

Pneumatic pumps



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CE

GB



Using and maintenance manual

***Pneumatic pump for grease, oil, waste oil
antifreeze and urea fluid (AdBlue®)***



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1 GENERALITY

1.1 General considerations and Destination Of use

In the present book use and maintenance are described the formalities of use and maintenance air operated piston pumps for the transfer of grease or oils. The system is composed by a same motor that can suit grease or pumping plungers suitable for different size of tanks. Different typologies of pump have been set up for the different materials, as described further on in the manual.

The machine must not be use for other types of operations without the express authorization of the **FLEXBIMEC INTERNATIONAL S.r.l.**

The machine has been projected to perform the best results if all the operative instructions and the recommendations described in this manual will be respected.

 The training of the personnel is important for the maintenance and the control of the respect of the procedures of operation and all the suitable safety norms detailed in this manual.

1.2 Consultation of the manual

This manual has been organized so that the user can find easily and quickly the necessary information for the use and the maintenance of the machine. The user must read the whole manual, paying extreme attention, and be make sure that all the contained information are perfectly assimilated.

The secondary function of the manual is to be document of reference and consultation to be used each time that will be necessary to perform a procedure or an operation. Insofar it must always be kept at disposal of the personnel employed to the management and to the maintenances to enable to be consulted in any moment.

The consultation of this manual is facilitated by the presence of a general index, that allows to immediately locate the chapter of the matter that interests.

The index is composed from 10 numbered main chapters, according to the logic [A, B] where "A" points out the number of the general chapter, "B" the paragraph with specific matters. For improve intelligibility some safety symbols have been inserted beside some paragraphs to underline its importance and to facilitate its individualization. To set particular attention to such notes.

Pneumatic pumps

1.3 Legislation Reference

- DIRECTIVE 2006/42/CE
Pertinent to the approaching of the legislations of the states member concerning the machines.

1.4 Reference Norms

- UNI – EN 12100 -1/ 2005.
Machine safety – base terms
- UNI – EN 12100 -2/ 2005.
Machine safety - Specifications and technical principles
- UNI – EN 349/Giu. 1994.
Minimum space to avoid crushing of parts of the body.
- EN 954-1/Dic. 1992
Machine safety. General design principles.

1.5 Symbols

On the manual we will use the following symbols in order to point out the indications and warnings that are particularly important.



PROHIBITION

This symbol indicates the prohibition to carry out some operations that can threaten the safety of the operator and the machine integrity.
Please read carefully the side note.



DANGER

This symbol indicates warning messages that are important for the operator safety. Please read carefully the side note.



ELECTRIC DANGER

This symbol indicates the existence of a danger caused by the electric energy.

IMPORTANT

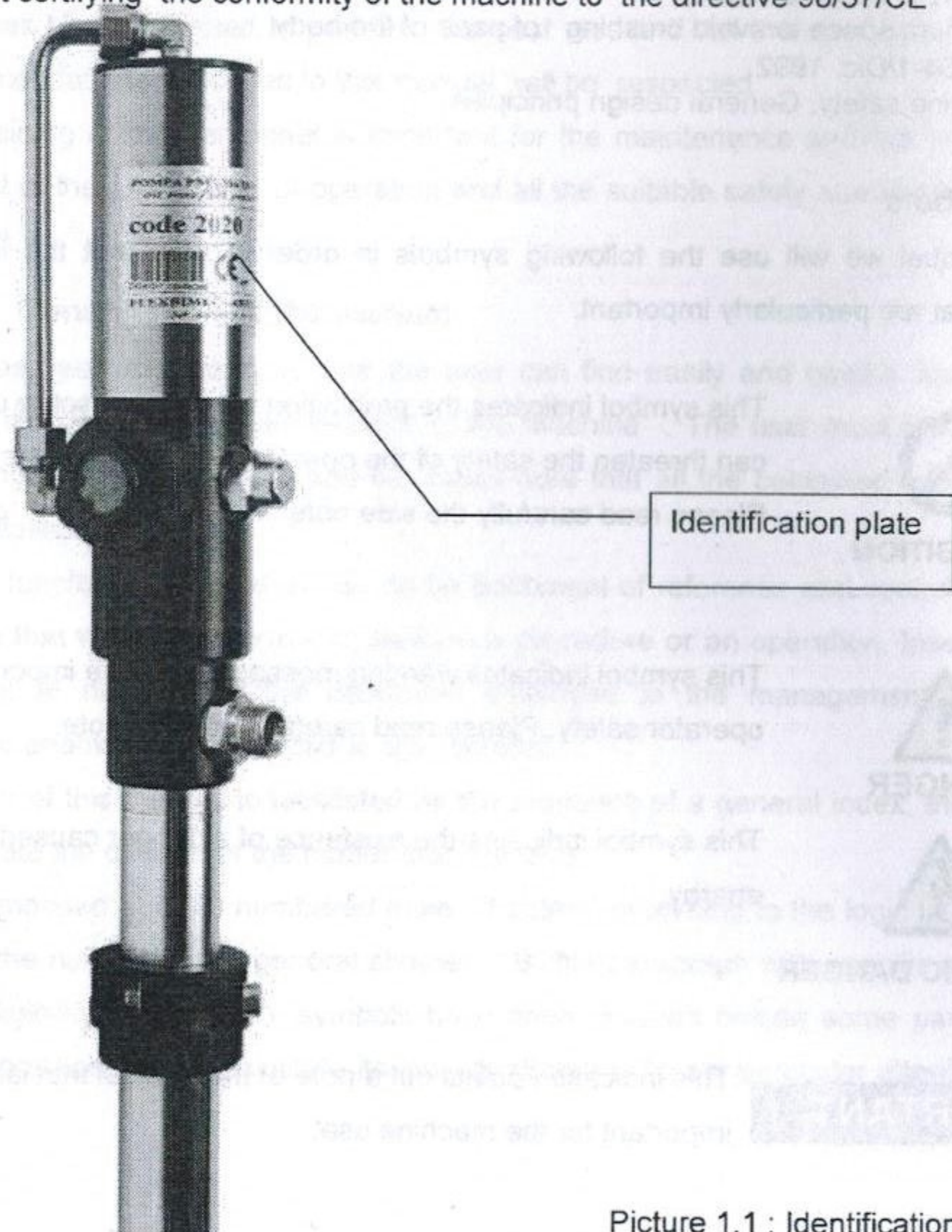
This indication points out a note of the manual that is particularly important for the machine use.

Pneumatic pumps

1.6 Manufacturer identification plate

the identification plate has been applied on the body of the pump-motor and on the attachment which includes exploded view and statement of conformity (see picture 1.1) with the following detailed information :

- 1 Manufacturer's identification
- 2 Machine model
- 3 Serial Number
- 4 Year of manufacture
- 5 CE Marks t certifying the conformity of the machine to the directive 98/37/CE



Picture 1.1 : Identification Plate

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1.7 Warranty

The period of warranty is, in accordance with the provisions of the general regulations in force, of 12 months from the date of purchase. Warranty only gives right to replacement of defective parts. Warranty is however excluded if the appliances have been used improperly or tampered with by persons we have not authorized, or anyhow using non-conforming components or techniques. Parts turning out to be defective at origin shall be replaced if returned free our warehouse.

1.8 Spare Parts Orders

Every request of spare parts must be carried out to the following phone number:

FLEXBIMEC INTERNATIONAL S.r.l. – Customer Technical Assistance Service Tel. 0522 347330 specifying:

- Machine model;
- Serial number
- Code of the part to be ordered
- Required quantity
- Shipping mean
- Reference person

Using the following suitable table:

Company		Street		
C.A.P.		City		
Tel.		Fax.		
Responsible Person				
Article Model:				
Table Number	Pos.	Code	Nr.	Description

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1.9 Statement of conformity

STATEMENT OF CONFORMITY "CE"

In conformity with Enclosed II B of the Directive 2006/42/CE,
as from D.P.R. n. 459 of 1996-07-24 of which G.U. n. 146 of 1996-09-06

FLEXBIMEC INTERNATIONAL s.r.l.
- Via Roma 26 - 42020 ALBINEA (REGGIO EMILIA) - ITALY -

CODES: SEE CHAPTER 3.2 OF THIS MANUAL

SERIAL NUMBERS: SEE ON PUMP BODY

The undersigned **Ruozi Maurizio**
In quality of legal representative of the company FLEXBIMEC INTERNATIONAL SRL

STATES

Under its own civil and penal responsibility that the products:

AIR OPERATED PUMPS FOR GREASE, OIL, WASTE OIL, ANTIFREEZE AND UREA FLUID

Are in conformity with all the main safety requirements that concern these items; as also for the application points of the following particular provisions:

- Directive 2006/42/CE received in Italy with DPR 459 of 24/07/1996
Concerning the machine safety.

Flexbimec International S.r.l.
Legal representative



(RUOZI MAURIZIO)

Date

01/06/14

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2 RULES FOR OPERATORS' SAFETY

2.1 Prescriptions for Operator's Safety

The following rules must be read carefully and must become a fundamental part of the daily work and maintenance of the machine, in order to avoid any accident to the persons and/or damages to the things.



Please don't try to put in function the machine until the functioning is not clearly understood.



Ensure that all the prescriptions concerning the safety are known by the personnel involved in the use, cleaning and maintenance of the machine.



Before starting the machine, the operator must test the presence of defects in the safety devices of the machine. In this case the operator has to inform immediately the warehouse responsible concerning the defect of the machine.



The protection devices must not be removed or become ineffective when the machine is working.



It's compulsory to keep all the plates with warning and safety signals in perfect conditions. In case of damages or deteriorations it's important to replace them immediately.



Replace the damaged parts with new ones indicated by FLEXBIMEC INTERNATIONAL S.r.l.

Please NEVER try hazardous solutions.



All the works executed on parts under tension must be carried out by authorized personnel only. Before starting the works the machine will have to be disconnected from the electric network.

Important: Please apply all the safety rules and be sure that they are respected; in case of doubts please check again this manual before working on the machine.

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The machine must be used only for the use for which it has been manufactured and according to what stated by FLEXBIMEC INTERNATIONAL S.r.l.



Don't use the machine for uses different from the ones indicated by the manual.

2.2 Individual Protection Devices

The operator, before starting the work, must know the disposition and the functioning of the commands and the machine features and must have read completely the present manual and also the enclosed manuals.

IMPORTANT !

It's compulsory that the company's owner supplies the Individual Protection Devices and informs the personnel concerning the correct use and maintenance.

IMPORTANT!

The operator must always follow the prescriptions indicated on the sign reported on the machine.

The Individual Protection Devices that the operator must use during the operations of Loading, Maintenance and Cleaning are:

Working Clothing, Shoes with slip prevention Sole and Gloves



2.3 Air Noise and Vibrations

The measurement of acoustic intensity, relative to the machine emissions, have been taken according to the rule in force CEE 256.

The measurement of outlet pressure has been executed in correspondence of the work place 1 mt. Far from the machine surface and at 1,60 mt height from the ground.

The measurements of acoustic intensity have pointed out an acoustic energy of less than 70 dB(A).

The vibrations measurement has not been effected because it has been estimated to be under the risk level.



Pneumatic pumps

3 FEATURES

3.1 Premise

The target of this chapter is to have a general framework of the machine features. The reading of this chapter is recommended to all the people working on that machine: **OPERATORS and QUALIFIED TECHNICIANS.**

3.2 Machine description

In the present using and maintenance manual we show the phases for use and maintenance of the air operated pumping systems suitable for the decanting of grease or oil:

Pneumatic pumps for oil

Models : 2012- 2013 - 2014 - 2015 - 2016 - 2020 - 2020TWDE - 2025 - 2025TWDE - 2030 - 2030 TWDE - 2032 - 2035 - 2035TWDE - 2040 - 2043 - 2043L - 2044 - 2061 - 2073 - 2075 - 2075L - 2075L TWDE - 2076 - 2076TWDE - 2076130 - 2089 - 2090 - 5011 - 5031 .

suitable for the distribution of the oil; the models are different depending on the expected performances (flow and pressure in the out-let hose) and on the adaptability to the different dimensions of the drums (eg. change of the length of the suction plunger);

Pneumatic pumps for grease

Models : 4018 - 4019 - 4019TWDE - 4020 - 4021 - 4021TWDE - 4021TWDS - 4022 - 4043- 4041/60 - 4045 - 4045/60 - 4060 - 4061 - 4061TWDE - 4061TWDS - 4062 - 4080 - 4081- 4081TWDE - 4081TWDS - 4082 - 40835000 - 5040 - 5060 - 5080. suitable for the grease pumping for the direct fastening to the drum

Pneumatic pumps for waste oil and antifreeze

Models: 2033 - 2047 - 2047L - 2049 - 2074. the features are the same as above but the sealing is made by Viton® material suitable for antifreeze liquid.

Pneumatic pumps for antifreeze and AdBlue® Urea fluid

Models: 1019 - 1020 - 1021 - 1022 - 1043 - 1045 - 1049 - 1050 - 1079 . Stainless steel pneumatic pumps are made for transferring aggressive liquids or liquids with particular chemical features. The shank of the pump is made in stainless steel AISI 304 and the packing are in EPDM in standard version and Viton®, Teflon PTFE® material on request. It is important to verify the compatibility of the fluids to transfer with the manufacturing materials of the pump . We remind that our pumps are **not suitable for transferring inflammable** liquids as petrol , gasoline ect...



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The Motomatic model code 5000 is an interchangeable motor suitable for one of the following plunger 5040 – 5060 – 5080 not at the same time and is to be considered a complementary device.

3.3 Not allowed uses



The pump is supplied in the different models suitable for the liquid type. Every pump must be used for the specific liquid (oil or grease). Don't use the same pump for oil and grease. Always obtain the safety file of the materials used and follow the instructions contained therein (contact competent technical personnel to choose correctly the liquid). Never dispose of any residues in the surrounding environment, keep to the provisions of current regulations. **Do not use with high inflammable, corrosive or toxic products.**

3.4 Technical Features:

PUMP MODEL	FEEDING bar	RATIO	MAX. OUTLET PRESSURE Bar	FREE PASSAGE Lt/m. - Kg/min	OUTSIDE Ø OF THE SHANK mm.	SHANK LENGTH mm.	FOR DRUMS KG.
CATEGORY: OIL – STANDARD PUMP FOR DRUM							
2012	2-8	6:1	48	32	40	950	180
2013	2-8	2:1	16	48	55	950	180
2015	2-8	5:1	40	18	40	950	180
2020	2-8	2,7:1	21	23	40	950	180
2020 TWDE	2-8	2,7:1	21	28	40	950	60
2025	2-8	5:1	40	15	40	950	180
2025 TWDE	2-8	5:1	40	22	40	950	180
2030	2-8	2,7:1	21	23	40	750	60
2030 TWDE	2-8	2,7:1	21	28	40	750	60
2035	2-8	5:1	40	15	40	750	60
2035 TWDE	2-8	5:1	40	22	40	750	60
2040	2-8	1,3:1	10	45	55	950	180
2043L	2-8	1,3:1	10	25	55	950	180
2073	2-8	2,7:1	21	16	40	950	180
2075	2-8	5:1	40	13	34	250	-
2075L	2-8	5:1	40	13	34	950	180
2075L TWDE	2-8	5:1	40	17	32	950	180
2090	2-8	8:1	64	7	28	950	180
5011	2-8	1,3:1	10	40	55	950	180
5031	2-8	2,7:1	21	14	40	950	180



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CATEGORY: OIL – WALL PUMP							
2014	2-8	5:1	40	18	40	-	-
2016	2-8	6:1	48	32	40	-	-
2032	2-8	2,7:1	21	20	40	-	-
2043	2-8	1,3:1	10	25	55	-	-
2044	2-8	1,3:1	10	35	55	-	-
2075	2-8	5:1	40	11	34	-	-
2075130	2-8	5:1	40	13	34	1300	1000 Lt
2089	2-8	8:1	64	7.5	28	-	-
CATEGORY: GREASE – PUMP FOR DRUM							
4018	4-8	54:1	430	1,360 Kg/min	28	335	18
4019	4-8	100:1	800	0,75 Kg/min	28	335	18
4019 TWDE	2-8	100:1	800	5 kg/min	28	335	16
4020	4-8	50:1	400	1 Kg/min	28	450	20/30
4021	4-8	100:1	800	0,75 Kg/min	28	450	20/30
4021 TWDE	2-8	100:1	800	5 kg/min	28	450	18-25
4021 TWDS	2-8	45:1	360	6.4 kg/min	28	450	18-25
4022	2-8	25:1	200	7 kg/min	28	450	18-25
4041	4-8	5:1	40	5 Kg/min	40	950	180
4041/60	4-8	5:1	40	5 Kg/min	40	750	60
4045	4-8	10:1	80	10 Kg/min	55	950	180
4045/60	4-8	10:1	80	10 Kg/min	55	750	60
4060	4-8	50:1	400	1 Kg/min	28	750	60
4061 TWDE	2-8	100:1	800	5 kg/min	28	750	50
4061 TWDS	2-8	45:1	360	6.4 kg/min	28	750	50
4062	2-8	25:1	200	7 kg/min	28	750	50
4061	4-8	100:1	800	0,75 Kg/min	28	750	60
4080	4-8	50:1	400	1 Kg/min	28	950	180
4081	4-8	100:1	800	0,75 Kg/min	28	950	180
4081 TWDE	2-8	100:1	800	5 kg/min	28	950	180
4081 TWDS	2-8	45:1	360	6.4 kg/min	28	950	180
4082	4-8	25:1	200	7 kg/min	28	950	180
4083	2-8	45:1	360	6.9 kg/min	28	950	180
5000	4-8	50:1	400	1 Kg/min	-	-	-
5040	4-8	50:1	400	1 Kg/min	28	450	20/30
5060	4-8	50:1	400	1 Kg/min	28	750	60
5080	4-8	50:1	400	1 Kg/min	28	950	180
CATEGORY: ANTIFREEZE AND WASTE OIL PUMPS							
1045	2-8	1,3:1	10	35	55	Wall Mounted	-
2047	2-8	1,3:1	10	35	55	Wall Mounted	-
2074	2-8	2,7:1	21	13	40	950	180
28703	2-8	2,7:1	21	13	40	950	180
2047L	2-8	1,3:1	10	35	55	Wall Mounted	-
2049	2-8	1,3:1	10	35	55	Wall Mounted	-



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CATEGORY: ANTIFREEZE AND AdBlue® UREA FLUID PUMPS							
1019	2-8	2,7:1	21	16,7	40	355	-
1020	2-8	2,7:1	21	16,7	40	355	-
1021	2-8	5:1	40	15	40	355	-
1022	2-8	5:1	40	15	40	355	-
1043	2-8	1,3:1	9	35	55	355	-
1045	2-8	1,3:1	9	35	55	355	-
1049	2-8	2,7:1	22	13	40	260	-
1050	2-8	2,7:1	22	13	40	1000	1000
1079	1-8	4:1	32	35	55X50	260	wall mounted

4 STORAGE, LIFTING AND TRANSPORT

4.1 Introduction

The target of the following chapter is to give all the necessary information for the lifting and transport of the machine.

The information of this chapter are addressed to **QUALIFIED TECHNICAL** personnel with adequate knowledge to operate in a suitable way and in safety conditions using crane trucks, travelling cranes or whatever is necessary.

4.2 General Warnings



In order to avoid that, in case the machine falls, some parts can hit the people, please ensure that during lifting operations, there are no persons near the lifting machines.

IMPORTANT!

The lifting operation, transport, placing, must be carried out by qualified and trained technical personnel.

4.3 Machine Lifting



MAX WEIGHT OF THE PUMP IS 12 Kg

For the lifting and handling of the machine it is not necessary to use the lifting machine because the weight is very few so it's possible to carry out the operation by hand.

Pneumatic pumps

4.4 Storage

In case of long period storage, please leave the machine repaired from rain and wind and possibly in a dry place.

Protect carefully from dust and external agents.

The pump can suffer big damages if, waiting for the installation, is kept in an environment at critical temperatures. Do not expose the machine to temperatures lower than -10°C and more than $+60^{\circ}\text{C}$.



It's forbidden to put the machine on inadequate structures.



It's forbidden to leave on the machine other materials or other equipments.

4.5 Transport

The transport must be carried out by hand complying peremptorily to the following rules:

- apply the rule in force as concerns the work hygiene and safety (in particular as concerns the total weight);
- take off the accessory devices or whatever else can hamper the operations;
- take out the pump from the drum, discharge the residual fluid and catch the pump on the pump body;
- keep the people not involved in the operation to an adequate distance.

5 INSTALLATION, CONNECTION AND FEEDING

5.1 Introduction

The target of the following chapter is to give information for the installation and use of the pump in safety conditions.

5.2 Installation Notes



Before starting the installation operations please check the following conditions:

Check always that all the components and devices are not damaged. In case it's necessary please contact immediately our authorized dealer in your area.

5.3 Connection hoses

5.3.1 Hoses for oil, antifreeze and urea fluid transfer

SAE 100 R1T Characteristics:

- **Tube:** black, oil, hydraulic fluids resistant synthetic rubber.
- **Reinforcement:** 1 wire braid.
- **Cover:** black, oil resistant synthetic rubber.
- **Operating temperature range:** from - 10 C° to + 130 C°.

For oil we recommend hose with Ø 1/2" R1T.

Ø Nom. inch.	Ø Int. mm.	Ø Ext. mm.	Pressure bar	Working psi	Testing Pressure bar	Burst pressure bar	Bend radius Min. mm.	Weight Kg./mt.
1/4	6,4	13,4	193	2755	386	773	100	0,338
5/16	7,9	15,0	158	2255	316	633	115	0,358
3/8	9,5	17,4	158	2255	316	633	130	0,454
1/2	12,7	20,6	140	1998	281	562	180	0,553
5/8	15,9	23,7	105	1499	210	422	200	0,635
3/4	19,0	27,7	88	1256	175	351	240	0,810
1	25,4	35,6	70	999	140	281	300	1,173



5.3.2 Hoses for grease transfer

SAE 100 R2T Characteristics:

- **Tube:** black, oil, hydraulic fluids resistant synthetic rubber.
- **Reinforcement:** 2 wire braid.
- **Cover:** black, oil resistant synthetic rubber.
- **Operating temperature range:** from - 10 C° to + 130 C°.

For grease we recommend hose with Ø min. 1/4 R2T.

Ø Nom. inch.	Ø Int. mm.	Ø Ext. mm.	Pressure bar	Working psi	Testing Pressure bar	Burst pressure bar	Bend radius Min. mm.	Weight Kg./mt.
1/4	6,4	15,5	351	5011	703	1404	101	0,493
5/16	7,9	16,5	298	4254	597	1404	115	0,539
3/8	9,5	19,5	281	4012	562	1124	127	0,673
1/2	12,7	22,5	245	3498	490	980	178	0,791
5/8	15,9	25,5	193	2755	386	772	203	0,936
3/4	19,0	29,5	158	2255	316	633	241	1,144
1	25,4	38	140	1998	281	562	305	1,575

5.4 Installation

The pump is installed on the drum/tank for the dispensing of the oil/grease. Below we show for every model the phases for the installation.



During the phases of work the equipment is located in the different places; we recommend to comply with the following rules:

- do not place the equipment near heat sources or other (eg. radiators);
- do not place the equipment in such a way as to hold up other operators in the site.



On demand we can provide trolley with different dimensions and shapes to use correctly the equipment drum-pump-gun. For the choice of the trolley see the chap. accessories.

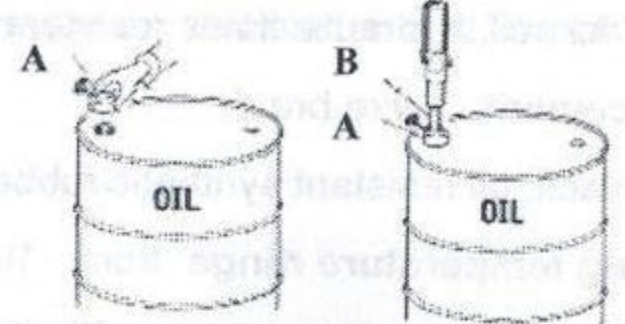
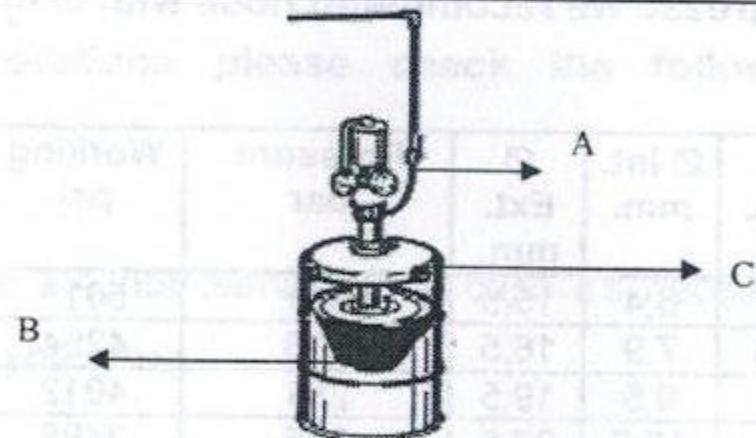
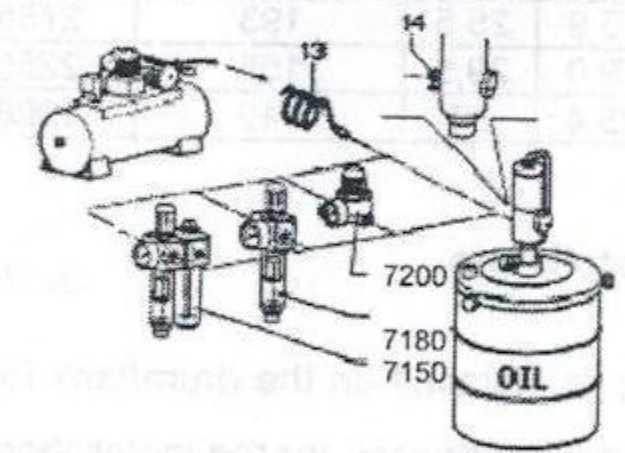
In case of need, immediately call our authorized area dealer or our technical assistance.



Pneumatic pumps

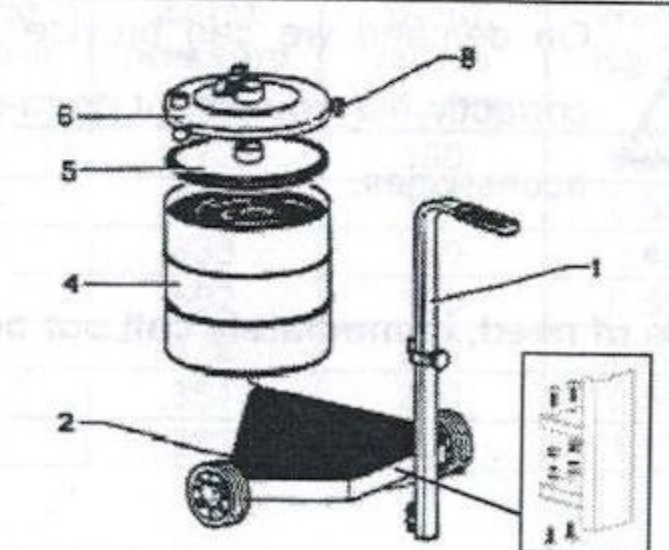
5.4.1 Oil pumps on the drum

We recommend to carry out the following operations for the installation:

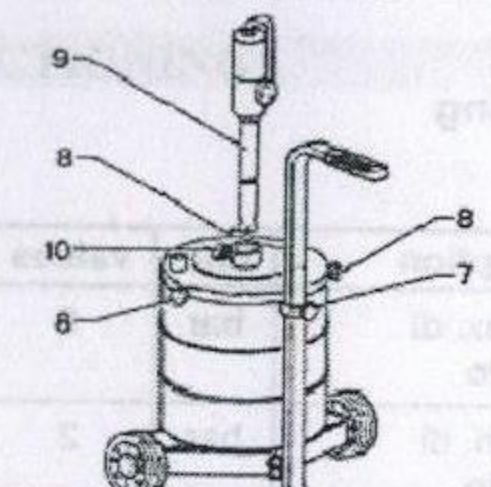
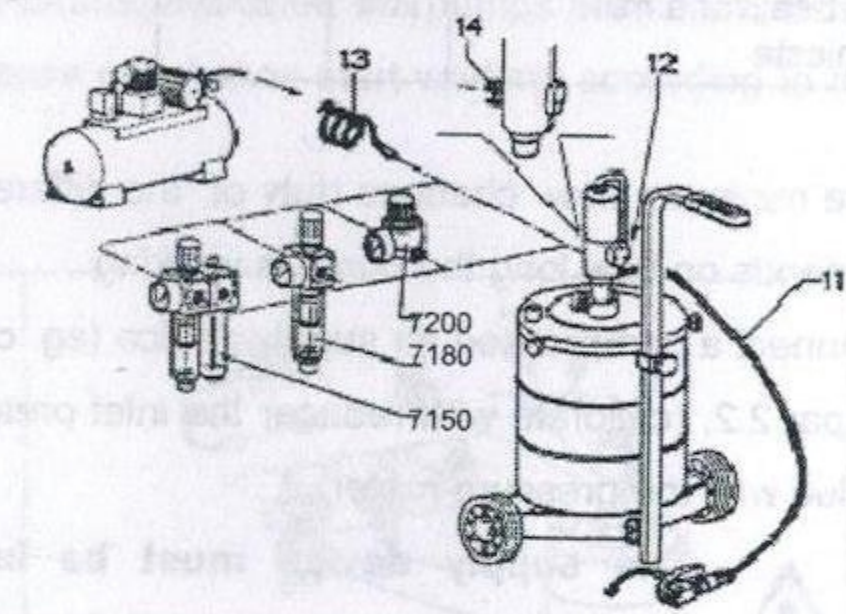
<p>Phase 1: fix the ring nut (part.A) in the drum of the liquid, that has to be pumped; thread the shank (part.B) in the ring nut (part.A);</p>	
<p>Phase 2: connect the outlet liquid hose with the pump outlet (part.A), drawing your attention on the tightening of the fitting; block the shank (part.B) on the oil drum with the ring nut (part.C);</p>	
<p>Phase 3: connect the air-hose (part.13 in part.14) and calibrate the air-inlet pressure (see chap. relative to the pneumatic supply and to the use).</p>	

5.4.2 Grease pumps on the drum

We recommend to carry out the following operations for the installation:

<p>Fase 1: set the grease drum on trolley (part.4) per Mod. 4911 - 4920C - 4960C - 4990C before fix the base (part.2) to the post (part.1), by means of the fastening-screws (part.3). Check that in the grease-drum is present the follower plate (part.5 - on demand), raising , if it is necessary, the grip located on the post (part.1). Lean the cover (part.6) on the grease drum (part.4)</p>	
--	--

Pneumatic pumps

<p>Phase 2: set the cover (part.6 phase 1) by means of the grips (part.8); set the pump (part.9) through the bores of the cover and lock all the equipment on the cover (part.6 - phase 1) by means of the grip (part.10). Lock the grease-drum lowering the grip (part.7) located on the post.</p>	
<p>Phase 3: connect the hose of the grease-outlet (part.11) in the outlet of the pump (part.12); connect the air-hose (part.13 in part.14) and calibrate the air-inlet-pressure (see chap. relative to the pneumatic supply and to the use).</p>	

Other application example



Art. 2991



Art. 4980C

Pneumatic pumps

5.5 Feeding

Description	unit	values
Pressione max. di funzionamento	bar	8
Pressione min. di funzionamento	bar	2
Portata d'aria min. richiesta	l/mi	200



Connection pressure must **NEVER** exceed **8 bar**. For the min. value see also the sticker on the pump.

The minimum flow changes duty of the different liquid features (eg. viscosity of the liquid and depends on how long the pump is working).

Connect a compressed air supply device (eg. compressor) with technical features as envisaged in par.2.2. (calibrate with reducer the inlet pressure until the value asked is reached; check the value with the pressure meter).



The supply device must be in conformity with current regulations (eg. equipped with pressure relief valve) and must **NEVER** exceed 8 bar.

We recommend to use the following devices:

- **Pressure reducer (Mod. 7200)**: necessary when the compressed air plant is not provided;

7200



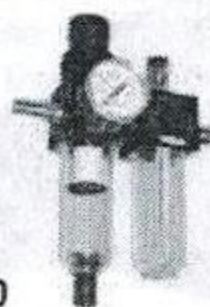
- **Pressure reducer with condensate separator and filter (Mod. 7180)**: it's essential in all pump type for a continuous use, over 10 minutes. It avoids condensate creation, which may cause pump blocking;

7180



- **Pressure reducer with condensate separator and lubricator and filter (Mod. 7150)**: suitable for fixed plants

7150



In case of need, immediately call our authorized area dealer.

Pneumatic pumps

6 COMMAND AND FUNCTIONING

6.1 Preliminary checks

Carry out always the checks suitable:

- Check the correct connection of the air hose
- Check the presence of the losses

6.2 How to use it

When the pumps are fitted into their oil or grease-drum and when the pumps are connected to their oil or grease-hoses (equipped with oil or grease guns) they start working according to the further related instructions

<p>Phase 1: connect the air-hose (part.13) and open the relative cock; the pump start working and the oil-out-let hose/grease-outlet-hose (part.12) reaches a pressure-value depending on preset air feeding calibration (part.14). When the above value is reached the pump stops;</p>		
<p>Phase 2: handle the grease or oil gun (P) and deliver grease or oil, after that the pressure drops in the line, the pump start working up to the reset of the peak-pressure (depending on preset air feeding calibration).</p>		

6.3 Stopping work

Pull out the pipe from the connection to pneumatic supply (part.15). To bleed the remaining pressure of the equipment squeeze the trigger of the gun. If the equipment is out of use for a while pls. clean from working residual particles.

7.1 Premise

This chapter is applied to both the OPERATOR and to the QUALIFIED TECHNICIAN (MAINTENANCE TECHNICIAN).

7.2 General Notes

The cleaning of the machine can be carried out by personnel without any specific technical knowledge, but this people must be well trained on the main commands for energy disconnection and must know the main features of the machine so that danger situations won't happen.

The pump maintenance must be carried out by specialized personnel with good knowledge of the machine.



The maintenance work must be carried out only when the system is without pressure. Please ensure against any possibility of unforeseen starts up of the machine.

7.3 Cleaning



Carry out cleaning operations always when the device is switched off. Wear the suitable Individual Protection Devices (Gloves, Overall, slip prevention Shoes).

General Cleaning of the Machine

Clean the casing of the pump, sleeves, motor and shank with fluffy cloth soaked with detergent liquids.



Don't use water or steam throw.

- Take off dust from the machine surfaces.
- An accurate daily cleaning from the dust is the first condition to keep the machine efficient.
- Keep clean the surrounding areas; in particular keep them clean from oil and greases that can make the floor slippery.

7.4 Ordinary Maintenance



Warning: this chapter is orientated exclusively to the QUALIFIED MAINTENANCE TECHNICIAN.

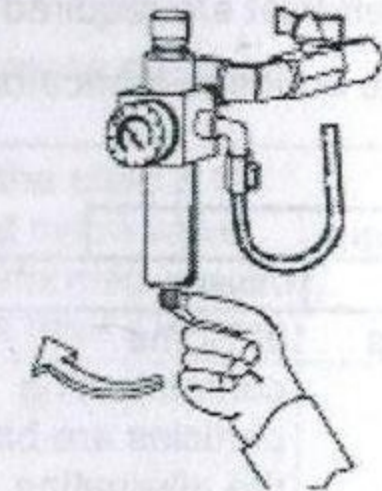


An extended contact with greases can cause irritation problems to the skin. Please follow carefully the personal hygiene rules on the work.

Models	Frequency/Cause	Test/Operation	Ref.
All	End of work	Discharge of the pressure	6.3
All	Weekly	Check the level of condensation and oil	7.5

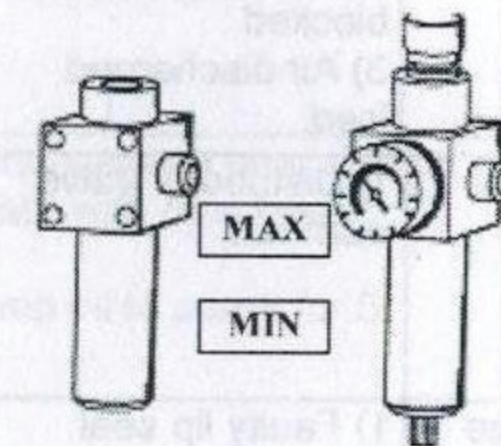
7.5 Discharge of the pressure and maintenance of reducer with filter and lubricator.

Pressure reducer with condensate separator and filter (Mod. 7180): to discharge the liquid it's enough unscrew a bung located below the filter. We recommend also to clean the glass with not toxic degreaser, and the filter located at the base. If the filter remain dirty it's necessary to replace them.



Pressure reducer with condensate separator and lubricator and filter (Mod. 7150):

see that is indicated for the filter group (Mod. 7180) further check that the oil is between the values indicated in the picture.



8 INCONVENIENTS AND REMEDIES

8.1 Extraordinary Maintenance

This chapter introduces a guide for the solution of the problems that may happen during the machine functioning; this chapter is orientated to the **QUALIFIED TECHNICIAN**.



Warning: During the maintenance operations please ensure that there is no residual pressure inside the machine.

The main inconvenient that the machine can suffer are:

1. the break or extreme worn-down of its parts:

In this case it's necessary to check the spare parts list enclosed to this manual and arrange to order the part to be replaced as described on paragraph 1.9.

8.2 Inconvenient, causes and remedies.

4 to 8 bar air-inlet are required for the grease (2-8 bar for the oil). In case of continuous use, fit a condensate drainage-lubricator filter with pressure adjuster, on the compressed air-inlet.

Grease Pump			
Problems	Causes	Solutions	Intervention
Motor does not start	1) Some contaminating particles are blocking the alternating movement; 2) Distributor valve blocked; 3) Air discharged iced.	1) Unscrew the pipe and clean filter. Check and move pin; (Par. 8.3) 2) Disassemble distributor body, removing pipe screws and check the free movement on the nylon valve. Re-assemble and take care to position the valve into the reversing bush seat (Par.8.10) 3) Remove silencer and increase pressure (Par.8.10)	1) 2) and 3) Technician
Air leakage from the silencer	1) Distributor valve worn out;	1) Unscrew as indicated in the chap. Maintenance and check that nylon valve striking surface is neither deformed nor dirty, nor blocked in its movement (that's is free) (Par.8.10)	1) Technician
Air leakage through pumping element	1) Faulty lip seal	1) Change seal.	1) Technician



Motor deceleration while working	1) Water at air inlet, causing condensing effect.	1) Fit a filter with condensate separator. (Par.5.5)	1) Technician
Pump does not stop	1) Dry running; 2) Ball by-pass is not closing because of impurities in the grease; 3) Valve blocked or ruined.	1) Check that there is no vacuum near suction pipe. Eventually fit a follower plate with membrane; (Par.10.2) 2) The ball is dirty. Pump oil to purge for 10 minutes; 3) Unscrew valve body and check that valve turns freely around the pin and that it is turned towards the motor. (Par.8.7)	1) 3) Technician; 2) Operator.

Oil, antifreeze and urea fluid Pumps

Problems	Causes	Solutions	Intervention
Motor does not start	1) Some foreign matter is blocking the alternating movement; 2) Distributor valve blocked; 3) Air discharged iced.	1) Unscrew the pipe and clean filter. Check and move pin (Par.8.8) 2) Disassemble distributor body, removing pipe, screws and check the free movement on the nylon valve. Re-assemble and take care to position the valve into the reversing bush seat; (Par.8.10) 3) Remove silencer and increase pressure (Par.8.10)	1) 2) and 3) Technician
Air leakage from the silencer	1) Distributor valve worn out;	1) Unscrew as indicated in the chap.8.10 Maintenance and check that nylon valve striking surface is neither deformed nor dirty, nor blocked in its movement (that's is free)	1) Technician
Air leakage through pumping element	1) Faulty lip seal	1) Change seal. (Par.8.8)	1) Technician
Motor deceleration while working	1) Water at air inlet, causing condensing effect.	1) Fit a filter with condensate separator. (Par.5.5)	1) Technician
Pump does not stop	1) Dry running; 2) Ball by-pass is not closing because of impurities in the fluid	1) Check that there is no vacuum near suction pipe Eventually fit a plate with membrane; (Par.8.8) 2) The ball is dirty. Pump oil to purge for 5 minutes.	1) Technician; 2) Operator.



Pneumatic pumps

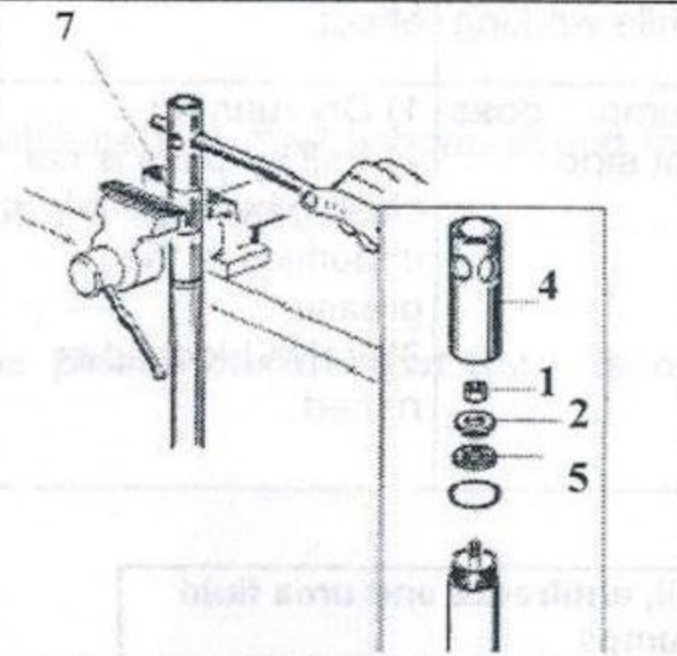
8.3 Pumps for grease - Disassembly of the suction pipe.

We recommend to follow these phases:

- handle the valve-body (part.7) and clamp the pumping shank by jaws of soft metal;
- unscrew the inlet part (part.4) by a pin of $\varnothing 10$ mm.;
- clamp by pliers the grease pressing washer (part.2) and unscrew the nut (part.1);
- release the filter washer (part.5).

Clean the equipment with detergent (don't use detergent corrosive) and eliminate the impurity (with compressed air gun).

Assemble the removed parts following carefully the same instructions (in the reverse direction).

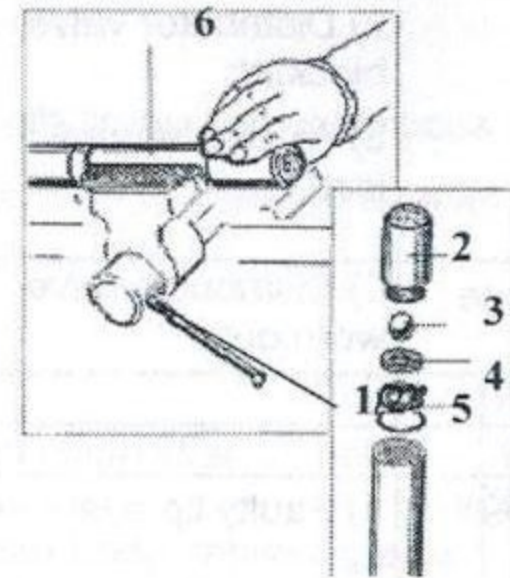


8.4 Pumps for oil, antifreeze and urea fluid - Disassembly of the suction pipe.

We recommend to follow these phases:

- clamp the pumping shank by jaws of soft metal, working on the sleeve (part.6); we recommend, don't press exceedingly;
- unscrew the inlet part (part.2);
- handle the seeger (part.5), release the filter washer (part.4) and the ball (part.3).

Check if impurities have been formed, wash carefully by a not-corrosive detergent, and dry by air-flow. Assemble the removed parts following carefully the same instructions (in the reverse direction).

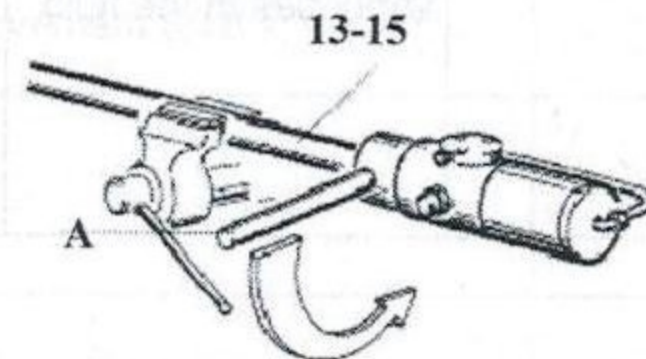


8.5 Removing off the suction pipe from the motor (all pumps)

We recommend to follow these phases:

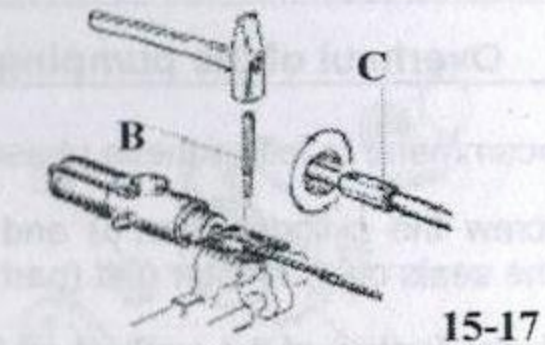
Phase 1: clamp the pumping shank (part.13-15) and lock the motor unit by jaws of soft metal; screw a pipe of $\varnothing 1/2$ " (part.A) in the outlet-bore of the product; unscrew the motor.

Unlock the pumping shank (part.13-15) from the vise and clamp the connection nut (part.15-17 phase 2);



Pneumatic pumps

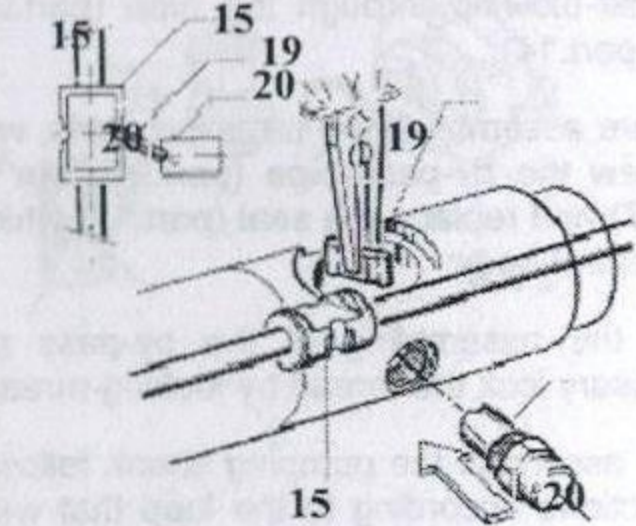
Phase 2: handle the elastic pin (part.C) by a drift of $\varnothing 3$ mm. (part.B) and remove the pin from the nut.



8.6 Assembly of the reversing plates (all pumps)

We recommend to follow these phases:

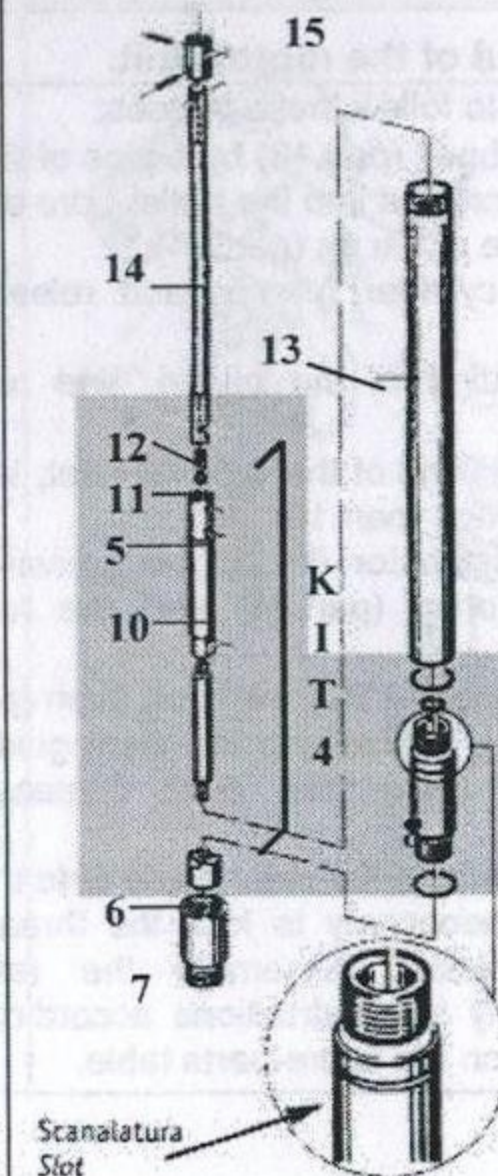
- locate the reversing bush (part.15) in to the central position, compared to the bore of the distributor seat;
- position opportunely the reversing plate (part.19) by pliers and approach the pressing spring pipe (with its complete parts - part.20) up to connection with the plate;
- check that the a.m. plate must be exactly fitted into the two seats;
- screw the pressing spring pipe into its own seat, remember to lock the thread with locking-thread-glue (locktite).



8.7 Overhaul of the pumping unit - pumps for grease.

We recommend to follow these phases:

- unscrew the extension (part.13) and the valve body (part.7) from the cylinder (part.8);
- release the dragging shaft (part.14);
- remove the elastic pin (part.5) using a vise with jaws of soft metal and using a draft of $\varnothing 3$ mm.;
- unscrew the shaft (part.14) out the pumping piston (part.10);
- check the wear of the by-pass spring (part.12) and the ball by-pass (part.11), and, if it's necessary, replace them.
- check the wear of the valve (part.6) and the play existing with the slide shaft; in the play is wider than 0,02-0,03 mm. contact the Assistance to replace the whole kit 4; locate with care and rightly the a.m. valve, its slot must be turned towards the motor side;
- be sure during the assembling of the cylinder (part.8) that the external channel must be turned towards the motor side;
- assemble the pumping shank following carefully the instructions according to the loop that we indicate on the spare-parts table.

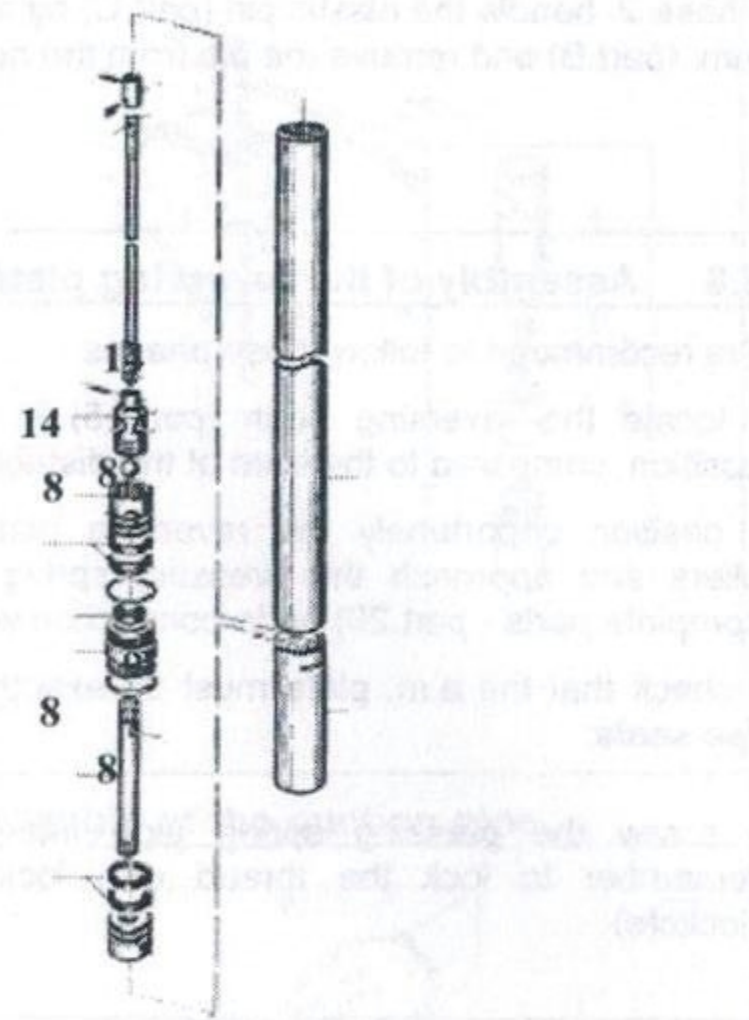


Pneumatic pumps

8.8 Overhaul of the pumping unit - pumps for oil, antifreeze and urea fluid.

We recommend to follow these phases:

- unscrew the cylinder (part.6) and the sleeve (part.15), take the seals off the motor unit (part.10);
- verify the fretting of the seals (part.8), and replace them if it is necessary;
- by air-blowing through the pipe (part.9) clean the ball seat (part.14);
- before assembling the removed parts, we recommend to unscrew the by-pass pipe (part.9) from the seals piston (part.7) and replace the seal (part.12) which is located into the central body;
- for the assembling of the by-pass pipe (part.9) it's necessary lock the thread by locking-thread-glue (locktite);
- now assemble the pumping shank following carefully the instructions according to the loop that we indicate on the spare-parts table.

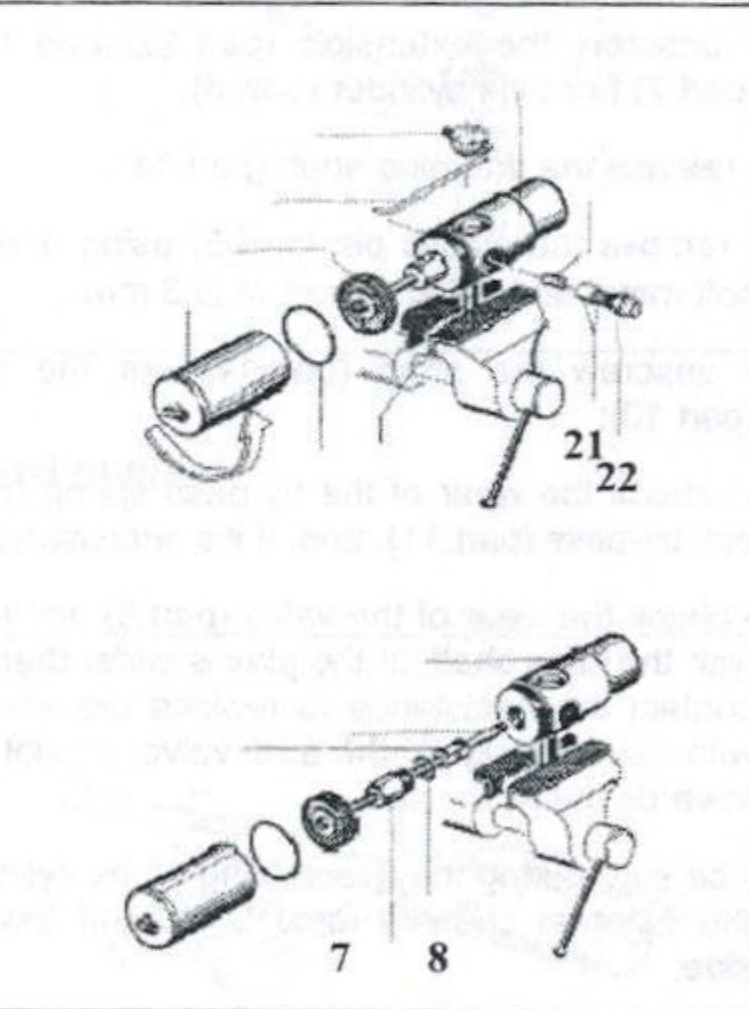


8.9 Overhaul of the motor unit.

We recommend to follow these phases:

- lock the motor body (part.16) by a pipe of $\varnothing 1/4"$ (part. D) which must be screwed into the outlet-bore of the air;
- remove the pipe of the air (part.24);
- unscrew the cylinder (part.5) and release the piston (part.4);
- verify the fretting of the piston, and replace if it is necessary;
- check the conditions of the cylinder seat; take care don't damage the O-Ring (part.10);
- remove the distributor (kit.2), the pressing spring-pipe (part.22), the spring (part.21) and the reversing plate (part.19);
- verify the condition of the reversing bush (part.15) and of its shaft (part.15), unscrewing the stem guide (part.7) out the motor body (take care, don't damage the O-Ring (part.8)).

When you reassemble the stem guide onto the motor body it is absolutely necessary to lock the thread by locking-thread-glue (locktite). Assemble the removed parts following carefully the instructions according to the loop that we indicate on the spare-parts table.

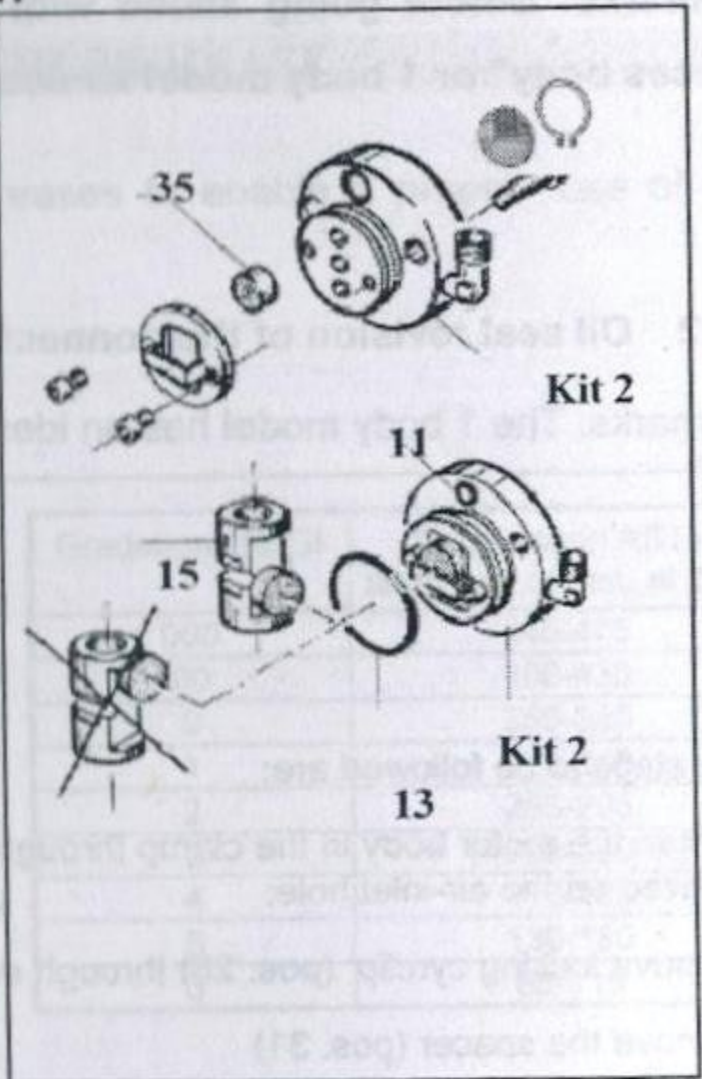


8.10 Disassembly and reassembly of the distributor.

We recommend to follow these phases:

- disassemble all the parts of the distributor (kit.2);
- verify and clean opportunely the bores of passage of the distributor;
- check the wear of the plate of the distribution (part.35) and replace it if it's necessary;
- check that the comparing plane on the distributor must be perfectly smooth and without defects;
- reassemble the removed parts (see tables spare parts).

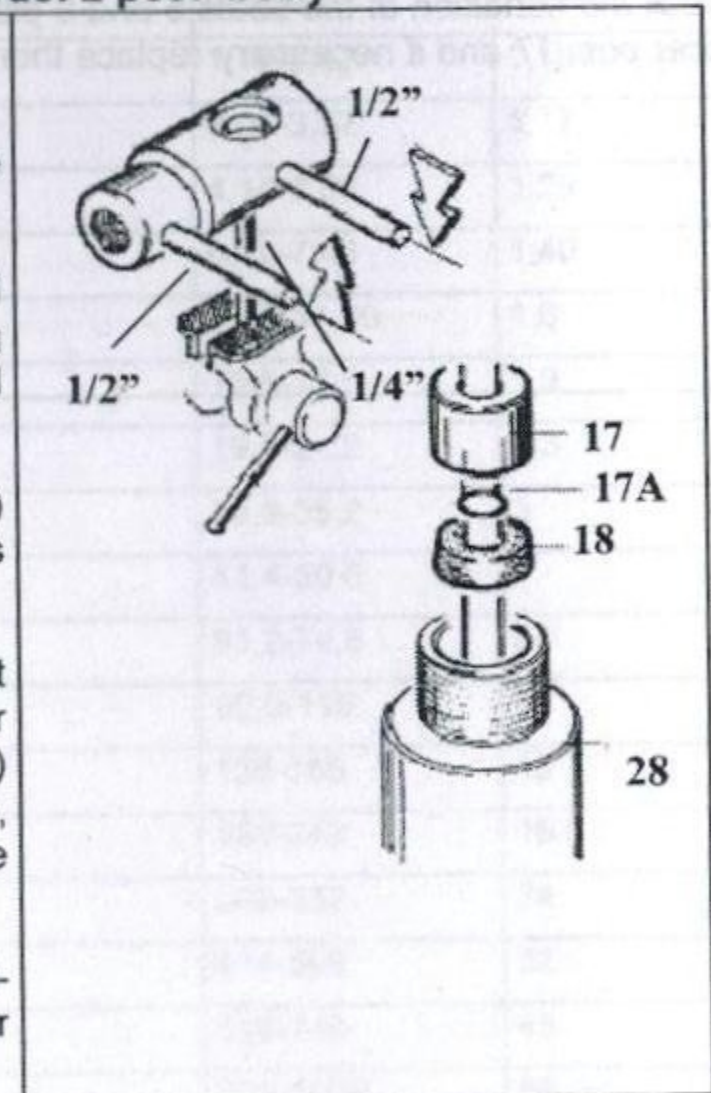
Be sure during the assembling of the distributor on the motor body that the plate must be perfectly fitted into the reversing bush seat (part.15). Take care don't damage the O-Rings (part.13-11).



8.11 Revision of the pump connection oil seals Model 2 pcs. body

We recommend to follow these phases:

- lock the motor body by a pipe of $\varnothing 1/4"$ which must be screwed in to the bore of the air inlet;
- by a pipe of $\varnothing 1/2"$ screwed into the pump-coupling and another pipe of $\varnothing 1/2"$ screwed into the pressing spring pipe (of the pump body), unscrew the two a.m. parts and release the spacer (part.17) and the seals (part.18);
- verify the fretting of the seal and of the O-Ring (part.17A) which is located into the spacer (part.17) and if it's necessary replace them;
- now reassemble the removed parts and take care that that the seat of the O-Ring (part.17A) located into the spacer (part.17) must be turned towards the coupling side (part.28) and also the edge of the seal must be located as our figure, i.e. with the edge of the seal the side of the edge of the connection (part.28);
- lock the thread of the pump-coupling by locking thread-glue (locktite), when it will be reassembled on the motor body.



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Pneumatic pumps

Remarks: Before going ahead with the oil-seals revision, please ensure if it's "the 2 pieces body" or 1 body model as described on paragraph 8.12

8.12 Oil seal revision of the connection of 1 body pump

Remarks: The 1 body model has an identification turning on the smaller diameter

The steps to be followed are:

- fasten the motor body in the clamp through a 1/4" pipe screwed on the air-inlet hole;
- remove locking cyrcclip (pos. 28) through suitable pincers.
- remove the spacer (pos. 31)
- check the wear condition of the oil seal (pos. 18) and if necessary replace it.
- check the condition of the seals 6 and 8 placed in the spacer pos. 17 and if necessary replace them;

Pneumatic pumps

9 CHARACTERISTICS OILS/GREASE

Below we detail the essentials features of the oils/greases to enable a proper use of the equipment.

9.1 Grease.

The classification N.L.G.I. is used very often to define the consistence of the grease, in particular the resistance of the deformation under stress. In the table the conversion between NLGI and ASTM 0217 is indicated (penetration strength (tenth part of mm.), in the grease in conditions defined, with a body (ball) with dimensions and weight .

Gradations NLGI	Deformation ASTM tenth part of mm. at 25°C
000	445-475
00	400-430
0	355-385
1	310-340
2	265-295
3	220-250
4	175-205
5	130-160
6	85-115

9.2 Oil.

The equipment for the measure of viscosity are different in the Country and Continents and besides it's very difficult to compare them, also with regard to the different temperature scale used. To solve the problem, the committee I.S.O. have defined the measure system based on the viscosity cinematic (mm²/s at the temperature of 40°C).

Gradation of viscosity symbol ISO	Value medium of viscosity mm ² /s at 40°C	Interval of viscosity mm ² /s a 40°C	Corr. Viscosity Engler/50°C (ind. visc. = VS)
ISO VG 2	2,2	1,10-2,42	1,10
ISO VG 3	3,2	2,08-3,52	1,17
ISO VG 5	4,6	4,14-3,66	1,29
ISO VG 7	6,8	6,12-7,48	1,40
ISO VG 10	10	9,00-11,00	1,6
ISO VG 15	15	13,5-16,5	1,9
ISO VG 22	22	19,8-24,2	2,3
ISO VG 32	32	28,8-35,2	3
ISO VG 46	46	41,4-50,6	4
ISO VG 68	68	61,2-74,8	5,7
ISO VG 100	100	90,0-110	8
ISO VG 150	150	135-165	12
ISO VG 220	220	198-242	16,5
ISO VG 320	320	288-352	24
ISO VG 460	460	414-566	32
ISO VG 680	680	612-748	45
ISO VG 1000	1000	900-1000	66
ISO VG 1500	1500	1350-1650	100

Pneumatic pumps

The SAE (Society of Automotive Engineers) American have subdivide the oils either for the motors or for the transmission on the ground of the viscosity, independently of the quality and of other characteristics. These codification is often used also in the industrial oils because these are the only codification international known.

Today, for the industrial oils, a codification industrial is present (see the table previous), prepared from the I.S.O., that have established a new codification of the oils based on the viscosity cinematic.

Oils for the motor								
Codification S.A.E.	Codification				Codification			
	S.A.E.		S.A.E.		S.A.E.		S.A.E.	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
5W	---	1200	---	---	---	2,25	---	1,31
10W	1300	2400	---	---	2,25	3,15	1,31	1,44
20W	2600	9600	---	---	3,15	3,30	1,44	1,46
20	---	---	5,7	9,6	3,30	6,50	1,46	1,80
30	---	---	9,6	12,9	6,50	9,80	1,80	2,10
40	---	---	12,9	16,8	9,80	14	2,10	2,54
50	---	---	16,8	22,7	14	20	2,54	3,50

Oils for the transmission				
Codification S.A.E.	Viscosity kinematic mm ² /s (cSt)		°Engler	
	100°C (210°F)		50°C	
	Min.	Max.		Min.
75W	4,1	---	3	---
80W	7	---	8	---
85W	11	---	12	---
90	14	<25	15	---
140	25	<43	40	---
250	43	---	60	---

The classification of the oils for transmissions is totally different from the classification for the oils for the motors; in the table we point the following correspondence.

SAE 75 W	SAE20W
SAE 80W	SAE30
SAE 90	SAE 50

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10 ACCESSORIES

We can fit up the accessories below indicated; in case of need, immediately call our authorized area dealer or our technical assistance. For the correct use of the equipment we recommend to use only the accessories fitted from our firm; our firm is not responsible for the damages or anomaly for the use of the accessories made from other firm.

10.1 Drum covers with pump fastening.

To fasten the pump at the drum of the oil/grease it's necessary to mount cover for the drum fastening with specific connection; it's necessary that the cover diameter is matching the sizes of branded fluid containers present in the market.

Available ø int. (mm): 283 – 330 – 400 – 600



10.1 Follower plates

It's necessary to arrange a follower plates into the drum to obtain an homogeneous grease distribution. For the plates with membrane the diameter of the metallic part and of the membrane is indicated. Available dimensions (external diameter (mm) – internal diameter (mm)): 275 – 230; 310 – 260; 390 – 325; 590 – 540

10.3 Meters gun

The oil delivery can be carried out with a simple oil gun, or in case equipped with meter (electronic or mechanical) to measure the oil dispensed quantity. For the correct use of the device please refer to what described in the use and maintenance manual. For the installation it's enough to connect the outlet pipeline of the pump to the connection and then lock-up with strength. For the use you have to:

- open the air cock of the pump;
- the oil is pumped in the pump outlet pipe and reaches the meter;
- by squeezing the gun lever the oil gets in the meter

10.4 Drums holder trolley

On request can be supplied a trolley that allows a better use of the pumps (with installation of its relative drum). For technical information please contact our area authorized dealer.

11 STORAGE, DEMOLITION AND DISMANTLING

11.1 Stocking

In case of long period storage, please leave the machine repaired from rain and wind and possibly in a dry place.

Protect carefully the electric parts from dust and external agents

The machine can suffer big damages if, waiting for the installation, is kept in an environment at critical temperatures. Do not expose the machine to temperatures lower than -10°C and more than $+60^{\circ}\text{C}$.



It's forbidden to put the machine on inadequate structures.



It's forbidden to leave on the machine other materials or other equipments

11.2 Machine dismantling

The dismantling of the wastes coming from the demolition of the machine will have to be carried out according to the environmental respect, avoiding to pollute ground, air and water.

However we must operate according to the local legislation in force.

Please remind that for "wastes" we intend every substance or object, included in the category of enclosed A to the point IV of Law 152/2006, that the holder wish to throw away or has decided or has the obligation to do that.

The wastes coming from the machine demolition are to be classifiable as special rubbish.

11.3 Demolition Materials

The following are special not dangerous wastes that can be recovered according to the Law February 5th 1998:

- Iron materials, stainless steel, copper
- Plastic materials
- Electronic card
- Hydraulic oil
- Electric Wiring

11.4 Indication for a suitable handling of the wastes

The correct handling of the special wastes schedules:

Storage in suitable places avoiding the mixing of dangerous wastes with not dangerous ones. Ensure that the transport and the dismantling/recovery of the same wastes is carried out by authorized transporters and recipients.

The transport of his own wastes to authorized collection centres is allowed exclusively if you have the registration to the Environmental Administration Register.

11.5 Wastes coming from Electric and Electronic devices

With the Law no. 151 of July 25th 2005, the Italian government has taken in the directives of the European Parliament as concerns the wastes dismantling of electric and electronic devices (RAEE) (Directive 2002/95/CE and 2003/108/CE).