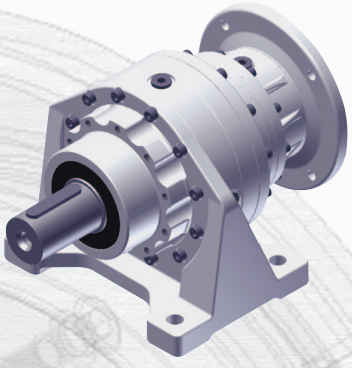
SITI SPA
SOCIETÀ ITALIANA TRASMISSIONI INDUSTRIALI ®



NRG

EN

INSTRUCTIONS AND SPARE PARTS MANUAL OF PLANETARY GEARBOXES

01.2025

Abstract

1. Introduction

1.1. Foreword

SITI S.p.A. thanks you for the trust granted and reminds you that your product is the result of a work of improvement our engineers are continuously pursuing, due to a constant research in the section.
Reading and understanding the present publication is an essential condition for a correct set up and following installation.
The Assistance network is anyway at your disposal in order to help you to settle all possible doubts that might arise.

1.2. Manufacturer's identification data

SOCIETÀ ITALIANA TRASMISSIONI INDUSTRIALI®

GEARBOXES
GEARED MOTORS
MECHANICAL VARIATORS
ELECTRIC MOTORS A.C./D.C.

HEADQUARTER and FACTORY

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1.3. Communications with the technical assistance

For whatever communication with the Technical Assistance Center, please always mention the gearbox technical data appearing on the name plate, located on the unit. These data will allow a whole identification of the unit (⇒ Identification name plate, 8).

1.4. List of contents of the manual

The present manual provides the installation, use and maintenance instructions of the product and refers to its use in the conditions as it will be clearly described in the following sections (⇒ Expected use, 7).
The present manual has been written in Italian as original language and thereafter translated into other languages. Therefore, the italian language constitutes the "ORIGINAL INSTRUCTIONS MANUAL", while the versions drawn up in other languages are to be considered "TRANSLATIONS OF THE ORIGINAL INSTRUCTIONS". Should you be convinced that the translation is wrong or missing a few parts, you are kindly requested to get in touch with the SITI S.p.A., who will provide to supply all the convenient clarifications and possibly to amend the translation where necessary.

1.5. Purpose and validity of the manual

The present manual provides instructions for installation, use and maintenance relating to NRG series planetary gearboxes and complies with all applicable laws, directives and standards in force at the time of sale. The copy delivered with the gearbox cannot be considered inadequate because only then updated based on new information. Any changes, adjustments, etc.. that were made to gearboxes sold later do not require the manufacturer to act retroactively on products previously delivered or to consider the same and the manual incomplete and inadequate.
Possible further integrations of the manual that the manufacturer will feel convenient to send to customers will have to be saved along with the manual, which they will represent integral part of.
The warranty related to the good running and performance and full compliance of the unit with the expected service is strictly dependent on the correct application of instructions held in the present manual.

1.6. Addressees of the manual

The present manual is addressed to:
- the manager of the plant;
- the personnel in charge of set ups;
- the personnel in charge of the maintenance.

The manual has to be guarded by a responsible person and kept, in the best status of preservation, in a place suitable to be always available for the consultation by the persons it is addressed to.
In case of loss or deterioration, the replacing documentation is to be requested to the manufacturer, indicating the reference data given on the identification plate (⇒ Identification name plate, 8).

1.7. Choice and qualification of the personnel

For the operations of handling, set up and maintenance, the user will have to commit the task to operators who have at their disposal the following features:
- Degree of education and training are adequate in view of the operation to be carried out.
- Knowledge of what is illustrated in the present manual in relation to the operation to be carried out.
- Knowledge of the accident prevention rules which are in force at the moment of use.
- Physical conditions suitable to the operation to be carried out.
- Equipment and use of certified individual protection devices.

1.8. Symbology used

Instructions are tied to symbols aimed at making the reading easier, by clarifying the kind of information supplied.

 Generalized danger for the safety of human beings.

 Important remarks in view of a correct usage without causing damages to the equipments.

 Instructions related to units expected for set up in environments having a potentially explosive atmosphere, complying with the directive 2014/34/UE (ATEX).

1.9. Glossary

P.P.E.
Acronym of Personal Protective Equipment.

1.10. Warranty

- Our warranty has a validity of one year, starting from the date of invoice of the product. It is limited exclusively to the free of charge repair or to the free replacement of the parts we recognize defective; checks intended to ascertain whether warranty can apply will be always carried out in the plant of the Seller or by one of the authorized branches. The claim can neither give rise to the cancellation of orders and not even to a high reduction of deliveries nor to the suspension of payments by the Buyer; not even the payment of a compensation in money of any kind effected by the Seller can be acceptable.
  Our warranty will expire if the pieces sent back as defective ones will prove to have been in any way altered or repaired without our previous written authorization; moreover, it will expire in case the Buyer fails in anyone of his contractual obligations, especially in reference to the payment conditions.
- Our warranty does not cover any damage or failure due to external factors, a missing maintenance, overloads, unsuitable lubrication, wrong choice of the type of unit, assembling error, caused by external components and by components subject to wear and deterioration as well as damages arising as a consequence of the transport carried out on account of the customer or through a transporter designed by the customer, considering that the shipment is always carried out on account and at risk afforded by the Buyer.
- Expenses (like for instance disassembling, labour, re-assembling, transport, board and lodging), which are undertaken due to the outer service of personnel of the Seller, even after acknowledgment of the warranty, are always on charge of the Buyer. On charge of the Seller, there are to be considered the components acknowledged under warranty and the time necessary for the replacement of the same.
- Any sort of compensation is not included and not even direct or indirect damages can be claimed (even towards thirds).
- The requests for repair under warranty and/or out of warranty are to be communicated by written through the suitable module to SITI S.p.A. in view of the acceptance of the repair.
  Material to be repaired either under warranty or anyway subject to troubles, will be withdrawn by our Company only if it is sent back at free port following up a written request, and it will be sent back with transport freights covered by the customer.

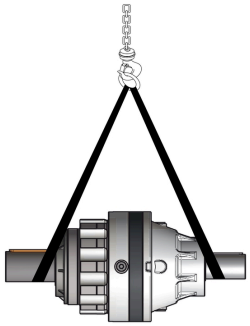
2. Accident prevention advices

2.1. General warnings

- It is prohibited to bring any kind of modification to the gearbox, without a previous authorization granted by the manufacturer.
- It is prohibited to use the gearbox in a potentially explosive atmosphere, unless the unit has been purposely pre-arranged for the use in such kind of atmosphere.
- The surface of a gearbox while operating might reach high ranges of temperature, such to cause skin burns. It is strictly recommended to check the temperature value of the outer surfaces of the gearbox, prior to enforcing any kind of service on the unit (⇒ Measure of the running temperature, 18).
- Whenever one is operating near the gearbox, it is recommended to wear a protection equipment, suitable for the operation to be carried out. All clothes worn while operating near a unit are to be close-fitting to the body. It is strongly recommendable to refrain from wearing ties, necklaces or belts, which might get caught by or squeeze in the rotating parts of the unit. It is necessary to always wear individual own protection devices, as called for by the manual in view of carrying out some kinds of service on the units.

2.2. Residual risks

In the stage of design and calculation of the gearboxes, an accurate analysis has been carried out about the risks, which the operators in charge of maintenance might be subject to, while they effect the manoeuvres and other kinds of maintenance and, due to this, all possible precautions have been taken, in order to make the gearbox safer and more reliable.
There are anyway a few conditions of risk depending on the installation type and on the operating conditions, which may be removed just by using simple precautions, as indicated on the manual in the related paragraphs.

Risk: crushing **Eventuality / risk location** Fall / crash of the gearbox during transport / set up stages. **Protections / precautions** Wear all P.P.E. called for. Comply with the instructions given in the manual (⇒ Handling and transport, 9).	

Risk: burns **Eventuality / risk location** By touching the gearbox during the use and maintenance. **Protections / precautions** Wear all the P.P.E. called for. Comply with the instructions given in the manual (⇒ Measure of the running temperature, 18) and (⇒ Oil replacement, 22).	

Risk: irritation of skin / eyes **Eventuality / risk location** Replacing / re-filling oil during the maintenance. **Protections / precautions** Wear all the P.P.E. called for. Comply with the instructions given in the manual (⇒ Oil replacement, 22).	

2.3. Advices for the use in a potentially explosive atmosphere

	 **Danger!** **Mixtures of explosive gases or high powder concentrations may cause serious damages especially when they get in touch with hot rotating parts of the gearbox.** Set up, connection, start up, maintenance or repair works on gearboxes are to be accomplished only by specialized and qualified technicians, who have to comply with the following prescriptions: • Follow all manufacturer's instructions. • Take care and comply with all notice marks and information signs applied on the units. • Strictly follow the specific rules related to the installation on which the unit is operating. • Strictly follow all rules which are in force in the country of manufacture (protection against explosions, safety, risk prevention).

2.4. Installation of parts on account of the customer

 **Caution!**
Prior to being set in motion, the gearbox must be provided with a few parts, essential in view of a full safety in the use and operations.

After set up, the user is requested to equip the gearbox with adapted repairs, suitable to protect rotating parts connecting input shafts and output shafts. On the protections, the following pictographs are to be applied:

 Do not remove the protections.

 Obligation to keep protections effective.

 **Caution!**
The SITI S.p.A. declines any responsibility in case of damages occurring to things or persons, caused by the use of the gearbox without taking all the due protections as mentioned here above.

3. General information

3.1. Expected use

The unit has been designed and manufactured in order to directly transmit the rotational motion, operating a revolution speed reduction between input and output shafts.
Performance and limitation of use are clearly specified in the technical/commercial catalogue, which is available upon request or may be downloaded from the site www.sitiriduttori.it

	 Only in case ATEX mounting is purposely requested, the gearbox can be used for operating in environments meeting the following requirements: Group: **II** Category **2 G / 2 D** Protection mode (not electrical): **Ex h** Modes of protection used: **"c" constructive safety - "k" immersion in liquid** Gas / Dust Group: **IIC / IIIC** Zone: **1 / 21** EPL: **Gb / Db** Maximum surface temperature: **T4 / T135 °C** **II 2G Ex h IIC T4 Gb** **II 2D E xh IIIC T135 °C Db** **-20 °C ≤ Ta ≤ + 60 °C** Ambient temperature: - 20°C min., +60°C max. Different ambient temperatures from the mentioned ones are to be evalualed along with our Engineering Dept. Marking according to rules IEC EN 80079-36, IEC EN-80079-37.

3.2. Prohibited uses

The gearbox cannot be used for purposes different from the expected ones.
The standard gearbox cannot be used in environments characterized by a potentially explosive atmosphere. For such a use, it is necessary to require the special version fulfilling the directive 2014/34/UE (ATEX).

3.3. Declaration of incorporation

In compliance with the Machinery Directory 2006/42/CE, the gearbox, being intended to be built in and/or fitted on other machines or machine components, is considered a "component", therefore it cannot be put in service as long as the machine, on which it will be built in, has not been declared in conformance with the Machinery Directory 2006/42/CE.

 **Remark:**
The subject product complies with the above mentioned features and with the ones given on the catalogue which is in force at the production date. SITI S.p.A. reserves the right to change them, in order to adapt them to the technology or material variations occurred.

3.4. Gearbox identification data

3.4.1. Identification name plate

The units are equipped with an identification name plate, showing the following pieces of information:

• Gearbox code • Type of gearbox - Transmission ratio - PAM - Version • Additional description • Serial number • Bar code and or QR Code for internal traceability	

	In case of units fulfilling the directive 2014/34/UE (ATEX), the specific name plate ATEX is applied, on which the following information is given: • Gearbox code • Type of gearbox - Transmission ratio - PAM - Version • Additional description • Serial number • Bar code and/or QR Code for internal traceability • Compliance with ATEX classification	

Remark:
The name plate must be always preserved in a way to be readable in relation to all data shown on it, providing periodically to its cleaning.
Should a name plate deteriorate and/or result to be not readable any longer, even in one only of the data appearing on it, it is recommended to require a new name plate to the manufacturer, mentioning the data which are still readable, and then provide to replace the name plate.

3.5. Technical specifications

Dimensions and performance
Features, dimensions and performance of gearboxes are given in the related technical/commercial catalogue available on request or they can be downloaded from the website www.sitiriduttori.it.
The specifications and instructions for use of worm gearboxes present as the first stage in the NRG unit in version V-PAM, are described respectively in the technical/commercial catalogue and in the instruction manual of the gearboxes of the series VSF, available on request or ready for download at the address www.sitiriduttori.it.

Noise
The level of noise emitted by a gearbox during a running period at full load in the worst operating conditions is always remarkably below the value of 70 dB (A).

3.6. Stocking

If, prior to set up, a period of stocking is expected, it is necessary to adhere to the following rules:
- Avoid to stock outdoor, in areas exposed to the bad weather and with excessive humidity.
- Always avoid the direct contact with the floor; for instance, use pallets or materials of another nature which anyway are such to insulate the product.
- For times of stocking longer than 60 days, it is recommended to coat with anti-oxidation products shafts, flanges and anyway all not painted surfaces.
- For times of stocking longer than 6 months, it is necessary to coat with grease all non machined parts, in order to prevent oxidation. Completely fill in the gearboxes with oil, keeping attention that the fill-in/breather plug is placed in the upper zone; of course, at the time of setting the unit up, it will be necessary to recover the proper oil amounts (⇒ Oil amount, 20).

4. Handling and transport

4.1. Handling and transport

Caution!
Read carefully and comply with the following instructions prior to handling the gearbox.

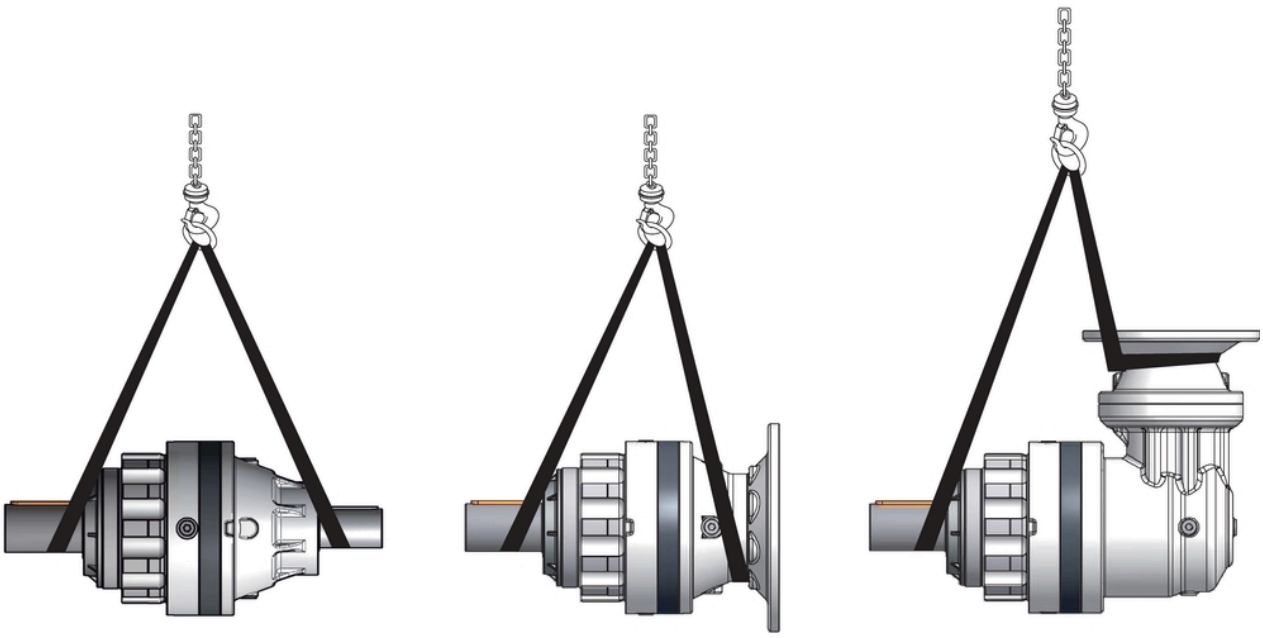
P.P.E. Helmet, safety shoes and protection gloves

- Usually the gearbox is delivered in the condition of assembled and packed unit. Should the product be delivered packed in cardboard containers, handle the packed product with suitable means of weight-lifting in compliance with the law rules.
- Do not stop or move below suspended loads during lifting and transport operations.

The packages which include more gearboxes are to be lifted and handled with appropriate and suitable means, adequate to the dimensions and weights involved, like transpallets, lift trucks, overhead travelling cranes using ropes, cables, belts or suspension chains.

Single gearboxes or geared motors packed or deprived of the package must be lifted with the following operational modes:

- if their weight is equal to or lower than 15 kg they can be moved by hand;
- in case their weight is more than 15 kg, they are to be moved using proper lifting and transport means, as above mentioned. In particular, the unpacked units are to be hooked up and harnessed as it is shown, as an example, by arranging ropes, belts or chains in function of the configuration of the product.



Caution!
- **Make sure that the grip of the load is steady and safe, even in case of oscillations.**

5. Set up

5.1. Set up

Caution!

All actions of set up, assembling and setting on account and on behalf of the buyer must be accomplished by qualified personnel. A wrong set up might lead to dangerous situations for the safety of the personnel and could give rise to serious or even irreparable damages to the product itself and to the connected machine.

Gearboxes are supplied already assembled in their main parts. Therefore, set up consists in placing and then fixing the unit in the place where it will operate, connecting input and output shafts to their matching parts, and carrying out the electric connections of the electric motor, whenever needed.
While setting a gearbox up, it is requested to adhere to a few strictly severe prescriptions:

- Make sure that the environment, where the unit will operate, does not highlight any unexpected conditions, like:
  - potentially explosive atmosphere;
  - immersion in water or corrosive solution;
  - vapours, radiations.
  For applications in peculiar environmental conditions, please consult the SITI S.p.A.
- It is necessary to avoid, or at least to reduce as much as possible narrowing and throttling in the air passages and especially the presence of heat sources located nearby gearboxes and such to be able to remarkably affect the temperature of the refrigerating air. Furthermore, it is necessary to prevent from an insufficient air circulation, which might compromise the regular heat removal from hot gearbox parts.
- Prior to setting the gearbox up, make sure that fill-in, unloading and level inspection plugs have been placed in the correct location in relation to the requested mounting position of the unit (⇒ Mounting positions, 13) and that the recommended oil has been used for filling the unit (⇒ Lubrication, 18).
- It is essential to fit the gearbox in a way such to avoid that it is subject to vibrations while operating. In fact, vibrations, in addition to causing noise, give rise to other kinds of problems, like the possible progressive unscrewing of the connection screws as well as an increase of loads acting on the inner parts submitted to fatigue stresses.
- Fixing surfaces are to be clean and are to have a sufficient microfinish in order to arrange that a good friction coefficient is available. In the screws and in the connection plains it is strictly necessary to use self-locking stickers.
- It is recommended to avoid as much as possible the fact of assembling cantilever mounted pinions and to reduce to the highest possible extent the stress of chains and belts. Should outer loads be there, it is suggested to use pins and positive stops.
- Prior to going ahead with the assembling, it is necessary to take particular care to clean accurately and lubricate the mating surfaces, in order to avoid possible oxidations and seizures.
- All parts which are press-fitted on the gearbox hollow shaft (made in tolerance range H7) are to be carried out with their fitting diameter made in a tolerance range h6. Wherever the kind of application requires a slight interference fit, it is possible to provide a fitting with a tolerance range female-male of the matching parts in (H7 - j6).
- Never use the hammer for assembling and disassembling fitted parts, but use the tapped holes provided on the shaft heads for suitable removal implements.
- It is of prior importance, in view of a good performance of the unit in operating conditions, to take care with the greatest attention of a good alignment of the gearbox with respect to the motor and to the machine to be driven. Whenever it is possible, it is recommended to fit elastic or self-aligning couplings. It is even suggested to proceed with a particular accuracy whenever an outrigger bearing is fitted, because possible errors in the alignment of this component would unavoidably involve the rise-up of overloads which would consequently destroy a bearing or break the shaft.
- When three-phase asynchronous electric motors are used and their start-up occurs in no load conditions or anyway under very restricted loads, it is necessary to accomplish very smooth starting times, very limited starting currents, even very restricted stresses and, whenever necessary, use the star/delta starting system.
- Whenever the application involves overloads of long duration, frequent shocks and danger of lock off, it is imperative to fit a motor saving system, electronic torque limiters, hydraulic couplings, safety couplings or control units.
- In case of use with a service factor involving several starting under load, it is recommended to make use of a motor protection by means of thermal sensors, in order to prevent the rise-up of dangerous overloading conditions for the motor, which might lead motor windings to overheat and thus to melt and fail.
- During the possible painting of the machine on which the unit is fitted, it is strictly recommended to protect the outer edge of shaft seals, aiming at preventing paint to make rubber dry, thus compromising the sealing effect.

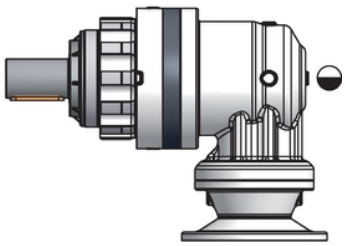
	It is advisable to use plastic inserts whenever there is a risk of electro-chemical corrosion between gearbox and actuator unit (due to the connection of different metals). Moreover, please provide all bolts with plastic washers! The plastic material used is to have an electric loss resistance < 10^9 W. Provide the outer structure with earth connection, furthermore use bolts with earth connection of the motor for the geared motors. Assure a convenient and sufficient cooling air flow and make sure that there is no return of heated air, coming from other devices.

5.2. Check and predisposition

Prior to proceeding with the gearbox mounting, the following checks are to be carried out:

- After unpacking the gearbox, it is recommended to carry out a visual check, intended to realize whether there is a full compliance with the order, whether the product integrity is assured and whether there is absence of defects on all gearbox parts. Should it be found out that there is no compliance with the order and/or presence of failures or damages, this will have to be promptly communicated to the SITI S.p.A.
- Make sure that the product is suitable to the requested use.
- Check the appropriateness of the structures on which the unit will be mounted, in relation to the actions and reactions due to the load application.
- Check the conformance of the mounting position indicated in the order acknowledgment with the wished one (⇒ Mounting positions, 13). A possible change of the mounting position can be accomplished only after having consulted the SITI S.p.A. and after having received their authorization, otherwise warranty and the possible conformity with the directive 2014/34/UE (ATEX) will expire.
- Make sure that the spaces available for set up and mounting can comply with the need of providing an easy assembling, maintenance, access to the plugs (⇒ Mounting positions, 13), air circulation, etc.
- Check whether the unit has been supplied complete with lubricant.
  Unless otherwise specified, the gearboxes are supplied without lubricant. In the event that lifetime lubrication is required, SITI S.p.A. will provide to fill the unit with synthetic oil (⇒ Type of oil, 19).

Therefore, it is strictly necessary to check whether there is actually lubricant inside the unit, by watching through the suitable inspection plug, firstly providing to directing the gearbox in conformance with the actual expected mounting position (⇒ Mounting positions, 13). In the opposite case, please proceed with oil filling in (⇒ First filling in of the gearbox, 14).

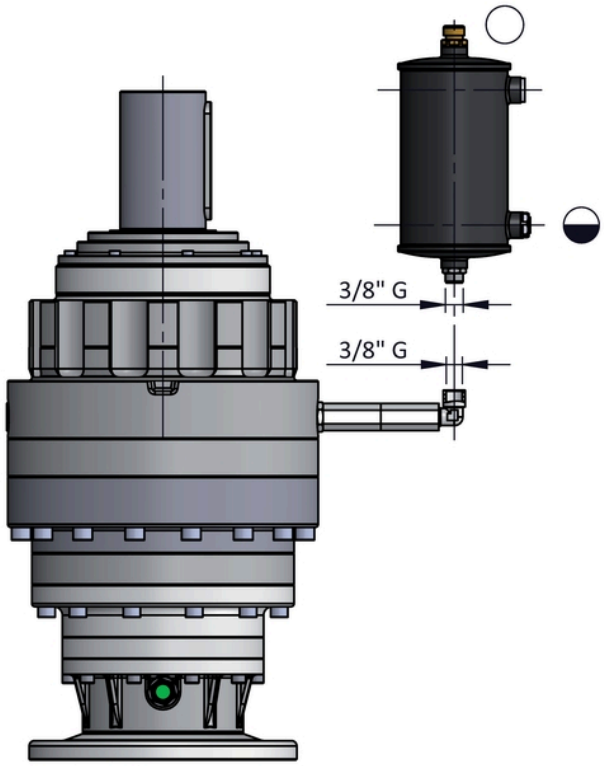


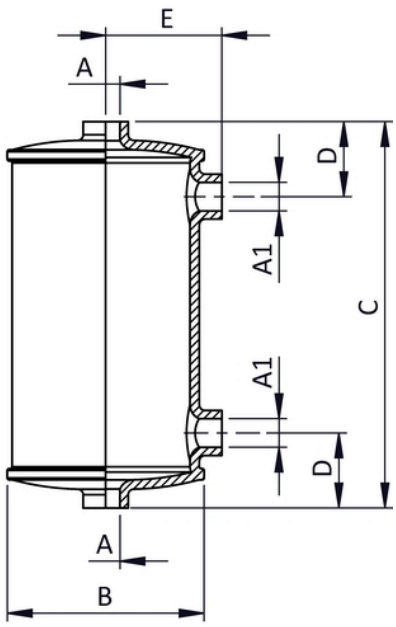
As far as the lubrication of worm gearboxes present as the first stage in the NRG gearboxes in version of V-PAM is concerned, please refer to the relevant instruction manual (⇒ Technical specifications, 8).

5.3. Expansion tank

In the case of applications with vertical mounting position, and when it is necessary to completely fill the gearbox, we recommend the use of an expansion tank (optional), which is a device designed to offset the increase in the volume of oil due to 'rise of temperature, or to ensure the oil refilling in inaccessible locations.

- Install the expansion tank as shown on the following schematic drawing, in which the dimensions are also indicated. The expansion tank kit does not include the connecting pipe, which is then on charge to the customer.
- Install the expansion tank in such a way that the oil level located at its inside (detectable through the transparent level plug) is higher than the gearbox.



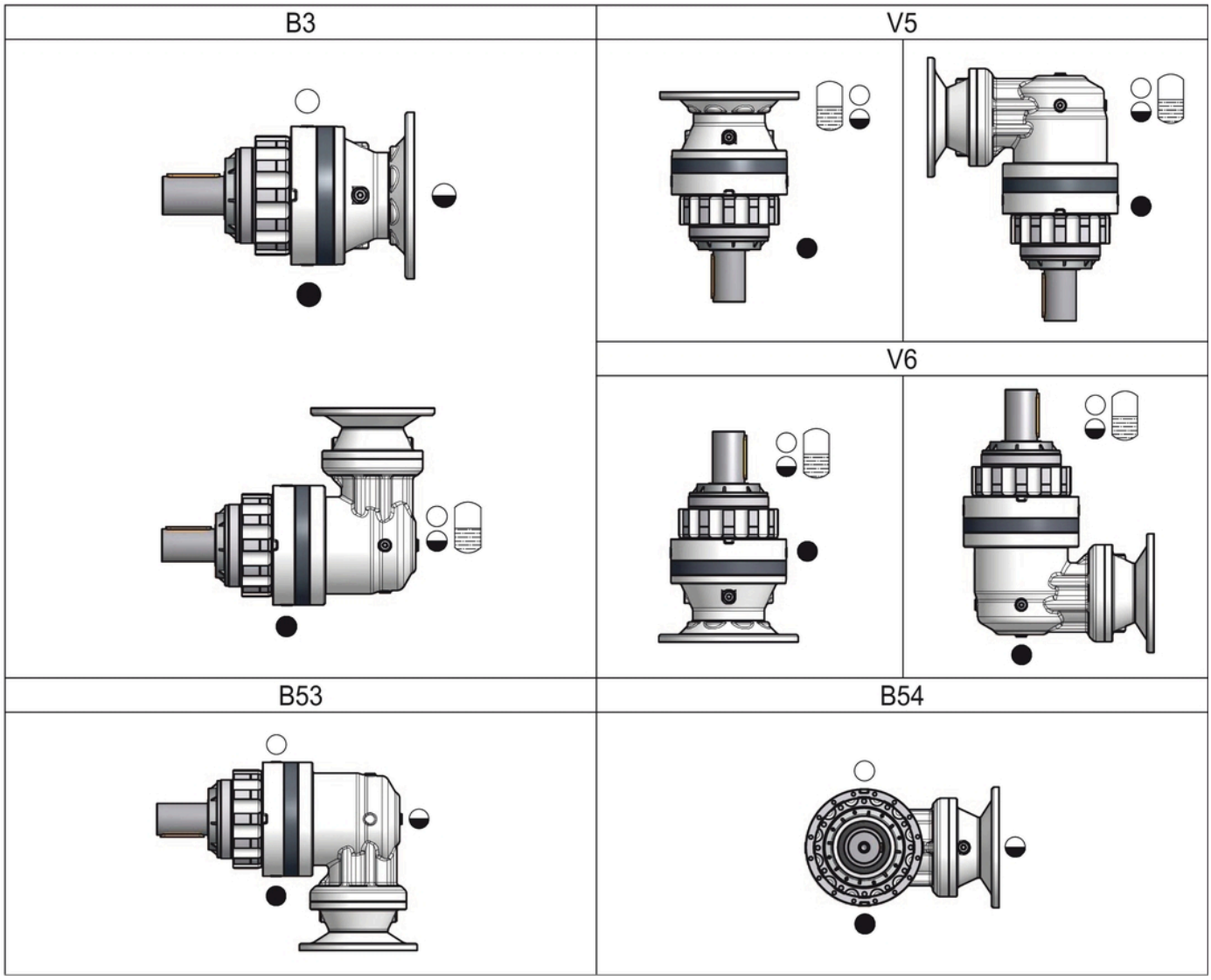


DIMENSIONS (mm)							CAPACITY (liters)
TYPE	A	A1	B	C	D	E	
VE 1.2	3/8” G	3/8” G	Ø 105	206	53	60	1.2

5.4. Mounting positions

The following schematic drawings represent the typical mounting positions of a gearbox and of the possible expansion tank with the respective identification codes. To the side of the gearbox units, there are also represented the positions of the filling plugs, level inspection plug, discharge plug and of the expansion tank.

○	◒	●	
Fill-in and breather plug	Level plug	Unloading plug	Expansion tank



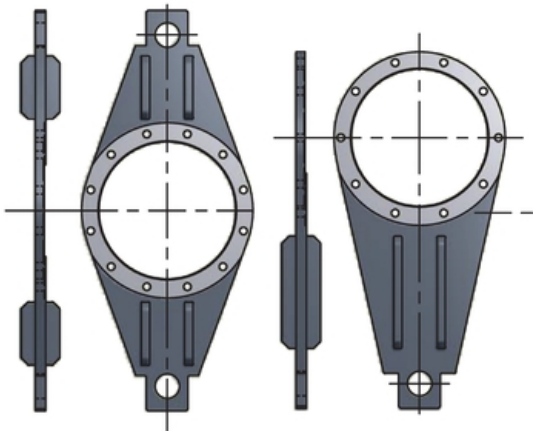
5.5. First filling in of the gearbox

P.P.E. Protection gloves and mask glasses

- Check that the unloading plug, located in the lowest position, and the level plug have been correctly fastened.
- For filling, use the filling / breather plug on the top of the gearbox (or the expansion tank, if present). The amount of oil to be filled is shown in the table (⇒ Oil amount, 20), but please note that quantities are merely indicative and are related only to the gearbox, without any expansion tank; the user will have in all cases to fill oil into the unit, until oli reaches the level visible at sight on the level plug of the gearbox (or of the expansion tank, if present), having already installed the gearbox unit in expected mounting position (⇒ Mounting positions, 13).

5.6. Assembling of torque arm

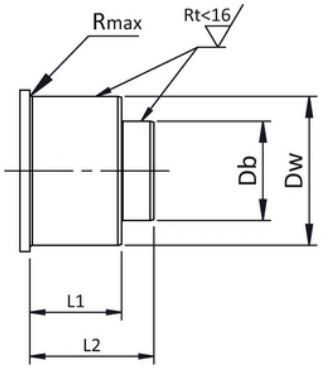
- Prior to fitting the torque arm on the gearbox, make sure that the mating spigots are clean and free of dents.
- Lubricate the mating surfaces, then fit the torque arm on the gearbox.
- Fix the torque arm with screws having a minimum strength class of 8.8. For applications having frequent starts and stops, we recommend the use of screws having class of at least 10.9 and possibly 12.9.
- The tightening torque must be equal to 70% of the yielding strength of the screws.

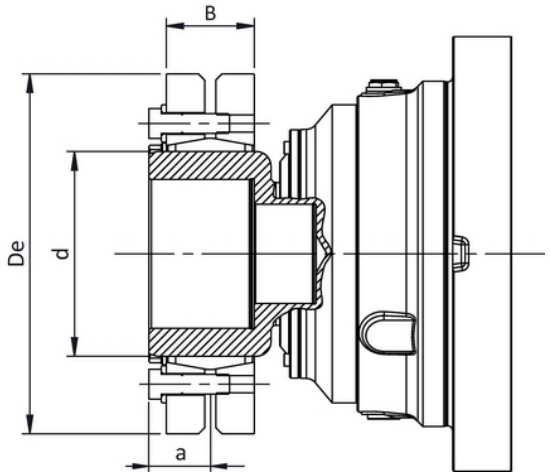


5.7. Assembling and removal of taper lock

5.7.1. Assembling

- Prior to fitting the taper lock device on the shaft, slightly tighten three screws of the taper lock located at approximately 120 ° from each other, so that the inner ring of the taper lock can be slightly rotated by hand; definitely avoid to tighten the screws in a way that could lead to the complete locking of the inner ring.
- Once you have lubricated the outer surface of the output shaft of the gearbox, put over it the taper lock as it has been prepared in the specified way.
- Provide to thoroughly clean both the inner surface of the gearbox shaft and the outer surface of the shaft of the machine to be connected, in order to increase the friction coefficient and thus the transmittable torque. Therefore it should not be definitely applied any kind lubricant to the surfaces, especially molybdenum disulphide.
- Fit the gearbox shaft onto the machine, or the opposite, taking care not to cause any excessive axial loads (tolerance class of shaft mating diameter Dw must correspond to the table shown in the following section).
- Place the taper lock onto the outer side of the gearbox, so that it is perpendicular to the center-line of the machine; to achieve this, strictly comply with the dimension "a" (distance between the center of the taper lock and the end of the hollow shaft of the gearbox) shown in the table.
- Provide now to tighten the screws on the taper lock, using a torque wrench, adopting a torque corresponding to that shown in the table, in relation to the size of taper lock used. In doing this, please proceed screw after screw in a circular direction and not on diametrically opposed screws. It is recommended not to exceed the specified tightening torques, in order not to distort the taper lock.
- Make sure that the rings of the taper lock remain parallel to each other and concentric within the permissible limits (maximum tolerance of parallelism equal to 0.3 % of the outer diameter of the taper lock).





Gearbox - Version	Shaft to match					Shrink disk					Connection screws	
	Dw	Db	Rmax	L1	L2	d	De	B	a	M (kNm) (*)	Screws	Tightening torque (Nm)
NRG 10 GA	50 g6	30 g6	R 1,5	38	48	62	110	30,5	16	2,2	M6 x 10	12
NRG 20 GA	50 g6	30 g6	R 1,5	38	48	62	110	30,5	16	2,2	M6 x 10	12
NRG 20 GA-A	75 g6	40 g6	R 1,5	70	98	100	170	44	34	7,5	M8 x 12	30
NRG 30 GA-A	75 g6	40 g6	R 1,5	70	98	100	170	44	34	7,5	M8 x 12	30
NRG 40 GA	75 g6	40 g6	R 1,5	70	98	100	170	44	34	7,5	M8 x 12	30
NRG 80 GA	90 g6	50 g6	R 1,5	90	123	125	215	54	42	13	M10 x 12	59
NRG 80 GA-A	120 g6	80 g6	R 1,5	85	133	165	290	71	41	35	M16 x 8	250
NRG 125 GA	120 g6	80 g6	R 1,5	85	133	165	290	71	41	35	M16 x 8	250
NRG 250 GA	130 g6	80 g6	R 1,5	100	148	175	300	71	52	41	M16 x 8	250

(*) The value M is the max. transmissible torque of the shrink disk. In this configuration (GA / GA-A), the max. transmissible torque is the lowest one between M e the value M_2 shown on the table of performance of the selected gearbox.

5.7.2. Disassembling

- Loosen the screws gradually, one after the other in a circular direction, unscrewing in a first phase only of a quarter turn on each screw, and thereafter completely.
- Remove the gearbox from the machine shaft.

6. Instructions for the use of the gearbox

6.1. Preliminary checks

Prior to the start up, a few very important checks are to be carried out:
- Make sure that the set up has been accomplished in a correct way, complying with all the prescriptions given on the chapter devoted to set up.
- Find out the temperature of the environment where the unit is mounted and pre-arrange a thermometer suitable to register the surface temperature (⇒ Measure of the running temperature, 18).

	Prior to starting a gearbox mounted in an environment with potentially explosive atmosphere, according to the ATEX 100a directive, the following checks are to be carried out.	✓
Inspect the packing, in order to check the status of goods at the moment of delivery.		
The following pieces of information given on the gearbox name plate correspond to the kind of explosive atmosphere approved: group, category, anti-deflagration zone, class of maximum allowed surface temperature.		
Do you feel sure that we are not in presence of a potentially explosive atmosphere, consisting of oils, gases, acids, vapours, radiations active during the gearbox set up?		
Does the ambient temperature meet the values given on paragraph (⇒ Check of running temperature, 17)?		
Make sure that gearboxes are sufficiently ventilated and that there are no outer sources of heat inlet (e.g. through connectors).		
Does mounting position correspond to the expected one? (⇒ Mounting positions, 13). **Caution!** **Any change of the mounting position can be carried out only if authorized by the manufacturer. ATEX compliance will expire in case of a missing consultation with the manufacturer.**		
Is oil level correct? (with the unit located exactly in the requested mounting position) (⇒ Check of oil level, 21)		
Are unloading and inspection plugs (whenever expected), as well as breather valves all easily accessible?		
Have input and output parts been mounted according to the ATEX rules?		
In case of motors driven by a frequency converter: make sure that the motor is regularly certified in view of its usage in combination with a frequency converter.		
The calibration and scaling of the technical parameters of the frequency converter are to be such to prevent the overloading of the gearbox.		

6.2. Running in

For planetary gearboxes, it is not needed any kind of running-in.
The gearboxes can be immediately employed under the conditions of use given on the name plate, provided they comply with the specifications given in the technical catalogue.
In the event a mineral oil is used, it is recommended to make the oil change after 400-500 hours of operation.

6.3. Checks during running

6.3.1. Check of running temperature

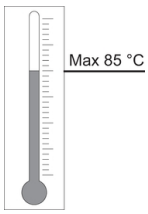
P.P.E. Heat insulated gloves
During the gearbox running time, it is necessary to keep the inner temperature controlled.
Temperature reached inside a unit depends on several factors:

- the kind of kinematism used for the transmission;
- type and amount of lubricant;
- main features and structure of the gearbox;
- input and output speed;
- mounting position;
- applied power;
- ambient temperature.

Temperature check may be effected by measuring its value on the gearbox outer surface. The max. surface temperature is achieved after about three running hours of continuous running and has not to overcome, in any operating condition, the differential value of 50 °C, compared with the ambient temperature, this being achieved with the max. allowable load applied. If this occurs in the period of time subsequent to running in and in standard operating conditions, the unit has to be stopped immediately and it is necessary to consult the SITI S.p.A.

Remark:
Please keep in mind that this value, like many other values of the max. admissible temperature mentioned in this manual, refers to environmental conditions characterized by an ambient temperature of 20 °C, and poor conditions of ventilation (air speed ≤0.5m/s).
Moreover, it refers to a correct selection and usage of the units, i.e. to a use with an effective service factor higher or equal to the minimum service factor requested by the heaviness of the application.
Even slight variations in comparison with these conditions, both environmental and operating ones, might remarkably adversely affect the temperature of the gearbox.

Standard shaft seals are made in nitrile rubber compounds NBR and are suitable to operate in the range of standard operating temperatures included between about -15 °C and +85 °C. Should temperature inside the unit reach and keep for meaningful time intervals some values out of this range, gearboxes are supplied in a special execution (upon request), which is equipped with shaft seals made in fluorinated compounds FKM (trademark: Viton) for temperatures higher than +85 °C or in silicon rubber compound called VMQ, for temperatures lower than -15 °C.

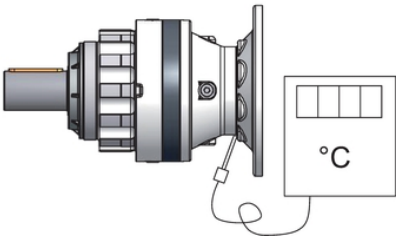


	During the running of a unit mounted in a potentially explosive atmosphere, according to the directive ATEX, the following check operations are to be carried out.	✓
Measure the surface temperature after about 3 hours of continuous service. The temperature differential in comparison with the ambient temperature has not to overcome a value of 50 °C.		
Should said temperature differential ΔT be higher, stop the gearbox immediately and consult the manufacturer.		

6.3.2. Measure of the running temperature

P.P.E. Heat insulated gloves

Caution!
Do not touch the gearbox prior to providing to the detection of the actual temperature with a thermometer.



For measuring the outer temperature of the housing, it is necessary to equip oneself with a thermometer provided with a temperature detection sensor. Any evaluation effected by touching the gearbox with a hand might be dangerous and additionally not reliable at all. In optimal conditions of use, the temperature of the housing rises up of at least 15-20 °C compared with the environment and the values of temperature usually reached by the housing during the running conditions are mostly too high to be born by the human skin. The fact of believing that a gearbox warms up too much because it is not possible to keep the hand on its housing is a statement missing any rational foundation. In fact, as soon as the temperature is even slightly above the value of 50 °C, the most of people are unable to keep their hand over the gearbox housing, although this is still a completely acceptable running temperature of an unit.
It is important to make sure that the running temperature at which a gearbox stabilizes in rated operating conditions, when there are the same modes of use, is more or less a constant value, considering that this a signal that the unit is operating without the possible rise up of adverse effects.
The gearbox surface temperature must be detected in the area of transition from gearbox to motor, where the location of the electric motor clamp hinders a correct ventilation.

7. Lubrication

7.1. Lubrication

All NRG series gearboxes provide lubrication in an oil bath.
In the mounting positions where the shaking does not assure a perfect lubrication (e.g. vertical mounting positions), suitable systems are provided to ensure a proper lubrication.
Prior to the settlement of the gearbox, it is needed to introduce the correct amount of lubricant oil, up to reaching the level which can be seen at sight on the transparent level plug (having already installed the gearbox in the correct mounting position).
The gearboxes are fitted with plugs for filling / breather, oil level and oil discharge. For proper orientation of the plugs, it is necessary to specify in the order the desired mounting position.
To use the gearboxes outside the normal conditions of use, where special requirements are needed, you should call our Customer Service SITI S.p.A.
The temperature on the housing must not exceed, in the hottest point, the value of 80-85 °C.
The most appropriate choice of the lubricant is generally tied to the application conditions. The gearboxes not particularly loaded, with a discontinuous duty cycle and operating without important thermal excursions, can be lubricated with mineral oil. Use only lubricants with additives of the type EP (extreme pressure).
In cases of heavy duty, when the gearboxes are expected to be very loaded and with a continuous duty, resulting in a temperature rise, it is recommended to use synthetic lubricants based on poly-alpha-olefin (PAO). It is not recommended to use synthetic lubricants based on polyglycols (PAG).
Do not mix synthetic oils of different brands; if, in the oil change, you wish to use a type of oil differing from that one previously used, carefully wash prior to oil refilling.
The following tables show the types of the recommended oils from the most popular brands of lubricants, depending on the ambient temperature T_a.
As far as the lubrication of worm gearboxes present as the first stage in NRG gearboxes in version V-PAM , please refer to the relevant instruction manual (⇒ Technical specifications, 8) .

Remark:
It is recommended never to mix mineral oils with synthetic oils.

7.2. Type of oil

(ISO 3448 rules with EP features)

TYPE	MINERAL OIL				SYNTHETIC OIL (PAO)		
ISO VG	**150**	**220**	**320**	**460**	**150**	**220**	**320**
ARAL	Degol BG 150	Degol BG 220	Degol BG 320	Degol BG 460	Degol PAS 150	Degol PAS 220	Degol PAS 320
CASTROL	Alpha SP 150	Alpha SP 220	Alpha SP 320	Alpha SP 460	Alphasyn T 150	Alphasyn T 220	Alphasyn T 320
KLÜBER	Kluberoil GEM 1-150 N	Kluberoil GEM 1-220 N	Kluberoil GEM 1-320 N	Kluberoil GEM 1-460 N	KluberSynt GEM 4-150 N	KluberSynt GEM 4-220 N	KluberSynt GEM 4-320 N
MOBIL	Mobil Gear XMP 150	Mobil Gear XMP 220	Mobil Gear XMP 320	Mobil Gear XMP 460	Mobil Gear SHC XMP 150	Mobil Gear SHC XMP 220	Mobil Gear SHC XMP 320
SHELL	Omala S2 G 150	Omala S2 G 220	Omala S2 G 320	Omala S2 G 460	Omala S4 GX 150	Omala S4 GX 220	Omala S4 GX 320
TOTAL	Carter EP 150	Carter EP 220	Carter EP 320	Carter EP 460	Carter SH 150	Carter SH 220	Carter SH 320
FUCHS	Renolin CKC 150	Renolin CKC 220	Renolin CKC 320	Renolin CKC 460	Renolin Unisyn CLP 150	Renolin Unisyn CLP 220	Renolin Unisyn CLP 320

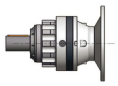
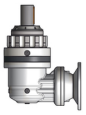
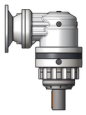
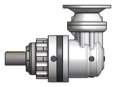
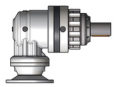
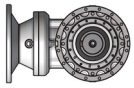
		T_a (°C)																		
		-40	**-35**	**-30**	**-25**	**-20**	**-10**	**-5**	**0**	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**60**
		(2)					(1)												(2)	
Mineral oil	150 VG	(3)																		
	220 VG																			
	320 VG																			
	460 VG																			
Synthetic oil (PAO)	150 VG	(3)																		
	220 VG																			
	320 VG																			

(1) Standard seals according to catalogue
(2) Special seals not in the catalogue
(3) Please get in touch with SITI Technical Service.

Note:
For special operations for which there are special requirements, please contact our Technical Service.

7.3. Oil amount

In the following tables, the oil amounts expressed in liters are given.

	MOUNTING POSITION															
	B3		V5		V6		V6		V5		B3		B53		B54	
																
NRG 10	SM	SMR	SM	SMR	SM	SMR	SM	SMR	SM	SMR	SM	SMR	SM	SMR	SM	SMR
NRG 10/1	1	1.1	1.6	1.7	1.5	1.5										
NRG 10/2	1.3	1.4	1.9	2	1.8	1.8	2.2	2.2	2.3	2.4	1.4	1.7	2	2.3	1.9	2
NRG 10/3	1.5	1.6	2.2	2.3	2	2	2.4	2.4	2.6	2.7	1.8	2.1	2.4	2.7	2.1	2.2
NRG 10/4	1.8	1.9	2.6	2.7	2.4	2.4	2.8	2.8	3	3.1	2.2	2.5	2.8	3.1	2.4	2.5

NRG 20	SM	SMR	SM	SMR	SM	SMR	SM	SMR	SM	SMR	SM	SMR	SM	SMR	SM	SMR
NRG 20/1	1.2	1.3	1.8	1.9	1.7	1.7										
NRG 20/2	1.5	1.6	2.1	2.2	2	2	2.4	2.4	2.5	2.6	1.6	1.9	2.2	2.5	2.1	2.2
NRG 20/3	1.7	1.8	2.4	2.5	2.2	2.2	2.6	2.6	2.8	2.9	2	2.3	2.6	2.9	2.3	2.4
NRG 20/4	2	2.1	2.8	2.9	2.5	2.6	3	3	3.2	3.3	2.4	2.7	3	3.3	2.6	2.7

NRG 30	SMR	SMR	SMR	SMR	SMR	SMR	SMR	SMR
NRG 30/1	1.2	1.8	1.6					
NRG 30/2	1.5	2.1	1.9	2.3	2.5	1.8	2.4	2.1
NRG 30/3	1.7	2.4	2.1	2.5	2.8	2.2	2.8	2.3
NRG 30/4	2	2.8	2.5	2.9	3.2	2.6	3.2	2.6

NRG 40	SMR	SMR	SMR	SMR	SMR	SMR	SMR	SMR
NRG 40/1	1.2	2.2	2					
NRG 40/2	1.4	2.7	2.5	2.9	3.2	2.2	2.6	1.8
NRG 40/3	2	3.2	3	3.4	3.7	2.5	2.9	2.4
NRG 40/4	2.2	3.8	3.6	4	4.3	2.8	3.2	2.6

NRG 80	SMR	SMR	SMR	SMR	SMR	SMR	SMR	SMR
NRG 80/1	2.8	5.6	3					
NRG 80/2	3	6.3	3.5	6.5	5.9	3.4	6.1	4.4
NRG 80/3	3.2	7	4	7.3	6.4	3.8	6.3	4.6
NRG 80/4	3.7	7.8	4.9	8	7.3	4.4	6.8	5.1

NRG 125	SM	SMR	SM	SMR	SM	SMR	SM	SMR	SM	SMR	SM	SMR	SM	SMR	SM	SMR
NRG 125/1	4.4	4.8	9	9.6	5.5	5.5										
NRG 125/2	5	5.4	10	10.4	5.6	5.6										
NRG 125/3	6.1	6.5	10.9	11.5	5.8	5.8	11	11.6	11	11.5	5.6	6.2	6.8	7.4	6.3	6.8
NRG 125/4	6.7	7.1	11.8	12.4	6	6	11.4	12	11.9	12.9	6.4	7	7.5	8.1	6.8	7.4

NRG 250	SMR	SMR	SMR	SMR	SMR	SMR	SMR	SMR
NRG 250/1	7.2	11.5	6.5					
NRG 250/2	8	18	15.5					
NRG 250/3	9.2	23	20	18	21	10	12.5	11
NRG 250/4	12	24.5	22	21	25.5	13	16	14

Remarks

- Please note that the amounts shown in the table are merely indicative: the user must in all cases put oil in, up to reaching the level which can be seen at sight on the transparent level plug (having already installed the gearbox in the correct mounting position).
- In the combined gearbox units, the lubrication of the planetary stage is separate from the one of the helical-worm gearbox (⇒ Lubrication, 18).

8. Maintenance

8.1. Maintenance

The program of maintenance includes the service actions of ordinary type, providing inspections, checks and audits effected directly by the operator and/or by qualified personnel committed to the usual maintenance and service actions of periodical type, including replacement of parts or recording, developed by personnel, who has been purposely trained on behalf of the manufacturer through specific courses or special issues.

8.2. Ordinary maintenance

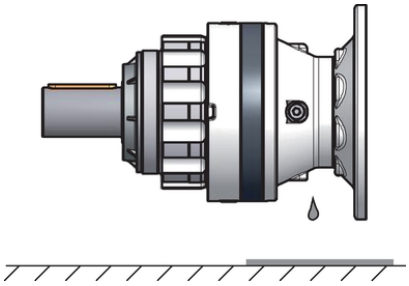
8.2.1. Cleaning

Carry out periodically the cleaning of the outer surface of the gearbox and of the air channels for the ventilation, in order to assure a satisfactory thermal exchange coefficient towards outside.

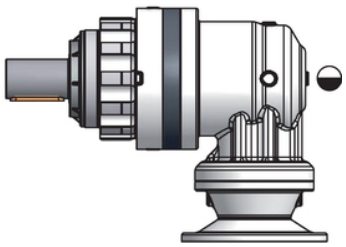
8.2.2. Check of oil level

Caution!
The damages a gearbox might be subject to, should it operate with a poor oil amount, are extremely serious and quick, and many times are fully irreparable!

A poor amount of lubricant, in addition to the fact of not allowing the proper lubrication of all inner parts, might adversely affect the thermal exchange conditions and, due to the highly reduced refrigerating and heat removal power, gives rise to the inner running temperature increase, especially on the mating surfaces of teeth flanks.
It is suggested to often make sure, through quick visual checks, that no oil leakages are occurring through shaft seals, gaskets, connecting flanges, attaching hardware of covers, end caps etc....



A more careful check of oil level has to be carried out at sufficiently frequent time intervals. This check is to be effected through the level plug when the unit is standing still and is sufficiently cool.
Should it be ascertained, through the same level plug, that an inner dirt sedimentation has occurred, it is strictly necessary to make sure that no foreign material, such as powder, sand, water or anything else has penetrated into the gearbox housing and anyway replace oil (⇒ Oil replacement, 22).
Should oil level have sunk down and shallowed below the recommended values, it is necessary to fill oil in, up to restoring the correct level.



8.3. Periodical maintenance operations

8.3.1. Oil replacement

The interval of periodical oil replacement depends on the conditions of use, briefly summarized in the following prospect.

Oil temperature (°C)	Service	Time interval between oil changes (hours)
< 60	Continuous Intermittent	5000 8000
> 60	Continuous Intermittent	2500 5000

 **Remark:**
Data given in the prospect refer to a lubrication with use of mineral oils.

Synthetic oils, if used in the range of standard temperatures from -15 °C up to +85 °C, can be used even for a lifetime lubrication.
This occurs in the case of all units already supplied by the SITI S.p.A. with a synthetic base lubrication.
In the case of large and expensive gearboxes, on which all possible maintenance actions are very costly, it is recommended for safety reasons to carry out an oil change, even if synthetic, whenever any maintenance repair service has been effected, provided that a period of operating time of 8000 thru 10000 service hours has occurred.

 **Remark:**
Unloading of oil is to be carried out in hot conditions, with the gearbox at a temperature of about 40-45 °C, but not beyond this range, in order to prevent from possible burnings.

 **Caution!**
Please be very careful in order to avoid to spill oil on the ground and pay attention to behave in full conformance with the environmental rules in force in the country of usage.

P.P.E. Protection gloves and mask glasses

- Unscrew the filling/breather plug.
- Unscrew the unloading plug located in the bottom and let oil completely flow out (this is particularly important in case of changing lubricant from a mineral to a synthetic oil or the opposite).
- Check whether the oil level plug is clean and transparent. In case it is not, unscrew and clean it.
- Screw again the unloading plug.
- Fill the gearbox from the upper hole (of the expansion tank, if present). The amount of oil to be filled is shown in the table (⇒ Oil amount, 20), but please note that quantities are merely indicative; the user has in all cases to fill oil into the unit, up to reaching the level which can be seen at sight on the transparent level plug (having already installed the gearbox and the possible expansion tank in the correct mounting position).
- Screw again the filling / breather plug.

8.3.2. Possible replacement of shaft seals

The running time and thus the endurance time of a shaft seal is affected in a conclusive way by the operating temperature in the mating area, by the possible chemical reactions which might occur between rubber compound and lubrication fluid and by the status of preservation of the shaft seal.
Replacement of the shaft seal is necessary if:

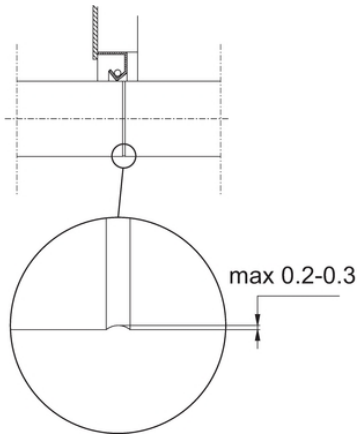
- a good serviceability of the sealing function is missing, and due to this an oil leakage towards outside of the unit is occurring;
- it is being effected a revision of the machine or of the installation.

Whenever a shaft seal is not developing its sealing function any longer, it is necessary to provide as soon as possible to its replacement, in order to prevent a leakage extending along the time, as well as a damage possibly extended to other components.

At the time of fitting a new shaft seal, it is needed:

- to take a particular care while handling the shaft seal and make sure of the intactness of the product (possibly avoid too long times of storage, which might give rise to a premature aging, especially if there is an excessive level of humidity);
- always check that the shaft seal seat is in a perfect status, in other words it is free of longitudinal or oriented scores, fingerprints, engravings, cuttings, marks or surface failures;
- take care to prevent that the shaft seal lip of the new seal operates exactly over the same trace left clearly by the previous one;

- whenever it is made sure that a deterioration of the shaft seal mating area has occurred, involving a depth greater than 0.2-0.3 mm, we strongly advise not to fit the new shaft seal and to get in touch with a workshop of our Assistance, which will provide to check whether there is any chance of recovering the shaft, and in any case will issue a diagnosis about the possible reasons of the damage occurred;



- fit the shaft seal in a way to be perpendicular to the axis and with the lip completely free and not overturned or pinched;
- position the shaft seal in a way that the sealing lip is oriented towards the fluid which is to be sealed, or on the side where a higher pressure is exerted;
- on shaft seals without a dust lip, spread grease in the outer area of the lip;
- fill in with grease the interspace between sealing and dust lip;
- coat with grease the shaft seal seat on the shaft;
- never use sealants, otherwise shaft seal lip or shaft surface would get smirched and thus would quickly deteriorate;
- exert the fitting force as close as possible to the shaft seal outer diameter;
- neither lock axially the seal nor submit it to a strong force;
- always use suitable toolings, in order to prevent possible damages to the shaft seal lip, due to the presence of threads, outlet chamfers, sharp edges, keyways;
- always protect the lip and its seat on the shaft, whenever one provides to repaint the unit or the machine on which it is fitted.

All above mentioned precautions do have the objective to avoid that a shaft seal might operate in dry conditions, especially during the first shaft turns, because otherwise too high temperatures might be achieved in the contact areas, which would immediately cause a deterioration of the materials shaft seal is made of: shaft seal getting harder, scorings, change of colourfulness.

8.3.3. Check of bearings

In every gearbox there are bearings even of different kind, subject to loading and lubrication conditions which might change as a function of the transmission ratio and of the type of application.
For this reason, considering the variability of the parameters involved, it is not defined a planned replacement interval, but it is requested a series of checks on bearings, allowing to understand when to proceed with the replacement.
Therefore, it is necessary to plan periodical checks of noise level and vibrations of bearings, using suitable instruments, according the the Table frequency of checks.
In case a deterioration of the measured values is detected, it is necessary to stop the machine and carry out an inner inspection of the gearbox, involving, whenever necessary, our Technical Dept.
Should the possible failure of a bearing and the following machine stop mean a danger for people, carry out a monitoring of vibrations and noise with continuity.

Table frequency of checks

Code	Subject of the check	Frequency
A	Sound level (noise)	On three-month basis
B	Vibrations	On three-month basis
C	Temperature	On three-month basis

8.4. Table of tightening torques of attaching hardware

For all gearboxes and possible accessories, please strictly adhere to the following values of the tightening torques.

Screw threads Class 8.8	Tightening torque for steel and cast iron (Nm)	Tightening torque for aluminium (Nm)
M4	2.9	2.3
M5	6	4.8
M6	10	8
M8	25	20
M10	49	39
M12	86	69
M14	135	108
M16	210	168
M18	290	232
M20	410	328

8.5. Troubles, causes, corrective actions

The conditions of malfunctioning, which might be reasonably expected, related to the single operating conditions of the unit, are reported; in the columns of the following table, the kind of trouble, the operating function and the component which might be the reason of the failure are accurately described.

TROUBLE	POSSIBLE CAUSES	CORRECTIVE ACTIONS
Motor does not start.	Faulty electric motor connection.	Check the connection.
	Faulty motor.	Replace the motor.
	Wrong motor sizing.	Replace the motor.
Motor and gearbox reach a too high temperature.	Mechanical overloading.	Check the mechanical parts driven by the motor-gearbox.
	Sizing of the motor-gearbox group wrong.	Replace the motor-gearbox group.
Motor current absorption and/ or motor temperature are too high.	Faulty motor.	Replace the motor.
	Wrong motor sizing.	Replace the motor.
Gearbox reaches a too high temperature.	Faulty gearbox.	Repair or replace the gearbox.
	Wrong sizing of the gearbox.	Replace the gearbox.
	Mounting position not complying with the one for which the gearbox has been arranged.	Make sure that the gearbox is in compliance with the order.
	Insufficient amount of lubricant.	Re-fill new lubricant in, until the oil level corresponding to the level plug has been reached.
Oil leakages through the shafts.	Worn or faulty shaft seals.	Replace shaft seals.
	Worn shaft seal seat on shafts.	Replace shaft seals and fit the new ones in a slightly shifted position or otherwise replace shafts.
Oil leakages through the mating surfaces between flanges/covers and housing.	Flanges not sufficiently tightened.	Tighten flanges.
	Faulty gaskets between mating plains.	Replace gaskets, making sure that the sealing surfaces are perfectly machined.
The gearbox emits a noise similar to a beat.	Faulty gear teeth.	Apply to the Technical Assistance Service.
The gearbox emits a noise similar to a whistle.	Insufficient amount of lubricant.	Re-fill new lubricant in, until the oil level corresponding to the level plug has been reached.
	Faulty or worn gears.	Apply to the Technical Assistance Service.
	Faulty or uncorrectly fitted bearings.	Apply to the Technical Assistance Service.

9. Scrapping and material disposal

9.1. Scrapping and material disposal

As soon as the gearbox has achieved its maximum limit of usage, it will have to be dismantled and scrapped.
Remove all oil from the gearbox, keeping in mind that exhausted oil has a strong adverse effect on the environment.
After scrapping, the operation of getting rid of the materials and of the lubricant will have to be accomplished in full compliance with all rules and law dispositions which are in force at the moment in the country of usage.
All operations related to getting rid of materials will have to be effected by qualified and authorized Companies; it is a task of the Company that is in charge of getting rid of materials to make sure that said Companies are complying with the requested National and International Directives.

10. Spare parts

To check the spare parts catalogue, contact the SITI S.p.A. Technical Service Department and require a hard copy of the documentation.

NOTE	NOTES	ANMERKUNG
NOTES	NOTAS	NOTAS

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