

## INSTRUCTION MANUAL

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### INDUSTRIAL PERISTALTIC PUMPS MODEL RBT-80

This manual forms an integral part of the pump and must accompany it until its demolition. The series RBT peristaltic pump is a machine destined to work in industrial areas and as such the instruction manual must form part of the legislative dispositions and the applicable technical standards and does not substitute any installation standard or eventual additional standard.

#### GENERAL SAFETY WARNING

Pumps are machines that due to their functioning under pressure and moving parts can present dangers.

- Improper use
- Removing the protections and/or disconnecting the protection device
- The lack of inspections and maintenance

#### CAN CAUSE SERIOUS DAMAGE OR INJURY

The person in charge of safety should therefore guarantee that

- The pump is transported, installed, put in service, used, maintained and repaired by qualified personnel who should therefore possess:

- Specific training and sufficient experience.
- Knowledge of the technical standards and applicable laws.
- Knowledge of the general national and local safety standards and also of installation.

Any work carried out on the electrical part of the pump should be authorised by the person responsible for safety. Given that the pump is destined to form part of an installation, it is the responsibility of whoever supervises the installation to guarantee absolute safety, adopting the necessary measures of additional protection.

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## TRANSPORT, STORAGE and ELEVATION

### TRANSPORT

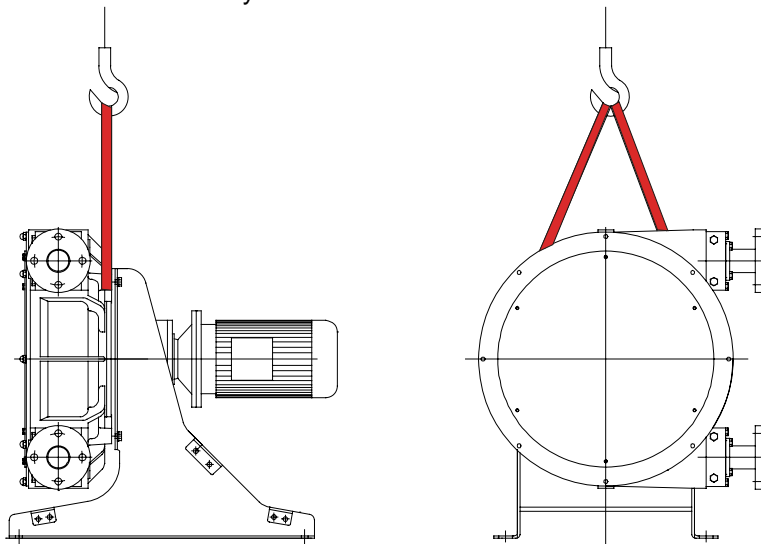
- The pump is protected by wood packaging.
- The packaging materials are recyclable.

### STORAGE

- Avoid areas open to inclement weather or excessive humidity.
- For storage periods of longer than 60 days, protect the coupling surfaces (clamps, reducers, and motors) with adequate anti-oxidant products.
- Spare tubes should be stored in a dry place away from direct light.

### ELEVATION

- It's necessary to use elevation belts for the transport and the elevation of the pump. In the next figure it's shown the way to use the elevation belts:



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## GENERAL SAFETY STANDARDS

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- The instructions of this manual, whose inobservance is determined as a failure to meet safety standards, are identified by this symbol



- The instructions of this manual, whose inobservance compromises electrical safety, are identified by this symbol.

WARNING!

- The instructions of this manual, whose inobservance compromises the correct working of the pump, are identified with this symbol.

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Do not start the pump without first having installed the front cover.



For any manipulation of the equipment, it is necessary to make certain that the pump is stopped and the electricity supply disconnected.



Changing the hose should be done with the pump stopped.

WARNING!

Do not exceed the nominal pressure, speed or temperature of the pump, or use the pump for applications other than that originally planned without first consulting the manufacturer or distributor.

**WARNING!**

Cleaning the pipe, including the hose, should be done with fluids compatible with the mentioned drive pump and at its maximum temperature recommended.

**WARNING!**

Do not start the pump without it being properly secured to the floor.



Do not carry out any maintenance operations or dismantle the pump without first making sure that the pipes are not under pressure and are empty or isolated.



The start system of the motor should be provided with a direction inverter, stop-go button and emergency stop button (together with the pump), in such a way that the pump can be manipulated with total safety.



As the peristaltic pump is volumetric and its functioning is positive displacement, it is necessary to prevent a possible overload of pressure, due to for example, the accidental closure of a valve. For this reason it is advisable to fit a safety device such as: a safety valve, pressure limiter, etc. ...



Check the turning direction of the pump, as it is reversible it could generate pressure in the suction and compromise the safety of the installation. The circulation of the fluid should be in the same direction as the turning direction of the pump as seen from the inspection plate situated on the front cover.



The durability of the hose can not be defined precisely so it is necessary to foresee the possibility of a rupture and subsequent leakage of fluid. If the tube rupture detection probe is fitted (optional part), it can cause the pump to stop or actuate an electric valve.



As the hose having an indeterminate life, and due to the possibility of its breakage or deterioration, the user is responsible for the prevention of a possible (although most unlikely) incorporation of breaks from the hose into the product being pumped, once the breakage phase or its deterioration has begun, either by means of filtration or a detection and removal of the possible breaks.



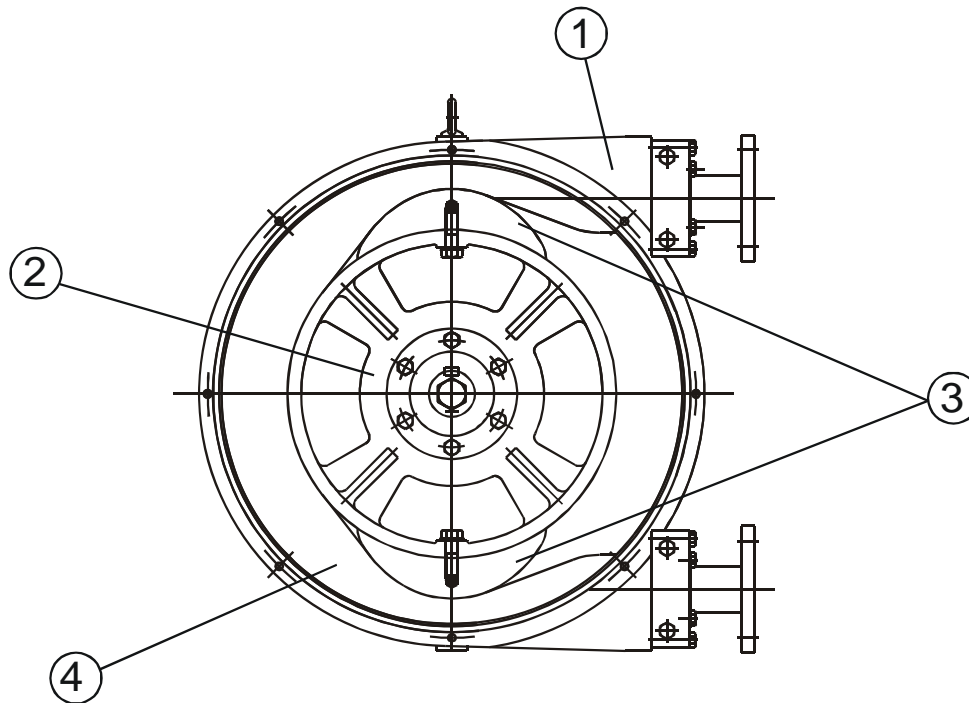
For C.I.P., or S.I.P. process, or similar, it's necessary to contact with the manufacturer, because it's necessary to use a determinate installation, and cleaning conditions.

## GENERAL DESCRIPTION

### PERISTALTIC PUMP

- **Construction of the pump.**

The outer casing terminates with flanged connections. Inside the casing are found the rotor, completed with two shoes. As this is revolving it compresses the reinforced tube and in this way generates a pumping action. A change in the direction of rotation will give rise to a change in direction of the pumped fluid.

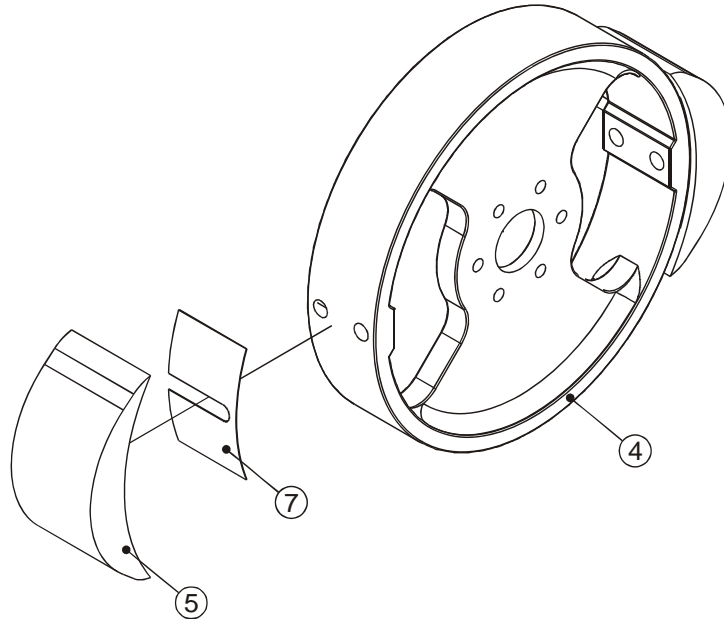


## INSTALLATION

- Installation should normally be made in a well-ventilated area away from heat sources. If it is necessary to place the pump outside it should be provided with a cover to protect it from sunlight and inclement weather.
- The positioning of the pump should allow easy access for all kinds of maintenance operations.
- **Suction.** The pump should be as near as possible to the supply of liquid so that the suction pipe is as short and straight as possible. The suction pipe should be perfectly airtight and made of suitable material so that it does not collapse due to the internal drop in vacuum. The minimum diameter should be similar to that of the tubular element. With viscous fluids a larger diameter is recommendable. (Consult manufacturer or distributor). The pump has automatic suction and does not need an inlet valve. The pump is reversible, and so the suction connection can be either one of the two. (Normally the one, which adapts itself physically better to the installation, would be chosen). It is recommendable to use a flexible connection between the piping and the collars of the pump in order to avoid the transmission of vibration to the piping.
- **Impulsion.** To reduce power being absorbed, use the straightest and shortest piping possible. The diameter should be the same as the nominal diameter of the pump, excepting precise calculations of load losses. With viscous fluids a bigger diameter is needed. (Consult the manufacturer or distributor). Connecting the fixed piping to the pump with a length of flexible pipe facilitates maintenance and avoids vibrations and loads on the pump. Fix the piping firmly. The impulsion is slightly pulsatory: To avoid such effect, it is advisable to install adequate pulsation dampeners. (See accessories.)

## PRESSURE ADJUSTMENT

The peristaltic pump includes shims (Figure 7), that are used to adjust the exact pressing distance of the shoe (figure 5).



The shims are installed from factory to work at the work conditions indicated (in function of the speed and the work pressure), and following the next tables:

Rpm	0-19	20-39	40-59	60-79	80-99
Bar					
0,5	3	2	1	0	0
2,5	4	3	2	1	--
5,0	6	5	4	3	--
7,5	7	6	5	--	--
10,0	9	8	7	--	--
12,5	10	9	8	--	--
15,0	12	11	--	--	--

## WORK CONDITIONS

There are limits of temperatures and pressures, in function of the hose selected. Those limits are:

MATERIAL	TEMPERATURE MIN. (°C)	TEMPERATURE MAX. (°C)	AMBIENT TEMPERATURE MIN. (°C)	PRESSURE MAX. (bar)
NR	-20	80	-40	8
NBR	-10	80	-40	8
EPDM	-10	80	-40	8
NR-A	-10	80	-40	8
NBR-A	-10	80	-40	8

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## CHECKS BEFORE SWITCHING ON THE PUMP

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Check that the pumping equipment has not suffered any damage during transportation or storage, any damage should be notified to the supplier immediately.

Check that the network voltage is suitable for the motor.

Make sure that the hose is suitable for the fluid to be pumped and that it will not be chemically affected, check also that the temperature of the fluid does not exceed that recommended.

**Lubrication.** Check that the level of the lubricant in the casing of the pump is correct.(RBT-70 = 25 lts. ). The specially formulated lubricant can be obtained from BOMBAS PERIFLO, S.L. or from the authorised distributor. The use of the aforementioned lubricant ensures a longer life of the pipe.

Check that the protectors of the moving parts are correctly assembled.

Check that the thermal protector corresponds with that of the values on the plate on the motor.

Check that the direction of rotation is the desired one. (rotation test).

Check that the optional electrical components are connected to the control panel and test that they function correctly.

In cases of doubt of the valuation of impulsion pressure (e.g. high viscosity), mount a pressure gauge on the impulsion.

Check in predicted working conditions that the values of flow, pressure and absorbed power of the motor correspond to the project.

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## MAINTENANCE

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Any work carried out on the pump must be done when the pump is stationary and disconnected from the electricity supply.

**Lubrication.** Check that the lubricant level is correct. The correct level is shown on the lower inspection cover installed on the front cover of the body of the pump. Add lubricant as necessary.

Check that the lubricant level in the gear reducer and/or the variator is correct and carry out periodic changes of lubricant according to the maintenance manual.

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## REPOSITIONING OF HOSE - DISMANTLING

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- Firstly, all valves must be closed to prevent losses of the product.
- The outer body of the pump must be drained of all lubricating liquid, removing both the interior drain plug and the upper suction plug. The plugs are found on the back part of the casing.
- Disconnect the suction and outlet pipes.
- Disconnect suction/outlet collars, removing the bolts. At this point the closing rings can remain fixed to the ends of the hose. They can be easily separated by using a flat-ended tool (e.g. a screwdriver) in the groove of the sealing ring to gently open it and then extract it from the hose.
- Start the motor to remove the hose from the body. (The front cover should remain installed).
- See repositioning of hose – fitting.

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## REPOSITIONING OF HOSE - MOUNTING

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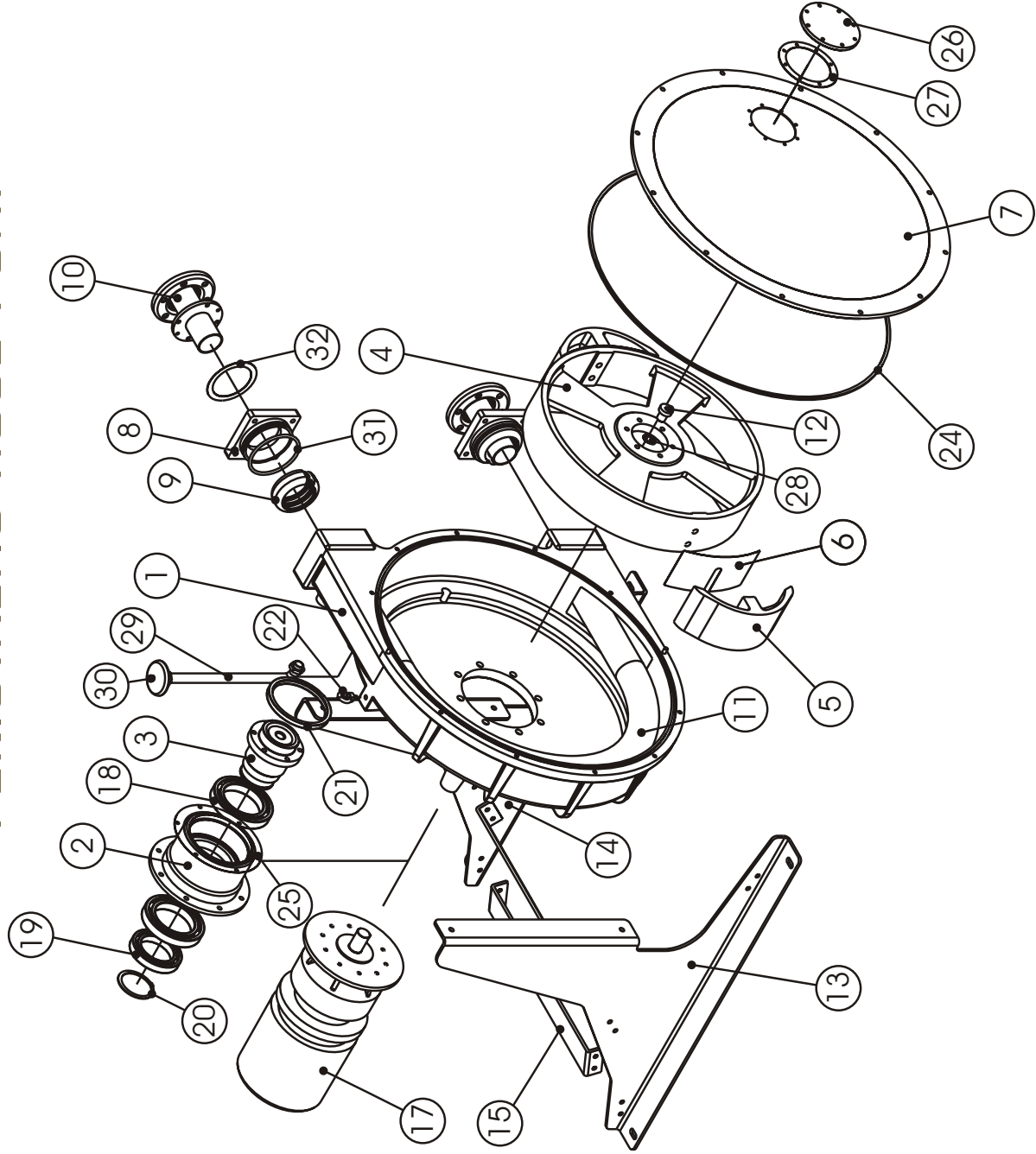
- Clean the internal surfaces of the pump body. All contamination should be removed. Lubricate the internal faces of the body of the pump where there could be friction with the hose. To carry out this operation correctly it is advisable to remove the front cover.
- Inspect the shoe, checking that there is no damage to the pressure surface
- Fit the front cover.
- The exterior surface of the new hose should now be cleaned and lubricated, applying manually one coat of lubricant.
- Insert the hose in the hole of the body without a collar and start the motor to feed the hose through the body of the motor. (It is necessary to carry out this operation with the front cover already installed). Continue until the hose just touches the preinstalled collar. Stop the motor the moment that the collar moves due to the movement of the hose.
- Remove the collar and slide the closing ring over the end of the hose, which will now protrude 10 mm., until the back of the closing ring fits together with the end of the hose.
- Having arrived at this point, the fitting of the collar should be verified and completed. The connection should be pushed inside the collar.
- The mounting of the collar should now be completed carefully bolting it to the casing. Tighten the four bolts of the collar.
- Fix the lower drain plug.
- Fill the body of the pump with lubricant via the upper filling and inspection cover.
- Reconnect suction/outlet pipes.

## PROBLEMS, CAUSES AND SOLUTIONS

PROBLEM	POSSIBLE CAUSE	SOLUCIÓN
<b>Elevated Temperature</b>	Use of non original lubricant Low level of lubricant Elevated temperature of product Poor or bad suction conditions  Excessive number of shims Excessive pumping speed	Use special lubricant PERIFLO Fill according to manufacturer's table Reduce pumping temperature Check there are no obstructions Recalculate sections and lengths Confirm the number of necessary shims Reduce velocity of pump
<b>Reduction of Capacity/pressure</b>	Suction or impulsion valve closed. Insufficient number of shims. Rupture of the hose (the product leaks to the casing) Partial obstruction of suction piping Insufficient product amount in suction reservoir Insufficient diameter of suction piping Excessive length of suction pipe High viscosity of product  Entry of air via the suction connections High pulsation on suction	Open valves Confirm the number of necessary shims Replace hose  Clean piping Fill reservoir Increase section length/reduce pump speed Shorten suction piping Reduce viscosity Increase section length of piping  Confirm that the pump is suitable Tighten collar joints and accessories Mount antipulsation equipment Reconsider application (speed etc.)
<b>Vibrations in Pump and piping</b>	The piping is not correctly fixed together Excessive pumping speed  Insufficient diameter of piping Bedplate of pump loose Elevated pulsation of pump	Refix piping Reduce the speed of the pump  Increase pipe diameter Fix the bedplate firmly Mount suction or outlet antipulsation equipment
<b>Short life of the hose</b>	Chemical attack  High speed of pump High pumping temperature High working pressure  Abnormal elevation of temperature Unsuitable lubricant Insufficient quantity of lubricant Cavitation of the pump	Confirm compatibility of the hose with the pumped fluid and the cleaning fluid  Reduce speed of pump Reduce temperature of product Reduce speed of pump Increase section diameter of piping Check number of shims Use lubricant PERIFLO Top up lubricant Reconsider suction conditions
<b>Stretching of the hose inside the pump</b>	Insufficient lubricant High suction pressures (>3 Bar) Hose full of sediment Brackets insufficiently tightened	Top up lubricant Reduce suction pressure Clean hose Retighten brackets
<b>The pump does not start</b>	Insufficient starter power Insufficient power from frequency converter  Blockage in the pump Misalignment of the equipment	Increase starter power Increase power Check that the voltage is adequate Do not drop below a frequency of 10Hz (confirm this point with the distributor) The starting up will occur at least 10Hz. Check there are no obstructions in the pipe Revise alignment of the pump and motor

# RBT-80

## PERISTALTIC HOSE PUMP



ITEM	DESCRIPTION	Q	CODE
1	Pump body	1	112.00.01
2	Ball bearing box	1	111.00.03
3	Rotor shaft	1	111.00.04
4	Rotor	1	114.00.01
5	Shoe	2	114.00.02
6	Shim		114.00.03
7	Front cover	1	114.00.04
8	Press flange	2	114.00.05
9	Press ring	2	112.00.10
10	Connection flange ANSI DN-65 INOX	2	112.00.12
	Connection flange ANSI DN-65 P P	2	112.00.15
	Connection TRI-CLAMP	2	112.00.43
11	Peristaltic hose NR	1	114.00.18
	Peristaltic hose NBR	1	114.00.19
	Peristaltic hose NBR-A	1	114.00.20
	Peristaltic hose EP DM	1	114.00.21
	Peristaltic hose HY PALON	1	114.00.22
12	Shaft cap	1	111.00.08
13	Base left	1	112.00.24
	Base left S.S.	1	112.00.36
14	Base right	1	112.00.25
	Base right S.S.	1	112.00.37
15	Base middle	3	112.00.26
	Base middle S.S.	3	112.00.38
16	Stud	2	112.00.44
17	Driver	1	
18	Ball bearing anterior	2	111.00.28
19	Ball bearing posterior	1	111.00.29
20	Ring elastic for shaft	1	111.00.30
21	Lip seal box	1	111.00.31
22	Eye bolt	1	112.00.29
23	Drain plug	2	114.00.06
24	O-ring front cover	1	112.00.35
25	Gasket ball bearing box	1	111.00.45
26	Inspection window	1	114.00.11
27	Gasket inspection window	1	114.00.12
28	Gasket shaft	1	111.00.44
29	Air breather tube	1	114.00.07
30	Air breather cap	1	114.00.08
31	O-ring flange	2	114.00.09
32	O-ring connection	2	114.00.10

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**WARRANTY**

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- Periflo warrants its equipment against all defects in materials, manufacturing and workmanship for one year from the date of delivery. This warranty does not include normal wearing items such as the hose or lubricant since their life is highly dependent on the specific operating conditions of the application and installation.
- This warranty is valid as long as the equipment functions within the parameters indicated in the technical information card supplied with every pump or on subsequent changes authorised by PERIFLO.

This warranty includes materials and labor only, and does not include transportation of materials to or from our warehouses in Loveland, Ohio, Transportation charges will be the responsibility of the customer.

**1 - CONDIZIONI DI  
FORNITURA**

I riduttori vengono forniti come segue:

- a) già predisposti per essere installati nella posizione di montaggio come definito in fase di ordine;
- b) **senza olio lubrificante ed internamente protetti con un film d'olio usato per il collaudo finale (tipo SHELL ENSIS OIL N);**
- c) verniciati con vernice di fondo antiossidante all'acqua di colore grigio (tipo Idrayon Primer-Ral 7042/C441). Le superfici di accoppiamento non sono verniciate. La verniciatura finale è a cura del cliente;
- d) collaudati secondo specifiche interne;
- e) appositamente imballati;
- f) provvisti di dadi e bulloni per montaggio motori elettrici versione IEC;
- g) già provvisti di lubrificante per quelli a lubrificazione permanente.

**1 - SUPPLY CONDITIONS**

*Gearboxes are supplied as follows:*

- a) *ready for installation in the mounting position specified on order;*
- b) ***dry; inner parts are protected by a film of the oil used for final testing (type SHELL ENSIS OIL N);***
- c) *painted with antioxidant water primer in the colour grey (type Idrayon Primer-Ral 7042/C441). Mating surfaces are not painted. Final coat is to be applied by the Customer;*
- d) *tested to in-house specifications;*
- e) *suitably packed;*
- f) *complete with mounting nuts and bolts for IEC electric motors;*
- g) *life-lubed gearboxes are factory filled with oil.*

**1 - LIEFERBEDINGUNGEN**

Die Getriebe werden folgendermaßen geliefert:

- a) bereits für die Installation in der Einbaulage gemäß Auftrag bereit;
- b) **ohne Schmieröl und innen mit einem Öl, das für die Endabnahmeprüfung verwendet wurde, überzogen (Typ SHELL ENSIS OIL N);**
- c) mit einer grauen, vor Oxydation durch Wasser schützenden Grundlackierung überzogen (Typ Idrayon Primer Ral 7042/C441). Die Verbindungsflächen sind nicht lackiert. Die Endlackierung geht zu Lasten des Kunden;
- d) gemäß werksinterner Spezifikationen geprüft;
- e) in angemessener Weise verpackt;
- f) mit Muttern und Schrauben für die Montage an Elektromotoren der Version IEC;
- g) die mit Dauerschmierung, bereits mit Schmiermittel ausgestattet.

**1 - CONDITIONS DE  
LIVRAISON**

*Les réducteurs sont livrés comme suit:*

- a) *déjà adaptés pour l'installation dans la position d'assemblage définie en cours de commande;*
- b) ***sans huile lubrifiante et protégés à l'intérieur avec un film d'huile utilisée lors de l'essai final (type SHELL ENSIS OIL N);***
- c) *peints avec une couche de fond de protection antioxydant à l'eau, de coloris gris (type idrayon Primer-Ral 7042/C441). Les surfaces d'accouplement ne sont pas peintes. La peinture de finition doit être réalisée par le client;*
- d) *essayés d'après les spécifications internes;*
- e) *dûment emballés;*
- f) *pourvus d'écrous et de boulons pour l'assemblage aux moteurs électriques, version CEI;*
- g) *déjà pourvus de lubrifiant pour ceux à lubrification permanente.*



## TRASPORTO

Durante il trasporto è norma trattare i riduttori come merce delicata per evitare danni. Durante i trasporti interni dei riduttori sballati, evitare che questi prendano urti per non danneggiare parti esterne delicate.

## STOCCAGGIO

Il corretto stoccaggio dei prodotti ricevuti richiede l'esecuzione delle seguenti attività:

- a) Escludere aree all'aperto, zone esposte alle intemperie o con eccessiva umidità;
- b) Interporre sempre tra il pavimento ed i prodotti, piane lignee o di altra natura, atti ad impedire il diretto contatto col suolo;
- c) Per periodi di stoccaggio superiori ai 60 giorni, le superfici interessate agli accoppiamenti quali flange, alberi e giunti, devono essere protette con idoneo prodotto antiossidante (SHELL ENSIS FLUID SDC od equivalente);
- d) Per periodi di stoccaggio previsti superiori ai 6 mesi, i prodotti devono essere oggetto delle seguenti attività:
  - d1) Ricoprire le parti lavorate esterne e quelle di accoppiamento con grasso atto ad evitare ossidazioni;
  - d2) Posizionare i riduttori con il tappo di sfianto nella posizione più alta e riempirli di olio ad eccezione di quelli con lubrificazione permanente. I riduttori, prima del loro utilizzo, dovranno essere riempiti con la corretta quantità e tipo di lubrificante previsto (vedi pag.35-36)

## SHIPMENT

*Always handle gearboxes as fragile goods during shipment. When moving unpacked gearboxes inside your factory, ensure that they are not subjected to impacts which could damage delicate external components and surfaces.*

## STORAGE

*Observe the following instructions to ensure correct storage of delivered products:*

- a) *Do not store outdoors, in areas exposed to weather or with excessive humidity;*
- b) *Always place boards in wood or other material between floor and products, to avoid direct contact with the floor;*
- c) *For storage periods of over 60 days, all machined surfaces such as flanges, shafts and couplings must be protected with a suitable antioxidation product (SHELL ENSIS FLUID SDC or equivalent product);*
- d) *The following measures must be taken in respect of products for which the expected storage period exceeds 6 months:*
  - d1) *Cover outer machined parts and mating parts with grease to avoid oxidation;*
  - d2) *Position the gearboxes with the breather plug up and fill them with oil (this does not apply to life-lubed gearboxes). Before use, the gearboxes should be filled with the proper amount of lubricant of the recommended type (page 35-36).*

## TRANSPORT

Während dem Transport empfiehlt es sich, die Getriebe mit Sorgfalt und Vorsicht zu behandeln, um Schäden zu vermeiden. Beim werksinternen Transport der schon ausgepackten Getriebe sollte vermieden werden, dass diese Schläge oder Stöße erleiden, welche empfindliche äussere Teile beschädigen könnten.

## LAGERUNG

Die korrekte Lagerung der Antriebe erfordert folgende Vorkehrungen:

- a) Die Produkte nicht im Freien lagern und nicht in Räumen, die der Witterung ausgesetzt sind, oder eine hohe Feuchtigkeit aufweisen;
- b) Die Produkte nie direkt auf dem Boden, sondern auf Unterlagen aus Holz oder einem anderen Material lagern;
- c) Bei Lagerzeiten von mehr als 60 Tagen die Oberflächen für die Verbindung, wie Flansche, Wellen oder Kupplungen mit einem geeigneten Oxidationsschutzmittel behandeln (SHELL ENSIS FLUID SDC oder ein äquivalentes Mittel);
- d) Bei Lagerzeiten von mehr als 6 Monaten müssen folgende Vorkehrungen getroffen werden:
  - d1) Die bearbeiteten Außenteile und die Passflächen mit Oxydationsschutzfett abdecken;
  - d2) Die Getriebe mit der Entlüftungsschraube in der obersten Position ausgerichtet aufstellen und, die mit Dauerschmierung ausgestatteten Getriebe ausgenommen, mit Öl füllen. Die Getriebe müssen vor ihrem Einsatz mit der richtigen Menge des vorgesehenen Schmiermittels aufgefüllt werden (Seite 35-36).

## TRANSPORT

*Durant le transport, il est nécessaire de traiter les réducteurs comme des produits délicats, afin d'éviter tout dommage. Durant les transports internes des réducteurs déballés, éviter que ces derniers ne subissent des chocs pour ne pas endommager les parties externes sensibles.*

## STOCKAGE

*Un stockage correct des produits reçus nécessite de respecter les règles suivantes:*

- a) *Exclure les zones à ciel ouvert, les zones exposées aux intempéries ou avec humidité excessive;*
- b) *Interposer dans tous les cas entre le plancher et les produits des planches de bois ou des supports d'autre nature empêchant le contact direct avec le sol;*
- c) *Pour les périodes de stockage supérieures à 60 jours, les surfaces concernées par les liaisons telles que les brides, les arbres et les accouplements doivent être protégées avec un produit antioxydant spécial (SHELL ENSIS FLUID SDC ou équivalent);*
- d) *Pour les périodes de stockage prévues supérieures à 6 mois, les produits doivent être objet des contrôles suivants:*
  - d1) *Recouvrir les parties extérieures usinées et les éléments d'accouplement avec de la graisse contre l'oxydation;*
  - d2) *Positionner les réducteurs avec le bouchon reniflard le plus haut possible et les remplir d'huile, à l'exception de ceux à lubrification permanente. Avant utilisation, les réducteurs doivent être remplis de la quantité et du type de lubrifiant préconisés (page 35-36).*

#### 4 - LUBRIFICAZIONE (prima della messa in funzione)

La lubrificazione è normale in bagno d'olio. A seconda dell'applicazione se in impianto fisso o su macchina mobile attenersi alle seguenti tabelle:

- 1) Macchine mobili: oli a norme SAE 80 W/90 con caratteristiche API GL5.
- 2) Impianti industriali: oli a norme ISO VG 150 con caratteristiche E.P.

Nella tabella seguente sono riportati le marche più diffuse di lubrificanti con i tipi di oli consigliati per applicazioni normali.

#### 4 - LUBRICATION (prior to start-up)

**Standard lubrication is oilbath. Respect the specifications given below for fixed and mobile machines:**

- 1) *Mobile machinery:*  
SAE 80W/90 oils with API GL5 properties
- 2) *Industrial machinery:*  
ISO VG 150 oils with E.P. properties

*The following table lists the most common brands of lubricant and the types recommended for normal applications.*

#### 4 - SCHMIERUNG (Von Inbetriebnahme)

Die Schmierung erfolgt normal im Ölbad.

Je nach Einsatz, d.h. Festanlage oder bewegliche Maschine, sollte man sich an folgenden Tabellen halten:

- 1) Bewegliche Maschinen:  
Öl gem. Norm SAE 80 W/90 mit Eigenschaften API GL5
- 2) Industrieanlagen:  
Öl gem. Norm ISO VG 150 mit Eigenschaften E.P.

In der nachfolgenden Tabelle sind die üblichsten Schmiermittelmärken aufgeführt, mit Angabe der empfohlenen Ölsorten für normalen Einsatz.

#### 4 - LUBRIFICATION (avant la mise en route)

La lubrification normale s'effectue en bain d'huile.

Selon l'application, installation fixe ou équipement mobile, se reporter aux tableaux suivants:

- 1) *Machines mobiles:*  
Huiles aux normes SAE VG 150 avec caractéristiques API GL5.
- 2) *Installations industrielles:*  
Huiles aux normes ISO VG 150 avec caractéristiques E.P.

Sur le tableau suivant on a reporté les marques les plus répandues de lubrifiants avec les types d'huile conseillés pour des applications normales.

	IMPIANTI INDUSTRIALI / INDUSTRIAL PLANTS INDUSTRIEANLAGEN / INSTALLATIONS INDUSTRIELLES		MACCHINE MOBILI / MOBILE MACHINES BEWEGLICHE MASCHINEN / MACHINES MOBILES	
	norme ISO .. con caratteristiche E.P. ISO standard .. E.P. grade ISO-Normen .. E.P.-Merkmalen normes ISO .. avec caractéristiques E.P.		norme SAE .. con caratteristica API GL5 SAE standard .. API GL5 grade SAE-Normen .. mit API GL5-Merkmalen normes SAE .. avec caractéristiques API GL5	
Temperatura ambiente Ambient temperature Temperaturbereiche Température ambiante	-10°C / +30°C		+20°C / +45°C	
			-10°C / +30°C	+20°C / +45°C
<b>AGIP</b>	ISO VG 150 BLASIA 150 BLASIA S150	ISO VG 220 BLASIA 220 BLASIA S 220	SAE 80W/90 ROTRA MP	SAE 85W/140 ROTRA MP
<b>ARAL</b>	DEGOL BG 150	DEGOL BG 220	GETRIEBEOL HYP	GETRIEBEOL HYP
<b>BP - MACH</b>	ENERGOL GR XP 150	ENERGOL GR XP 220 ERNESYN HTX 220	HYPOGEAR EP	HYPOGEAR EP
<b>CASTROL</b>	ALPHA SP 150	ALPHA SP 220	HYPOY	HYPOY
<b>CHEVRON</b>	EDWN.L. GEAR COMPOUND 150	N.L. GEAR COMPOUND 220	UNIVERSAL GEAR LUBRICANTE	UNIVERSAL GEAR LUBRICANTE
<b>ELF</b>	REDUCTELF SP 150	REDUCTELF SP 220	TRANSELF8	TRANSELF8
<b>ESSO</b>	SPARTAN EP 150 GLYCOLUBE 150	SPARTAN EP 220 GLYCOLUBE 220	GEAR OIL GX PONTONIC MP	GEAR OIL GX PONTONIC MP
<b>FINA</b>	GIRAN 150	GIRAN 220		
<b>I.P.</b>	MELLANA 150 PONTIAX HDS	MELLANA 220 PONTIAX HDS	PONTIAX HD	PONTIAX HD
<b>KLÜBER</b>	LAMORA 150 SYNTHESO D150 EP	LAMORA 220 SYNTHESO D220 EP		
<b>MOBIL</b>	MOBILGEAR 629 SHC 629	<b>MOBILGEAR 630</b> SHC 630	MOBILUBE HD	MOBILUBE HD
<b>SHELL</b>	OMALA EP 150 TIVELA OIL WA-SA	OMALA EP 220 TIVELA OIL WB	SPIRAX HD	SPIRAX HD
<b>TOTAL</b>	CARTER EP 150	CARTER EP 220	TRANSMISSION TM	TRANSMISSION TM

— Temperatura sulla carcassa, questa non deve superare nel punto più caldo i 70-75°C

— *The temperature of the gear case, which should not exceed 70-75°C at the hottest point.*

— Gehäusestemperatur, an der Wärmsten Stelle max. 70-75°C.

— *La température sur la carcasse; l'échauffement maximum de celle-ci ne devant pas dépasser les 70-75°C.*

 Oli a base sintetica

 Synthetic oil

 Synthetische Öle

 Huiles à base synthétique

#### LUBRIFICAZIONE FRENI

I freni idraulici a dischi multipli hanno lubrificazione unica con il riduttore.

#### BRAKES LUBRICATION

*The hydraulically operated multidisc brakes are lubricated by the same oil as the gearbox.*

#### BREMSE SCHMIERUNG

Die hydraulischen Lamellenbremsen werden über die Schmierung des Untersetzgetriebes geschmiert.

#### FREINS LUBRIFICATION

*Les freins hydrauliques à disques multiples sont lubrifiés avec la même huile que les réducteurs.*

STADIO RIDUZIONE A VITE SENZA FINE (3/VF) / WORM REDUCTION MODULE (3/VF)  
SCHNECKENÜBERSETZUNGSSTUFE (3/VF) / ETAGE DE REDUCTION A VIS SANS FIN (3/VF)  
STADIO RIDUZIONE AD ASSI ORTOGONALI (3/A) / HELICAL BEVEL REDUCTION MODULE (3/A)  
KEGELRADÜBERSETZUNGSSTUFE (3/A) / ETAGE DE REDUCTION A AXES ORTHOGONAUX (3/A)

Tipo di carico / Type of Load Art der Belastung / Type de charge	0 °C / +20 °C		+20 °C / +40 °C	
	Olio minerale Mineral oil Mineralöl Huile minérale ISO VG	Olio sintetico Synthetic oil Syntheseöl Huile synthétique ISO VG	Olio minerale Mineral oil Mineralöl Huile minérale ISO VG	Olio sintetico Synthetic oil Syntheseöl Huile synthétique ISO VG
Carico leggero / Light load / Leicht / Charge légère	150	150	220	220
Carico medio / Medium load / Normal / Charge moyenne	150	150	320	220
Carico pesante / Heavy load / Schwer / Charge lourde	220	220	460	320

Per applicazioni particolari come temperature particolarmente elevate, requisiti di non infiammabilità dell'olio, ecc. interpellare l'Ufficio tecnico TRASMITAL.

*For particular applications like: high temperature running conditions, nonflammable oil, etc. contact Trasmital Technical Departements.*

Für spezielle Einsatzbedingungen, wie sehr hohe Temperaturen, Notwendigkeit der Verwendung von nicht entflammbarem Öl, usw. setzen Sie sich bitte mit dem technischen Büro von Trasmital in Verbindung.

*Dans le cas d'applications particulières avec des températures élevées...où la non inflammabilité de l'huile est requise,...etc., contacter le service technique TRASMITAL.*

La temperatura massima dell'olio in esercizio continuo non deve comunque superare gli 85°C.

**Maximum operating oil temperature must never exceed 85° C.**

Die maximale Öltemperatur darf im Dauerbetrieb 85°C nicht überschreiten.

*La température maximum de l'huile en fonctionnement continu ne doit de toute façon pas dépasser 85°C.*

**Periflo ships the reducer with lube**

**RIEMPIMENTO**

**FILLING**

**EINFÜLLEN**

**REPLISSAGE**

I riduttori vengono forniti senza olio lubrificante.

**Gearboxes are supplied without oil.**

Die Getriebe werden ohne Schmieröl ausgeliefert.

**Les réducteurs sont livrés sans huile de lubrification.**

Tutti i riduttori sono provvisti dei tappi di carico, livello, sfianto e scarico olio.

**All gearboxes are equipped with filler, lever, breather, and drain plugs. To fill the gearbox secure it in its exact working position, unscrew the oil filler plug, and add oil until it is visible in the level window. The position of the window will obviously depend on whether the unit is mounted horizontally or vertically.**

Alle Getriebe sind mit Füllstopfen, Füllstandanzeige, Entlüftung und Ölabblass ausgestattet. Zum Einfüllen des Öls muss sich das Getriebe in der genauen Betriebsposition befinden, dann den Nachfüllstopfen lösen und bis zum korrekten Füllstand auffüllen, der von der Einbaulage abhängt: senkrecht oder waagrecht. Zum Ablassen des Öl den magnetischen Ablasstopfen entfernen und das Öl abfließen lassen.

*Tous les réducteurs sont équipés de bouchons de remplissage, niveau, reniflard et vidange d'huile.*

Per effettuare il riempimento olio occorre avere il riduttore nella esatta posizione di funzionamento, svitare il tappo di carico olio e riempire fino al livello la cui posizione dipende dal tipo di montaggio: orizzontale o verticale.

**To drain, remove the magnetic drain plug and drain off oil. If possible, drain while the oil is hot and remove the filler plug from the top of the gearbox to give optimum oil flow.**

Dieser Vorgang ist einfacher, wenn das Öl noch warm ist und bei abgeschraubtem Nachfüllstopfen, damit die Luft besser nachfließt.

*Pour effectuer le remplissage d'huile il faut présenter le réducteur dans la position exacte de fonctionnement, dévisser le bouchon de remplissage d'huile et remplir jusqu'au niveau dépendant du type de montage: horizontal ou vertical.*

Per lo scarico svitare il tappo di scarico magnetico e lasciare defluire l'olio.

Per agevolare l'operazione sarebbe meglio che l'olio fosse ancora caldo e che si sia smontato anche un tappo posizionato in alto nel riduttore per avere una circolazione di aria.

*Pour la vidange dévisser le bouchon magnétique de vidange et laisser couler l'huile. Pour faciliter l'opération il est préférable que l'huile soit encore chaude et qu'un autre bouchon positionné en hauteur soit ôté pour permettre une circulation d'air.*

NOTA: per i riduttori con freno, la lubrificazione del freno è comune a quella del riduttore.

*Note: In gearboxes with brakes, brake lubrication is provided by the gearbox lubricant.*

Anmerkung: Für Getriebe mit Bremse, entspricht die Schmierung der Bremse auf jeden Fall der Getriebeschmierung.

*NOTA: Pour les réducteurs équipés de frein, la lubrification de ce dernier est commune avec celle du réducteur.*

**POSIZIONE TAPPI OLIO**

**PLUG POSITIONS**

**POSITION DER SCHRAUBEN**

**POSITIONS DES BOUCHONS**

(FIG.32)

- |                          |                           |
|--------------------------|---------------------------|
| <b>TUTTI I RIDUTTORI</b> | <b>ALL GEARBOXES</b>      |
| 1 Tappo carico e sfiato  | Filling/breather oil plug |
| 2 Tappo di livello       | Oil level plug            |
| 3 Tappo scarico          | Oil draining plug         |
| 4 Comando freno          | Brake port                |

- |                                      |                                 |
|--------------------------------------|---------------------------------|
| <b>RIDUTTORI LINEARI AD 1 STADIO</b> | <b>1 STAGE INLINE GEARBOXES</b> |
| 1A Tappo carico e sfiato             | Filling/breather oil plug       |
| 3A Tappo scarico                     | Oil draining plug               |

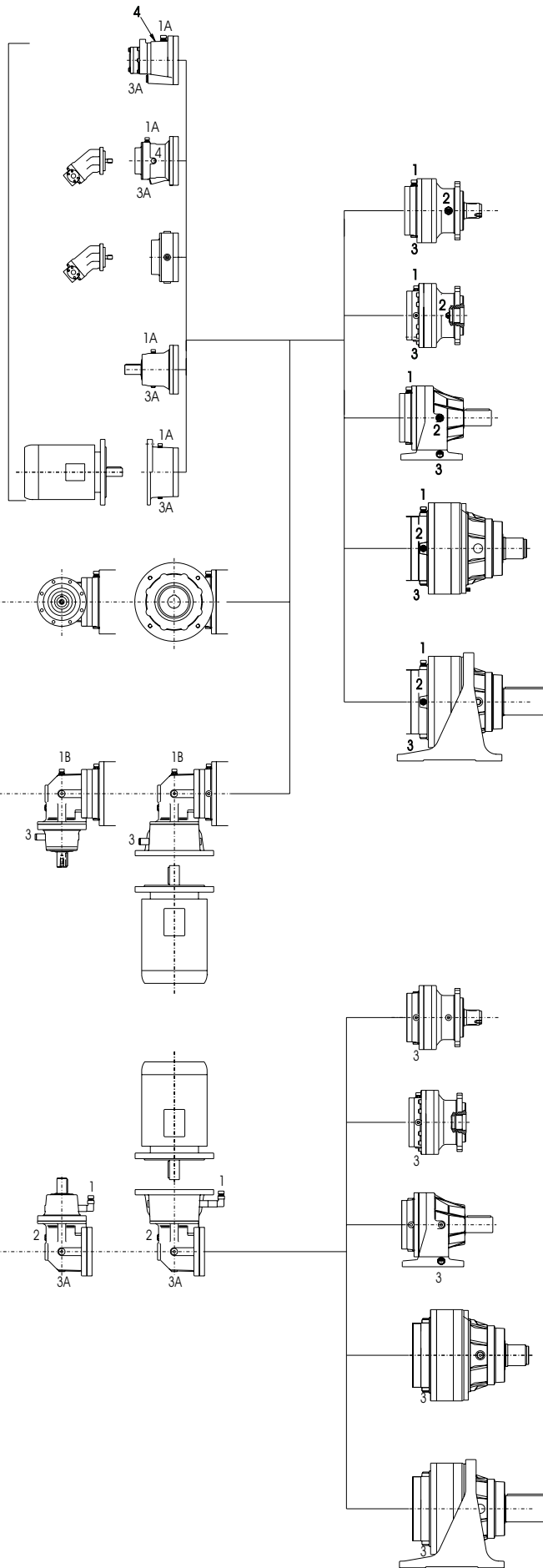
- |                                    |                                      |
|------------------------------------|--------------------------------------|
| <b>RIDUTTORI LINEARI A 2 STADI</b> | <b>2 STAGE RIGHT ANGLE GEARBOXES</b> |
| 1b Tappo carico e sfiato           | Filling/breather oil plug            |
| 3A Tappo scarico                   | Oil draining plug                    |

- |                              |                                     |
|------------------------------|-------------------------------------|
| <b>ALLE GETRIEBE</b>         | <b>TOUTES REDUCTEURS</b>            |
| 1 Einfüll-und Ablassschraube | Bouchon de remplissage et reniflard |
| 2 Ölstandschrabe             | Bouchon de niveau                   |
| 3 Ölablasschrabe             | Bouchon de vidange                  |
| 4 Bremsöffnung               | Commande frein                      |

- |                                     |                                                      |
|-------------------------------------|------------------------------------------------------|
| <b>LINEAR GETRIEBE MIT 1 STUFEN</b> | <b>REDUCTEURS COAXIALE AVEC 1 TRAIN DE REDUCTION</b> |
| 1A Einfüll-und Ablassschraube       | Bouchon de remplissage et reniflard                  |
| 3A Ölablassschraube                 | Bouchon de vidange                                   |

- |                                          |                                                               |
|------------------------------------------|---------------------------------------------------------------|
| <b>RECHTWINLIG GETRIEBE MIT 2 STUFEN</b> | <b>REDUCTEURS A RENVOI D'ANGLE AVEC 2 TRAINS DE REDUCTION</b> |
| 1B Einfüll-und Ablassschraube            | Bouchon de remplissage et reniflard                           |
| 3A Ölablassschraube                      | Bouchon de vidange                                            |

**A**  
**E**



**B1**  
**B3**  
**I1**  
**I3**

**B2**  
**I2**

**B0**  
**I0**

**300-307**

**309-321**

**300-307**





**309-321**

**QUANTITÀ OLIO (l)**  
**Serie 3\_L e 3\_R**

**OIL QUANTITY (l)**  
**3\_L and 3\_R Series**

**SCHMIEROLMENGE (l)**  
**Serie 3\_L und 3\_R**

**QUANTITÉ D'HUILE (l)**  
**Série 3\_L et 3\_R**

Tipo/Type Typ/Type		3_L 				3_R 					
		Posizione di montaggio Mounting position Einbaulagen Position de montage 			VK	Posizione di montaggio Mounting position Einbaulagen Position de montage 			VK		
		A	T	O	T	BO	U	P	U		
300	L1	0.6	1.0	0.9		300	R2	1.2	1.7	1.5	
	L2	0.9	1.3	1.2			R3	1.5	2.0	1.8	
	L3	1.2	1.6	1.5			R4	1.8	2.3	2.1	
	L4	1.5	1.9	1.8							
301	L1	0.8	1.2	1.1		301	R2	1.6	2.1	1.9	
	L2	1.1	1.5	1.4			R3	1.9	2.4	2.2	
	L3	1.4	1.8	1.7			R4	2.2	2.7	2.5	
	L4	1.7	2.1	2.0							
303	L1	1.3	2.3	2.0	2.8	303	R2	2.2	2.8	2.6	3.3
	L2	1.6	2.6	2.3	3.1		R3	2.5	3.1	2.9	3.6
	L3	1.9	2.9	2.6	3.4		R4	2.8	3.4	3.2	3.9
	L4	2.2	3.2	2.9	3.7						
305	L1	1.6	2.6	2.4	3.1	305	R2	2.5	3.1	2.9	3.6
	L2	2.1	3.1	2.9	3.6		R3	3.0	3.6	3.4	4.1
	L3	2.4	3.4	3.2	3.9		R4	3.3	3.9	3.7	4.4
	L4	2.7	3.7	3.5	4.2						
306	L1	2.5	3.5	3.2	4.5	306	R2	4.0	5.0	4.8	6.0
	L2	3.3	4.3	4.0	5.3		R3	4.8	5.8	5.6	6.8
	L3	3.6	4.6	4.3	5.6		R4	5.1	6.1	5.9	7.1
	L4	3.9	4.9	4.6	5.9						
307	L1	3.5	5.0	4.5	6.0	307	R2	6.0	8.0	7.0	9.0
	L2	4.5	6.0	5.5	7.0		R3	7.0	9.0	8.0	10.0
	L3	5.0	6.5	6.0	7.5		R4	7.5	9.5	8.5	10.5
	L4	5.3	6.8	6.3	7.8						
309	L1	4.0	5.5	5.0	6.5	309	R2	6.5	8.5	7.5	9.5
	L2	5.0	6.5	6.0	7.5		R3	7.5	9.5	8.5	10.5
	L3	5.5	7.0	6.5	8.0		R4	8.0	10.0	9.0	11.0
	L4	5.8	7.3	6.8	8.3						
310	L1	5.0	6.5	6.0	8.5	310	R3	11.0	13.0	12.0	15.0
	L2	6.3	7.8	7.3	9.8		R4	12.0	14.0	13.0	16.0
	L3	7.1	8.6	8.1	10.6						
	L4	7.4	8.9	8.4	10.9						
311	L1	7.0	12.0	10.0	14.0	311	R2	14.0	19.0	17.0	21
	L2	9.0	14.0	12.0	16.0		R3	16.0	21	19.0	23
	L3	10.0	15.0	13.0	17.0		R4	17.0	22	20	24
	L4	10.5	15.5	13.5	18.0						
313	L1	9.0	14.0	12.0	16.0	313	R2	16.0	21	19	23
	L2	11.5	16.5	14.5	19.0		R3	19.0	24	22	26
	L3	12.5	17.5	15.5	20		R4	20	25	23	28
	L4	13.0	18.0	16.0	21						
315	L1	15.0	23	19.0	26	315	R3	27	35	31	38
	L2	19.0	27	23	30		R4	30	38	34	41
	L3	21	29	25	32						
	L4	22	30	26	33						
317	L1	20	35	30		317	R3	38	52	48	
	L2	26	41	36			R4	42	56	52	
	L3	29	44	39							
	L4	30	45	40							
319	L1	25	45	38							
	L2	35	55	48							
	L3	40	60	53							
	L4	43	63	56							
321	L1	30	50	43							
	L2	45	65	58							
	L3	51	71	64							
	L4	55	75	68							

N.B. Le quantità d'olio sono indicative. Verificare l'esatto livello al momento del riempimento tramite l'apposito tappo.

N.B. Oil quantities are indicative. Check actual level after filling through the appropriate plug.

Achtung! Die Angabe bezüglich Ölmenge sind Richtwerte. Der Ölstand soll während des Einfüllens anhand des Ölstandstopfens überprüft werden.

N.B. Les quantités d'huile sont indicatives. Vérifiez la quantité correcte de lubrifiant selon le niveau d'huile.

## 5 - MESSA IN FUNZIONE

Prima di avviare il riduttore controllare:

- Esatto posizionamento tappi olio.
- Tappo sfiato che non sia ostruito da sporcizia o vernice. La sua chiusura provoca sovrappressione all'interno del riduttore con conseguente espulsione degli anelli di tenuta.
- Avviare il riduttore possibilmente senza carico e quando è possibile a bassa velocità.
- Verificare che il funzionamento sia regolare ed in assenza di eccessiva rumorosità.

Dopo le prime ore di esercizio verificare:

- Temperatura sulla carcassa, questa non deve superare nel punto più caldo i 70-75°C.
- Esatto serraggio viti.

## 5 - START-UP

*Before starting the gearbox, check the exact position of the oil plug and check that the breather is not blocked by dirt or paint.*

*If the breather is blocked, pressure can build up inside the gearbox and blow out the seal rings.*

*If possible, start up the gearbox without load and at low speed.*

*Check that the gearbox runs smoothly and does not generate excessive noise;*

*After the first few hours operation, check the temperature of the gearbox casing.*

*At its hottest point it should not exceed 70°-75°C.*

*Also check that all bolts are tight.*

## 5 - INBETRIEBNAHME

Von Inbetriebnahme des Getriebes folgendes kontrollieren:

- Korrekte Position des Ölstopfens.
- Entlüftungsstopfen darf nicht von Schmutz oder Lack verstopft sein. Ist er geschlossen, dann führt dies zu Überdruck im Getriebe und die Dichtringe lösen sich.
- Das Getriebe möglichst ohne Last und, falls möglich, mit geringer Geschwindigkeit anfahren.
- Kontrollieren, ob der Betrieb gleichmäßig und ohne Störgeräusche erfolgt.

Nach den ersten Betriebsstunden:

- Temperatur am Gehäuse prüfen: sie darf an der heißesten Stelle 70-75°C nicht überschreiten.
- Prüfen ob alle Schrauben gut angezogen sind.

## 5 - MISE EN ROUTE

Avant la mise en route, vérifier:

- La position exacte des bouchons.
- Que le bouchon reniflard ne soit pas obstrué par des impuretés ou de la peinture. Son obstruction provoque une surpression à l'intérieur du réducteur avec pour conséquence l'extrusion des bagues d'étanchéité.
- Procéder au démarrage du réducteur si possible à vide et éventuellement à basse vitesse.
- Vérifier que le fonctionnement est normal et sans bruit excessif.

Après les premières heures de fonctionnement, vérifier:

- La température sur le carter - celle-ci ne doit pas dépasser au point le plus chaud 70-75°C.
- Le bon serrage des vis.

## 6 - MANUTENZIONE

In condizioni di normale esercizio il riduttore non necessita di manutenzione.

Sono solo da effettuare le normali verifiche di livello e cambio olio come segue:

### Cambio olio

Effettuare il primo cambio olio circa dopo 100÷150 ore di lavoro.

Successivamente effettuare il cambio ogni 2000÷3000 ore a seconda degli impieghi o almeno una volta all'anno.

È buona norma comunque controllare il livello una volta al mese per funzionamento intermittente, più frequentemente per funzionamento in continuo e aggiungere olio se necessario.

**Nota:** è sempre opportuno procedere al cambio degli anelli di tenuta, quando:

- l'anello di tenuta viene smontato;
- quando si fa una revisione del riduttore;
- riposizionare l'anello di tenuta in modo che il labbro di tenuta del nuovo anello non lavori sulla stessa pista di scorrimento dell'anello precedente.

**Nota:** se il riduttore dovesse rimanere fermo per lunghi periodi si consiglia di riempirlo completamente di olio che sarà riportato al giusto livello quando questo verrà rimesso in esercizio.

## 6 - MAINTENANCE

**Gearboxes are virtually maintenance free under normal operating conditions. The only periodic operations required are checks on oil level and oil changes as follows:**

### Oil Changes

**Change the oil first after 100-150 hours operation.**

**Subsequently, change the oil only every 2000-3000 hours operation depending on application. Alternatively change oil once a year.**

**Check the oil level in the gearbox every month and top up as necessary.**

**Note:** We recommend that you also change the oil seals on the following occasions:

- whenever the seal rings are removed;
- whenever the gearbox is serviced/reconditioned;
- at least once a year with electric motor drives.

*When fitting new seals, avoid locating the lip of the new seal in exactly the same place as that of the old seal.*

**Note:** Fill a gearbox completely with oil before any long idle period. Drain to the normal level prior to re-starting operation.

## 6 - WARTUNG

Unter normalen Betriebsbedingungen bedarf das Getriebe keiner Wartung. Nur der Ölstand sollte regelmässig geprüft und das Öl muss gewechselt werden:

### Ölwechsel

Den ersten Ölwechsel nach ca. 100-150 Betriebsstunden vornehmen, dann alle 2000 bis 3000 Betriebsstunden je nach Einsatz, oder mindestens einmal im Jahr. Es empfiehlt sich, die Ölstand einmal im Monat zu kontrollieren und, falls nötig, nachfüllen.

**Anmerkung:** Es ist stets empfehlenswert, die Dichtringe auszutauschen, wenn:

- der Dichtring ausgebaut wird
- wenn das Getriebe überholt wird
- bei Antrieb mit Elektromotor mindestens einmal jährlich.

Den Dichtring so einsetzen, daß die Dichtlippe des neuen Rings nicht an der gleichen Stelle ansetzt, wie jene des alten Rings.

**Anmerkung:** Sollte das Getriebe über längere Zeiträume stehen, dann wird empfohlen, es vollständig mit Öl zu füllen und den korrekten Füllstand erst bei erneuter Inbetriebnahme wiederherzustellen.

## 6 - ENTRETIEN

Dans les conditions normales d'utilisation le réducteur ne nécessite pas d'entretien. Seul sont à effectuer les contrôles habituels de niveau et la vidange de l'huile comme suit:

### Vidange d'huile

Effectuer la première vidange après 100/150 heures de travail environ.

Puis successivement toutes les 2000-3000 heures selon le type d'utilisation ou au minimum une fois l'an.

Il est toutefois conseillé de contrôler le niveau une fois par mois et faire l'appoint d'huile si nécessaire.

**Remarque:** Il est toujours opportun de procéder au changement des joints d'étanchéité, lorsque:

- Le joint a été démonté.
- On procède à une révision du réducteur.

Replacer le nouveau joint de façon que les bords ne travaillent pas sur la même piste de glissement que le joint précédent.

**Remarque:** Si par nécessité le reducteur devait rester arrêté pour de longues périodes, il est conseillé de remplir complètement d'huile.

La mise à niveau sera effectuée lors de la remise en route du réducteur.