

To the customers

Congratulations on receiving your Suzzarablu pump. We are pleased to provide you with a system designed to give you maximum reliability and efficiency.

The pump has been designed, tested, and approved for use with AUS32.

Please take care of all the precautions when handling this liquid.

Your safety is important to us. Furthermore to assure the longest possible service life, it is important that you follow the operation and maintenance procedures outlined in this manual.

We are proud to provide you with a quality product and dedicated support. Together with your careful use, we are sure that you will have years of safe and dependable use.

The President
PIUSI S.p.A.

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| B MACHINE AND MANUFACTURER IDENTIFICATION | | |
| CODE PRODUCT | 120V/230V AC PUMPA A MISCELANEA 2200512 DEF-ADBLUE | YEAR OF MANUFACTURE |
| MODEL | 120V/230V AC PUMPA A MISCELANEA 2200512 DEF-ADBLUE | |
| TECHNICAL DATA | 220V 50Hz 100W 12.5A/450V 230V/50Hz IP55 | |
| AVAILABLE MODELS: MANUFACTURER: 120V/230V AC PIUSI S.p.A. Via Pacinotti Z.I. Rangavino 46029 Suzzara (Mantova) Italy | | |

C DECLARATION OF INCORPORATION OF THE PARTLY-COMPLETED MACHINERY

The undersigned PIUSI S.p.A. Via Pacinotti cm., z.l.Rangavino 46029 Suzzara - Mantova - Italy

HEREBY STATES under its own responsibility, that the partly-completed machinery: Description: **Pump for the transfer of AUS32 - WATER** Model: **Diaphragm pump** Serial No. refer to Lot Number shown on CE plate affixed to product. Year of manufacture: refer to the year of production shown on the CE plate affixed to the product. is intended to be incorporated in a machine (or to be with other machines) so as to create a machine to which applies Machine Directive 2006/42/EC, may not be brought into service before the machine into which it is to be incorporated has been declared in conformity with the provisions of the directive 2006/42/EC. is in conformity with the legal provisions indicated in the directives: - Machine Directive 2006/42/EC - Electromagnetic Compatibility Directive 2004/108/EC

To which the essential safety requirements have been applied and complied with what indicated on annex (I) of the machine directive applicable to the product and shown below: 1.1.5 - 1.5 - 1.3.1 - 1.3.2 - 1.3.3 - 1.3.4 - 1.3.7 - 1.3.8 - 1.4.1 - 1.4.2.1 - 1.5.1 - 1.5.2 - 1.5.4 - 1.5.5 - 1.5.8 - 1.5.9 - 1.5.11 - 1.5.13 - 1.5.15 - 1.6.1 - 1.6.3 - 1.6.4 - 1.7.1 - 1.7.2 - 1.7.3 - 1.7.4.

The documentation is at the disposal of the competent authority following motivated request at PIUSI S.p.A. or following request sent to the email address: doc_tec@piusi.com

The person authorised to compile the technical file and draw up the declaration is Otto Varni as legal representative.

Suzzara, 01/01/2010

D MACHINE DESCRIPTION

PUMP: Five-chamber positive-displacement diaphragm pump. MOTOR: Asynchronous motor, single-phase, 2 pole, closed type, protection class IP55 according to CEI-EN 60034-5.

D1 HANDLING AND TRANSPORT

Due to the limited weight and dimensions of the pumps, special lifting equipment is not required to handle them. The pumps are carefully packed before dispatch. Check the packing when receiving the material and store in a dry place.

E GENERAL WARNINGS

Important precautions
Symbols used in the manual

ATTENTION
This symbol indicates safe working practices for operators and/or potentially exposed persons.
WARNING
This symbol indicates that there is risk of damage to the equipment and/or its components.
NOTE
This symbol indicates useful information.

Manual preservation
This manual should be complete and legible throughout. It should remain available to end users and specialist installation and maintenance technicians for consultation at any time.

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F FIRST AID RULES

Contact with the product
In the event of problems developing following EVE/SPIN CONTACT, INHALATION or INGESTION of the treated product, please refer to the SAFETY DATA SHEET AUS32/DEF/AD-BLUE.

Persons who have suffered electric shock
Disconnect the power source, or use a dry insulator to protect yourself while you move the injured person away from any electrical conductor. Avoid touching the injured person with your bare hands until he is far away from any conductor. Immediately call for help from qualified and trained personnel. Do not operate switches with wet hands.
Please refer to the safety data sheet for the product

G GENERAL SAFETY RULES

Essential protective equipment characteristics
Wear protective equipment that is:
- suited to the operations that need to be performed;
- resistant to cleaning products.

Personal protective equipment that must be worn
- safety shoes;
- close-fitting clothing;

- protection gloves;
- safety goggles;

- instructions manual

Protective gloves
Prolonged contact with the treated product may cause skin irritation; always wear protective gloves during dispensing.

DANGER
Never touch the electric plug or socket with wet hands.
Do not switch the dispensing system on if the network connection cable or important parts of the apparatus are damaged, such as the inlet/outlet pipe, nozzle or safety devices. Replace the damaged pipe immediately.

Before each use, check that the network connection cable and power plug are not damaged. Have the network connection cable replaced immediately by a qualified electrician.

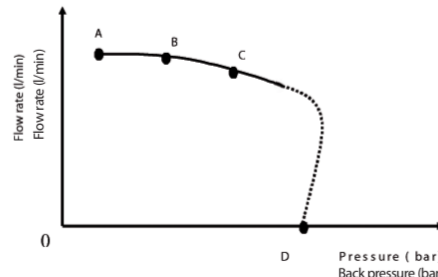
ATTENTION
The electrical connection between the plug and socket must be kept well away from water.
Unsuitable extension leads can be dangerous. In accordance with current regulations, only extension cords that are labelled for outdoor use and have a sufficient conduction path should be used outdoors.

For safety reasons, we recommend that, in principle, the equipment be used only with a earth-leakage circuit breaker (max 30 mA).

H TECHNICAL DATA

H1 PERFORMANCE SPECIFICATIONS
The performance diagram shows flow rate as a function of back pressure.

| Flow Rate | Voltage (V) | Absorption (A) | No. 4 metres of 3/4" pipe | K04 Meter | Manual nozzle | Automatic Dispensing Nozzle |
|-----------------------|-------------|----------------|---------------------------|-----------|---------------|-----------------------------|
| A (Maximum flow rate) | 28 120 3.1 | 32 230 1.2 | . | . | . | . |
| B (High flow rate) | 27 120 3.2 | 31 230 1.3 | . | . | . | . |
| C (Normal conditions) | 25 120 3.3 | 29 230 1.3 | . | . | . | . |
| D (By pass) | 0 120 3.3 | 0 230 1.3 | | | | Delivery closed |



ATTENTION
The curve refers to the following operating conditions:
Fluid: AUS32 - DEF - ADBLUE
Temperature: 20 °C
Suction conditions: The pipe and the pump position relative to the fluid level is such that a flow pressure of 0.3 bar is generated at the nominal flow rate.
Under different suction conditions higher low pressure values can be created that reduce the flow rate compared to the same back pressure values. To obtain the best performance, it is very important to reduce loss of suction pressure as much as possible by following these instructions:
- shorten the suction pipe as much as possible
- avoid useless elbows or throttling in the pipes
- keep the suction filter clean
- use a pipe with a diameter equal to, or greater than, indicated (see installation).

I ELECTRICAL DATA

| PUMP MODEL | Current | Voltage (V) | Frequency (Hz) | CURRENT Max (*) (A) |
|--------------|---------|-------------|----------------|---------------------|
| 120V version | AC | 120 | 60 | 3.5 |
| 230V version | AC | 230 | 50 | 1.5 |

(*) Refers to functioning in by-pass mode.

L OPERATING CONDITIONS

L1 ENVIRONMENTAL CONDITIONS

| | |
|-------------------|--|
| TEMPERATURE | min. +23 °F / max +104 °F min. -5 °C / max +40 °C |
| RELATIVE HUMIDITY | max. 90% |
| LIGHTING | The environment must conform to directive 89/654/EEC on work environments. In case of non-EU countries, refer to directive EN ISO 12100-2 § 4.8.6. |

ATTENTION
The temperature limits shown apply to the pump components and must be respected to avoid possible damage or malfunction.

L2 ELECTRICAL POWER SUPPLY

NOTE
The pump must be powered by AC single-phase line, the nominal values of which are indicated on the table in the paragraph "G - ELECTRICAL DATA". The maximum acceptable variations from the electrical parameters are:
Voltage: +/- 5% of the nominal value
Frequency: +/- 2% of the nominal value

ATTENTION
Power supply from lines with values that do not fall within the indicated limits could cause damage to the electrical components.

L3 DUTY CYCLE

NOTE
The pumps have been designed for intermittent use and a 20-minute duty cycle under conditions of maximum back pressure.

ATTENTION
Functioning under by-pass conditions is only allowed for short periods of time (max. 3 minutes).

L4 PERMITTED AND NON-PERMITTED FLUIDS

| | | |
|--|--|---|
| FLUIDS PERMITTED | - AUS32 (DEF, AD-Blue); - WATER - LIQUID FOOD PRODUCTS | |
| FLUIDS NON-PERMITTED AND RELATED DANGERS | - DIESEL FUEL - PETROL - INFLAMMABLE LIQUIDS - CORROSIVE CHEMICAL PRODUCTS - SOLVENTS - LIQUIDS WITH VISCOSITY > 20 cSt | - OXIDATION OF PUMP - FIRE - EXPLOSION - CORROSION AND INJURY TO PERSONS - DAMAGE TO GASKET SEALS - MOTOR OVERLOAD |

M INSTALLATION

ATTENTION
The pump must never be operated before the delivery and suction lines have been connected.

PRELIMINARY INSPECTION
- Verify that all components are present. Request any missing parts from the manufacturer.
- Check that the pump has not suffered any damage during transport or storage.
- Carefully clean the suction and delivery inlets and outlets, removing any dust or other packaging material that may be present.
- Check that the electrical data corresponds to those indicated on the data plate.
- Always install in an illuminated area.
- Install the pump at a height of min. 80 cm.

M1 POSITIONING, CONFIGURATIONS AND ACCESSORIES

NOTE
In the case of installation in the open air, proceed to protect the pump by providing a protection roof.

ATTENTION
The pump can be installed in any position (pump axis vertical or horizontal).
The pump must be secured in a stable way using the holes on the bed of the motor and vibration damping devices.

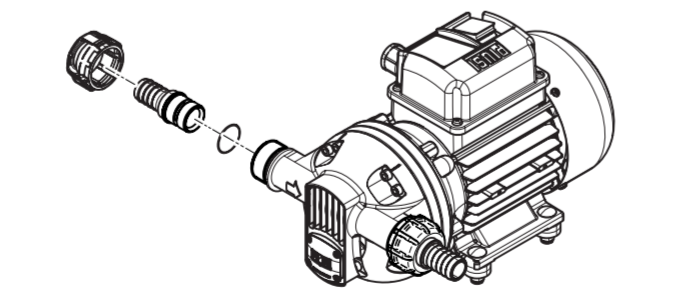
ATTENTION
THE MOTORS ARE NOT OF THE ANTI-EXPLOSIVE-TYPE. DO NOT install them where inflammable vapours could be present.

NOTE
The broad range of pump accessories make it suitable for many different uses, installations, and applications. The supporting base can be positioned in different ways.

NOTE
The pump can be installed in any position (pump axis vertical or horizontal).

ATTENTION
It is the responsibility of the installer to provide the necessary line accessories to ensure the correct and safe operation of the pump. The accessories that are not suitable to be used with the previously indicated material could damage the pump and/or cause injury to persons, as well as causing pollution.

ATTENTION
To maximise performance and prevent damage that could affect pump operation, always demand original accessories.



M2 NOTES ON SUCTION AND DELIVERY LINES

DELIVERY EFFECTS FLOW RATE
ON Length and diameter of pipe, flow rate of dispensed liquid, accessories fitted, can create back pressures above those allowed. In this case, the pump mechanical control (bypass) will trip to reduce the flow rate.

HOW TO REDUCE EFFECTS ON FLOW RATE
To avoid these problems, system flow resistances must be reduced using shorter and/or larger diameter pipes, as well as line accessories with low resistances (e.g., automatic nozzle for higher flow rates).

CHARACTERISTICS OF DELIVERY PIPES
The delivery pipe must have the following technical characteristics:
- recommended minimum nominal diameter: 3/4"
- recommended nominal pressure: 10 bar

SUCTION

FOREWORD
Diaphragm positive-displacement pumps are self-priming and feature good suction capacity. During the start-up phase, when the suction pipe is empty and the pump is wet, the electric pump unit is able to suck liquid from a maximum vertical distance of 2 mt.

IMPORTANT NOTE
Priming time can last a few minutes. We suggest performing priming operations without automatic nozzle and making sure the pump is properly wet.

WARNING
Always install a foot valve to prevent the suction pipe from being emptied and to keep the pump wet at all times. In this way, the pump will always start up immediately the next times it is used.

CAVITATION
The pump is able to work with vacuums of up to 0.5 bar at the suction mouth. Over this value, CAVITATION can occur that causes a fall in flow rate and increase in noise levels.

HOW TO PREVENT CAVITATION
It is important to ensure low vacuums at suction mouth by using:
- short pipes with larger or identical diameter to that recommended to allow the suction pipes to fill up and the diameter pipes must be larger. It is recommended that the pump not be installed at a vertical distance greater than 2 meters.

WARNING
If the suction tank is higher than the pump, an anti-siphon valve should be installed to prevent accidental product leaks. Slope the installation to contain the back pressures caused by water hammering.

ATTENTION
It is a good system practice to immediately install vacuum and air pressure gauges at the inlets and outlets of the pump which allow verification that operating conditions are within anticipated limits. To prevent the suction pipes from being emptied when the pump stops, a foot valve should be installed.

ATTENTION
The suction pipe must have the following technical specifications:
- recommended minimum nominal diameter: 3/4";
- recommended nominal pressure: 10 bar;
- use pipes suitable for low pressure operation (e.g. with metal core)

N CONNECTIONS

N1 ELECTRICAL CONNECTIONS

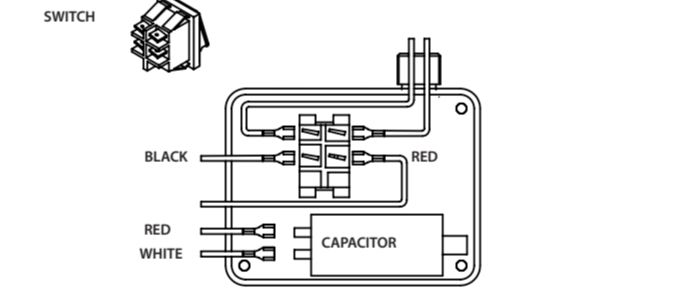
ATTENTION
IT IS THE INSTALLER'S RESPONSIBILITY TO CARRY OUT THE ELECTRICAL CONNECTIONS IN COMPLIANCE WITH THE RELEVANT STANDARDS.

WARNING
Comply with the following (not exhaustive) instructions to ensure a proper electrical connection:

- During installation and maintenance make sure that power supply to the electric lines has been turned off.
- Use cables with minimum sections, rated voltages and installation type that are suitable for the characteristics indicated in paragraph "I - ELECTRICAL DATA" and the installation environment.
- Always make sure that the cover of the terminal strip box is closed before switching on the power supply, after having checked the integrity of the seal gaskets that ensure the IP55 protection grade.
- All motors are equipped with a grounding terminal that is to be connected to the ground line of the electrical system.

PUMP FITTINGS
The pump is fitted with:
- single-phase motor with 2-mt. power cord
- bipolar switch
- capacitor

NOTE
Wired and installed inside the terminal strip box (see chart)
The capacitor characteristics are those indicated on the pump label. The switch has the only function of starting/stopping the pump and cannot in any way replace the main power switch required by the relevant standards.



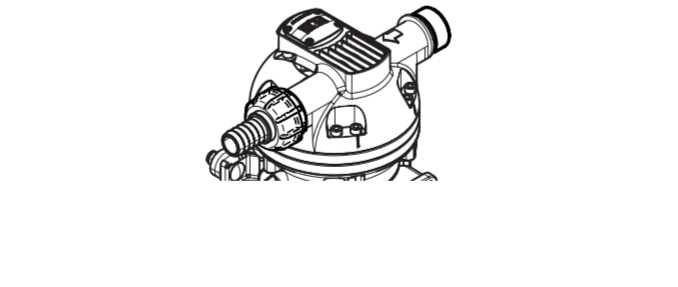
N2 PIPING CONNECTIONS

FOREWORD
- Before carrying out any connection, refer to the visual indications i.e. arrow on the pump head, to identify suction and delivery.

ATTENTION
Wrong connection can cause serious pump damage.

PRELIMINARY INSPECTION
- Before connecting, make sure that the piping and the suction tank are free of dirt and solid residue that could damage the pump and its accessories.
- Before connecting the delivery pipe, partially fill the pump body, from delivery side with the liquid that needs to be pumped in order to facilitate priming.
- Do not use conical threaded fittings, which could damage the threaded inlet or outlet openings of the pump if excessively tightened.

NOTE
If not already fitted, fit a suction filter.



O INITIAL START-UP

FOREWORD
- Check that the quantity of fluid in the suction tank is greater than the amount you wish to transfer.
- Make sure that the residual capacity of the delivery tank is greater than the quantity you wish to transfer.
- Make sure that the piping and line accessories are in good condition.

ATTENTION
Do not run the pump dry for more than 20 minutes. This can cause serious damage to its components.
Fluid leaks can damage objects and injure persons.

NOTE
- Never start or stop the pump by connecting or cutting out the power supply.
- Prolonged contact with some fluids can damage the skin. The use of goggles and gloves is recommended.

ATTENTION
Extreme operating conditions with duty cycles longer than 20 minutes can cause the motor temperature to rise thus damaging the engine. For each duty cycle of 20 minutes, allow for a rest phase of 20 minutes with motor switched off.

NOTE
During the priming phase, the pump must discharge all the air that is initially present from the delivery line. Therefore it is necessary to keep the outlet open to permit the evacuation of the air.

WARNING
If an automatic type dispensing nozzle is installed on the end of the delivery line, the evacuation of the air will be difficult because of the automatic stopping device that keeps the valve closed. It is recommended that the automatic nozzle be temporarily removed during initial start-up.

IF THE PUMP DOES NOT PRIME
Depending on the system characteristics, the priming phase can last from several seconds to a few minutes. If this phase is prolonged, stop the pump and verify:
- that the pump is not running completely dry (fill with fluid from the delivery line);
- that the suction pipe guarantees against air infiltration;
- that the suction filter is not clogged;
- that the suction height is not higher than 2 mt.;
- that all air has been released from the delivery pipe.

AT THE END OF THE INITIAL START-UP
When priming has occurred, verify that the pump is operating within the anticipated range, in particular:
- that under conditions of maximum back pressure, the power absorption of the motor stays within the values shown on the identification plate;
- that the suction pressure is not greater than 0.5 bar;
- that the delivery back pressure does not exceed the maximum back pressure for the pump.

P EVERY DAY USE

USE PROCEDURE
1 If flexible pipes are used, attach the ends of the piping to the tanks. In the absence of an appropriate slot, solidly grasp the delivery pipe before beginning dispensing.

2 Before starting the pump make sure that the delivery valve is closed (dispensing nozzle or line valve)
3 Turn the ON/OFF switch on
4 Open the delivery valve, solidly grasping the pipe
5 While dispensing, do not inhale the pumped product
6 Should you spill any fluid while dispensing, bank it with earth or sand to absorb it and limit its spreading

7 Close the delivery valve to stop dispensing
8 When dispensing is finished, turn off the pump

ATTENTION
The by-pass valve allows functioning with delivery closed only for short periods (max. 3 minutes)
To avoid damaging the pump, after use, make sure the pump is off.

In case of a power break, switch the pump off straight away.
Should any sealants be used on the suction and delivery circuit of the pump, make sure that these products are not released inside the pump.

Foreign bodies in the suction and delivery circuit of the pump could cause malfunctioning and breakage of the pump components.

In case of prolonged dry-running of the pump, the suction circuit may be empty and suction may become difficult. If so, fill the suction circuit with demineralised water

Q MAINTENANCE

Safety instructions
The dispensing system was designed and built to require a minimal amount of maintenance. Before carrying out any maintenance work, disconnect the dispensing system from any electrical and hydraulic power source. During maintenance, the use of personal protective equipment (PPE) is compulsory. In any case always bear in mind the following basic recommendations for a good functioning of the pump

All maintenance must be performed by qualified personnel. Tampering can lead to performance degradation, danger to persons and/or property and may result in the warranty being voided.

Whenever there is risk of frost, empty the circuit and the pump, taking care to place the pump in an environment where the temperature is no lower than 0°C/32°F.
Check that the labels and plates found on the dispensing system do not deteriorate or become detached over time.

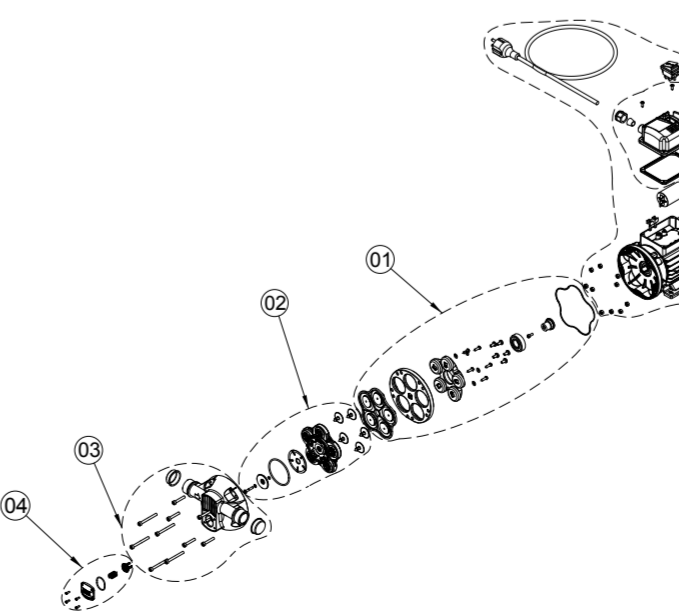
ONCE A WEEK:
- Check that the pipe connections are not loose to prevent any leaks;
- Check and keep the filter installed on the suction line clean.

ONCE A MONTH:
- Check the pump body and keep it clean and free of any impurities;
- Check that the electrical supply cables are in good condition.

Whenever it is thought that the system will remain unused for at least 15 days, it must be emptied in order to prevent the product from crystallising inside. This shall be followed by a washing cycle.

R NOISE LEVEL

In normal operating conditions, noise emissions of all models do not exceed 70 dB at a distance of 1 metre from the electric pump.



S PROBLEMS AND SOLUTIONS

For any problems contact the authorised dealer nearest to you.

| PROBLEM | POSSIBLE CAUSE | CORRECTIVE ACTION |
|--------------------------------------|--|---|
| THE MOTOR IS NOT TURNING | Lack of electric power Rotor jammed | Check the electrical connections and the safety systems. Check for possible damage or obstruction of the rotating components. Contact the Service Department |
| THE MOTOR TURNS SLOWLY WHEN STARTING | Low voltage in the electric power line Low level in the suction tank Foot valve blocked Filter clogged | Bring the voltage back within the anticipated limits Refill the tank Clean and/or replace the valve Clean the filter |
| LOW OR NO FLOW RATE | Excessive suction pressure High loss of head in the delivery circuit (working with the by-pass open) By-pass valve blocked Air entering the pump or the suction piping A narrowing in the suction piping Low rotation speed | Lower the pump with respect to the level of the tank or increase the cross-section of the piping Use shorter piping or of greater diameter Dismantle the valve, clean and/or replace it Check the seals of the connections Use piping suitable for working under suction pressure Check the voltage at the pump. Adjust the voltage and/or use cables of greater cross-section Raise the piping |
| INCREASED PUMP NOISE | The suction piping is resting on the bottom of the tank Cavitation occurring Irregular functioning of the by-pass | Reduce suction pressure Dispense until the air is purged from the by-pass system |
| LEAKAGE FROM THE PUMP BODY | Presence of air in the fluid Seal damaged | Verify the suction connections Check and replace the seal |
| THE PUMP DOES NOT PRIME THE LIQUID | Suction circuit blocked Malfunction of foot valve fitted on suction circuit The suction chambers are dry | Remove the blockage from the suction circuit Replace foot valve Add liquid from pump delivery side Remove the blockages from the suction and delivery valves |
| | The pump chambers are dirty or blocked | |

T DEMOLITION AND DISPOSAL

Foreword
If the system needs to be disposed, the parts which make it up must be delivered to companies that specialize in the recycling and disposal of industrial waste and, in particular: DISPOSAL OF OTHER PARTS.

The packaging consists of biodegradable cardboard which can be delivered to companies for normal recycling of cellulose.

Disposal of packing materials
Disposal of metal parts
Metal parts, whether paint-finished or in stainless steel, can be consigned to scrap metal collectors.

Disposal of electric and electronic components
These must be disposed of by companies that specialize in the disposal of electronic components, in accordance with the indications of directive 2002/96/CE (see text of directive below).

Information regarding the environment for clients residing within the European Union
European Directive 2002/96/EC requires that all equipment marked with this symbol on the product and/or packaging not be disposed of together with non-differentiated urban waste. The symbol indicates that this product must not be disposed of together with normal household waste. It is the responsibility of the owner to dispose of these products as well as other electric, or electronic equipment by means of the specific refuse collection structures indicated by the government or the local governing authorities.

Disposal of miscellaneous parts
Other components, such as pipes, rubber gaskets, plastic parts and wires, must be disposed of by companies specialising in the disposal of industrial waste.