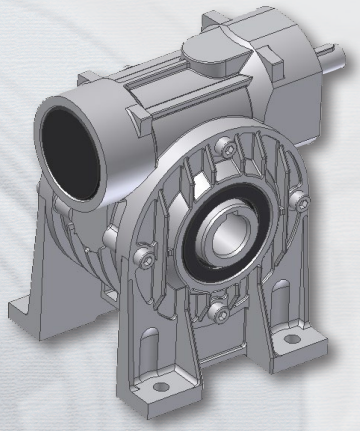
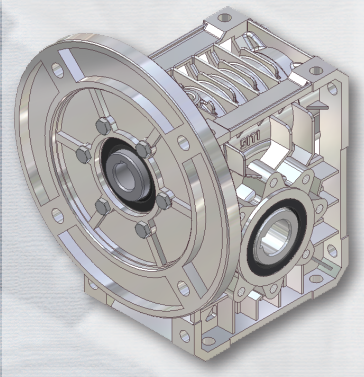
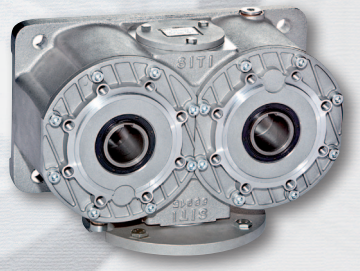
SPA
SOCIETÀ ITALIANA TRASMISSIONI INDUSTRIALI



I-MI



U-MU



MD

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WORMGEARBOXES INSTRUCTION AND SPARE PARTS MANUAL

12.2024

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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Fax. +39/051/6714858
E-mail: info@sitiriduttori.it
WebSite: www.sitiriduttori.it

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 offers the instructions for set up, use and maintenance related to worm gearboxes of the series I-MI, U-MU, MP-I, MP-U, SR-I, SR-U and MD and complies with all the law dispositions, to the directives and to the rules which are in force at the time of the sale. The copy of the manual delivered along with the gearbox cannot be considered inadequate simply because it has been subsequently updated due to new experiences. Should any possible changes, adjustments etc.. be carried out to the marketed units in a following moment, they neither will force the manufacturer to come in action retrospectively on products previously supplied nor to consider the same products and the related manual as missing or unsuitable.
Possible further inclusions to 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, 17).
- 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.

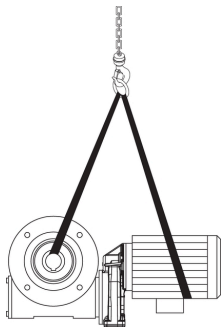
2.2. Residual risks

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, 17) and (⇒ Oil replacement, 21).

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, 21).	

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/EU (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.

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 storage longer than 6 months, it is necessary to coat with grease all machined parts, in order to prevent from oxidation.Completely fill the unit with oil , paying attention that the breather plug is located in the higher portion. Of course, at the time of starting up the equipment, it will be necessary to recover the proper amount of lubricant (⇒ 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.

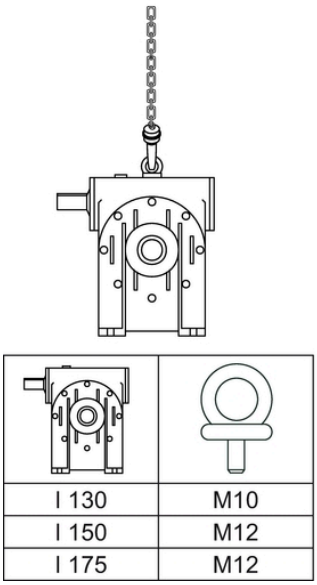
The packages which include more gearboxes are to be lifted and handled with appropriate and suitable means, adequate to the dimensions and weights involved, like transpallets, lift trucks, overhead travelling cranes using ropes, cables, belts or suspension chains.

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

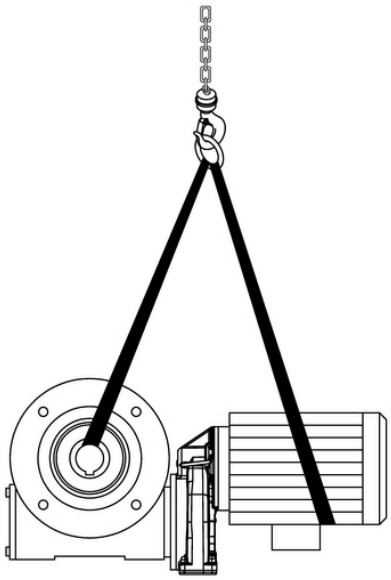
- if their weight is equal to or lower than 15 kg they can be moved by hand;
- in case their weight is more than 15 kg, they are to be moved using proper lifting and transport means, as above mentioned. In particular, the unpacked units are to be hooked up and harnessed as it is shown, as an example,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

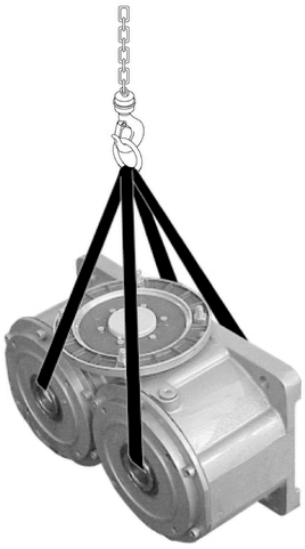
On the gearboxes I-MI130/150/175 there is a tapped hole conceived for fitting an eyebolt (not supplied), by means of which it is possible a safe hook (see table of dimensions). In the case of geared motors, a second belt has to be arranged, in order to distribute and correctly balance the weight.

Caution!
- **Make sure that the grip of the load is steady and safe, even in case of oscillations.**
- **The eyebolt is suitable for lifting a single gearbox or a geared motor and not for lifting the whole complex of components which it will be fitted on.**



I 130	M10
I 150	M12
I 175	M12





5. Set up

5.1. Warnings

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.

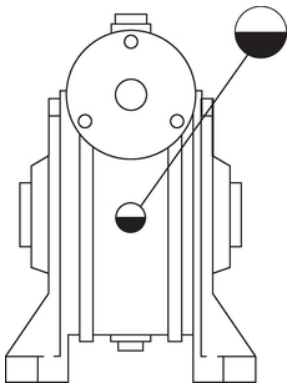
	It is advisable to use plastic inserts whenever there is a risk of electro-chemical corrosion between gearbox and actuator unit (due to the connection of different metals). Moreover, please provide all bolts with plastic washers! The plastic material used is to have a surface electric resistance < 10^9 Ω. 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 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.
  Units without plugs are filled in by SITI S.p.A. and are provided with lifetime lubrication.
  Units with plugs might be delivered with or without lubrication oil, depending on the type and size.

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).

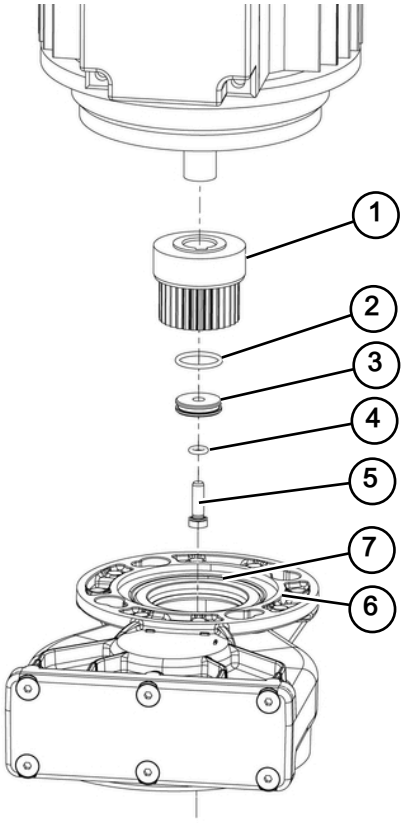


5.3. Assembling of the primary reduction unit on the gearbox

When it is expected that the assembling of the primary reduction unit will have to be carried out by the customer, proceed as follows:

- fit the pinion **1** on the motor shaft;
- place the O ring **2** on the pinion;
- place the O ring **4** and the ring **3** over the screw **5** and screw up this one on the pinion;
- fill in the primary reduction unit with the amount and the type of oil indicated (⇒ Lubrication, 18);
- fit the motor on the primary reduction housing **6**, paying attention not to damage the gasket **7**.

Remark:
During assembling, keep the position shown on the figure.



5.4. Mounting positions

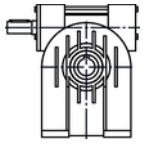
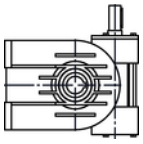
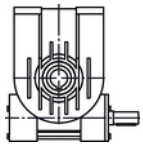
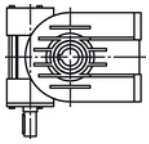
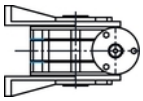
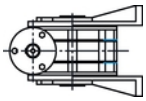
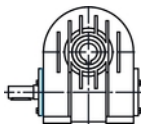
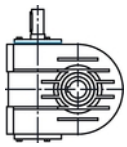
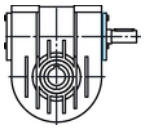
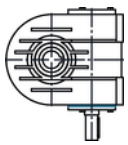
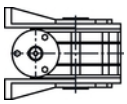
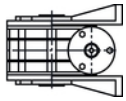
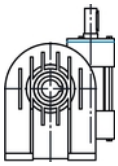
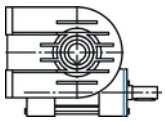
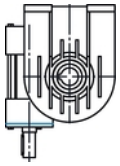
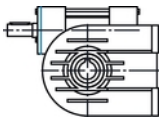
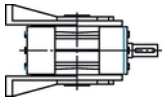
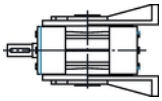
5.4.1. I-MI range mounting positions

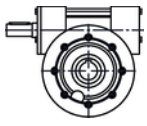
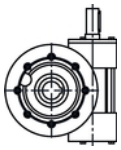
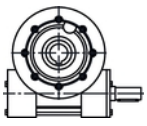
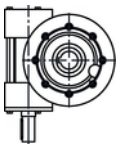
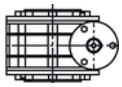
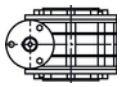
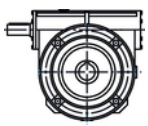
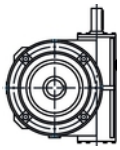
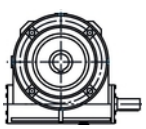
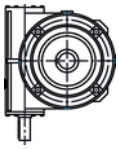
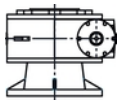
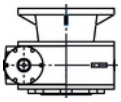
Up to size I-MI 50 included, it is not necessary to point the mounting position out, considering that smaller sizes of the gearbox do not need any action and they may be supplied in their standard version, suitable for all mounting positions. On the other hand, starting from size I-MI 60, the knowledge of the mounting position becomes necessary. Should clear indications in connection with this be missing, the unit will be supplied in standard version, which is version B3 for foot-mounting units and B5 for flange-mounting units.
The following schematic drawings show the typical mounting positions of an unit with the correspondant identification marks. On a side of the gearboxes, they are even given, with circular-shaped symbols, the positions of the fill-in plug, breather plug, level indication plug and unloading plug, if they are actually present on the unit.

○ Fill-in and breather plug

◒ Level plug

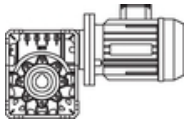
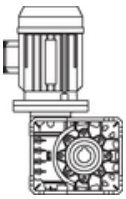
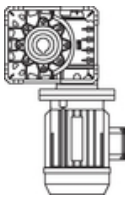
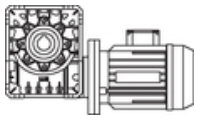
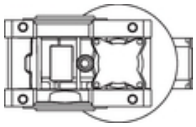
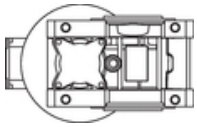
● Unloading plug

Version	I range						Position of plugs
	B3 (Standard)	V5	B8	V6	B6	B7	
A							○ ◒ ●
B							○ ◒ ●
V							○ ◒ ●

Version	MI range						Position of plugs
	B5 (Standard)	B51	B53	B52	V1	V3	
FP							○ ◒ ●
F FBR FBM FBML							○ ◒ ●

5.4.2. U-MU range mounting positions

Up to the size of the range U-MU 50 included, it is not necessary to specify the mounting position, considering that the standard gearbox is suitable to operate in all monting positions. Starting from size U-MU63 the knowledge of the mounting position becomes necessary. Should specific indications be missing, the unit will be supplied in the standard version B3.

U-MU range		
B5	**B51**	**B53**
Standard  **B3**	 **V5**	 **V6**
 **B8**	 **B6**	 **B7**

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 oil in, use the fill-in/breather plug, located in the upper gearbox portion. Oil amount to be filled in is given in the table (⇒ Oil amount, 20), but we point out that said amounts have a merely indicative value; the user will have in any case to fill oil in, until the oil level visible at sight on the level plug has been reached, once the unit has been already mounted in the correct mounting position (⇒ Mounting positions, 13).

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, 17).

Ex	**Prior to starting a gearbox mounted in an environment with potentially explosive atmosphere, according to the ATEX 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, 16)?		
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, 20)		
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

All gearboxes are to be submitted to a running.
It is recommended to increase progressively during the running in time the transmitted power up to a limit of the 50-70 % of the maximum allowed power (in the first running hours).
During this time, values of temperature higher than the standard ones might occur.
Made exception for the units already supplied as lubricated by SITI S.p.A. with a lifetime lubricant, on which no oil replacement is requested, on all the units supplied by the SITI S.p.A. without oil it is recommended an oil change after running in, in order to assure higher reliability and a longer gearbox time of life (⇒ Oil replacement, 21).

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:

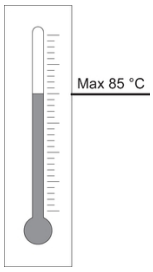
- the kind of kinematism used for the transmission;
- type and amount of lubricant;
- main features and structure of the gearbox;
- input and output speed;
- mounting position;
- applied power;
- ambient temperature.

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, poor conditions of ventilation (air speed ≤0.5m/s) and applies when running in time has been completed.
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. During the stage of running in (first 300-400 operating hours), the values of temperature increase ΔT might be even 25% higher.

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, it is necessary to require a special version of the gearbox, which is to be 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.

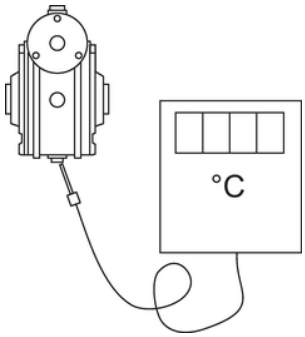


	During the running of a unit mounted in a potentially explosive atmosphere, according to the directive ATEX, the following check operations are to be carried out.	✓
Measure the surface temperature after about 3 hours of continuous service. The temperature differential in comparison with the ambient temperature 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.

6.3.3. Check of the torque limiter (optional device)

P.P.E. Heat insulated gloves
If the gearbox is equipped with the torque limiter, check during running that said device is correctly adjusted:
- in conditions of standard load, the sliding of the coupling has not to occur in any way;
- on the contrary, in conditions of overloading, the sliding of the coupling has to occur imperatively.

Shouldn't these conditions be complied with, stop the unit and adjust correctly the torque limiter (⇒ Adjustment of the torque limiter (optional device), 24).

7. Lubrication

7.1. Lubrication

All units of the U-MU range, MD range and I-MI range, up to size 90 included,are supplied pre-filled with oil by SITI S.p.A., and do not have any oil plugs, sinlce the type of oil used is a lifetime lubricant, in other words it does not require any maintenance in the course of the entire gearbox life.
Upon request, gearboxes of the range U-MU and of the range I-MI, up to size 90 included, might be supplied complete with oil plugs, i.e. fill-in plug, unloading plug, and oil level inspection plug.
Gearboxes of the range I-MI 110/130/150/175 are supplied without oil, but complete with all oil plugs, i.e. fill-in plug, unloading plug and oil level inspection plug. In this case, filling the unit with oil is a customer task, and the customer himself will use one of the mineral-base lubricants, or synthetic-base lubricants, recommended (⇒ Oil grade, 19).

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

The helical worm units of the range MP and of the range SR are supplied complete with lifetime lubrication, and this one does not require any oil replacement.

I-MI range	Lubricant	Oil plugs
30	SYNT OIL ISO VG 320 PAG (suitable for all mounting positions)	Upon request
40		
50		
60	SYNT OIL ISO VG 320 PAG	
70		
80		
90		
110	Supplied without any lubricant	Standard with plugs (fill-in/breather plug-level inspection plug-unloading plug)
130		
150		
175		

U-MU range	Lubricant	Oil plugs
40	SYNT OIL ISO VG 320 PAG (suitable for all mounting positions)	Upon request
50		
63	SYNT OIL ISO VG 320 PAG	
75		
90		
110		

7.2. Oil grade

		Ambient operating temperature																		
		-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)																	(2)	
	220 VG																			
	320 VG																			
Synthetic oil (PAG)	150 VG	(3)																	(2)	
	220 VG																			
	320 VG																			

(1) Standard catalogue shaft seals
(2) Special out-of-catalogue shaft seals
(3) Get in touch with SITI Engineering

7.3. Comparison table

TYPE	Mineral oil				Synthetic oil (PAO)			Synthetic oil (PAG)		
ISO VG	**150**	**220**	**320**	**460**	**150**	**220**	**320**	**150**	**220**	**320**
ARAL	Degol BG				Degol PAS			Degol GS		
CASTROL	Alpha SP				Alphasyn EP			Alphasyn PG		
KLÜBER	Kluberoil GEM 1				KluberSynt GEM 4			KluberSynt GH 6		
MOBIL	Mobil Gear XMP				Mobil Gear SHC XMP			Mobil Glygoyle		
SHELL	Omala S2 G				Omala S4 GX			Omala S4 WE		
TOTAL	Carter EP				Carter SH			Carter SY		
FUCHS	Renolin CKC				Renolin Unisyn CLP			Renolin PG		

7.4. Oil amount

I-MI range	Pre-lubricated with synthetic oil ISO VG 320 PAG							To be filled in on account of the customer			
Size	I 30	I 40	I 50	I 60	I 70	I 80	I 90	I 110	I 130	I 150	I 175
Oil amount (l)	0.035	0.15	0.19	0.39	0.55	0.85	1.50	1.60	2.70	6.10	6.80

U-MU range	Pre-lubricated with synthetic oil ISO VG 320 PAG					
Size	U 40	U 50	U 63	U 75	U 90	U 110
Oil amount (l)	0.13	0.19	0.33	0.50	0.90	1.40

MD range	Pre-lubricated with synthetic oil ISO VG 320 PAG				
Size	MD 126	MD 160	MD 200	MD 220	MD 250
Oil amount (l)	0.9	1.9	3.5	4.0	7.5

P range	Synthetic oil ISO VG 320 PAG				
Size	P 63	P 71	P 80	P 90	P 110
Oil amount (l)	0.04	0.05	0.08	0.08	0.45

SR range	Synthetic oil ISO VG 220 PAO			
Size	SR 63	SR 71	SR 80	SR 100
Oil amount (l)	0.08	0.10	0.20	0.40

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

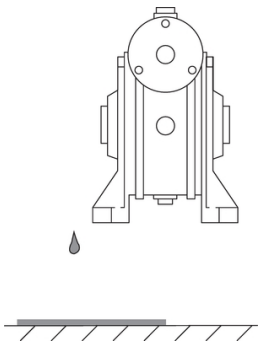
Carry out periodically the cleaning of the outer surface of the gearbox and of the air channels for the ventilation, in order to assure a satisfactory thermal exchange coefficient towards outside.

8.2.2. Check of oil level

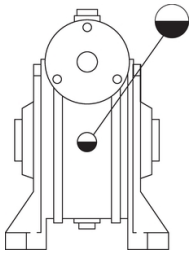
For the units supplied by SITI S.p.A. without oil plugs and filled in with synthetic oil, the fact of checking oil level is neither requested nor possible, due to the missing level plug.
Should the user, however, detect oil leakages or should he make sure that some running malfunction events take place, which induce him to assume that the oil level might have been meaningfully reduced, we recommend to apply to the Technical Assistance Dept. SITI S.p.A., in order to ask for an advice about the way to behave.

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, 21).
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

For the oil replacement after the running in time, comply with the instructions given on the paragraph (⇒ Running in, 15) and (⇒ Lubrication, 18).

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

Oil temperature (°C)	Service	Time interval of oil replacement (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 fill-in/breather plug.
- Unscrew the unloading plug located down 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 level plug is clean and transparent. In case it is not, unscrew and clean it.
- Screw again the unloading plug.
- Fill in the units from the upper hole. The oil amount to be filled in is indicated in the table (⇒ Oil amount, 20), but we point out that the mentioned amounts do have a simply indicative value; the user has to fill oil in, until the oil level visible at sight through the transparent level plug has been achieved (having already mounted the unit in the expected mounting position).
- Screw again the fill-in breather plug located above.

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:

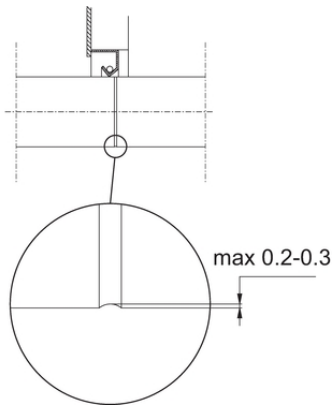
- a good serviceability of the sealing function is missing, and due to this an oil leakage towards outside of the unit is occurring;
- it is being effected a revision of the machine or of the installation.

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.

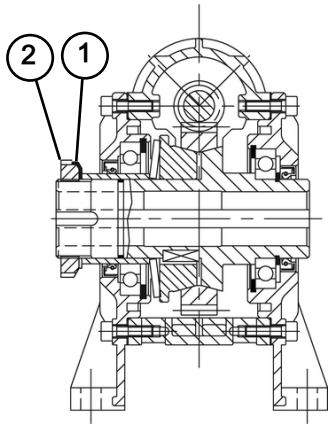
Table frequency of checks

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

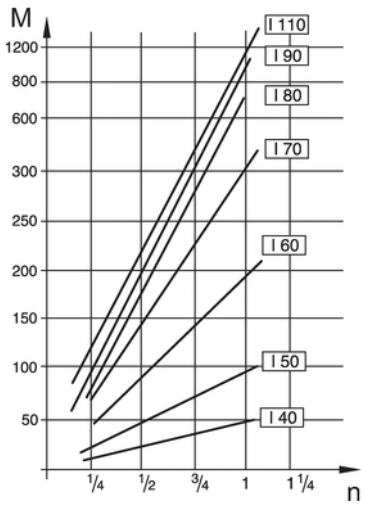
8.4. Adjustment of the torque limiter (optional device)

P.P.E. Protection gloves

In order to adjust the torque limiter, it is needed:
- to stop the unit;
- fold the tooth **1** of the anti-unscrewing washer;
- turn the nut **2** in a clockwise direction, in order to increase the transmissible torque, or turn it in counterclockwise direction, in order to decrease said torque;
- refold the tooth of the washer inside one of the little grooves.



In the reported graph, the values of the max. transmissible torque as a function of the number of turns of the nut are given for each gearbox size. However, it is to be pointed out that the values given in the graph are merely indicative and a correct and refined adjustment has to be carried out by means of different tries (⇒ Check of the torque limiter (optional device), 17).



M = Transmitted torque (Nm)
n = Number of turns of the threaded nut

8.5. 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

8.6. 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

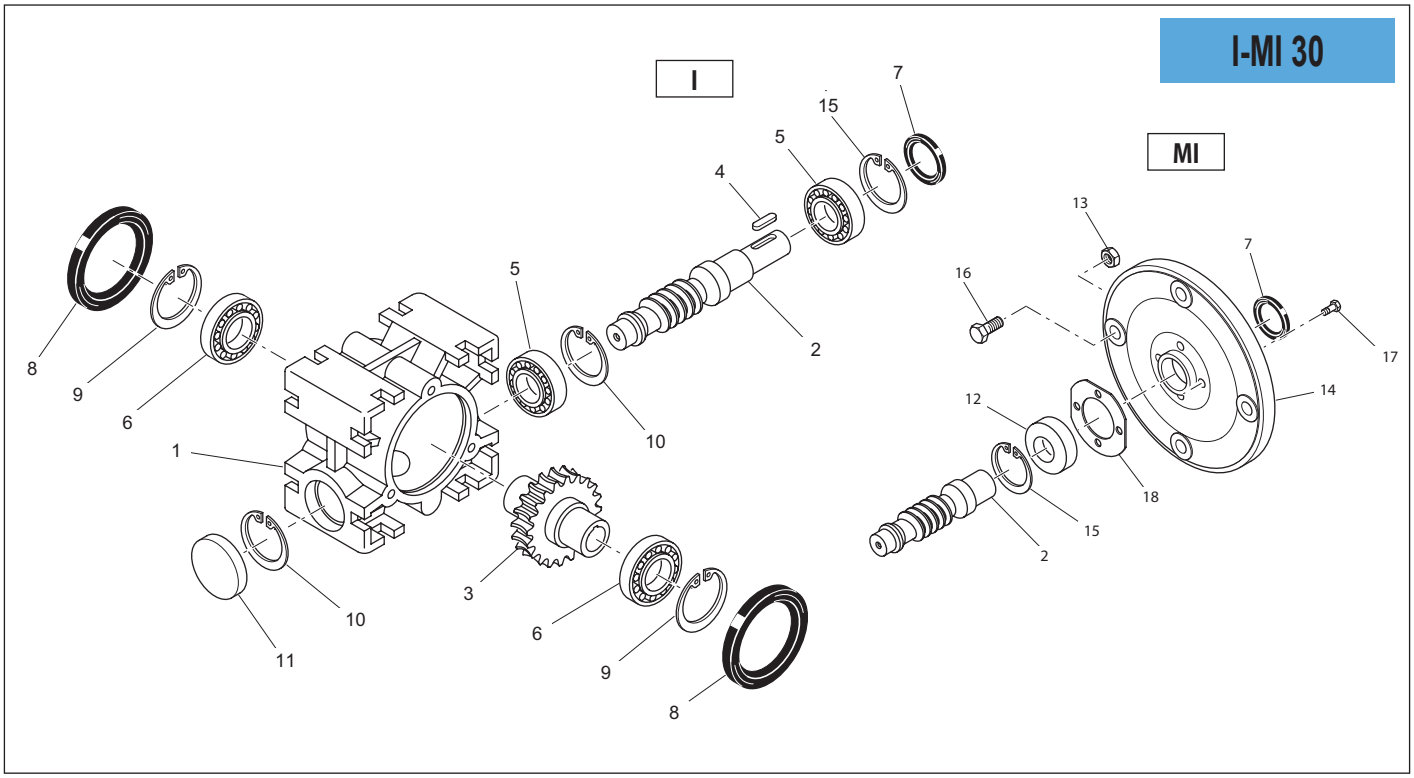
9.1. Scrapping and material disposal

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.

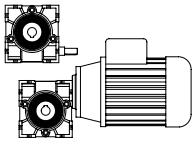
NOTE	NOTES	ANMERKUNG
NOTES	NOTAS	NOTAS

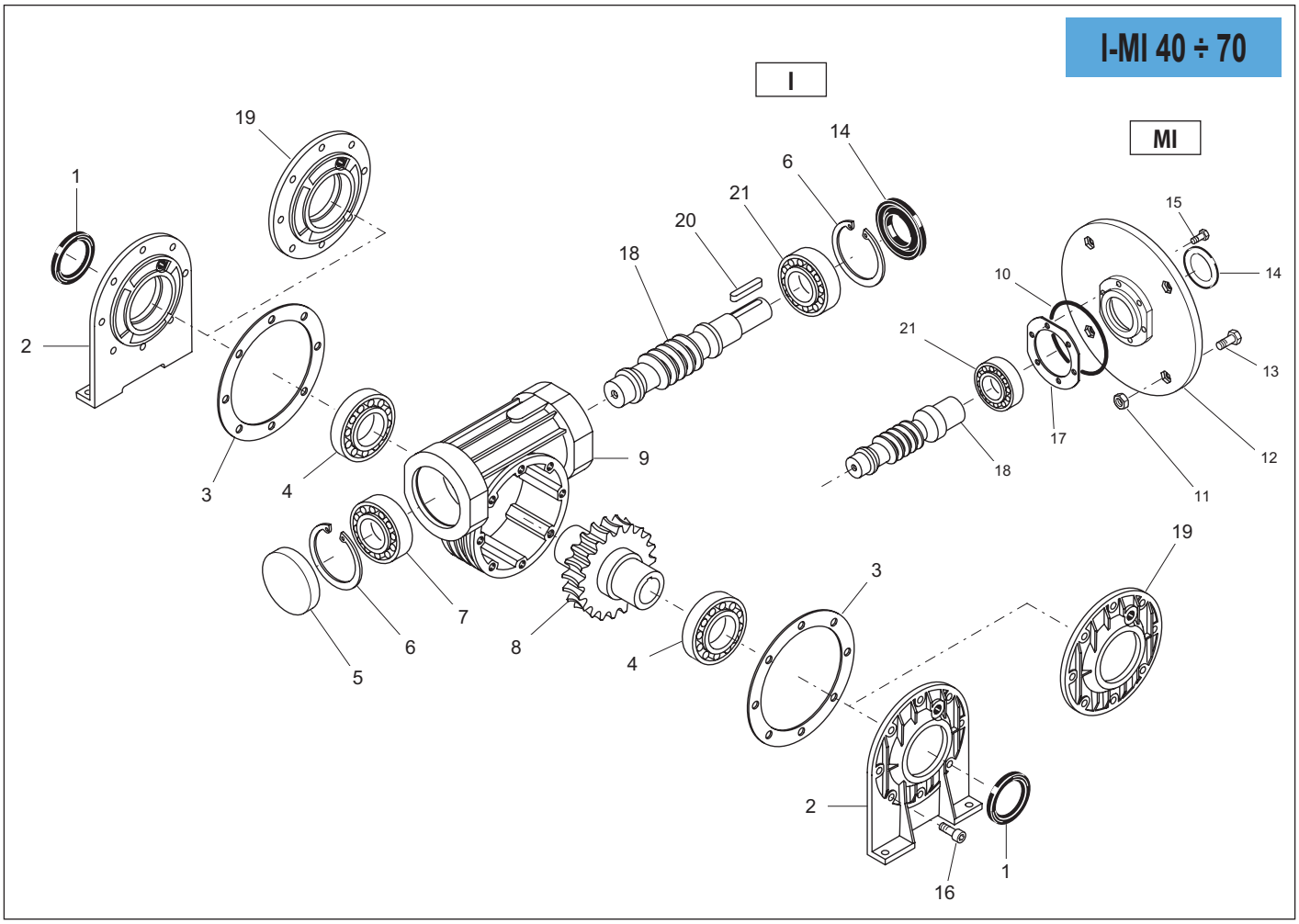
10. Spare parts

To check the spare parts catalogue, contact the SITI S.p.A. Technical Service Department and require a hard copy of the documentation or the interactive CD-ROM (when available).

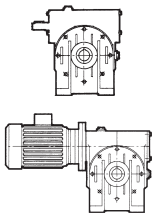


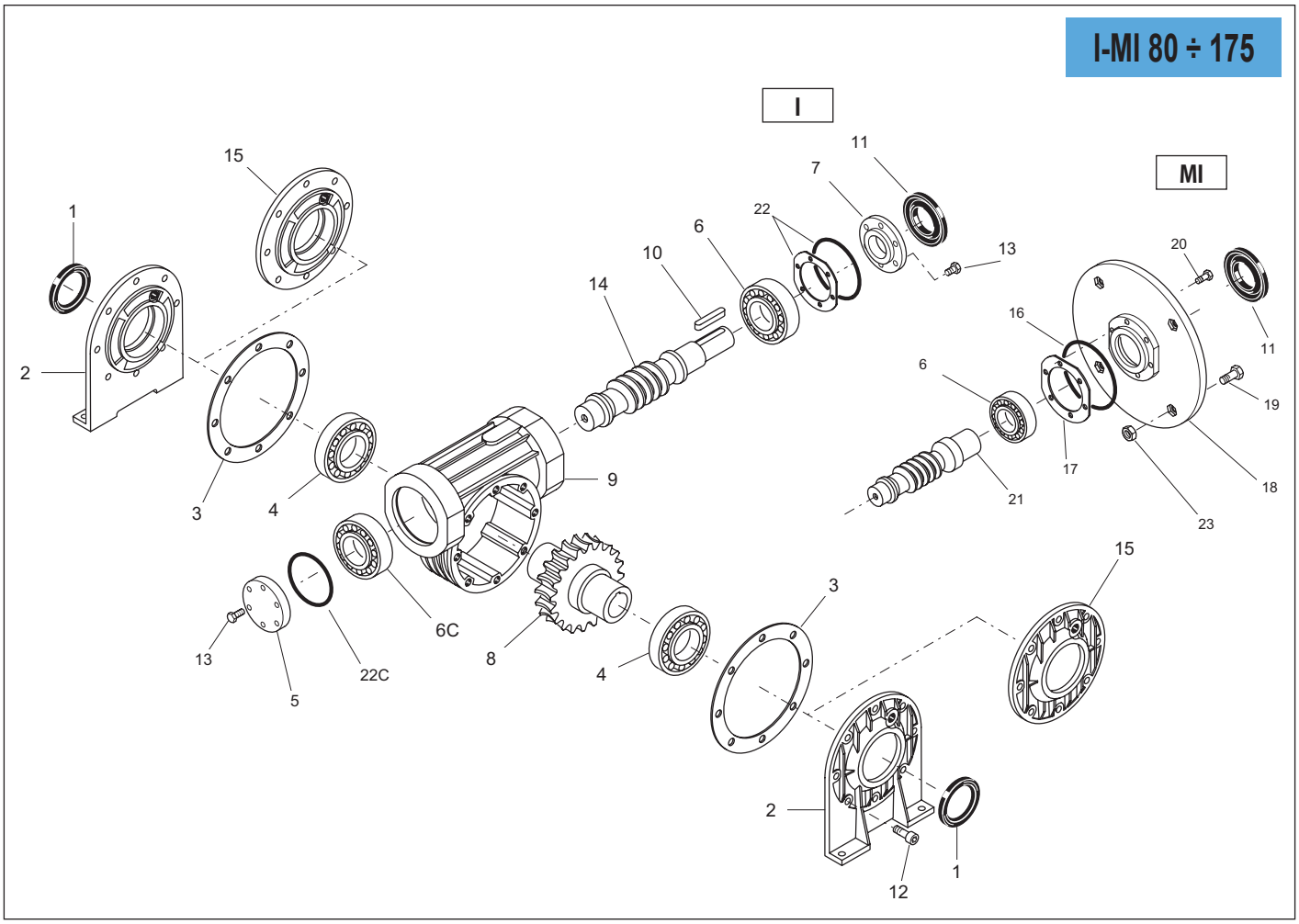
Pos.	Descrizione	Description	Beschreibung	Description	Descripción	Descrição
1	CORPO	BODY	KÖRPER	CORPS	CUERPO	CARCAÇA
2	V.S.F.	WORM SCREW	V.S.F	V.S.F.	T.S.F.	ROSCA SEM FIM
3	CORONA	CROWN GEAR	KRANZ	COURONNE	CORONA	COROA
4	LINGUETTA	KEY	LASCHE	LANGUETTE	LENGUETA	LINGUETA
5	CUSCINETTO	BEARING	LAGER	ROULEMENT	COJINETE	ROLAMENTO
6	CUSCINETTO	BEARING	LAGER	ROULEMENT	COJINETE	ROLAMENTO
7	AN. DI TENUTA	OIL SEAL	DICHTRING	JOINT D'ÉTANCHÉITÉ	AN. DE RETENCIÓN	RETENTOR
8	AN. DI TENUTA	OIL SEAL	DICHTRING	JOINT D'ÉTANCHÉITÉ	AN. DE RETENCIÓN	RETENTOR
9	ANELLO SEEGER	SNAP RING	SEEGERRING	ANNEAU D'ARRÊT	ANILLO SEEGER	ANEL ELÁSTICO
10	ANELLO SEEGER	SNAP RING	SEEGERRING	ANNEAU D'ARRÊT	ANILLO SEEGER	ANEL ELÁSTICO
11	CAPPELLOTTO	CAP	KAPPE	CHAPEAU	CAPERUZA	TAMPÃO
12	BOCCOLA	BUSHING	BUCHSE	DOUILLE	CASQUILLO	CASQUILHO
13	DADO ESAGONALE	NUT	SECHSKANTMUTTER	ÉCROU HÉXAGONAL	TUERCA HEXAGONAL	PORCA
14	F.A.M	F.A.M	F.A.M	F.A.M	F.A.M	FLANGE
15	ANELLO SEEGER	SEEGER	SEEGERRING	ANNEAU D'ARRÊT	ANILLO SEEGER	ANEL ELÁSTICO
16	VITE T.E.	SCREW T.E.	SECHSKANTSCHRAUBE	VIS T.H.	TORNILLO T.E.	PARAFUSO
17	VITE T.C.E.I	SCREW T.C.E.I	INNENSECHS-KANTSCHRAUBE	VIS C.H.C.	TORNILLO T.C.E.I	PARAFUSO
18	GUARNIZIONE ENTRATA	GASKET	ANTRIEBSDICHTUNG	GARNITURE ENTRÉE	JUNTA DE ENTRADA	JUNTA

	IEC (PAM)	Cuscinetti / Bearings / Kugellager Roulements / Cojinetes / Rolamentos		Anelli di tenuta / Oilseals / Simmerringe Joints d'étanchéité / Anillos de retención / Retentores	
		5	6	7	8
I 30		6000	16006	10/26/7	30/55/7
MI 30 PAM 9/80 **MI 30 PAM 9/120** **MI 30 PAM 11/90** **MI 30 PAM 11/140**	**56B14** **56B5** **63B14** **63B5**	6000 6000 6000 6000 6000	16006 16006 16006 16006 16006	17/25/4 17/25/4 17/25/4 17/25/4 17/25/4	30/55/7 30/55/7 30/55/7 30/55/7 30/55/7

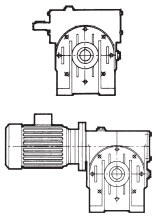


Pos.	Descrizione	Description	Beschreibung	Description	Descripción	Descrição
1	AN. DI TENUTA	SHAFT SEAL	WELLENDICHTUNG	JOINT D'ÉTANCHÉITÉ	AN. DE RETENCIÓN	RETENTOR
2	PIEDE	FOOT	FUSS	PIED	PIE	PÉ
3	GUARNIZIONE USCITA	OUTPUT GASKET	ABTRIEBSGARNITUR	GARNITURE SORTIE	JUNT.ÁRB.LENTO	JUNTA DE SAÍDA
4	CUSCINETTO	BEARING	LAGER	ROULEMENT	COJINETE	ROLAMENTO
5	CAPPELLOTTO	ENDCAP	ENDKAPPE	CHAPEAU DE FERME-TURE	CAPERUZA	TAMPÃO
6	ANELLO SEEGER	SNAP RING	SEEGERRING	ANNEAU D'ARRÊT	ANILLO SEEGER	ANEL ELÁSTICO
7	CUSCINETTO	BEARING	LAGER	ROULEMENT	COJINETE	ROLAMENTO
8	CORONA	WORM WHEEL	SCHNECKENRAD	COURONNE HÉLI-COÏDALE	CORONA	COROA
9	CORPO	HOUSING	GEHAEUSE	CARCASSE	CUERPO	CORPO
10	O-RING	O "RING"	O "RING"	JOINT TORIQUE	OR	ANEL DE VEDAÇÃO "OR"
11	DADO	HEXAGONAL NUT	SECHSKANTMUTTER	ÉCROU HÉXAGONAL	TUERCA HEXAGONAL	PORCA
12	FLANGIA FAM	FLANGE FAM	FLANSCH	BRIDE	BRIDA	FLANGE
13	VITE	SCREW	SECHSKANTSCHRAUBE	VIS T.H.	TORNILLO T.E.	PARAFUSO
14	AN. DI TENUTA	SHAFT SEAL	WELLENDICHTUNG	JOINT D'ÉTANCHÉITÉ	AN. DE RETENCIÓN	RETENTOR
15	VITE	SCREW	SECHSKANTSCHRAUBE	VIS	TORNILLO	PARAFUSO
16	VITE	SCREW	INNENSECHS-KANTSCHRAUBE	VIS	TORNILLO	PARAFUSO
17	GUARNIZIONE ENTRATA	INPUT GASKET	ANTRIEBSGARNITUR	GARNITURE ENTRÉE	JUNTA	JUNTA DE ENTRADA
18	VITE SENZA FINE	WORM SHAFT	SCHNECKENWELLE	VIS SANS FIN	TORNILLO SINFÍN	ROSCA SEM FIM
19	FLANGIA PIATTA	FLAT FLANGE	FLACHFLANSCH	BRIDE PLATE	BRIDA PLANA	FLANGE FP
20	LINGUETTA	KEY	LASCHE	LANGUETTE	LENGUETA	LINGUETA
21	CUSCINETTO	BEARING	LAGER	ROULEMENT	COJINETE	ROLAMENTO

		IEC (PAM)	Cuscinetto Bearing Kugellager Roulement Cojinete Rolamento				Anello di tenuta Oilseal Simmerringe Joints d'étanchéité Anillos de retención Retentor		O-ring	Cappellotto Cover Deckel Chapeau Capuchón Tampão
			21	**7**	**4**		**1**	**14**	**10**	**5**
					standard	optional				
I 40		-	6004	6004	16006	32006X	30-40-7 BASL	20-42-7 BASL	-	42-7
I 40 BISP		-	6004	6004	16006	32006X	30-40-7 BASL	20-42-7 BASL	-	20-42-7 BASL
MI 40	PAM 9/80	56B14	6004	6004	16006	32006X	30-40-7 BASL	20-35-7 BASL	OR 39X1,5	42-7
MI 40	PAM 9/120	56B5	6004	6004	16006	32006X	30-40-7 BASL	20-35-7 BASL	OR 39X1,5	42-7
MI 40	PAM 11/90	63B14	6004	6004	16006	32006X	30-40-7 BASL	20-35-7 BASL	OR 39X1,5	42-7
MI 40	PAM 14/105	71B14	61905	6004	16006	32006X	30-40-7 BASL	25-35-7 BASL	OR 39X1,5	42-7
MI 40	PAM 14/160	71B5	61905	6004	16006	32006X	30-40-7 BASL	25-35-7 BASL	OR 39X1,5	42-7
I 50		-	30204	30204	16007	32007X	35-47-7 BASL	20-47-7 BASL	-	47-7
I 50 BISP		-	30204	30204	16007	32007X	35-47-7 BASL	20-47-7 BASL	-	20-47-7 BASL
MI 50	PAM 11/90	63B14	6005	6204	16007	32007X	35-47-7 BASL	25-40-7 BASL	ORM 0430-20	47-7
MI 50	PAM 11/140	63B5	6005	6204	16007	32007X	35-47-7 BASL	25-40-7 BASL	ORM 0430-20	47-7
MI 50	PAM 14/105	71B14	6005	6204	16007	32007X	35-47-7 BASL	25-40-7 BASL	ORM 0430-20	47-7
MI 50	PAM 14/160	71B5	6005	6204	16007	32007X	35-47-7 BASL	25-40-7 BASL	ORM 0430-20	47-7
MI 50	PAM 19/120	80B14	61906	6204	16007	32007X	35-47-7 BASL	30-40-7 BASL	ORM 0430-20	47-7
MI 50	PAM 19/200	80B5	61906	6204	16007	32007X	35-47-7 BASL	30-40-7 BASL	ORM 0430-20	47-7
I 60		-	6006	6006	6008	32008X	40-56-8 BASL	30-55-7 BASL	-	55-10
I 60 BISP		-	6006	6006	6008	32008X	40-56-8 BASL	30-55-7 BASL	-	30-55-7 BASL
MI 60	PAM 14/105	71B14	6006	6006	6008	32008X	40-56-8 BASL	30-47-7 BASL	OR 2187	55-10
MI 60	PAM 14/160	71B5	6006	6006	6008	32008X	40-56-8 BASL	30-47-7 BASL	OR 2187	55-10
MI 60	PAM 19/120	80B14	6006	6006	6008	32008X	40-56-8 BASL	30-47-7 BASL	OR 2187	55-10
MI 60	PAM 19/200	80B5	6006	6006	6008	32008X	40-56-8 BASL	30-47-7 BASL	OR 2187	55-10
MI 60	PAM 24/140	90B14	61907	6006	6008	32008X	40-56-8 BASL	35-47-7 BASL	OR 2187	55-10
MI 60	PAM 24/200	90B5	61907	6006	6008	32008X	40-56-8 BASL	35-47-7 BASL	OR 2187	55-10
I 70		-	30305	30305	6009	32009X	45-60-7 BASL	25-62-10	-	62-10
I 70 BISP		-	30305	30305	6009	32009X	45-60-7 BASL	35-55-10 BASL	-	25-62-10
MI 70	PAM 14/105	71B14	6007	6305	6009	32009X	45-60-7 BASL	35-55-10 BASL	OR 2200	62-10
MI 70	PAM 14/160	71B5	6007	6305	6009	32009X	45-60-7 BASL	35-55-10 BASL	OR 2200	62-10
MI 70	PAM 19/120	80B14	6007	6305	6009	32009X	45-60-7 BASL	35-55-10 BASL	OR 2200	62-10
MI 70	PAM 19/200	80B5	6007	6305	6009	32009X	45-60-7 BASL	35-55-10 BASL	OR 2200	62-10
MI 70	PAM 24/140	90B14	6007	6305	6009	32009X	45-60-7 BASL	35-55-10 BASL	OR 2200	62-10
MI 70	PAM 24/200	90B5	6007	6305	6009	32009X	45-60-7 BASL	35-55-10 BASL	OR 2200	62-10
MI 70	PAM 28/160	100-112B14	61908	6305	6009	32009X	45-60-7 BASL	40-55-8 BASL	-	62-10
MI 70	PAM 28/250	100-112B5	61908	6305	6009	32009X	45-60-7 BASL	40-55-8 BASL	-	62-10

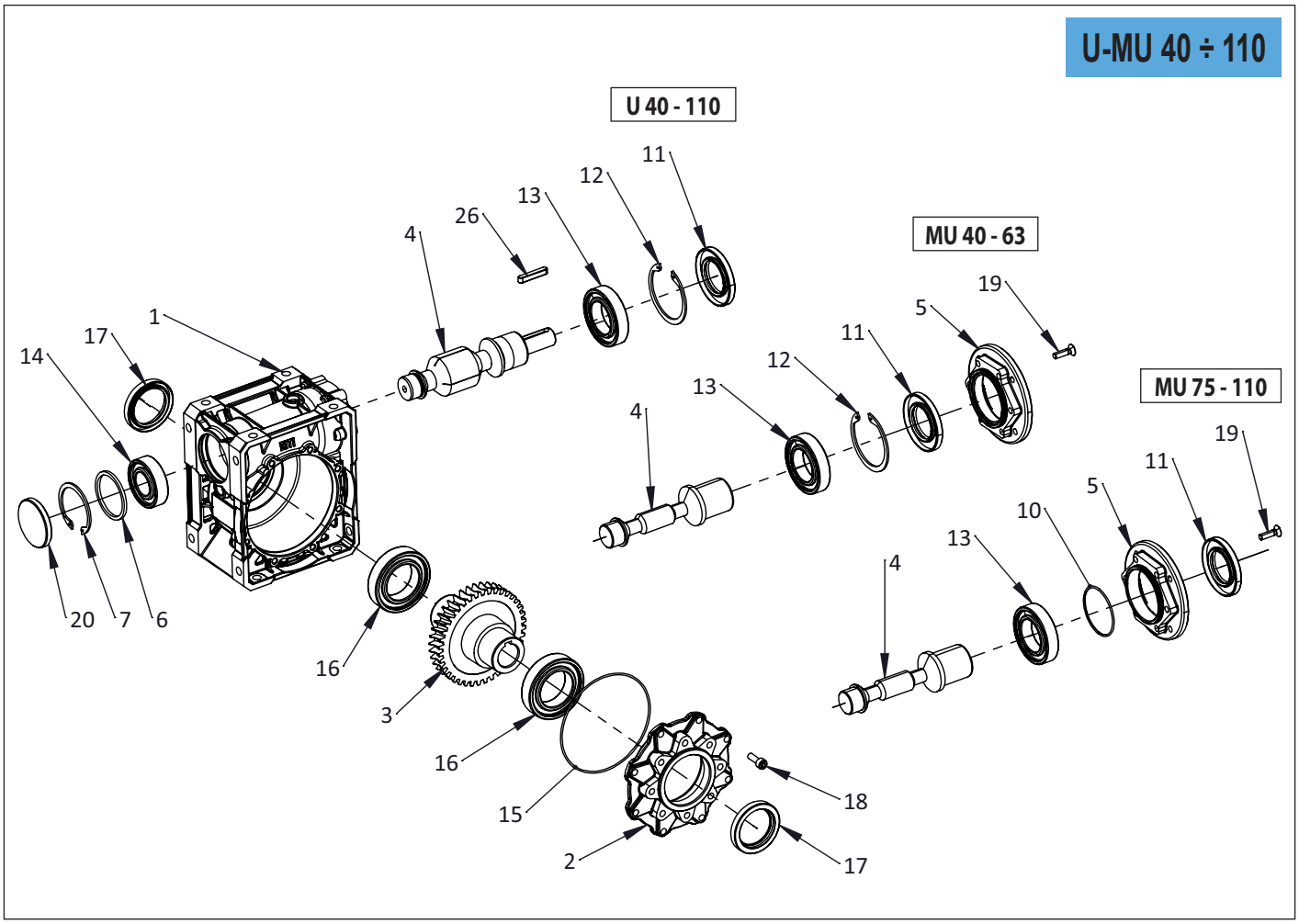


Pos.	Descrizione	Description	Beschreibung	Description	Descripción	Descrição
1	AN. DI TENUTA	SHAFT SEAL	WELLENDICHTUNG	JOINT D'ÉTANCHÉITÉ	AN. DE RETENCIÓN	RETENTOR
2	PIEDE	FOOT	FUSS	PIED	PIE	PÉ
3	GUARNIZIONE USCITA	OUTPUT GASKET	ABTRIEBSGARNITUR	GARNITURE SORTIE	JUNT.ÁRB.LENTO	JUNTA DE SAÍDA
4	CUSCINETTO	BEARING	LAGER	ROULEMENT	COJINETE	ROLAMENTO
5	COPERCHIO	COVER	DECKEL	COUVERCLE	CUBIERTA	TAMPA
6	CUSCINETTO	BEARING	LAGER	ROULEMENT	COJINETE	ROLAMENTO
7	COPERCHIO	COVER	DECKEL	COUVERCLE	CUBIERTA	TAMPA
8	CORONA	WORM WHEEL	SCHNECKENRAD	COURONNE HÉLI-COÏDALE	CORONA	COROA
9	CORPO	HOUSING	GEHAEUSE	CARCASSE	CUERPO	CORPO
10	LINGUETTA	KEY	LASCHE	LANGUETTE	LENGUETA	LINGUETA
11	AN. DI TENUTA	SHAFT SEAL	WELLENDICHTUNG	JOINT D'ÉTANCHÉITÉ	AN. DE RETENCIÓN	RETENTOR
12	VITE	SCREW	SECHSKANTSCHRAUBE	VIS T.H.	TORNILLO T.E.	PARAFUSO
13	VITE	SCREW	SECHSKANTSCHRAUBE	VIS T.H.	TORNILLO T.E.	PARAFUSO
14	VITE SENZA FINE	WORM SHAFT	SCHNECKENWELLE	VIS SANS FIN	TORNILLO SINFÍN	ROSCA SEM FIM
15	FLANGIA FP	FLANGE FP	FLANSCH	BRIDE	BRIDA	FLANGE
16	O-RING	O "RING"	O "RING"	JOINT TORIQUE	OR	ANEL DE VEDAÇÃO "OR"
17	GUARNIZIONE ENTRATA	INPUT GASKET	ANTRIEBSGARNITUR	GARNITURE ENTRÉE	JUNTA	JUNTA DE ENTRADA
18	FLANGIA FAM	FLANGE FAM	FLANSCH	BRIDE	BRIDA	FLANGE
19	VITE	SCREW	SECHSKANTSCHRAUBE	VIS T.H.	TORNILLO T.E.	PARAFUSO
20	VITE	SCREW	SECHSKANTSCHRAUBE	VIS T.H.	TORNILLO T.E.	PARAFUSO
21	VITE SENZA FINE	WORM SHAFT	SCHNECKENWELLE	VIS SANS FIN	TORNILLO SINFÍN	ROSCA SEM FIM
22	O-RING / GUARNIZIONE	O-RING / GASKET	OR / ABTRIEBSGAR-NITUR	OR / GARNITURE	OR / JUNT	OR / JUNTA
23	DADO	HEXAGONAL NUT	SECHSKANTMUTTER	ÉCROU HÉXAGONAL	TUERCA HEXAGONAL	PORCA

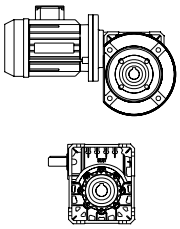


		IEC (PAM)	Cuscinetto Bearing Kugellager Roulement Cojinete Rolamento				Anello di tenuta Oilseal Simmerringe Joints d'étanchéité Anillos de retención Retentor		Cappellotto - Anello di tenuta Cover - Shaft seals Deckel - Wellendichtung Chapeau - Joints d'étanchéité Capuchón - Anillos de retención Tampão - Retentor	O-ring
			6	6C	4		11	1	5	22 - 22C
					standard	optional				
I 80		-	30305	30305	6010	32010X	25-40-7 BASL	50-65-8 BASL	-	-
I 80 BISP		-	30305	30305	6010	32010X	25-40-7 BASL	50-65-8 BASL	25-40-7 BASL	-
MI 80	PAM 19/120	80B14	32007X	30305	6010	32010X	35-50-7 BASL	50-65-8 BASL	-	-
MI 80	PAM 19/200	80B5	32007X	30305	6010	32010X	35-50-7 BASL	50-65-8 BASL	-	-
MI 80	PAM 24/140	90B14	32007X	30305	6010	32010X	35-50-7 BASL	50-65-8 BASL	-	-
MI 80	PAM 24/200	90B5	32007X	30305	6010	32010X	35-50-7 BASL	50-65-8 BASL	-	-
MI 80	PAM 28/160	100-112B14	61908	6305	6010	32010X	40-55-8 BASL	50-65-8 BASL	-	-
MI 80	PAM 28/250	100-112B5	61908	6305	6010	32010X	40-55-8 BASL	50-65-8 BASL	-	-
I 90		-	30306	30306	6011	32011X	30-60-10	55-72-10 BASL	-	OR 2262
I 90 BISP		-	30306	30306	6011	32011X	30-60-10	55-72-10 BASL	30-60-10	OR 2262
MI 90	PAM 19/120	80B14	30207	30306	6011	32011X	35-60-10	55-72-10 BASL	-	OR 2262
MI 90	PAM 19/200	80B5	30207	30306	6011	32011X	35-60-10	55-72-10 BASL	-	OR 2262
MI 90	PAM 24/140	90B14	30207	30306	6011	32011X	35-60-10	55-72-10 BASL	-	OR 2262
MI 90	PAM 24/200	90B5	30207	30306	6011	32011X	35-60-10	55-72-10 BASL	-	OR 2262
MI 90	PAM 28/160	100-112B14	32008X (*)	30306	6011	32011X	40-60-10 BASL	55-72-10 BASL	-	OR 2262
MI 90	PAM 28/250	100-112B5	32008X (*)	30306	6011	32011X	40-60-10 BASL	55-72-10 BASL	-	OR 2262
I 110		-	30307	30307	6012	32012X	35-72-10 BASL	60-80-10 BASL	-	OR 2300
I 110 BISP		-	30307	30307	6012	32012X	35-72-10 BASL	60-80-10 BASL	35-72-10 BASL	OR 2300
MI 110	PAM 24/140	90B14	30208	30307	6012	32012X	40-60-10 BASL	60-80-10 BASL	-	OR 2300
MI 110	PAM 24/200	90B5	30208	30307	6012	32012X	40-60-10 BASL	60-80-10 BASL	-	OR 2300
MI 110	PAM 28/160	100-112B14	30208	30307	6012	32012X	40-60-10 BASL	60-80-10 BASL	-	OR 2300
MI 110	PAM 28/250	100-112B5	30208	30307	6012	32012X	40-60-10 BASL	60-80-10 BASL	-	OR 2300
MI 110	PAM 38/300	132B5	33010	30307	6012	32012X	50-70-10 BASL	60-80-10 BASL	-	OR 2300
I 130		-	32209	32209	6014	32014X	45-72-10	70-90-10 BASL	-	-
I 130 BISP		-	32209	32209	6014	32014X	45-72-10	70-90-10 BASL	45-72-10	-
MI 130	PAM 24/140	90B14	32209	32209	6014	32014X	45-72-10	70-90-10 BASL	-	-
MI 130	PAM 24/200	90B5	32209	32209	6014	32014X	45-72-10	70-90-10 BASL	-	-
MI 130	PAM 28/160	100-112B14	32209	32209	6014	32014X	45-72-10	70-90-10 BASL	-	-
MI 130	PAM 28/250	100-112B5	32209	32209	6014	32014X	45-72-10	70-90-10 BASL	-	-
MI 130	PAM 38/300	132B5	32011X	32209	6014	32014X	55-80-10 BASL	70-90-10 BASL	-	-
I 150		-	30211	30211	6216	30216	55-80-10 BASL	80-100-10 BASL	-	-
I 150 BISP		-	30211	30211	6216	30216	55-80-10 BASL	80-100-10 BASL	55-80-10 BASL	-
MI 150	PAM 28/160	100-112B14	30211	30211	6216	30216	55-80-10 BASL	80-100-10 BASL	-	-
MI 150	PAM 28/250	100-112B5	30211	30211	6216	30216	55-80-10 BASL	80-100-10 BASL	-	-
MI 150	PAM 38/300	132B5	30211	30211	6216	30216	55-80-10 BASL	80-100-10 BASL	-	-
MI 150	PAM 42/350	160B5	30211	30211	6216	30216	60-80-10 BASL	80-100-10 BASL	-	-
I 175		-	30212	30212	6217	30217	60-80-10 BASL	85-110-13 BASL	-	-
I 175 BISP		-	30212	30212	6217	30217	60-80-10 BASL	85-110-13 BASL	60-80-10 BASL	-
MI 175	PAM 28/160	100-112B14	30212	30212	6217	30217	60-80-10 BASL	85-110-13 BASL	-	-
MI 175	PAM 28/250	100-112B5	30212	30212	6217	30217	60-80-10 BASL	85-110-13 BASL	-	-
MI 175	PAM 38/300	132B5	30212	30212	6217	30217	60-80-10 BASL	85-110-13 BASL	-	-
MI 175	PAM 42/350	160B5	30212	30212	6217	30217	60-80-10 BASL	85-110-13 BASL	-	-

(*) = With bearing-carrier bushing (just for PAM 100/112)

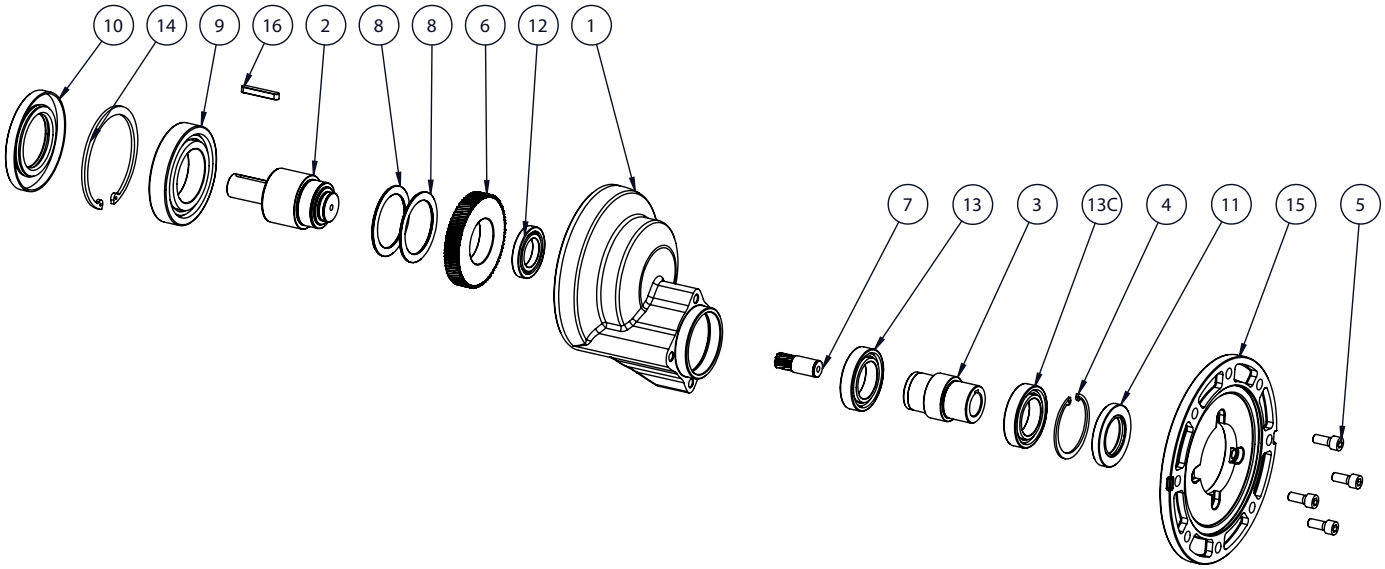


Pos.	Descrizione	Description	Beschreibung	Description	Descripción	Descrição
1	CARCASSA	HOUSING	GEHAEUSE	CARCASSE	CARCASA	CAIXA
2	COPERCHIO LATERALE	SIDE COVER	SEITLICHER DECKEL	COUVERCLE LATÉRALE	CUBIERTA LATERAL	TAMPA LATERAL
3	CORONA	WORMWHEEL	SCHNECKENRAD	COURONNE HELICOI-DALE	CORONA	COROA
4	VITE SENZA FINE	WORM SHAFT	SCHNECKENWELLE	VIS SANS FIN	T.S.F.	ROSCA SEM FIM
5	FLANGIA ATTACCO MOTORE	MOTOR CONNECTION FLANGE	MOTORFLANSCH	BRIDE ACCOUPLE-MENT MOTEUR	BRIDA CONEXIÓN MOTOR	FLANGE ACOPLAGEM MOTOR
6	DISTANZIALE	SPACER	DISTANZRING	DISTANTIAL	DISTANCIADOR	ESPAÇADOR
7	ANELLO SEEGER	SNAP RING	SEEGERRING	ANNEAU D'ARRÊT	ANILLO SEEGER	ANEL ELÁSTICO
10	"O" RING	"O" RING	"O" RING	JOINT TORIQUE	"OR"	ANEL DE VEDAÇÃO "OR"
11	ANELLO DI TENUTA	OILSEALS	SIMMERRINGE	JOINT D'ÉTANCHÉITÉ	ANILLO DE RETENCIÓN	ANEL RETENTOR
12	ANELLO SEEGER	SNAP RING	SEEGERRING	ANNEAU D'ARRÊT	ANILLO SEEGER	ANEL ELÁSTICO
13	CUSCINETTO	BEARING	LAGER	ROULEMENT	COJINETE	MANCAL
14	CUSCINETTO	BEARING	LAGER	ROULEMENT	COJINETE	MANCAL
15	"O" RING	"O" RING	"O" RING	JOINT TORIQUE	"OR"	ANEL DE VEDAÇÃO "OR"
16	CUSCINETTO	BEARING	LAGER	ROULEMENT	COJINETE	MANCAL
17	ANELLO DI TENUTA	OILSEALS	SIMMERRINGE	JOINT D'ÉTANCHÉITÉ	ANILLO DE RETENCIÓN	ANEL RETENTOR
18	VITI	SCREWS	SCHRAUBEN	VIS	TORNILLOS	ROSCAS
19	VITI	SCREWS	SCHRAUBEN	VIS	TORNILLOS	ROSCAS
20	CAPPELLOTTO	END COVER	ENDKAPPE	COUVERCLE DE FERMETURE	CAPERUZA	TAMPÃO
26	LINGUETTA	TAB	LASCHE	LANGUETTE	LENGUETA	LINGUETA



		IEC (PAM)	Cuscinetto Bearing Kugellager Roulement Cojinete Rolamento				Anello di tenuta Oilseal Simmerringe Joints d'étanchéité Anillos de retención Retentor		O-ring		Cappellotto Cover Deckel Chapeau Capuchón Tampão
			13	14	16		11	17	10	15	20
					standard	optional					
U 40		-	16005	6203 2RS	6006	32006X	25-47-7 BASL	30-40-7 BASL	-	ORM 0700-15	40-7
U 40 BISP.		-	16005	6203 2RS	6006	32006X	25-47-7 BASL	30-40-7 BASL	-	ORM 0700-15	17-40-7 BASL
MU 40	PAM 11/90	63B14	16005	6203 2RS	6006	32006X	25-47-7 BASL	30-40-7 BASL	-	ORM 0700-15	40-7
MU 40	PAM 14/105	71B14	16005	6203 2RS	6006	32006X	25-47-7 BASL	30-40-7 BASL	-	ORM 0700-15	40-7
MU 40	PAM 14/160	71B5	16005	6203 2RS	6006	32006X	25-47-7 BASL	30-40-7 BASL	-	ORM 0700-15	40-7
U 50		-	6006	6204 2RS	6008	32008X	30-55-7 BASL	40-55-8 BASL	-	OR 2325	47-7
U 50 BISP.		-	6006	6204 2RS	6008	32008X	30-55-7 BASL	40-55-8 BASL	-	OR 2325	20-47-7 BASL
MU 50	PAM 11/140	63B5	6006	6204 2RS	6008	32008X	30-55-7 BASL	40-55-8 BASL	-	OR 2325	47-7
MU 50	PAM 14/105	71B14	6006	6204 2RS	6008	32008X	30-55-7 BASL	40-55-8 BASL	-	OR 2325	47-7
MU 50	PAM 14/160	71B5	6006	6204 2RS	6008	32008X	30-55-7 BASL	40-55-8 BASL	-	OR 2325	47-7
MU 50	PAM 19/120	80B14	6006	6204 2RS	6008	32008X	30-55-7 BASL	40-55-8 BASL	-	OR 2325	47-7
MU 50	PAM 19/200	80B5	6006	6204 2RS	6008	32008X	30-55-7 BASL	40-55-8 BASL	-	OR 2325	47-7
U 63		-	6007	6205 2RS	6008	32008X	35-62-7 BASL	40-56-8 BASL	-	OR 2425	52-7
U 63 BISP.		-	6007	6205 2RS	6008	32008X	35-62-7 BASL	40-56-8 BASL	-	OR 2425	25-52-7 BASL
MU 63	PAM 14/105	71B14	6007	6205 2RS	6008	32008X	35-62-7 BASL	40-56-8 BASL	-	OR 2425	52-7
MU 63	PAM 14/160	71B5	6007	6205 2RS	6008	32008X	35-62-7 BASL	40-56-8 BASL	-	OR 2425	52-7
MU 63	PAM 19/120	80B14	6007	6205 2RS	6008	32008X	35-62-7 BASL	40-56-8 BASL	-	OR 2425	52-7
MU 63	PAM 19/200	80B5	6007	6205 2RS	6008	32008X	35-62-7 BASL	40-56-8 BASL	-	OR 2425	52-7
MU 63	PAM 24/140	90B14	6007	6205 2RS	6008	32008X	35-62-7 BASL	40-56-8 BASL	-	OR 2425	52-7
MU 63	PAM 24/200	90B5	6007	6205 2RS	6008	32008X	35-62-7 BASL	40-56-8 BASL	-	OR 2425	52-7
U 75		-	32008X	30206	6010	32010X	40-68-10 BASL	50-70-10 BASL	-	OR 2500	62-7
U 75 BISP.		-	32008X	30206	6010	32010X	40-68-10 BASL	50-70-10 BASL	-	OR 2500	30-62-7 BASL
MU 75	PAM 19/120	80B14	32008X	30206	6010	32010X	40-56-8 BASL	50-70-10 BASL	OR 2250	OR 2500	62-7
MU 75	PAM 19/200	80B5	32008X	30206	6010	32010X	40-56-8 BASL	50-70-10 BASL	OR 2250	OR 2500	62-7
MU 75	PAM 24/140	90B14	32008X	30206	6010	32010X	40-56-8 BASL	50-70-10 BASL	OR 2250	OR 2500	62-7
MU 75	PAM 24/200	90B5	32008X	30206	6010	32010X	40-56-8 BASL	50-70-10 BASL	OR 2250	OR 2500	62-7
MU 75	PAM 28/160	100-112B14	32008X	30206	6010	32010X	40-56-8 BASL	50-70-10 BASL	OR 2250	OR 2500	62-7
MU 75	PAM 28/250	100-112B5	32008X	30206	6010	32010X	40-56-8 BASL	50-70-10 BASL	OR 2250	OR 2500	62-7
U 90		-	32008X	32206	6011	32011X	40-68-10 BASL	55-72-10 BASL	-	OR 2637	62-10
U 90 BISP.		-	32008X	32206	6011	32011X	40-68-10 BASL	55-72-10 BASL	-	OR 2637	30-62-10 BASL
MU 90	PAM 19/120	80B14	32008X	32206	6011	32011X	40-56-8 BASL	55-72-10 BASL	OR 2250	OR 2637	62-10
MU 90	PAM 19/200	80B5	32008X	32206	6011	32011X	40-56-8 BASL	55-72-10 BASL	OR 2250	OR 2637	62-10
MU 90	PAM 24/140	90B14	32008X	32206	6011	32011X	40-56-8 BASL	55-72-10 BASL	OR 2250	OR 2637	62-10
MU 90	PAM 24/200	90B5	32008X	32206	6011	32011X	40-56-8 BASL	55-72-10 BASL	OR 2250	OR 2637	62-10
MU 90	PAM 28/160	100-112B14	32008X	32206	6011	32011X	40-56-8 BASL	55-72-10 BASL	OR 2250	OR 2637	62-10
MU 90	PAM 28/250	100-112B5	32008X	32206	6011	32011X	40-56-8 BASL	55-72-10 BASL	OR 2250	OR 2637	62-10
U 110		-	30208	30307	6012	32012X	40-80-10 BASL	60-80-10 BASL	-	OR 3750	80-10
U 110 BISP.		-	30208	30307	6012	32012X	40-80-10 BASL	60-80-10 BASL	-	OR 3750	35-80-10 BASL
MU 110	PAM 24/140	90B14	30208	30307	6012	32012X	40-60-10 BASL	60-80-10 BASL	OR 2300	OR 3750	80-10
MU 110	PAM 24/200	90B5	30208	30307	6012	32012X	40-60-10 BASL	60-80-10 BASL	OR 2300	OR 3750	80-10
MU 110	PAM 28/160	100-112B14	30208	30307	6012	32012X	40-60-10 BASL	60-80-10 BASL	OR 2300	OR 3750	80-10
MU 110	PAM 28/250	100-112B5	30208	30307	6012	32012X	40-60-10 BASL	60-80-10 BASL	OR 2300	OR 3750	80-10
MU 110	PAM 38/300	132B5	32010X	30307	6012	32012X	50-70-10 BASL	60-80-10 BASL	OR 2300	OR 3750	80-10

SR 63 ÷ 100



Pos.	Descrizione	Description	Beschreibung	Description	Descripción	Descrição
1	CARCASSA	HOUSING	GEHAEUSE	CARCASSE	CARCASA	CAIXA
2	ALBERO USCITA	OUTPUT SHAFT				
3	ALBERO ENTRATA	INPUT SHAFT				
4	AN. SEEGER	SNAP RING	SEEGERRING	ANNEAU D'ARRÊT	ANILLO SEEGER	ANEL ELÁSTICO
5	VITE	SCREW	SECHSKANTSCHRAUBE	VIS	TORNILLO	PARAFUSO
6	CORONA	GEAR				
7	PIGNONE	GEAR				
8	DISTANZIALE	SPACER	DISTANZRING	DISTANTIAL	DISTANCIADOR	ESPAÇADOR
9	CUSCINETTO	BEARING	LAGER	ROULEMENT	COJINETE	MANCAL
10	AN. DI TENUTA	OILSEALS	SIMMERRINGE	JOINT D'ÉTANCHÉITÉ	ANILLO DE RETENCIÓN	ANEL RETENTOR
11	AN. DI TENUTA	OILSEALS	SIMMERRINGE	JOINT D'ÉTANCHÉITÉ	ANILLO DE RETENCIÓN	ANEL RETENTOR
12	CUSCINETTO	BEARING	LAGER	ROULEMENT	COJINETE	MANCAL
13	CUSCINETTO	BEARING	LAGER	ROULEMENT	COJINETE	MANCAL
13C	CUSCINETTO	BEARING	LAGER	ROULEMENT	COJINETE	MANCAL
14	AN. SEEGER	SNAP RING	SEEGERRING	ANNEAU D'ARRÊT	ANILLO SEEGER	ANEL ELÁSTICO
15	FLANGIA FAM	MOTOR CONNECTION FLANGE	MOTORFLANSCH	BRIDE ACCOUPLE-MENT MOTEUR	BRIDA CONEXIÓN MOTOR	FLANGE ACOPLAGEM MOTOR
16	LINGUETTA	TAB	LASCHE	LANGUETTE	LENGUETA	LINGUETA

SR	Cuscinetti / Bearings / Kugellager Roulements / Cojinetes / Rolamentos				Anelli di tenuta / Oilseals / Simmerringe Joints d'étanchéité / Anillos de retención / Retentores	
	9	12	13	13C	10	11
63	16007	16003	HK 1812	16004	30x62x7 BASL	20x42x7 BASL
71	16009	16004	6005	16005	45x75x8 BASL	25X47x7 BASL
80	16011	16005	6008	6008	45x90x10 BASL	40x68x10 BASL
100	6213	16007	6009	6009	65x120x12 BASL	45x75x10 BASL

NOTE	NOTES	ANMERKUNG
NOTES	NOTAS	NOTAS

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RIDUTTORI	*GEARBOXES*
MOTORIDUTTORI	*GEARED MOTORS*
VARIATORI MECCANICI	*MECHANICAL VARIATORS*
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ITALIA *ITALY*
SEDE e STABILIMENTO *HEADQUARTERS*

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