Options (applied to greased bearings and seal cavities)**

| NLGI Grade | Grease Type/Thickener | Ambient Temperature Range | Manufacturer Brand/Type | Notes |
|---|---|---|---|---|
| NLGI 2 | Standard (Li-Complex) | -30 to 60°C (-22 to 140°F) | Mobil Grease XHP222 | ♦❶ |
| | High Temp (Polyurea) | -40 to 80°C (-40 to 176°F) | Mobil / Polyrex EP 2 | ♦❷ |
| | Food-Grade (Polyurea) | -30 to 40°C (-22 to 104°F) | Mobil SHC Polyrex 222 | ♦ |

♦ Stocked Lubricants

❶ Standard product on serviceable gear units

❷ Standard product on maintenance free gear units

### *IMPORTANT NOTES*

- The "Ambient Temperature" is intended to be an operation guideline based upon the typical properties of all the lubricant. The viscosity and other properties of the lubricant change based upon load, speed, ambient conditions, and reducer operating temperatures. The user should consult with their lubrication supplier & NORD gear before considering changes in oil type or viscosity.
- To prevent reducer overheating, observe the maximum operating oil temperature limits:
  Mineral Oil: 80-85 °C (176 – 180 °F).
  Synthetic Oil: 105 °C (225 °F).
- In the following instances, please consult NORD for specific recommendations:
  - √ Gear units will operate in high ambient temperature conditions exceeding 40 °C (104 °F).
  - √ Gear units will operate in cold ambient temperature conditions approaching 0 °C (32 °F) or lower.
  - √ Lower than an ISO VG100 viscosity oil is being considered for a cold-temperature service.
  - √ Fluid grease is required for lubricating the gear unit.
- Observe the general lubrication guidelines outlined in user manual U10750.

**Oil Formulation Codes**

MIN-EP - Mineral Oil with EP Additive
PAO-EP - Synthetic Polyalphaolefin Oil with EP Additive
PAO - Synthetic Polyalphaolefin Oil
PG - Synthetic Polyglycol Oil
FG - Food-Grade Oil
FG-PAO - Food-Grade, Synthetic Poyalphaolefin Oil
FG-PG - Food-Grade, Synthetic Polyglycol Oil

**Lubrication Notes**

- Avoid using (EP) gear oils in worm gears that contain sulfur-phosphorous chemistries, as these additives can react adversely with bronze worm gears and accelerate wear.
- Food grade lubricants must be in compliance with FDA 212 CFR 178.3570 and qualify as a NSF-H1 lubricant. Please consult with lubrication manufacturer for more information.
- When making a lubrication change, check with the lubrication supplier to assure compatibility and to obtain recommended cleaning or flushing procedures.
- Do not to mix different oils with different additive packages or different base oil formulation types. Polyglycol (PG) oils are not miscible with other oil types and should never be mixed with mineral oil or polyalphaolefin (PAO) synthetic oil.

# HELICAL & BEVEL REDUCER LUBRICATION TYPES

**Oil Cross-reference Chart**

| ISO Viscosity | Oil Type | Ambient Temperature Range | Mobil | Shell | Castrol | FUCHS | KLÜBER LUBRICATION |
|---|---|---|---|---|---|---|---|
| VG150 | MIN-EP | 0 to 25°C (32 to 77°F) | Mobilgear 600XP150 | Omala 150 | Alpha SP150 | Renolin EP150 | Klüberoil GEM 1-150N |
| | PAO-EP | -30 to 25 °C (-22 to 77 °F) | Mobilgear SHC150 | Omala HD 150 | Alphasyn EP150 | Gearmaster SYN150/NA | Klübersynth EG 4-150 |
| | PAO | -30 to 25°C (-22 to 77°F) | Mobil SHC629 | Omala RL 150 | Alphasyn T150 | N/A | Klübersynth GEM 4-150N |
| | PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 150 | Tivela S150 | Alphasyn PG150 | Renolin PG150 | Klübersynth GH 6-150 |
| | FG | 0 to 25°C (32 to 77°F) | Mobil DTE FM 150 | N/A | N/A | N/A | N/A |
| | FG-PAO | -15 to 25°C (5 to 77°F) | Mobil SHC Cibus 150 | N/A | N/A | Cassida GL150 | Klüberoil 4 UH 1-150N |
| | FG-PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 150 | N/A | N/A | N/A | Klübersynth UH1 6-150 |
| VG220 | MIN-EP | 0 to 40°C (32 to 104°) | Mobilgear 600XP220 | Omala 220 | Alpha SP220 | Renolin EP220 | Klüberoil GEM 1-220N |
| | PAO-EP | -30 to 60 °C (-22 to 140 °F) | Mobilgear SHC220 | Omala HD220 | Alphasyn EP220 | Gearmaster SYN220/NA | Klübersynth EG 4-220 |
| | PAO | -30 to 60°C (-22 to 140°F) | Mobil SHC630 | Omala RL220 | Alphasyn T220 | N/A | Klübersynth GEM 4-220N |
| | PG | -25 to 60°C (-13 to 140°F) | Mobil Glygoyle 220 | Tivela S220 | Alphasyn PG220 | Renolin PG220 | Klübersynth GH 6-220 |
| | FG | 0 to 40°C (32 to 104°F) | Mobil DTE FM 220 | N/A | N/A | Fuchs FM220 | N/A |
| | FG-PAO | -25 to 60°C (-13 to 140°F) | Mobil SHC Cibus 220 | N/A | N/A | Cassida GL220 | Klüberoil 4 UH 1-220N |
| | FG-PG | -25 to 60°C (-13 to 140°F) | Mobil Glygoyle 220 | N/A | N/A | Cassida WG220 | Klübersynth UH1 6-220 |
| VG460 | MIN-EP | 0 to 40°C (32 to 104°F) | Mobilgear 600XP460 | Omala 460 | Alpha SP460 | Renolin EP460 | Klüberoil GEM 1-460N |
| | PAO-EP | -20 to 80°C (-4 to 176°F) | Mobilgear SHC460 | Omala HD460 | Alphasyn EP460 | Gearmaster SYN460/NA | Klübersynth EG 4-460 |
| | PAO | -20 to 80°C (-4 to 176°F) | Mobil SHC 634 | Omala RL460 | Alphasyn T460 | N/A | Klübersynth GEM 4-460N |
| | PG | -20 to 80°C (-4 to 176°F) | Mobil Glygoyle 460 | Tivela S460 | Alphasyn PG460 | N/A | Klübersynth GH 6-460 |
| | FG | 0 to 40°C (32 to 104°F) | Mobil DTE FM460 | N/A | N/A | Fuchs FM460 | N/A |
| | FG-PAO | -20 to 80°C (-4 to 176°F) | Mobil SHC Cibus 460 | N/A | N/A | Cassida GL460 | Klüberoil 4 UH 1-460N |
| | FG-PG | -20 to 80°C (-4 to 176°F) | Mobil Glygoyle 460 | N/A | N/A | Cassida WG460 | Klübersynth UH1 6-460 |

Low-end service temperature limit may vary for a specific lubricant; Please also see the important notes on Page 1.

# HELICAL-WORM REDUCER LUBRICATION TYPES



## Lubrication Tables – Helical Worm Gear Units

**Standard Oil Lubricants**

| ISO Viscosity | Oil Type | Ambient Temperature Range | Manufacturer Brand/Type | Notes |
|---|---|---|---|---|
| **VG680** | PAO | 0 to 60°C (32 to 140°F) | Mobil SHC636 | ♦ |

**Optional Oil Lubricants**

| ISO Viscosity | Oil Type | Ambient Temperature Range | Manufacturer Brand/Type | Notes |
|---|---|---|---|---|
| **VG460** | PAO | 0 to50°C (32 to 122°F) | Mobil SHC 634 | - |
| | FG-PAO | 0 to50°C (32 to 122°F) | Mobil SHC Cibus 460 | - |

**Grease Options (applied to greased bearings and seal cavities)**

| NLGI Grade | Grease Type/Thickener | Ambient Temperature Range | Manufacturer Brand/Type | Notes |
|---|---|---|---|---|
| **NLGI 2** | Standard (Li-Complex) | -30 to 60°C (-22 to 140°F) | Mobil Grease XHP222 | ♦ |
| | High Temp (Polyurea) | -40 to 80°C (-40 to 176°F) | Mobil / Polyrex EP 2 | ♦ |
| | Food-Grade (Polyurea) | -30 to 40°C (-22 to 104°F) | Mobil SHC Polyrex 222 | ♦ |

♦ **Stocked Lubricants**

### *IMPORTANT NOTES*

- The "Ambient Temperature" is intended to be an operation guideline based upon the typical properties of all the lubricant. The viscosity and other properties of the lubricant change based upon load, speed, ambient conditions, and reducer operating temperatures. The user should consult with their lubrication supplier & NORD Gear before considering changes in oil type or viscosity.
- To prevent reducer overheating, observe the maximum operating oil temperature limits:

  Synthetic Oil: 105 °C (225 °F).
- In the following instances, please consult NORD for specific recommendations:

√ Gear units will operate in high ambient temperature conditions exceeding 40 °C (104 °F).
√ Gear units will operate in cold ambient temperature conditions approaching 0 °C (32 °F) or lower.
√ Lower than an ISO VG100 viscosity oil is being considered for a cold-temperature service.
√ Fluid grease is required for lubricating the gear unit.

- Observe the general lubrication guidelines outlined in user manual U10770.

**Oil Formulation Codes**

PAO - Synthetic Polyalphaolefin Oil
PG - Synthetic Polyglycol Oil
FG-PAO - Food-Grade, Synthetic Poyalphaolefin Oil
FG-PG - Food-Grade, Synthetic Polyglycol Oil

**Lubrication Notes**

- Avoid using (EP) gear oils in worm gears that contain sulfur-phosphorous chemistries, as these additives can react adversely with bronze worm gears and accelerate wear.
- Food grade lubricants must be in compliance with FDA 212 CFR 178.3570 and qualify as a NSF-H1 lubricant. Please consult with lubrication manufacturer for more information.
- When making a lubrication change, check with the lubrication supplier to assure compatibility and to obtain recommended cleaning or flushing procedures.
- Do not to mix different oils with different additive packages or different base oil formulation types. Polyglycol (PG) oils are not miscible with other oil types and should never be mixed with mineral oil or polyalphaolefin (PAO) synthetic oil.

# HELICAL-WORM REDUCER LUBRICATION TYPES

**Oil Cross-reference Chart**

| ISO Viscosity | Oil Type | Ambient Temperature Range | Mobil | Shell | Castrol | FUCHS | KLÜBER LUBRICATION |
|---|---|---|---|---|---|---|---|
| VG 100 | PAO | -35 to 25°C (-31 to 77°F) | Mobil SHC627 | N/A | N/A | N/A | Klübersynth GEM 4-100N |
| | PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 100 | N/A | N/A | N/A | Klübersynth GH 6-100 |
| | FG-PAO | -35 to 25°C (-31 to 77°F) | Mobil SHC Cibus 100 | N/A | N/A | N/A | Klüberoil 4 UH 1-100N |
| | FG-PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 100 | N/A | N/A | N/A | Klübersynth UH1 6-100 |
| VG150 | PAO | -35 to 25°C (-31 to 77°F) | Mobil SHC629 | Omala RL 150 | Alphasyn T150 | N/A | Klübersynth GEM 4-150N |
| | PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 150 | Tivela S150 | Alphasyn PG150 | Renolin PG150 | Klübersynth GH 6-150 |
| | FG-PAO | -15 to 25°C (5 to 77°F) | Mobil SHC Cibus 150 | N/A | N/A | Cassida GL150 | Klüberoil 4 UH 1-150N |
| | FG-PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 150 | N/A | N/A | N/A | Klübersynth UH1 6-150 |
| VG220 | PAO | -15 to 40°C (5 to 104°F) | Mobil SHC630 | Omala RL220 | Alphasyn T220 | N/A | Klübersynth GEM 4-220N |
| | PG | -25 to 40°C (-13 to 104°F) | Mobil Glygoyle 220 | Tivela S220 | Alphasyn PG220 | Renolin PG220 | Klübersynth GH 6-220 |
| | FG-PAO | -25 to 40°C (-13 to 104°F) | Mobil SHC Cibus 220 | N/A | N/A | Cassida GL220 | Klüberoil 4 UH 1-220N |
| | FG-PG | -25 to 40°C (-13 to 104°F) | Mobil Glygoyle 220 | N/A | N/A | Cassida WG220 | Klübersynth UH1 6-220 |
| VG460 | PAO | 0 to50°C (32 to 122°F) | Mobil SHC 634 | Omala RL460 | Alphasyn T460 | N/A | Klübersynth GEM 4-460N |
| | PG | 0 to50°C (32 to 122°F) | Mobil Glygoyle 460 | Tivela S460 | Alphasyn PG460 | N/A | Klübersynth GH 6-460 |
| | FG-PAO | 0 to50°C (32 to 122°F) | Mobil SHC Cibus 460 | N/A | N/A | Cassida GL460 | Klüberoil 4 UH 1-460N |
| | FG-PG | 0 to50°C (32 to 122°F) | Mobil Glygoyle 460 | N/A | N/A | Cassida WG460 | Klübersynth UH1 6-460 |
| VG680 | PAO | 0 to 60°C (32 to 140°F) | Mobil SHC636 | Omala RL680 | N/A | N/A | Klübersynth GEM 4-680N |
| | PG | 0 to 60°C (32 to 140°F) | Mobil Glygoyle 680 | Tivela S680 | N/A | N/A | Klübersynth GH 6-680 |
| | FG-PAO | 0 to 60°C (32 to 140°F) | N/A | N/A | N/A | Cassida GL680 | Klüberoil 4 UH1-680N |
| | FG-PG | 0 to 60°C (32 to 140°F) | Mobil Glygoyle 680 | N/A | N/A | Cassida WG680 | Klübersynth UH1 6-680 |

Low-end service temperature limit may vary for a specific lubricant; Please also see the important notes on Page 1.

# MINICASE® (SM SERIES) WORM GEAR LUBRICATION TYPES



## Lubrication Tables – MINICASE® (SM series) Worm Gear Units

**Standard Oil Lubricants**

| ISO Viscosity | Oil Type | Ambient Temperature Range | Manufacturer Brand/Type | Notes |
|---|---|---|---|---|
| **VG680** | PG | -20 to 40°C (-4 to 104°F) | Klübersynth GH 6-680 | ♦ |

**Optional Oil Lubricants**

| ISO Viscosity | Oil Type | Ambient Temperature Range | Manufacturer Brand/Type | Notes |
|---|---|---|---|---|
| **VG680** | FG-PG | -25 to 80°C (-13 to 176°F) | Klübersynth UH1 6-680 | ♦ |

**Grease Options (applied to greased bearings and seal cavities)**

| NLGI Grade | Grease Type/Thickener | Ambient Temperature Range | Manufacturer Brand/Type | Notes |
|---|---|---|---|---|
| **NLGI 2** | High Temp (Polyurea) | -25 to 80°C (-13 to 176°F) | Kluber / Petamo GHY133N | ♦ |
| | Food-Grade (Aluminum Complex) | -25 to 40°C (-13 to 104°F) | Kluber / Klubersynth UH1 14-151 | ♦ |

♦ **Stocked Lubricants**

### *IMPORTANT NOTES*

- Observe the general lubrication guidelines in User Manual U17900.
- Ambient temperature range is a guideline only. The allowed operating temperature range for the gear unit is dependent upon assembly components used, their individual temperature limits, and the actual operating conditions.
- The selected oil type and viscosity is considered appropriate for most applications utilizing the specified NORD gear unit type. Different oil types or viscosity grades may be recommended if the gear unit is exposed to frequent high load conditions or operating under extreme low or high ambient temperature conditions.
- To prevent reducer overheating, observe the maximum operating oil temperature limits:
  Synthetic oil: 105 °C (225 °F).
- Consult NORD for recommendations in the following instances:
  √ The gear unit is exposed to frequent high load conditions.
  √ Ambient temperature conditions exceed 40 °C (104 °F) or approach 0 °C (32 °F) or lower.
  √ Fluid grease is being considered or specified for lubricating the gear unit.
  √ Lower than an ISO VG100 viscosity oil is being considered for a cold-temperature service.

**Oil Formulation Codes**

PAO - Synthetic Polyalphaolefin Oil
PG - Synthetic Polyglycol Oil
FG-PAO - Food-Grade, Synthetic Poyalphaolefin Oil
FG-PG - Food-Grade, Synthetic Polyglycol Oil

### *WARNING*

- Avoid using (EP) gear oils in worm gears that contain sulfur-phosphorous chemistries, as these additives can react adversely with bronze worm gears and accelerate wear.
- Food grade lubricants must be in compliance with FDA 212 CFR 178.3570 and qualify as a NSF-H1 lubricant. Please consult with lubrication manufacturer for more information.
- When making a lubrication change, check with the lubrication supplier to assure compatibility and to obtain recommended cleaning or flushing procedures.
- Do not to mix different oils with different additive packages or different base oil formulation types. Polyglycol (PG) oils are not miscible with other oil types and should never be mixed with mineral or polyaolphaolefin (PAO) oils.

# MINICASE® (SM SERIES) WORM GEAR LUBRICATION TYPES



**Oil Cross-reference Chart**

| ISO Viscosity | Oil Type | Ambient Temperature Range | Mobil | Shell | Castrol | FUCHS | KLÜBER LUBRICATION |
|---|---|---|---|---|---|---|---|
| VG 100 | PAO | -35 to 25°C (-31 to 77°F) | Mobil SHC627 | N/A | N/A | N/A | Klübersynth GEM 4-100N |
| | PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 100 | N/A | N/A | N/A | Klübersynth GH 6-100 |
| | FG-PAO | -30 to 25°C (-22 to 77°F) | Mobil SHC Cibus 100 | N/A | N/A | N/A | Klüberoil 4 UH 1-100N |
| | FG-PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 100 | N/A | N/A | N/A | Klübersynth UH1 6-100 |
| VG150 | PAO | -35 to 25°C (-31 to 77°F) | Mobil SHC629 | Omala RL 150 | Alphasyn T150 | N/A | Klübersynth GEM 4-150N |
| | PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 150 | Tivela S150 | Alphasyn PG150 | Renolin PG150 | Klübersynth GH 6-150 |
| | FG-PAO | -15 to 25°C (5 to 77°F) | Mobil SHC Cibus 150 | N/A | N/A | Cassida GL150 | Klüberoil 4 UH 1-150N |
| | FG-PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 150 | N/A | N/A | N/A | Klübersynth UH1 6-150 |
| VG220 | PAO | -35 to 40°C (-31 to 104°F) | Mobil SHC630 | Omala RL220 | Alphasyn T220 | N/A | Klübersynth GEM 4-220N |
| | PG | -25 to 40°C (-13 to 104°F) | Mobil Glygoyle 220 | Tivela S220 | Alphasyn PG220 | Renolin PG220 | Klübersynth GH 6-220 |
| | FG-PAO | -25 to 40°C (-13 to 104°F) | Mobil SHC Cibus 220 | N/A | N/A | Cassida GL220 | Klüberoil 4 UH 1-220N |
| | FG-PG | -25 to 40°C (-13 to 104°F) | Mobil Glygoyle 220 | N/A | N/A | Cassida WG220 | Klübersynth UH1 6-220 |
| VG460 | PAO | -20 to 40°C (-4 to 104°F) | Mobil SHC 634 | Omala RL460 | Alphasyn T460 | N/A | Klübersynth GEM 4-460N |
| | PG | -20 to 40°C (-4 to 104°F) | Mobil Glygoyle 460 | Tivela S460 | Alphasyn PG460 | N/A | Klübersynth GH 6-460 |
| | FG-PAO | -5 to 40°C (23 to 104°F) | Mobil SHC Cibus 460 | N/A | N/A | Cassida GL460 | Klüberoil 4 UH 1-460N |
| | FG-PG | -5 to 40°C (23 to 104°F) | Mobil Glygoyle 460 | N/A | N/A | Cassida WG460 | Klübersynth UH1 6-460 |
| VG680 | PAO | -20 to 40°C (-4 to 104°F) | Mobil SHC636 | Omala RL680 | N/A | N/A | Klübersynth GEM 4-680N |
| | PG | -20 to 40°C (-4 to 104°F) | Mobil Glygoyle 680 | Tivela S680 | N/A | N/A | Klübersynth GH 6-680 |
| | FG-PAO | -5 to 40°C (23 to 104°F) | N/A | N/A | N/A | Cassida GL680 | Klüberoil 4 UH1-680N |
| | FG-PG | -25 to 80°C (-13 to 176°F) | Mobil Glygoyle 680 | N/A | N/A | Cassida WG680 | Klübersynth UH1 6-680 |

Low-end service temperature limit may vary for a specific lubricant; Please also see the important notes on Page 1.

# MINICASE® (SMI/SMID) WORM GEAR LUBRICATION TYPES



## Lubrication Tables – MINICASE® (SMI/SMID series) Worm Gear Units

**Standard Oil Lubricants**

| ISO Viscosity | Oil Type | Ambient Temperature Range | Manufacturer Brand/Type | Notes |
|---|---|---|---|---|
| **VG680** | PG | -20 to 40°C (-4 to 104°F) | Klübersynth GH 6-680 | ♦ |

**Optional Oil Lubricants**

| ISO Viscosity | Oil Type | Ambient Temperature Range | Manufacturer Brand/Type | Notes |
|---|---|---|---|---|
| **VG680** | FG-PG | -25 to 80°C (-13 to 176°F) | Klübersynth UH1 14-151 | ♦ |

**Grease Options (applied to greased bearings and seal cavities)**

| NLGI Grade | Grease Type/Thickener | Ambient Temperature Range | Manufacturer Brand/Type | Notes |
|---|---|---|---|---|
| **NLGI 2** | High Temp (Polyurea) | -25 to 80°C (-13 to 176°F) | Kluber / Petamo GHY133N | ♦ |
| | Food-Grade (Aluminum Complex) | -25 to 40°C (-13 to 104°F) | Kluber / Klubersynth UH1 14-151 | ♦ |

♦ **Stocked Lubricants**

### *IMPORTANT NOTES*

- Observe the general lubrication guidelines in User Manual U10800.
- Ambient temperature range is a guideline only. The allowed operating temperature range for the gear unit is dependent upon assembly components used, their individual temperature limits, and the actual operating conditions.
- The selected oil type and viscosity is considered appropriate for most applications utilizing the specified NORD gear unit type. Different oil types or viscosity grades may be recommended if the gear unit is exposed to frequent high load conditions or operating under extreme low or high ambient temperature conditions.
- To prevent reducer overheating, observe the maximum operating oil temperature limits:
  Synthetic oil: 105 °C (225 °F).
- Consult NORD for recommendations in the following instances:
  √ The gear unit is exposed to frequent high load conditions.
  √ Ambient temperature conditions exceed 40 °C (104 °F) or approach 0 °C (32 °F) or lower.
  √ Fluid grease is being considered or specified for lubricating the gear unit.
  √ Lower than an ISO VG100 viscosity oil is being considered for a cold-temperature service.

**Oil Formulation Codes**

PAO - Synthetic Polyalphaolefin Oil
PG - Synthetic Polyglycol Oil
FG-PAO - Food-Grade, Synthetic Poyalphaolefin Oil
FG-PG - Food-Grade, Synthetic Polyglycol Oil

### *WARNING*

- Avoid using (EP) gear oils in worm gears that contain sulfur-phosphorous chemistries, as these additives can react adversely with bronze worm gears and accelerate wear.
- Food grade lubricants must be in compliance with FDA 212 CFR 178.3570 and qualify as a NSF-H1 lubricant. Please consult with lubrication manufacturer for more information.
- When making a lubrication change, check with the lubrication supplier to assure compatibility and to obtain recommended cleaning or flushing procedures.
- Do not to mix different oils with different additive packages or different base oil formulation types. Polyglycol (PG) oils are not miscible with other oil types and should never be mixed with mineral or polyaolphaolefin (PAO) oils.

# MINICASE® (SMI/SMID) WORM GEAR LUBRICATION TYPES

**Oil Cross-reference Chart**

| ISO Viscosity | Oil Type | Ambient Temperature Range | Mobil | Shell | Castrol | FUCHS | KLÜBER LUBRICATION |
|---|---|---|---|---|---|---|---|
| VG 100 | PAO | -35 to 25°C (-31 to 77°F) | Mobil SHC627 | N/A | N/A | N/A | Klübersynth GEM 4-100N |
| | PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 100 | N/A | N/A | N/A | Klübersynth GH 6-100 |
| | FG-PAO | -30 to 25°C (-22 to 77°F) | Mobil SHC Cibus 100 | N/A | N/A | N/A | Klüberoil 4 UH 1-100N |
| | FG-PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 100 | N/A | N/A | N/A | Klübersynth UH1 6-100 |
| VG150 | PAO | -35 to 25°C (-31 to 77°F) | Mobil SHC629 | Omala RL 150 | Alphasyn T150 | N/A | Klübersynth GEM 4-150N |
| | PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 150 | Tivela S150 | Alphasyn PG150 | Renolin PG150 | Klübersynth GH 6-150 |
| | FG-PAO | -15 to 25°C (5 to 77°F) | Mobil SHC Cibus 150 | N/A | N/A | Cassida GL150 | Klüberoil 4 UH 1-150N |
| | FG-PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 150 | N/A | N/A | N/A | Klübersynth UH1 6-150 |
| VG220 | PAO | -35 to 40°C (-31 to 104°F) | Mobil SHC630 | Omala RL220 | Alphasyn T220 | N/A | Klübersynth GEM 4-220N |
| | PG | -25 to 40°C (-13 to 104°F) | Mobil Glygoyle 220 | Tivela S220 | Alphasyn PG220 | Renolin PG220 | Klübersynth GH 6-220 |
| | FG-PAO | -25 to 40°C (-13 to 104°F) | Mobil SHC Cibus 220 | N/A | N/A | Cassida GL220 | Klüberoil 4 UH 1-220N |
| | FG-PG | -25 to 40°C (-13 to 104°F) | Mobil Glygoyle 220 | N/A | N/A | Cassida WG220 | Klübersynth UH1 6-220 |
| VG460 | PAO | -20 to 40°C (-4 to 104°F) | Mobil SHC 634 | Omala RL460 | Alphasyn T460 | N/A | Klübersynth GEM 4-460N |
| | PG | -20 to 40°C (-4 to 104°F) | Mobil Glygoyle 460 | Tivela S460 | Alphasyn PG460 | N/A | Klübersynth GH 6-460 |
| | FG-PAO | -5 to 40°C (23 to 104°F) | Mobil SHC Cibus 460 | N/A | N/A | Cassida GL460 | Klüberoil 4 UH 1-460N |
| | FG-PG | -5 to 40°C (23 to 104°F) | Mobil Glygoyle 460 | N/A | N/A | Cassida WG460 | Klübersynth UH1 6-460 |
| VG680 | PAO | -20 to 40°C (-4 to 104°F) | Mobil SHC636 | Omala RL680 | N/A | N/A | Klübersynth GEM 4-680N |
| | PG | -20 to 40°C (-4 to 104°F) | Mobil Glygoyle 680 | Tivela S680 | N/A | N/A | Klübersynth GH 6-680 |
| | FG-PAO | -5 to 40°C (23 to 104°F) | N/A | N/A | N/A | Cassida GL680 | Klüberoil 4 UH1-680N |
| | FG-PG | -25 to 80°C (-13 to 176°F) | Mobil Glygoyle 680 | N/A | N/A | Cassida WG680 | Klübersynth UH1 14-151 |

Low-end service temperature limit may vary for a specific lubricant; Please also see the important notes on Page 1.

# FLEXBLOC™ (SI/SID SERIES) WORM GEAR LUBRICATION TYPES

## Lubrication Tables – FLEXBLOC™ (SI/SID Series) Worm Gear Units

### Standard Oil Lubricants

NORD uses a semi automated assembly process to produce the FLEXBLOC™ gear unit assemblies. During this process the gear units are factory filled in accordance with the following table.

**Standard Oil Lubricants**

| ISO Viscosity | Oil Type | Ambient Temperature Range | Manufacturer Brand/Type | Notes |
|---|---|---|---|---|
| VG680 | FG-PG | -25 to 80°C (-13 to 176°F) | Klübersynth UH1 6-680 | Inch |
| | PG | -20 to 40°C (-4 to 104°F) | Klübersynth GH 6-680 | Metric |
| VG220 | FG-PG | -25 to 40°C (-13 to 104°F) | Klübersynth UH1 6-220 | Inch |
| | PG | -25 to 40°C (-13 to 104°F) | Klübersynth GH 6-220 | Metric |

**Grease Options (applied to greased bearings and seal cavities)**

| NLGI Grade | Grease Type/Thickener | Ambient Temperature Range | Manufacturer Brand/Type | Notes |
|---|---|---|---|---|
| NLGI 2 | High Temp (Polyurea) | -25 to 80°C (-13 to 176°F) | Kluber / Petamo GHY133N | ♦ |
| | Food-Grade (Aluminum Complex) | -25 to 40°C (-13 to 104°F) | Kluber / Klubersynth UH1 14-151 | ♦ |

♦ **Stocked Lubricants**

### *IMPORTANT NOTES*

- Observe the general lubrication guidelines in User Manual U10800.
- Ambient temperature range is a guideline only. The allowed operating temperature range for the gear unit is dependent upon assembly components used, their individual temperature limits, and the actual operating conditions.
- The selected oil type and viscosity is considered appropriate for most applications utilizing the specified NORD gear unit type. Different oil types or viscosity grades may be recommended if the gear unit is exposed to frequent high load conditions or operating under extreme low or high ambient temperature conditions.
- To prevent reducer overheating, observe the maximum operating oil temperature limits:
  Synthetic oil: 105 °C (225 °F).
- Consult NORD for recommendations in the following instances:
  √ The gear unit is exposed to frequent high load conditions.
  √ Ambient temperature conditions exceed 40 °C (104 °F) or approach 0 °C (32 °F) or lower.
  √ Fluid grease is being considered or specified for lubricating the gear unit.
  √ Lower than an ISO VG100 viscosity oil is being considered for a cold-temperature service.

**Oil Formulation Codes**

PAO - Synthetic Polyalphaolefin Oil
PG - Synthetic Polyglycol Oil
FG-PAO - Food-Grade, Synthetic Poyalphaolefin Oil
FG-PG - Food-Grade, Synthetic Polyglycol Oil

### *WARNING*

- Avoid using (EP) gear oils in worm gears that contain sulfur-phosphorous chemistries, as these additives can react adversely with bronze worm gears and accelerate wear.
- Food grade lubricants must be in compliance with FDA 212 CFR 178.3570 and qualify as a NSF-H1 lubricant. Please consult with lubrication manufacturer for more information.
- When making a lubrication change, check with the lubrication supplier to assure compatibility and to obtain recommended cleaning or flushing procedures.
- Do not to mix different oils with different additive packages or different base oil formulation types. Polyglycol (PG) oils are not miscible with other oil types and should never be mixed with mineral or polyaolphaolefin (PAO) oils.

# FLEXBLOC™ (SI/SID SERIES) WORM GEAR LUBRICATION TYPES

**Oil Cross-reference Chart**

| ISO Viscosity | Oil Type | Ambient Temperature Range | Mobil | Shell | Castrol | FUCHS | KLÜBER LUBRICATION |
|---|---|---|---|---|---|---|---|
| VG 100 | PAO | -35 to 25°C (-31 to 77°F) | Mobil SHC627 | N/A | N/A | N/A | Klübersynth GEM 4-100N |
| | PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 100 | N/A | N/A | N/A | Klübersynth GH 6-100 |
| | FG-PAO | -30 to 25°C (-22 to 77°F) | Mobil SHC Cibus 100 | N/A | N/A | N/A | Klüberoil 4 UH 1-100N |
| | FG-PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 100 | N/A | N/A | N/A | Klübersynth UH1 6-100 |
| VG150 | PAO | -35 to 25°C (-31 to 77°F) | Mobil SHC629 | Omala RL 150 | Alphasyn T150 | N/A | Klübersynth GEM 4-150N |
| | PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 150 | Tivela S150 | Alphasyn PG150 | Renolin PG150 | Klübersynth GH 6-150 |
| | FG-PAO | -15 to 25°C (5 to 77°F) | Mobil SHC Cibus 150 | N/A | N/A | Cassida GL150 | Klüberoil 4 UH 1-150N |
| | FG-PG | -25 to 25°C (-13 to 77°F) | Mobil Glygoyle 150 | N/A | N/A | N/A | Klübersynth UH1 6-150 |
| VG220 | PAO | -35 to 40°C (-31 to 104°F) | Mobil SHC630 | Omala RL220 | Alphasyn T220 | N/A | Klübersynth GEM 4-220N |
| | PG | -25 to 40°C (-13 to 104°F) | Mobil Glygoyle 220 | Tivela S220 | Alphasyn PG220 | Renolin PG220 | Klübersynth GH 6-220 |
| | FG-PAO | -25 to 40°C (-13 to 104°F) | Mobil SHC Cibus 220 | N/A | N/A | Cassida GL220 | Klüberoil 4 UH 1-220N |
| | FG-PG | -25 to 40°C (-13 to 104°F) | Mobil Glygoyle 220 | N/A | N/A | Cassida WG220 | Klübersynth UH1 6-220 |
| VG460 | PAO | -20 to 40°C (-4 to 104°F) | Mobil SHC 634 | Omala RL460 | Alphasyn T460 | N/A | Klübersynth GEM 4-460N |
| | PG | -20 to 40°C (-4 to 104°F) | Mobil Glygoyle 460 | Tivela S460 | Alphasyn PG460 | N/A | Klübersynth GH 6-460 |
| | FG-PAO | -5 to 40°C (23 to 104°F) | Mobil SHC Cibus 460 | N/A | N/A | Cassida GL460 | Klüberoil 4 UH 1-460N |
| | FG-PG | -5 to 40°C (23 to 104°F) | Mobil Glygoyle 460 | N/A | N/A | Cassida WG460 | Klübersynth UH1 6-460 |
| VG680 | PAO | -20 to 40°C (-4 to 104°F) | Mobil SHC636 | Omala RL680 | N/A | N/A | Klübersynth GEM 4-680N |
| | PG | -20 to 40°C (-4 to 104°F) | Mobil Glygoyle 680 | Tivela S680 | N/A | N/A | Klübersynth GH 6-680 |
| | FG-PAO | -5 to 40°C (23 to 104°F) | N/A | N/A | N/A | Cassida GL680 | Klüberoil 4 UH1-680N |
| | FG-PG | -25 to 80°C (-13 to 176°F) | Mobil Glygoyle 680 | N/A | N/A | Cassida WG680 | Klübersynth UH1 6-680 |

Low-end service temperature limit may vary for a specific lubricant; Please also see the important notes on Page 1.

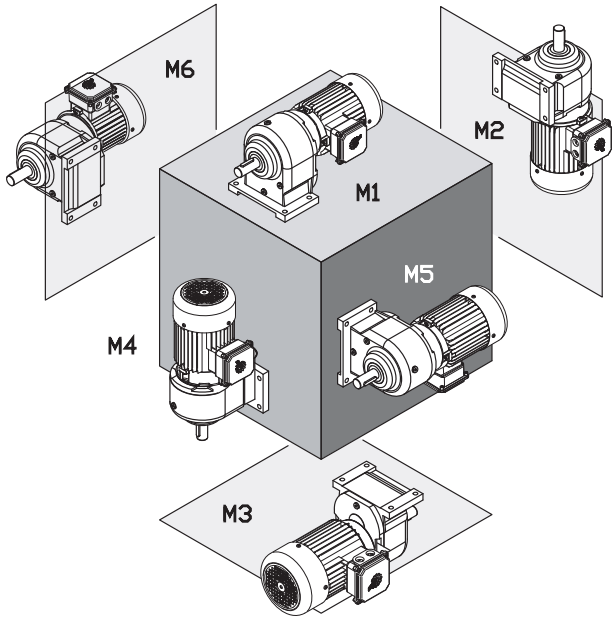
# STANDARD IN-LINE FOOTED OIL FILL QUANTITIES

### Standard In-line footed lubrication

All Standard In-line reducers are shipped from NORD with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. When filling these gear units the oil must be measured and added until one establishes the proper fill quantity. For additional information please refer to the "Oil & vent plug locations" documentation for your specified gear unit

**STOP** *HARMFUL SITUATION* **STOP**

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.




| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK0 / SK05** | 0.14 | 0.13 | 0.23 | 0.22 | 0.14 | 0.13 | 0.23 | 0.22 | 0.14 | 0.13 | 0.14 | 0.13 |
| **SK000** | 0.25 | 0.24 | 0.42 | 0.40 | 0.25 | 0.24 | 0.42 | 0.40 | 0.25 | 0.24 | 0.25 | 0.24 |
| **SK01 / SK015** | 0.23 | 0.22 | 0.40 | 0.38 | 0.23 | 0.22 | 0.40 | 0.38 | 0.23 | 0.22 | 0.23 | 0.22 |
| **SK010 / SK0105** | 0.40 | 0.38 | 0.63 | 0.60 | 0.40 | 0.38 | 0.63 | 0.60 | 0.40 | 0.38 | 0.40 | 0.38 |
| **SK20 / SK205** | 0.58 | 0.55 | 1.06 | 1.00 | 0.58 | 0.55 | 1.06 | 1.00 | 0.58 | 0.55 | 0.58 | 0.55 |
| **SK200 / SK2005** | 0.85 | 0.80 | 1.37 | 1.30 | 0.85 | 0.80 | 1.37 | 1.30 | 0.85 | 0.80 | 0.85 | 0.80 |
| **SK25 / SK255** | 0.53 | 0.50 | 1.06 | 1.00 | 0.53 | 0.50 | 1.06 | 1.00 | 0.53 | 0.50 | 0.53 | 0.50 |
| **SK250 / SK2505** | 1.27 | 1.20 | 1.59 | 1.50 | 1.27 | 1.20 | 1.59 | 1.50 | 1.27 | 1.20 | 1.27 | 1.20 |
| **SK30 / SK305** | 0.95 | 0.90 | 1.37 | 1.30 | 0.95 | 0.90 | 1.37 | 1.30 | 0.95 | 0.90 | 0.95 | 0.90 |
| **SK300 / SK3005** | 1.27 | 1.20 | 2.11 | 2.00 | 1.27 | 1.20 | 2.11 | 2.00 | 1.27 | 1.20 | 1.27 | 1.20 |
| **SK33 / SK335** | 1.06 | 1.00 | 1.69 | 1.60 | 1.06 | 1.00 | 1.69 | 1.60 | 1.06 | 1.00 | 1.06 | 1.00 |
| **SK330 / SK3305** | 1.90 | 1.80 | 2.96 | 2.80 | 1.90 | 1.80 | 2.96 | 2.80 | 1.90 | 1.80 | 1.90 | 1.80 |

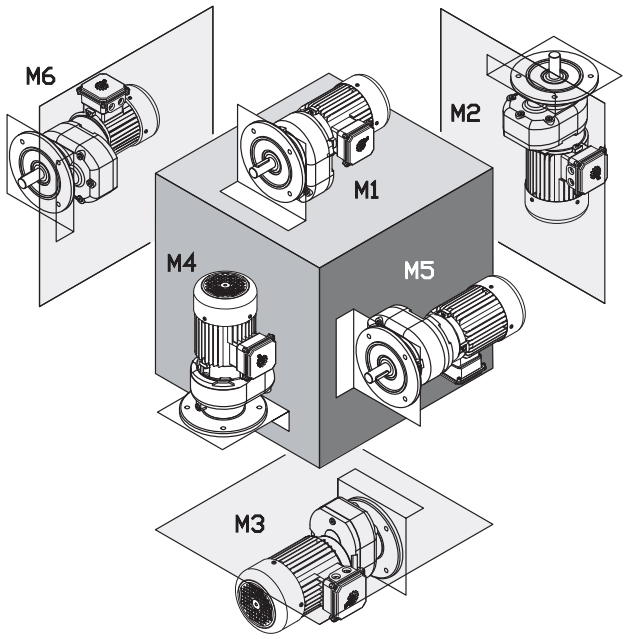
# STANDARD IN-LINE FLANGED OIL FILL QUANTITIES

### Standard In-line flanged lubrication

All Standard In-line reducers are shipped from NORD with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. When filling these gear units the oil must be measured and added until one establishes the proper fill quantity. For additional information please refer to the "Oil & vent plug locations" documentation for your specified gear unit

STOP *HARMFUL SITUATION* STOP

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.




| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK0 F / SK05 F** | 0.14 | 0.13 | 0.23 | 0.22 | 0.14 | 0.13 | 0.23 | 0.22 | 0.14 | 0.13 | 0.14 | 0.13 |
| **SK000 F** | 0.25 | 0.24 | 0.43 | 0.41 | 0.25 | 0.24 | 0.43 | 0.41 | 0.25 | 0.24 | 0.25 | 0.24 |
| **SK01 F** | 0.23 | 0.22 | 0.40 | 0.38 | 0.23 | 0.22 | 0.40 | 0.38 | 0.23 | 0.22 | 0.23 | 0.22 |
| **SK010 F / SK0105 F** | 0.37 | 0.35 | 0.69 | 0.65 | 0.37 | 0.35 | 0.78 | 0.74 | 0.37 | 0.35 | 0.37 | 0.35 |
| **SK20 F** | 0.37 | 0.35 | 0.63 | 0.60 | 0.37 | 0.35 | 0.63 | 0.60 | 0.37 | 0.35 | 0.37 | 0.35 |
| **SK200 F / SK2005 F** | 0.69 | 0.65 | 1.00 | 0.95 | 0.69 | 0.65 | 1.16 | 1.10 | 0.69 | 0.65 | 0.69 | 0.65 |
| **SK25 F** | 0.53 | 0.50 | 1.06 | 1.00 | 0.53 | 0.50 | 1.06 | 1.00 | 0.53 | 0.50 | 0.53 | 0.50 |
| **SK250 F / SK2505 F** | 0.95 | 0.90 | 1.48 | 1.40 | 0.95 | 0.90 | 1.69 | 1.60 | 0.95 | 0.90 | 0.95 | 0.90 |
| **SK30 F** | 0.74 | 0.70 | 1.16 | 1.10 | 0.74 | 0.70 | 1.16 | 1.10 | 0.74 | 0.70 | 0.74 | 0.70 |
| **SK300 F / SK3005 F** | 1.32 | 1.25 | 1.59 | 1.50 | 1.32 | 1.25 | 1.90 | 1.80 | 1.32 | 1.25 | 1.32 | 1.25 |
| **SK33 F / SK335F** | 1.06 | 1.00 | 1.59 | 1.50 | 1.06 | 1.00 | 1.59 | 1.50 | 1.06 | 1.00 | 1.06 | 1.00 |
| **SK330 F / SK3305 F** | 1.69 | 1.60 | 2.64 | 2.50 | 1.69 | 1.60 | 3.06 | 2.90 | 1.69 | 1.60 | 1.69 | 1.60 |

# HELICAL IN-LINE FOOTED OIL FILL QUANTITIES

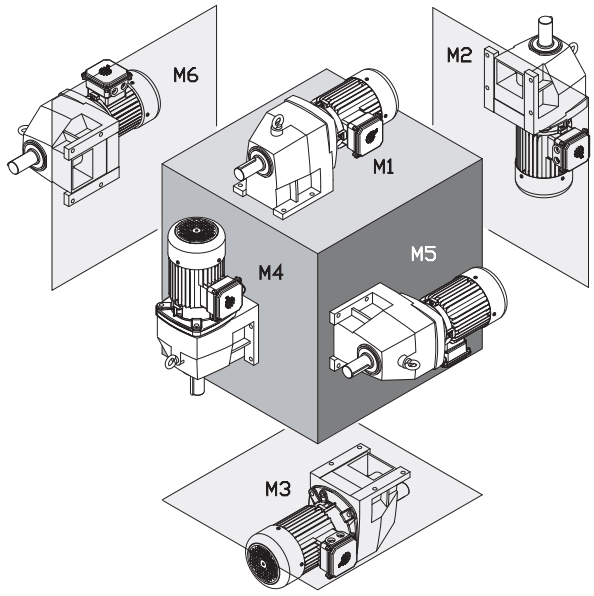
### Helical In-line footed lubrication

The following NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.

**STOP** *HARMFUL SITUATION* **STOP**

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil level plug and drain or add addition oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.




| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK02** | 0.21 | 0.20 | 0.79 | 0.75 | 0.79 | 0.75 | 0.69 | 0.65 | 0.63 | 0.60 | 0.63 | 0.60 |
| **SK 03** | 0.37 | 0.35 | 1.27 | 1.20 | 0.85 | 0.80 | 1.06 | 1.00 | 0.74 | 0.70 | 0.74 | 0.70 |
| **SK11E** | 0.26 | 0.25 | 0.53 | 0.50 | 0.69 | 0.65 | 0.53 | 0.50 | 0.42 | 0.40 | 0.42 | 0.40 |
| **SK12** | 0.26 | 0.25 | 0.85 | 0.80 | 0.90 | 0.85 | 0.79 | 0.75 | 0.58 | 0.55 | 0.58 | 0.55 |
| **SK 13** | 0.79 | 0.75 | 1.37 | 1.30 | 1.37 | 1.30 | 1.27 | 1.20 | 0.79 | 0.75 | 0.79 | 0.75 |
| **SK21E** | 0.63 | 0.60 | 1.27 | 1.20 | 1.37 | 1.30 | 1.06 | 1.00 | 1.06 | 1.00 | 1.06 | 1.00 |
| **SK22** | 0.53 | 0.50 | 2.01 | 1.90 | 2.22 | 2.10 | 1.90 | 1.80 | 1.48 | 1.40 | 1.48 | 1.40 |
| **SK 23** | 1.27 | 1.20 | 2.11 | 2.00 | 2.01 | 1.90 | 2.54 | 2.40 | 1.69 | 1.60 | 1.69 | 1.60 |
| **SK31E** | 1.16 | 1.10 | 2.11 | 2.00 | 2.32 | 2.20 | 1.80 | 1.70 | 1.59 | 1.50 | 1.59 | 1.50 |
| **SK32** | 0.95 | 0.90 | 2.64 | 2.50 | 3.28 | 3.10 | 3.28 | 3.10 | 2.11 | 2.00 | 2.11 | 2.00 |
| **SK 33N** | 1.85 | 1.75 | 3.17 | 3.00 | 3.59 | 3.40 | 4.23 | 4.00 | 2.43 | 2.30 | 2.43 | 2.30 |
| **SK41E** | 1.69 | 1.60 | 2.75 | 2.60 | 3.49 | 3.30 | 2.96 | 2.80 | 2.43 | 2.30 | 2.43 | 2.30 |
| **SK42** | 1.48 | 1.40 | 4.76 | 4.50 | 4.76 | 4.50 | 4.54 | 4.30 | 3.38 | 3.20 | 3.38 | 3.20 |
| **SK 43** | 3.17 | 3.00 | 5.92 | 5.60 | 5.49 | 5.20 | 6.97 | 6.60 | 3.80 | 3.60 | 3.80 | 3.60 |
| **SK51E** | 1.90 | 1.80 | 3.70 | 3.50 | 4.33 | 4.10 | 4.23 | 4.00 | 4.02 | 3.80 | 4.02 | 3.80 |
| **SK52** | 2.64 | 2.50 | 7.40 | 7.00 | 7.19 | 6.80 | 7.19 | 6.80 | 5.39 | 5.10 | 5.39 | 5.10 |
| **SK 53** | 4.76 | 4.50 | 9.19 | 8.70 | 8.14 | 7.70 | 9.19 | 8.70 | 6.34 | 6.00 | 6.34 | 6.00 |
| **SK62** | 6.87 | 6.50 | 15.9 | 15.0 | 13.7 | 13.0 | 16.9 | 16.0 | 15.9 | 15.0 | 15.9 | 15.0 |
| **SK 63** | 13.7 | 13.0 | 15.3 | 14.5 | 15.3 | 14.5 | 16.9 | 16.0 | 13.7 | 13.0 | 13.7 | 13.0 |
| **SK72** | 10.6 | 10.0 | 24.3 | 23.0 | 19.0 | 18.0 | 27.5 | 26.0 | 24.3 | 23.0 | 24.3 | 23.0 |
| **SK 73** | 21.7 | 20.5 | 21.1 | 20.0 | 23.8 | 22.5 | 28.5 | 27.0 | 21.1 | 20.0 | 21.1 | 20.0 |
| **SK82** | 14.8 | 14.0 | 37.0 | 35.0 | 28.5 | 27.0 | 46.5 | 44.0 | 33.8 | 32.0 | 33.8 | 32.0 |
| **SK 83** | 31.7 | 30.0 | 32.8 | 31.0 | 35.9 | 34.0 | 39.1 | 37.0 | 34.9 | 33.0 | 34.9 | 33.0 |
| **SK92** | 26.4 | 25.0 | 77.0 | 73.0 | 49.7 | 47.0 | 80.0 | 76.0 | 55.0 | 52.0 | 55.0 | 52.0 |
| **SK 93** | 56.0 | 53.0 | 74.0 | 70.0 | 62.0 | 59.0 | 76.0 | 72.0 | 52.0 | 49.0 | 52.0 | 49.0 |
| **SK102** | 38.0 | 36.0 | 84.0 | 79.0 | 70.0 | 66.0 | 108 | 102 | 75.0 | 71.0 | 75.0 | 71.0 |
| **SK 103** | 78.0 | 74.0 | 75.0 | 71.0 | 78.0 | 74.0 | 102 | 97.0 | 71.0 | 67.0 | 71.0 | 67.0 |

# HELICAL IN-LINE FLANGED OIL FILL QUANTITIES

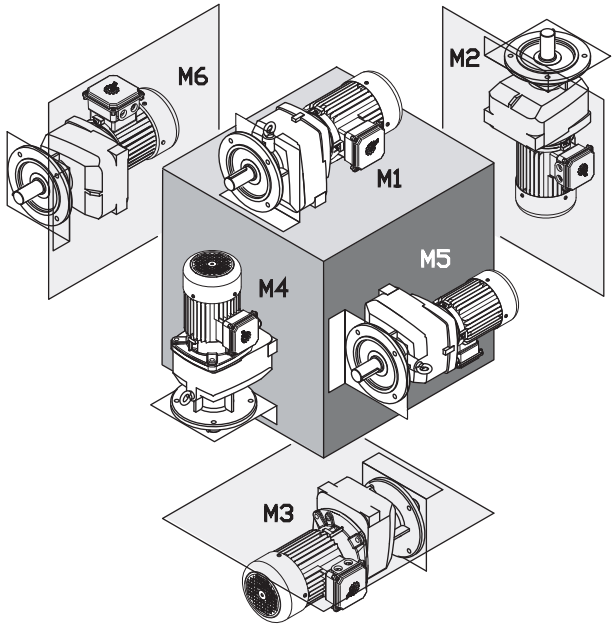
### Helical In-line flanged lubrication

The following NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.

**STOP** *HARMFUL SITUATION* **STOP**

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil level plug and drain or add addition oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.



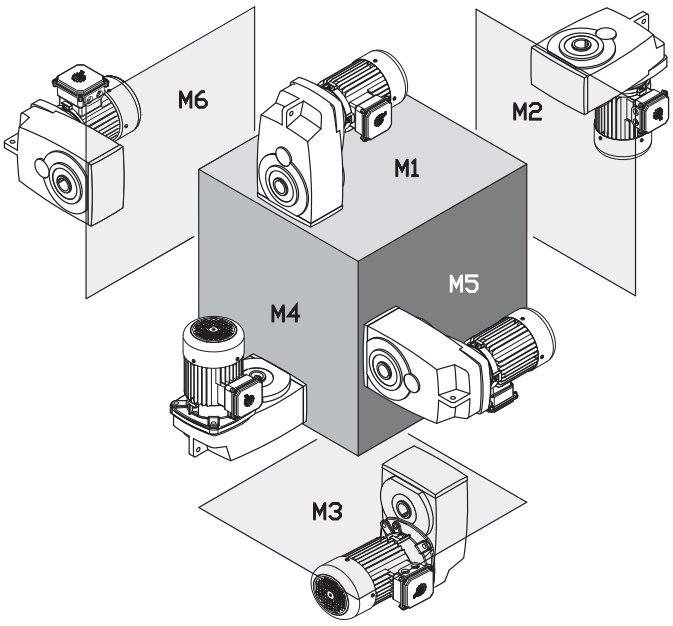

| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK02F** | 0.26 | 0.25 | 0.74 | 0.70 | 0.74 | 0.70 | 0.74 | 0.70 | 0.53 | 0.50 | 0.53 | 0.50 |
| **SK 03 F** | 0.58 | 0.55 | 1.00 | 0.95 | 0.95 | 0.90 | 1.27 | 1.20 | 0.95 | 0.90 | 0.95 | 0.90 |
| **SK11E F** | 0.32 | 0.30 | 0.53 | 0.50 | 0.53 | 0.50 | 0.48 | 0.45 | 0.42 | 0.40 | 0.42 | 0.40 |
| **SK12F** | 0.37 | 0.35 | 0.90 | 0.85 | 0.95 | 0.90 | 0.95 | 0.90 | 0.74 | 0.70 | 0.74 | 0.70 |
| **SK 13 F** | 1.06 | 1.00 | 1.37 | 1.30 | 1.37 | 1.30 | 1.27 | 1.20 | 1.06 | 1.00 | 1.06 | 1.00 |
| **SK21E F** | 0.53 | 0.50 | 1.27 | 1.20 | 1.37 | 1.30 | 0.63 | 0.60 | 0.95 | 0.90 | 0.95 | 0.90 |
| **SK22F** | 0.74 | 0.70 | 1.90 | 1.80 | 1.90 | 1.80 | 1.90 | 1.80 | 1.48 | 1.40 | 1.48 | 1.40 |
| **SK 23 F** | 1.48 | 1.40 | 2.75 | 2.60 | 2.43 | 2.30 | 2.96 | 2.80 | 2.96 | 2.80 | 2.96 | 2.80 |
| **SK31E F** | 0.95 | 0.90 | 1.90 | 1.80 | 1.74 | 1.65 | 1.37 | 1.30 | 1.32 | 1.25 | 1.32 | 1.25 |
| **SK32F** | 1.27 | 1.20 | 2.96 | 2.80 | 3.28 | 3.10 | 3.28 | 3.10 | 2.32 | 2.20 | 2.32 | 2.20 |
| **SK 33N F** | 2.32 | 2.20 | 3.17 | 3.00 | 3.59 | 3.40 | 4.44 | 4.20 | 2.43 | 2.30 | 2.43 | 2.30 |
| **SK41E F** | 1.27 | 1.20 | 2.43 | 2.30 | 2.85 | 2.70 | 2.11 | 2.00 | 2.01 | 1.90 | 2.01 | 1.90 |
| **SK42F** | 1.90 | 1.80 | 4.65 | 4.40 | 4.76 | 4.50 | 4.23 | 4.00 | 3.91 | 3.70 | 3.91 | 3.70 |
| **SK 43 F** | 3.70 | 3.50 | 6.02 | 5.70 | 5.28 | 5.00 | 6.45 | 6.10 | 4.33 | 4.10 | 4.33 | 4.10 |
| **SK51E F** | 1.90 | 1.80 | 3.70 | 3.50 | 4.33 | 4.10 | 3.17 | 3.00 | 4.02 | 3.80 | 4.02 | 3.80 |
| **SK52F** | 3.17 | 3.00 | 7.19 | 6.80 | 6.55 | 6.20 | 7.82 | 7.40 | 5.92 | 5.60 | 5.92 | 5.60 |
| **SK 53 F** | 5.49 | 5.20 | 8.88 | 8.40 | 7.40 | 7.00 | 9.40 | 8.90 | 7.08 | 6.70 | 7.08 | 6.70 |
| **SK 62 F** | 7.40 | 7.00 | 15.9 | 15.0 | 14.8 | 14.0 | 19.5 | 18.5 | 16.9 | 16.0 | 16.9 | 16.0 |
| **SK 63 F** | 14.3 | 13.5 | 14.8 | 14.0 | 16.4 | 15.5 | 19.0 | 18.0 | 14.8 | 14.0 | 14.8 | 14.0 |
| **SK 72 F** | 10.6 | 10.0 | 24.3 | 23.0 | 19.5 | 18.5 | 29.6 | 28.0 | 24.3 | 23.0 | 24.3 | 23.0 |
| **SK 73 F** | 23.2 | 22.0 | 23.8 | 22.5 | 24.3 | 23.0 | 29.1 | 27.5 | 21.1 | 20.0 | 21.1 | 20.0 |
| **SK 82 F** | 15.9 | 15.0 | 39.1 | 37.0 | 30.6 | 29.0 | 47.6 | 45.0 | 36.5 | 34.5 | 36.5 | 34.5 |
| **SK 83 F** | 32.8 | 31.0 | 35.9 | 34.0 | 37.0 | 35.0 | 42.3 | 40.0 | 35.9 | 34.0 | 35.9 | 34.0 |
| **SK 92 F** | 27.5 | 26.0 | 77.0 | 73.0 | 49.7 | 47.0 | 82.0 | 78.0 | 55.0 | 52.0 | 55.0 | 52.0 |
| **SK 93 F** | 56.0 | 53.0 | 74.0 | 70.0 | 62.0 | 59.0 | 78.0 | 74.0 | 52.0 | 49.0 | 52.0 | 49.0 |
| **SK 102 F** | 42.3 | 40.0 | 86.0 | 81.0 | 70.0 | 66.0 | 110 | 104 | 76.0 | 72.0 | 76.0 | 72.0 |
| **SK 103 F** | 73.0 | 69.0 | 82.0 | 78.0 | 82.0 | 78.0 | 105 | 99.0 | 71.0 | 67.0 | 71.0 | 67.0 |

# CLINCHER™ OIL FILL QUANTITIES



## CLINCHER™ lubrication

Unless otherwise noted below, the following NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.




**STOP** *HARMFUL SITUATION* **STOP**

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil level plug and drain or add addition oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.

| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK 0182NB** | 0.42 | 0.40 | 0.58 | 0.55 | 0.58 | 0.55 | 0.42 | 0.40 | 0.42 | 0.40 | 0.42 | 0.40 |
| **SK 0282NB** | 0.74 | 0.70 | 1.16 | 1.10 | 0.85 | 0.80 | 1.16 | 1.10 | 0.95 | 0.90 | 0.95 | 0.90 |
| **SK 1282** | 1.00 | 0.95 | 1.37 | 1.30 | 0.95 | 0.90 | 1.37 | 1.30 | 1.06 | 1.00 | 1.06 | 1.00 |
| **SK 1382NB** | 1.48 | 1.40 | 2.43 | 2.30 | 2.32 | 2.20 | 2.32 | 2.20 | 2.11 | 2.00 | 2.11 | 2.00 |
| **SK 1382** | 1.53 | 1.45 | 1.69 | 1.60 | 1.22 | 1.15 | 1.80 | 1.70 | 1.16 | 1.10 | 1.16 | 1.10 |
| **SK 2282** | 1.80 | 1.70 | 2.43 | 2.30 | 1.80 | 1.70 | 2.32 | 2.20 | 2.01 | 1.90 | 2.01 | 1.90 |
| **SK 2382** | 2.43 | 2.30 | 2.85 | 2.70 | 2.22 | 2.10 | 3.38 | 3.20 | 2.11 | 2.00 | 2.11 | 2.00 |
| **SK 3282** | 2.96 | 2.80 | 4.23 | 4.00 | 3.49 | 3.30 | 4.02 | 3.80 | 3.17 | 3.00 | 3.17 | 3.00 |
| **SK 3382** | 4.02 | 3.80 | 4.54 | 4.30 | 3.17 | 3.00 | 5.81 | 5.50 | 3.17 | 3.00 | 3.17 | 3.00 |
| **SK 4282** | 4.44 | 4.20 | 5.71 | 5.40 | 4.65 | 4.40 | 5.28 | 5.00 | 4.44 | 4.20 | 4.44 | 4.20 |
| **SK 4382** | 6.45 | 6.10 | 7.29 | 6.90 | 5.18 | 4.90 | 8.88 | 8.40 | 5.28 | 5.00 | 5.28 | 5.00 |
| **SK 5282** | 7.93 | 7.50 | 9.30 | 8.80 | 7.93 | 7.50 | 9.30 | 8.80 | 7.61 | 7.20 | 7.61 | 7.20 |
| **SK 5382** | 13.2 | 12.5 | 12.7 | 12.0 | 7.08 | 6.70 | 14.8 | 14.0 | 8.77 | 8.30 | 8.77 | 8.30 |
| **SK 6282** | 18.0 | 17.0 | 16.4 | 15.5 | 13.2 | 12.5 | 18.5 | 17.5 | 11.6 | 11.0 | 14.8 | 14.0 |
| **SK 6382** | 16.9 | 16.0 | 13.7 | 13.0 | 10.6 | 10.0 | 19.0 | 18.0 | 14.8 | 14.0 | 13.2 | 12.5 |
| **SK 7282** | 26.9 | 25.5 | 22.2 | 21.0 | 21.7 | 20.5 | 28.5 | 27.0 | 16.9 | 16.0 | 22.2 | 21.0 |
| **SK 7382** | 23.2 | 22.0 | 22.2 | 21.0 | 16.9 | 16.0 | 26.4 | 25.0 | 24.3 | 23.0 | 23.2 | 22.0 |
| **SK 8282** | 39.6 | 37.5 | 34.9 | 33.0 | 32.2 | 30.5 | 46.5 | 44.0 | 32.8 | 31.0 | 32.8 | 31.0 |
| **SK 8382** | 36.5 | 34.5 | 34.3 | 32.5 | 26.4 | 25.0 | 40.2 | 38.0 | 37.0 | 35.0 | 31.7 | 30.0 |
| **SK 9282** | 79.0 | 75.0 | 74.0 | 70.0 | 59.0 | 56.0 | 85.0 † | 80.0 † | 69.0 | 65.0 | 62.0 | 59.0 |
| **SK 9382** | 78.0 | 74.0 | 74.0 | 70.0 | 45.4 | 43.0 | 79.0 † | 75.0 † | 69.0 | 65.0 | 63.0 | 60.0 |
| **SK 10282** | 95.0 | 90.0 | 95.0 | 90.0 | 42.3 | 40.0 | 95.0 † | 90.0 † | 63.0 | 60.0 | 87.0 | 82.0 |
| **SK 10382** | 90.0 | 85.0 | 95.0 | 90.0 | 77.0 | 73.0 | 106 † | 100 † | 85 | 80.0 | 85.0 | 80.0 |
| **SK 11282*** | 174 | 165 | 169 | 160 | 153 | 145 | 206 † | 195 † | 106 | 100 | 148 | 140 |
| **SK 11382*** | 169 | 160 | 164 | 155 | 148 | 140 | 222 † | 210 † | 164 | 155 | 143 | 135 |
| **SK 12382*** | 169 | 160 | 164 | 155 | 148 | 140 | **222 †** | **210 †** | 164 | 155 | 143 | 135 |

*** For shipping purposes the larger Clincher™ gear units are supplied without oil.**

**† Oil quantities shown are for the gearbox only. When the OT (oil tank) option is used, the oil must be filled to the level shown on the dipstick which is located inside of the oil tank. Even when the gear unit is filled by NORD, the user MUST add more oil untill the oil is filled to the proper level.**

# 90.1 HELICAL-BEVEL FOOTED OIL FILL QUANTITIES

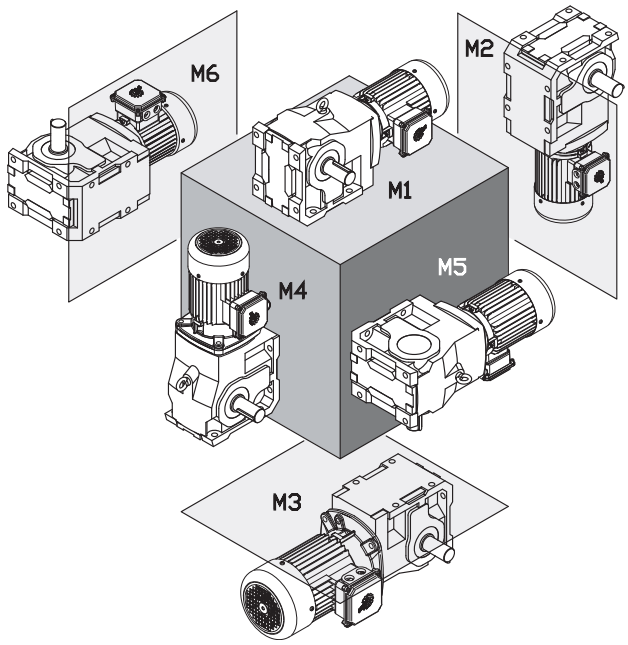
### 90.1 Helical-bevel footed lubrication

Unless otherwise noted below, the following NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.

*HARMFUL SITUATION*

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil level plug and drain or add addition oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.




| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK 9012.1** | 0.74 | 0.70 | 1.80 | 1.70 | 2.01 | 1.90 | 2.22 | 2.10 | 1.16 | 1.10 | 1.59 | 1.50 |
| **SK 9013.1** | 1.43 | 1.35 | 2.22 | 2.10 | 2.27 | 2.15 | 2.91 | 2.75 | 1.06 | 1.00 | 1.90 | 1.80 |
| **SK 9016.1** | 0.74 | 0.70 | 1.80 | 1.70 | 2.01 | 1.90 | 2.22 | 2.10 | 1.16 | 1.10 | 1.59 | 1.50 |
| **SK 9017.1** | 1.37 | 1.30 | 2.11 | 2.00 | 2.22 | 2.10 | 2.85 | 2.70 | 1.06 | 1.00 | 1.80 | 1.70 |
| **SK 9022.1** | 1.37 | 1.30 | 3.06 | 2.90 | 3.49 | 3.30 | 4.02 | 3.80 | 1.80 | 1.70 | 2.96 | 2.80 |
| **SK 9023.1** | 2.32 | 2.20 | 3.38 | 3.20 | 3.80 | 3.60 | 4.97 | 4.70 | 2.32 | 2.20 | 3.06 | 2.90 |
| **SK 9032.1** | 1.90 | 1.80 | 5.71 | 5.40 | 6.45 | 6.10 | 7.19 | 6.80 | 3.17 | 3.00 | 4.86 | 4.60 |
| **SK 9033.1** | 3.28 | 3.10 | 6.02 | 5.70 | 6.66 | 6.30 | 8.45 | 8.00 | 3.59 | 3.40 | 5.07 | 4.80 |
| **SK 9042.1** | 2.85 | 2.70 | 9.51 | 9.00 | 10.6 | 10.0 | 11.3 | 10.7 | 5.49 | 5.20 | 8.14 | 7.70 |
| **SK 9043.1** | 5.28 | 5.00 | 10.7 | 10.1 | 11.6 | 11.0 | 14.1 | 13.3 | 6.02 | 5.70 | 8.56 | 8.10 |
| **SK 9052.1** | 6.87 | 6.50 | 16.9 | 16.0 | 20.1 | 19.0 | 22.7 | 21.5 | 11.6 | 11.0 | 16.4 | 15.5 |
| **SK 9053.1** | 10.6 | 10.0 | 18.0 | 17.0 | 21.1 | 20.0 | 25.9 | 24.5 | 12.2 | 11.5 | 17.4 | 16.5 |
| **SK 9062.1** | 10.6 | 10.0 | 29.1 | 27.5 | 33.8 | 32.0 | 38.0 | 36.0 | 19.0 | 18.0 | 25.4 | 24.0 |
| **SK 9072.1** | 10.6 | 10.0 | 29.1 | 27.5 | 33.8 | 32.0 | 38.0 | 36.0 | 19.0 | 18.0 | 25.4 | 24.0 |
| **SK 9082.1** | 18.0 | 17.0 | 54.0 | 52.0 | 66.0 | 63.0 | 76.0 | 72.0 | 34.9 | 33.0 | 49.1 | 46.5 |
| **SK 9086.1** | 30.6 | 29.0 | 77.0 | 73.0 | 90.0 | 85.0 | 108 | 102 | 51.0 | 48.0 | 66.0 | 62.0 |
| **SK 9092.1** | 43.3 | 41.0 | 166 | 157 | 180 | 170 | 182 | 172 | 85.0 | 80.0 | 95.0 | 90.0 |
| **SK 9096.1** | 74.0 | 70.0 | 198 | 187 | 205 | 194 | 268 | 254 | 115 | 109 | 161 | 152 |

**Oil Levels shown apply to base models and gear units ending in LX, AX, & VX.**

# 90.1 HELICAL-BEVEL FLANGED OIL FILL QUANTITIES

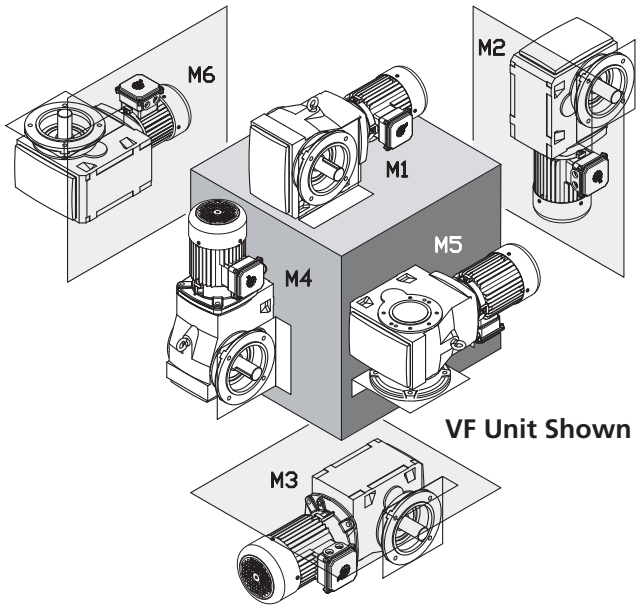
### 90.1 Helical-bevel flanged lubrication

Unless otherwise noted below, the following NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.

**STOP** *HARMFUL SITUATION* **STOP**

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil level plug and drain or add addition oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.



VF Unit Shown

| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK 9012.1** | 1.06 | 1.00 | 2.01 | 1.90 | 2.01 | 1.90 | 2.32 | 2.20 | 1.27 | 1.20 | 1.80 | 1.70 |
| **SK 9013.1** | 1.53 | 1.45 | 2.43 | 2.30 | 2.22 | 2.10 | 2.96 | 2.80 | 1.11 | 1.05 | 1.90 | 1.80 |
| **SK 9016.1** | 1.06 | 1.00 | 2.01 | 1.90 | 2.01 | 1.90 | 2.32 | 2.20 | 1.27 | 1.20 | 1.80 | 1.70 |
| **SK 9017.1** | 1.53 | 1.45 | 2.43 | 2.30 | 2.22 | 2.10 | 2.96 | 2.80 | 1.11 | 1.05 | 1.90 | 1.80 |
| **SK 9022.1** | 1.69 | 1.60 | 3.70 | 3.50 | 3.70 | 3.50 | 4.44 | 4.20 | 2.43 | 2.30 | 2.96 | 2.80 |
| **SK 9023.1** | 2.43 | 2.30 | 3.70 | 3.50 | 4.02 | 3.80 | 5.60 | 5.30 | 2.32 | 2.20 | 3.59 | 3.40 |
| **SK 9032.1** | 2.22 | 2.10 | 5.07 | 4.80 | 6.76 | 6.40 | 7.50 | 7.10 | 3.49 | 3.30 | 5.39 | 5.10 |
| **SK 9033.1** | 3.91 | 3.70 | 6.02 | 5.70 | 7.08 | 6.70 | 9.09 | 8.60 | 3.80 | 3.60 | 5.60 | 5.30 |
| **SK 9042.1** | 4.76 | 4.50 | 10.6 | 10.0 | 10.6 | 10.0 | 12.2 | 11.5 | 6.87 | 6.50 | 8.66 | 8.20 |
| **SK 9043.1** | 6.87 | 6.50 | 11.1 | 10.5 | 12.6 | 11.9 | 15.5 | 14.7 | 7.08 | 6.70 | 9.83 | 9.30 |
| **SK 9052.1** | 7.93 | 7.50 | 17.4 | 16.5 | 21.1 | 20.0 | 24.8 | 23.5 | 12.2 | 11.5 | 19.0 | 18.0 |
| **SK 9053.1** | 13.7 | 13.0 | 19.0 | 18.0 | 22.7 | 21.5 | 28.0 | 26.5 | 13.7 | 13.0 | 18.0 | 17.0 |
| **SK 9062.1** | 12.7 | 12.0 | 29.1 | 27.5 | 34.9 | 33.0 | 40.7 | 38.5 | 20.1 | 19.0 | 27.5 | 26.0 |
| **SK 9072.1** | 12.7 | 12.0 | 29.1 | 27.5 | 34.9 | 33.0 | 40.7 | 38.5 | 20.1 | 19.0 | 27.5 | 26.0 |
| **SK 9082.1** | 22.2 | 21.0 | 57.0 | 54.0 | 70.0 | 66.0 | 85.0 | 80.0 | 40.2 | 38.0 | 55.0 | 52.0 |
| **SK 9086.1** | 38.0 | 36.0 | 82.0 | 78.0 | 96.0 | 91.0 | 113 | 107 | 56.0 | 53.0 | 80.0 | 76.0 |
| **SK 9092.1** | 42.3 | 40.0 | 137 | 130 | 163 | 154 | 185 | 175 | 87.0 | 82.0 | 96.0 | 91.0 |
| **SK 9096.1** | 85.0 | 80.0 | 198 | 187 | 204 | 193 | 272 | 257 | 119 | 113 | 165 | 156 |

**Oil Levels shown apply to base models and gear units ending in AZ, AF, VZ, & VF.**

# 92 SERIES HELICAL-BEVEL FOOTED OIL FILL QUANTITIES

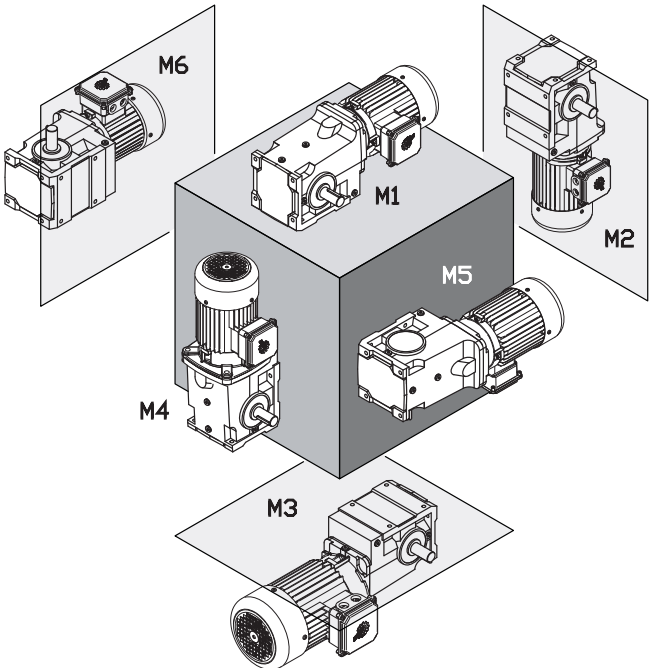
### 92 Helical-bevel footed lubrication

The following NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.

**STOP** *HARMFUL SITUATION* **STOP**

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil level plug and drain or add addition oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.




| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK 92072** | 0.42 | 0.40 | 0.63 | 0.60 | 0.53 | 0.50 | 0.58 | 0.55 | 0.42 | 0.40 | 0.42 | 0.40 |
| **SK 92172** | 0.63 | 0.60 | 0.95 | 0.90 | 1.06 | 1.00 | 1.16 | 1.10 | 1.16 | 1.10 | 0.85 | 0.80 |
| **SK 92372** | 0.95 | 0.90 | 1.69 | 1.60 | 1.59 | 1.50 | 2.01 | 1.90 | 1.59 | 1.50 | 0.95 | 0.90 |
| **SK 92672** | 1.90 | 1.80 | 3.70 | 3.50 | 3.80 | 3.60 | 3.59 | 3.40 | 2.75 | 2.60 | 2.75 | 2.60 |
| **SK 92772** | 2.43 | 2.30 | 4.76 | 4.50 | 4.86 | 4.60 | 5.60 | 5.30 | 4.33 | 4.10 | 4.33 | 4.10 |

**Oil Levels shown apply to base models and gear units ending in LX, AX, & VX.**

# 92.1/93.1 SERIES HELICAL-BEVEL OIL FILL QUANTITIES

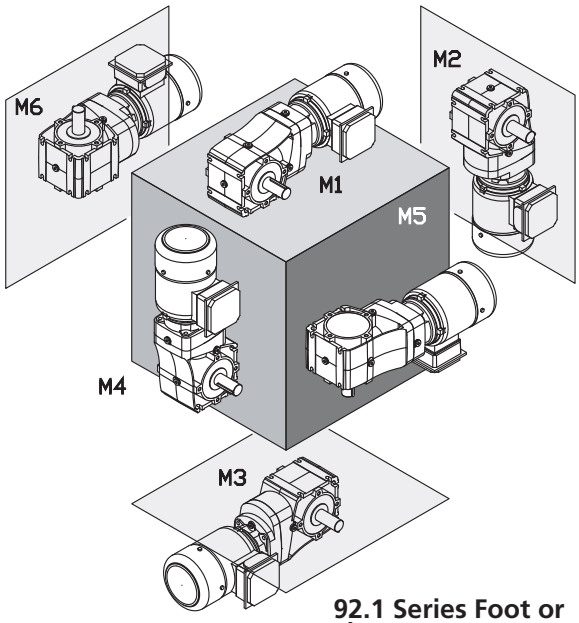
### 92.1/93.1 Helical-bevel lubrication

All NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size & mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.

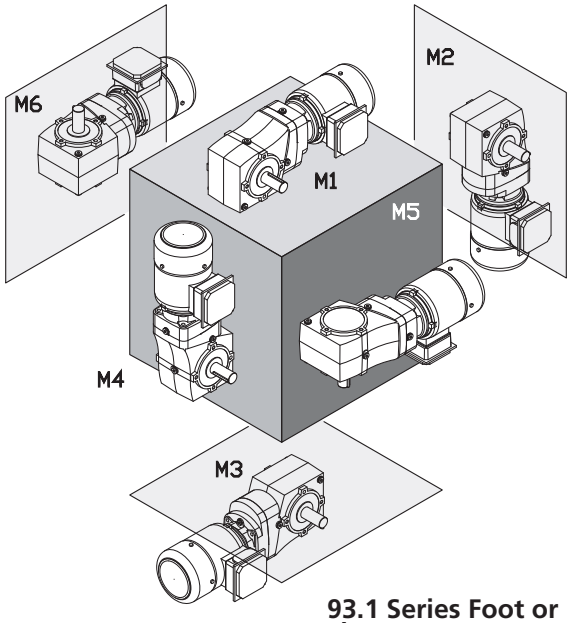
**STOP** *HARMFUL SITUATION* **STOP**

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil level plug and drain or add addition oil as needed.

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.




**92.1 Series Foot or Flange Mount**




**93.1 Series Foot or Flange Mount**

**92.1 Series Oil Fill**

| | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK 92072.1** | 0.28 | 0.26 | 0.52 | 0.49 | 0.44 | 0.42 | 0.57 | 0.54 | 0.31 | 0.29 | 0.33 | 0.31 |
| **SK 92172.1** | 0.36 | 0.34 | 0.65 | 0.61 | 0.55 | 0.52 | 0.71 | 0.67 | 0.44 | 0.42 | 0.51 | 0.48 |
| **SK 92372.1** | 0.45 | 0.43 | 0.97 | 0.92 | 0.77 | 0.73 | 0.88 | 0.83 | 0.58 | 0.55 | 0.65 | 0.61 |
| **SK 92672.1** | 0.90 | 0.85 | 1.69 | 1.60 | 1.27 | 1.20 | 1.59 | 1.50 | 1.08 | 1.02 | 1.08 | 1.02 |
| **SK 92772.1** | 1.37 | 1.30 | 2.80 | 2.65 | 1.97 | 1.86 | 2.59 | 2.45 | 1.69 | 1.60 | 1.69 | 1.60 |

**Oil levels shown apply to all foot & flange mounted units.**

**93.1 Series Oil Fill**

| | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK 93072.1** | 0.41 | 0.39 | 0.98 | 0.93 | 0.84 | 0.79 | 1.08 | 1.02 | 0.52 | 0.49 | 0.66 | 0.62 |
| **SK 93172.1** | 0.63 | 0.60 | 1.24 | 1.17 | 0.99 | 0.94 | 1.29 | 1.22 | 0.69 | 0.65 | 0.90 | 0.85 |
| **SK 93372.1** | 1.06 | 1.00 | 2.08 | 1.97 | 1.74 | 1.65 | 2.26 | 2.14 | 1.18 | 1.12 | 1.42 | 1.34 |
| **SK 93672.1** | 1.90 | 1.80 | 3.41 | 3.23 | 2.86 | 2.71 | 4.44 | 4.20 | 2.13 | 2.02 | 2.59 | 2.45 |
| **SK 93772.1** | 2.87 | 2.72 | 4.89 | 4.63 | 3.91 | 3.70 | 5.71 | 5.40 | 3.10 | 2.93 | 3.43 | 3.25 |

**Oil levels shown apply to all foot & flange mounted units.**

# 92 SERIES HELICAL-BEVEL FLANGED OIL FILL QUANTITIES

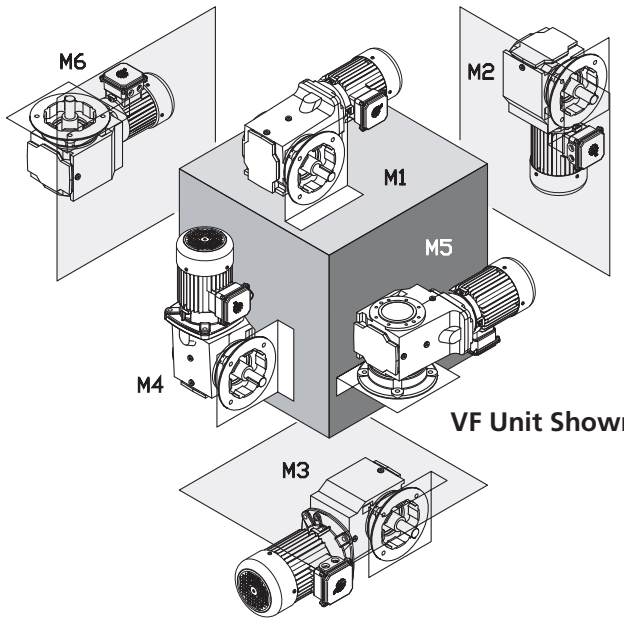
## 92 Helical-bevel flanged lubrication

The following NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.

**STOP** *HARMFUL SITUATION* **STOP**

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil level plug and drain or add addition oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.



VF Unit Shown

| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK 92072** | 0.42 | 0.40 | 0.63 | 0.60 | 0.58 | 0.55 | 0.58 | 0.55 | 0.42 | 0.40 | 0.42 | 0.40 |
| **SK 92172** | 0.53 | 0.50 | 1.06 | 1.00 | 0.95 | 0.90 | 1.11 | 1.05 | 0.95 | 0.90 | 0.63 | 0.60 |
| **SK 92372** | 1.27 | 1.20 | 1.69 | 1.60 | 1.59 | 1.50 | 2.01 | 1.90 | 1.37 | 1.30 | 1.37 | 1.30 |
| **SK 92672** | 1.69 | 1.60 | 2.96 | 2.80 | 2.64 | 2.50 | 3.49 | 3.30 | 2.54 | 2.40 | 2.54 | 2.40 |
| **SK 92772** | 2.96 | 2.80 | 4.65 | 4.40 | 4.76 | 4.50 | 5.81 | 5.50 | 3.70 | 3.50 | 3.70 | 3.50 |

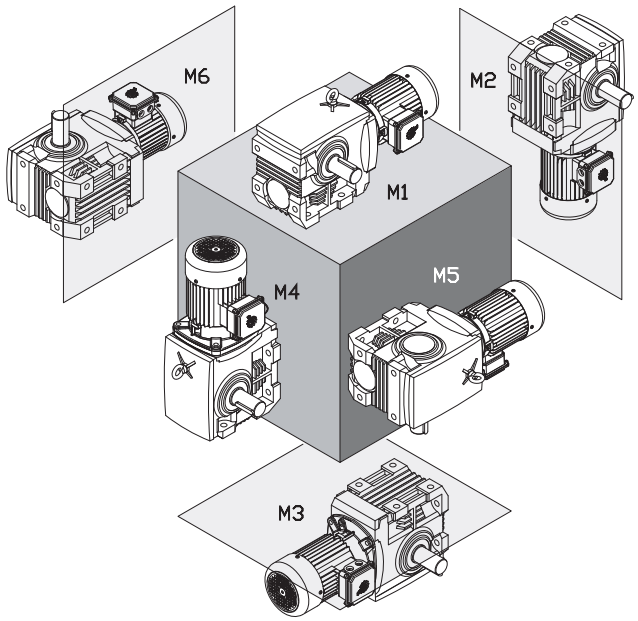
**Oil Levels shown apply to gear units ending in AZ, AF, VZ, & VF.**

# HELICAL-WORM FOOTED OIL FILL QUANTITIES



### Helical-worm footed lubrication

The following NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.




STOP *HARMFUL SITUATION* STOP

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil level plug and drain or add addition oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

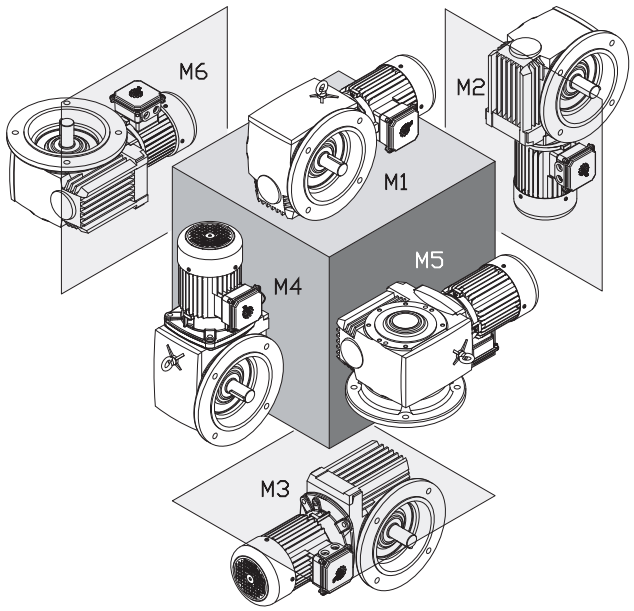
For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.

| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK 02040** | 0.42 | 0.40 | 0.85 | 0.80 | 0.79 | 0.75 | 0.69 | 0.65 | 0.53 | 0.50 | 0.53 | 0.50 |
| **SK 02050** | 0.42 | 0.40 | 1.48 | 1.40 | 1.16 | 1.10 | 1.37 | 1.30 | 0.74 | 0.70 | 0.74 | 0.70 |
| **SK 13050** | 0.79 | 0.75 | 1.85 | 1.75 | 1.37 | 1.30 | 1.85 | 1.75 | 0.79 | 0.75 | 0.79 | 0.75 |
| **SK 12063** | 0.63 | 0.60 | 1.90 | 1.80 | 1.27 | 1.20 | 1.69 | 1.60 | 1.06 | 1.00 | 1.06 | 1.00 |
| **SK 13063** | 1.06 | 1.00 | 2.43 | 2.30 | 1.59 | 1.50 | 2.32 | 2.20 | 1.16 | 1.10 | 1.16 | 1.10 |
| **SK 12080** | 0.95 | 0.90 | 3.28 | 3.10 | 2.54 | 2.40 | 3.17 | 3.00 | 1.90 | 1.80 | 1.90 | 1.80 |
| **SK 13080** | 1.80 | 1.70 | 3.70 | 3.50 | 3.70 | 3.50 | 3.70 | 3.50 | 2.11 | 2.00 | 2.11 | 2.00 |
| **SK 32100** | 1.59 | 1.50 | 6.66 | 6.30 | 5.92 | 5.60 | 5.81 | 5.50 | 3.80 | 3.60 | 3.80 | 3.60 |
| **SK 33100** | 2.54 | 2.40 | 6.76 | 6.40 | 5.71 | 5.40 | 6.87 | 6.50 | 3.59 | 3.40 | 3.59 | 3.40 |
| **SK 42125** | 2.96 | 2.80 | 12.5 | 11.8 | 10.8 | 10.2 | 10.6 | 10.0 | 6.55 | 6.20 | 6.55 | 6.20 |
| **SK 43125** | 4.49 | 4.25 | 13.7 | 13.0 | 11.1 | 10.5 | 14.3 | 13.5 | 7.61 | 7.20 | 7.61 | 7.20 |

# HELICAL-WORM SOLID SHAFT/FLANGED OIL FILL QUANTITIES

### Helical-worm solid shaft/flanged lubrication

The following NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.




STOP *HARMFUL SITUATION* STOP

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil level plug and drain or add addition oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.

| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK 02040 VF** | 0.53 | 0.50 | 0.85 | 0.80 | 0.79 | 0.75 | 0.63 | 0.60 | 0.53 | 0.50 | 0.53 | 0.50 |
| **SK 02050 VF** | 0.42 | 0.40 | 1.59 | 1.50 | 1.32 | 1.25 | 1.27 | 1.20 | 0.95 | 0.90 | 0.79 | 0.75 |
| **SK 13050 VF** | 0.79 | 0.75 | 1.90 | 1.80 | 1.59 | 1.50 | 1.80 | 1.70 | 1.11 | 1.05 | 0.95 | 0.90 |
| **SK 12063 VF** | 0.53 | 0.50 | 2.06 | 1.95 | 1.80 | 1.70 | 1.85 | 1.75 | 1.27 | 1.20 | 1.00 | 0.95 |
| **SK 13063 VF** | 1.06 | 1.00 | 2.43 | 2.30 | 2.01 | 1.90 | 2.32 | 2.20 | 1.43 | 1.35 | 1.16 | 1.10 |
| **SK 12080 VF** | 0.95 | 0.90 | 3.91 | 3.70 | 3.38 | 3.20 | 3.59 | 3.40 | 2.64 | 2.50 | 2.43 | 2.30 |
| **SK 13080 VF** | 1.69 | 1.60 | 4.02 | 3.80 | 3.70 | 3.50 | 4.12 | 3.90 | 2.85 | 2.70 | 2.64 | 2.50 |
| **SK 32100 VF** | 1.48 | 1.40 | 6.66 | 6.30 | 6.45 | 6.10 | 6.45 | 6.10 | 4.23 | 4.00 | 3.80 | 3.60 |
| **SK 33100 VF** | 2.80 | 2.65 | 7.61 | 7.20 | 6.76 | 6.40 | 8.03 | 7.60 | 4.54 | 4.30 | 4.02 | 3.80 |
| **SK 42125 VF** | 3.17 | 3.00 | 12.2 | 11.5 | 12.2 | 11.5 | 11.6 | 11.0 | 8.88 | 8.40 | 7.71 | 7.30 |
| **SK 43125 VF** | 4.97 | 4.70 | 15.9 | 15.0 | 13.7 | 13.0 | 16.9 | 16.0 | 9.51 | 9.00 | 8.14 | 7.70 |

# HELICAL-WORM HOLLOW SHAFT OIL FILL QUANTITIES

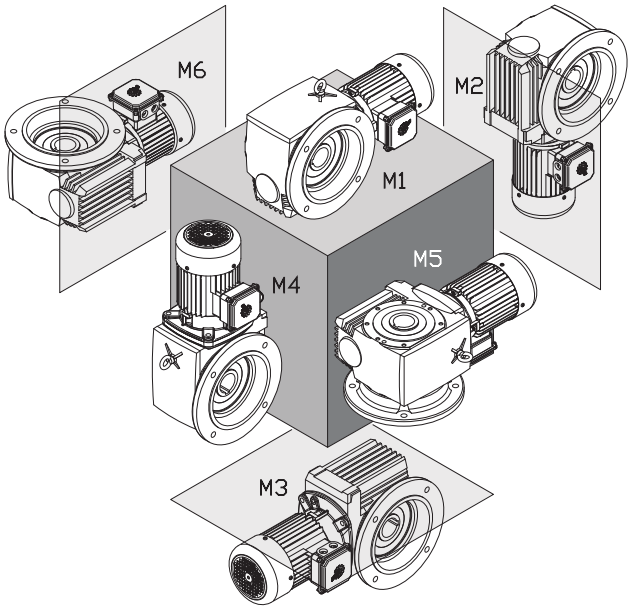
### Helical-worm hollow shaft lubrication

The following NORD Gear reducers are shipped from the factory with a pre-determined oil fi ll level in accordance to the specifi ed reducer size and mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.

**STOP** *HARMFUL SITUATION* **STOP**

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fi ll level using the reducer's oil level plug and drain or add addition oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.




**AF Unit Shown**

| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK 02040** | 0.42 | 0.40 | 0.74 | 0.70 | 0.69 | 0.65 | 0.69 | 0.65 | 0.58 | 0.55 | 0.58 | 0.55 |
| **SK 02050** | 0.48 | 0.45 | 1.48 | 1.40 | 1.22 | 1.15 | 1.16 | 1.10 | 0.79 | 0.75 | 0.79 | 0.75 |
| **SK 13050** | 0.95 | 0.90 | 1.90 | 1.80 | 1.37 | 1.30 | 1.74 | 1.65 | 1.37 | 1.30 | 1.37 | 1.30 |
| **SK 12063** | 0.58 | 0.55 | 1.53 | 1.45 | 1.69 | 1.60 | 1.69 | 1.60 | 1.16 | 1.10 | 1.16 | 1.10 |
| **SK 13063** | 1.11 | 1.05 | 2.22 | 2.10 | 1.90 | 1.80 | 2.22 | 2.10 | 1.48 | 1.40 | 1.48 | 1.40 |
| **SK 12080** | 0.85 | 0.80 | 3.28 | 3.10 | 3.38 | 3.20 | 2.96 | 2.80 | 1.90 | 1.80 | 1.90 | 1.80 |
| **SK 13080** | 1.69 | 1.60 | 3.80 | 3.60 | 3.06 | 2.90 | 3.96 | 3.75 | 2.11 | 2.00 | 2.11 | 2.00 |
| **SK 32100** | 1.59 | 1.50 | 5.92 | 5.60 | 5.92 | 5.60 | 5.60 | 5.30 | 4.23 | 4.00 | 4.23 | 4.00 |
| **SK 33100** | 2.75 | 2.60 | 6.34 | 6.00 | 6.13 | 5.80 | 6.34 | 6.00 | 3.70 | 3.50 | 3.70 | 3.50 |
| **SK 42125** | 3.17 | 3.00 | 13.2 | 12.5 | 11.4 | 10.8 | 11.4 | 10.8 | 6.87 | 6.50 | 6.87 | 6.50 |
| **SK 43125** | 4.86 | 4.60 | 14.4 | 13.6 | 12.0 | 11.4 | 15.1 | 14.3 | 8.03 | 7.60 | 8.03 | 7.60 |

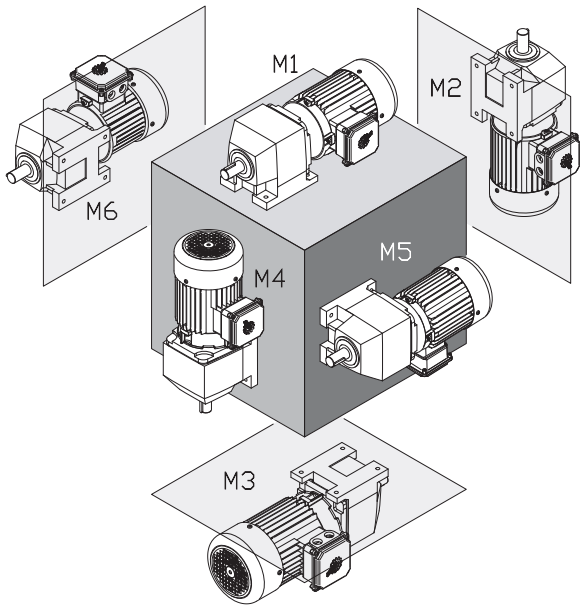
**Oil Levels shown apply to gear units ending in AZ, AF.**

# NORDBLOC® FOOTED OIL FILL QUANTITIES



### NORDBLOC® footed lubrication

The following NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.




**STOP** *HARMFUL SITUATION* **STOP**

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil level plug and drain or add addition oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.

| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK 172** | 0.37 | 0.35 | 0.53 | 0.50 | 0.53 | 0.50 | 0.53 | 0.50 | 0.53 | 0.50 | 0.53 | 0.50 |
| **SK 272** | 0.63 | 0.60 | 1.06 | 1.00 | 1.06 | 1.00 | 1.06 | 1.00 | 1.06 | 1.00 | 1.06 | 1.00 |
| **SK 273** | 0.66 | 0.62 | 1.16 | 1.10 | 1.16 | 1.10 | 1.16 | 1.10 | 1.16 | 1.10 | 1.16 | 1.10 |
| **SK 372** | 0.63 | 0.60 | 1.06 | 1.00 | 1.06 | 1.00 | 1.06 | 1.00 | 1.06 | 1.00 | 1.06 | 1.00 |
| **SK 373** | 0.58 | 0.55 | 1.16 | 1.10 | 1.16 | 1.10 | 1.16 | 1.10 | 1.16 | 1.10 | 1.16 | 1.10 |
| **SK 472** | 1.06 | 1.00 | 2.01 | 1.90 | 2.01 | 1.90 | 2.11 | 2.00 | 1.90 | 1.80 | 1.90 | 1.80 |
| **SK 473** | 1.37 | 1.30 | 2.64 | 2.50 | 2.22 | 2.10 | 2.54 | 2.40 | 2.22 | 2.10 | 2.22 | 2.10 |
| **SK 572** | 1.06 | 1.00 | 2.01 | 1.90 | 2.01 | 1.90 | 2.11 | 2.00 | 1.90 | 1.80 | 1.90 | 1.80 |
| **SK 573** | 1.37 | 1.30 | 2.64 | 2.50 | 2.22 | 2.10 | 2.54 | 2.40 | 2.22 | 2.10 | 2.22 | 2.10 |
| **SK 672** | 1.48 | 1.40 | 3.59 | 3.40 | 3.28 | 3.10 | 3.33 | 3.15 | 1.53 | 1.45 | 3.33 | 3.15 |
| **SK 673** | 1.90 | 1.80 | 4.02 | 3.80 | 3.38 | 3.20 | 3.59 | 3.40 | 3.06 | 2.90 | 3.17 | 3.00 |
| **SK 772** | 2.11 | 2.00 | 3.49 | 3.30 | 3.70 | 3.50 | 4.44 | 4.20 | 2.85 | 2.70 | 3.49 | 3.30 |
| **SK 773** | 2.64 | 2.50 | 4.76 | 4.50 | 3.91 | 3.70 | 4.86 | 4.60 | 3.49 | 3.30 | 3.49 | 3.30 |
| **SK 872** | 3.91 | 3.70 | 10.1 | 9.60 | 9.62 | 9.10 | 7.71 | 7.30 | 4.97 | 4.70 | 8.45 | 8.00 |
| **SK 873** | 6.55 | 6.20 | 8.88 | 8.40 | 7.93 | 7.50 | 9.62 | 9.10 | 7.93 | 7.50 | 7.93 | 7.50 |
| **SK 972** | 6.87 | 6.50 | 16.9 | 16.0 | 16.6 | 15.7 | 15.5 | 14.7 | 8.98 | 8.50 | 14.8 | 14.0 |
| **SK 973** | 11.6 | 11.0 | 16.7 | 15.8 | 13.7 | 13.0 | 16.9 | 16.0 | 14.1 | 13.3 | 13.7 | 13.0 |

# NORDBLOC® FLANGED OIL FILL QUANTITIES



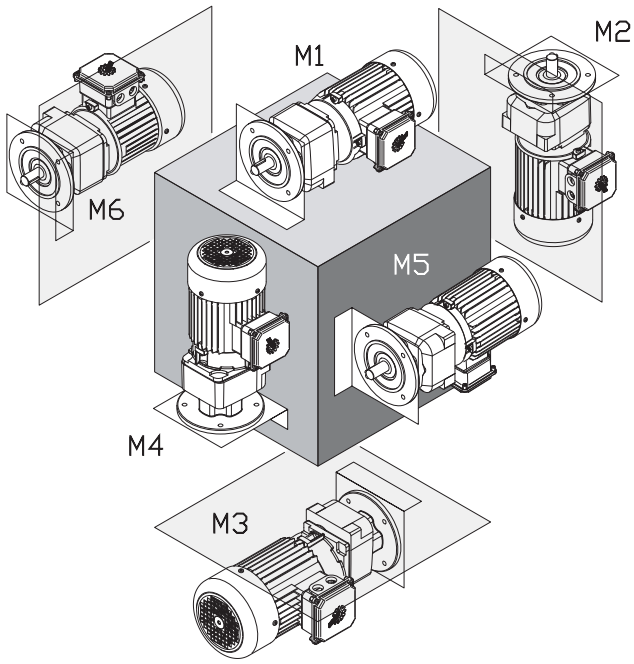
### NORDBLOC® flanged lubrication

The following NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.

**STOP** *HARMFUL SITUATION* **STOP**

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil level plug and drain or add addition oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.




| Mounting Position | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK 172 F** | 0.37 | 0.35 | 0.53 | 0.50 | 0.53 | 0.50 | 0.53 | 0.50 | 0.53 | 0.50 | 0.53 | 0.50 |
| **SK 272 F** | 0.63 | 0.60 | 1.06 | 1.00 | 1.06 | 1.00 | 1.06 | 1.00 | 1.06 | 1.00 | 1.06 | 1.00 |
| **SK 273 F** | 0.66 | 0.62 | 1.16 | 1.10 | 1.16 | 1.10 | 1.16 | 1.10 | 1.16 | 1.10 | 1.16 | 1.10 |
| **SK 372 F** | 0.63 | 0.60 | 1.06 | 1.00 | 1.06 | 1.00 | 1.06 | 1.00 | 1.06 | 1.00 | 1.06 | 1.00 |
| **SK 373 F** | 0.58 | 0.55 | 1.16 | 1.10 | 1.16 | 1.10 | 1.16 | 1.10 | 1.16 | 1.10 | 1.16 | 1.10 |
| **SK 472 F** | 1.06 | 1.00 | 2.01 | 1.90 | 2.01 | 1.90 | 2.01 | 1.90 | 2.01 | 1.90 | 1.59 | 1.50 |
| **SK 473 F** | 1.32 | 1.25 | 2.54 | 2.40 | 2.22 | 2.10 | 2.64 | 2.50 | 2.22 | 2.10 | 2.22 | 2.10 |
| **SK 572 F** | 1.06 | 1.00 | 2.01 | 1.90 | 2.01 | 1.90 | 2.01 | 1.90 | 2.01 | 1.90 | 1.59 | 1.50 |
| **SK 573 F** | 1.32 | 1.25 | 2.54 | 2.40 | 2.22 | 2.10 | 2.64 | 2.50 | 2.22 | 2.10 | 2.22 | 2.10 |
| **SK 672 F** | 1.22 | 1.15 | 3.59 | 3.40 | 2.85 | 2.70 | 2.96 | 2.80 | 1.32 | 1.25 | 2.85 | 2.70 |
| **SK 673 F** | 1.80 | 1.70 | 4.02 | 3.80 | 3.17 | 3.00 | 3.38 | 3.20 | 3.17 | 3.00 | 3.17 | 3.00 |
| **SK 772 F** | 1.69 | 1.60 | 3.49 | 3.30 | 3.70 | 3.50 | 3.49 | 3.30 | 3.28 | 3.10 | 3.28 | 3.10 |
| **SK 773 F** | 2.43 | 2.30 | 5.28 | 5.00 | 3.80 | 3.60 | 4.76 | 4.50 | 4.12 | 3.90 | 4.12 | 3.90 |
| **SK 872 F** | 3.70 | 3.50 | 9.51 | 9.00 | 8.35 | 7.90 | 8.14 | 7.70 | 4.12 | 3.90 | 7.61 | 7.20 |
| **SK 873 F** | 5.28 | 5.00 | 9.30 | 8.80 | 8.03 | 7.60 | 8.45 | 8.00 | 8.45 | 8.00 | 8.45 | 8.00 |
| **SK 972 F** | 6.87 | 6.50 | 15.9 | 15.0 | 13.7 | 13.0 | 14.3 | 13.5 | 6.87 | 6.50 | 12.7 | 12.0 |
| **SK 973 F** | 10.9 | 10.3 | 17.4 | 16.5 | 13.7 | 13.0 | 16.9 | 16.0 | 14.8 | 14.0 | 14.8 | 14.0 |

# NORDBLOC®.1 FOOTED OIL FILL QUANTITIES



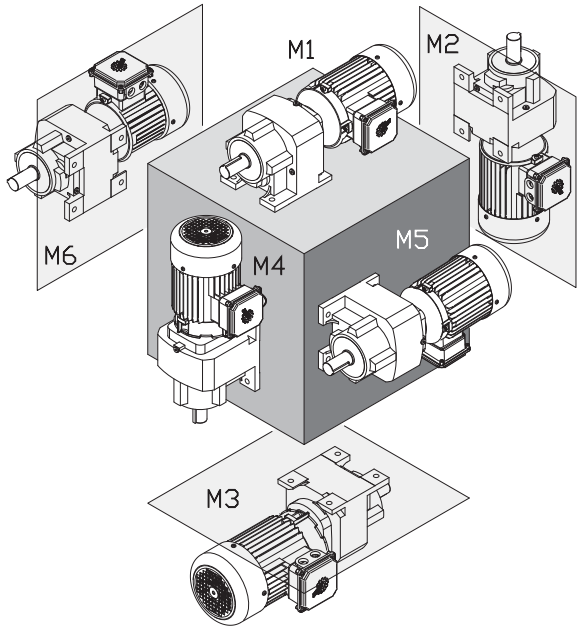
### NORDBLOC®.1 footed lubrication

The following NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.

**STOP** *HARMFUL SITUATION* **STOP**

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil level plug and drain or add addition oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.




| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK072.1** | 0.17 | 0.16 | 0.34 | 0.32 | 0.22 | 0.21 | 0.24 | 0.23 | 0.19 | 0.18 | 0.21 | 0.20 |
| **SK172.1** | 0.29 | 0.27 | 0.62 | 0.59 | 0.44 | 0.42 | 0.48 | 0.45 | 0.34 | 0.32 | 0.41 | 0.39 |
| **SK372.1** | 0.48 | 0.45 | 1.11 | 1.05 | 0.79 | 0.75 | 1.06 | 1.00 | 0.63 | 0.60 | 0.69 | 0.65 |
| **SK373.1** | 0.48 | 0.45 | 1.11 | 1.05 | 0.79 | 0.75 | 1.06 | 1.00 | 0.63 | 0.60 | 0.69 | 0.65 |
| **SK572.1** | 0.79 | 0.75 | 2.01 | 1.90 | 1.59 | 1.50 | 2.11 | 2.00 | 1.16 | 1.10 | 1.22 | 1.15 |
| **SK573.1** | 0.79 | 0.75 | 2.01 | 1.90 | 1.59 | 1.50 | 2.11 | 2.00 | 1.16 | 1.10 | 1.22 | 1.15 |
| **SK672.1** | 1.16 | 1.10 | 2.75 | 2.60 | 2.27 | 2.15 | 2.85 | 2.70 | 1.64 | 1.55 | 1.74 | 1.65 |
| **SK673.1** | 1.16 | 1.10 | 2.75 | 2.60 | 2.27 | 2.15 | 2.85 | 2.70 | 1.64 | 1.55 | 1.74 | 1.65 |
| **SK772.1** | 1.37 | 1.30 | 4.02 | 3.80 | 2.54 | 2.40 | 3.38 | 3.20 | 1.69 | 1.60 | 2.64 | 2.50 |
| **SK773.1** | 2.43 | 2.30 | 4.02 | 3.80 | 3.49 | 3.30 | 3.38 | 3.20 | 2.54 | 2.40 | 3.28 | 3.10 |
| **SK872.1** | 3.06 | 2.90 | 8.24 | 7.80 | 4.86 | 4.60 | 6.76 | 6.40 | 2.64 | 2.50 | 4.23 | 4.00 |
| **SK873.1** | 4.44 | 4.20 | 8.24 | 7.80 | 6.23 | 5.90 | 6.76 | 6.40 | 4.33 | 4.10 | 6.23 | 5.90 |
| **SK972.1** | 4.76 | 4.50 | 12.7 | 12.0 | 7.93 | 7.50 | 12.2 | 11.5 | 4.44 | 4.20 | 7.93 | 7.50 |
| **SK973.1** | 7.93 | 7.50 | 12.7 | 12.0 | 11.1 | 10.5 | 12.2 | 11.5 | 7.93 | 7.50 | 11.1 | 10.5 |
| **SK772.1VL** | 2.11 | 2.00 | 4.02 | 3.80 | 2.54 | 2.40 | 3.38 | 3.20 | 1.69 | 1.60 | 2.64 | 2.50 |
| **SK773.1VL** | 2.43 | 2.30 | 4.02 | 3.80 | 3.49 | 3.30 | 3.38 | 3.20 | 2.54 | 2.40 | 3.28 | 3.10 |
| **SK872.1VL** | 5.28 | 5.00 | 8.24 | 7.80 | 4.86 | 4.60 | 6.76 | 6.40 | 2.64 | 2.50 | 4.23 | 4.00 |
| **SK873.1VL** | 4.44 | 4.20 | 8.24 | 7.80 | 6.23 | 5.90 | 6.76 | 6.40 | 4.33 | 4.10 | 6.23 | 5.90 |
| **SK972.1VL** | 8.98 | 8.50 | 12.7 | 12.0 | 7.93 | 7.50 | 12.2 | 11.5 | 4.44 | 4.20 | 7.93 | 7.50 |
| **SK973.1VL** | 7.93 | 7.50 | 12.7 | 12.0 | 11.1 | 10.5 | 12.2 | 11.5 | 7.93 | 7.50 | 11.1 | 10.5 |

# NORDBLOC®.1 FLANGED OIL FILL QUANTITIES



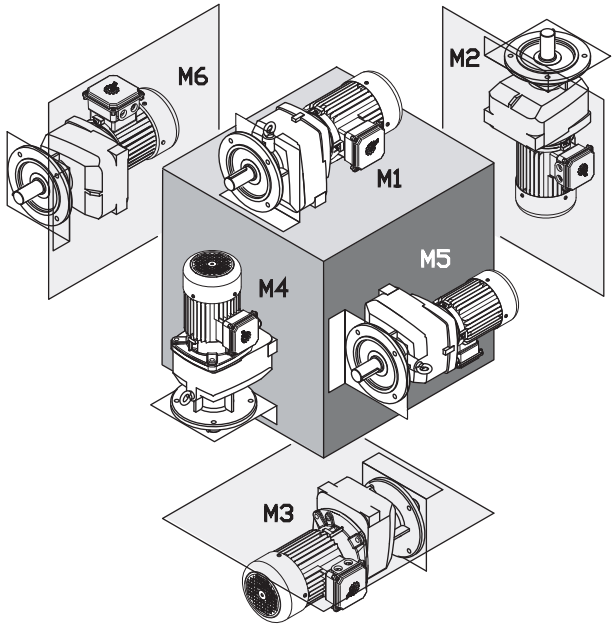
### NORDBLOC®.1 flanged lubrication

The following NORD Gear reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. For additional information, please refer to the "Oil Plug & Vent Locations" documentation for your gear unit.

**STOP** *HARMFUL SITUATION* **STOP**

Actual oil volume can vary slightly depending upon the gear case size, mounting and ratio. Prior to commissioning the reducer, check the oil-fill level using the reducer's oil level plug and drain or add addition oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole.

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.




| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters | Quarts | Liters |
| **SK072.1 F** | 0.17 | 0.16 | 0.34 | 0.32 | 0.22 | 0.21 | 0.24 | 0.23 | 0.19 | 0.18 | 0.21 | 0.20 |
| **SK172.1 F** | 0.29 | 0.27 | 0.62 | 0.59 | 0.44 | 0.42 | 0.48 | 0.45 | 0.34 | 0.32 | 0.41 | 0.39 |
| **SK372.1 F** | 0.48 | 0.45 | 1.11 | 1.05 | 0.79 | 0.75 | 1.06 | 1.00 | 0.63 | 0.60 | 0.69 | 0.65 |
| **SK373.1 F** | 0.48 | 0.45 | 1.11 | 1.05 | 0.79 | 0.75 | 1.06 | 1.00 | 0.63 | 0.60 | 0.69 | 0.65 |
| **SK572.1 F** | 0.79 | 0.75 | 2.01 | 1.90 | 1.59 | 1.50 | 2.11 | 2.00 | 1.16 | 1.10 | 1.22 | 1.15 |
| **SK573.1 F** | 0.79 | 0.75 | 2.01 | 1.90 | 1.59 | 1.50 | 2.11 | 2.00 | 1.16 | 1.10 | 1.22 | 1.15 |
| **SK672.1 F** | 1.16 | 1.10 | 2.75 | 2.60 | 2.27 | 2.15 | 2.85 | 2.70 | 1.64 | 1.55 | 1.74 | 1.65 |
| **SK673.1 F** | 1.16 | 1.10 | 2.75 | 2.60 | 2.27 | 2.15 | 2.85 | 2.70 | 1.64 | 1.55 | 1.74 | 1.65 |
| **SK772.1 F** | 1.37 | 1.30 | 4.02 | 3.80 | 2.54 | 2.40 | 3.49 | 3.30 | 1.80 | 1.70 | 2.54 | 2.40 |
| **SK773.1 F** | 2.11 | 2.00 | 3.70 | 3.50 | 3.38 | 3.20 | 3.06 | 2.90 | 2.43 | 2.30 | 3.17 | 3.00 |
| **SK872.1 F** | 3.06 | 2.90 | 7.93 | 7.50 | 5.39 | 5.10 | 7.08 | 6.70 | 2.75 | 2.60 | 4.54 | 4.30 |
| **SK873.1 F** | 4.33 | 4.10 | 8.03 | 7.60 | 7.29 | 6.90 | 6.97 | 6.60 | 5.28 | 5.00 | 6.97 | 6.60 |
| **SK973.1 F** | 7.82 | 7.40 | 12.9 | 12.2 | 11.7 | 11.1 | 12.3 | 11.6 | 8.45 | 8.00 | 11.5 | 10.9 |
| **SK972.1 F** | 4.76 | 4.50 | 13.2 | 12.5 | 8.45 | 8.00 | 13.2 | 12.5 | 4.76 | 4.50 | 8.14 | 7.70 |
| **SK772.1F VL** | 2.11 | 2.00 | 4.02 | 3.80 | 2.54 | 2.40 | 3.49 | 3.30 | 1.80 | 1.70 | 2.54 | 2.40 |
| **SK773.1F VL** | 2.11 | 2.00 | 3.70 | 3.50 | 3.38 | 3.20 | 3.06 | 2.90 | 2.43 | 2.30 | 3.17 | 3.00 |
| **SK872.1F VL** | 5.28 | 5.00 | 7.93 | 7.50 | 5.39 | 5.10 | 7.08 | 6.70 | 2.75 | 2.60 | 4.54 | 4.30 |
| **SK873.1F VL** | 4.33 | 4.10 | 8.03 | 7.60 | 7.29 | 6.90 | 6.97 | 6.60 | 5.28 | 5.00 | 6.97 | 6.60 |
| **SK972.1F VL** | 8.98 | 8.50 | 13.2 | 12.5 | 8.45 | 8.00 | 13.2 | 12.5 | 4.76 | 4.50 | 8.14 | 7.70 |
| **SK973.1F VL** | 7.82 | 7.40 | 12.9 | 12.2 | 11.7 | 11.1 | 12.3 | 11.6 | 8.45 | 8.00 | 11.5 | 10.9 |

# MINICASE® (SM SERIES) WORM GEAR OIL FILL QUANTITIES - FOOT HOUSING

**MINICASE® (SM Series) Lubrication**

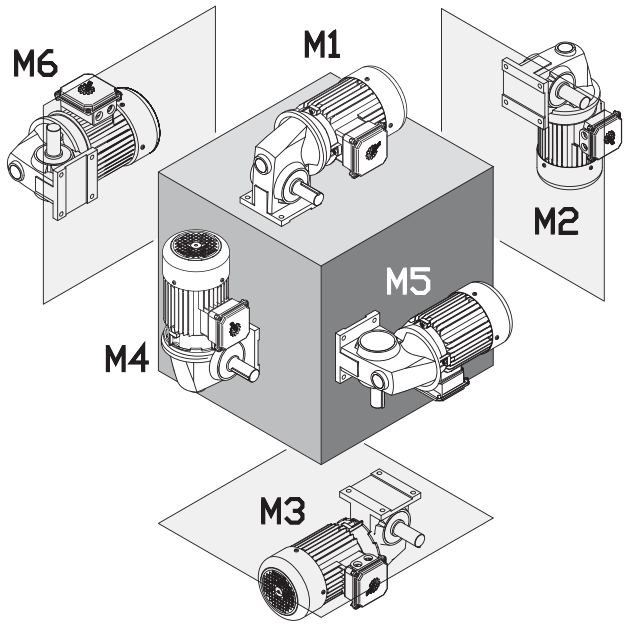
NORD MINICASE® (SM Series) worm gear reducers and worm gearmotors are inherently maintence free, factory oil filled, and supplied with a high quality, long life synthetic gear oil intended to be suitable for the life of the product. These gear units are also supplied without oil service plugs or vents.

**Related User Manuals**

U10790 MINICASE® (SM Series) Worm – Lubrication Guidelines.
U11040 MINICASE® (SM Series) Worm – Lubrication Types.

STOP *HARMFUL SITUATION* STOP

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.




| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml |
| **SK 1SM31** | 4.1 | 120 | 4.1 | 120 | 4.1 | 120 | 4.1 | 120 | 4.1 | 120 | 4.1 | 120 |
| **SK 1SM40** | 7.4 | 220 | 7.4 | 220 | 7.4 | 220 | 7.4 | 220 | 7.4 | 220 | 7.4 | 220 |
| **SK 2SM40** | 11.2 | 330 | 11.2 | 330 | 11.2 | 330 | 12.2 | 360 | 11.2 | 330 | 11.2 | 330 |
| **SK 1SM50** | 8.5 | 250 | 8.5 | 250 | 8.5 | 250 | 8.5 | 250 | 8.5 | 250 | 8.5 | 250 |
| **SK 2SM50** | 11.8 | 350 | 11.8 | 350 | 11.8 | 350 | 14.2 | 420 | 11.8 | 350 | 11.8 | 350 |
| **SK 1SM63** | 14.2 | 420 | 14.2 | 420 | 14.2 | 420 | 14.2 | 420 | 14.2 | 420 | 14.2 | 420 |
| **SK 2SM63** | 17.9 | 530 | 17.9 | 530 | 17.9 | 530 | 21.3 | 630 | 17.9 | 530 | 17.9 | 530 |

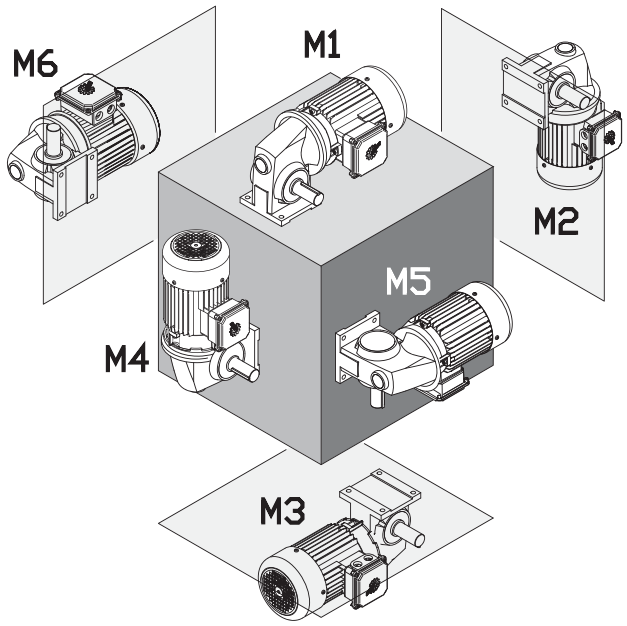
**Oil levels shown apply to any foot-mount gear housings including those ending with no suffix or ending with LX or AX.**

# MINICASE® (SMI/SMID) WORM GEAR OIL FILL QUANTITIES - FOOT HOUSING

**MINICASE® (SMI/SMID Series) Lubrication**

NORD MINICASE® (SMI/SMID Series) worm gear reducers and worm gearmotors are inherently maintence free, factory oil filled, and supplied with a high quality, long life synthetic gear oil intended to be suitable for the life of the product. For lubrication types see user manual U11050.

NORD MINICASE® (SMI/SMID Series) worm gear reducers and worm gearmotors are equipped with oil plugs. Venting the gear unit is optional as discussed in user manual U14750.




### Related User Manuals

U10800 - MINICASE® (SMI/SMID Series) Worm – Lubrication Guidelines.
U11050 - MINICASE® (SMI/SMID Series) Worm – Lubrication Types
U14750 - MINICASE® (SMI/SMID Series) Worm – Oil Plug Locations

**STOP** *HARMFUL SITUATION* **STOP**

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.

**MINICASE® (SMI Series) Gear Reducer Oil Fill - Foot Housing**

| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml |
| SK 1SMI31 | 1.5 | 45 | 1.5 | 45 | 1.5 | 45 | 1.5 | 45 | 1.5 | 45 | 1.5 | 45 |
| SK 1SMI40 | 2.7 | 80 | 2.7 | 80 | 2.7 | 80 | 2.7 | 80 | 2.7 | 80 | 2.7 | 80 |
| SK 1SMI50 | 4.4 | 130 | 4.4 | 130 | 4.4 | 130 | 4.4 | 130 | 4.4 | 130 | 4.4 | 130 |
| SK 1SMI63 | 9.1 | 270 | 9.1 | 270 | 9.1 | 270 | 9.1 | 270 | 9.1 | 270 | 9.1 | 270 |
| SK 1SMI75 | 14.2 | 420 | 14.2 | 420 | 14.2 | 420 | 14.2 | 420 | 14.2 | 420 | 14.2 | 420 |

**Oil fill level is universal and independent of mounting position**
**Oil levels shown apply to any foot-mount gear housings including those ending with no-suffix or LX or AX.**

**MINICASE® (SMID Series) Integral Gearmotor Oil Fill - Foot Housing**

| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml |
| SK 1SMID31 | 2.0 | 60 | 3.6 | 105 | 2.4 | 70 | 1.7 | 50 | 2.4 | 70 | 2.4 | 70 |
| SK 1SMID40 | 3.4 | 100 | 5.6 | 165 | 4.1 | 120 | 3.0 | 90 | 4.1 | 120 | 4.1 | 120 |
| SK 1SMID50 | 5.9 | 175 | 8.8 | 260 | 6.6 | 195 | 5.4 | 160 | 6.6 | 195 | 6.6 | 195 |
| SK 1SMID63 | 9.6 | 285 | 14.4 | 425 | 11.0 | 325 | 9.1 | 270 | 11.0 | 325 | 11.0 | 325 |

**Oil levels shown apply to any foot-mount gear housings including those ending with no-suffix or LX or AX.**

# MINICASE® (SM SERIES) WORM GEAR OIL FILL QUANTITIES - FLANGE HOUSING

**MINICASE® (SM Series) Lubrication**

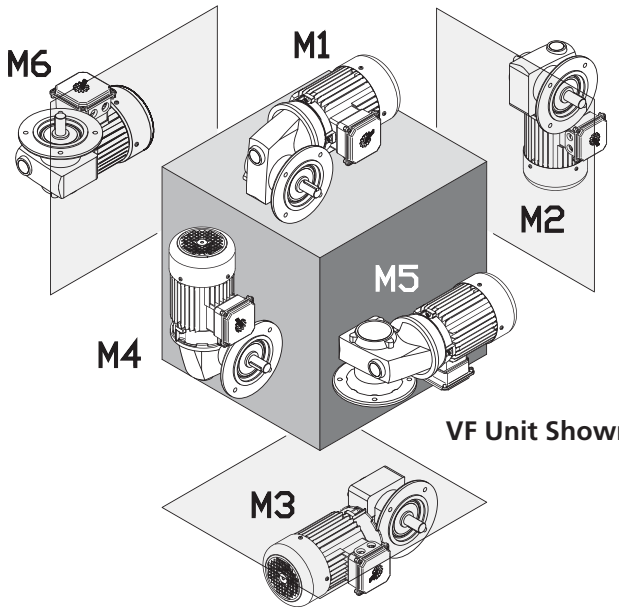
NORD MINICASE® (SM Series) worm gear reducers and worm gearmotors are inherently maintence free, factory oil filled, and supplied with a high quality, long life synthetic gear oil intended to be suitable for the life of the product. These gear units are also supplied without oil service plugs or vents.

**Related User Manuals**

U10790 MINICASE® (SM Series) Worm – Lubrication Guidelines.
U11040 MINICASE® (SM Series) Worm – Lubrication Types.

STOP *HARMFUL SITUATION* STOP

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.




**VF Unit Shown**

| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml |
| **SK 1SM31** | 4.4 | 130 | 4.4 | 130 | 4.4 | 130 | 4.4 | 130 | 4.4 | 130 | 4.4 | 130 |
| **SK 1SM40** | 8.1 | 240 | 8.1 | 240 | 8.1 | 240 | 8.1 | 240 | 8.1 | 240 | 8.1 | 240 |
| **SK 2SM40** | 11.5 | 340 | 11.5 | 340 | 11.5 | 340 | 12.8 | 380 | 11.5 | 340 | 11.5 | 340 |
| **SK 1SM50** | 9.1 | 270 | 9.1 | 270 | 9.1 | 270 | 9.1 | 270 | 9.1 | 270 | 9.1 | 270 |
| **SK 2SM50** | 12.5 | 370 | 12.5 | 370 | 12.5 | 370 | 15.2 | 450 | 12.5 | 370 | 12.5 | 370 |
| **SK 1SM63** | 15.2 | 450 | 15.2 | 450 | 15.2 | 450 | 15.2 | 450 | 15.2 | 450 | 15.2 | 450 |
| **SK 2SM63** | 20.3 | 600 | 20.3 | 600 | 20.3 | 600 | 24.7 | 730 | 20.3 | 600 | 20.3 | 600 |

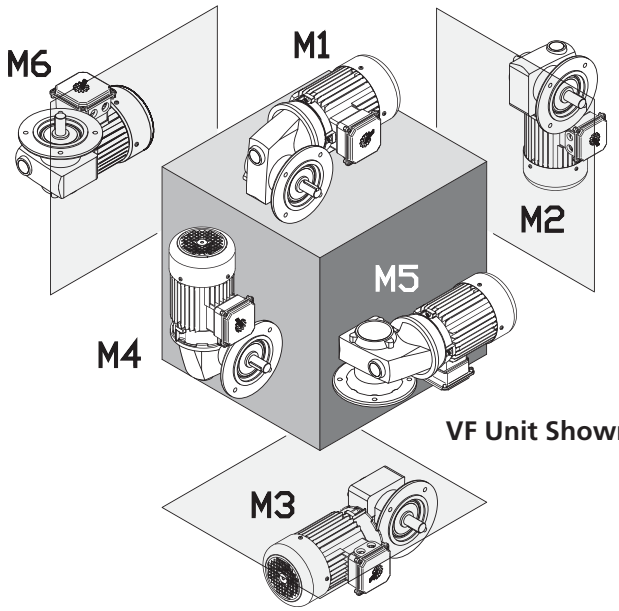
**Oil Levels shown apply to flange-mount gear housings with model type ending in AZ, AF, VZ or VF.**

# MINICASE® (SMI/SMID) WORM GEAR OIL FILL QUANTITIES - FLANGE HOUSING

**MINICASE® (SMI/SMID Series) Lubrication**

NORD MINICASE® (SMI/SMID Series) worm gear reducers and worm gearmotors are inherently maintence free, factory oil filled, and supplied with a high quality, long life synthetic gear oil intended to be suitable for the life of the product. For lubrication types see user manual U11050.

NORD MINICASE® (SMI/SMID Series) worm gear reducers and worm gearmotors are equipped with oil plugs. Venting the gear unit is optional as discussed in user manual U14750.



VF Unit Shown

### Related User Manuals

U10800 - MINICASE® (SMI/SMID Series) Worm – Lubrication Guidelines.
U11050 - MINICASE® (SMI/SMID Series) Worm – Lubrication Types
U14750 - MINICASE® (SMI/SMID Series) Worm – Oil Plug Locations

**STOP** *HARMFUL SITUATION* **STOP**

For mounting orientations other than shown please consult NORD Gear. Reducer modifications may be required.

**MINICASE® (SMI Series) Gear Reducer Oil Fill - Flange Housing**

| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml |
| **SK 1SMI31** | 1.5 | 45 | 1.5 | 45 | 1.5 | 45 | 1.5 | 45 | 1.5 | 45 | 1.5 | 45 |
| **SK 1SMI40** | 2.7 | 80 | 2.7 | 80 | 2.7 | 80 | 2.7 | 80 | 2.7 | 80 | 2.7 | 80 |
| **SK 1SMI50** | 4.4 | 130 | 4.4 | 130 | 4.4 | 130 | 4.4 | 130 | 4.4 | 130 | 4.4 | 130 |
| **SK 1SMI63** | 9.1 | 270 | 9.1 | 270 | 9.1 | 270 | 9.1 | 270 | 9.1 | 270 | 9.1 | 270 |
| **SK 1SMI75** | 14.2 | 420 | 14.2 | 420 | 14.2 | 420 | 14.2 | 420 | 14.2 | 420 | 14.2 | 420 |

**Oil Fill is universal and independent of mounting position.**
**Oil Levels shown apply to flange-mount gear housings with model type ending in AZ, AF, VZ or VF.**

**MINICASE® (SMID Series) Integral Gearmotor Oil Fill - Flange Housing**

| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml |
| **SK 1SMID31** | 2.0 | 60 | 3.6 | 105 | 2.4 | 70 | 1.7 | 50 | 2.4 | 70 | 2.4 | 70 |
| **SK 1SMID40** | 3.4 | 100 | 5.6 | 165 | 4.1 | 120 | 3.0 | 90 | 4.1 | 120 | 4.1 | 120 |
| **SK 1SMID50** | 5.9 | 175 | 8.8 | 260 | 6.6 | 195 | 5.4 | 160 | 6.6 | 195 | 6.6 | 195 |
| **SK 1SMID63** | 9.6 | 285 | 14.4 | 425 | 11.0 | 325 | 9.1 | 270 | 11.0 | 325 | 11.0 | 325 |

**Oil Levels shown apply to flange-mount gear housings with model type ending in AZ, AF, VZ or VF.**

# FLEXBLOC™ (SI/SID SERIES) WORM GEAR OIL FILL QUANTITIES



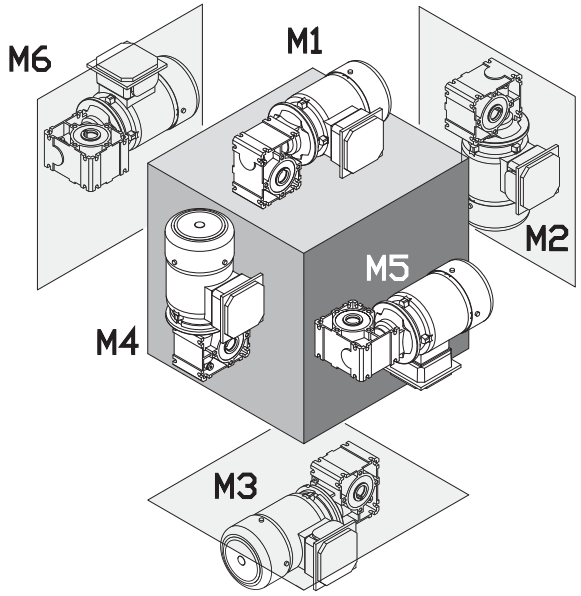
### FLEXBLOC™ (SI/SID Series) Lubrication

NORD FLEXBLOC™ worm gear reducers are inherently maintence free, factory oil filled, and supplied with a high quality, long life synthetic gear oil intended to be suitable for the life of the product. For lubrication types see User Manual U11060.

NORD FLEXBLOC™ worm gear reducers are equipped with oil plugs. Venting the gear unit is optional as discussed in User Manual U14800.

**Related User Manuals**

U10810 FLEXBLOC™ (SI/SID Series) Worm – Lubrication Guidelines
U11060 FLEXBLOC™ Worm (SI/SID Series) – Lubrication Types
U14800 FLEXBLOC™ Worm (SI/SID Series) – Oil Plug Locations




**FLEXBLOC™ (SI Series) Gear Reducer Oil Fill**

| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml |
| **SK 1SI31** | 1.0 | 30 | 1.0 | 30 | 1.0 | 30 | 1.0 | 30 | 1.0 | 30 | 1.0 | 30 |
| **SK 1SI40** | 1.9 | 55 | 1.9 | 55 | 1.9 | 55 | 1.9 | 55 | 1.9 | 55 | 1.9 | 55 |
| **SK 1SI50** | 3.2 | 95 | 3.2 | 95 | 3.2 | 95 | 3.2 | 95 | 3.2 | 95 | 3.2 | 95 |
| **SK 1SI63** | 6.1 | 180 | 6.1 | 180 | 6.1 | 180 | 6.1 | 180 | 6.1 | 180 | 6.1 | 180 |
| **SK 1SI75** | 12.2 | 360 | 12.2 | 360 | 12.2 | 360 | 12.2 | 360 | 12.2 | 360 | 12.2 | 360 |

**Oil Fill is universal and independent of mounting position.**

**FLEXBLOC™ (SID Series) Gear Reducer Oil Fill**

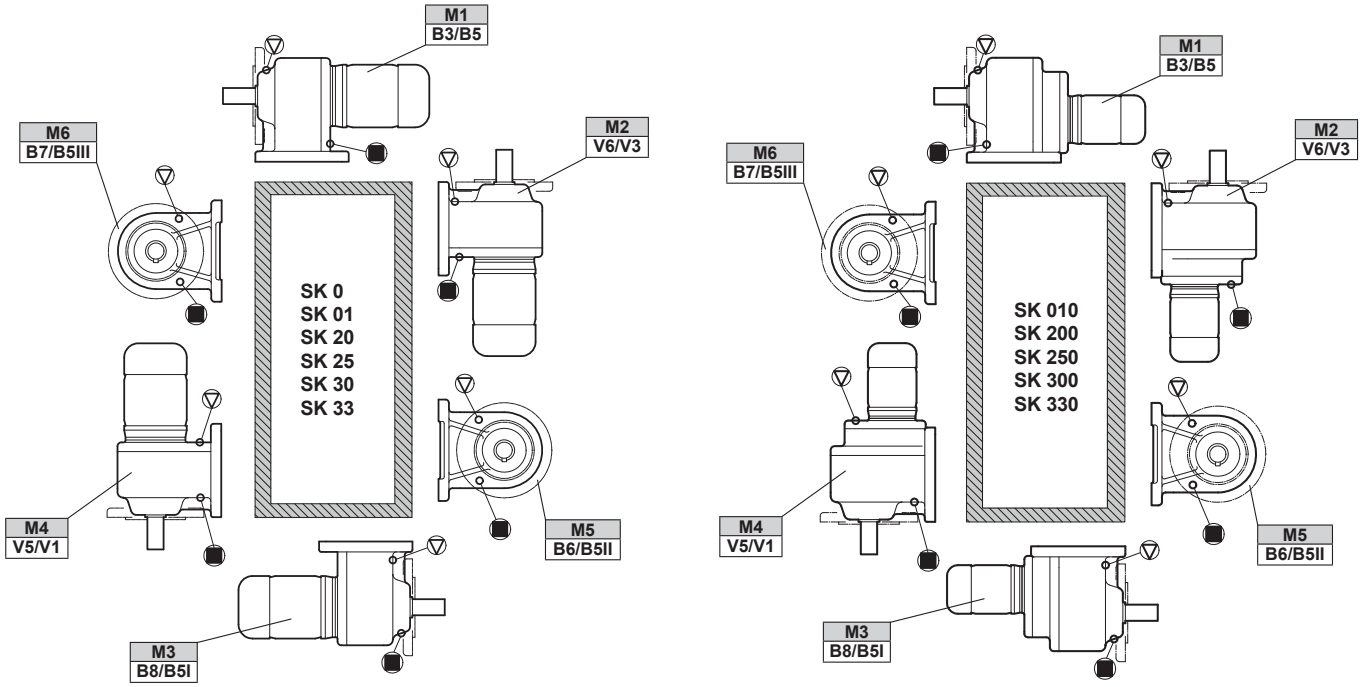
| Type | M1 | | M2 | | M3 | | M4 | | M5 | | M6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml | oz | ml |
| **SK 1SID31** | 1.7 | 50 | 3.0 | 90 | 2.4 | 70 | 1.7 | 50 | 2.4 | 70 | 2.4 | 70 |
| **SK 1SID40** | 3.0 | 90 | 5.1 | 150 | 3.7 | 110 | 2.7 | 80 | 4.1 | 120 | 4.1 | 120 |
| **SK 1SID50** | 5.7 | 170 | 6.8 | 200 | 5.7 | 170 | 5.1 | 150 | 6.1 | 180 | 6.1 | 180 |
| **SK 1SID63** | 9.8 | 280 | 12.2 | 360 | 9.8 | 290 | 8.1 | 240 | 10.5 | 310 | 10.5 | 310 |

**Integral gear motors only available upon special request.**

# STANDARD IN-LINE OIL PLUG & VENT LOCATIONS

### Oil plug connections

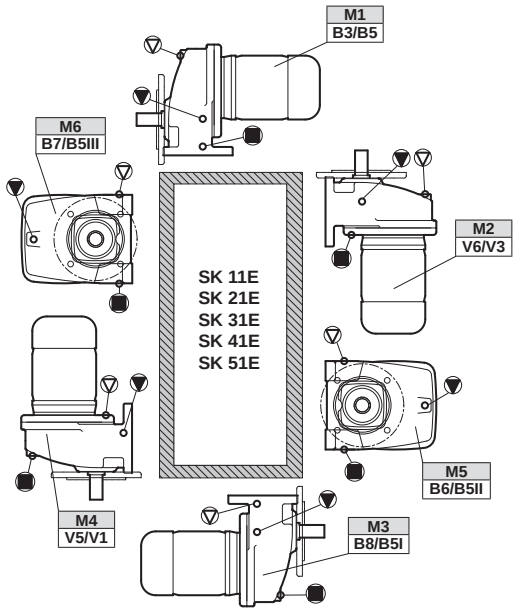
All reducers are shipped from the factory with a pre-determined oil fill level in accordance to the specified reducer size and mounting position. ***For mounting orientations other than shown please consult NORD Gear. New plug locations may be required.***

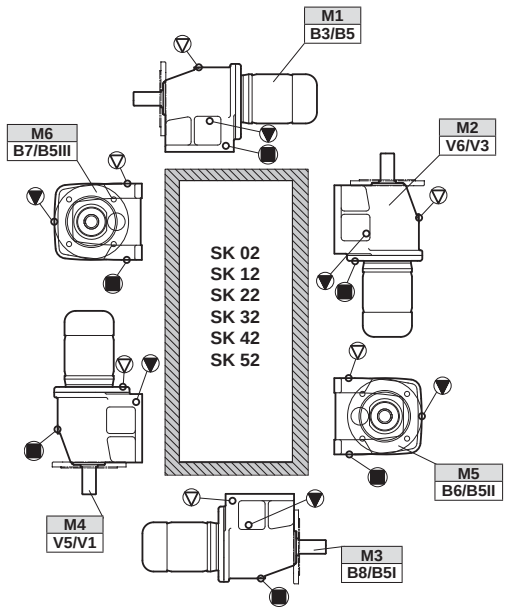


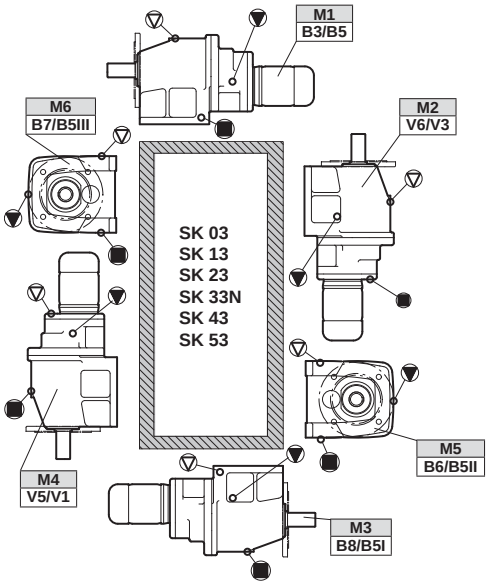
# HELICAL IN-LINE
# OIL PLUG & VENT LOCATIONS

### Oil plug connections

Prior to commissioning the reducer, check the oil-fill level using the reducer's oil-level plug and drain or add additional oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole. ***For mounting orientations other than shown please consult NORD Gear. New plug locations may be required.***



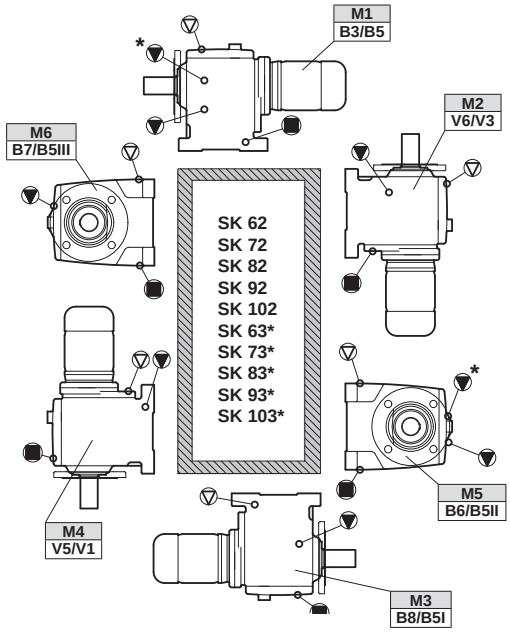




▽ = Vent

▼ = Oil Level

■ = Oil Plug

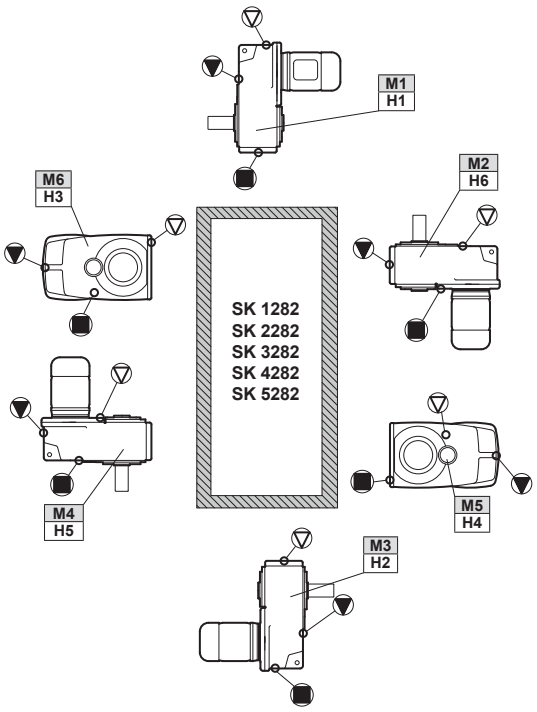


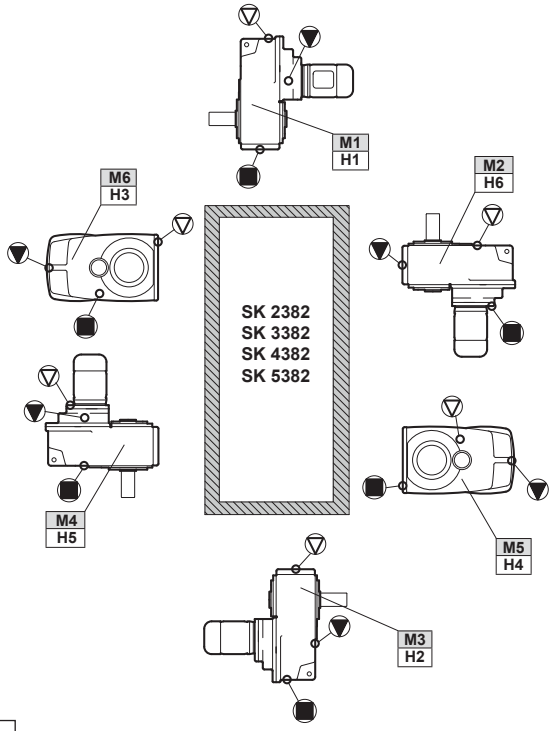

*** Oil level for 3 stage gear units.**

# CLINCHER™ OIL PLUG & VENT LOCATIONS

## Oil plug connections

Prior to commissioning the reducer, check the oil-fill level using the reducer's oil-level plug and drain or add additional oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole. ***For mounting orientations other than shown please consult NORD Gear. New plug locations may be required.***

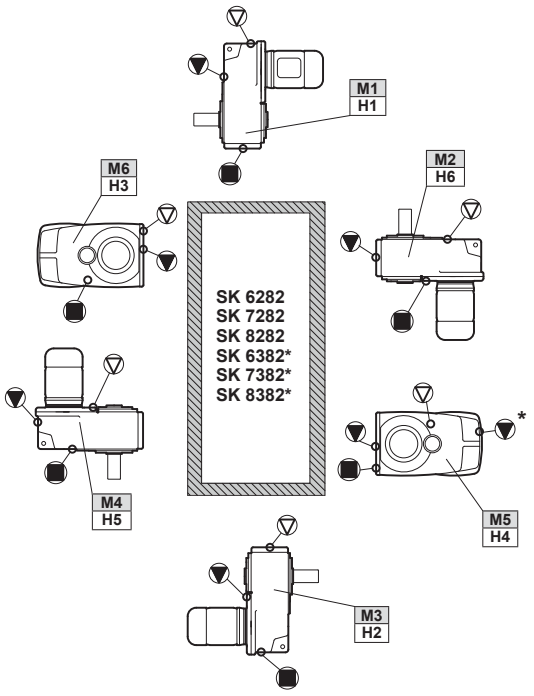


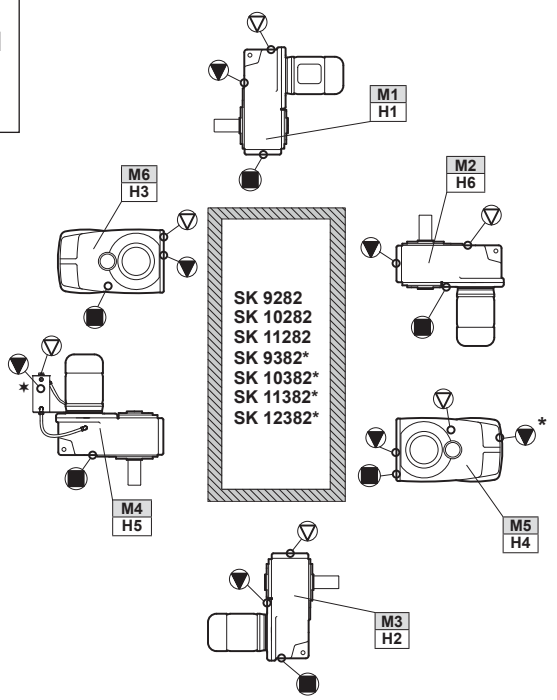

▽ = Vent

▼ = Oil Level

■ = Oil Plug




* Oil level for 3 stage gear units




* Oil level for 3 stage gear units

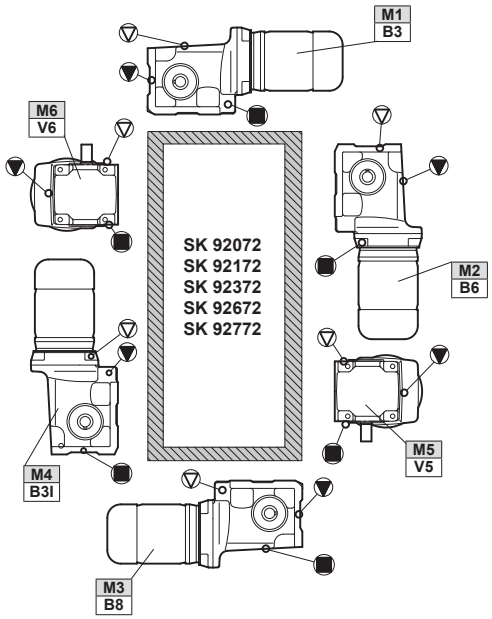
∗ Oil fill level should be verified using the dip stick located in the oil tank for the M4/H5 position.

# 92 SERIES HELICAL-BEVEL OIL PLUG & VENT LOCATIONS

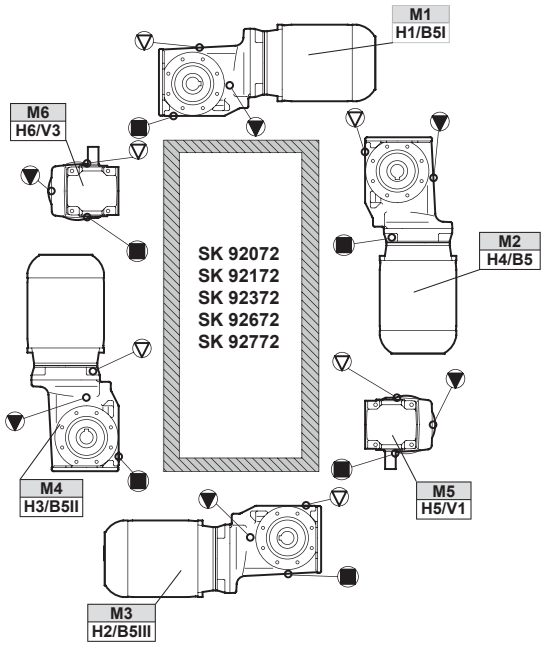
### Oil plug connections

Prior to commissioning the reducer, check the oil-fill level using the reducer's oil-level plug and drain or add additional oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole. ***For mounting orientations other than shown please consult NORD Gear. New plug locations may be required.***

### Foot Mount




### Shaft/Flange Mount




▽ = Vent

▼ = Oil Level

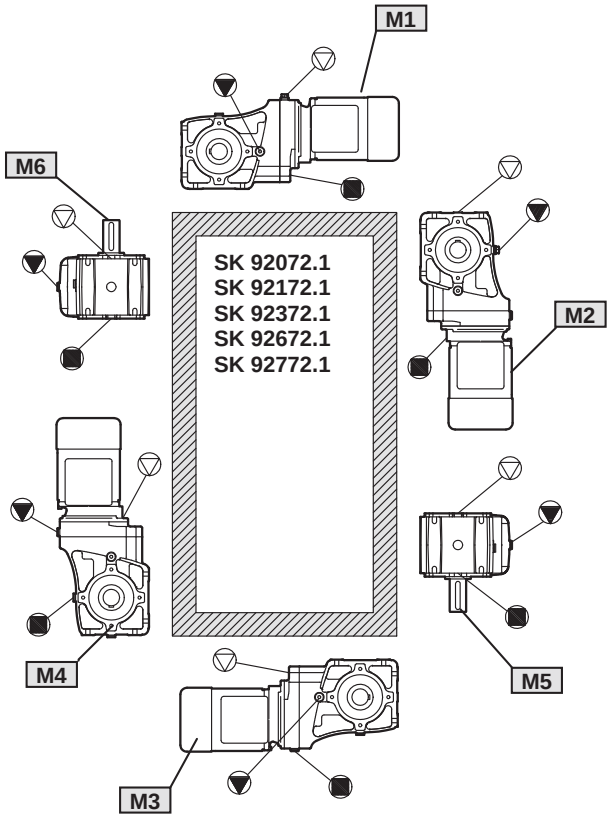
■ = Oil Plug

# 92.1/93.1 SERIES HELICAL-BEVEL OIL PLUG & VENT LOCATIONS

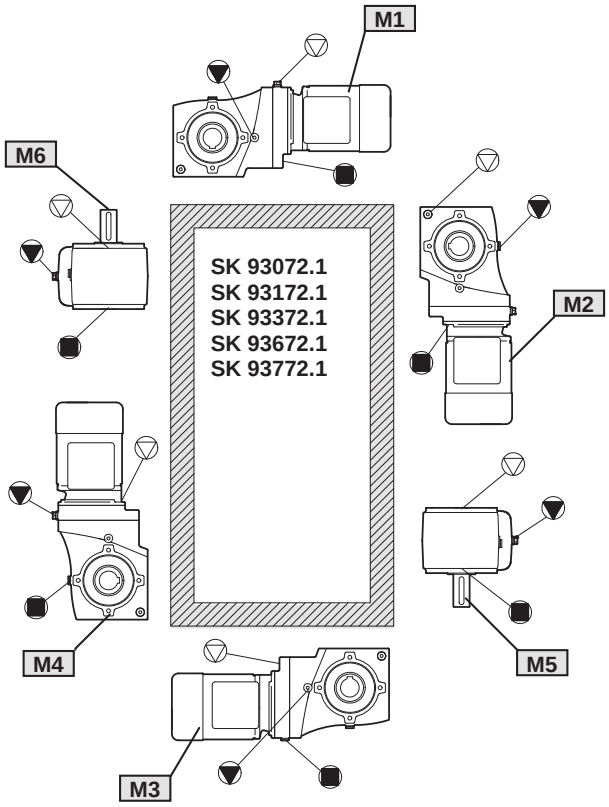
## Oil plug locations

Prior to commissioning the reducer, check the oil-fill level using the reducer's oil-level plug and drain or add additional oil as needed. ***For mounting orientations other than shown please consult NORD Gear. New plug locations may be required.***

### 92.1 Series




### 93.1 Series




▽ = Vent

▼ = Oil Level

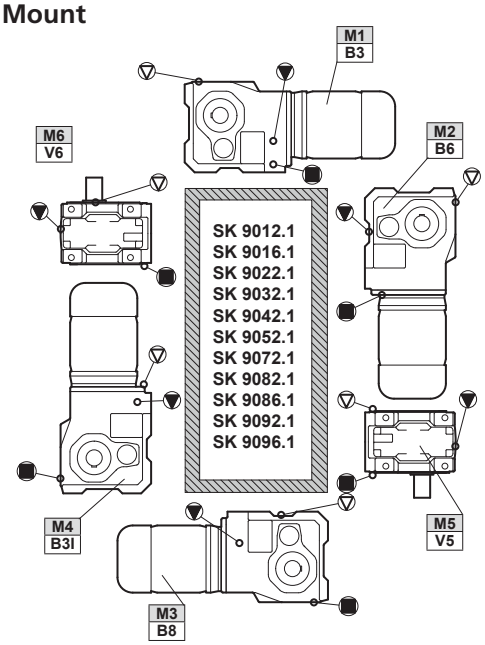
■ = Oil Plug

# 90.1 HELICAL-BEVEL OIL PLUG & VENT LOCATIONS

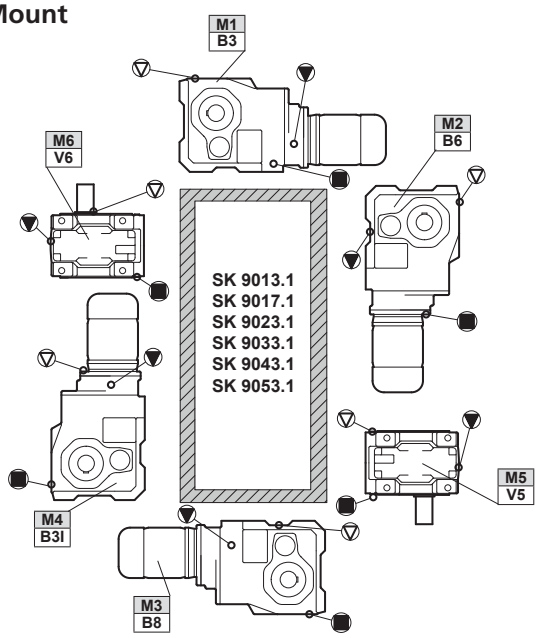
### Oil plug connections

Prior to commissioning the reducer, check the oil-fill level using the reducer's oil-level plug and drain or add additional oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole. ***For mounting orientations other than shown please consult NORD Gear. New plug locations may be required.***

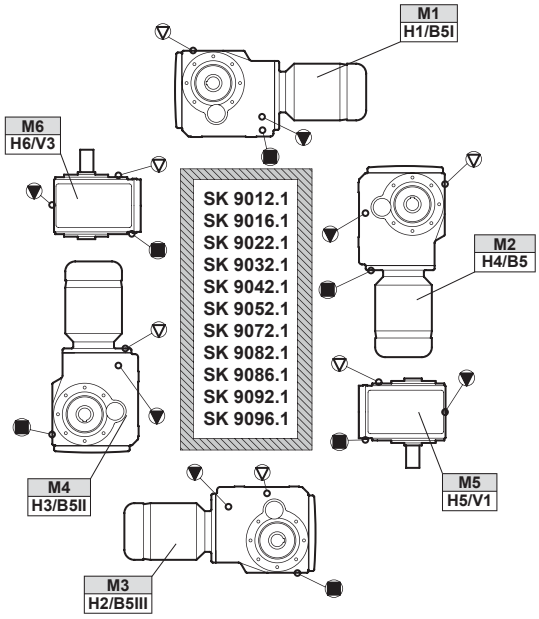
**Foot Mount**



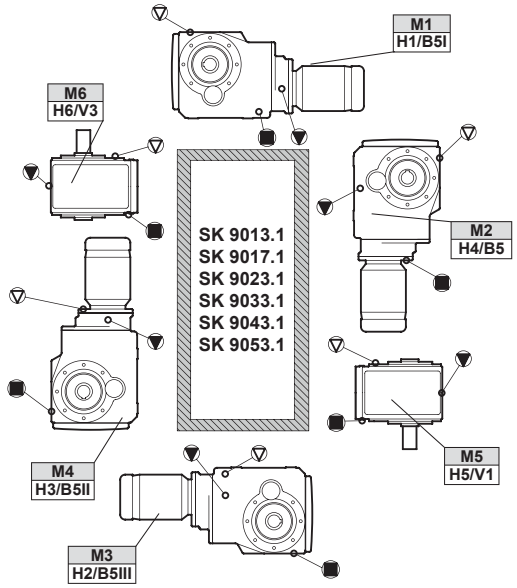

**Foot Mount**




**Shaft/Flange Mount**




**Shaft/Flange Mount**




▽ = Vent

▼ = Oil Level

■ = Oil Plug

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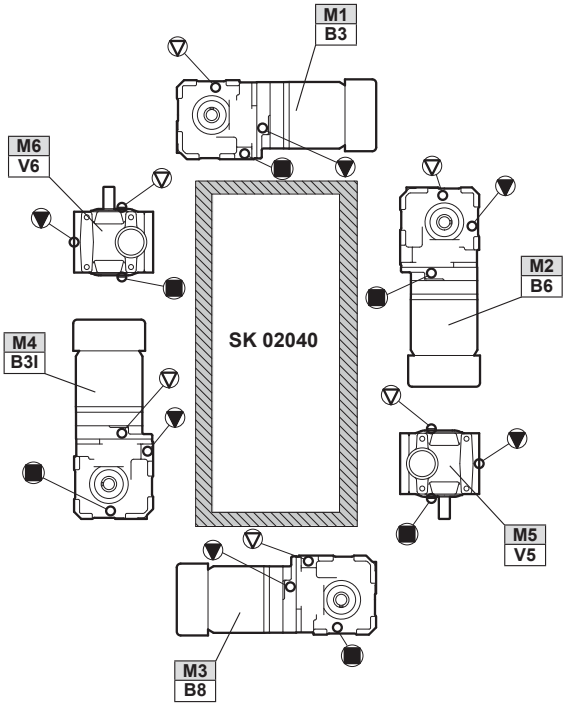
# HELICAL-WORM
# OIL PLUG & VENT LOCATIONS

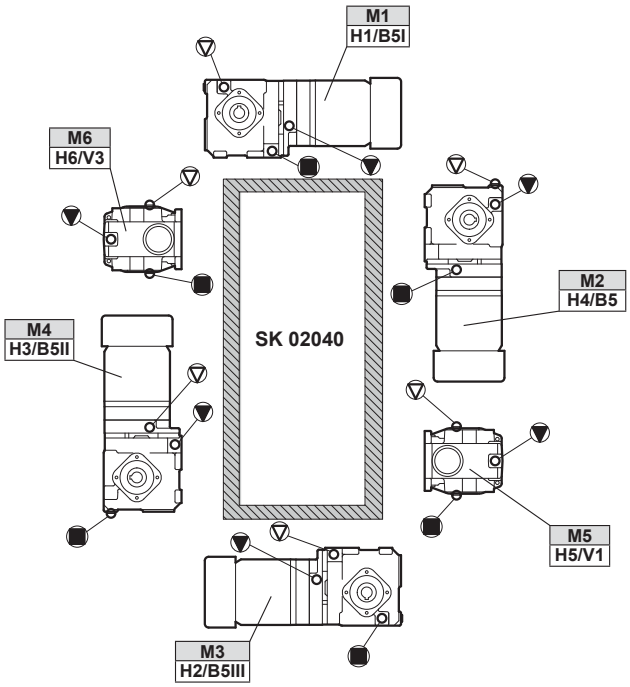
### Oil plug connections

Prior to commissioning the reducer, check the oil-fill level using the reducer's oil-level plug and drain or add additional oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole. ***For mounting orientations other than shown please consult NORD Gear. New plug locations may be required.***

**Foot Mount**




**Shaft/Flange Mount**



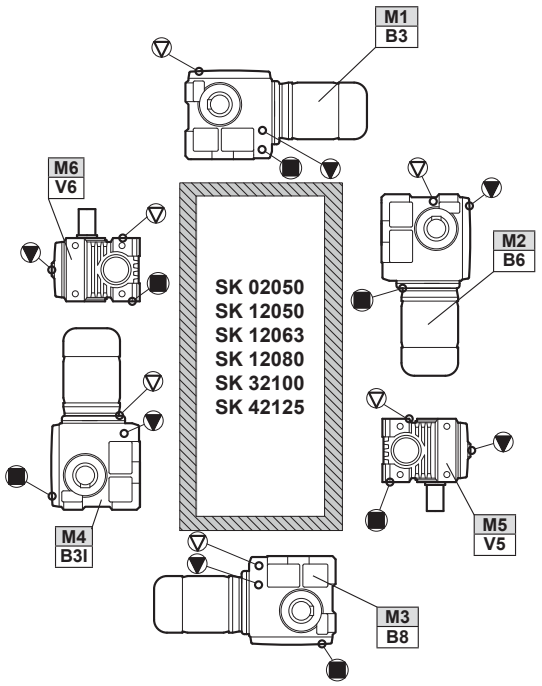

▽ = Vent

▼ = Oil Level

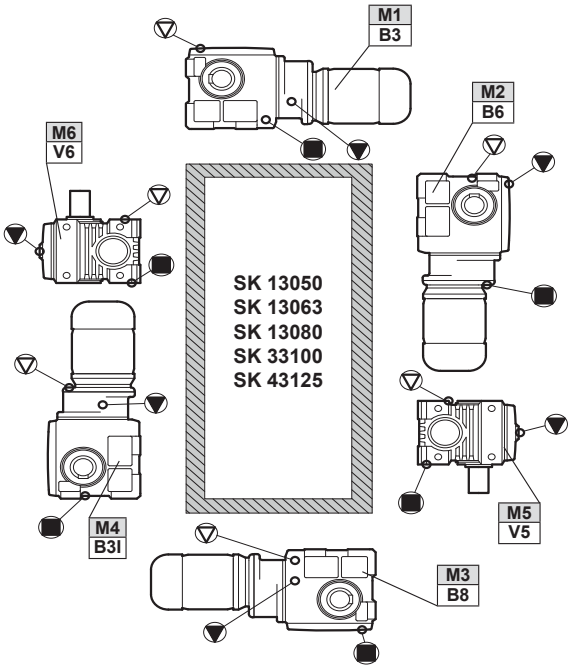
■ = Oil Plug

# HELICAL-WORM
# OIL PLUG & VENT LOCATIONS

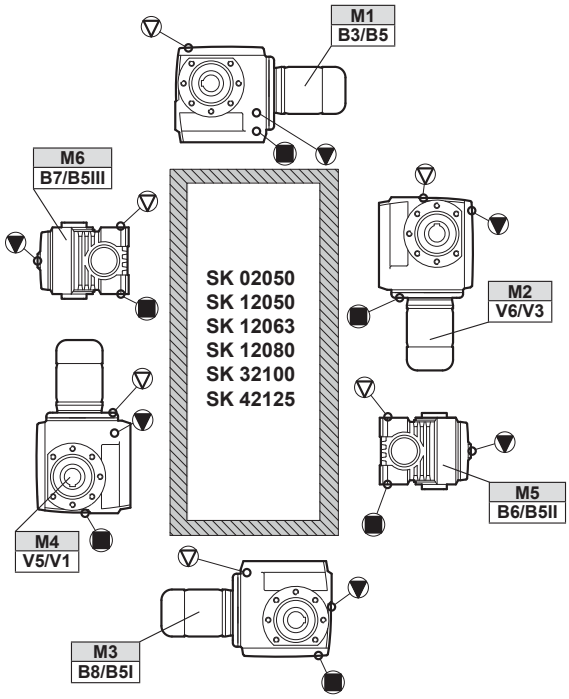
**Foot Mount**



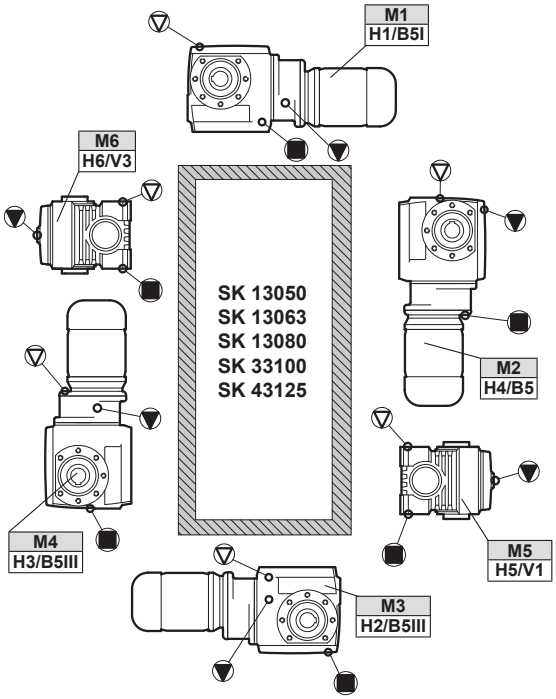

**Foot Mount**




**Shaft/Flange Mount**




**Shaft/Flange Mount**




▽ = Vent

▼ = Oil Level

■ = Oil Drain

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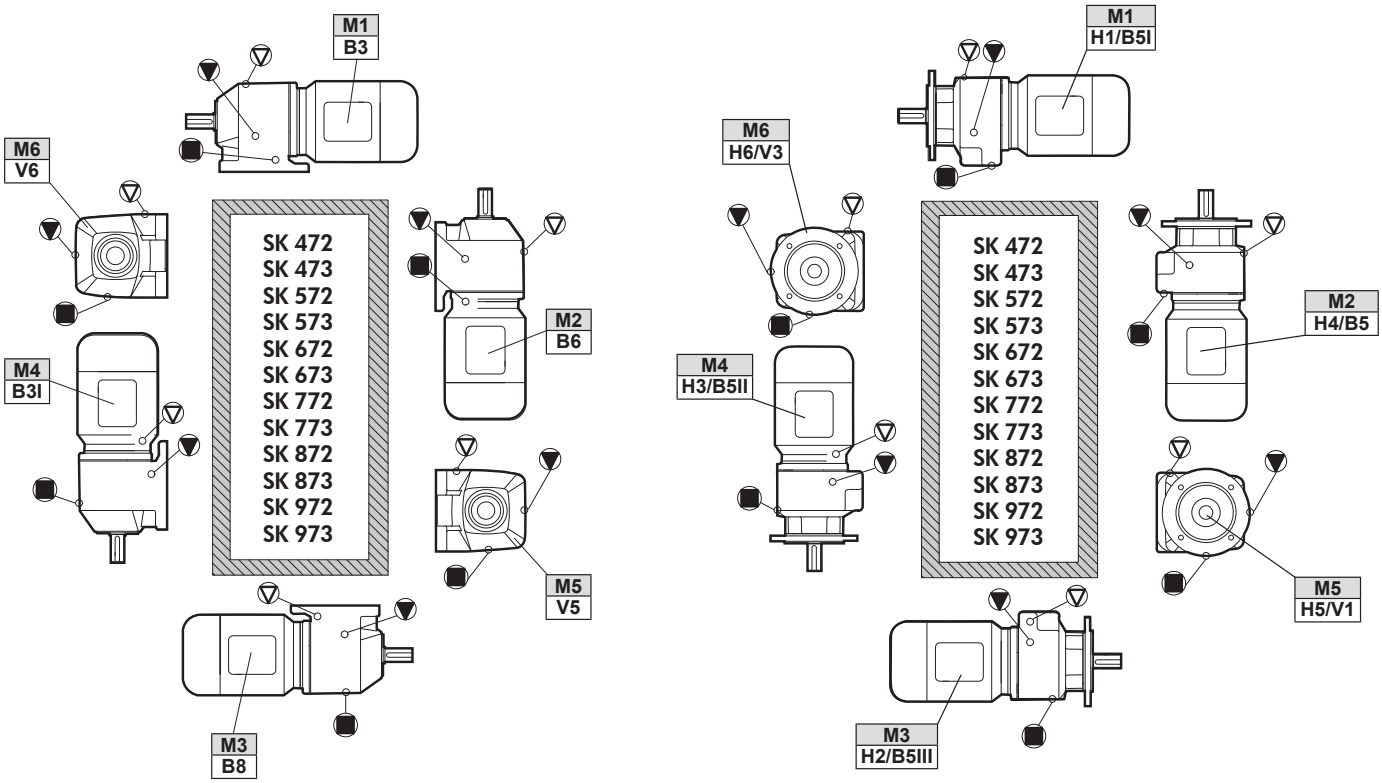
# NORDBLOC®
# OIL PLUG & VENT LOCATIONS

### Oil plug connections

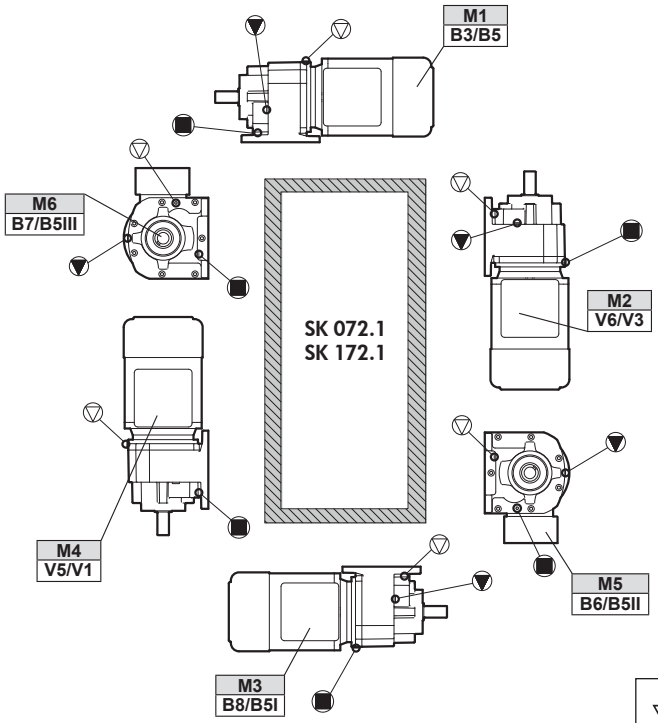
Prior to commissioning the reducer, check the oil-fill level using the reducer's oil-level plug and drain or add additional oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole. ***For mounting orientations other than shown please consult NORD Gear. New plug locations may be required.***

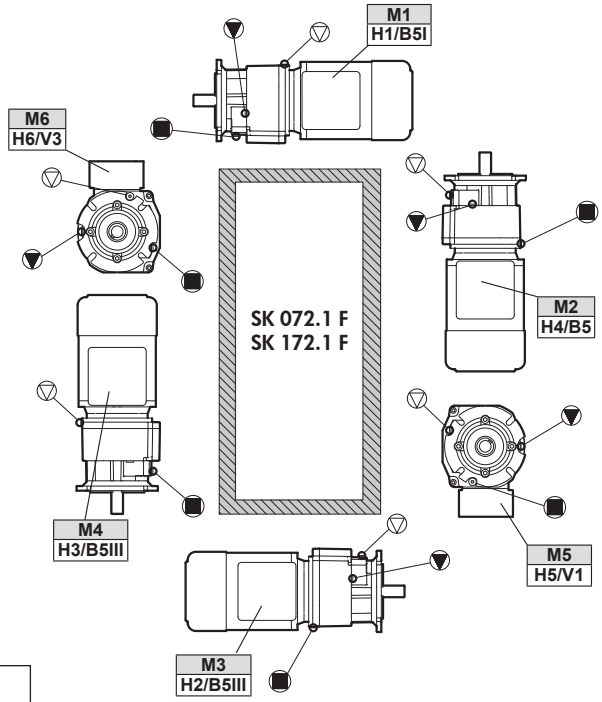


# NORDBLOC®.1
# OIL PLUG & VENT LOCATIONS

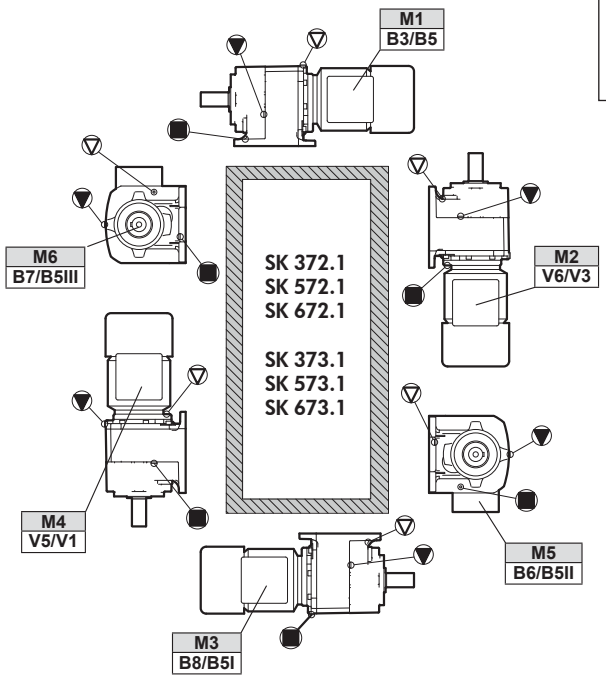
## Oil plug connections

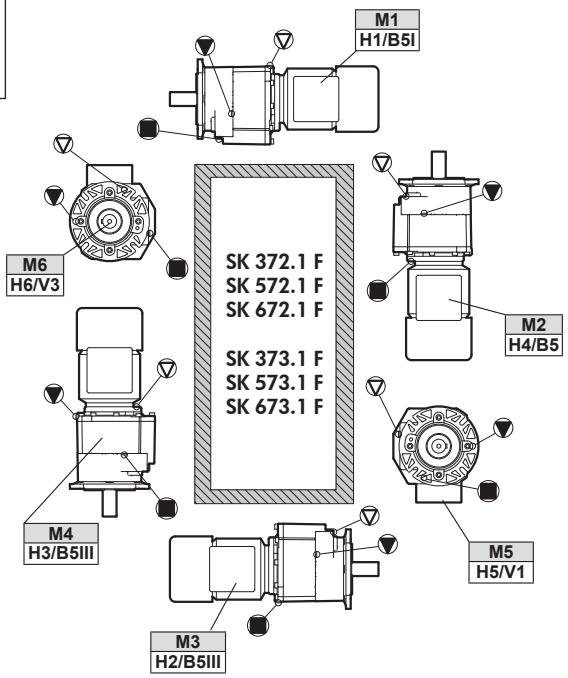
Prior to commissioning the reducer, check the oil-fill level using the reducer's oil-level plug and drain or add additional oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole. ***For mounting orientations other than shown please consult NORD Gear. New plug locations may be required.***




▽ = Vent
▼ = Oil Level
■ = Oil Plug

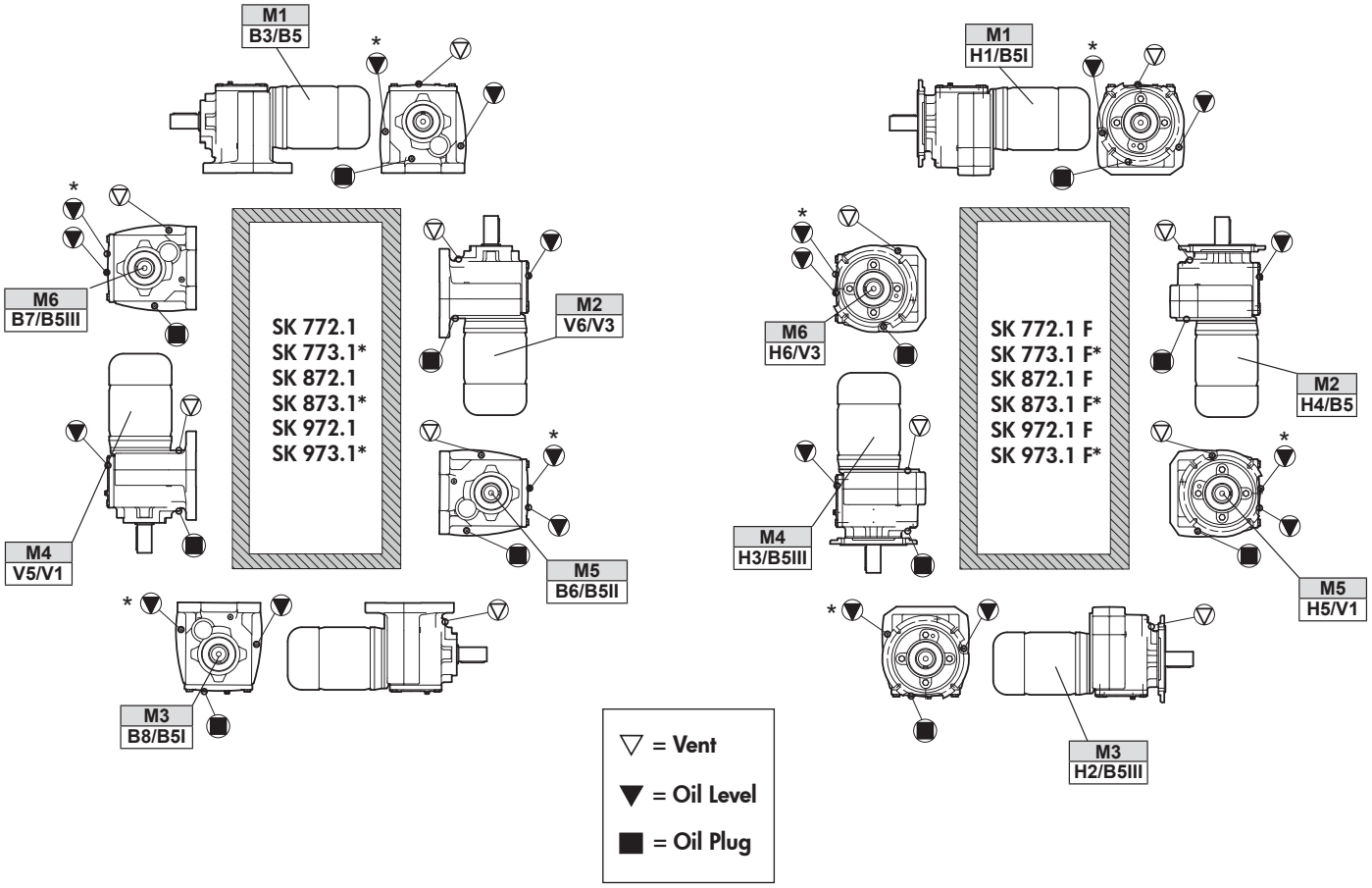


# NORDBLOC®.1
# OIL PLUG & VENT LOCATIONS

### Oil plug connections

Prior to commissioning the reducer, check the oil-fill level using the reducer's oil-level plug and drain or add additional oil as needed. The minimum acceptable oil level is 0.15 in (4mm) below the oil level hole. ***For mounting orientations other than shown please consult NORD Gear. New plug locations may be required.***




*** Oil fill level for three stage gear units.**

# MINICASE® (SMI/SMID) WORM GEAR OIL PLUG & VENT LOCATIONS

DRIVESYSTEMS — RETAIN FOR FUTURE USE — U14750 - 1 of 1

## Oil Plug and Vent Locations

MINICASE® (SMI/SMID) reducers and gear motors are fitted with oil plugs to allow for optional venting of the gear unit. NORD can supply either an AUTOVENT™ (valve-type) vent or an open vent. Vent options are available for most gear unit sizes and positions as indicated by the table below. For more complete details on vent options and when to consider reducer venting, see user manual U10800.

### Vent Compatability by Unit Size & Mounting Position

| | M1 | M2 | M3 | M4 | M5 | M6 |
|---|---|---|---|---|---|---|
| SMI/SMID 31 | | ✓ | ✓ | ✓ | | ✓ |
| SMI/SMID 40 | | ✓ | ✓ | ✓ | | ✓ |
| SMI/SMID 50 | ✓ | ✓ | ✓ | ✓ | | ✓ |
| SMI/SMID 63 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| SMI/SMID 75 | ✓ | ✓ | ✓ | ✓ | | ✓ |

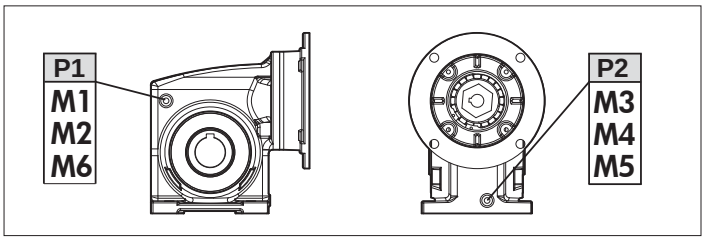
**Continuous Input speed ≤ 1800 rpm**

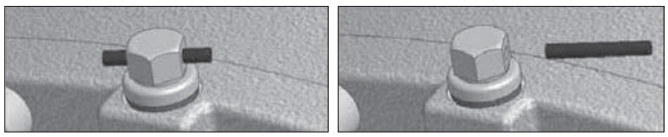
### Vent Kit Part Numbers

| Type | Transportation Seal | Installation | Part Number |
|---|---|---|---|
| AUTOVENT™ | Included | Factory or Field site | 66093510 |
| Open Vent | None | Field Only | 60693500 |
| Open Vent | Included | Factory or Field site | 22008004 (vent)<br>25308120 (gasket) |

**Unless noted by a seperate part number, vent kits include the housing gasket**

### Optional Vent Locations

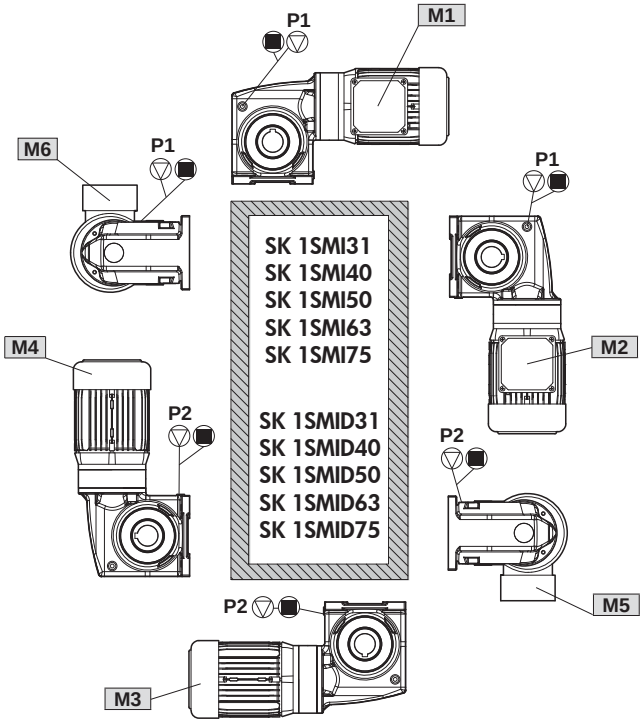


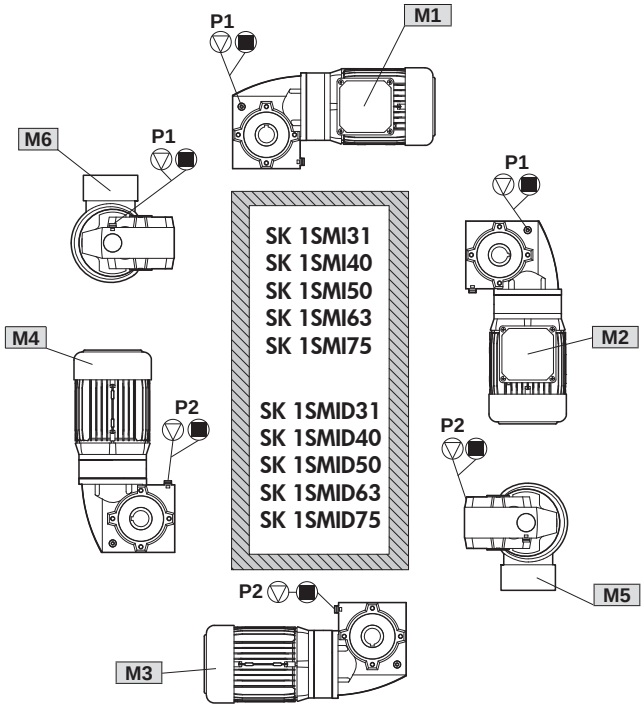
**WARNING**

To prevent build-up of excessive pressure, sealed vents must be activated as shown prior to gear unit start-up.

### MINICASE® (SMI/SMID) Foot Housing




### MINICASE® (SMI/SMID) Flange Housing




▽ = Vent
■ = Oil Plug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# FLEXBLOC™ (SI/SID SERIES) WORM GEAR OIL PLUG & VENT LOCATIONS



### Vent locations

FLEXBLOC™ (SI?SID SERIES) reducers are fitted with oil plugs to allow for optional venting of the gear unit. NORD can supply either an AUTOVENT™ (valve-type) vent or an open vent. Vent options are available for most gear unit sizes and positions as indicated by the table below. For more complete details on vent options and when to consider reducer venting, see user manual U10810.

### Vent Compatability by Unit Size & Mounting Position

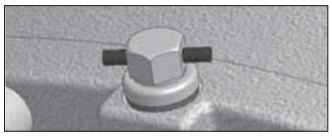
| | M1 | M2 | M3 | M4 | M5 | M6 |
|---|---|---|---|---|---|---|
| SI/SID 31 | | ✓ | ✓ | ✓ | | ✓ |
| SI/SID 40 | | ✓ | ✓ | ✓ | | ✓ |
| SI/SID 50 | ✓ | ✓ | ✓ | ✓ | | ✓ |
| SI/SID 63 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| SI/SID 75 | ✓ | ✓ | ✓ | ✓ | | ✓ |

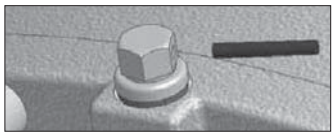
**Continuous Input speed ≤ 1800 rpm**

### Vent Kit Part Numbers

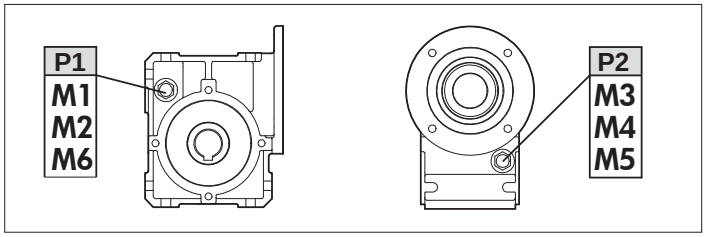
| Type | Transportation Seal | Installation | Part Number |
|---|---|---|---|
| AUTOVENT™ | Included | Factory or Field site | 66093510 |
| Open Vent | None | Field Only | 60693500 |
| Open Vent | Included | Factory or Field site | 22008004 (vent) 25308120 (gasket) |

**Unless noted by a seperate part number, vent kits include the housing gasket**





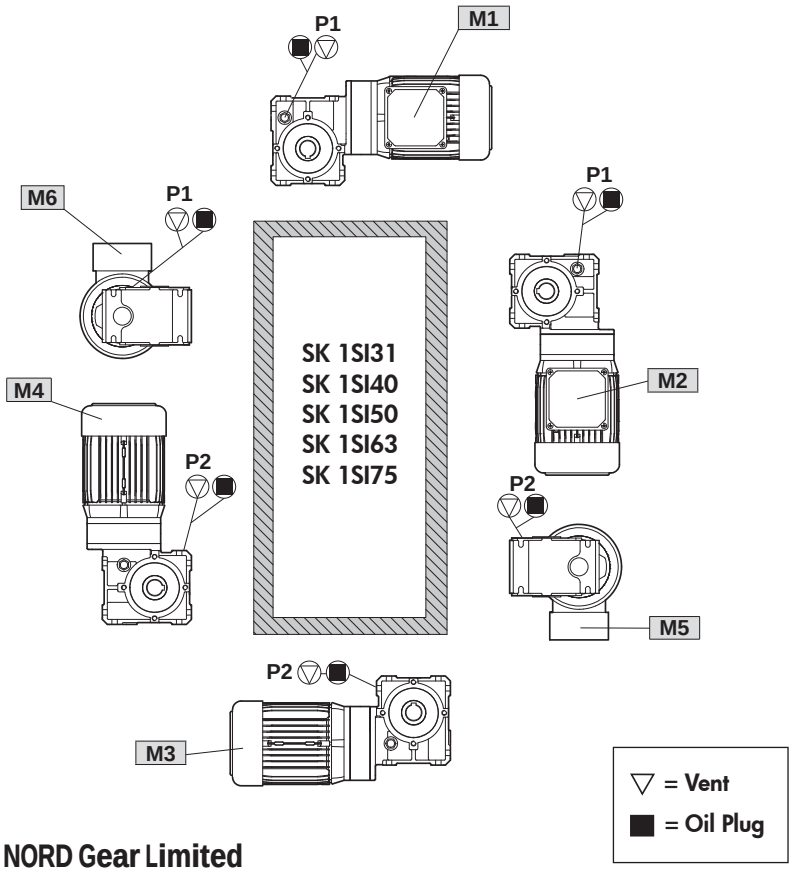
### Optional Vent Locations




**WARNING**

To prevent build-up of excessive pressure, sealed vents must be activated as shown prior to gear unit start-up.

### FLEXBLOC™ (SI Series) Universal Housing

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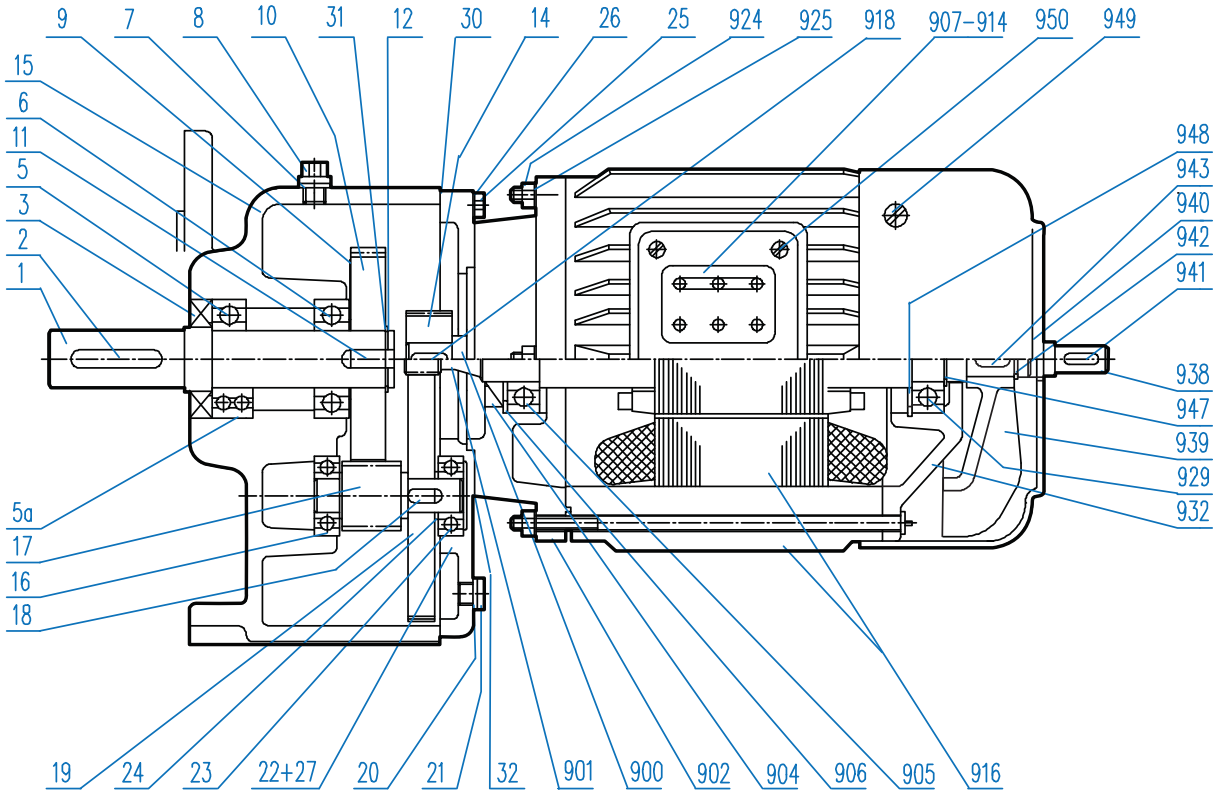
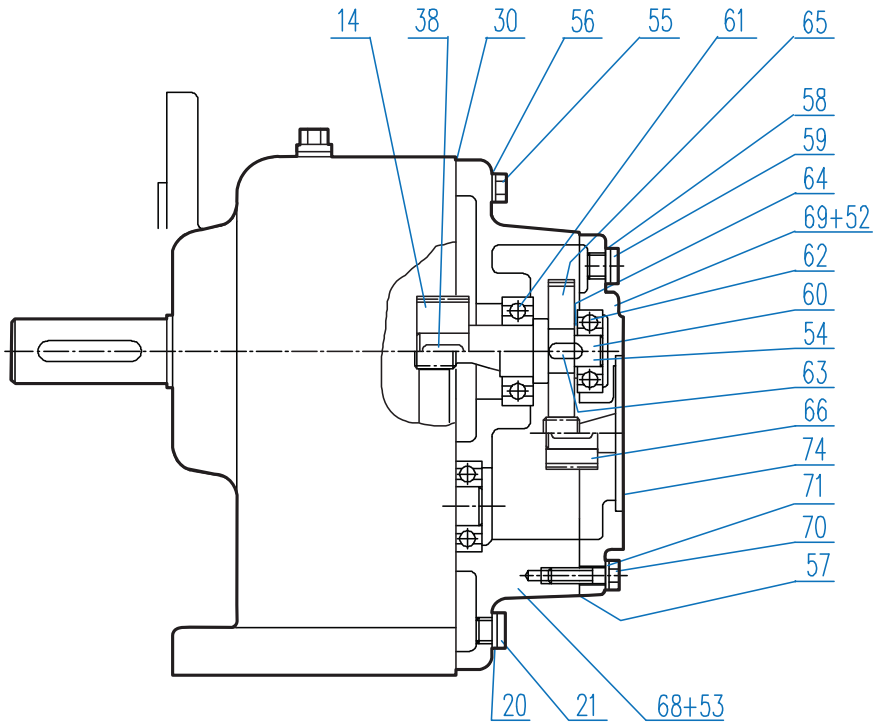



## SK 0 - SK 33 Helical Gear Unit

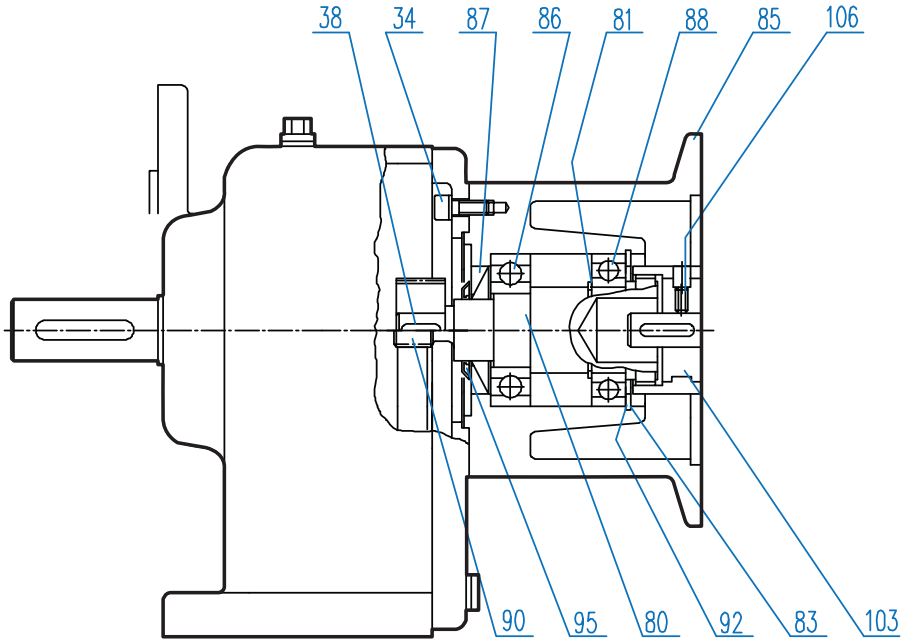
| | | | | | |
|---|---|---|---|---|---|
| 1 | Output shaft | 21 | Plug | 910 | Terminal box cover gasket |
| 2 | Key | 22 | Gear case cover | 911 | Terminal board |
| 3 | Shaft seal | 23 | Pinion shaft bearing | 914 | Cable entry gland |
| 5 | Output shaft bearing, normal | 24 | Shim | 916 | Stator case |
| 5A | Output shaft bearing, reinforced | 25 | Hexagon bolt | 918 | Key |
| 6 | Output shaft bearing | 26 | Washer | 924 | Collar bolt |
| 7 | Seal | 27 | Spiral pin | 925 | Hexagonal nut |
| 8 | Vent screw | 30 | Seal | 929 | Bearing B |
| 9 | Shim | 31 | Shim | 932 | Endshield B |
| 10 | Driven gear | 32 | Seal | 938 | Second motor shaft end* |
| 11 | Key | 900 | Rotor with shaft,plain | 939 | Fan |
| 12 | Circlip | 901 | Rotor with shaft,gearcut | 940 | Fan cover |
| 14 | Driving pinion | 902 | End shield A | 941 | Key |
| 15 | Gear case | 904 | Shaft seal | 942 | Circlip |
| 16 | Pinion shaft, bearing | 905 | Bearing A | 943 | Key |
| 17 | Driven pinion | 906 | Bearing shim | 947 | Circlip |
| 18 | Key | 907 | Terminal box frame | 948 | Circlip |
| 19 | Driving gear | 908 | Terminal box cover | 949 | Oval flat-head bolt |
| 20 | Seal | 909 | Terminal box frame gasket | 950 | Oval flat-head bolt |

* Optional Part



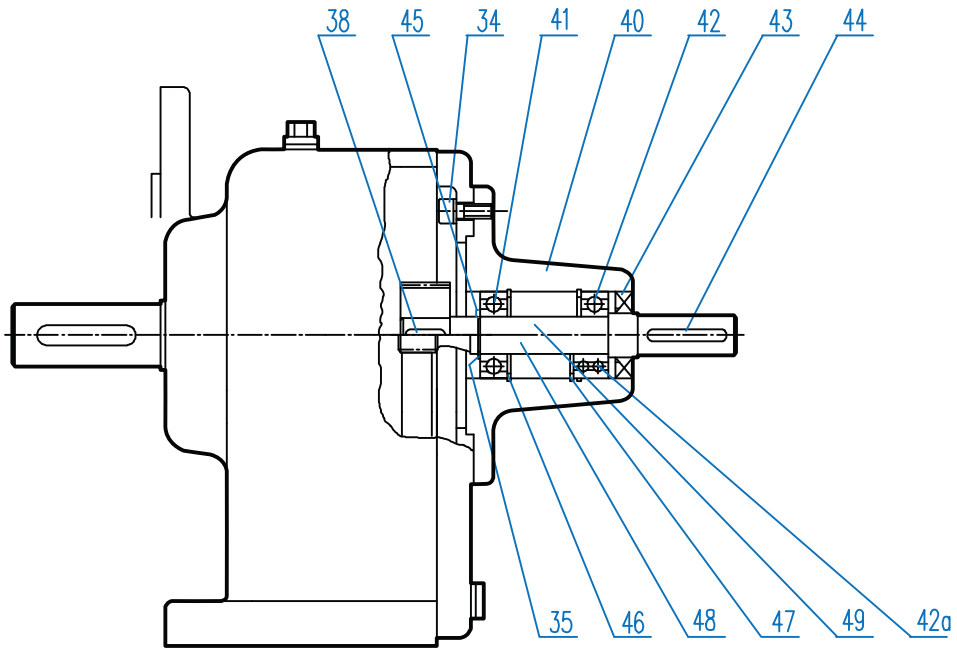

## SK 010 - SK 330 Third Stage Reduction Gear

| | | | | | |
|---|---|---|---|---|---|
| 14 | Driving pinion | 55 | Hexagon bolt | 64 | Shim |
| 20 | Seal | 56 | Washer | 65 | Driving gear |
| 21 | Plug | 57 | Seal | 66 | Driving pinion |
| 27 | Spiral pin | 58 | Seal | 68 | Gear case 3rd.-red. |
| 30 | Seal | 59 | Plug | 69 | Gear case cover |
| 38 | Key | 60 | Intermediate shaft, plain | 70 | Hexagon bolt |
| 52 | Spiral pin | 61 | Grooved ball bearing | 71 | Washer |
| 53 | Spiral pin | 62 | Grooved ball bearing | 74 | Seal |
| 54 | Intermediate shaft, gearcut | 63 | Key | | |



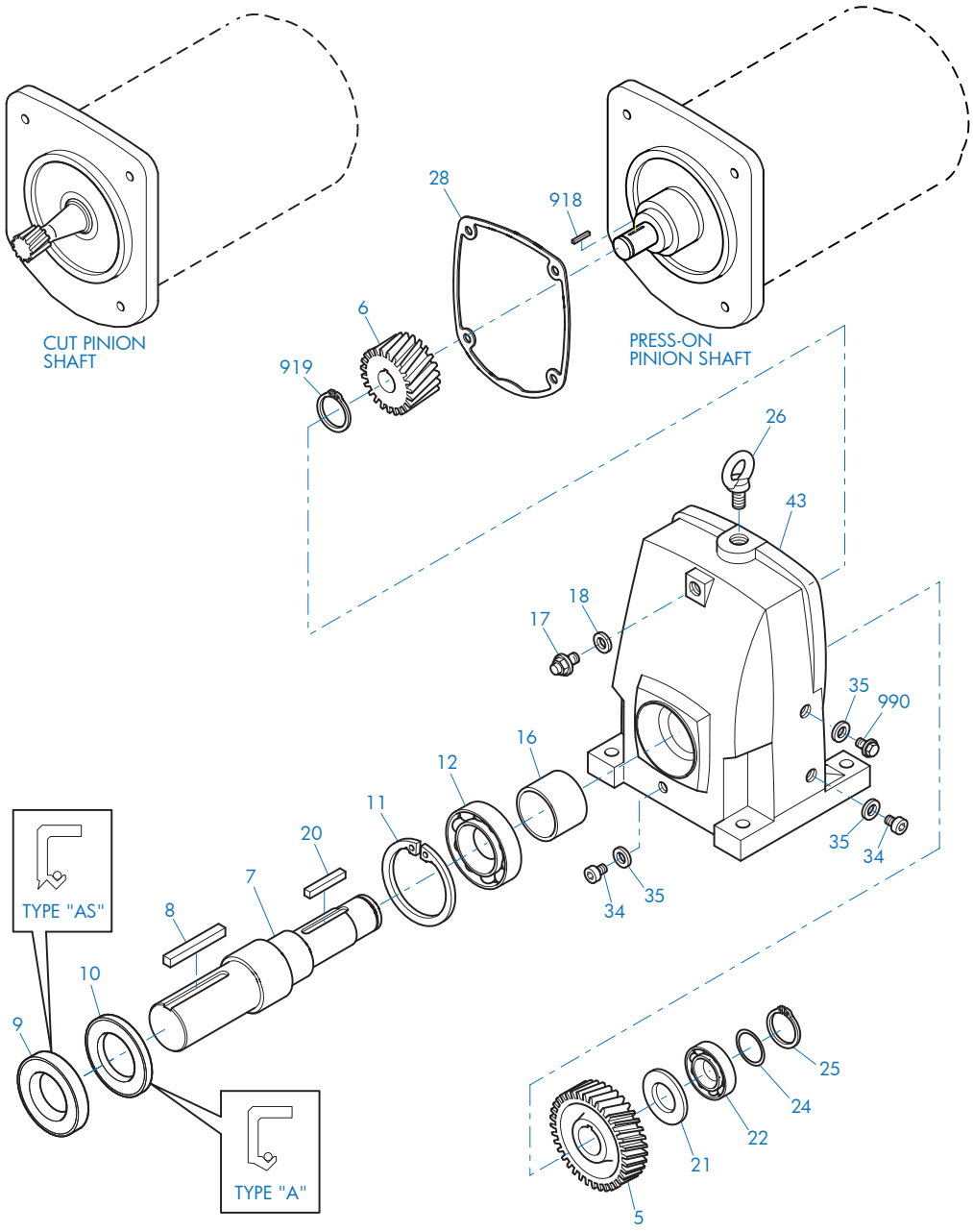

## SK 0 - SK 330 IEC Input

| | | | | | |
|---|---|---|---|---|---|
| 34 | Socket head bolt | 85 | IEC adaptor | 92 | Shim |
| 38 | Key | 86 | Input shaft bearing | 103 | Coupling |
| 80 | Input shaft | 87 | Shaft seal | 106 | Set screw |
| 81 | Circlip | 88 | Input shaft bearing | | |
| 83 | Circlip | 90 | Pinion shaft | | |



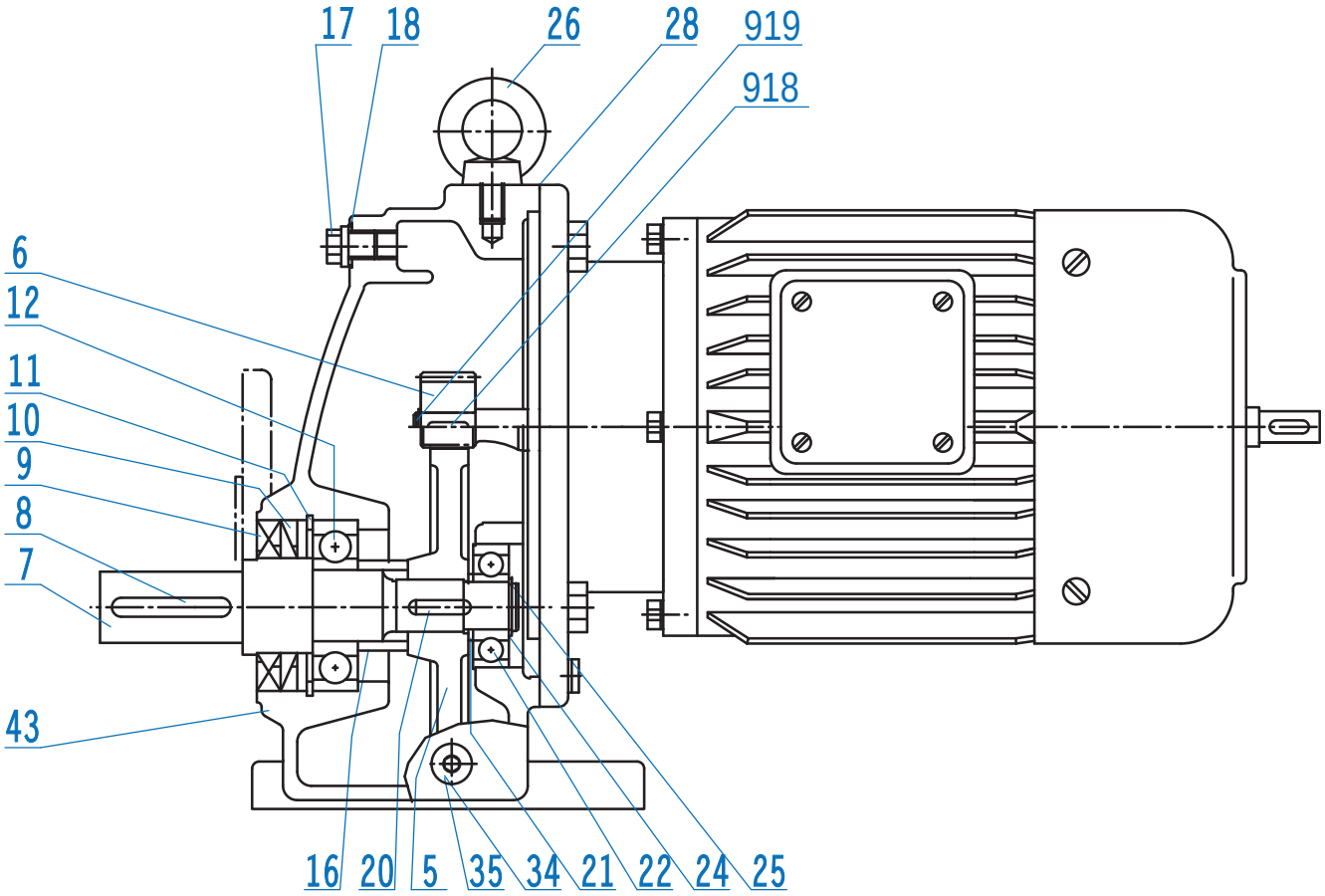

## SK 0 - SK 330 Solid Shaft Input (W)

| | | | | | |
|---|---|---|---|---|---|
| 34 | Socket head bolt | 42 | Grooved ball bearing, normal | 46 | Circlip |
| 35 | Shim | 42A | Grooved ball bearing, reinforced | 47 | Circlip |
| 38 | Key | 43 | Shaft seal | 48 | Input shaft, gearcut |
| 40 | Input bearing housing | 44 | Key | 49 | input shaft, plain |
| 41 | Grooved ball bearing | 45 | Circlip | | |




## SK 11E - SK 51E Foot Mount

| | | | | | |
|---|---|---|---|---|---|
| 5 | Gear | 16 | Spacer | 26 | Flanged Eye Bolt |
| 6 | Pinion | 17 | Vent Plug | 28 | Gasket |
| 7 | Output Shaft | 18 | Seal | 34 | Drain Plug |
| 8 | Key | 20 | Key | 35 | Gasket |
| 9 | Oil Seal | 21 | Spacer | 43 | Gearcase |
| 10 | Oil Seal | 22 | Anti-Friction Bearing | 918 | Key |
| 11 | Snap Ring | 24 | Shim | 919 | Snap Ring |
| 12 | Anti-Friction Bearing | 25 | Snap Ring | 990 | Oil Level Plug |




## SK 11E - SK 51E Foot Mount

| | | | | | |
|---|---|---|---|---|---|
| 5 | Gear | 16 | Spacer | 26 | Flanged Eye Bolt |
| 6 | Pinion | 17 | Vent Plug | 28 | Gasket |
| 7 | Output Shaft | 18 | Seal | 34 | Drain Plug |
| 8 | Key | 20 | Key | 35 | Gasket |
| 9 | Oil Seal | 21 | Spacer | 43 | Gearcase |
| 10 | Oil Seal | 22 | Anti-Friction Bearing | 918 | Key |
| 11 | Snap Ring | 24 | Shim | 919 | Snap Ring |
| 12 | Anti-Friction Bearing | 25 | Snap Ring | | |