## 1. Information

Proper lubrication makes for:
- Lower friction;
- Less heating;
- Increased efficiency;
- Lower oil temperature;
- Less wear.

In cases of ambient temperatures not envisaged in the table, please contact MOTOVARIO TECHNICAL SERVICE. In the case of temperatures under -30°C or over 60°C it is necessary to use oil seals with special properties. For operating ranges with temperatures under 0°C it is necessary to consider the following:
1. The motors need to be suitable for operation at the envisaged ambient temperature.
2. The power of the electric motor needs to be adequate for exceeding the higher starting torques required.
3. Pay attention to impact loads since cast iron may have problems of fragility at temperatures under -15°C.
4. During the early stages of service, problems of lubrication may arise due to the high level of viscosity taken on by the oil and so it is wise to have a few minutes of rotation under no load.

For the recommended oil change frequencies, please refer to the Product Use and Maintenance Manual.

## 2. Lubricants

MOTOVARIO epicycloidal gear reducers in Series HPL have been designed for oil bath lubrication.
The **HPL** reducers are supplied without lubricant, whilst the initial fill of lubricant can be requested as an option when ordering.

In the event of a request for a gear reducer supplied complete with lubricant, this is to be established by MOTOVARIO and can be seen on the Order Confirmation and on the plate.
If different lubricants and/or lubricants with temperature ranges other than those recommended by MOTOVARIO are utilised, the warranty shall be void, with the exception of any authorisations provided in accordance with the applications and granted in writing.
The lubricants listed in the table must not be interpreted as a guarantee of quality, given that they are supplied by the lubricant manufacturer who remains responsible for their product.
Do not mix different synthetic lubricants with each other or even with the minerals! Additionally, lubricants with the same viscosity class yet produced by different manufacturers do not bear the same characteristics.
Choose the lubricant only after having conducted the necessary thermal check of the gear reducer (see the Thermal Power paragraph).

**Specifications of LUBRICANTS RECOMMENDED BY MOTOVARIO**

| | * Polyalphaolefin synthetic oil (PAO) | Mineral oil |
|---|---|---|
| **ENI** | BLASIA SX | BLASIA |
| **SHELL** | OMALA S4 GXV | OMALA S2 GX |
| **KLUBER** | Klubersynth GEM 4-...N | Kluberoil GEM 1-...N |
| **MOBIL** | SHC GEAR | MOBILGEAR XMP |
| **CASTROL** | ALPHASYN T | ALPHA SP |
| **BP** | ENERSYN EPX | ENERGOL GR-XP |
| **TOTAL** | CARTER SH | CARTER EP |
| **ESSO** | SPARTAN S-EP | SPARTAN EP |

*** Recommended**

# LUBRICATION



Based on the output speed $n_2$, check the oil type to be used in table ISO VISCOSITY GRADES, that provides the average kinematic speed value [cSt] at 40 °C.

**Table ISO VISCOSITY GRADES**

| | $T_{amb}$ °C | |
|---|---|---|
| $n_2$ [rpm] | Synthetic oil | Mineral oil |
| | (-15) ÷ (+50) | (-5) ÷ (+40) |
| > 150 | 220 | 220 |
| 150 ÷ 5 | 320 | 320 |
| < 5 | 460 | 460 |

## 3. Special lubricants

If 'special' lubricant is required please contact MOTOVARIO TECHNICAL SERVICE.

## 4. Quantity

For the gear reducers of the HPL series, the expected mounting position must be always specified. The amount of oil in the table are indicative only and for the proper topping up you will have to refer to the level cap or the dipstick, if any. Any deviations in level can depend on construction tolerances, transmission ratio but also on the placement on the unit or by the mounting surface at the customers' premises. For this reason it is appropriate that the customer checks and, if necessary, restores the level when the unit is installed.

**Table OIL CAPACITIES IN LITRES ~ [l]**

| HPL-1 | 010 | 020 | 030 | 050 | 080 |
|---|---|---|---|---|---|
| B3/B5 B6/B7 B8 | 0,69 | 0,82 | 1,21 | 1,35 | 2,63 |
| V1/V5 | 0,77 | 0,92 | 1,61 | 1,82 | 2,96 |
| V3/V6 | 1,04 | 1,04 | 1,64 | 1,63 | 4,03 |

| HPL-2 | 010 | 020 | 030 | 050 | 080 |
|---|---|---|---|---|---|
| B3/B5 B6/B7 B8 | 0,95 | 1,09 | 1,32 | 1,49 | 2,54 |
| V1/V5 | 1,31 | 1,44 | 2,09 | 2,21 | 4,19 |
| V3/V6 | 1,58 | 1,72 | 1,88 | 1,88 | 3,88 |

| HPL-3 | 010 | 020 | 030 | 050 | 080 |
|---|---|---|---|---|---|
| B3/B5 B6/B7 B8 | 1,2 | 1,38 | 1,57 | 1,78 | 2,66 |
| V1/V5 | 1,85 | 1,99 | 2,63 | 2,75 | 4,67 |
| V3/V6 | 2,13 | 2,26 | 2,42 | 2,42 | 4,12 |

| HPL-4 | 010 | 020 | 030 | 050 | 080 |
|---|---|---|---|---|---|
| B3/B5 B6/B7 B8 | 1,46 | 1,67 | 1,82 | 2,07 | 2,91 |
| V1/V5 | 2,39 | 2,53 | 3,21 | 3,29 | 5,17 |
| V3/V6 | 2,67 | 2,8 | 2,96 | 2,96 | 4,67 |