



## INSTALLATION AND MAINTENANCE INSTRUCTIONS GEAR REDUCERS AND GEARMOTORS

UT. D 045 rev. 5

11-04/0 - 15 000 | GB

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### Recycling (keeping in mind the instructions in force):

- the elements of casing, gear pairs, shafts and bearings of gear reducer must be transformed into steel scraps. The elements in grey cast iron will be subjected to the same treatment if there is no particular instruction;
- the worm wheels are made in bronze and must be treated adequately;
- exhausted oils must be recycled and treated according to the instructions.



The paragraphs marked with present symbol contain dispositions to be strictly respected in order to assure personal **safety** and to avoid any **heavy damages** to the machine or to the system (e.g.: works on live parts, on lifting machines, etc.); the responsible for the installation or maintenance must scrupulously **follow all instructions contained in present handbook**.

### 1 - General safety instructions

Gear reducers and gearmotors present dangerous parts because they may be:



- live;
- at temperature higher than +50 °C;
- rotating during the operation;
- eventually noisy (sound levels > 85 dB(A)).

An incorrect installation, an improper use, the removing or disconnection of protection devices, the lack of inspections and maintenance, improper connections may cause severe personal injury or property damage. Therefore the component must be moved, installed, commissioned, handled, controlled, serviced and repaired **exclusively by responsible qualified personnel** (definition to IEC 364).

It is recommended to pay attention to all instructions of present handbook, all instructions relevant to the system, all existing safety laws and standards concerning correct installation.

**Attention!** Components in non-standard design or with constructive variations may differ in the details from the ones described here following and may require additional information.

**Attention!** For the installation, use and maintenance of the electric motor (standard, brake or non-standard motor) and/or the electric supply device (frequency converter, soft-start, etc.) and accessories, if any (flow indicators, independent cooling unit, thermostat, ecc) consult the attached specific documentation. If necessary, require it.

**Attention!** For any clarification and/or additional information consult ROSSI MOTORIDUTTORI and specify all name plate data.

Gear reducers and gearmotors of present handbook are normally suitable for installations in industrial areas: **additional protection measures**, if necessary for different employs, must be adopted and assured by the person responsible for the installation.

**IMPORTANT:** the components supplied by ROSSI MOTORIDUTTORI must be incorporated into machinery and **should not be commissioned before the machinery in which the components have been incorporated conforms to:**

– **Machinery directive 98/37/EEC; in particular, possible safety guards for shaft ends not being used and for eventually accessible fan cover passages (or other) are the Buyer's responsibility;**

– **«Electromagnetic compatibility (EMC)» directive 89/336/EEC and subsequent updtings.**

When operating on gear reducer (gearmotor) or on components connected to it **the machine must be at rest:** disconnect motor (including auxiliary equipments) from power supply, gear reducer from load, be sure that safety systems are on against any accidental starting and, if necessary, pre-arrange mechanical locking devices (to be removed before commissioning).

If deviations from normal operation occur (temperature increase, unusual noise, etc.) immediately switch off the machine.

The products relevant to this handbook correspond to the technical level reached at the moment the handbook is printed. ROSSI MOTORIDUTTORI reserves the right to introduce, without notice, the necessary changes for the increase of product performances.

### 2 - Operating conditions

Gear reducers are designed for industrial applications according to name plate data, at ambient temperature 0 ÷ +40 °C (with peaks at -10 °C and +50 °C), maximum altitude 1 000 m.

Not allowed running conditions: application in aggressive environments having explosion danger, etc. Ambient conditions must comply with specifications stated on name plate.

### 3 - How supplied

#### 3.1 - Receipt

At receipt verify that the unit corresponds to the one ordered and has not been damaged during the transport, in case of damages, report them immediately to the courier.

Avoid commissioning gear reducers and gearmotors, that are even if slightly damaged.

#### 3.2 - Name plate

Every gear reducer presents a name plate in anodised aluminium containing main technical information relevant to operating and constructive specifications and defining, according to contractual agreements, the application limits (see fig. 1); the name plate must not be removed and must be kept integral and readable. All name plate data must be specified on eventual spare part orders.

#### 3.3 - Painting

Products are painted according to the painting table shown on page 18.

#### 3.4 - Protections and packing

Overhanging free shaft ends and hollow shafts are treated with protective anti-rust long life oil and protected with a plastic (polyethylene) cap (only up to D ≤ 48 mm for overhanging shafts, D ≤ 110 mm for hollow shafts). All internal parts are protected with protective anti-rust oil.

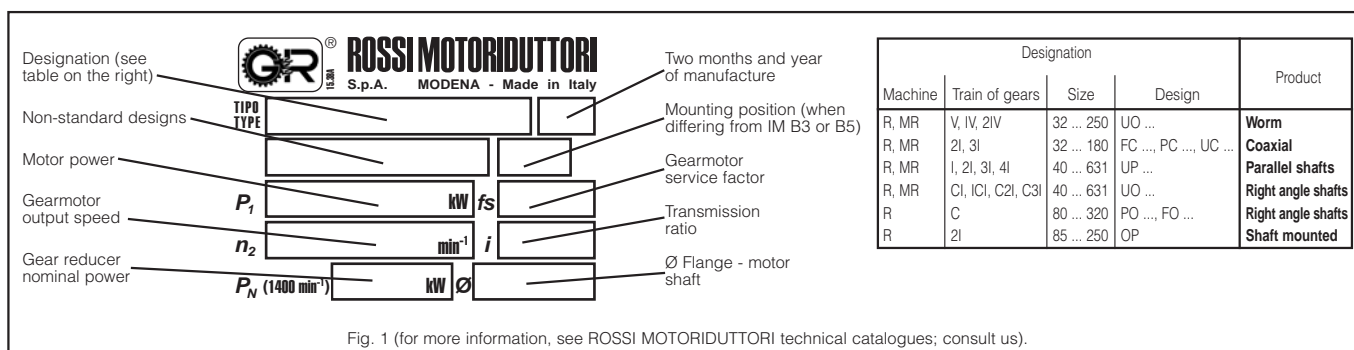


Fig. 1 (for more information, see ROSSI MOTORIDUTTORI technical catalogues; consult us).

**Attention!** for the maintenance, installation of gear reducers coupled with synchronous and asynchronous servomotors (even if with a different name plate) follow the instructions of present handbook.

Unless otherwise agreed in the order, products are adequately packed: on pallet, protected with a polyethylene film, wound with adhesive tape and strap (bigger sizes); in carton pallet, wound with adhesive tape and strap (smaller sizes); in carton boxes wound with tape (for small dimensions and quantities). If necessary, gear reducers are conveniently separated by means of anti-shock foam cells or of filling cardboard.

Do not stock packed products on top of each other.

## 4 - Storing

Surroundings should be sufficiently clean, dry and free from excessive vibrations ( $v_{eff} \leq 0,2 \text{ mm/s}$ ) to avoid damage to bearings (excessive vibration should also be guarded during transit, even if within wider range) and ambient storage temperature should be  $0 \div +40 \text{ }^\circ\text{C}$ : peaks of  $10 \text{ }^\circ\text{C}$  above and below are acceptable.

The gear reducers filled with oil must be positioned according to the mounting position mentioned on the order during transport and storage.

Every six months rotate the shafts (some revolutions are sufficient) to prevent damage to bearings and seal rings.

Assuming normal surroundings and the provision of adequate protection during transit, the unit is protected for storage up to 1 year.

For a 2 year storing period in normal surroundings it is necessary to pay attention also to following instructions:

- generously grease the sealings, the shafts and the unpainted machined surfaces, if any, and periodically control conservation state of the protective anti-rust oil;
- for gear reducers and gearmotors supplied without oil: insert anti-condensation pastilles into the gear reducers to be replaced before due date and remove them before commissioning (as alternative completely fill the gear reducers with lubrication oil and the specified level before commissioning).

For storages longer than 2 years or in aggressive surroundings or outdoors, consult ROSSI MOTORIDUTTORI.

## 5 - Installation

### 5.1 - General

Before the installation, verify that:

- there were no damages during the storing or the transport;
- design is suitable to the environment (temperature, atmosphere, etc.);
- electrical connection (power supply, etc.) corresponds to motor name plate data;
- used mounting position corresponds to the one stated in name plate.



**Attention!** When lifting and transporting the gear reducer or gearmotor use through holes or tapped holes of the gear reducer casing; be sure that load is properly balanced and provide lifting systems, and cables of adequate section. If necessary, gear reducer and gearmotor masses are stated in ROSSI MOTORIDUTTORI technical catalogues.

Be sure that the structure on which gear reducer or gearmotor is fitted is plane, levelled and sufficiently dimensioned in order to assure fitting stability and vibration absence (vibration speed  $v_{eff} \leq 3,5 \text{ mm/s}$  for  $P_N \leq 15 \text{ kW}$  and  $v_{eff} \leq 4,5 \text{ mm/s}$  for  $P_N > 15 \text{ kW}$  are acceptable), keeping in mind all transmitted forces due to the masses, to the torque, to the radial and axial loads.

For the dimensions of fixing screws of gear reducer feet and the depth of tapped holes consult the ROSSI MOTORIDUTTORI technical catalogues.

Carefully select the length of fixing screws when using tapped holes for gear reducer fitting, in order to assure a sufficient meshing thread length for the correct gear reducer fitting to the machine without breaking down the threading seat.



**Attention! Bearing life and good shaft and coupling running depend on alignment precision between the shafts.** Carefully align the gear reducer with the motor and the driven machine (with the aid of shims if need be, for gear reducers size  $\geq 400$  use level tapped holes), interposing flexible couplings whenever possible.

**Incorrect alignment** may cause **breakdown of shafts and/or bearings** (which may cause overheatings) which may represent **heavy danger for people**.

Do not use motor eyebolts when lifting the gearmotors.

Position the gear reducer or gearmotor so as to allow a free passage of air for cooling both gear reducer and motor (especially at their fan side).

Avoid: any obstruction to the air flow; heat sources near the gear reducer that might affect the temperature of cooling air and of gear reducer (for radiation); insufficient air recycle and applications hindering the steady dissipation of heat.

Mount the gear reducer or gearmotor so as not to receive vibrations.

Mating surfaces (of gear reducer and machine) must be clean and sufficiently rough to provide a good friction coefficient: remove by a scraper or solvent the eventual paint of gear reducer coupling surfaces.

When external loads are present use pins or locking blocks, if necessary.

When fitting gear reducer and machine and/or gear reducer and eventual flange **B5** it is recommended to use **locking adhesives** such as LOCTITE on the fastening screws (also on flange mating surfaces).

Before wiring-up the gearmotor make sure that motor voltage corresponds to input voltage. If direction of rotation is not as desired, invert two phases at the terminals.

Y- $\Delta$  starting should be adopted for no-load starting (or with a very small load) and for smooth starts, low starting current and limited stresses, if requested.

If overloads are imposed for long periods or if shocks or danger of jamming are envisaged, then motor-protection, electronic torque limiters, fluid couplings, safety couplings, control units or other similar devices should be fitted.

**Usually protect the motor with a thermal cut-out** however, where duty cycles involve a high number of on-load starts, it is necessary to utilise **thermal probes** for motor protection (fitted on the wiring); magnetothermic breaker is unsuitable since its threshold must be set higher than the motor nominal current of rating.

**Connect thermal probes, if any, to auxiliary safety circuits.**

Use varistors and/or RC filters to limit voltage peaks due to contactors.

When gear reducer is equipped with a backstop device<sup>1)</sup>, provide a protection system where a backstop device breaking could cause personal injury or property damage.

Whenever a leakage of lubricant could cause heavy damages, increase the frequency of inspections and/or envisage appropriate control devices (e.g.: remote level gauge, lubricant for food industry, etc.).

In polluting surroundings, take suitable precautions against lubricant contamination through seal rings or other.

For outdoor installation or in a hostile environment, protect the gear reducer or gearmotor with an anticorrosion paint; added protection may be afforded by applying water-proof grease (especially around the rotary seating of seal rings and at shaft end access points).

Gear reducers and gearmotors should be protected whenever possible and by appropriate means from solar radiation and extremes of weather; weather protection **becomes essential** when high or low speed shafts are vertically disposed or when the motor is installed vertical with fan uppermost.

For ambient temperature greater than  $+40 \text{ }^\circ\text{C}$  or less than  $0 \text{ }^\circ\text{C}$ , consult ROSSI MOTORIDUTTORI.

When gear reducer or gearmotor is supplied with water cooling by coil or independent cooling unit, see ch 7.

<sup>1)</sup> The presence on gear reducer of backstop device is stated by the arrow near the low speed shaft, indicating the free rotation, excluding shaft mounted gear reducers where B or C designs are stated (see ROSSI MOTORIDUTTORI technical catalogues).

## 5.2 - Fitting of components to shaft ends

It is recommended that the holes of parts keyed onto shaft ends should be machined to H7 tolerance; for high speed shaft ends having  $D \geq 55$  mm, tolerance G7 is permissible provided that the load is uniform and light; for low speed shaft end having  $D \leq 180$  mm, tolerance must be **K7** if load is not uniform and light.

Before mounting, thoroughly clean mating surfaces and lubricate against seizure and fretting corrosion.

**Attention!** Installing and removal operations should be carried out with the aid of **jacking screws** and **pullers** using the tapped hole at the shaft butt-end (see table in fig. 2) taking care to avoid impacts and shocks which may **irremediably damage the bearings**, the **circlips** or other parts, for H7/m6 and K7/j6 fits it is advisable that the part to be keyed is preheated to a temperature of  $80 \div 100$  °C.

Shaft ends	
D Ø	d Ø
11	M 5
14 ÷ 19	M 6
24 ÷ 28	M 8
30 ÷ 38	M 10
42 ÷ 55	M 12
60 ÷ 75	M 16
80 ÷ 95	M 20
100 ÷ 110	M 24
125 ÷ 140	M 30
160 ÷ 210	M 36
240 ÷ 320	M 45

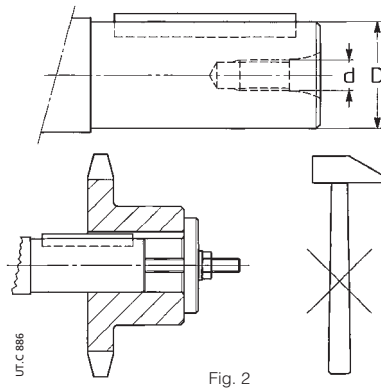


Fig. 2

The couplings having a tip speed on external diameter up to 20 m/s must be statically balanced; for higher tip speeds they must be dynamically balanced.

Where the transmission link between gear reducer and machine or motor generates shaft end loads, (see fig. 3), ensure that:

- loads do not rise above catalogue values;
- transmission overhang is kept to a minimum;
- gear-type transmissions must guarantee a minimum of backlash on all mating flanks;
- drive-chains should not be tensioned (if necessary – alternating loads and/or motion – foresee suitable chain tighteners);
- drive-belts should not be over-tensioned.

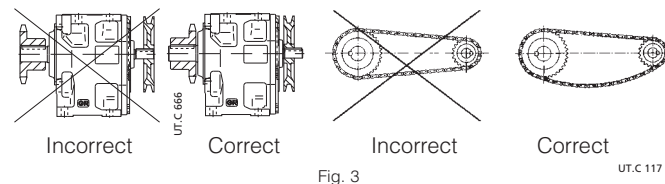


Fig. 3

## 5.3 - Shaft-mounting

When shaft mounted, the gear reducer must be supported both axially and radially (also for mounting positions B3 ... B8) by the machine shaft end, as well as anchored against rotation only, by means of a reaction having **freedom of axial movement** and sufficient **clearance in its couplings** to permit minor oscillations always in evidence without provoking dangerous overloading on the gear reducer.

Lubricate with proper products the hinges and the parts subject to sliding; when mounting the screws it is recommended to apply locking adhesives type LOCTITE 601.

For the mounting of the "kit using reaction disc springs" (sizes  $\leq 125$  parallel shafts) use the tapped butt end hole on the shaft end of the driven machine and the flat machined chamfered surface for compressing and fitting the disc springs into the reaction recess.

Concerning the reaction system, follow the project indications stated in the technical catalogues ROSSI MOTORIDUTTORI. Whenever personal injury or property damage may occur, foresee **adequate supplementary protection devices** against:

- rotation or unthreading of the gear reducer from shaft end of driven machine following to accidental breakage of the reaction arrangement;
- accidental breakage of shaft end of driven machine.

## 5.4 - Hollow low speed shaft

For machine shaft ends onto which the hollow shafts of gear reducers are to be keyed, h6, j6, and k6 tolerances are recommended, according to requirements.

**Important!** The shoulder diameter of the shaft end of the driven machine abutting with the gear reducer must be at least  $1,18 \div 1,25$  times the internal diameter of hollow shaft. For other data on machine shaft end, in case of standard hollow low speed shaft, stepped shaft, with locking rings or bush, with shrink disc see ROSSI MOTORIDUTTORI technical catalogues.



**Attention!** For **vertical ceiling-type** mounting and only for gear reducers equipped with locking rings or bush, gear reducer support is due only to friction, for this reason it is advisable to provide it with a fastening system.

When **installing** and **removing** gear reducers and gearmotors with hollow low speed shaft incorporating a circlip groove – whether with keyway or shrink disc – proceed as per fig. 4a and 4b, respectively, on page 10.

In order to remove the hollow low speed shaft of the parallel and right angle shaft gear reducers (this is the first operation to perform when disassembling the gear reducer) turn the shaft until the keyway is facing the intermediate shaft as indicated in fig. 5 and push the shaft from the reference groove side (circumferential keyway on shaft shoulder).

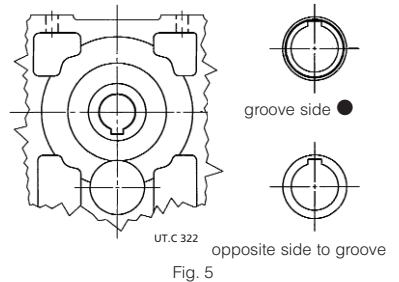


Fig. 5

The system shown in fig. 4c and 4d, page 10, is good for **axial fastening**: when the shaft end of the driven machine has no shoulder (as in the lower half of the drawing) a spacer may be located between the circlip and the shaft end itself. Parts in contact with the circlip must have sharp edges.

The use of **locking rings** (fig. 4e, page 10) or **locking bush** (fig. 4f page 10), will permit easier and more accurate installing and removing and eliminate backlash between the key and keyway.

The locking rings or bush are fitted after mounting and after having carefully degreased the coupling surfaces. Do not use molybdenum bisulphide or equivalent lubricant for the lubrication of the parts in contact. When tightening the bolt, we recommend the use of a **locking adhesive** LOCTITE 601.

Respect the tightening torques stated in the table on page 18.

In case of axial fastening with locking rings or bush – especially when having heavy duty cycles, with frequent reversals – verify, after some hours of running, the bolt tightening torque and eventually apply the locking adhesive again.

When fitting with **shrink disc** (fig. 4g, page 10) proceed as follows:

- carefully degrease the surfaces of hollow shaft and shaft end of driven machine to be fitted;
- mount the gear reducer onto the shaft end of driven machine following the method indicated in fig. 4a, page 10;
- gradually and uniformly tighten the screws of shrink disc by a continuous sequence (not crossing) and during several phases up to a torque stated in the table on page 18;
- at operation end verify the screw tightening torque by means of a dynamometric key (flat, when it is mounted onto machine end).


## 6 - Lubrication

### 6.1 - General

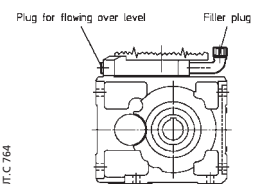
Depending on type and size, gear reducers and gearmotors may be grease-lubricated and supplied **FILLED WITH GREASE**, or (synthetic or mineral) oil-lubricated and supplied **FILLED WITH OIL** or **WITHOUT OIL** depending on type and size (see ch. 6.2). When supplying **WITHOUT OIL**, the filling up to specified level (normally stated by means of transparent level plug) is Buyer's responsibility.

Every gear reducer has a **lubrication plate**.

Concerning lubricant type and quantity, gear reducer type, how supplied, plugs, filling instructions, oil-change interval, etc. see lubrication table (6.2).

Be sure that for gear reducers and gearmotors size  $\geq 100$ , the filler plug is provided with a valve (symbol ); otherwise, replace it with the one normally supplied with.

When gear reducer or gearmotor is provided with a **spilway plug** (red colour) fill after unscrewing a.m. plug in order to check the obtained level by oil outlet.



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When gear reducer or gearmotor is provided with a **level plug with rod**, fill with oil up to specified level on rod.

When gear reducer or gearmotor is supplied with a level plug (size  $\geq 100$ ), the necessary lubricant quantity is that which **reaches a.m. level in center line of plug (gear reducer at rest)** and not the approximate quantity given on the catalogue.

Usually bearings are automatically and continuously lubricated (bathed, splashed, through pipes or by a pump) utilising the main gear reducer lubricant. The same applies for backstop devices, when fitted to gear reducers.

In certain gear reducers in vertical mounting positions V1, V3, V5

6.2 - Lubrication table

Product	How supplied* and plugs	Directions for first filling																																																		
<p><b>Worm sizes 32 ... 81</b></p>	<p><b>FILLED WITH SYNTHETIC OIL</b>                      AGIP Blasias S 320, KLÜBER Klübersynth GH 6-320, MOBIL Glygoyle HE 320, SHELL Tivela WB/SD</p> <p>Worm speed <math>\leq 280 \text{ min}^{-1}</math>                      KLÜBER Klübersynth GH 6-680, MOBIL Glygoyle HE 680</p> <p><b>Filler plug</b>                      1 filler plug sizes 32 ... 64</p> <p><b>Filler/drain plug</b>                      2 filler/drain plugs for sizes 80, 81</p>																																																			
<p><b>Worm sizes 100 ... 250</b></p>	<p><b>WITHOUT OIL</b>                      (except different statement on lubrication name plate)</p> <p><b>Filler plug with valve, drain and level plug</b></p>	<p>Before putting into service, fill to specified level with <b>synthetic oil</b> (AGIP Blasias S, ARAL Degol GS, BP-Energol SG-XP, MOBIL Glygoyle HE, SHELL Tivela Oil ... , KLÜBER Klübersynth GH ...) having the ISO viscosity grade given in the table.</p> <p>ISO viscosity grade [cSt]</p> <table border="1"> <thead> <tr> <th rowspan="2">Worm speed <math>\text{min}^{-1}</math></th> <th colspan="4">Ambient temperature <math>0 \div +40 \text{ }^\circ\text{C}^{(2)}</math></th> </tr> <tr> <th colspan="4">Gear reducer size</th> </tr> <tr> <th></th> <th>100</th> <th>125 ... 161</th> <th colspan="2">200, 250</th> </tr> <tr> <th></th> <th></th> <th>B3<sup>1)</sup>, V5, V6</th> <th>B6, B7, B8</th> <th>B3<sup>1)</sup>, V5, V6</th> <th>B6, B7, B8</th> </tr> </thead> <tbody> <tr> <td>2 800 <math>\div</math> 1 400<sup>3)</sup></td> <td>320</td> <td>320</td> <td>220</td> <td>220</td> <td></td> </tr> <tr> <td>1 400 <math>\div</math> 710<sup>3)</sup></td> <td>320</td> <td>320</td> <td></td> <td>320</td> <td>220</td> </tr> <tr> <td>710 <math>\div</math> 355<sup>3)</sup></td> <td>460</td> <td>460</td> <td></td> <td>460</td> <td>320</td> </tr> <tr> <td>355 <math>\div</math> 180<sup>3)</sup></td> <td>680</td> <td>680</td> <td>460</td> <td></td> <td>460</td> </tr> <tr> <td>&lt; 180</td> <td>680</td> <td>680</td> <td></td> <td></td> <td>680</td> </tr> </tbody> </table> <p>1) Not stated on the name plate.                      2) Peaks of <math>10 \text{ }^\circ\text{C}</math> above and <math>10 \text{ }^\circ\text{C}</math> (<math>20 \text{ }^\circ\text{C}</math> for <math>\leq 460 \text{ cSt}</math>) below the ambient temperature range are acceptable.                      3) For these speeds we advise to replace oil after running-in.</p>	Worm speed $\text{min}^{-1}$	Ambient temperature $0 \div +40 \text{ }^\circ\text{C}^{(2)}$				Gear reducer size					100	125 ... 161	200, 250				B3 <sup>1)</sup> , V5, V6	B6, B7, B8	B3 <sup>1)</sup> , V5, V6	B6, B7, B8	2 800 $\div$ 1 400 <sup>3)</sup>	320	320	220	220		1 400 $\div$ 710 <sup>3)</sup>	320	320		320	220	710 $\div$ 355 <sup>3)</sup>	460	460		460	320	355 $\div$ 180 <sup>3)</sup>	680	680	460		460	< 180	680	680			680
Worm speed $\text{min}^{-1}$	Ambient temperature $0 \div +40 \text{ }^\circ\text{C}^{(2)}$																																																			
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<p><b>Coaxial sizes 32 ... 41</b></p> <p><b>Right angle shaft sizes 80 ... 125</b></p>	<p><b>FILLED WITH SYNTHETIC GREASE</b>                      SHELL Tivela Compound A                      IP Telesia Compound A                      MOBIL Glygoyle Grease 00</p> <p><b>Filler/drain plug</b>                      (only for coaxial)</p>																																																			
<p><b>Coaxial sizes 50 ... 81</b></p> <p><b>Parallel and right angle shaft sizes 40 ... 81</b></p>	<p><b>FILLED WITH SYNTHETIC OIL</b>                      KLÜBER Klübersynth GH 6-220, MOBIL Glygoyle 30</p> <p><b>Filler/drain plug</b>                      2 filler/drain plugs for sizes 80, 81</p>																																																			
<p><b>Coaxial sizes 100 ... 180</b></p> <p><b>Parallel and right angle shaft sizes 100 ... 631</b></p> <p><b>Right angle shaft sizes 160 ... 320</b></p> <p><b>Shaft mounted</b></p>	<p><b>WITHOUT OIL**</b>                      (except different statement on lubrication name plate)</p> <p><b>Filler plug with valve</b>                      (with breathing for shaft mounted gear reducers),  <b>drain and level plugs</b></p>	<p>Before putting into service, fill to specified level with <b>mineral oil</b> (AGIP Blasias, ARAL Degol BG, BP-Energol GR-XP, ESSO Spartan EP, IP Mellana oil, MOBIL Mobilgear 600, SHELL Omala, TEXACO Meropa, TOTAL Carter EP) or <b>polyglycol** synthetic oil</b> (KLÜBER Klübersynth GH6 ..., MOBIL Glygoyle, SHELL Tivela S oil) or <b>polyalphaolefines** synthetic oil</b> (AGIP Blasias SX, CASTROL Tribol 1510, ELF Reductelf SYNTHÈSE, ESSO Spartan SEP, KLÜBER Klübersynth EG4, MOBIL SHC Molykote L11 ...) having the ISO viscosity grade given in the table.</p> <p>ISO viscosity grade [cSt]</p> <table border="1"> <thead> <tr> <th rowspan="2">Speed <math>n_2</math> <math>\text{min}^{-1}</math></th> <th colspan="4">Ambient temperature<sup>1)</sup> [<math>^\circ\text{C}</math>]</th> </tr> <tr> <th colspan="2">mineral oil</th> <th colspan="2">synthetic oil</th> </tr> <tr> <th></th> <th>Right angle shaft</th> <th>Others</th> <th>0 <math>\div</math> 20</th> <th>10 <math>\div</math> 40</th> <th>0 <math>\div</math> 40</th> </tr> </thead> <tbody> <tr> <td>&gt; 710</td> <td></td> <td>&gt; 224</td> <td>150</td> <td>150</td> <td>150</td> </tr> <tr> <td>710 <math>\div</math> 280</td> <td></td> <td>224 <math>\div</math> 22,4</td> <td>150</td> <td>220</td> <td>220</td> </tr> <tr> <td>280 <math>\div</math> 90</td> <td></td> <td>22,4 <math>\div</math> 5,6</td> <td>220</td> <td>320</td> <td>320</td> </tr> <tr> <td>&lt; 90</td> <td></td> <td>&lt; 5,6</td> <td>320</td> <td>460</td> <td>460</td> </tr> </tbody> </table> <p>1) Peaks of <math>10 \text{ }^\circ\text{C}</math> (<math>20 \text{ }^\circ\text{C}</math>) below and <math>10 \text{ }^\circ\text{C}</math> above the ambient temperature range are acceptable.</p>	Speed $n_2$ $\text{min}^{-1}$	Ambient temperature <sup>1)</sup> [ $^\circ\text{C}$ ]				mineral oil		synthetic oil			Right angle shaft	Others	0 $\div$ 20	10 $\div$ 40	0 $\div$ 40	> 710		> 224	150	150	150	710 $\div$ 280		224 $\div$ 22,4	150	220	220	280 $\div$ 90		22,4 $\div$ 5,6	220	320	320	< 90		< 5,6	320	460	460											
Speed $n_2$ $\text{min}^{-1}$	Ambient temperature <sup>1)</sup> [ $^\circ\text{C}$ ]																																																			
	mineral oil		synthetic oil																																																	
	Right angle shaft	Others	0 $\div$ 20	10 $\div$ 40	0 $\div$ 40																																															
> 710		> 224	150	150	150																																															
710 $\div$ 280		224 $\div$ 22,4	150	220	220																																															
280 $\div$ 90		22,4 $\div$ 5,6	220	320	320																																															
< 90		< 5,6	320	460	460																																															

**Independently-lubricated bearings, motor-bearings, backstop device fitted to motor:**

lubrication is «for life» (except some cases of motors in which relubrication device is adopted). Should there be either a possibility of the grease becoming contaminated, or a particular type of duty-cycle, it is good policy to check on the state of the grease (between one change and the next, or every year or 2 years) and remove and replace grease in independently-lubricated bearings (every change or every other change, or every 2 or 4 years). Bearings should be filled with ESSO BEACON 3 bearing-grease for ball bearings, KLÜBER STABURAGS NBU 8 EP for roller bearings; lubricate the backstop device with ESSO BEACON 2.

## Oil-change interval and lubricant quantity

Oil quantity [l] for **worm gear reducers sizes 32 ... 81**  
For the other sizes the quantity is given by the level stated by the proper plug.

Size	R V, MR V			R IV, MR IV			MR 2IV			
	B3 <sup>1)</sup> , V5, V6	B6, B7	B8 <sup>1)</sup>	B3 <sup>1)</sup> , V5, V6	B6, B7	B8 <sup>1)</sup>	B3 <sup>1)</sup>	B6, B7	B8 <sup>1)</sup>	V5, V6
<b>32</b>	0,16	0,2	0,16	0,2	0,25	0,2	—	—	—	—
<b>40</b>	0,26	0,35	0,26	0,32	0,4	0,32	0,42	0,5	0,42	0,42
<b>50</b>	0,4	0,6	0,4	0,5	0,7	0,5	0,6	0,8	0,6	0,6
<b>63, 64</b>	0,8	1,15	0,8	1	1,3	1	1,2	1,55	1,2	1,2
<b>80, 81</b>	1,3	2,2	1,7	1,5	2,5	2	1,7	2,8	2,3	1,8

1) Not stated on name plate (B8, only sizes 32 ... 64).  
Ambient temperature 0 ÷ +40 °C with peaks up to -20 °C and +50 °C.

An overall guide to **oil-change interval** is given in the table, and assumes pollution-free surroundings. Where heavy overloads are present, halve the values.

Apart from running hours, replace or regenerate the oil each 5 ÷ 8 years according to size, running and environmental conditions.

Oil temperature [°C]	Oil-change interval [h]
≤ 65	18 000
65 ÷ 80	12 500
80 ÷ 95	9 000
95 ÷ 110	6 300

### Grease quantity [kg] for coaxial gear reducers

Lubrication «for life» (assuming external pollution-free environment).

Size	R 2I, MR 2I, 3I			
	B3 <sup>1)</sup> , B6, B7, B8	V5, V6	B5 <sup>1)</sup>	V1, V3
<b>32</b>	0,14	0,25	0,1	0,18
<b>40, 41</b>	0,26	0,47	0,19	0,35

1) Non stated on name plate  
Ambient temperature 0 ÷ +40 °C with peaks up to -20 °C and +50 °C.

Lubrication «for life» (assuming external pollution-free environment). Oil quantity [l] for sizes **50 ... 81**

Coaxial size	R 2I, 3I, MR 2I, 3I		
	B3 <sup>1)</sup>	B6, B7, B8, V6	V5
<b>50, 51</b>	0,8	1,1	1,4
<b>63, 64</b>	1,6	2,2	2,8
<b>80, 81</b>	3,1	4,3	5,5

Parallel size	R I			R 2I, MR 2I			R 3I, MR 3I			MR 4I			
	B3 <sup>1)</sup> , B8	B7	B6, V5, V6	B3 <sup>1)</sup> , B8	B6 <sup>2)</sup>	B7, V5, V6	B3 <sup>1)</sup> , B8	B6	B7, V5 <sup>3)</sup> , V6	B3 <sup>1)</sup> , B8	B6	B7, V6	V5 <sup>3)</sup>
<b>40</b>	—	—	—	0,4	0,9	0,55	0,47	0,7	0,6	—	—	—	—
<b>50</b>	—	—	—	0,6	0,9	0,8	0,7	1,05	0,9	—	—	—	—
<b>63, 64</b>	0,7	0,8	1	0,9	1,4	1,2	1	1,5	1,3	1,1	1,8	1,4	1,3
<b>80</b>	1,2	1,5	1,9	1,5	2,7	2,3	1,7	2,9	2,5	1,9	3,2	2,7	2,5

1) Not stated on name plate.  
2) Values valid for R 2I; for MR 2I the values are respectively: 0,8; 1,2; 2,3.  
3) The first reduction stage (the first two for 4I) is lubricated with grease for life.  
Ambient temperature 0 ÷ +40 °C with peaks up to -20 °C and +50 °C.

Right angle size	R CI, MR CI			R ICI, MR ICI				MR C3I			
	B3 <sup>1)</sup> , B6, B7	B8	V5, V6	B3 <sup>1)</sup> , B7	B6	B8	V5, V6	B3 <sup>1)</sup> , B7	B6	B8	V5, V6
<b>40</b>	0,26	0,35	0,3	0,31	0,5	0,4	0,35	—	—	—	—
<b>50</b>	0,4	0,6	0,45	0,45	0,8	0,65	0,5	0,5	0,9	0,7	0,55
<b>63, 64</b>	0,8	1	0,95	1	1,6	1,2	1,15	1,2	1,8	1,4	1,35
<b>80, 81</b>	1,3	2	1,8	1,6	2,7	2,2	2	1,9	3	2,5	2,3

An overall guide to **oil-change interval** is given in the table, and assumes pollution-free surroundings. Where heavy overloads are present, halve the values.

Apart from running hours:

- replace mineral oil each 3 years;
- replace or regenerate synthetic oil each 5 ÷ 8 years according to gear reducer size, running and environmental conditions.

The oil quantity is given by the level stated by the proper plug.

Oil temperature [°C]	Oil-change interval [h]	
	mineral oil	synthetic oil
≤ 65	8 000	25 000
65 ÷ 80	4 000	18 000
80 ÷ 95	2 000	12 500
95 ÷ 110 <sup>1)</sup>	—	9 000

1) Values admissible only for parallel, right angle shaft gear reducers (cat. G and L) an for non-continuous duties.

\* Identification through specific lubrication name plate.

\*\* Lubrication with synthetic oil (polyglycol basis must be with special internal painting; polyalphaolefines basis is advisable for sizes ≥ 200 and obligatory for sizes ≥ 400). It is always recommended, particularly for: high speed gear reducers, increase of oil-change interval («long life»), increase of the ambient temperature range, increase of the thermal power or decrease of oil temperature.

and V6, and right-angle shaft gear reducers in horizontal positions B3, B6 and B51 (though not gearmotors in this case, for which the above indications hold good) upper bearings are independently lubricated with a special grease «for life», assuming pollution-free surroundings. The same applies for motor bearings (except some cases in which relubrication device is adopted) and backstop devices when fitted to motors.

Always be sure that the gear reducer is located as per the mounting position ordered, which appears on the name plate. When no indication is given, the gear reducer may be used in horizontal mounting position B3 or B5 (B3, B8, worm gear reducers size  $\leq 64$ ), or vertical position V1 (in the case of right angle shaft gear reducers in the design incorporating flange FO1...).

**Combined gear reducer units.** Lubrication remains independent, thus data relative to each single gear reducer hold good.

### 6.3 - Extruder support lubrication (parallel and right angle shaft)

The lubrication of **extruder support** is **separate** from the gear reducer, except:

- for designs HA ... HC;
- in presence of the independent cooling unit, if applied to lubricate both the gear reducer and the support.

The **separate lubrication** of extruder support sensibly improves the reliability and real life of the axial bearing; the separation between gear reducer and support is granted by a seal ring.

With separate lubrication, for the extruder support, use polyalphaolephines based synthetic oil (MOBIL SHC XMP 680, CASTROL Tribol 1510/680) with **ISO 680 cSt** viscosity grade.

With **common lubrication** (designs HA ... HC in presence of independent cooling unit, if applied to lubricate both the gear reducer and the support), lubricant ISO viscosity grade must be according to the instructions given in ch. 6.2 «lubrication table» and oil must be polyalphaolephine based synthetic type.

For the filling up of oil of extruder support, see the table below.

Gear reducer size	Lubrication of extruder support	
	Separate lubrication <sup>1)</sup>	Joint lubrication <sup>2)</sup>
<b>125 ... 451</b>	Filling up to the level (of support)	Filling up to the level (of gear reducer)

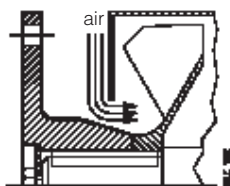
1) Support with metal filler plug with filter and valve, level and draining plug.  
2) The level is metal only in the gear reducer casing.

For the lubrication of gear reducer refer to ch. 6.2, lubrication table.

## 7 - Cooling system

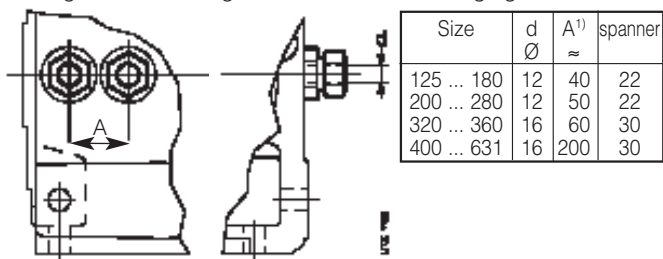
### 7.1 - Cooling by fan

**If there is fan on the gear reducer verify that there is sufficient space allowing for adequate circulation of cooling air also after fitting coupling protection. If a coupling protection is fitted (drilled case or wire netting), smooth, the coupling hub, if necessary.**



### 7.2 - Water cooling by coil

The presence of coil is given by water inlets (pipes DIN 2353) protruding from the casing as shown in the following figure.



1) These values for some mounting positions and designs can vary.

**Attention:** Do not tamper with the eventual stop plate in order to keep the pipes them locked; in particular keep the pipe locked while tightening the nut of connection pipe. Water fed into the system must:

- be not too hard;
- be at max temperature +20 °C;
- flow at 10 ÷ 20 dm<sup>3</sup>/min;
- have a pressure 0,2 ÷ 0,4 MPa (2 ÷ 4 bar).

Where ambient temperature may be less than 0 °C, make provision for water drain and compressed air inlet, so as to be able to empty out the coil completely and avoid freezing up.

When risking high input pressure peaks, install a safety valve set to a proper operating threshold.

### 7.3 - Independent cooling unit

See specific documentation supplied together with the unit.

## 8 - Commissioning

Carry out an overall check, making particularly sure that the gear reducer is filled with lubricant.

Where star-delta starting is being used, input voltage must match the motor lower voltage ( $\Delta$  connection).

For asynchronous three-phase motor, if the direction of rotation is not as desired, invert two phases at the terminals.

Before running gear reducers fitted with **backstop device**, make sure that the **direction of rotation in machine, gear reducer and motor all correspond correctly**.



**Attention!** One or more startings in the false direction, even if short, could irremediably damage the backstop device, the coupling seats and/or the electric motor.

A **running-in** period is advisable:

- of approx. 400 ÷ 1 600 h for gear reducers with worm gear pairs in order to reach maximum efficiency;
- of approx. 200 ÷ 400 h for gear reducers with bevel and/or cylindrical gear pairs in order to reach maximum functionality.

The temperature of both gear reducer and lubricant may well rise beyond normal values during running-in. After the running-in period it may be necessary to verify the gear reducer fixing bolt tightness.

Note: worm gear reducer efficiency is lower in the **first running hours** (about 50) and at every cold starting (efficiency will be better with oil temperature increasing). For further information consult ROSSI MOTORIDUTTORI technical catalogues.

## 9 - Maintenance

### 9.1 - General

At machine rest, verify at regular intervals (more or less frequently according to environment and use):

- all external surfaces are clean and air passages to the gear reducer or gearmotors are free, in order that cooling remains fully effective;
- oil level and deterioration degree (check with cold gear reducer at rest);
- the correct fastening screws tightening.

During the operation check:

- noise level;
- vibrations;
- seals;
- etc.



**Attention!** After a running period, gear reducer (excluding the shaft mounted gear reducers) is subject to a light internal overpressure which may cause burning liquid discharge. Therefore, before loosening whichever plug wait until gear reducer has become cold; if not possible, take the necessary protection measures against burning due to warm oil contact. In all cases, always proceed with great care.

Maximum oil temperatures indicated in lubrication table (see ch.6.2) do not represent a hindrance to the gear reducer regular running.

During the oil change, after having unscrewed also the filler plug in order to improve the discharge, it is recommended to clean internally the gear reducer casing using the same oil type suitable for the running. For the next filling use a 60  $\mu$ m oil filter.

Replace the seal rings in case of dismantling or of periodical check of gear reducer; in this case, the new ring must be positioned so that the new ring does not work on the same sliding race of previous ring.

When dismantling the cap (whenever gear reducers are provided with), reset the sealing with adhesive on cleaned and degreased mating surfaces.

### 9.2 - Coil

In case of long non-running periods at ambient temperatures lower than 0 °C, the coil should be emptied out using compressed air to blast out all the coolant, so as to avoid freezing-up which would cause the coil to break.

### 9.3 - Seal rings

It is always recommended that the seal rings are replaced with new ones when they are removed or during periodic checks of gear reducer; in this case, the new ring should be generously greased and positioned so that the seal line does not work on the same point of sliding contact as the previous ring.

Oil seals must be protected against heat radiation, also during the shrink fitting of parts, if applicable.

### 9.4 - Motor replacement

Since gearmotors are realised with **standardised** motor, motor replacement – in case of failure – is extremely easy. Simply observe the following instructions:

- be sure that the mating surfaces are machined under accuracy

rating (UNEL 13501-69; DIN 42955);

- clean surfaces to be fitted thoroughly;
- check and, if necessary, lower the parallel key so as to leave a clearance of  $0,1 \div 0,2$  mm between its top and the bottom of the keyway of the hole. If shaft keyway is without shoulder, lock the key with a pin.

When the motor shaft end is keyed direct to worm or to cylindrical or bevel pinion (garmotors: worm MR V, parallel shaft MR 3I size 140 ... 360 and MR 2I, right angle shaft MR CI and MR C2I);

- check that the fit-tolerance (push-fit) between hole and shaft end is G7/j6 for  $D \leq 28$  mm, F7/k6 for  $D \geq 38$  mm;
- lubricate surfaces to be fitted against fretting corrosion.

**Before disassembling motor sizes 200 ... 315 on MR 2I, 3I or servomotors (coupled with key and bronze bush with hub clamp) and for gear reducer sizes 40 ... 81 design «square flange for servomotors» proceed as follows:**

- align the key through hole with the tightening screw of the hub clamp;
- loosen the tightening screw and consequently the hub clamp;
- disassemble the motor.

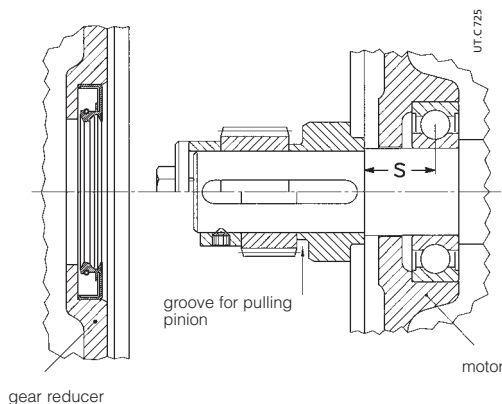
For the motor mounting proceed as above stated in the opposite direction.

When a cylindrical pinion is keyed onto the motor shaft end (gearmotors: worm MR IV, parallel shaft MR 3I sizes 50...125, 4I, right angle shaft MR ICI, C3I, coaxial):

- in case of gear reducer (sizes 40...81), execution «square flange for servomotors», before removing the motor, loose the hub clamp through the proper opening on the top of the square flange;
- check that the fit-tolerance (standard locking) between hole and shaft end is K6/j6 for  $D \leq 28$  mm, and J6/k6 for  $D \geq 38$  mm; key length should be at least 0,9 pinion width;
- make sure that the motors have bearing location and overhang (distance S) as shown in the table;

Motor size	Min dynamic load capacity daN		Max dimension 'S' mm
	Front	Rear	
<b>63</b>	450	335	16
<b>71</b>	630	475	18
<b>80</b>	900	670	20
<b>90</b>	1 320	1 000	22,5
<b>100</b>	2 000	1 500	25
<b>112</b>	2 500	1 900	28
<b>132</b>	3 550	2 650	33,5
<b>160</b>	4 750	3 350	37,5
<b>180</b>	6 300	4 500	40
<b>200</b>	8 000	5 600	45
<b>225</b>	10 000	7 100	47,5
<b>250</b>	12 500	9 000	53
<b>280</b>	16 000	11 200	56

- locate the spacer (with adhesive, check that between keyway and motor shaft shoulder there is a grounded cylindrical part of at least 1,5 mm) and pinion on the motor (pinion pre-heated to  $+80 \div +100$  °C) locking the entire assembly by means of a bolt to the butt-end or hub clamp;
- grease the pinion teeth, the sealing ring rotary seating and the ring itself, and assemble carefully.



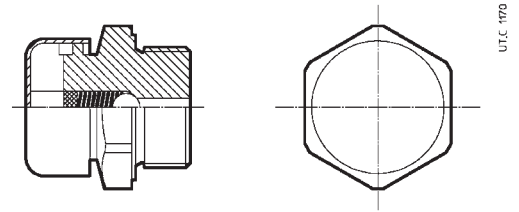
## 9.5 - Bearings

Since there are many different types of bearings in a gear reducer (roller, tapered roller, straight roller, etc.) and each bearing works with different loads and speeds depending on the input speed, the nature of the load of the driven machine, the transmission ratio, etc., and with different lubricants (oil bath, oil splash, grease, oil circulation, etc.), it is not possible to define any periodical maintenance and replacement of bearings in advance.

If a precautionally maintenance is required, **undertake periodical checks to verify noise level and vibration with the help of appropriate diagnostic equipment and instruments.** If the measured values worsen even slightly it is necessary to stop gear reducer or gear motor and after having inspected inside the unit replace the bearings which are subject to breakdown.

## 9.6 - Metal filler plug with filter and valve

When the gear reducer or gearmotor (size  $\geq 100$ ) is equipped with metal filler plug with filter and valve (see fig. here following), in order to clean it, it is necessary to unscrew it from the gear reducer (preventing any debris or other foreign items from entering the reducer, disassemble the cover, wash it with solvent, dry with compressed air and reassemble it). This operation is to be made according to environment conditions.



## 10 - Sound levels

Most of the ROSSI MOTORIDUTTORI product range is characterised by **sound pressure levels  $L_{pA}$**  (mean value of measurement, assuming nominal load and input speed  $n_1 = 1\,400 \text{ min}^{-1}$ , at 1 m from external profile of gear reducer standing in free field on a reflecting surface, according to draft proposal ISO/CD 8579) **lower or equal to 85 dB(A).**

The table indicates the products which **can exceed** a.m. threshold. For further information about sound levels of every single product see ROSSI MOTORIDUTTORI technical catalogues.

Machine/Train of gears		$i_N$	Size
Parallel shaft	R I	$\leq 3,15$	$\geq 160$
		$\geq 4$	$\geq 200$
	R 2I	all	$\geq 320$
	R 3I	all	$\geq 400$
Right angle shaft	R 4I	$\leq 160$	$\geq 500$
		$\geq 200$	$\geq 630$
Right angle shaft	R CI	all	$\geq 320$
	R C2I	$\leq 63$	$\geq 400$
		$\geq 71$	$\geq 500$
	R C3I	all	$\geq 630$
Right angle shaft	R C	1	$\geq 250$

## Painting table

Product	Size	Internal painting	External painting		Notes
			(final colour always blue RAL 5010)	Specifications	
<b>Worm</b> <b>Parallel and right angle</b> <b>Coaxial</b>	<b>32 ... 81</b> <b>40 ... 100</b> <b>32 ... 41</b>	Epoxy powder (prepainted)	Epoxy powder (prepainted)	Resistant to atmospheric and aggressive agents. Suitable for further painting only after degreasing and sanding.	Machined parts remain unpainted; they are protected with an easily removable anti-rust oil (before painting remove the protective oil).
<b>Worm</b> <b>Coaxial</b>	<b>100 ... 250</b> <b>50 ... 81</b>	Dual-compound epoxy primer (prepainted)	Dual-compound epoxy primer (prepainted) + Water-soluble enamel	Good resistance to atmospheric and aggressive agents.  Not resistant to solvents.	The internal painting does not resist polyglycol synthetic oils (polyalphaolefines synthetic oils are suitable).
<b>Parallel and right angle</b> <b>Coaxial</b> <b>Right angle</b>	<b>125 ... 631</b> <b>100 ... 180</b> <b>160 ... 320</b>	Water-soluble single-compound alkyd basis primer (prepainted)	Water-soluble single-compound alkyd basis primer (prepainted) + Water-soluble enamel	Suitable for further coats of single-compound synthetic paints (normally also dual-compound).  Machined parts are painted with water-soluble enamel only.	
<b>Right angle</b> <b>Shaft mounted</b>	<b>80 ... 125</b>	—	Water-soluble enamel	—	
<b>Coaxial<sup>2)</sup></b> <b>Right angle</b>	<b>56 ... 142</b> <b>85 ... 142</b>	—	Zinc phosphate primer + half luster water-soluble enamel	Good resistance to atmospheric and aggressive agents. Not resistant to solvents. Suitable for further coats of single-compound synthetic paints (normally also dual-compound).	Machined parts remain unpainted; they are protected with an easily removable anti-rust oil (before painting remove the protective oil).

1) When gear reducers are coupled with servomotors (servogearmotors) the final colors is black RAL 9005.

2) Integrated low backlash planetary servogearmotors.

## Table of tightening torques for axial fastening bolts and shrink disc<sup>2)</sup>

Worm gear reducers size	32	40	50	—	63, 64	—	80, 81	100	125, 126	160	161	—	200	—	250	—	—	—	—	—	—	—	—	—
Parallel and right angle shaft size	40	50	—	63	64	80	81	100	125	140	—	160	180	200	225	250	280	320, 321	360	400, 401	450, 451	500, 501	560, 561	630, 631
M [daN m] for rings or bush	2,9	3,5	4,3	4,3	4,3	5,1	5,3	9,2	17	21	21	34	43	66	83	135	166	257	315	—	—	—	—	—
Bolts for axial fastening UNI 5737-88 class 10.9	M8 <sup>1)</sup>	M8 <sup>1)</sup>	M10 <sup>1)</sup>	M10	M10	M10	M10	M12	M14	M16	M16	M20	M20	M24	M24	M30	M30	M36	M36	M30	M30	M36	M36	M36
M [daN m] for shrink disc	—	0,4	—	1,2	1,2	1,2	—	3	3	3	—	6	6	10	10	25	25	25	25	49	49	49	49	84
Bolts for shrink disc UNI 5737-88 class 10.9	—	M5	—	M6	M6	M6	—	M8	M8	M8	—	M10	M10	M12	M12	M16	M16	M16	M16	M20	M20	M20	M20	M24

1) For worm gear reducers UNI 5931-84.

2) The bolts of shrink disc must be gradually and uniformly tightened, with continuous sequence (not diagonally!) and in several phases up to the reaching of maximum tightening torque stated on table.

## Table of tightening torques fastening bolts (foot and flange)

Bolt	M (daN m) UNI 5737-88	
	class 8.8	class 10.9
<b>M5</b>	0,6	0,85
<b>M6</b>	1,1	1,5
<b>M8</b>	2,5	3,5
<b>M10</b>	5	7,1
<b>M12</b>	8,5	12
<b>M14</b>	13,5	19
<b>M16</b>	20,5	29
<b>M18</b>	28	40
<b>M20</b>	40	56
<b>M22</b>	55	77
<b>M24</b>	71	100
<b>M27</b>	100	140
<b>M30</b>	138	195
<b>M33</b>	200	280
<b>M36</b>	250	355
<b>M39</b>	295	420
<b>M42</b>	410	580
<b>M45</b>	500	710
<b>M48</b>	610	860
<b>M56</b>	980	1380

## Table of tightening torques for plugs

Thread dimension	[daN m]
G 1/4"	0,7
16 MB	1,4
G 1/2"	1,4
G 3/4"	1,4
G 1"	2,5

### Note

- Class 8.8 is usually sufficient.

- Before tightening the bolt be sure that the eventual centering of flanges are inserted properly

- The bolts are to be diagonally tightened with the maximum tightening torque.



## Gear reducer troubles: causes and corrective actions

Trouble	Possible causes	Corrective actions
Excessive oil temperature	Inadequate lubrication: – excessive or insufficient oil quantity;	Check: – oil level (gear reducer at rest) or quantity
	– unsuitable lubricant (different type, too viscous, exhausted, etc.)	– lubricant type and/or state (see ch. 6.2 lubrication table); replace if necessary
	– Wrong mounting position	– Change mounting position
	– Too tightened taper roller bearings	Consult ROSSI MOTORIDUTTORI
	– Worm gear reducer with excessive load during running-in	Reduce the load
	– Excessive ambient temperature	Increase the cooling or correct the ambient temperature
	Obstructed passage of air	Eliminate obstructive material
	Slow or missing air recycle	Arrange auxiliary ventilation
	Radiance	Screen gear reducer and motor properly
Anomalous noise	Inefficiency of auxiliary bearing lubrication system	Check the pump and the pipes
	Worn, faulty or badly lubricated bearings	Consult ROSSI MOTORIDUTTORI
	Inefficient or out of service oil cooling system: obstructed filter, insufficient oil (exchanger) or water (coil) flow rate, pump out of service, water temperature >20 °C, etc.	Check pump, pipes, oil filter and safety devices efficiency (pressure switches, thermostats, flow indicators, etc.)
	One or more teeth with: – dents or spillings – excessive flanks roughness	Consult ROSSI MOTORIDUTTORI
Lubricant leaking from seal rings	Worn, faulty or badly lubricated bearings	Consult ROSSI MOTORIDUTTORI
	Taper roller bearings with excessive clearance	Consult ROSSI MOTORIDUTTORI
	Vibrations	Check the fastening and the bearings
	Seal ring with worn, bakelized, damaged or false mounted seal lip	Replace seal ring (see ch. 8.3)
Oil leaking from filler plug	Damaged raceway surface (scoring, rust, dent, etc.)	Restore the raceway
	Mounting position differs from the one stated on the name plate	Position the gear reducer correctly
	Too much oil	Check oil level/quantity
Low speed shaft not rotating even with high speed shaft/motor running	Incorrect mounting position	Check mounting position
	Inefficient vent valve	Clean/replace filler plug with vent valve
	Broken key	Consult ROSSI MOTORIDUTTORI
Completely worn gear pair		
Lubricant leaking from joints (covers or half-casing joints)	Defective oil seals	Consult ROSSI MOTORIDUTTORI
Water in the oil	Defective cooling coil or heat exchanger	Consult ROSSI MOTORIDUTTORI

Motor: see specific instructions.

### NOTE

When consulting ROSSI MOTORIDUTTORI state:

- all data of gear reducer or gearmotor name plate;
- nature and duration of failure;
- when and under which conditions the failure occurred;
- during the warranty period, in order not to lose validity, do not disassemble nor tamper the gear reducer or gearmotor without approval by ROSSI MOTORIDUTTORI.



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