

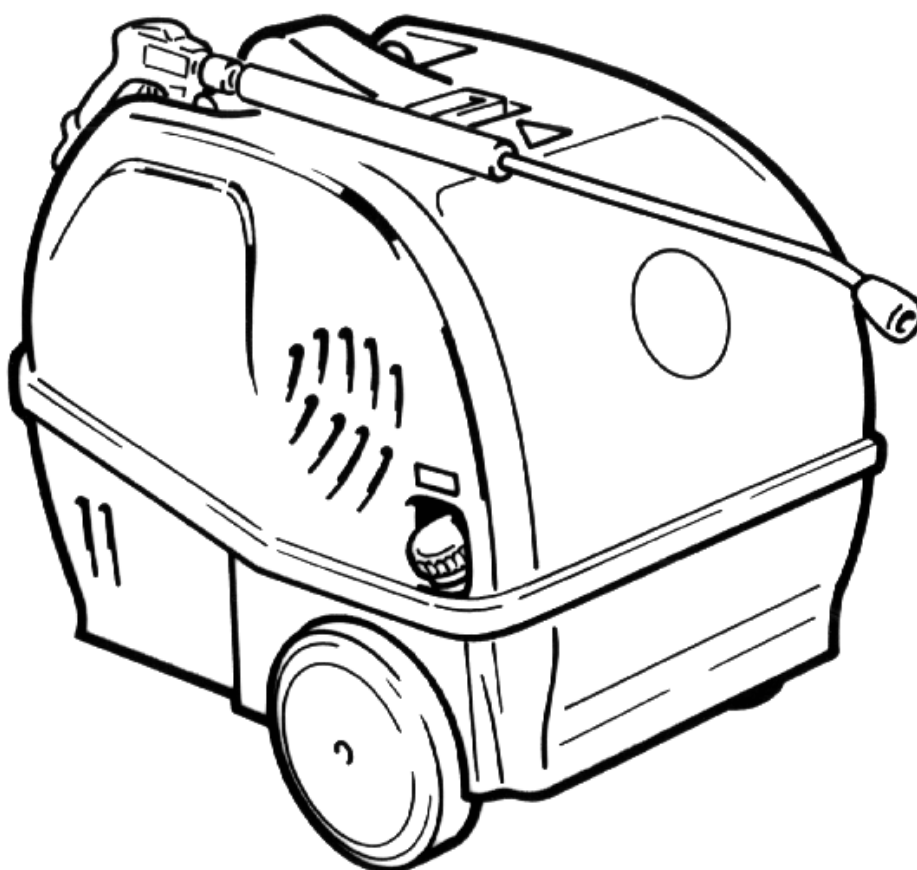
tecno.mec

Hot water cleaner

Kappa



Operating instructions



Tecno.Mec
Casalgrande (RE) - I

rev. MAG.2000

HOT WATER HIGH PRESSURE CLEANER

Kappa

Congratulations, you have chosen a cleaner of high quality and great performance. The KAPPA hot water cleaner will assist you professionally for all washing, descaling, cleaning and sandblasting purposes. KAPPA cleaners are recommended for use in all fields of industry, agriculture, building industry and tourism. KAPPA can give you an answer to all your cleaning requirements both hobby and professional because it is light and handy, easy to use and easy to maintain. The large range of versions perfectly fit each kind of use.

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NOTICE



Carefully read the notices of this handbook because they give important informations concerning safe installation, use and maintenance; take confidence with the machine in order to speedily switch it off and eliminate pressure. Carefully read the paragraph “prohibited operations - safety regulations”

This handbook is an integral and essential part of the product which, as provided by directive 98/37/CE, will be consigned to the user in order to ensure the training/information for personnel.

The manufacturer does not assume responsibility for damage caused to persons, things or to the machine, in case of improper use.

Carefully preserve this handbook for any further consultation.

Make sure of the model of your cleaner by reading the details on the identification tag on the machine. Upon delivery, inspect the machine for all accessories and for damage which may have occurred during transport.

Complaints will be accepted only in writing within eight (8) days from delivery.

WARRANTY REGULATIONS

- 1) The Tecno.Mec cleaners are guaranteed against material defects for a period of six (6) months after the date of purchase. Parts deteriorating due to normal wear (pistons, grommets, gaskets and electrical parts) are not covered under warranty. Repairs made by unauthorised persons invalidate the warranty.
- 2) Obligations of Tecno.Mec are restricted to replacement of defective parts.
The manufacturer makes the ultimate decision concerning the replacement or repair of defective parts. The warranty does not cover: transport charges and risks, removal and installation of the machine, or other charges directly or indirectly connected with repair of the product.
- 3) All repairs under warranty must be made by Tecno.Mec or by an authorized after-sales service representative. Repairs made by unauthorized persons will not be refunded.
Unauthorised repairs leading to damage of the machine are not covered under warranty.
- 4) Periodical checks, calibrations, maintenance and modifications are not under warranty.

DESCRIPTION OF THE MACHINE

KAPPA is a cold and hot water high pressure cleaner formed by a metal chassis with wheels and a handle for moving; generator for the production of hot water; gas-oil burner; gas-oil tank; duct for exhaust smokes; motor-pump for inlet of pressurized water, electric system with plug; power cable and electric board for control; cover and washing lance with gun (or other accessories).

CONDITIONS OF USE

USE

The cleaner has been designed and manufactured for the use in car-washing, body-shops, industries, filling stations, farms, etc.

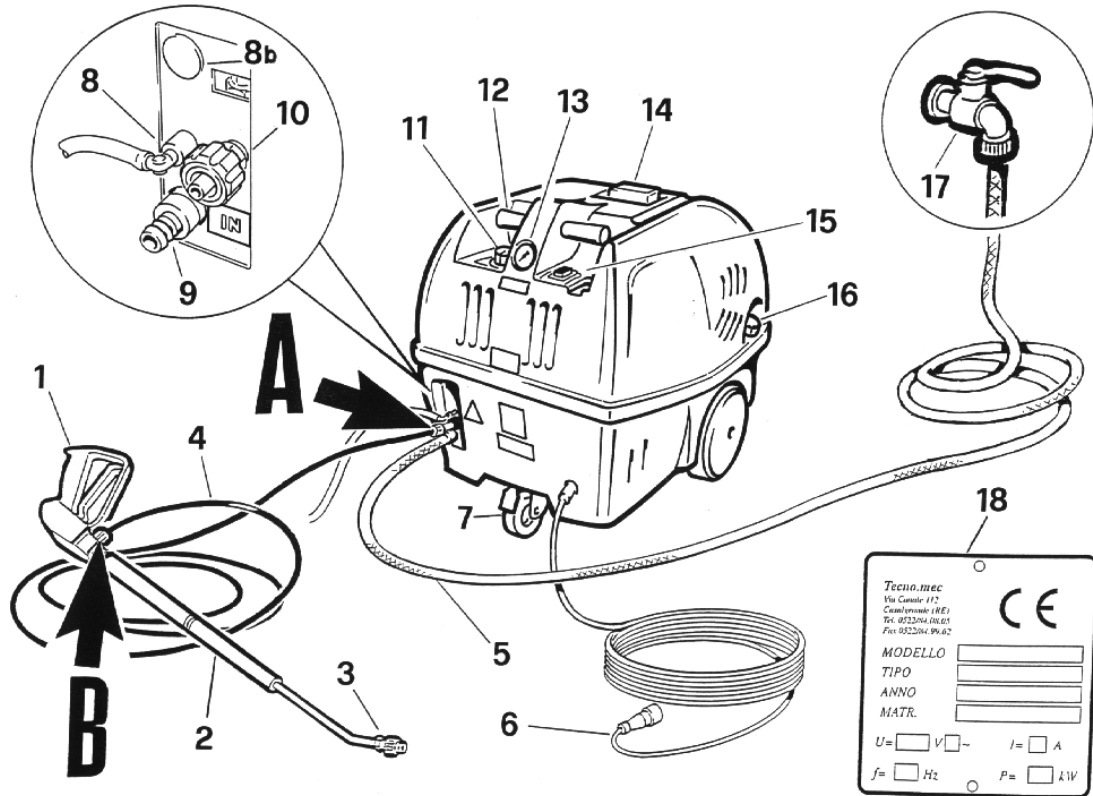
If the machine is used in closed rooms proper aeration and a good exhaust system is necessary to avoid the risk of poisoning. To correctly execute these instructions, please contact our authorised technical service center. It is forbidden the use for cleaning of machines or other units with electric motors or other equipments wich can short-circuit because of water contact.

ENVIRONMENT

The electric plant IP 54 allows to use the machine
-OUTSIDE ON SMOOTH SURFACES
-IN A DAMP ENVIRONMENT

In all cases, to assure easy and safe manual handling it is necessary for the floor to be as smooth as possible. The machine has not been designed to be pulled or towed trained by mechanical devices.

GENERAL VIEW - MARKING AND IDENTIFICATION



- 1 - Automatic gun
- 2 - Lance handgrip
- 3 - Lance nozzle
- 4 - High pressure hose
- 5 - Water feeding hose (not supplied)
- 6 - Electric cable
- 7 - Rotating wheel with brake
- 8 - Detergent feeding connection
- 8b - Detergent regulation tap (only on prearranged models)
- 9 - Water feeding connection
- 10 - Outlet high pressure water connection
- 11 - Burner starting knob and water temperature regulation
- 12 - Handles
- 13 - Pressure gauge
- 14 - Exhaust smoke device
- 15 - General switch
- 16 - Fuel tank
- 17 - Water tap
- 18 - Features plate

A - High pressure hose connection to the machine
 B - High pressure hose connection to the lance

Standard equipment	
The standard equipment is:	
- High pressure hose	
- Washing lance with safety gun	
Optionals	
Tecno.Mec cleaners may be equipped with other accessories according to the cleaning needs; require them to your after sales service center.	
- SANDBLASTING KIT	to sandblast with the high pressure power
- PIPE CLEANING KIT	to clean obstructed pipe
- ROTATING/FIXED BRUSH	to take away difficult dirt
- FOAM LANCE	transforms the detergent in a dense foam
- UNDERBODY LANCE	to clean the underbody of vehicles
- ROTATING NOZZLE	increases the water jet power and the washing power

OPERATING FEATURES

- THREE-PHASE MODELS: feeding from the three-phase network with protection conductor (without neutral wire): 400V+/- 10%; 50Hz
- SINGLE-PHASE MODELS: feeding from the single phase network with protection conductor 220V 50Hz (+ - 10%)
- continuous service;
- max room temperature: +40°C;
- min. room temperature: +5°C;
- max. humidity: 80%
- sound level: 79.5;

Model		Axial		Dynamic			Energy		
Max. pressure	(Bar)	120	150	100	140	150	110	150	150
Capacity	(Lt/min)	10	11	11	12	15	11	11	13
Motor power	(HP)	3	4,5	3	4,5	5,5	3	4	5
R.P.M.		2800	2800	2800	2800	2800	1450	1450	1450
Max. outlet water temperature	(°C)	100	100	100	100	100	100	100	100
Gas-oil tank capacity	(Lt)	13	13	13	13	13	13	13	13
Gas-oil consumption	(Lt./H)	4	4	4	4,5	5	4	4	4,5
Absorbed power	(KW)	2,5	3,6	2,5	3,6	4,3	2,5	3,3	4
Volt (*)	(Volt-Hertz)	230-50	380-50	230-50	380-50	380-50	230-50	380-50	380-50
Absorption	(A)	12	7	12	7	10	13	7	9
Boiler		15 Lt.	15 Lt.	15 Lt.	15 Lt.	15 Lt.	15 Lt.	15 Lt.	15 Lt.
Hose		10 mt. R1	10 mt. R1	10 mt. R1	10 mt. R1	10 mt. R2	10 mt. R1	10 mt. R2	10 mt. R2
Dimensions	LxPxH (Cm)	60x81x74	60x81x74	60x81x74	60x81x74	60x81x74	60x81x74	60x81x74	60x81x74
Equipment									Water tank
Optionals									Total stop device

(*) Voltage may change according to the country and local specifications (check the label on the machine - see page 4)

The rigorous observance of the instructions contained in this handbook is the main condition for a safe use of the cleaner. We will not be responsible for IMPROPER OR WRONG USE of our machines. For your information the following are examples of dangerous behaviour.

IMPROPER USE

Improper use is using the machine in manners for which it was not designed.

- USE IN ROOMS WHERE THERE IS DANGER OF EXPLOSION OR IN WHICH THERE IS A FIRE HAZZARD (e.g. paint stores, near petrol pumps, in deposit of material such as wood, straw, etc.)
- USE IN CLOSED ROOMS NOT PROPERLY AIRED
- USE IN CLOSED ROOMS WITHOUT A CONNECTION WITH AN EXHAUST DEVICE
- USE IN THE RAIN OR DURING THUNDERSTORMS
- USE FOR CLEANING ANIMALS
- USE BY CHILDREN
- WASHING OF ANY OBJECT CONNECTED TO AN ELECTRICAL NETWORK
- WASHING TYRES AT A DISTANCE OF LESS THAN 30 CM. (the tyres can be damaged from the jet of water and could explode)
- USE IN THE PRESENCE OF PEOPLE WHO COULD BE HIT BY DIRT OR PARTICLES AS A RESULT OF THE HIGHLY PRESSURIZED STREAM OF WATER



WRONG USE

Using the machine without following the directions contained in this handbook is considered wrong use (see also "Forbidden Operations"). Failure to observe these directions can represent a risk to the operator or damage to the machine. The following are examples of unauthorized use.

- WRONG CONNECTION/USE OF STANDARD EQUIPMENT
- WRONG SUCCESSION OF STARTING INSTRUCTIONS
- THE USE OF NON-ORIGINAL SPARE PARTS
- USE OF FUEL DIFFERENT FROM GAS-OIL
- STARTING THE MACHINE WITH GAS-OIL TANK ON EMPTY
- REPAIRS MADE BY UNAUTHORIZED PERSONS
- MAINTENANCE MADE BY UNQUALIFIED PEOPLE
- USES FOR WHICH THE MACHINE HAS NOT BEEN DESIGNED (see improper use)
- LACK OF MAINTENANCE

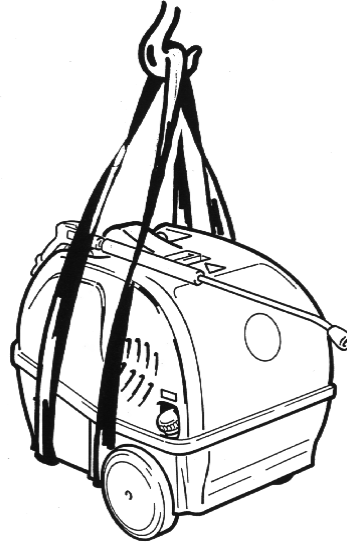
PACKING AND TRANSPORT

The machine is fixed to a wooden pallet and covered by a corrugated board packaging which is fastened with a high resistance plastic ribbon. The machine packed in this way can be lifted also by a lift truck with forks.

During shipment the container must be protected from atmospheric agents, such as rain, fog, sun, etc.

The packed machine can be lifted by a lift truck or a transpallet with the capacity of at least 200 Kg. In case of further transport, when it is not possible to use the original packaging, the machine must be immobilized to avoid any shift inside the vehicle.

Put the machine on a smooth floor. When the machine is not used, store it in a room protected from atmospheric agents.



WARNING: verify that the capacity of the hoisting equipment is right.

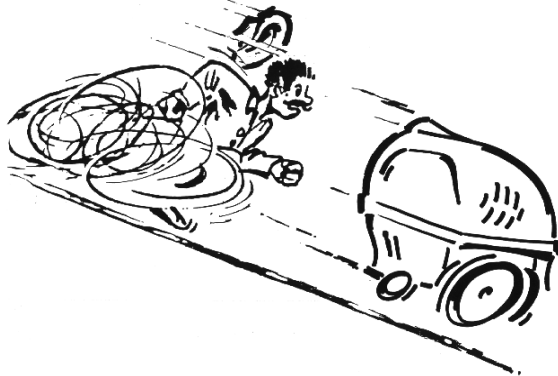
INSTALLATION

This operation must be done in clean and well-lit rooms. For references to the machine parts, see page 4 "General view" of this handbook

1 - Remove the packing carefully and inspect the machine for damage which may have occurred during transport. In case of doubt, do not use the machine and contact the after-sales service.

The packing elements (cardboard, wood, etc.) must be put on a suitable dump and never left within reach of children who could be injured.

2 - Put the cleaner on a properly arranged place, in any case on a smooth surface, acting on the brake pedal of the rotating wheel (FIG. 7) block up the machine.

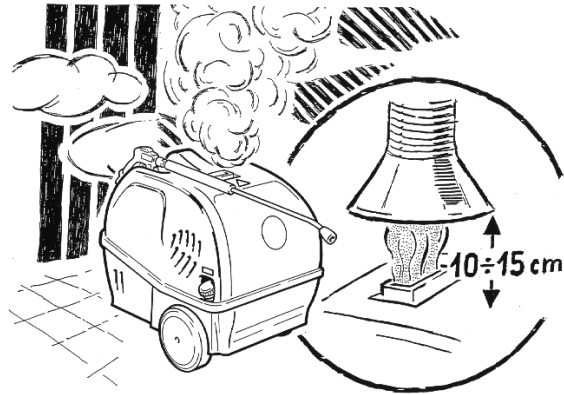


The work station must be equipped with:

- a current tap 400V/16A 3+PH three-phase or 220V/16A single-phase 2PH+T according to the models (see technical features on the label - see paragraph "Marking and identification")
- a water plug 1/2", pressure 0.3 Mpa, with an on-off valve
- a connection to the drainage system for the treatment of the waste water.

- Prearrange a device for the elimination of exhaust gas as gas released in closed rooms is dangerous, and properly air the room.

3 - Connect the water feeding hose to the tap, this connection must be done with a suitable flexible hose which must be as short as possible to avoid stumbling.



4 - After having unscrewed the plug (FIG. 16) fill the tank with diesel. It is necessary to use clean fuel, filter it if necessary.

5 - Connect the lance to the high pressure hose (FIG. B) by means of a 17mm key. Connect this one to the fitting (FIG. A).

6) Connect the water feeding to the quick connection (FIG. 9) fixing it with a hose clamp. The feeding hose must be perfectly clean inside, use a filter upstream if necessary.



7) **ATTENTION** - Before doing the electric connections turn the main switch (FIG. 15) onto OFF position and be sure that the indications on the label (FIG. 18) correspond to those of the electrical mains. The installation must be carried out by qualified personnel in compliance with IEC 360 standards and current national and local regulations.



8) **ATTENTION** - Verify that the section of the cables, their serviceability and their capacity is suitable for the drawn power as indicated on the rating plate. It is important to protect the supply line using thermo-magnetic devices, coordinated with the thermo-magnetic device of the machine. The features are indicated on the device.



9) **ATTENTION** - The connection with the electrical mains must be done using taps complying with IEC 309 rule and without using extensions.

10) The unit is safe only when it is correctly connected with a grounded plant and in presence of an automatic cutout device able to grant a voltage contact not higher than 25V. Use a circuit breaker corresponding to ≤ 30 mA A class

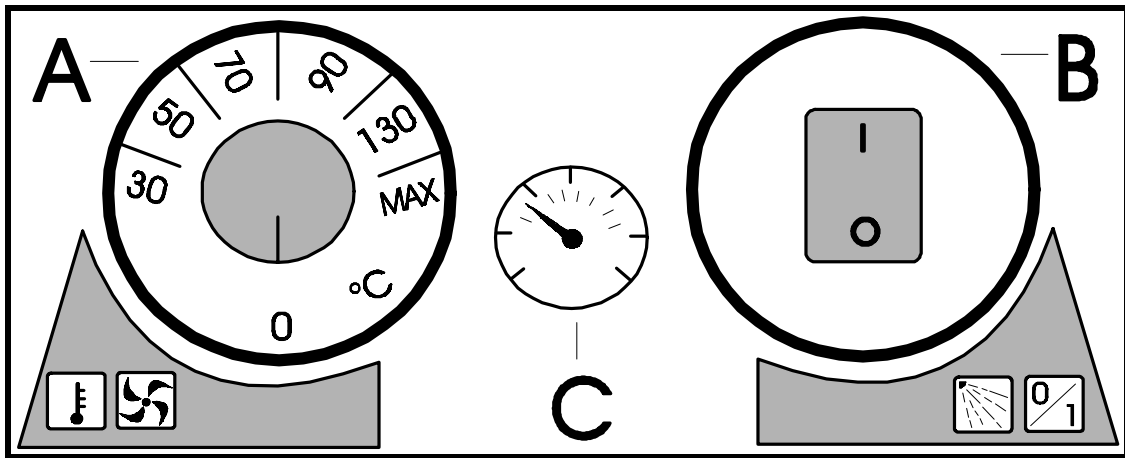


WARNING: in case of a power failure the machine will stop. If it is not disconnected, when power is restored, the machine will start automatically.

11) Signal all the forbidden operations contained in this paragraph using the right warnings.

The execution of these operations is fundamental for the regular working of the machine.

NORMAL USE OF THE MACHINE



Controls and indicators

- A** - Starting knob/burner temperature
- B** - On/Off general switch (according to the models the switch may be a I/O push button or a knob)
- C** - Pressure gauge

AT THE BEGINNING OF EACH WORKING SHIFT

- Verify that the supply cable, the plug and the water hose are in good condition. If they are damaged, do not connect the machine to the electrical network and contact an after-sales service center for the replacement.
- Check that the machine does not have plain damage
- Verify the efficiency of the main switch
- Verify the presence of the fuel inside the tank (to avoid damages to the gas-oil pump, never use the machine on empty)
- If the electric features of your plant correspond to those of the label of the machine, you can insert the pin



WARNING: a new machine needs the motor-pump group to be run in. Running in consists of operating the machine for 1 hour then waiting for 1 hour for it to cool, this operation must be done 4 or 5 times.



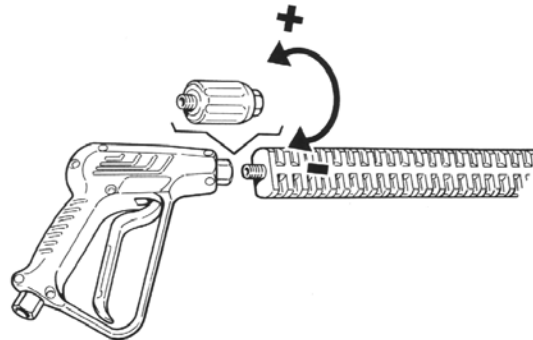
WARNING !

CAUTION: high pressure jet of water
. Grip the lance with both hands.
Never direct the jet of water toward
people or animals.

TO START THE MACHINE IT IS NECESSARY TO FOLLOW THE FOLLOWING SEQUENCE:

1) STARTING STAGES

- A) Turn on the water
- B) Set to zero the pressure by turning the regulating knob (see picture) on the lance (when present). The pressure is indicated by the pressure gauge (FIG. C)
- C) Press the starting switch ON/I (FIG. B)



Pressure regulator



CAUTION: grip the lance and the spray gun with both hands. The pressure of the machine cause a light recoil at the opening of the gun, so it is necessary to grip it with both hands and stay on a sure position.

- D) Hold the gun in the open position for a few seconds to allow the air to escape from the hoses.
- E) After eliminating the air, proceed normally.
- F) Select the temperature of the water by turning the starting knob of the burner (FIG. A). In position 0 the burner is OFF and water is cold

2) USE

The machine can suck and mix detergents or other liquid chemicals (not corrosive) thanks to an automatic device.

The machine is equipped with a detergent suction hose with filter or with an external suction hose according to models (see table page 5)

- in case the machine is equipped by an internal tank, to mix detergent with water, it is enough to put it in the tank and to regulate the quantity by means of the tap (Fig. 8b page 4)
- in case the machine is equipped by the suction external hose it is enough to insert the hose (Fig. 8) in an external can (not supplied) full of detergent; the quantity of detergent can be regulated by turning the lance head.

We suggest proceeding in the following way:

- distribute the detergent on the surface to be cleaned
- stop the delivery and wait 3-4 minutes
- start the hot jet of water

To avoid chemical deposits building up we suggest to clean the chemical suction kit by sucking water for a few seconds.

Always clean surfaces in little parts, if the detergent get dry, it can damage the painted surfaces.

3) SWITCHING OFF

When finished using the machine act as follows:

- A) Close the spray gun
- B) Turn the knob (FIG. A) up to 0 (burner OFF)
- C) Open the spray gun and let water flow for about one minute (until the temperature lowers and cold water comes out).



CAUTION: be sure that water is cold before stopping the machine

- D) Press the main switch (Fig. B) in OFF position
- E) Turn off the water tap
- F) Open the spray gun for a few seconds to allow the water to come out of the hoses
- G) When finished using the machine disconnect electrical and water mains and put the machine away in a closed room.

FORBIDDEN OPERATIONS - SAFETY REGULATIONS

- Do not obstruct the high pressure hose, it could explode causing damage to the operator

- When the machine is working, never take away the cover of the internal equipment.

- When machine is running, it generates heat, so touch it only when it cools down. Do not touch the exhaust device until it is completely cool.

- Do not pull the machine by its electrical cable or by the water hose

- Do not use the electrical plug to execute the starting and switching off stages

- Do not use the machine on tilted surfaces

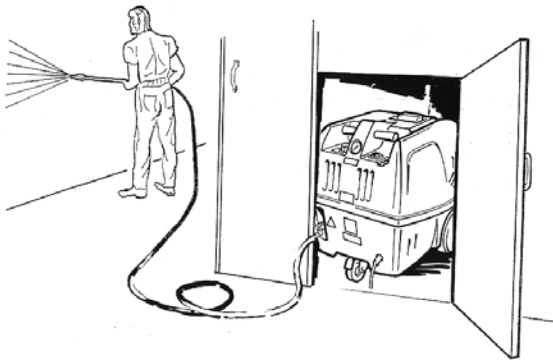
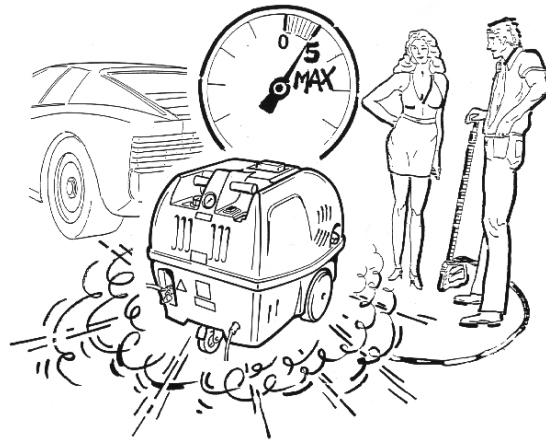
- Do not use the machine bare-footed



- To protect against parts rebounding, it is necessary to wear protective clothes (especially during sandblasting or descaling operations, etc.)
- Always wear rubber boots and protective glasses when using the machine
- Never drink the water coming out from the machine, it has not to be used like drinkable water.
- Never leave the machine unattended when it is running. In case of long stops it is compulsory to switch it off.

- If the machine is used in a danger zone (for example petrol pumps) act according to the safety rules

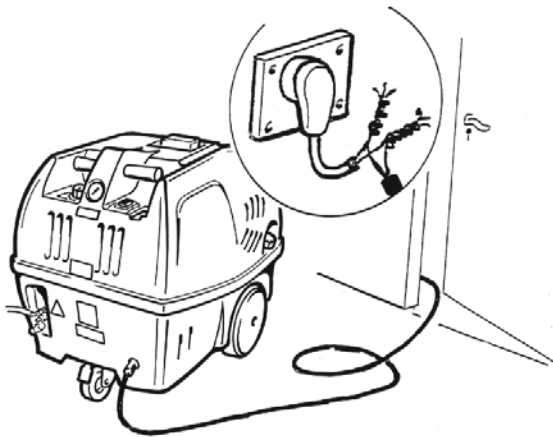
- The machine equipped with "Total Stop" (see table page 5) automatically stops if it is inactive for more than one minute, thanks to a safety device to avoid damages to the seals. To use it again it is enough to open the spray gun. If your machine has not the total stop, in case it runs for more than 4-5 minutes with the gun closed, it is necessary to switch it off.



- Do not store the unit in closed rooms or in places with insufficient ventilation. The machine must have the possibility to blow off gas exhaust and to restore air.



- Do not repair or adjust the working unit before switching off the power and disconnecting the plug from the electrical network.

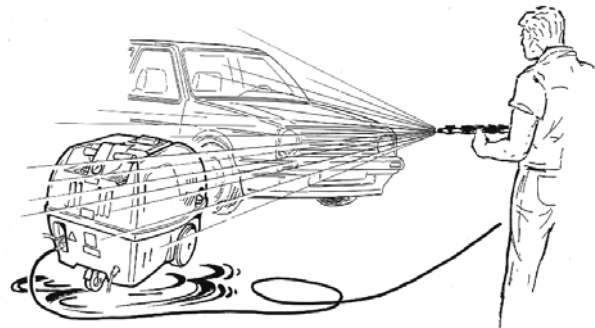


- Do not make repairs on, or do damage to the electrical cable

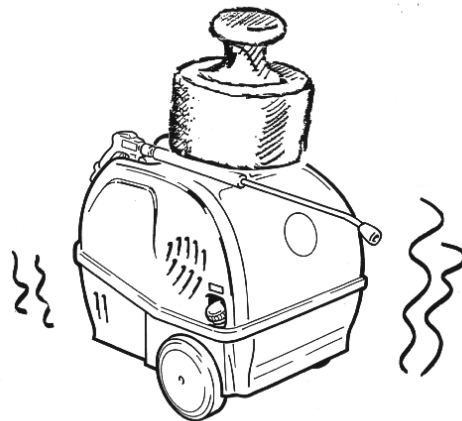
- The machine must be used in rooms or in hours such to assure a sufficient lighting.

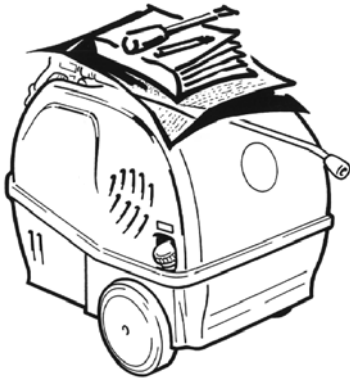
- Do not direct the jet of water on the unit or any other electrical parts and appliances. It can damage the electrical system, it is especially dangerous for the operator.

- Protect the machine from atmospheric agents by not working with the unit in the rain or any other situation in which liquids can infiltrate into the pump.



- Do not place heavy objects on the cover of the machine. It could be damaged.





- Do not obstruct the exhaust device
- Avoid using the pump without water; it could damage the internal parts of the pump.

PRECAUTIONS IN THE HIGH PRESSURE HOSE USE



The high pressure hose supplied with the machine is subjected to rigorous safety controls. It is easy to avoid damages to the hose by following the next precautions:

- Unfold the hose before starting the operations;
- Do not pull the eventual knots, but unfold the hose
- Do not crush or fold up the hose
- Do not pull the machine by its water hose

Avoid to use the hose in case of blowing or damages in the external covering, never try to repair the hose and in case of anomalies replace it by using a new one.

ACCESSORIES

In case of use of accessories which are not in the standard equipment, follow the instructions attached to the accessories. Verify that accessories comply with the features of the cleaner with whom they have to be used.

The manufacturer does not assume responsibility for damages caused to the machine or to the operator by using non-original spare parts.

MAINTENANCE



WARNING

If the machine is out of order or in the case of bad operation, immediately switch off the machine by means of the main switch, and advise the qualified personnel. Switch off the machine and disconnect the water and electrical mains and do not effect any repair. Immediately contact qualified personnel. The repairs must be done by the manufacturer or by an authorised after-sales center, always using original spare parts.

The following operations must be done to avoid damage to mechanical parts and to keep your cleaner efficient.

For all maintenance operations on the boiler, the high pressure pump and on the machine in general, it is necessary to contact qualified personnel or an authorized after-sales center.

Before doing any maintenance on the machine:

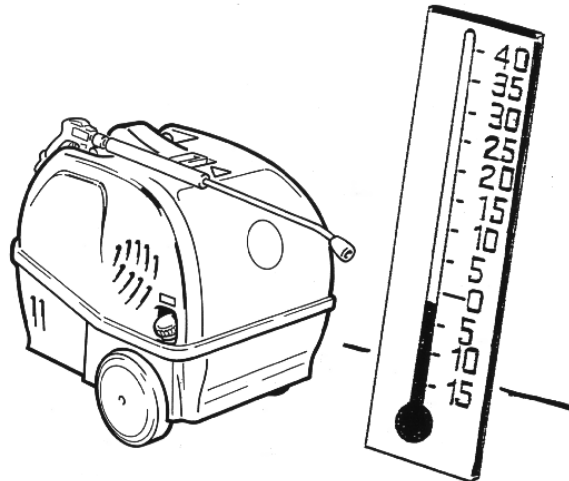
- 1 - Switch off the machine (switch in OFF/O position)
- 2 - take away the plug from the socket
- 3 - Close the water tap
- 4 - Discharge the residual pressure (pull the gun trigger)



WARNING: The cleaner cannot be opened without the authorization of the after-sales service.
SAFETY DANGER - LOSS OF WARRANTY

- 1) Check that the oil level is always over the dipstick cut. Change the oil after 50 working hours, and successively every 500 hours; use oil type SAE 20/30. To check the oil level, unscrew the handles (FIG. 12) of the machine, and the cap of the gas-oil tank (FIG. 16), then lift the cover from low to high. Now check that the oil level inside the high pressure pump covers at least half of the oil window of the pump (or unscrew the oil cap and verify that the oil covers the lower cut). If the quantity of oil is not enough, do not start the machine.

- 2) Do not expose the unit to low temperatures. Intense cold may damage the pump and seriously harm other circuits. In case of long stops in temperatures lower than 0°C empty the circuits and intake a small quantity of antifreeze. Vice versa, high temperatures may overload the motor when the machine is operating.
DAMAGES CAUSED BY FREEZE ARE NOT COVERED BY WARRANTY



- 3) When the machine has been stored for a long time, there is a possibility of calcium deposits building up. This could make instant starting difficult. In this case to avoid the consequences of electrical over charging, before plugging the unit in, we suggest turning the motor shaft with a screwdriver (important: disconnect the machine before doing this operation). So you will know the cause of the locking (frost, incrustations, or others) and you will be able to behave consequently.
- 4) Never intake corrosive liquids (paints, acids solvents, oily or very thick liquids) which could permanently damage the pump. To avoid chemical deposits building up we suggest cleaning the chemical suction kit by sucking water for a few seconds.
- 5) The cleaning of the boiler must be done each 200 working hours as follows:
- disassemble the nozzle and the electrodes holder flange (burner head)
 - clean the nozzle filter using compressed air and check the position of the electrodes
 - take away the boiler cover and clean the baffle
 - slip the inside cover off
 - unscrew the locking nuts of the coil and take it off from boiler
 - clean the coil using a wire brush
 - suck the residue from the boiler
 - assemble again all the parts doing the operations on the contrary
 - periodically the total check and the combustion regulation must be done by specialized personnel as prescribed by laws
- 6) The descaling treatment must be periodically done by using specific products according to the water hardness.
- In a water can of about 15 litres pour one litre of a descaling product type "TM KAL" or "TM COILS" following the instructions written on the packing. Use a can with tap, connect the tap to the cleaner water feeding (Fig. 9), keep the can in such a way that the descaling product enter by drop. Take the gun off from the high pressure hose, immerse the other end of the hose inside the can, in a way to create a closed circuit and to let the cleaner intake the descaling product for at least 10 minutes it is advisable that the delivery hose discharge inside a small cloth bag to avoid to re-cycle the limestone taken away.
- Restore the normal connection and rinse with cold water. It's advisable to get the operation executed by personnel of the after-sales service center because the descaling product could damage the components.
- For the elimination of the descaling product follow the local laws.



CAUTION: the descaling liquid contains acid substances which could damage the objects to be cleaned: be sure to have correctly rinsed them.

- 7) From time to time check the wear of electrodes, the right distance from one end to the other is 3 mm.
- 8) Replace the high pressure water hose every 2 working years. On the new hose it must clearly appear the maximum allowed pressure, the producer's name or the producer's mark. Before use verify that the pressure values of the new hose correspond to those of the machine.

- 9) In case the water filter is dirt or clogged, the water quantity is reduced and this could damage the pump. A lightly damaged filter do not carry on its work causing damages to the pump. Periodically (at least each 500 working hours) take the filter away and clean it to eliminate dirt. In case of doubt replace the filter to avoid that foreign matters come into the pump.
- 10) The clogging of the lance nozzle caused by limestone incrustation or other cause an excessive increase of the pump pressure, and damage it. It is necessary to clean periodically the nozzle.
- 11) Periodically check the gas oil filter and in case it is too dirt or damaged, replace it.
- 12) In case the electric cable is damaged, replace it by a special cable H07RNF, according to the electric diagram. The replacement must be done by a specialized electrician.

CLOGGED NOZZLE - BY-PASS VALVE

IMPORTANT!: In case the nozzle is clogged, the cleaner is equipped with a by-pass valve to automatically control the excess of pressure.

The by-pass valve immediately reduce the pressure, to protect the mechanical parts of the pump and the motor.

IN CASE THE BY-PASS VALVE IS TAMPERED, THE MOTOR AND THE PUMP COULD BE PERMANENTLY DAMAGED!

THE BY-PASS VALVE CAN BE REGULATED, CLEANED, REPAIRED OR REPLACED ONLY BY THE AFTER-SALES CENTER SERVICE.

TROUBLESHOOTING

In case of operating difficulties, please check the following table. If difficulties persist, contact a technician authorised by the manufacturer.



WARNING: Before doing any kind of maintenance, disconnect the machine from the electric mains

FAULT	CAUSE	REMEDY	
Pump running normally but pressure does not achieve rated values	Pump sucking air	Operate the pump with open lance	
	Valves worn or dirty	Clean or replace	
	Nozzle incorrect or worn	Check and replace	
	Worn piston packing	Check and replace	
	Cloggy suction filter	Clean or replace	
	Unloader pin valve	Clean or replace	
Fluctuating pressure	Valves worn, dirty or stuck	Check, clean or replace	
	Pump sucking air	Check that hoses and fittings are air tight	
	Worn piston packing	Check and/or replace	
Pressure drops	Nozzle worn	Replace	
	Valves dirty	Check, clean or replace	
	Unloader valve pin worn or locked	Check and/or replace	
	Worn piston packing	Check and/or replace	
Pump noisy	Pump sucking air	Check that hose and fittings are air tight	
	Valves dirty, worn or locked	Check, clean or replace	
	Worn bearings	Check and/or replace	
Presence of water in oil	Piston packing and oil seal worn	Check and/or replace	
Water dripping from pump head	Piston packing worn	Replace	
	The O rings of piston guide or retainer worn	Replace	
Oil dripping	Oil seal worn	Replace	
The motor does not start	Plug not well connected	Check plug, cable and switch	
	Lack of power supply	Check plug, cable and switch	
The motor hums but does not start	The main voltage is insufficient, lower than the minimum required	Check that the mains power supply is adequate	
	The pump is locked or frozen	Check by turning the motor manually (see ADVICE)	
	Incorrect extension cable	See table INSTALLATION	
The motor stops suddenly	Tripped thermal overload due to over heating	Check that the main voltage correspond to the specifications. Switch off the motor and let it cool for a few minutes	
The burner does not start	Lack of gas-oil	Check the gas-oil level and the float	
	Electrodes worn	Check (see MAINTENANCE)	
	Electrodes damaged	Replace	
	Gas-oil filter obstructed	Replace	
	Gas-oil nozzle obstructed	Clean the burner nozzle	
	Fuse of the motor burner and transformer damaged	Replace	
The operations marked with the black square must be done only by qualified personnel			

DEMOLITION OF THE MACHINE

When you decide to discard the machine it is necessary to make it inactive:

- empty the inner tanks
- disconnect from the electrical mains
- cut the external electric cable
- cut the motor cable
- take away the wheels

ECOLOGICAL INFORMATIONS:

It is necessary to follow the local laws concerning the connection to the water network. The elimination of the package, of the intaked dust, of the replaced parts and of waste arising from demolition of the machine must be carried out in a manner which does not pollute ground, water and air. Consult your local laws for more informations.

DISCARDING WASTE MATERIALS:

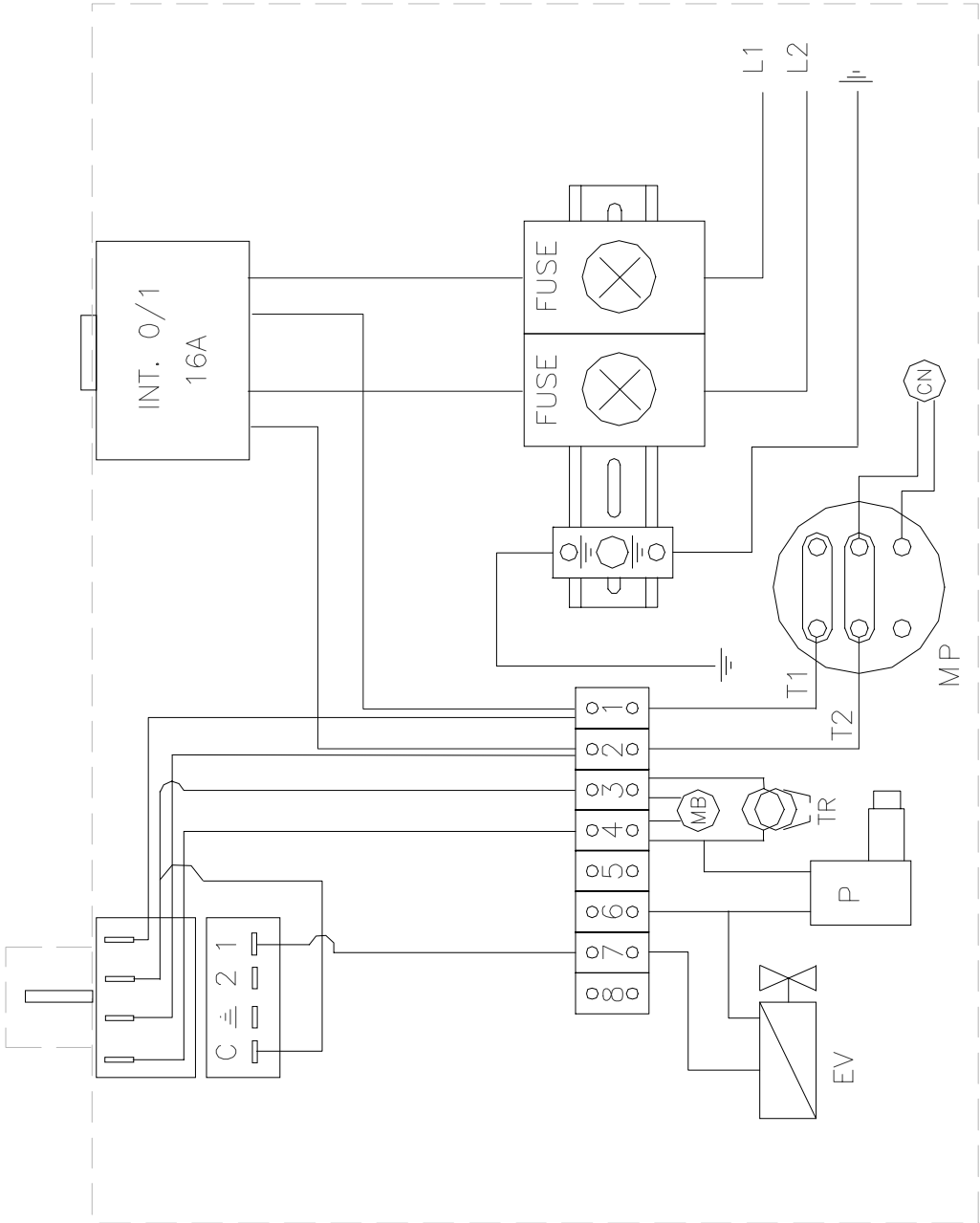
- Ferrous materials, aluminium, copper are recyclable and must be brought to an authorised collecting center
- Plastic materials must be carried to a proper recycling center (if one exists for such purposes) or to a dump or burning center
- Exausted oils must be brought to an authorised collecting center.

Technical features of the product can be modified by the manufacturer at any time.

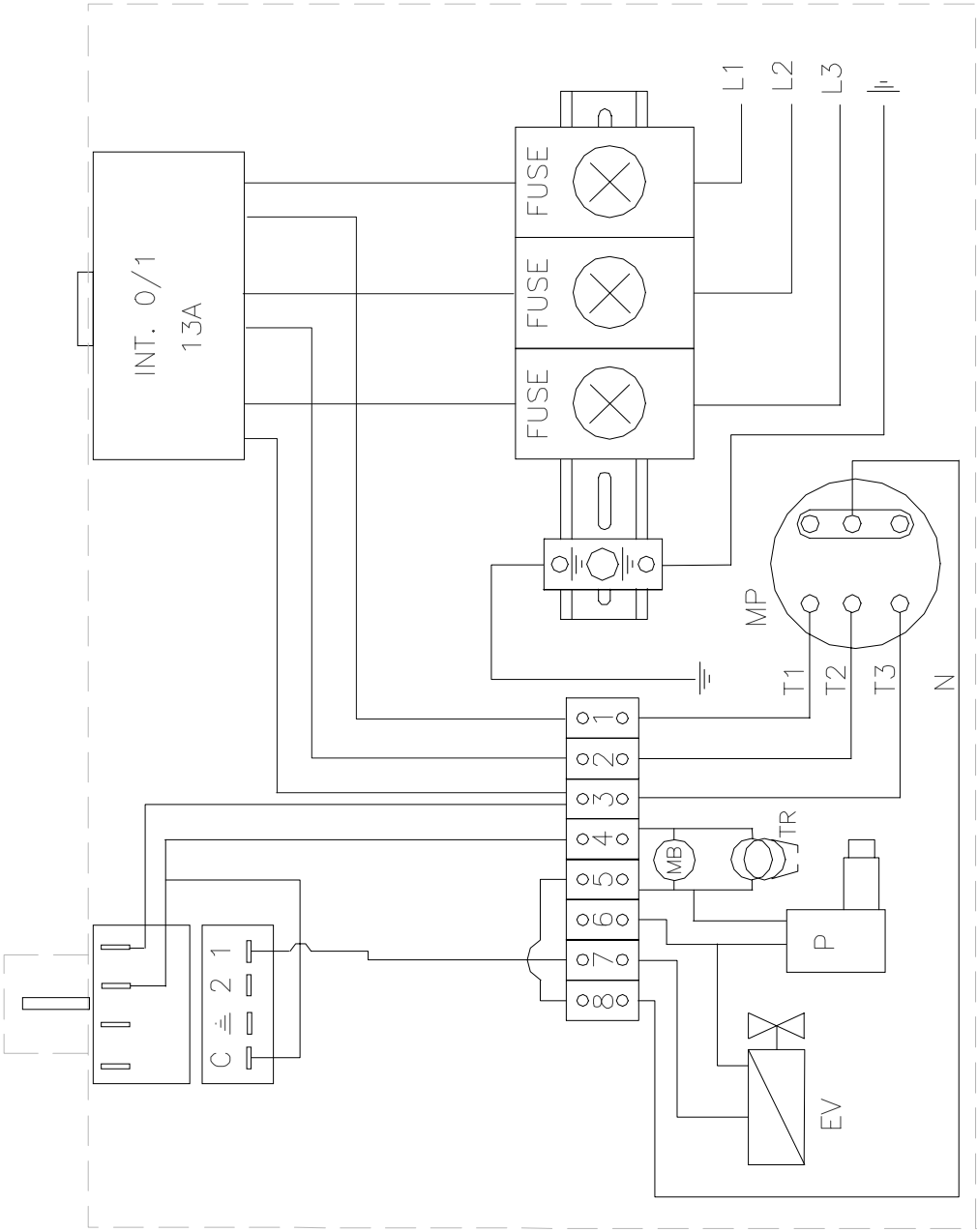
WIRING DIAGRAM

C	Common
1	NC
P	Pressure switch
EV	Solenoid valve
MB	Burner motor
TR	Transformer
N	Neutral
L	Inlet line
T	Outlet line
FUSE	Fuse
INT	Switch
MP	Main motor
CN	Capacitor

SINGLE-PHASE WIRING DIAGRAM



THREE-PHASE WIRING DIAGRAM



CONFORMITY DECLARATION

THE MANUFACTURER

Tecno.Mec Srl
Via Canale, 114 - Loc. Villalunga
42013 CASALGRANDE (RE) - ITALY

DECLARES THAT THE PRODUCTS:

WATER CLEANERS

KAPPA

TO WHICH THIS DECLARATION REFERS, SATISFY THE FOLLOWING DIRECTIVES :
73/23/EEC - 89/392/EEC - 91/368/EEC - 93/44/EEC - 93/68/EEC

Tecno.Mec Srl

Managing director

MELIGA PIER PAOLO



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