

3 Intended use

The sound enclosure is intended to reduce the sound emission from a rotary blower.

When installed in rotary blower package a compact unit is formed that can be transported by fork truck.

4 Construction

The sound enclosure is supported by the base frame, which also provides the stability for transport.

The enclosure consists of three fixed side panels, one removable access sub-panel and a cover.

The panels are finished by powder coating and are clad with a 40-mm layer of sound damping material.

4.1 Airflow

A fan on the motor draws air into the enclosure through the air inlet opening to provide cooling for the motor and as inlet air for the blower.

A fan mounted in the discharge air deflector strengthens the airflow to improve cooling in the enclosure.

Never block the apertures through improper installation or by objects.

Process air is drawn in through a separate opening or duct. In this case, it must be ensured that the air to be compressed is at ambient temperature.

Reducing the size of the cooling air inlet and exhaust openings will lead to malfunctioning of the blower package and the sound enclosure.

5 Rotary Blower Package Maintenance

Removing the panel gives access to the air filter in the inlet silencer.

Access can also be obtained from here to the terminal box and motor bearing greasing point. The belt tension can be seen and adjusted if necessary.

The air filter service warning indicator can be seen as well as the oil level in the block. The oil can be changed from this position when necessary.

The ventilator fan and terminal box can be accessed.

The function of blow-off and inlet valves can be checked.

The unloaded start valve can be adjusted.

6 Assembly

The sound enclosure is supplied already fitted to the blower.

When placed in position, the following must be carried out:

- Electrical connection to the fan motor in accordance with local regulations and with reference to the electrical diagram.
Ensure that there is no tension on the connecting cable, that it is of sufficient length and that fuses are connected.
(The fan power cable should be of sufficient length to allow the dismantled but still connected fan to be placed on top of the enclosure).
- Attach the collar halves to the compensator hose at the end of the port and fix with counter-sunk screws.

7 Electrical Diagrams

Fan CMP 512 2T (Part No. 893211.0)

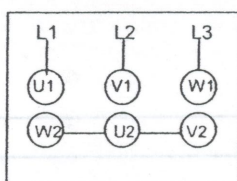
3-phase fan motor

Voltage/frequency: Delta (Δ): 230 V / 50 Hz
Wye (Y): 400 V / 50 Hz

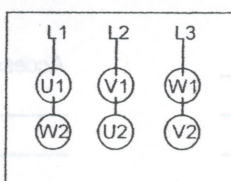
Power: 80 W (50 Hz)
Current: 0.55 A (Δ) (50 Hz) / 0.32 (Y) (50 Hz)
Rated speed: 2850 rpm (50 Hz)
Enclosure protection: IP55
Connection: direct to the motor terminal box

Connection diagram

Wye
Y (400 V)



Delta
 Δ (230 V)



Max. delivery of fan: 475 m³/h (50 Hz)

Connecting Instructions

- The fan motor should be so connected that it runs concurrent with the blower motor.
- Direction of airflow is out of the sound enclosure.
- Make sure that earth is connected. Make sure that cables connected in the terminal box are not under mechanical tension.
(The fan power cable should be of sufficient length to allow the dismantled but still connected fan to be placed on top of the enclosure)
- If the fan stops while the rotary blower is in operation the temperature inside the enclosure can rise to an unacceptable level.
- In such a case, a supply of cooling air must be provided or the blower motor stopped to avoid damage.
- If the fan is arranged to continue running for about 15 minutes after the blower motor has stopped, this improves the thermal conditions in the sound enclosure.

Attention!

The connection to the power supply and protective measures taken must be carried out to the provisions of the local electricity supply authority by a qualified electrician.

14.11.5

Declaration of Contamination
concerning compressors, blowers, vacuum pumps and components

Repair and/or maintenance work will only be carried out on items for which a Declaration of Contamination form has been filled out and attached. **A completed Declaration is required for each item.** Any item not accompanied by a Declaration is liable to be returned untouched. Items that have been contaminated with microbiological, explosive or radioactive substances will only be accepted when accompanied by confirmation that they have been **fully decontaminated** according to regulation. This Declaration may only be filled out and signed by the authorized representative of the ordering party (sender of the item).

Sender/dept.:	_____	Reason for sending the item: _____ _____ _____ _____ _____ (use rear side of form if necessary)
Contact name:	CITY OF IQUALUIT	
Address:	C/O WASTE WATER TREAT.PLANT C/O POTABLE WATER PLANT P.O.BOX 460, IQUALUIT,	
Phone / Fax:	NUNAVUT, XOA OHO	

Specification of the item:

Model/type name: _____
Part no.: _____
Serial no.: _____
Oil used: _____

Accessories: _____

Condition of the item:

	yes	no	not known
- has it been used?	☐	☐	☐
- emptied/vented?	☐	☐	☐
- all openings airtight closed?	☐	☐	☐
- cleaned / decontaminated?	☐	☐	☐

Cleaning substance used: _____

Cleaning method: _____

Information on contaminants:

- with what substances has the item been in contact?

	Trade name	Chemical name	Characteristics
a)			
b)			
c)			
d)			

	yes	no	not known
- Are the substances listed above hazardous to health?	☐	☐	☐
- Are any hazardous substances given off by heating?	☐	☐	☐

Which? _____

We declare that the information given in this declaration is true and complete and that the signatory is authorized and in a position to make this declaration. We are aware of our liability for any damages resulting from false or incomplete information given in this declaration and we engage to hold the contractor free of claims from third parties for compensation for damages resulting from such incomplete or false information.

Name of the authorized signatory (please print): _____

Date _____

Authorized signature _____

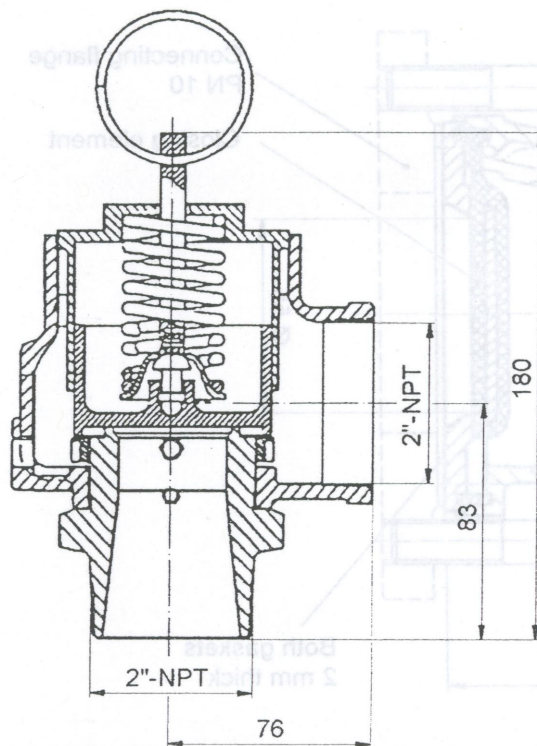
Sender's company seal: _____

Safety Valve for gauge pressure

Part No.: 891514.00520

KAESER
KOMPRESSOREN

Technical Specification



Pressure setting: 520 mbar

0.52 bar

Installation

Installation of the safety valve is only possible in the standing position (see dimensional diagram)

Pressure pipe connection

General

The safety valve serves to protect the rotary blower package against excessive pressure. The medium is blown off into the open. The safety valve must be positioned such that no danger can arise. When the blow off valve opens very high noise levels can occur.

Check the safety valve at regular intervals for correct function by opening with the venting lever. The intervals should be set by the user but must be opened at least once annually.

During the blow off check the working pressure should be at least 80% of the pressure setting. Close the blow off valve immediately after the valve blows off.

If contamination causes the safety valve to leak, the valve could be cleaned by blowing off several times.

Attention!

The safety valve is set to the pressure quoted above and sealed. It is not permitted to change the safety valve setting and any such change invalidates all liability whatever.

14.11.7

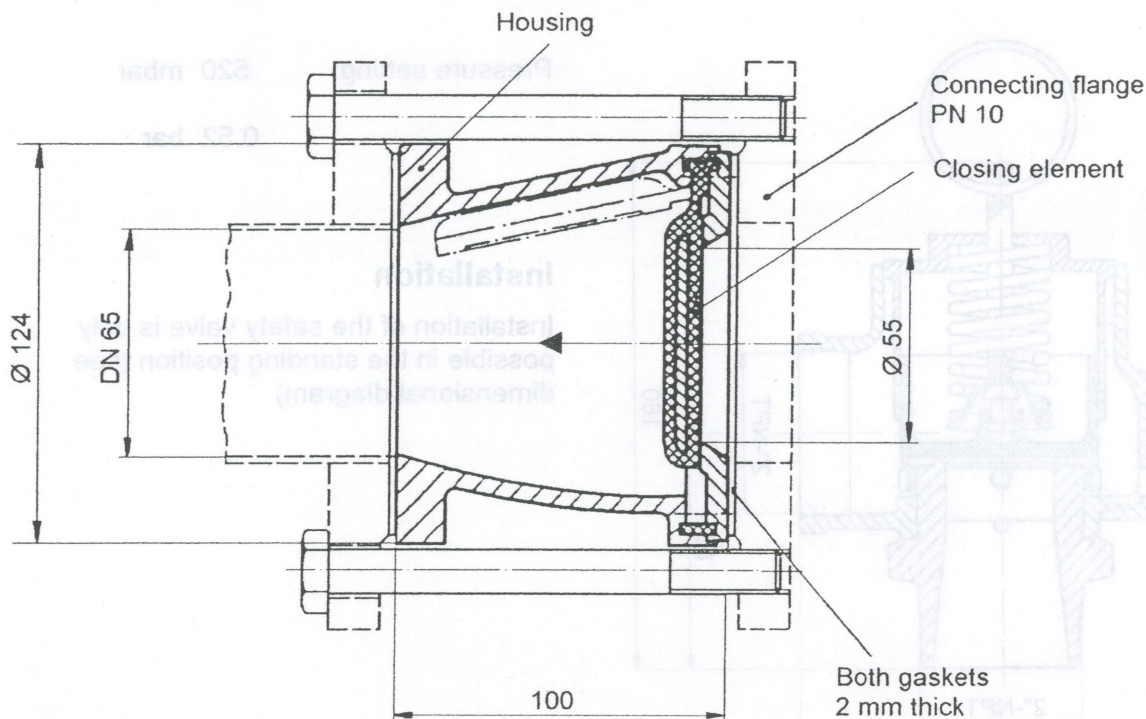
Check Plate

complete with fixing screws
and gaskets

Part No.: 887151.0

KAESER
KOMPRESSOREN

Technical Specification



Description

The heart of the check plate is the closing element together with its vulcanised plate.

The design of the housing, the closing element and its hinge allow 100% free airflow giving extremely low flow resistance and quiet operation.

The check plate cannot block, needs no maintenance and is airtight even with very low back pressure.

Installation

Installation of the check plate is only possible in the horizontal flow direction (in the direction of the arrow). The closing element hinge must be at the top. The upper side of the check plate is marked "TOP".

Fitting

Use a temperature resistant thread sealant (e.g. part no. 9.3001.0 silicone sealant) on the threads of the bolts that fix the check plate to the inlet or discharge flange.

Attention!

Do not tighten the fixing bolts beyond a torque of 70 Nm.

This is sufficient for a proper seal.

The bolts should be tightened evenly and diagonally opposite.

Attention!

Over-tightening can cause damage to the housing.

14.11.8

Maintenance Indicator

For front panel installation

Part No.: 885593.0

Issue: 12/97

Contents:

- 1 Scope of delivery/Spare parts list
- 2 Fitting instructions
- 3 Diagram of connection to blower package
- 4 Function

1 Scope of delivery/Spare parts list

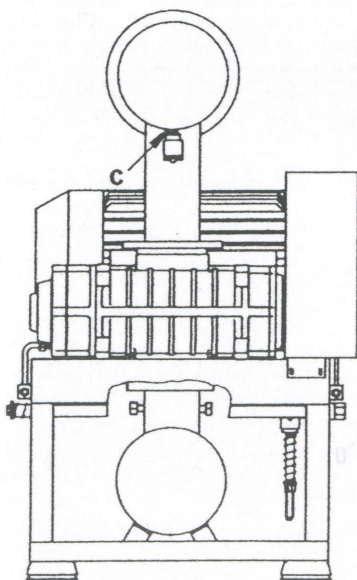
Item No.	No. off	Part No..	Description
1	1	6.0246.0	1/8 Male stud fitting tapered
2	2	9.0675.0	Insert for Tecalan pipe
3	1	9.0616.0	Tecalan pipe 2 m
4	1	885594.0	Fitting for maintenance indicator
5	1	892224.0	Maintenance indicator

2 Fitting instructions

Attention! Carry out this work when the package is shut down only!

- 2.1 Remove the plug at test point "c" on the blower package
- 2.2 Screw in the male stud fitting (item 1) and seal with liquid sealing material
- 2.3 Push the insert (item 2) into one end of the Tecalan pipe (item 3) and fit into the male stud fitting (item 1)
- 2.4 Fit the fitting (item 4) to the maintenance indicator (item 5)
- 2.5 Prepare the connecting point of the maintenance indicator (item 5) to the blower package (if not already done) by removing the cover and any foam behind the cover
- 2.6 Pull off the snap ring from the maintenance indicator (item 5) and insert the ring from the front into the 55mm diameter hole provided. Push the maintenance indicator into the snap ring from the rear
- 2.7 Push the second insert (item 2) into the free end of the Tecalan pipe (item 3) and connect the pipe to the fitting (item 4)

3 Diagram of connection to blower package



4 Function

If the maintenance indicator moves into the red area the air filter is clogged up and must be serviced. After servicing reset the indicator by pressing the knob.

14.11.9

Pressure Gauge

Part No.: 887177.0

Issue: 2/01

KAESER
KOMPRESSOREN

Contents:

- 1 Scope of Delivery/Spare Parts List
- 2 Installation Instructions
- 3 Diagram showing connection of Measuring Points on the Blower Package

1 Scope of Delivery/Spare Parts List

Item No.	No. off	Order No.	Description
1	1	890458.0	Male stud fitting 1/4 taper
2	2	9.0675.0	Insert for Tecalan pipe
3	1	9.0616.0	Tecalan pipe, 2 m long
4	1	6.1704.0	Pressure gauge fitting
5	1	893235.0	Pressure gauge, 1.6 bar

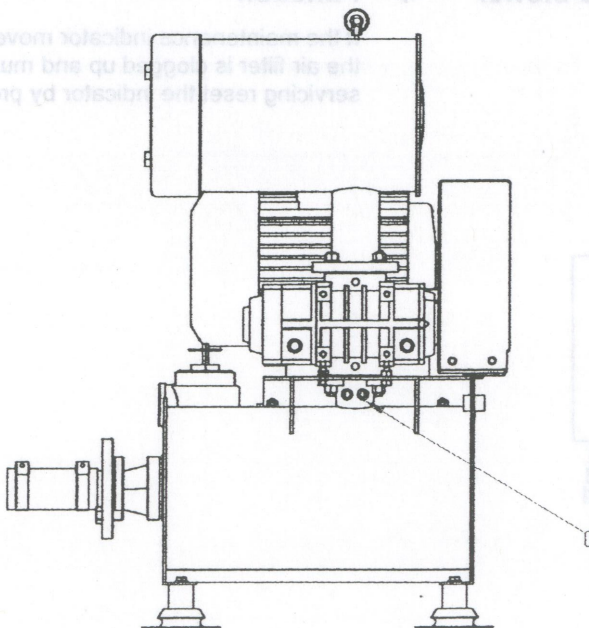
2 Installation Instructions

Attention!

Remove all power from the package before commencing work !

- 2.1 Remove the screw plug at measuring point "a" on the blower package.
- 2.2 Screw in the male stud fitting (item 1) and seal with liquid sealing material.
- 2.3 Push the Tecalan pipe insert (item 2) into one end of the Tecalan pipe (item 3) and fit into the fitting (item 1).
- 2.4 Fit the pressure gauge fitting (item 4) to the gauge (item 5).
Caution! lay in the sealing ring first.
- 2.5 If not already done, prepare the fitting point for the pressure gauge (item 5) by removing the cover and any foam that may be present.
- 2.6 After removing the clamp, push the pressure gauge (item 5) into the 64 mm hole provided and affix with the clamp.
- 2.7 Push the insert (item 2) into the free end of the Tecalan pipe (item 3) and connect the Tecalan pipe to the pressure gauge fitting (item 4).

3 Diagram showing connection of Measuring Points on the Blower Package



14.11.10

SALSNES FILTER

Date of delivery/installation	
Customer	
Salsnes Filter AS representative	
Salsnes Filter unit type/model	
Serial number	

[illegible]

Salsnes Filter
AS/representative

1. Customer
2. Salsnes Filter AS representative/distributor
3. Salsnes Filter AS (manufacturer)

Telephone +47 7427 4860/Fax +47 7427 4859

1 of 1 page(s)

SALSNES FILTER INSPECTION AND MAINTENANCE GUIDE

	Description	Weekly	Monthly	300 hrs	3000 hrs
1	Visual function inspection of the system should be carried out weekly.	x			
2	Remove the lid at the dewatering unit and check that the wedge wire screen is not clogged or damaged. Flush manually if necessary.	x			
3	Inspect the air pressure gauge from the air compressor. Normal pressure is 0.30-0.60 bar, max. 0.6 bar.	x			
4	Check the filter mesh/cloth for damage such as tears, holes etc. and that the air doctor cleans the whole width of the filter mesh/cloth.	x			
5	Check the oil level in the air compressor by controlling the oil level gauge at the back of the air compressor.	x			
6	Inspect that grease or other sediments do not clog the sludge conveyor. (Clean the sludge conveyor manually when necessary)	x			
7	Inspect the compartment and clean manually if necessary.	x			
8	Check the driving belts between the conveyor belt motor and the drive roller, in particular it's condition and tension. Control that the drive roller motor or its gears are not abnormally hot.		x		
9	Inspect and eventually rinse/change the compressor air filter. (If specific conditions appear, and dust is created in the air compressor area or at the air intake, the air filter must be rinsed/replaced each day)		x		
10	Rinse the strainer attached to the water inlet, and inspect the hot water nozzles.		x		
11	Check that the pressure transmitter pipe and the pressure transmitter level indicator are not clogged by fat and grease. Clean carefully if necessary.		x		
12	Lubricate bearings in the drive roller and the flange sealing for the gear on the sludge conveyor (dewatering screw in the sludge compartment).			x	
13	Change the oil in the air compressor.			x	
14	Inspect the wedge wire screen in the dewatering cylinder and the sludge conveyor in the compartment for wear and tear				x
15	Lubrication				x

14.12.1

Salsnes Filter AS, PO Box 279, N-7801 Namsos

14.12.2

Spare Parts
for
Salsnes Filter System[©]
Model
SF6000

76012100_001

21.10.2004



SALSNES FILTER AS
7817 SALSNES

Telephone: +47 74 27 48 60
Fax: +47 74 27 48 59
Email: firmapost@salsnes-filter.no

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1/19

Revisions:

Revision	Changes	Author
001	First version	Svein Storø

Table of content:

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1.1. Complete spare part list	4
1.2. Recommended spare parts for the lifetime of the product.....	5

1. Spare parts SF6000

This documents lists all spare parts for the Salsnes Filter System® SF6000.

It also includes a list of recommended spare parts to keep in stock for the lifetime of the product.

1.1. Complete spare part list

The following attachments gives the position and part no. for all relevant spare parts:

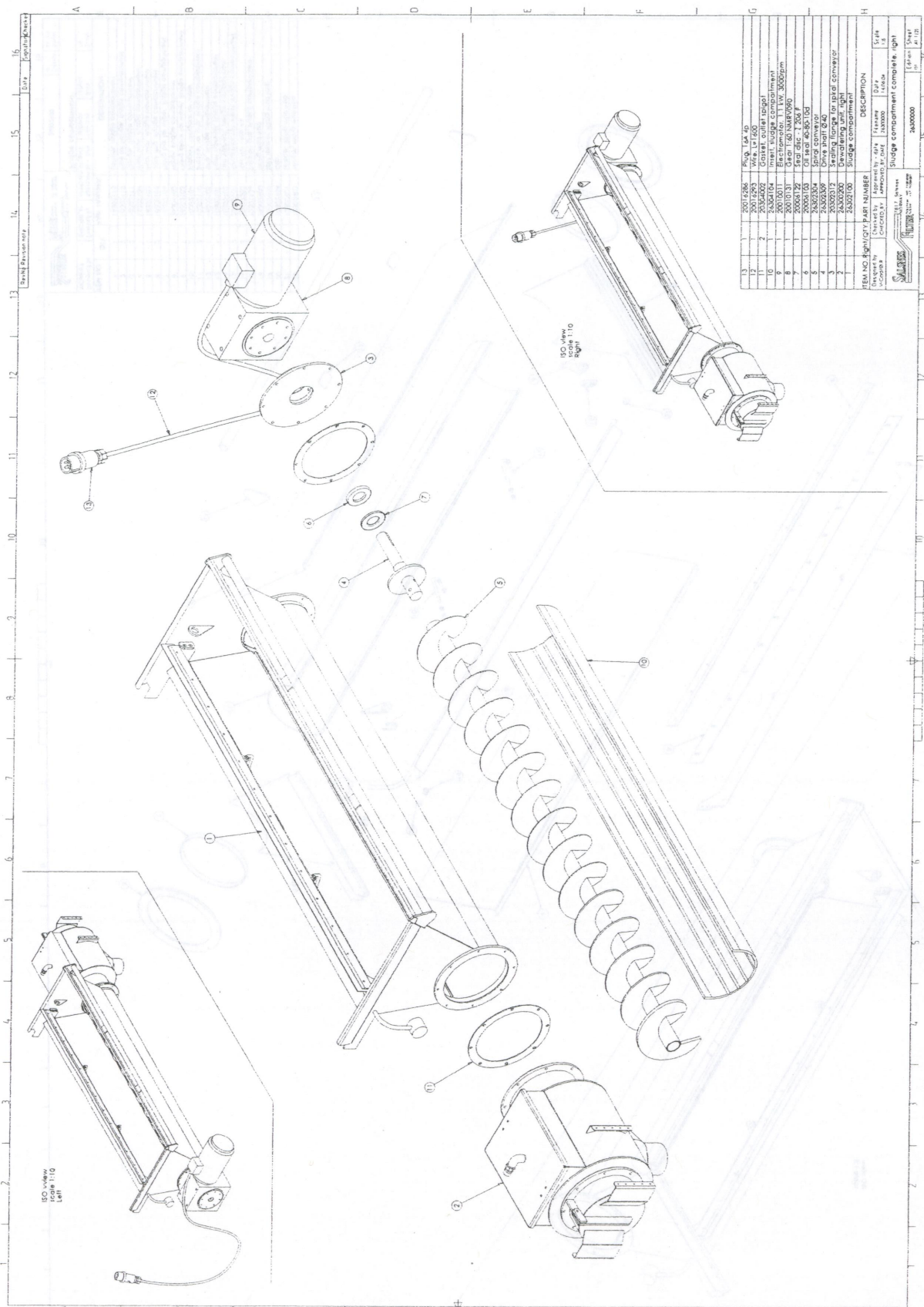
- 26000000LL Spare Parts Main Assembly
- 26200000LL Spare Parts Housing
- 26202101LL Spare Parts Housing Assembly
- 26300000 Spare Parts Sludge Compartment
- 26300200 Spare Parts Dewatering Unit
- 26302100 Spare Parts Sludge Compartment Assembly
- 26400000 Spare Parts Cover
- 26500000 Spare Parts Frame
- 26500100 Spare Parts Frame Assembly
- 26500200 Spare Parts Guiding Roller Complete
- 26500300 Spare Parts Under Roller
- 26500400 Spare Parts Drive Roller Complete
- 26502200 Spare Parts Guiding Roller Assembly

1.2. Recommended spare parts for the lifetime of the product

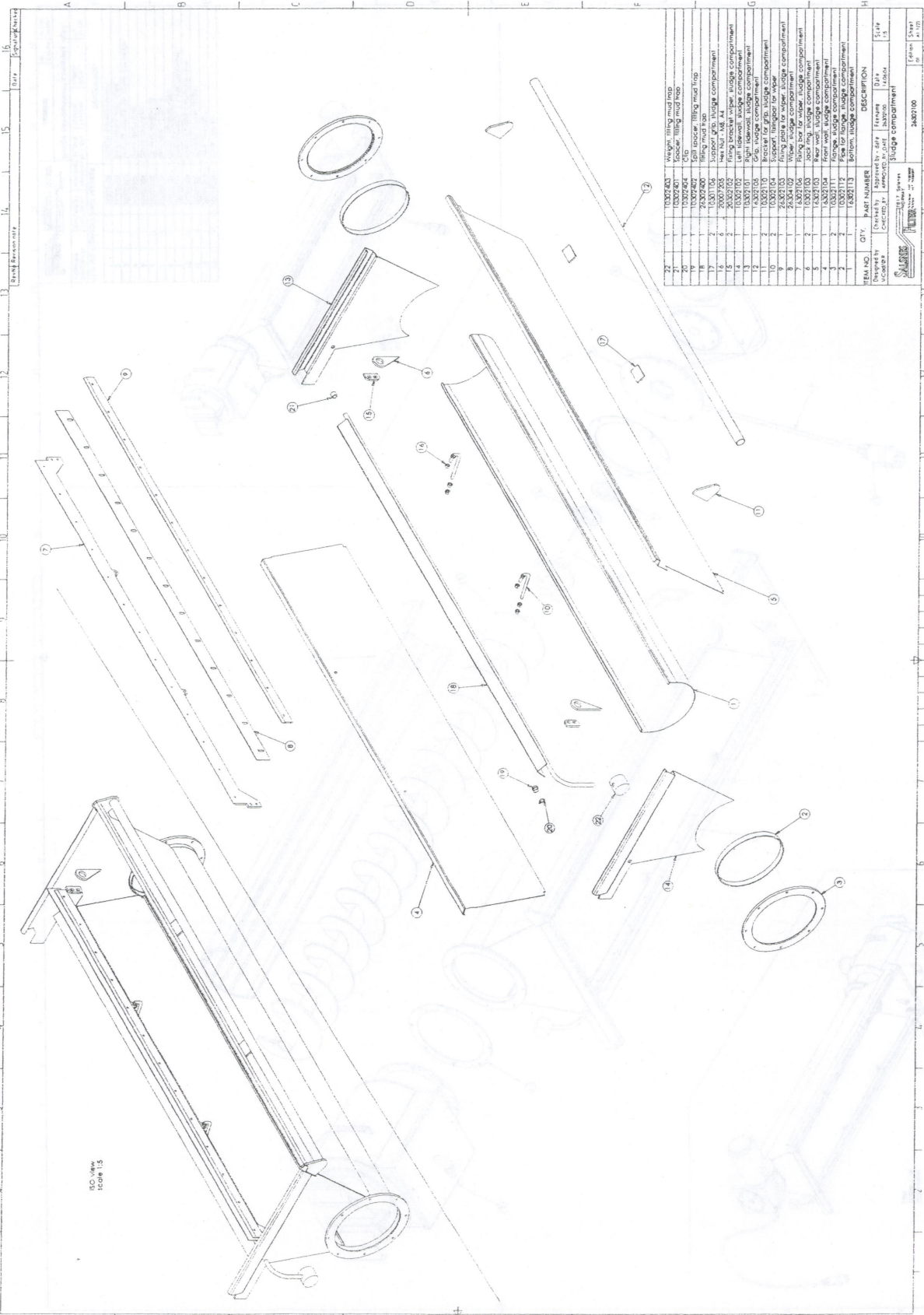
Part.no	Amount	Description
22513501	1	Filter mesh 1500 mm, all micron sizes for SF 6000]
20012036	5	Plastic nozzles for hot water spray
20110111	1	Gear 30:1 NMRV 90 for SF 6000
20511407	1	Drive belt GT REM 8M 896 / 21 (gear to drive roller)
22302202	1	Wedge wire screen SF6000
22302304	1	Sludge dewatering screw Ø175

Table 1: Recommended spare parts for the lifetime of the SF6000

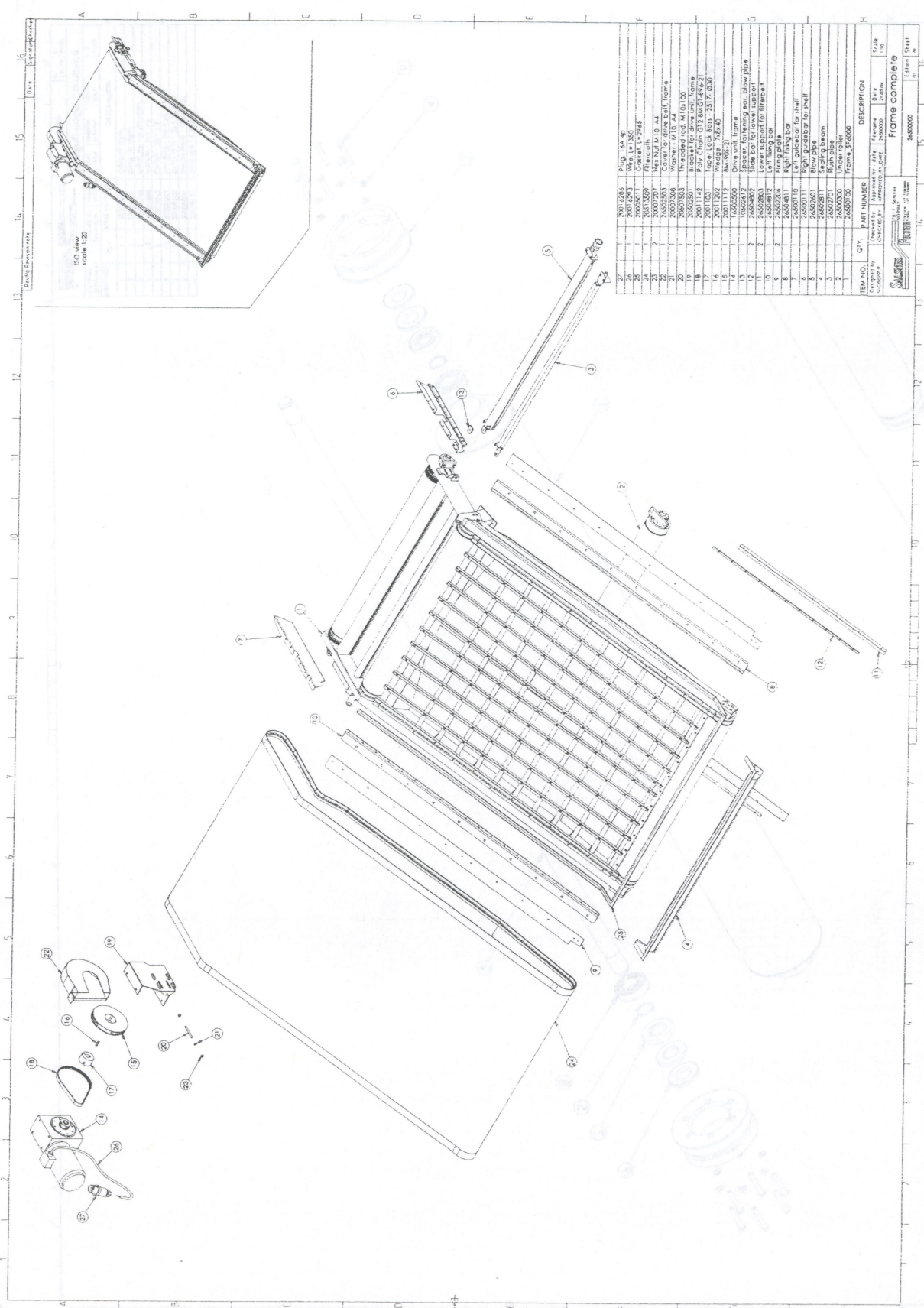
It's recommended to control the spare part stock once a year, and if required supply needed items.



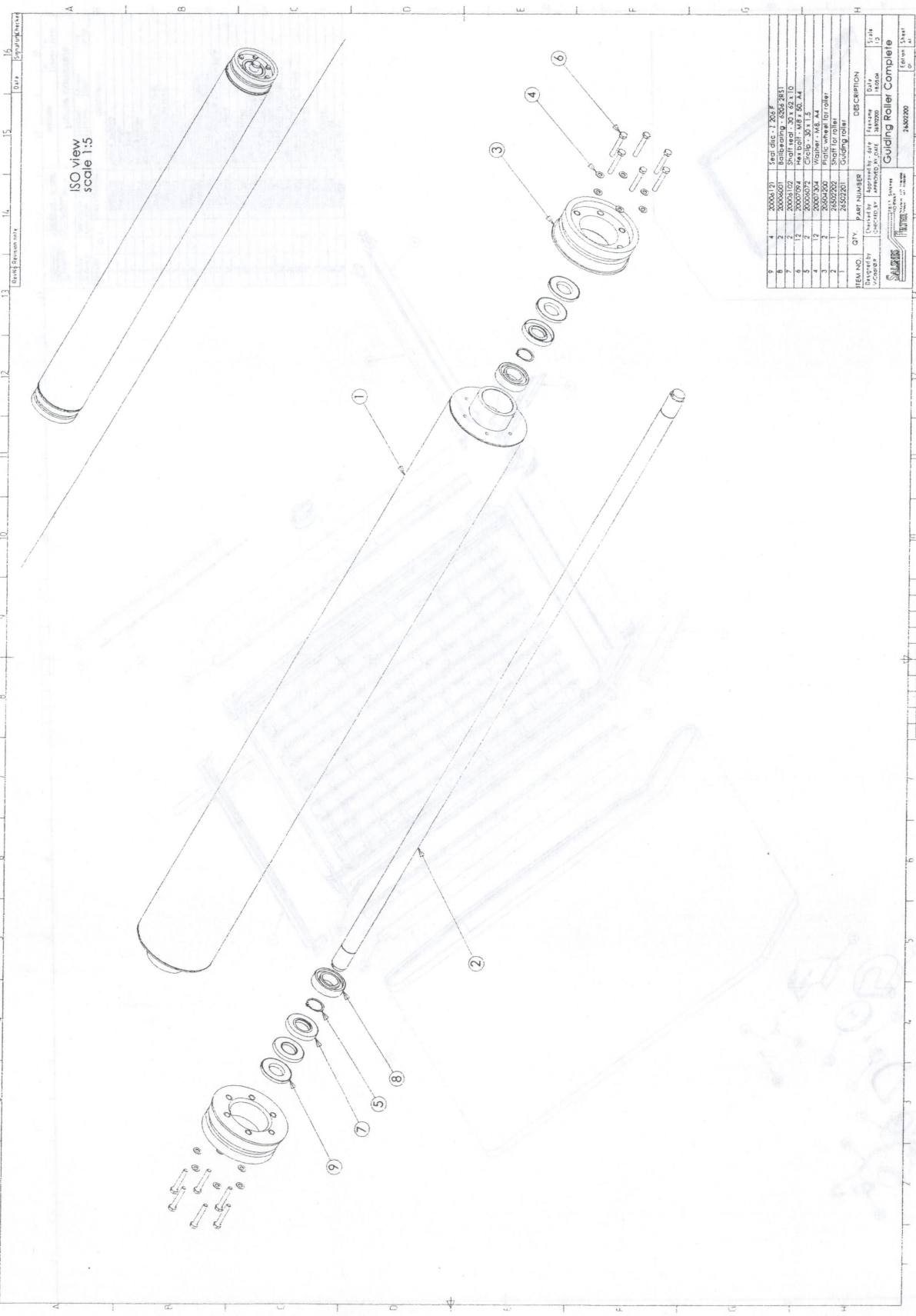
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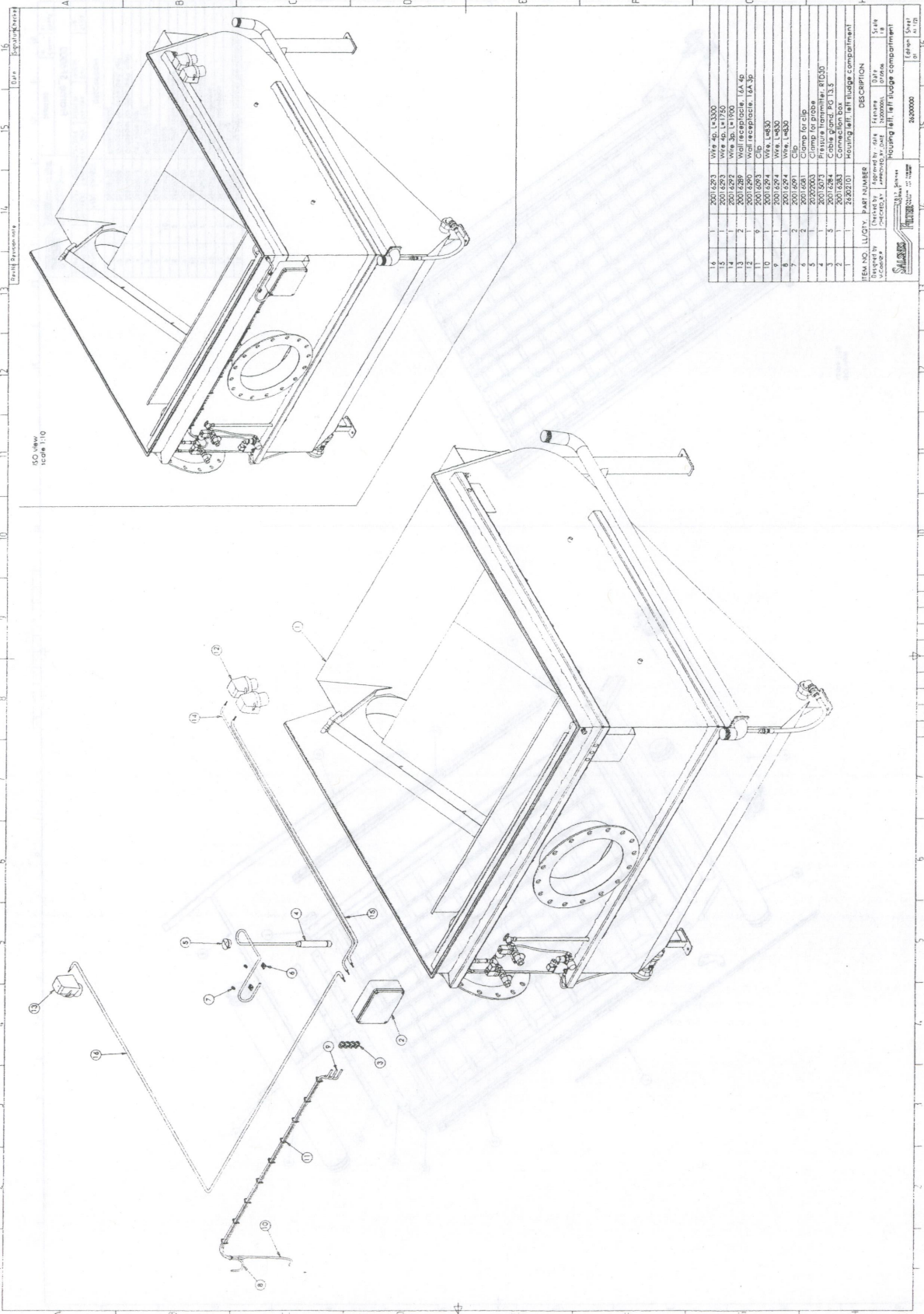


ISO view
scale 1:5

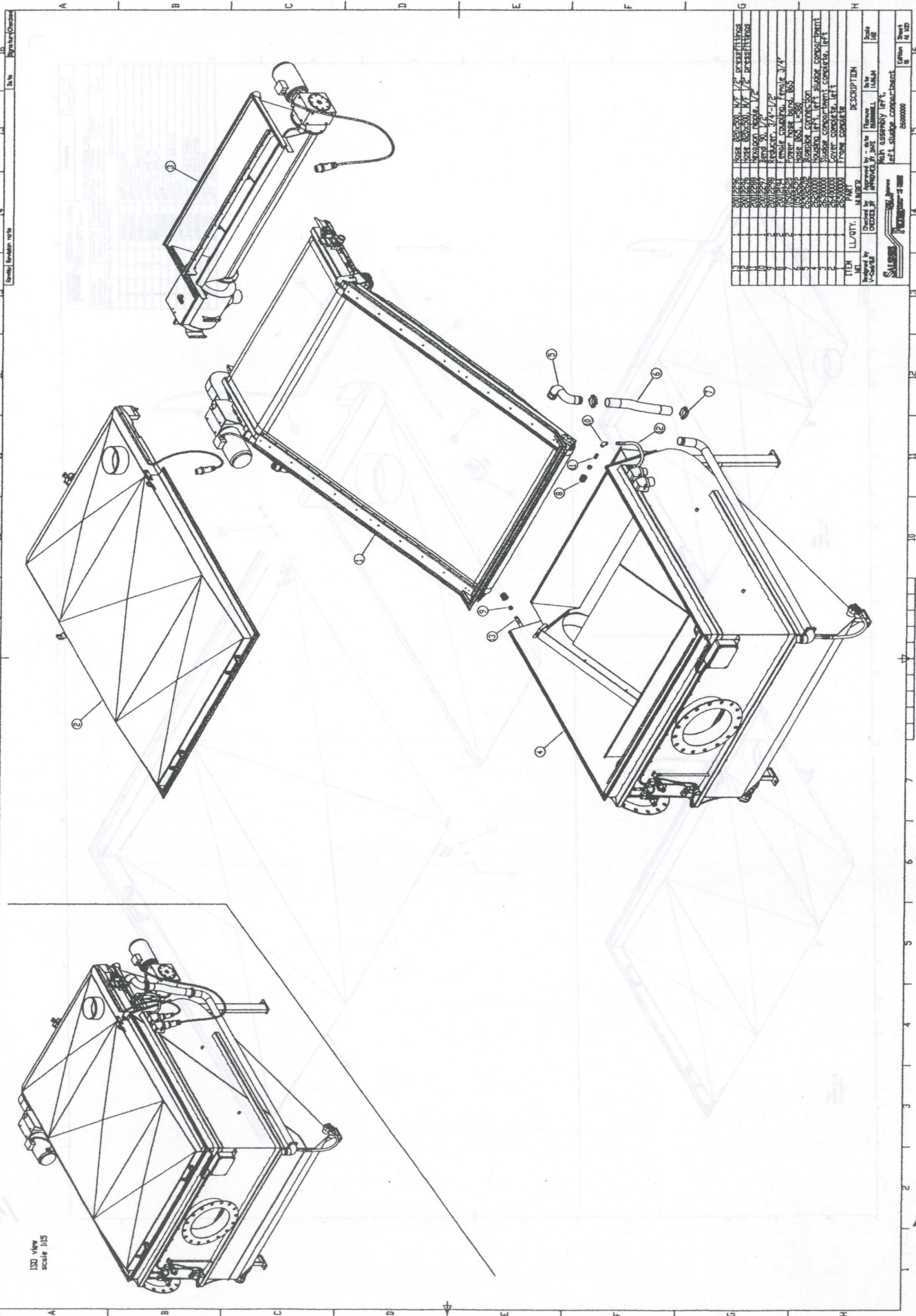
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION	REVISION	DATE	BY	CHKD.
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14.1

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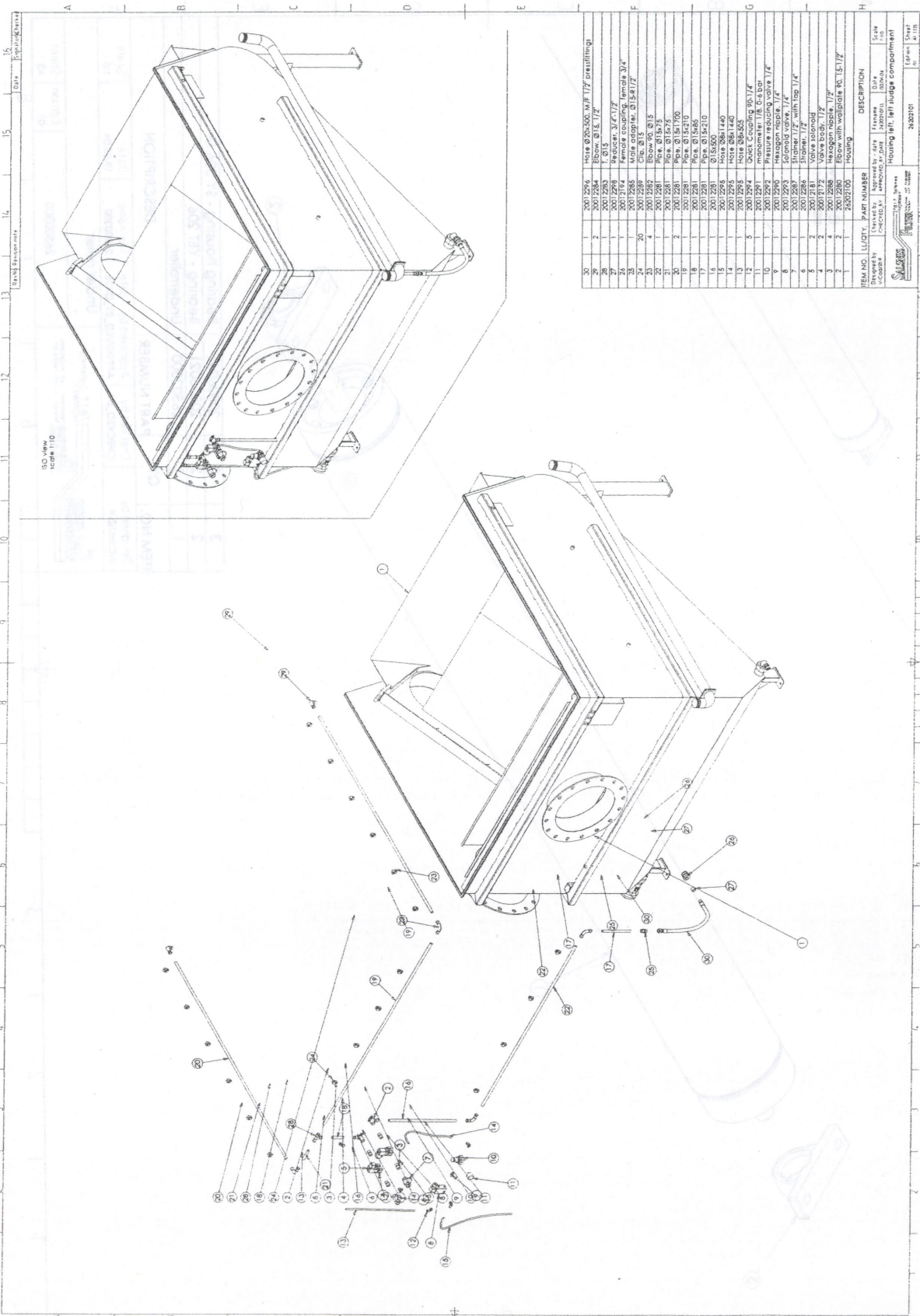
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ISO View
scale 1:15

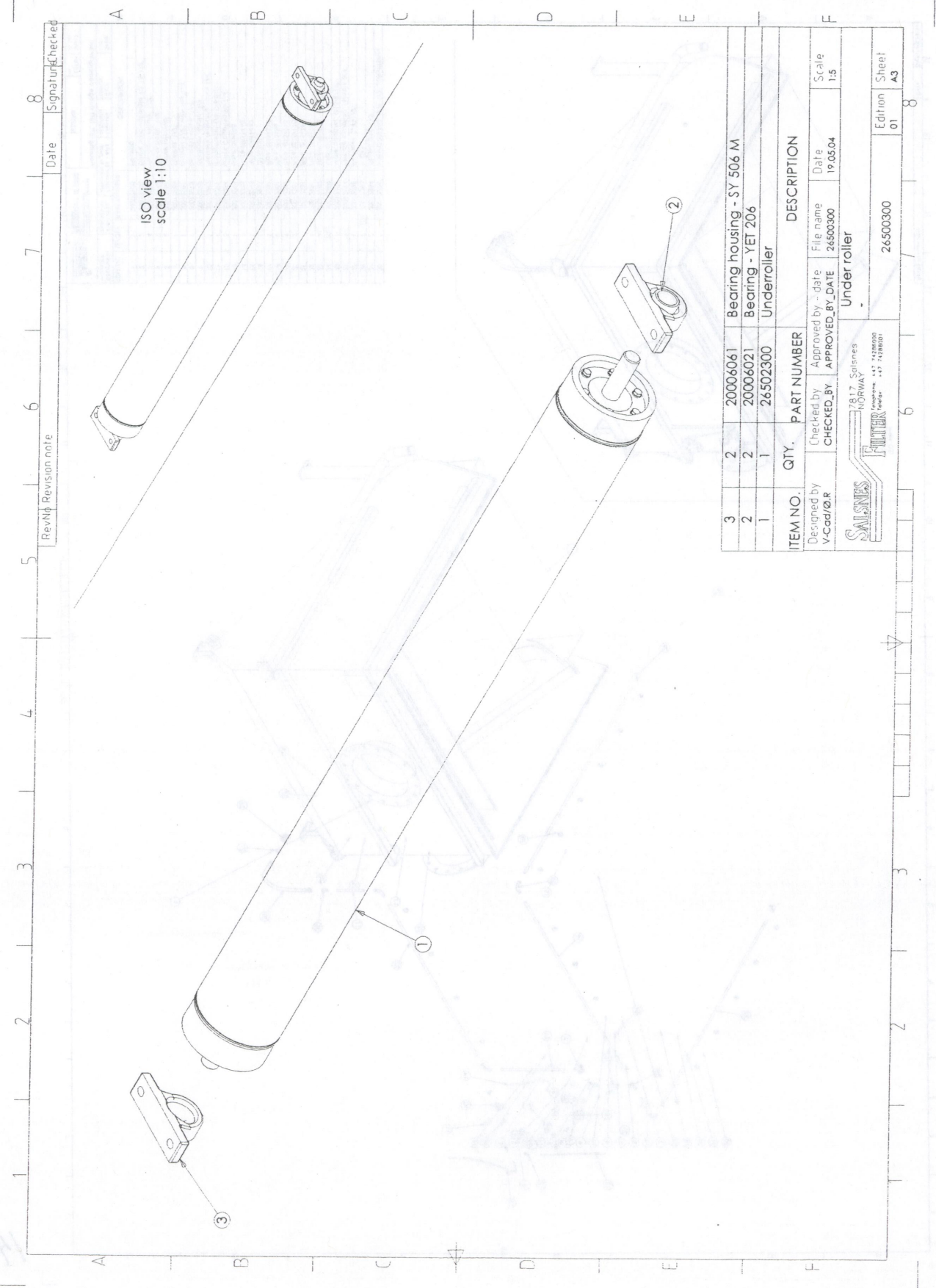
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3		SCREW
4		FLANGE
5		SCREW
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8		SCREW
9		SCREW
10		SCREW
11		SCREW
12		SCREW
13		SCREW
14		SCREW
15		SCREW
16		SCREW
17		SCREW

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ITEM NO.	QUANTITY	PART NUMBER	DESCRIPTION
1	1	2001294	Hose 3/8x500 1/2" ID with top
2	1	2001294	End cap 1/2" ID
3	1	2001294	End cap 1/2" ID
4	1	2001294	End cap 1/2" ID
5	1	2001294	End cap 1/2" ID
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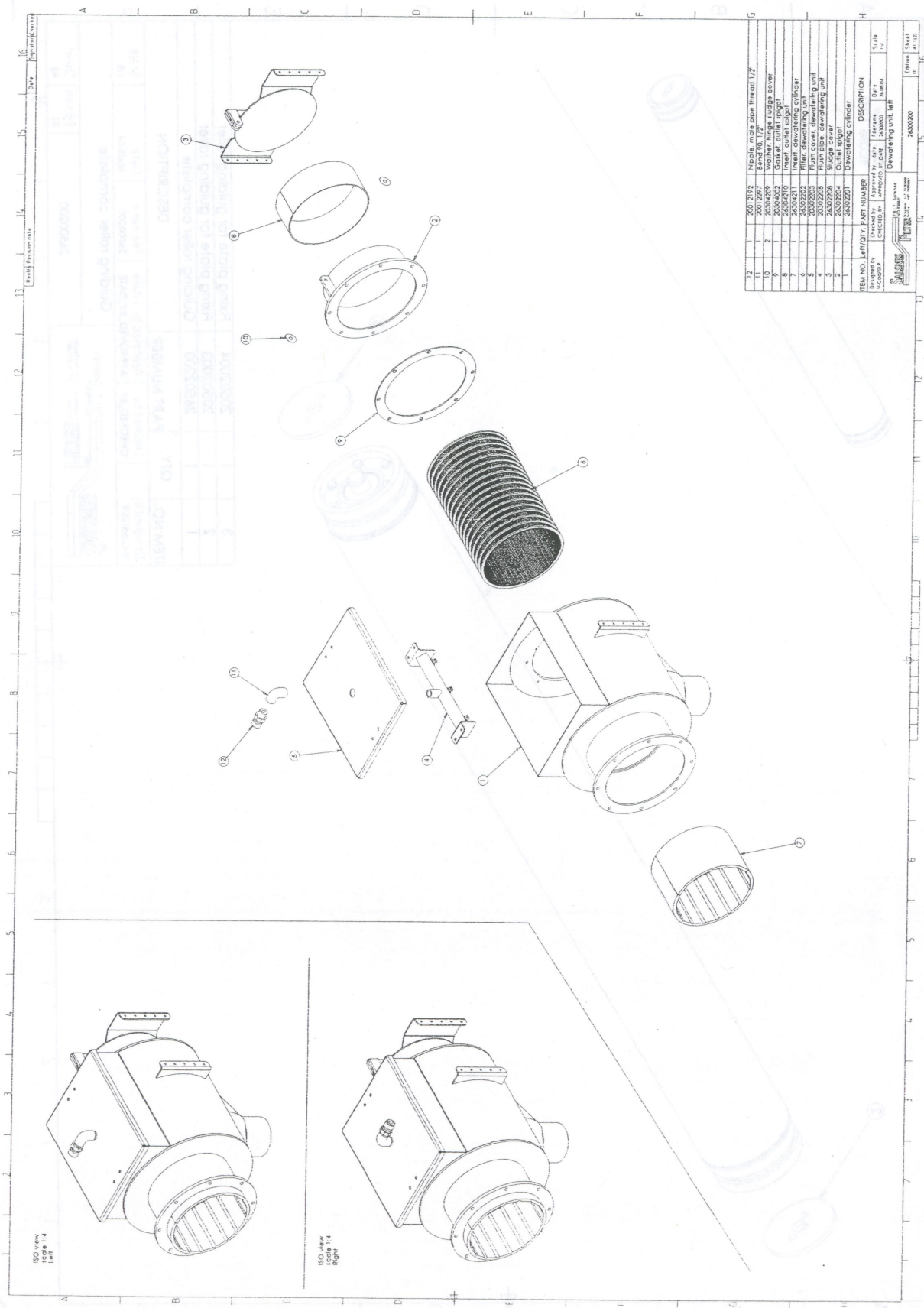
RevNo	Revision note	Date	Signature	checked
8				

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
3	2	20006061	Bearing housing - SY 506 M
2	2	20006021	Bearing - YET 206
1	1	26502300	Under roller

Designed by	Checked by	Approved by - date	File name	Date	Scale
V-Cad/Q.R	CHECKED_BY	APPROVED_BY DATE	26500300	19.05.04	1:5

SALINIS 7817 Solinas		Under roller	
NORWAY			
26500300		Edition 01	
Sheet A3		8	

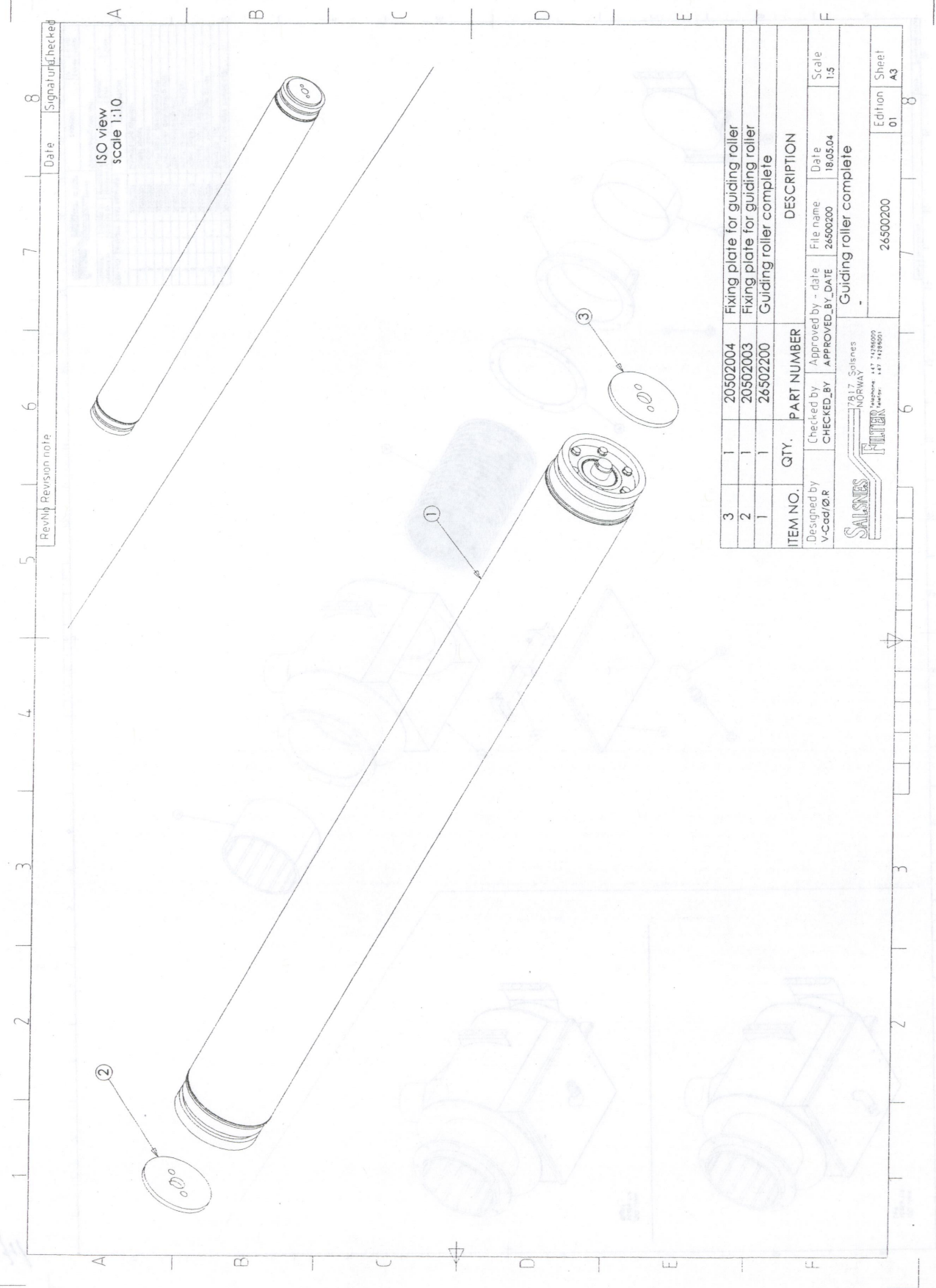
15-
14.10



ITEM NO.	ITEM NAME	DESCRIPTION
1	2601113	Washer, 1/2"
2	2601113	Washer, 1/2"
3	2601113	Washer, 1/2"
4	2601113	Washer, 1/2"
5	2601113	Washer, 1/2"
6	2601113	Washer, 1/2"
7	2601113	Washer, 1/2"
8	2601113	Washer, 1/2"
9	2601113	Washer, 1/2"
10	2601113	Washer, 1/2"
11	2601113	Washer, 1/2"
12	2601113	Washer, 1/2"
13	2601113	Washer, 1/2"

14.13

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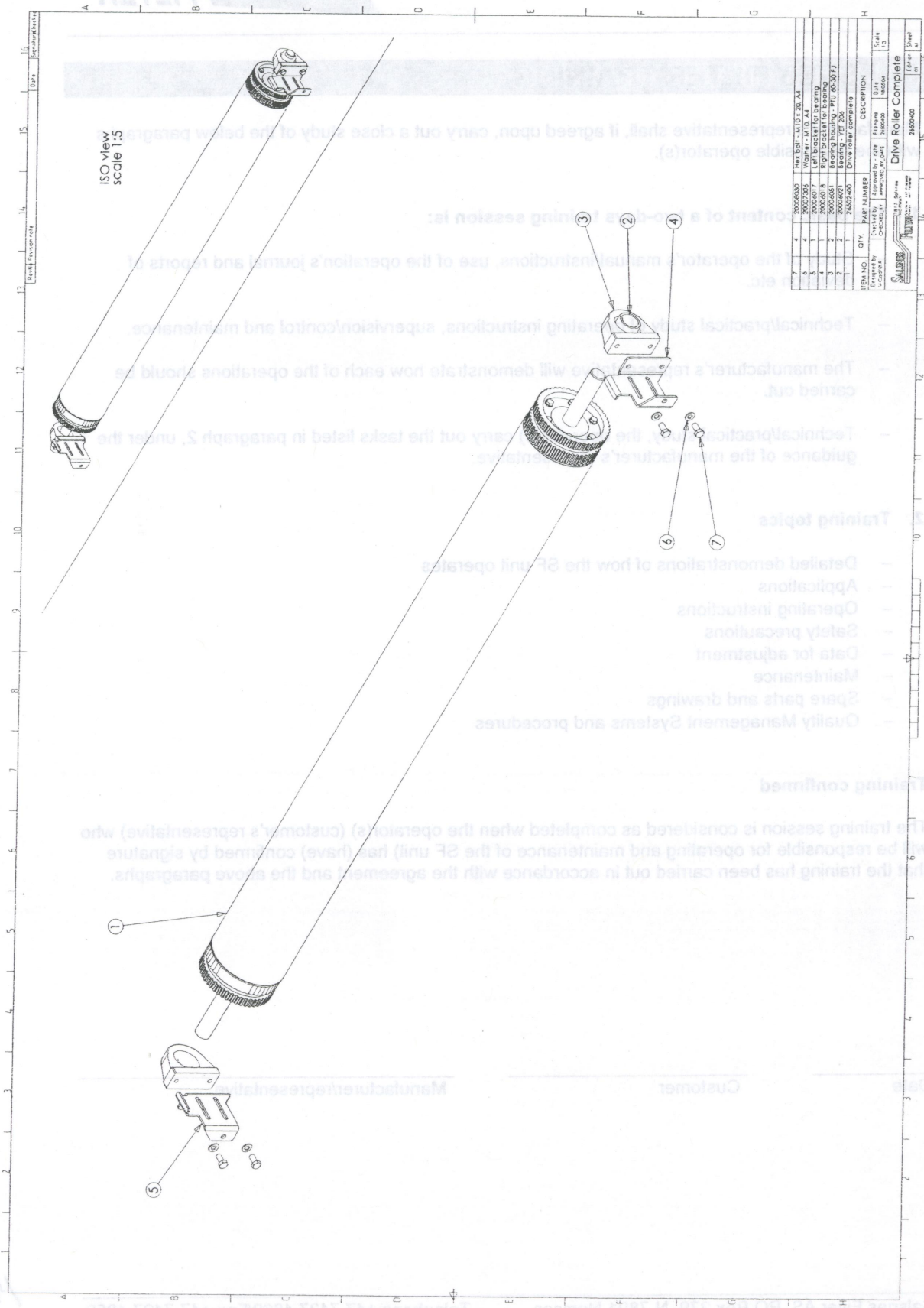


ISO view
scale 1:10

3	1	20502004	Fixing plate for guiding roller
2	1	20502003	Fixing plate for guiding roller
1	1	26502200	Guiding roller complete
ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
Designed by V-Cad/Ø.R	Checked by CHECKED_BY	Approved by - date APPROVED_BY DATE	File name 26500200
		18.05.04	Scale 1:5
Guiding roller complete			
SALINIS 7817 Solnes FILTRO NORWAY			26500200
Edition 01			Sheet A3

14.12

17



ITEM NO.	QTY	PART NUMBER	DESCRIPTION
1	1	2000000	Drive roller complete
2	1	2000001	Motor
3	1	2000002	Gear
4	1	2000003	Bracket
5	1	2000004	Bracket
6	2	2000005	Screw

Drive Roller Complete

14.13

81

SALSNES FILTER TRAINING

Manufacturer's representative shall, if agreed upon, carry out a close study of the below paragraphs with the responsible operator(s).

1. The basic content of a two-days training session is:

- Study of the operator's manual/instructions, use of the operation's journal and reports of deviation etc.
- Technical/practical study of operating instructions, supervision/control and maintenance.
- The manufacturer's representative will demonstrate how each of the operations should be carried out.
- Technical/practical study, the operator(s) carry out the tasks listed in paragraph 2, under the guidance of the manufacturer's representative.

2. Training topics

- Detailed demonstrations of how the SF unit operates
- Applications
- Operating instructions
- Safety precautions
- Data for adjustment
- Maintenance
- Spare parts and drawings
- Quality Management Systems and procedures

Training confirmed

The training session is considered as completed when the operator(s) (customer's representative) who will be responsible for operating and maintenance of the SF unit) has (have) confirmed by signature that the training has been carried out in accordance with the agreement and the above paragraphs.

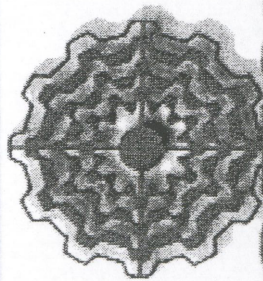
Date

Customer

Manufacturer/representative

14.12

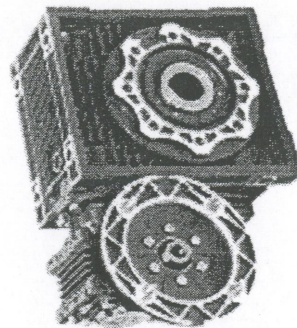
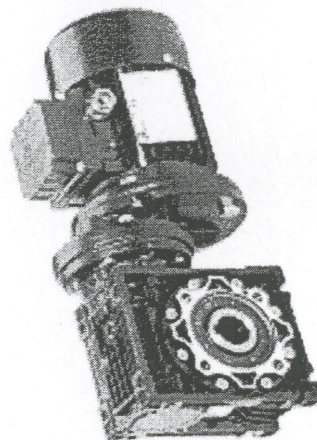
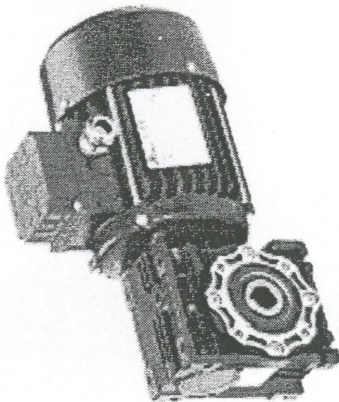
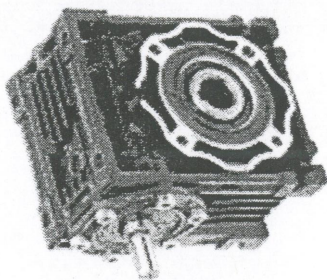
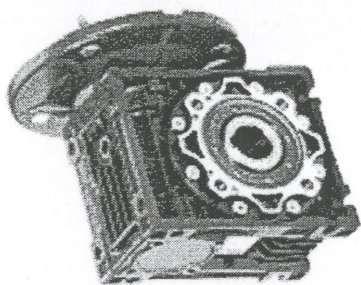
19/19



MOTOVARIO

MAINTENANCE AND OPERATING
INSTRUCTIONS FOR WORM GEAR
REDUCERS AND GEARMOTORS
SERIES:

NMRV - MCV - NRV
NMRV+NMRV
PC+NMRV



45 pages

14.14

NMRV-UM-9 99/01 rev.15.07.99

CE



14.14



When moving the unit, care should be taken to protect external parts from breakage or damage due to accidental knocks or falls.

If the unit is to be stored in a hostile atmosphere or for a long period of time (2/4 months), it is important to apply protective and waterproofing products to avoid deterioration of shafts and rubber parts.

Before starting up the unit, carry out the following checks:

Check the data shown on the name plate of the reduction unit and/or the electric motor;

Check for any leaks of lubricant

If possible, remove any traces of dirt from the shaft and from the areas around the oil seal.

If the oil seal is not immersed in the lubricant inside the assembly during particularly long storage periods (4/6 months) it is recommended that it should be replaced as the rubber might stick to the shaft or even have lost the elasticity it needs to work.

Installation

Particular care must be taken when installing drives, as this is often the source of damage and down time. Careful choice of the type of drive and mounting position can often avoid the need for protection of sensitive areas, particularly underneath the unit from oil leaks, however limited they may be.

- The machine must be firmly fastened in place in order to prevent any vibrations.
- Whenever possible, protect the reduction unit from direct sunlight and bad weather, especially when it is mounted on its vertical axis.
- Make sure the air intake on the fan side is unobstructed in order to ensure that the motor is correctly cooled.
- In the case of temperatures of $< -5^{\circ}\text{C}$ or $> +40^{\circ}\text{C}$, contact Technical Assistance.
- If the motor is to be started very often under load, the use of a heat probe inserted into the motor is recommended.
- The various machine members (pulleys, gear wheels, couplings, etc.) must be mounted on the shafts using special threaded holes or other systems that ensure correct operation without risk of causing damage to the bearings or the external parts of the assemblies (fig.1).
- Lubricate the surfaces that come into contact in order to prevent oxidation or seizure.

Example of a pulley mounted correctly on the slow shaft of a reduction unit

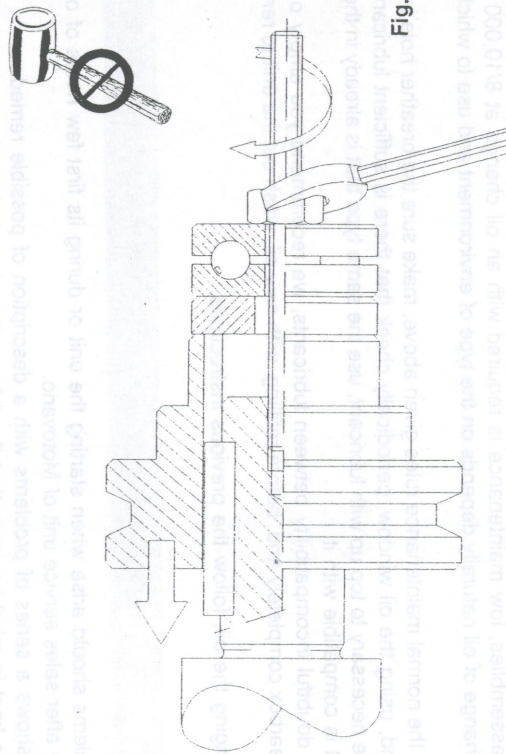


Fig. 1

Correct and incorrect examples of pulleys mounted on the main shaft of a reduction unit.

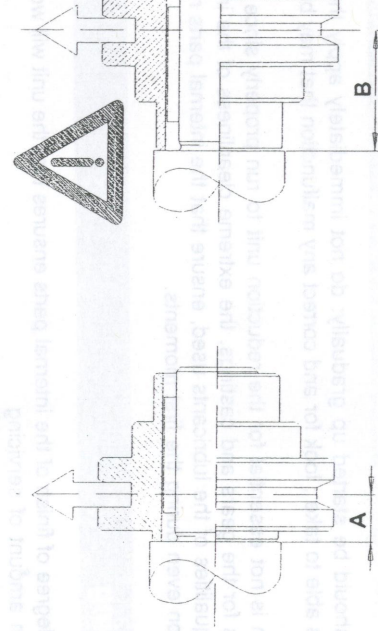
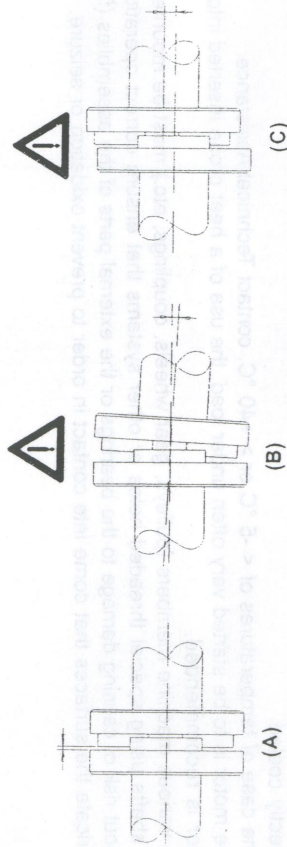


Fig. 2



Correct and incorrect examples of coupling connections

Fig. 3



The pulley must be mounted on the main shaft as close as possible to the shoulder so that it does not cause excessive radial load on the bearings (fig. 2). Great care must be taken when connecting the couplings to ensure that they are well aligned, so as not to cause excessive radial load on the bearings (fig. 3). When it is applied, paint must never be used on rubber parts: oil seal, etc. It must never be applied to any breather holes in plugs if they are mounted on the unit. In the case of assemblies with oil plugs, remove the closed cap used for transport and fit it with the breather plug that is supplied with the reduction unit. When the assembly is supplied without a motor, the following precautions must be followed in order to ensure that connections are properly made

Mounting the motor on the pam B5/B14 flange

Check that the tolerance of the motor shaft and the motor flange comply with at least one 'normal' class of quality. Carefully clean off any trace of dirt or paint from the shaft, the centering diameter and the face of the flange. Carry out mounting operations making sure not to use force. If this is not possible, check the tolerance of the motor key and ensure that it is correctly fitted. Apply assembly grease to the shaft in order to prevent oxidation or seizure caused by contact.

Good quality motors should be used in order to ensure that the unit works correctly, without vibrations or noise.

Before mounting the unit on the machine, check that the principal shaft of the reduction unit rotates in the right direction.

Use the oil window, if present, to check that the lubricant reaches the correct level required for the mounting position used.

The unit should be started up gradually: do not immediately apply the maximum load the machine is able to take; look for and correct any malfunction that may be caused by incorrect mounting.

Running-in is not essential for the reduction unit to run properly since modern construction techniques for the gears and castings, the extreme cleanliness of the internal parts, and the excellent qualities of the lubricants used, ensure that the internal parts receive a high degree of protection even during the first moments.

Sealing

The high degree of finish of the internal parts ensures that the unit will work correctly with only a minimum amount of servicing

Generally speaking, the following rules should be followed: periodically check that the exterior of the assembly is clean, especially in the cooling areas; periodically check to see if there are any leaks, especially in the areas around the oil seals.

Assemblies that are lubricated for life and thus do not have any oil plugs do not require any special maintenance except as stated above.

For other assemblies, low maintenance is required with an oil change at 8/10,000 hours of use. The change of oil naturally depends on the type of environment and use to which the unit is put.

Apart from the normal maintenance rules given above, make sure the breather hole in the plug is clean and, using the oil window, periodically check that there is sufficient lubricant.

Should it be necessary to top up with lubricant, use the same type that is already in the reducer or one that is compatible with it.

In case of doubtful incompatibility between lubricants, we recommend you empty out the oil from the gearbox completely and, before refilling with new oil, wash out the unit to remove any residue.

When changing the oil, follow the previous instructions.

If any problems should arise when starting the unit or during its first few hours of operation, contact the after sales service unit of MotoVARIO.

The table shows a series of problems with a description of possible remedies.

It should be kept in mind however that the information given is for reference only, as all the drives manufactured by MotoVARIO are thoroughly tested and checked before they leave the factory.

Please note that tampering with the assembly without prior authorization from MotoVARIO immediately invalidates the warranty and often makes it impossible to ascertain the causes of a defect or malfunction.



PROBLEMS	CAUSES	ACTION (1)	ACTION (2)
The motor does not start.	Problems with power supply. Defective motor. Wrong size of motor.	Check power supply.	Replace electric motor.
Current absorbed by the motor is greater than shown on the data plate.	Wrong size of motor.	Check the application.	Replace the electric motor and, if necessary, the reduction unit.
Temperature of the motor housing is very high.	Defective motor. Wrong size of motor. Incorrect mounting of motor	Check the application.	Replace the electric motor and, if necessary, the reduction unit.
Temperature of the reduction unit housing is very high.	Wrong size of reduction unit. Mounting position does not comply with the order. Incorrect mounting of motor	Check the application.	Correct the working conditions: mounting position and/or lubricant level.
Incorrect rotation speed of the main reducer unit shaft.	Incorrect reduction ratio. Incorrect polarity of motor.	Check reduction ratio. Check polarity of motor.	Replace reduction unit and/or electric motor.
Oil leak from oil seal.	Defective oil seal. Oil seal damaged during shipment. Defective motor shaft.	Replace the oil seal. Repair motor shaft (if possible).	Replace the part or return the assembly to Motovario.
Oil leak from joint.	Flat gasket or O-ring damaged.	Replace damaged gasket or O-ring.	Return the assembly to Motovario.
The main shaft rotates the wrong way.	Incorrect connection of the electric motor.	Swap two phases of the motor supply.	
Intermittent noise from the gears.	Dents in the gear wheels.	No practical problem if the noise has no effect on the application.	Return the assembly to Motovario if there is significant noise when loaded.

PROBLEMS	CAUSES	ACTION (1)	ACTION (2)
Intermittent noise from the gears.	Dirt inside the gearbox.	No practical problem if the noise has no effect on the application.	Return the assembly to Motovario if there is significant noise when loaded.
Noise (whine) from the drive assembly.	Bearings incorrectly adjusted. Gears with mesh errors. Insufficient lubricant.	Check correct quantity of lubricant.	Return the assembly to Motovario.
Electric motor vibrates.	Misalignment of the assembly coupling.	Check geometric tolerance of flange on electric motor. Check tolerance and geometry of key on motor shaft.	Replace electric motor.



Critical applications

The performance given in the catalogue correspond to mounting position B3 or similar, ie. when the first stage is not entirely immersed in oil. For other mounting positions and/or particular input speeds, refer to the tables below that highlight different critical situations for each size of reduction unit.

It is also necessary to take due consideration of and carefully assess the following applications by calling our Technical Service.

- As a speed increasing.
- Use in services that could be hazardous for people if the reduction unit fails.
- Applications with especially high inertia.
- Use as a lifting winch.
- Applications with high dynamic strain on the case of the reduction unit.
- In places with T° under -5°C or over 40°C.
- Use in chemically aggressive environments.
- Use in a salty environment.
- Mounting positions not envisaged in the catalogue.
- Use in radioactive environment.
- Use in environments with pressures other than atmospheric pressure
- Avoid applications where even partial immersion of the reduction unit is required.

NMRV - MCV

V5: 1500 < n1 < 3000

n1 > 3000

V6

	025	030	040	050	063	075	090	105	110	130	150
V5: 1500 < n1 < 3000	-	-	-	-	-	B	B	B	B	B	B
n1 > 3000	B	B	B	B	B	A	A	A	A	A	A
V6	B	B	B	B	B	B	B	B	B	B	B

A - Application not recommended

B - Check the application and/or call our technical service



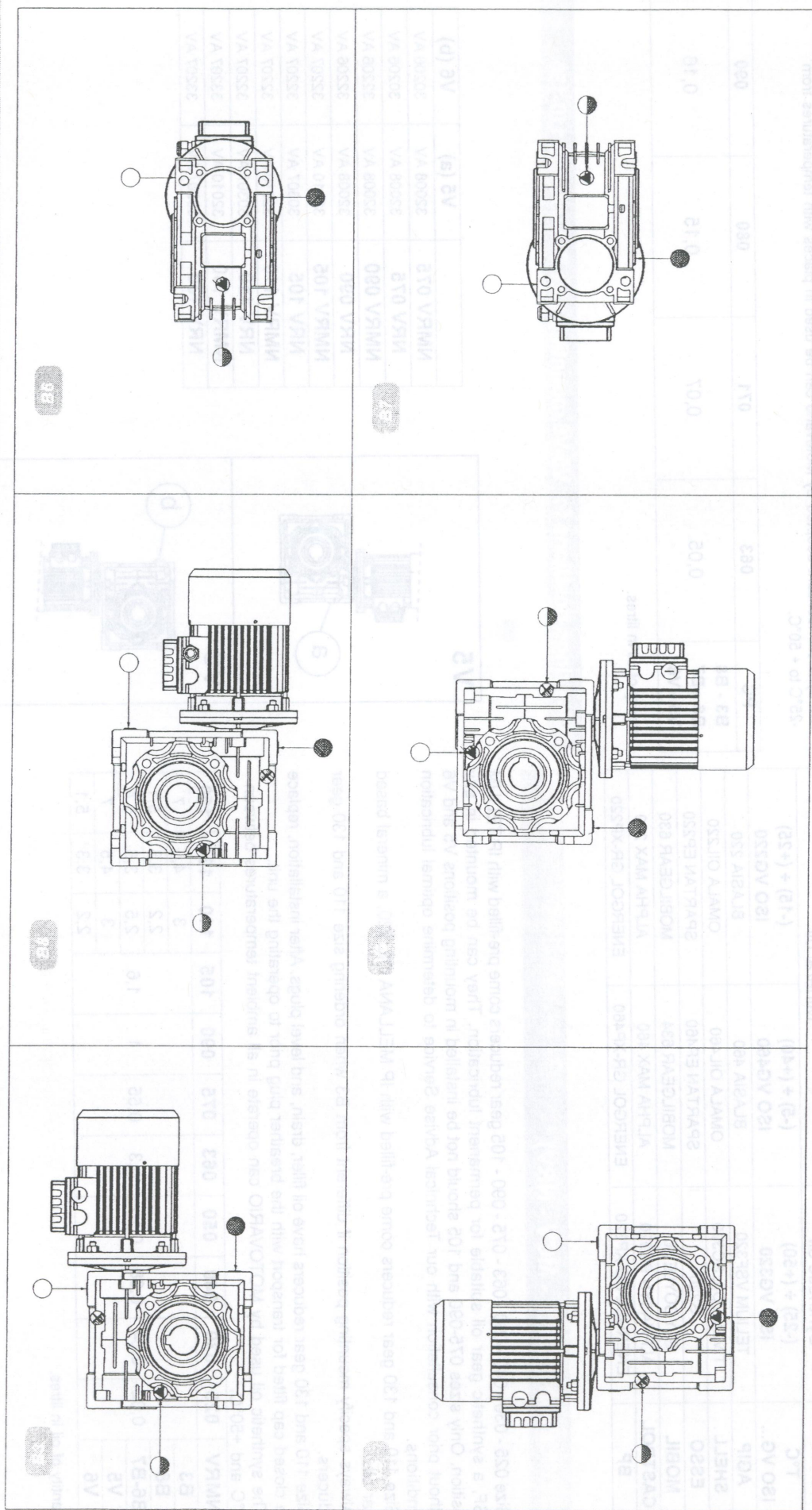
MotoVARIO Limited - sales@motovario.co.uk



MOTOVARIO

Oil filling position

025 - 101



- Oil fill / breather plug
- Oil level plug
- Oil drain plug

MotoVARIO Limited - sales@motovario.co.uk

MOTOVARIO

14.14



T°C ISO VG...	NMRV 025 ÷ 105 PC 063 ÷ 090		NMRV 110 ÷ 150	
	Synthetic oil		Mineral oil	
AGIP	(-25) ÷ (+50) ISO VG320	(-5) ÷ (+40) ISO VG460	(-15) ÷ (+25) ISO VG220	
SHELL	TELUM VSF320	BLASIA 460	BLASIA 220	
ESSO	TIVELA OIL SC320	OMALA OIL460	OMALA OIL220	
MOBIL	S220	SPARTAN EP460	SPARTAN EP220	
CASTROL	GLYGOYLE 30	MOBILGEAR 634	MOBILGEAR 630	
BP	ALPHASYN PG320	ALPHA MAX 460	ALPHA MAX 220	
	ENERGOL SG-XP320	ENERGOL GR-XP460	ENERGOL GR-XP220	

- Size 025 - 030 - 040 - 050 - 063 - 075 - 090 - 105 gear reducers come pre-filled with IP TELIUM VSF, a synthetic gear oil suitable for permanent lubrication. They can be mounted in any position. Only sizes 075-090 and 105 should not be installed in mounting positions V5 and V6 without prior consultation with our Technical Advise Service to determine optimal lubrication conditions.
- Size 110 and 130 gear reducers come pre-filled with IP MELLANA OIL 220, a mineral based gear oil.
- Always specify mounting position if different from B3 when ordering size 110 and 130 gear reducers.
- Size 110 and 130 gear reducers have oil filler, drain, and level plugs. After installation, replace the closed cap fitted for transport with the breather plug prior to operating the unit.
- The synthetic oil used by MOTOVARIO can operate in all ambient temperatures between -25°C and +50°C.

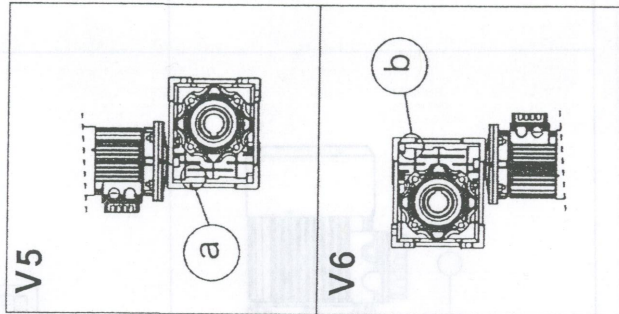
NMRV	025	030	040	050	063	075	090	105	110	130	150
B3									3	4,5	7
B8									2,2	3,3	5,1
B6-B7	0,02	0,04	0,08	0,15	0,3	0,55	1	1,6	2,5	3,5	5,4
V5									3	4,5	7
V6									2,2	3,3	5,1

Quantity of oil in litres.

- The pre-stage helical modules are supplied complete with life-long lubricant, synthetic oil, AGIP TELIUM VSF, and can therefore be mounted in all of the positions.
- Lubrication is separate from that of the worm reduction unit.
- The synthetic lubricant adopted by MotoVARIO can be used in places with temperatures from -25°C to + 50°C.

PC	063	071	080	090
B3 - B8				
B6 - B7	0,05	0,07	0,15	0,16
V5 - V6				

Quantity of oil in litres.

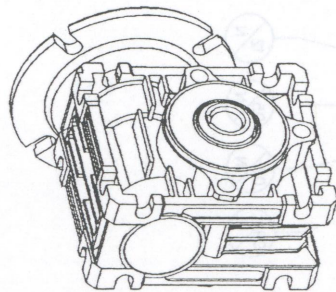


NMRV 075	V5 (a)	V6 (b)
NRV 075	32008 AV	30206 AV
NMRV 090	32008 AV	30206 AV
NRV 090	32008 AV	32206 AV
NMRV 105	32010 AV	32206 AV
NRV 105	30307 AV	32207 AV
NMRV 110	32010 AV	32207 AV
NRV 110	30307 AV	32207 AV
NMRV 130	32010 AV	33207 AV
NRV 130	30307 AV	33207 AV



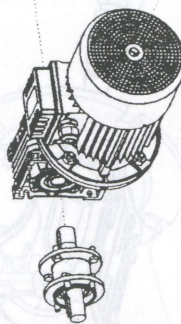
025-150

001 For 025

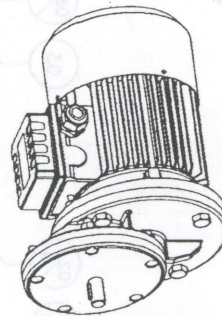


004 For 025

005 For 030+063

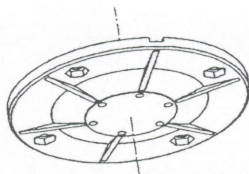


006 For 063+090



007 For 030

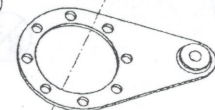
008 For 040+150



009 For 025

010 For 040+150

011 For 030



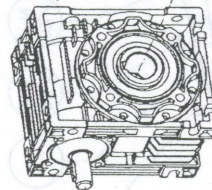
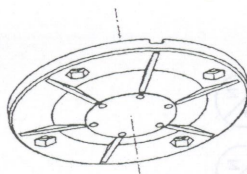
012 For 030

013 For 040+150

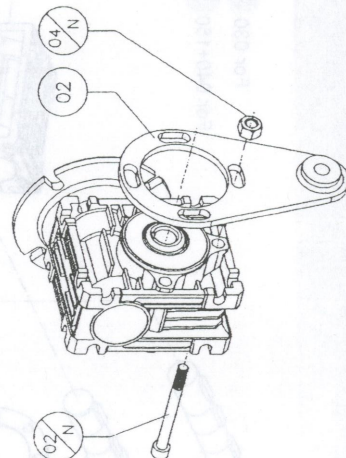
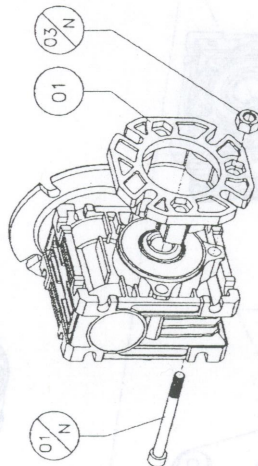
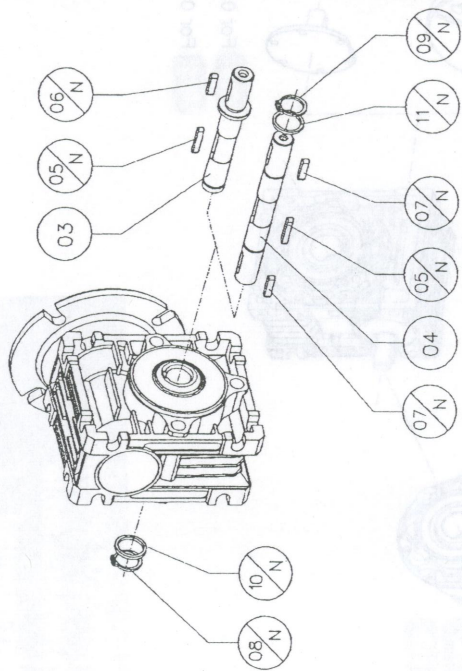
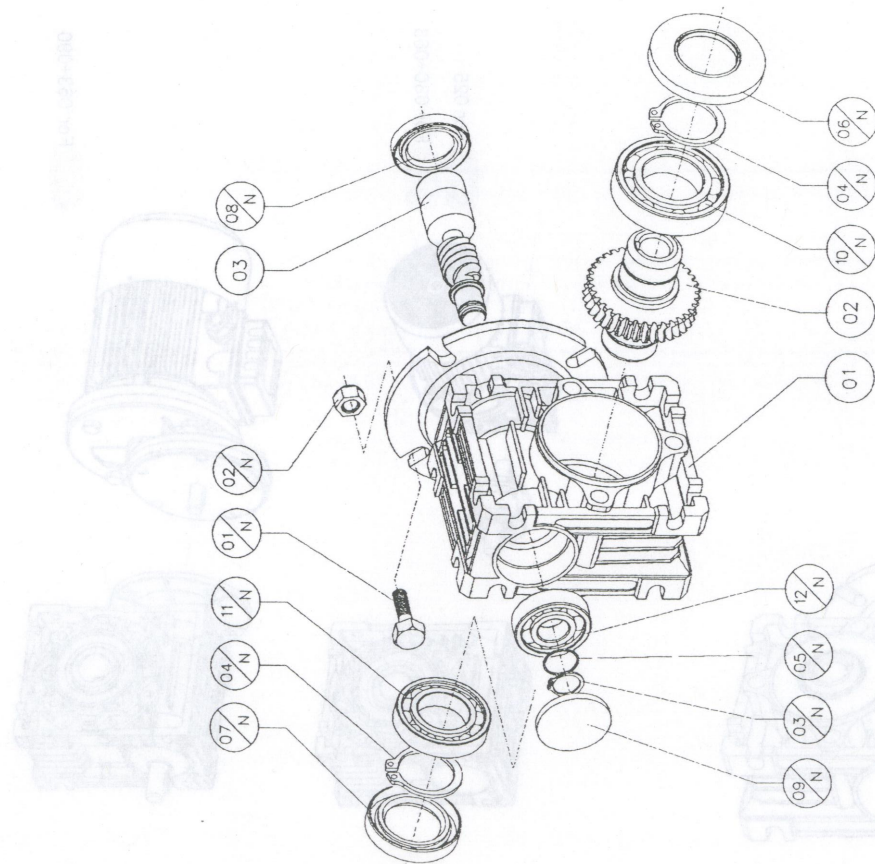


014 For 030

015 For 040+150



P = Reference part number
T = Reference table
C = Part number

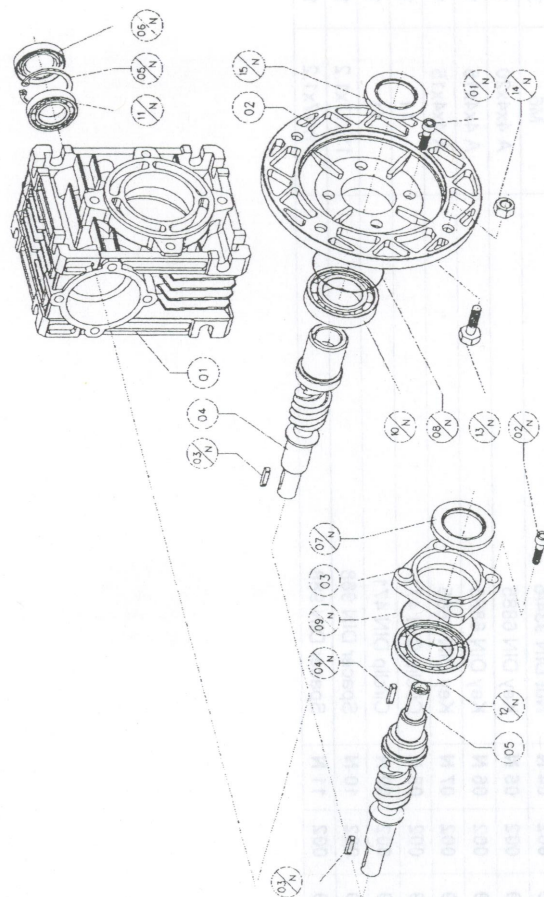
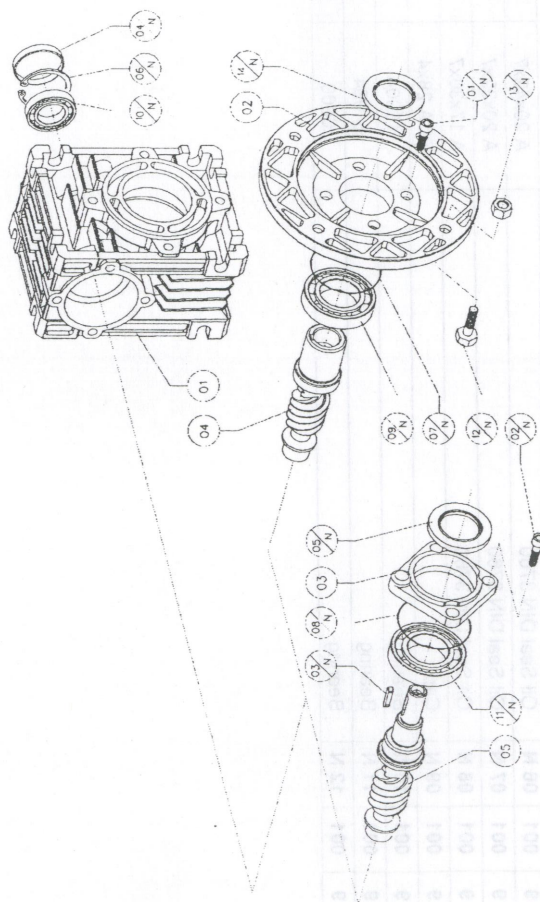


P	T	C	Built	025
9	001	01	Casing	9.025.01
9	001	02	Worm Wheel	9.025.11
9	001	03	PAM worm	9.025.14

P	T	C	Commercial	025
9	001	01 N	Screw DIN 931	M5x10
9	001	02 N	Nut DIN 934/6	M5
9	001	03 N	Circlip DIN 471	10
9	001	04 N	Circlip DIN 471	20
9	001	05 N	Spacer DIN 988	10x16x1,2
9	001	06 N	Oil Seal DIN 3760	A 20x42x7
9	001	07 N	Oil Seal DIN 3760	A 20x32x7
9	001	08 N	Oil Seal DIN 3760	A 17x30x7
9	001	09 N	Cap	RCA 28x4
9	001	10 N	Bearing	16004
9	001	11 N	Bearing	61904
9	001	12 N	Bearing	6000

P	T	C	Built	025
9	002	01	Output Flange F	9.025.04
9	002	02	Torque arm	9.025.05
9	002	03	Single output shaft	9.025.21
9	002	04	Double output shaft	9.025.22

P	T	C	Commercial	025
9	002	01 N	Screw DIN 912	M6x65
9	002	02 N	Screw DIN 912	M6x55
9	002	03 N	Nut DIN 934/6	M6
9	002	04 N	Nut DIN 934/6	M6
9	002	05 N	Key DIN 6885	A 4x4x20
9	002	06 N	Key DIN 6885	A 4x4x15
9	002	07 N	Key DIN 6885	A 4x4x15
9	002	08 N	Circlip DIN 471	11
9	002	09 N	Circlip DIN 471	11
9	002	10 N	Spacer DIN 988	11x17x1,2
9	002	11 N	Spacer DIN 988	11x17x1,2

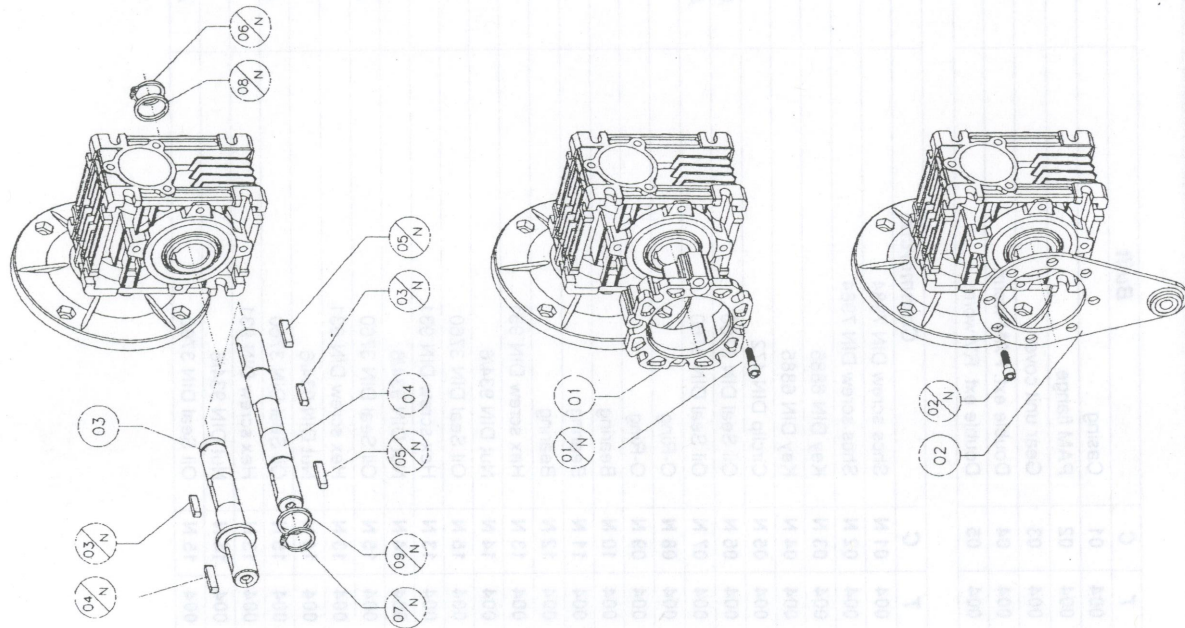
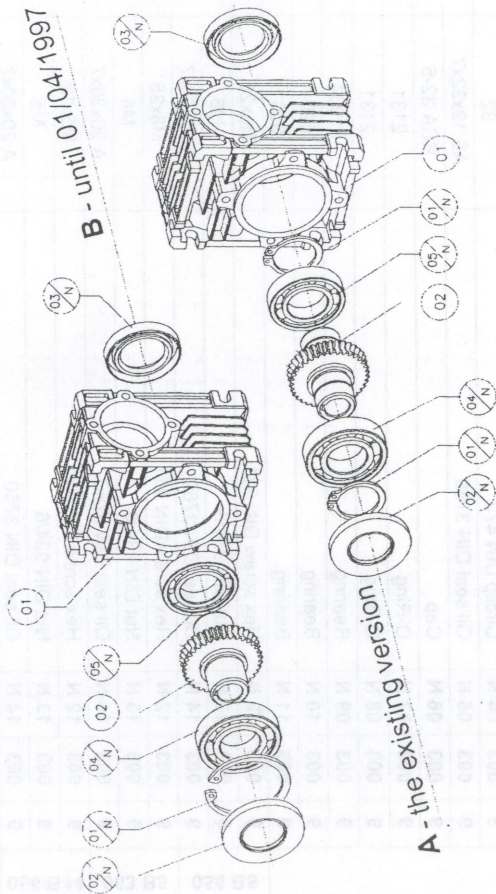


P	T	C	Built	030
9	003	01	Casing	9.030.01
9	003	02	PAM flange	9.030.03
9	003	03	Gear unit cover	9.030.06
9	003	04	PAM worm	9.030.14
9	003	05	RV worm	9.030.16

P	T	C	Built	030
9	004	01	Casing	9.030.01
9	004	02	PAM flange	9.030.03
9	004	03	Gear unit cover	9.030.06
9	004	04	Double ext. PAM worm	9.030.15
9	004	05	Double ext. RV worm	9.030.17

pam	P	T	C	Commercial	030
056 B5	9	003	01 N	Shcs screw DIN 7984	M6x12 4
	9	003	02 N	Shcs screw DIN 7984	M6x12 3
	9	003	03 N	Key DIN 6885	A 3x3x15 1
	9	003	04 N	Circlip DIN 472	32 1
	9	003	05 N	Oil seal DIN 3760	AS 12x32x7 1
	9	003	06 N	Cap	RCA 32-5 1
	9	003	07 N	O-Ring	2131 1
	9	003	08 N	O-Ring	2131 1
	9	003	09 N	Bearing	61904 1
	9	003	10 N	Bearing	6201 1
056 B5	9	003	11 N	Bearing	6301 1
	9	003	12 N	Hex screw DIN 931	M6x20 4
	9	003	13 N	Nut DIN 934/6	M6 4
	9	003	14 N	Oil seal DIN 3760	A 20x30x7 1
	9	003	12 N	Hex screw DIN 931	M8x25 4
	9	003	13 N	Nut DIN 934/6	M8 4
	9	003	14 N	Oil seal DIN 3760	A 20x30x7 1
	9	003	12 N	Hex screw DIN 931	M5x12 4
	9	003	13 N	Nut DIN 934/6	M5 4
	9	003	14 N	Oil seal DIN 3760	A 20x30x7 1
063 B14	9	003	12 N	Hex screw DIN 931	M5x12 4
	9	003	13 N	Nut DIN 934/6	M5 4
	9	003	14 N	Oil seal DIN 3760	A 20x30x7 1
	9	003	12 N	Hex screw DIN 931	M5x12 4
	9	003	13 N	Nut DIN 934/6	M5 4
	9	003	14 N	Oil seal DIN 3760	A 20x30x7 1
	9	003	12 N	Hex screw DIN 931	M5x12 4
	9	003	13 N	Nut DIN 934/6	M5 4
	9	003	14 N	Oil seal DIN 3760	A 20x30x7 1
	9	003	12 N	Hex screw DIN 931	M5x12 4

pam	P	T	C	Commercial	030
056 B5	9	004	01 N	Shcs screw DIN 7984	M6x12 4
	9	004	02 N	Shcs screw DIN 7984	M6x12 3
	9	004	03 N	Key DIN 6885	A 3x3x15 1
	9	004	04 N	Key DIN 6885	A 3x3x15 1
	9	004	05 N	Circlip DIN 472	32 1
	9	004	06 N	Oil Seal DIN 3760	AS 12x32x7 1
	9	004	07 N	Oil Seal DIN 3760	AS 12x32x7 1
	9	004	08 N	O-Ring	2131 1
	9	004	09 N	O-Ring	2131 1
	9	004	10 N	Bearing	61904 1
056 B5	9	004	11 N	Bearing	6201 1
	9	004	12 N	Bearing	6301 1
	9	004	13 N	Hex screw DIN 931	M6x20 4
	9	004	14 N	Nut DIN 934/6	M6 4
	9	004	15 N	Oil Seal DIN 3760	A 20x30x7 1
	9	004	13 N	Hex screw DIN 931	M8x25 4
	9	004	14 N	Nut DIN 934/6	M8 4
	9	004	15 N	Oil Seal DIN 3760	A 20x30x7 1
	9	004	13 N	Hex screw DIN 931	M5x12 4
	9	004	14 N	Nut DIN 934/6	M5 4
063 B14	9	004	15 N	Oil Seal DIN 3760	A 20x30x7 1
	9	004	13 N	Hex screw DIN 931	M5x12 4
	9	004	14 N	Nut DIN 934/6	M5 4
	9	004	15 N	Oil Seal DIN 3760	A 20x30x7 1
	9	004	13 N	Hex screw DIN 931	M5x12 4
	9	004	14 N	Nut DIN 934/6	M5 4
	9	004	15 N	Oil Seal DIN 3760	A 20x30x7 1
	9	004	13 N	Hex screw DIN 931	M5x12 4
	9	004	14 N	Nut DIN 934/6	M5 4
	9	004	15 N	Oil Seal DIN 3760	A 20x30x7 1

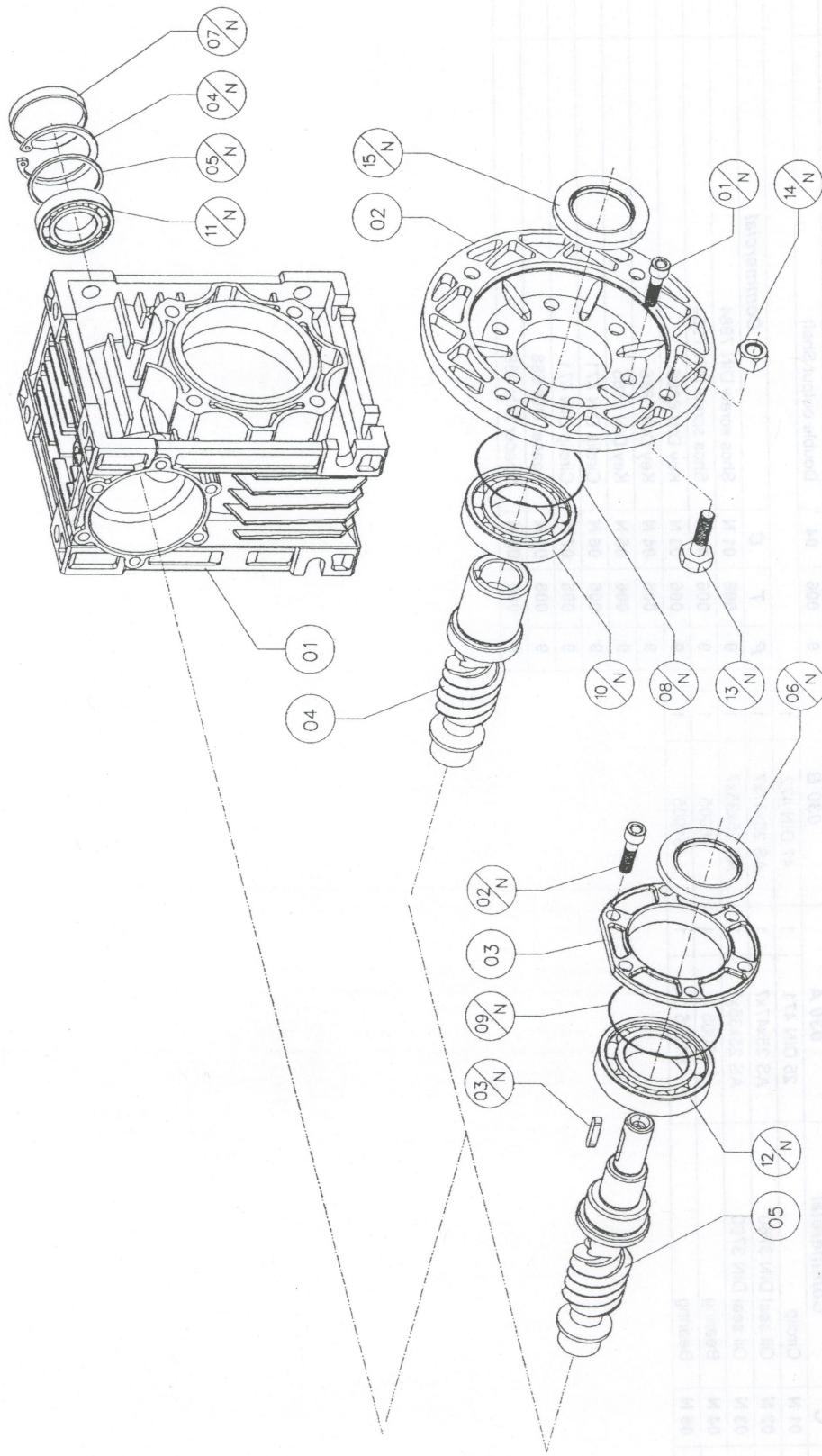


P	T	C	Built	030 A	030 B
9	005	01	Casing	9.030.01	9.030.01
9	005	02	Worm Wheel	9.030.11	9.030.11

P	T	C	Commercial	030 A	030 B
9	005	01 N	Circlip	25 DIN 471	1 47 DIN 472
9	005	02 N	Oil seal DIN 3760	AS 25x47x7	1 AS 25x47x7
9	005	03 N	Oil seal DIN 3760	AS 25x35x7	1 AS 25x35x7
9	005	04 N	Bearing	16005	1 16005
9	005	05 N	Bearing	61905	1 61905

P	T	C	Built	030
9	006	01	Output flange F	9.030.04
9	006	02	Torque arm	9.030.05
9	006	03	Single output Shaft	9.030.21
9	006	04	Double output Shaft	9.030.22

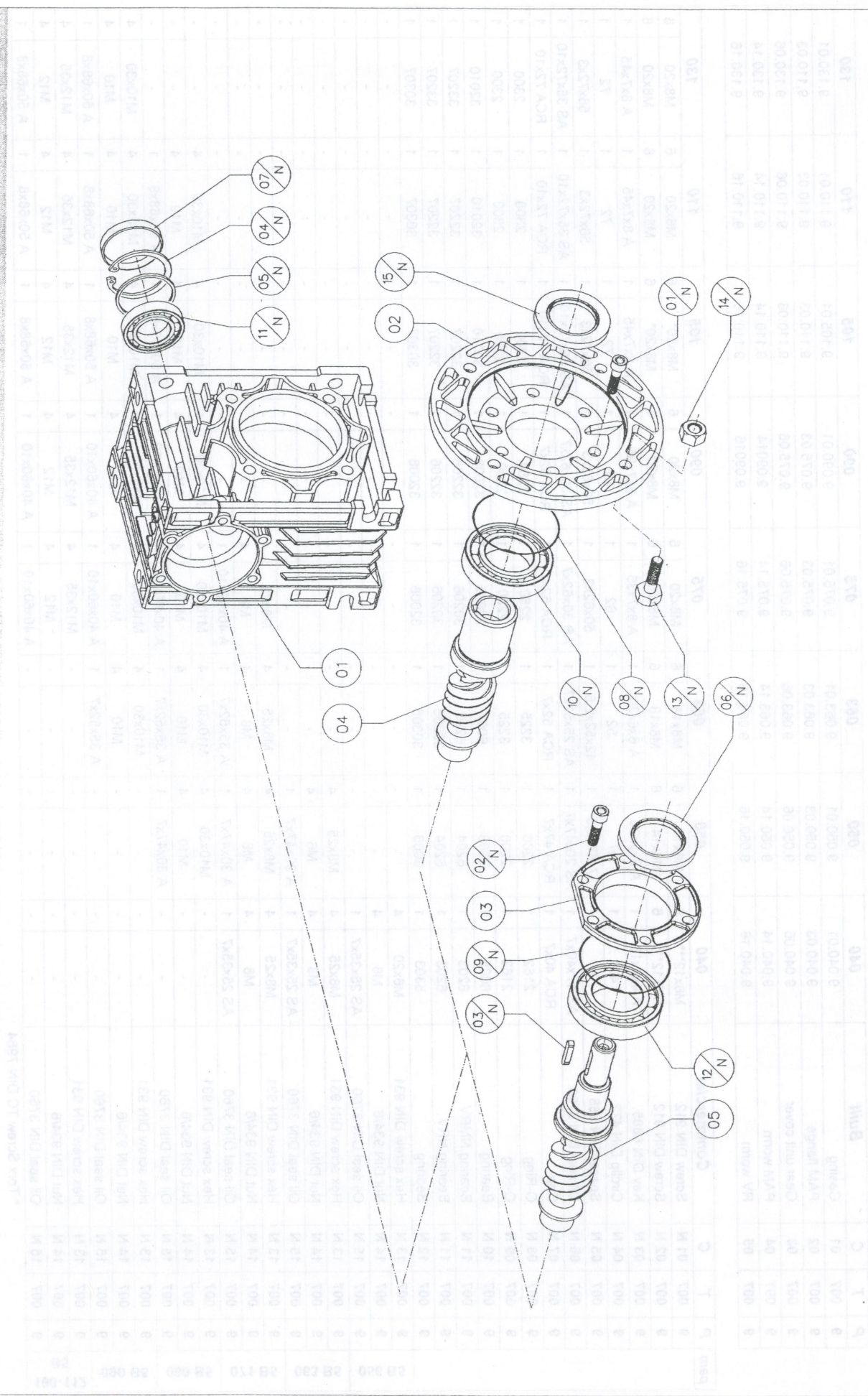
P	T	C	Commercial	030
9	006	01 N	Shcs screw DIN 7984	M6x12 4
9	006	02 N	Shcs screw DIN 7984	M6x12 4
9	006	03 N	Key DIN 6885	A 5x5x25 1
9	006	04 N	Key DIN 6885	A 5x5x20 1
9	006	05 N	Key DIN 6885	A 5x5x20 1
9	006	06 N	Circlip DIN 471	14 1
9	006	07 N	Circlip DIN 471	14 1
9	006	08 N	Spacer DIN 988	14x20x1.5 1
9	006	09 N	Spacer DIN 988	14x20x1.5 1



P	T	C	Built	040	050	063	075	090	105	110	130
9	007	01	Casing	9.040.01	9.050.01	9.063.01	9.075.01	9.090.01	9.105.01	9.110.01	9.130.01
9	007	02	PAM flange	9.040.03	9.050.03	9.063.03	9.075.03	9.075.03	9.110.03	9.110.03	9.130.03
9	007	03	Gear unit cover	9.040.06	9.050.06	9.063.06	9.075.06	9.075.06	9.110.06	9.110.06	9.130.06
9	007	04	PAM worm	9.040.14	9.050.14	9.063.14	9.075.14	9.090.14	9.110.14	9.110.14	9.130.14
9	007	05	RV worm	9.040.16	9.050.16	9.063.16	9.075.16	9.090.16	9.110.16	9.110.16	9.130.16

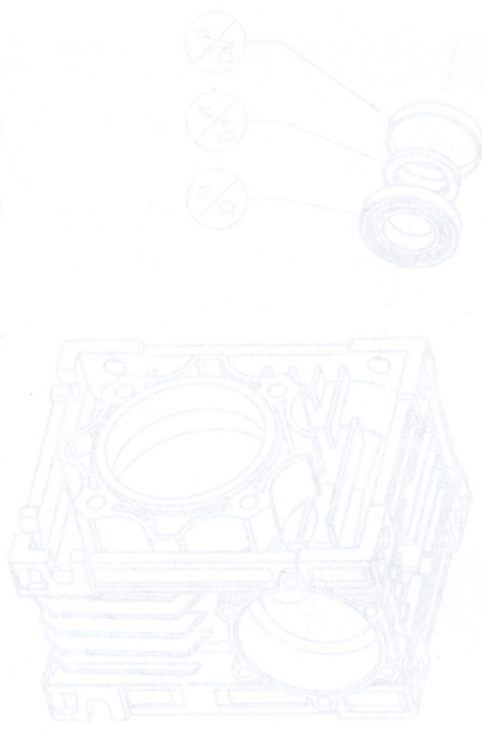
P	T	C	Commercial	040	050	063	075	090	105	110	130
9	007	01 N	Screw DIN 912	M6x12***	6	M8x18	6	M8x20	6	M8x20	6
9	007	02 N	Screw DIN 912	M6x12***	6	M8x18	6	M8x20	6	M8x20	6
9	007	03 N	Key DIN 6885	A 4x4x15	1	A 6x6x30	1	A 8x7x35	1	A 8x7x45	1
9	007	04 N	Circlip DIN 472	40	1	52	1	62	1	72	1
9	007	05 N	Spacer DIN 988	-	37x47x2.5	1	42x52x2.5	1	50x62x3	1	56x72x3
9	007	06 N	Oil seal DIN 3760	AS 17x40x7	1	AS 20x47x7	1	AS 30x62x7	1	AS 35x72x10	1
9	007	07 N	Cap	RCA 40x7	1	RCA 47x7	1	RCA 62x7	1	RCA 72x10	1
9	007	08 N	O-Ring	2162	1	2200	1	2250	1	2300	1
9	007	09 N	O-Ring	2162	1	2200	1	2250	1	2300	1
9	007	10 N	Bearing	6005	1	6006	1	32008	1	32010	1
9	007	11 N	Bearing NMRV	6203	1	6204	1	32006	1	32207	1
9	007	11 N	Bearing NRV	6203	1	6204	1	32006	1	32207	1
9	007	12 N	Bearing	6303	1	6006	1	32008	1	30307	1
9	007	13 N	Hex screw DIN 931	M6x20	4	-	-	-	-	-	-
9	007	14 N	Nut DIN 934/6	M6	4	-	-	-	-	-	-
9	007	15 N	Oil seal DIN 3760	AS 25x35x7	1	-	-	-	-	-	-
9	007	13 N	Hex screw DIN 931	M8x25	4	M8x25	4	M10x30	4	M10x30	4
9	007	14 N	Nut DIN 934/6	M8	4	M8	4	M10	4	M10	4
9	007	15 N	Oil seal DIN 3760	AS 25x35x7	1	A 30x47x7	1	A 40x60x10	1	A 50x68x8	1
9	007	13 N	Hex screw DIN 931	M8x25	4	M8x25	4	M10x30	4	M10x30	4
9	007	14 N	Nut DIN 934/6	M8	4	M8	4	M10	4	M10	4
9	007	15 N	Oil seal DIN 3760	AS 25x35x7	1	A 30x47x7	1	A 40x60x10	1	A 50x68x8	1
9	007	13 N	Hex screw DIN 931	-	-	M10x30	4	M10x30	4	M10x30	4
9	007	14 N	Nut DIN 934/6	-	-	M10	4	M10	4	M10	4
9	007	15 N	Oil seal DIN 3760	-	-	A 30x47x7	1	A 40x60x10	1	A 50x68x8	1
9	007	13 N	Hex screw DIN 931	-	-	M10x30	4	M10x30	4	M10x30	4
9	007	14 N	Nut DIN 934/6	-	-	M10	4	M10	4	M10	4
9	007	15 N	Oil seal DIN 3760	-	-	A 30x47x7	1	A 40x60x10	1	A 50x68x8	1
9	007	13 N	Hex screw DIN 931	-	-	M10x30	4	M10x30	4	M10x30	4
9	007	14 N	Nut DIN 934/6	-	-	M10	4	M10	4	M10	4
9	007	15 N	Oil seal DIN 3760	-	-	A 30x47x7	1	A 40x60x10	1	A 50x68x8	1
9	007	13 N	Hex screw DIN 931	-	-	M10x30	4	M10x30	4	M10x30	4
9	007	14 N	Nut DIN 934/6	-	-	M10	4	M10	4	M10	4
9	007	15 N	Oil seal DIN 3760	-	-	A 30x47x7	1	A 40x60x10	1	A 50x68x8	1
9	007	13 N	Hex screw DIN 931	-	-	M10x30	4	M10x30	4	M10x30	4
9	007	14 N	Nut DIN 934/6	-	-	M10	4	M10	4	M10	4
9	007	15 N	Oil seal DIN 3760	-	-	A 30x47x7	1	A 40x60x10	1	A 50x68x8	1
9	007	13 N	Hex screw DIN 931	-	-	M10x30	4	M10x30	4	M10x30	4
9	007	14 N	Nut DIN 934/6	-	-	M10	4	M10	4	M10	4
9	007	15 N	Oil seal DIN 3760	-	-	A 30x47x7	1	A 40x60x10	1	A 50x68x8	1

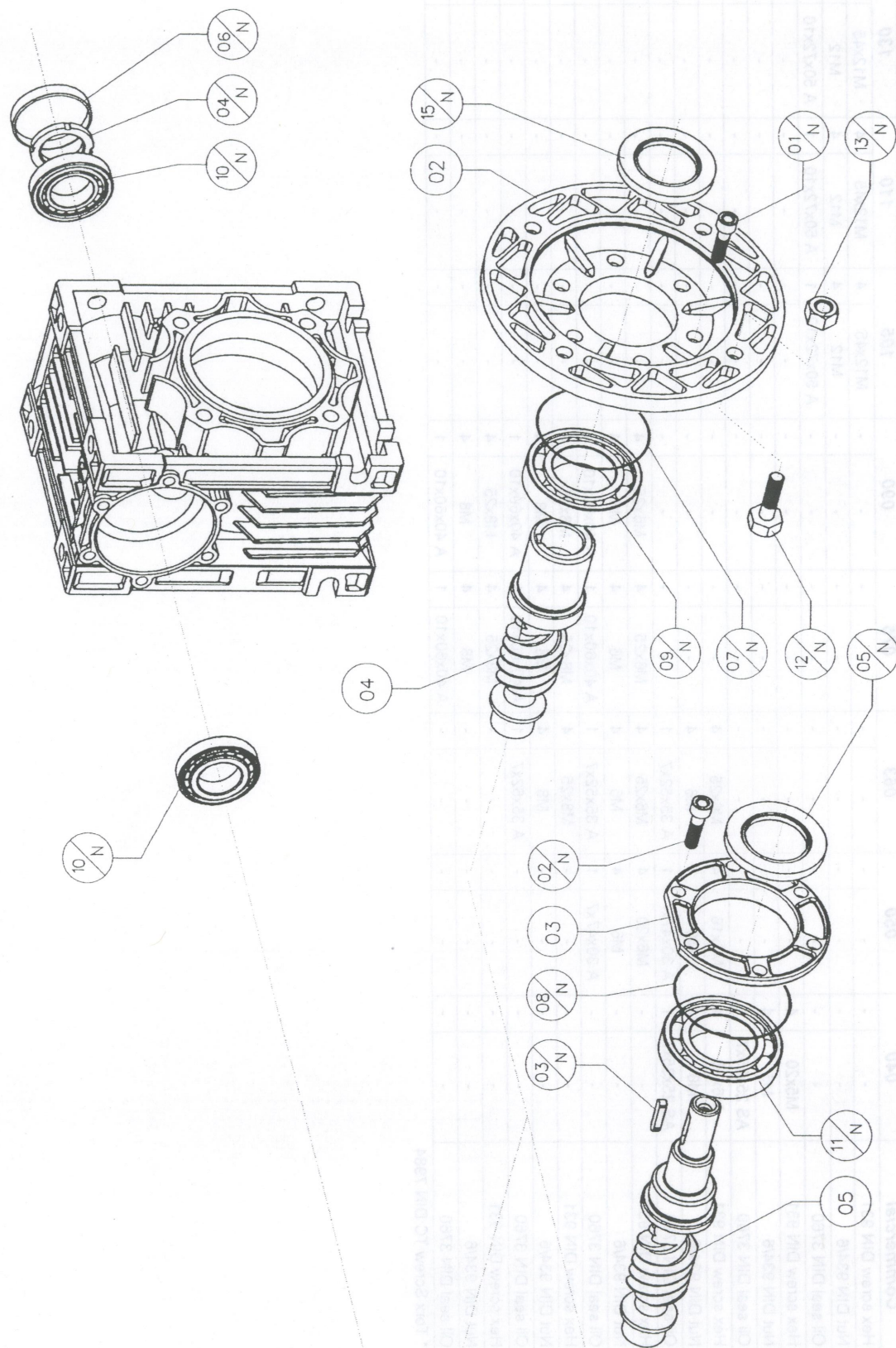
* Torx Screw TC DIN 7984



P	T	C	Commercial	040	050	063	075	090	105	110	130
9	007	13 N	Hex screw DIN 931	-	-	-	-	-	M12x45	4	M12x45
9	007	14 N	Nut DIN 934/6	-	-	-	-	-	M12	4	M12
9	007	15 N	Oil seal DIN 3760	-	-	-	-	-	A 50x72x10	1	A 50x72x10
9	007	13 N	Hex screw DIN 931	M5x20	4	-	-	-	-	-	-
9	007	14 N	Nut DIN 934/6	M5	4	-	-	-	-	-	-
9	007	15 N	Oil seal DIN 3760	AS 25x35x7	1	-	-	-	-	-	-
9	007	13 N	Hex screw DIN 931	M6x16	4	M6x25	4	-	-	-	-
9	007	14 N	Nut DIN 934/6	M6	4	M6	4	-	-	-	-
9	007	15 N	Oil seal DIN 3760	AS 25x35x7	1	A 35x52x7	1	-	-	-	-
9	007	13 N	Hex screw DIN 931	-	-	M6x20	4	M6x25	4	M6x25	4
9	007	14 N	Nut DIN 934/6	-	-	M6	4	M6	4	M6	4
9	007	15 N	Oil seal DIN 3760	-	-	A 30x47x7	1	A 40x60x10	1	A 40x60x10	1
9	007	13 N	Hex screw DIN 931	-	-	-	-	M8x25	4	M8x25	4
9	007	14 N	Nut DIN 934/6	-	-	-	-	M8	4	M8	4
9	007	15 N	Oil seal DIN 3760	-	-	-	-	A 40x60x10	1	A 40x60x10	1
9	007	13 N	Hex screw DIN 931	-	-	-	-	M8x25	4	M8x25	4
9	007	14 N	Nut DIN 934/6	-	-	-	-	M8	4	M8	4
9	007	15 N	Oil seal DIN 3760	-	-	-	-	A 40x60x10	1	A 40x60x10	1
9	007	13 N	Hex screw DIN 931	-	-	-	-	M8x25	4	M8x25	4
9	007	14 N	Nut DIN 934/6	-	-	-	-	M8	4	M8	4
9	007	15 N	Oil seal DIN 3760	-	-	-	-	A 40x60x10	1	A 40x60x10	1

* Torx Screw TC DIN 7984

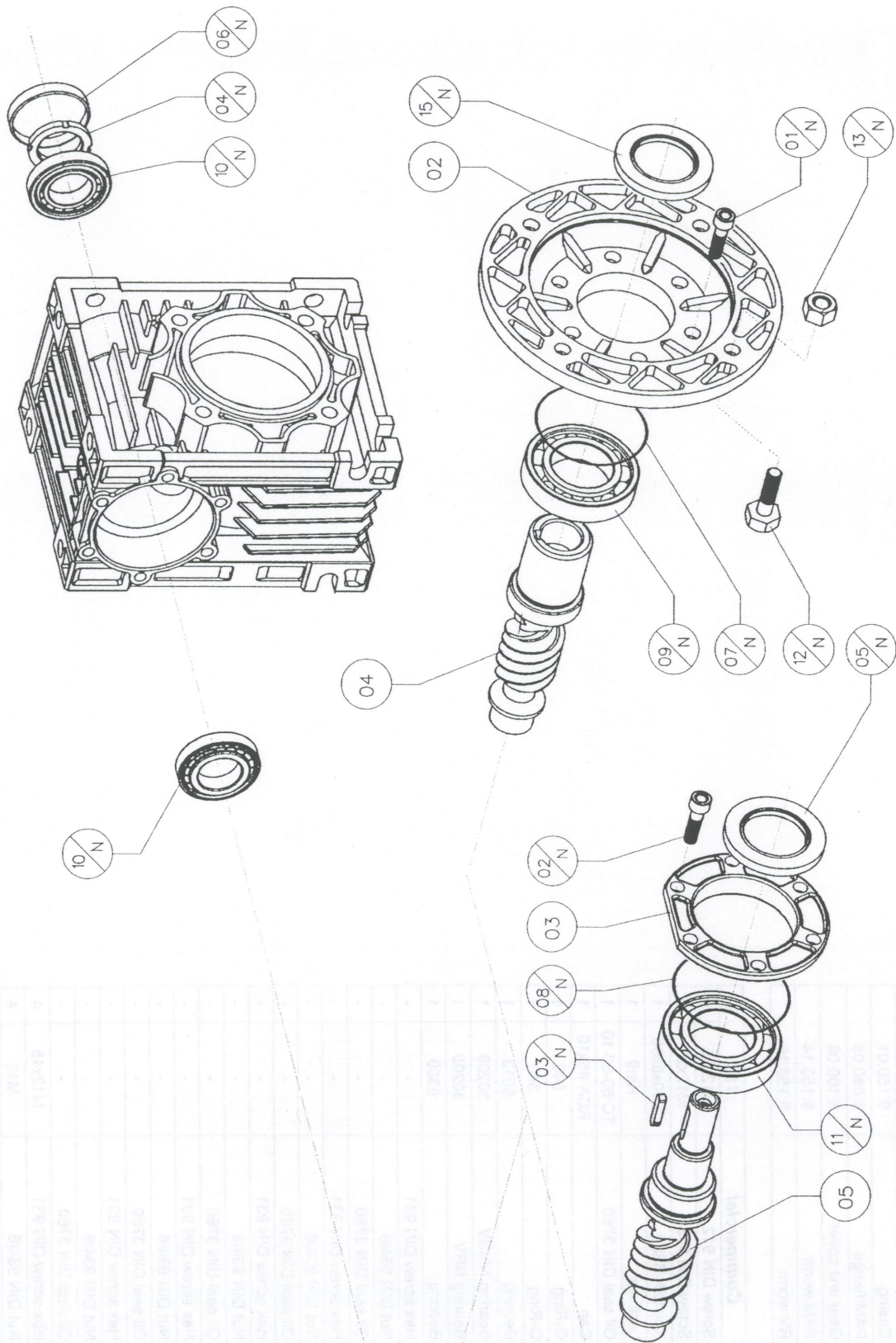




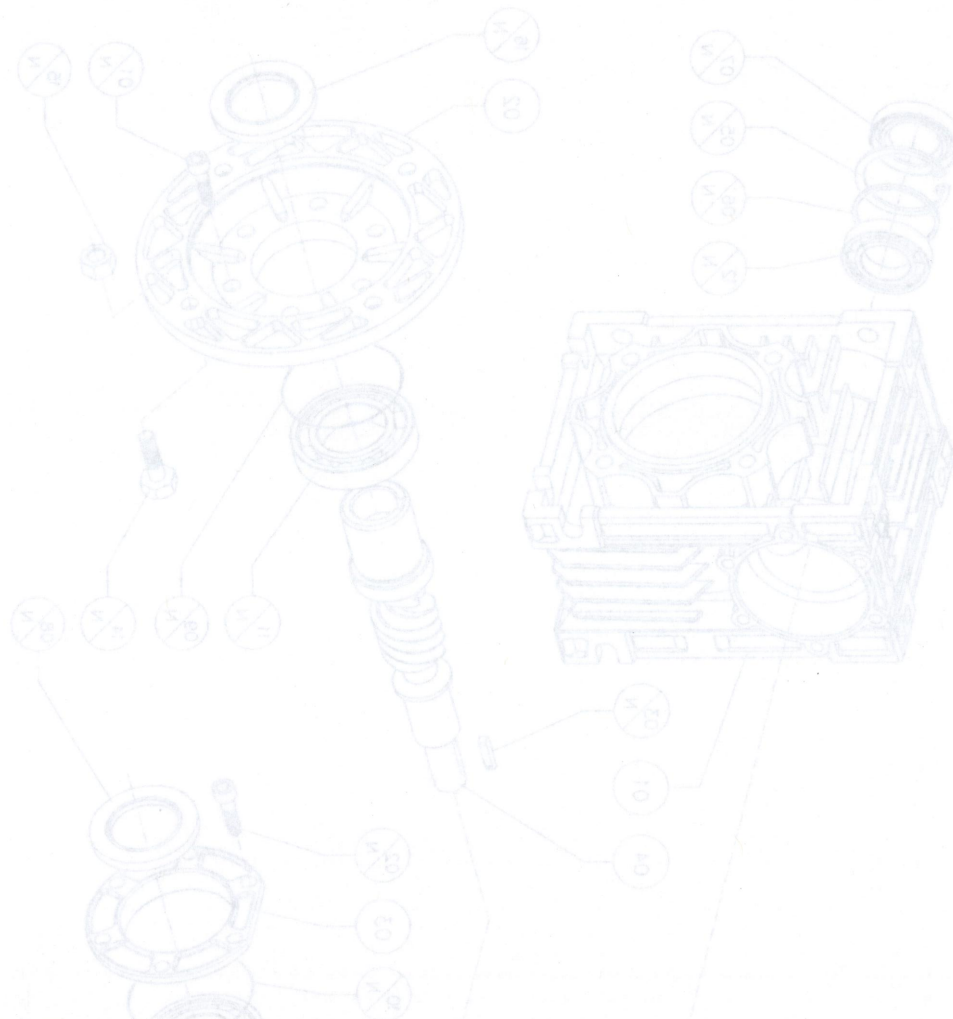
P	T	C	Built	150
9	007	01	Casing	9.150.01
9	007	02	PAM flange	4.080.05
9	007	03	Gear unit cover	8.100.08
9	007	04	PAM worm	9.150.14
9	007	05	RV worm	9.150.16

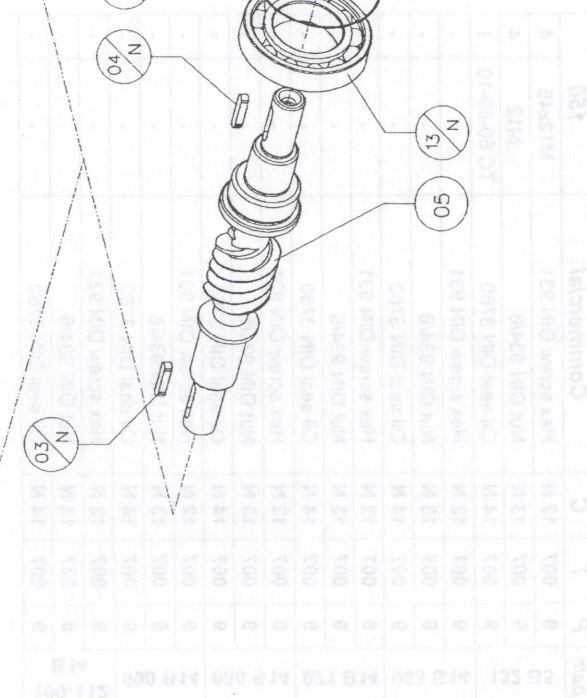
P	T	C	Commercial	150
9	007	01 N	Screw DIN 912	M12x25
9	007	02 N	Screw DIN 912	M12x25
9	007	03 N	Key DIN 6885	A 10x8x60
9	007	04 N	Lock nut	Km9
9	007	05 N	Oil seal DIN 3760	TC 60-80-10
9	007	06 N	Cap	RCA 85x10
9	007	07 N	O-Ring	540
9	007	08 N	O-Ring	540
9	007	09 N	Bearing	6013
9	007	10 N	Bearing NMRV	30209
9	007	10 N	Bearing NRV	30209
9	007	11 N	Bearing	6309
9	007	12 N	Hex screw DIN 931	-
9	007	13 N	Nut DIN 934/6	-
9	007	14 N	Oil seal DIN 3760	-
9	007	12 N	Hex screw DIN 931	-
9	007	13 N	Nut DIN 934/6	-
9	007	14 N	Oil seal DIN 3760	-
9	007	12 N	Hex screw DIN 931	-
9	007	13 N	Nut DIN 934/6	-
9	007	14 N	Oil seal DIN 3760	-
9	007	12 N	Hex screw DIN 931	-
9	007	13 N	Nut DIN 934/6	-
9	007	14 N	Oil seal DIN 3760	-
9	007	12 N	Hex screw DIN 931	-
9	007	13 N	Nut DIN 934/6	-
9	007	14 N	Oil seal DIN 3760	-
9	007	12 N	Hex screw DIN 931	M12x45
9	007	13 N	Nut DIN 934/6	M12
9	007	14 N	Oil seal DIN 3760	TC 60-80-10

Part No.	Part Name	Part Description	Part Code
001	01	01	01
002	02	02	02
003	03	03	03
004	04	04	04
005	05	05	05
006	06	06	06
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100	100	100	100



part	P	T	C	Commercial	150	
					M12x45	4
132 B5	9	007	12 N	Hex screw DIN 931	M12	4
	9	007	13 N	Nut DIN 934/6	TC 60-80-10	1
063 B14	9	007	14 N	Oil seal DIN 3760	-	-
	9	007	12 N	Hex screw DIN 931	-	-
071 B14	9	007	13 N	Nut DIN 934/6	-	-
	9	007	14 N	Oil seal DIN 3760	-	-
080 B14	9	007	12 N	Hex screw DIN 931	-	-
	9	007	13 N	Nut DIN 934/6	-	-
090 B14	9	007	14 N	Oil seal DIN 3760	-	-
	9	007	12 N	Hex screw DIN 931	-	-
100-112 B14	9	007	13 N	Nut DIN 934/6	-	-
	9	007	14 N	Oil seal DIN 3760	-	-
	9	007	12 N	Hex screw DIN 931	-	-
	9	007	13 N	Nut DIN 934/6	-	-
	9	007	14 N	Oil seal DIN 3760	-	-
	9	007	12 N	Hex screw DIN 931	-	-
	9	007	13 N	Nut DIN 934/6	-	-
	9	007	14 N	Oil seal DIN 3760	-	-





<i>P</i>	<i>T</i>	<i>C</i>	<i>Built</i>	040	050	063	075	090	105	110	130
9	008	01	Casing	9.040.01	9.050.01	9.063.01	9.075.01	9.090.01	9.105.01	9.110.01	9.130.01
9	008	02	PAM flange	9.040.03	9.050.03	9.063.03	9.075.03	9.075.03	9.110.03	9.110.03	9.110.03
9	008	03	Gear unit cover	9.040.06	9.050.06	9.063.06	9.075.06	9.075.06	9.110.06	9.110.06	9.130.06
9	008	04	Double ext. PAM worm	9.040.15	9.050.15	9.063.15	9.075.15	9.090.15	9.110.15	9.110.15	9.130.15
9	008	05	Double ext. RV worm	9.040.17	9.050.17	9.063.17	9.075.17	9.090.17	9.110.17	9.110.17	9.130.17

part	P	T	C	Commercial	040		050		063		075		090		105		110		130
B5	9 008	01 N		Screw DIN 912	M6x12***	6	M6x14	6	M8x18	6	M8x20	6	M8x20	6	M8x20*	6	M8x20	6	M8x20
	9 008	02 N		Screw DIN 912	M6x12***	6	M6x14	6	M8x18	6	M8x20	6	M8x20	6	M8x20*	6	M8x20	6	M8x20
	9 008	03 N		Key DIN 6885	A 4x4x15	1	A 5x5x20	1	A 6x6x30	1	A 8x7x35	1	A 8x7x35	1	A 8x7x45	1	A 8x7x45	1	A 8x7x45
	9 008	04 N		Key DIN 6885	A 4x4x15	1	A 5x5x20	1	A 6x6x30	1	A 8x7x35	1	A 8x7x35	1	A 8x7x45	1	A 8x7x45	1	A 8x7x45
	9 008	05 N		Circlip DIN 472	40	1	47	1	52	1	62	1	62	1	72	1	72	1	72
	9 008	06 N		Spacer DIN 988	-	-	37x47x2.5	1	42x52x2.5	1	50x62x3	1	50x62x3	1	56x72x3	1	56x72x3	1	56x72x3
	9 008	07 N		Oil seal DIN 3760	AS 17x40x7	1	AS 20x47x7	1	AS 25x52x7	1	AS 30x62x7	1	AS 30x62x7	1	AS 35x72x10	1	AS 35x72x10	1	AS 35x72x10
	9 008	08 N		Oil seal DIN 3760	AS 17x40x7	1	AS 20x47x7	1	AS 25x52x7	1	AS 30x62x7	1	AS 30x62x7	1	AS 35x72x10	1	AS 35x72x10	1	AS 35x72x10
	9 008	09 N		O-Ring	2162	1	2200	1	3225	1	2250	1	2250	1	2300	1	2300	1	2300
	9 008	10 N		O-Ring	2162	1	2200	1	3225	1	2250	1	2250	1	2300	1	2300	1	2300
	9 008	11 N		Bearing	6005	1	6006	1	6007	1	32008	1	32008	1	32010	1	32010	1	32010
	9 008	12 N		Bearing NMRV	6203	1	6204	1	6205	1	30206	1	30206	1	32207	1	32207	1	32207
	9 008	12 N		Bearing NRV	6203	1	6204	1	30205	1	30206	1	30206	1	32207	1	32207	1	32207
	9 008	13 N		Bearing	6303	1	6006	1	30305	1	32008	1	32008	1	30307	1	30307	1	30307
	9 008	14 N		Hex screw DIN 931	M6x20	4	-	-	-	-	-	-	-	-	-	-	-	-	-
	056 B5	9 008	15 N		Nut DIN 934/6	M6	4	-	-	-	-	-	-	-	-	-	-	-	-
9 008		16 N		Oil seal DIN 3760	AS 25x35x7	1	-	-	-	-	-	-	-	-	-	-	-	-	
9 008		14 N		Hex screw DIN 931	M8x25	4	M8x25	4	-	-	-	-	-	-	-	-	-	-	
9 008		15 N		Nut DIN 934/6	M8	4	M6	4	-	-	-	-	-	-	-	-	-	-	
063 B5	9 008	16 N		Oil seal DIN 3760	AS 25x35x7	1	A 30x47x7	1	-	-	-	-	-	-	-	-	-	-	
	9 008	14 N		Hex screw DIN 931	M8x25	4	M8x25	4	M8x25	4	M8x25	4	M10x30	4	M10x30	4	M10x30	4	
	9 008	15 N		Nut DIN 934/6	M8	4	M8	4	M8	4	M8	4	M10	4	M10	4	M10	4	
	9 008	16 N		Oil seal DIN 3760	AS 25x35x7	1	A 30x47x7	1	A 35x52x7	1	A 40x60x10	1	-	-	-	-	-	-	
071 B5	9 008	14 N		Hex screw DIN 931	M8x25	4	M8x25	4	M8x25	4	M8x25	4	M10x30	4	M10x30	4	M10x30	4	
	9 008	15 N		Nut DIN 934/6	M8	4	M8	4	M8	4	M8	4	M10	4	M10	4	M10	4	
	9 008	16 N		Oil seal DIN 3760	AS 25x35x7	1	A 30x47x7	1	A 35x52x7	1	A 40x60x10	1	-	-	-	-	-	-	
	9 008	14 N		Hex screw DIN 931	M8x25	4	M10x30	4	M10x30	4	M10x30	4	M10x30	4	M10x30	4	M10x30	4	
080 B5	9 008	15 N		Nut DIN 934/6	-	-	M10	4	M10	4	M10	4	M10	4	M10	4	M10	4	
	9 008	16 N		Oil seal DIN 3760	-	-	A 30x47x7	1	A 35x52x7	1	A 40x60x10	1	-	-	-	-	-	-	
	9 008	14 N		Hex screw DIN 931	-	-	-	4	M10x30	4	M10x30	4	M10x30	4	M10x30	4	M10x30	4	
	9 008	15 N		Nut DIN 934/6	-	-	-	4	M10	4	M10	4	M10	4	M10	4	M10	4	
090 B5	9 008	16 N		Oil seal DIN 3760	-	-	A 30x47x7	1	A 35x52x7	1	A 40x60x10	1	-	-	-	-	-	-	
	9 008	14 N		Hex screw DIN 931	-	-	-	4	M10x30	4	M10x30	4	M10x30	4	M10x30	4	M10x30	4	
	9 008	15 N		Nut DIN 934/6	-	-	-	4	M10	4	M10	4	M10	4	M10	4	M10	4	
	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M10	4	M10	4	M10	4	M10	4	M10	4	
100-112	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 35x52x7	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
B5	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
100-112	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
B5	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
100-112	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
100-112	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
100-112	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
100-112	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
100-112	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
100-112	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
100-112	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
100-112	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
	9 008	15 N		Nut DIN 934/6	-	-	-	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	M12x35	4	
	9 008	16 N		Oil seal DIN 3760	-	-	-	4	M12	4	M12	4	M12	4	M12	4	M12	4	
100-112	9 008	14 N		Hex screw DIN 931	-	-	-	4	A 40x60x10	1	A 40x60x10	1	A 40x60x10	1	A 50x68x8	1	A 50x68x8	1	
	9 008																		

* Torx Screw TC DIN 7984

