-tecno.mec_

Hot water cleaner

SYMBOL (E

Operating instructions



TECNOMEC S.r.I. Casalgrande (RE) - Italy

IMPORTANT: Read this booklet carefully

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NOTICE

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. Carefully read the notices of this handbook because they give important infomation concerning safe installation, use and maintenance.

The manufacturer does not assume responsibility for damage caused by improper use of the machine.

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 occured during transport.

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

WARRANTY REGULATIONS

- 1) Your SYMBOL cleaner is 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 the manufacturer 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.
- All repairs under warranty must be made by our technicians or by an authorized aftersales 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.

HOT WATER HIGH PRESSURE CLEANER

SYMBOL

Congratulations, you have chosen a cleaner of high quality and great performance.

The SYMBOL hot water cleaner will assist you professionally for all washing, descaling, cleaning and sandblasting purposes.

SYMBOL cleaners are recommended for use in all fields of industry, agriculture, building industry and tourism.

SYMBOL 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.

DESCRIPTION OF THE MACHINE

SYMBOL 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.

ENVIRONMENT

The electric plant IP 54 allows to use the machine -OUTSIDE ON SMOOTH SURFACES

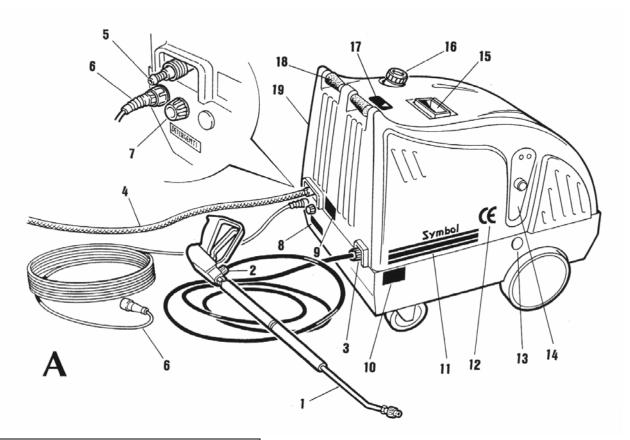
-IN A DAMP ENVIRONMENT

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.

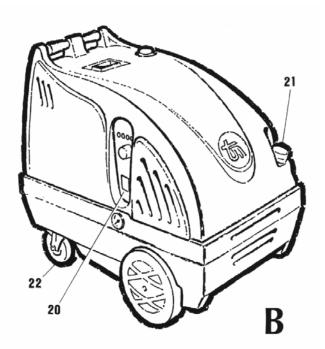
TECHNICAL FEATURES

Model	Max. pressure	Capacity	Motor power	Outlet water max. temp.	Fuel tank	Volt
	(Psi)	(Gp.m)	(KW)	(°F)	(Gal.)	(Volt-Hertz)
Symbol 110/11 M.	1600	2,9	2,2	285	5,2	220-50
Symbol 110/11 T.	1600	2,9	2,2	285	5,2	380-50
Symbol 150/15	2200	4	4	285	5,2	380-50
Symbol 200/15	2900	4	5,5	285	5,2	380-50
Symbol 200/21	2900	5,5	7,4	285	5,2	380-50
Symbol 150/21	2200	5,5	5,5	285	5,2	380-50

GENERAL VIEW



- 1) Washing lance
- 2) Gun/hose pipe fitting
- 3) Quick connection
- 4) Water feeding hose
- 5) Water feeding pipe fitting
- 6) Electric cable
- 7) Detrgent tap
- 8) "DETERGENT" label
- 9) "BAR" label
- 10) "Technical specification plate
- 11) "MODEL" label
- 12) "EC" label
- 13) "Pressure gauge
- 14) Control board
- 15) Exaust smoke device
- 16) Detergent tank
- 17) "WARNING" label
- 18) Handles
- 19) Cover
- 20) General switch
- 21) Fuel tank
- 22) Rotating wheel with brake



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 deposits 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



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 capcity of at least 200 Kg.

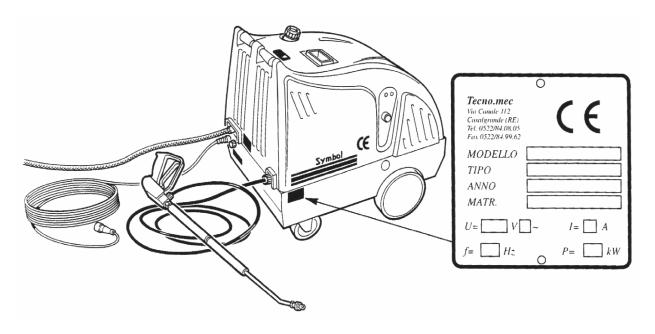
Please, **verify that the capacity of the hoisting equipment is right**. In case of further transport, when it is not possible to use the original packaging, the machine must be immobilized to avoid any shift inside the vehicle.

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





MARKING AND IDENTIFICATION



CONFORMITY DECLARATION

THE MANUFACTURER

Tecno.Mec Srl

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

DECLARES THAT THE PRODUCTS:

WATER CLEANERS

SYMBOL

TO WHICH THIS DECLARATION REFERS, SATISFY THE FOLLOWING DIRECTIVES:

98/37/CE - 73/23/CEE - 89/336/CEE - 93/68/CEE

July

Tecno.Mec Srl

Managing director

MELIGA PIER PAOLO

INSTALLATION

This operation must be done in clean and well-lit rooms.

1) Remove the packing carefully and inspect the machine for damage which may have occured 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. B/22) block up the machine. The work station must be equipped with:
- a current tap 400V/16A 3+PE (230V for single-phase version)
- 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. B/21) fill the tank with diesel. It is necessary to use clean fuel, filter it if necessary.
- 5) Connect the lance (FIG. A/1) to the hose (FIG. A/2).

Connect this one to the fitting (FIG. A/3)



- 6) Connect the water feeding to the quick connection (FIG. A/5) fixing it with a hose clamp. The feeding hose must be perfectly clean inside, use a filter upstream if necessary.
- 7) Before doing the electric connections turn the main switch (FIG. B/20) onto OFF position and be sure that the indications on the label (FIG. A/10) correspond to those of the electrical mains. The installation must be done by qualified persons according to national and local rules.
- 8) 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) 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



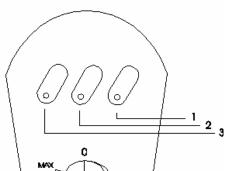
WARNING: in case of a power failure the machine will stop. If it is not disconnected, when

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.

USE OF THE MACHINE



CONTROLS AND INDICATORS

- 1) Warning light burner lock
- 2) Warning light for lack of gas-oil
- 3) Electrical connection warning light
- 4) Starting knob/burner temperature
- 5) ON switch (green)
- 6) OFF switch (red)
- 7) Pressure gauge

$rac{2}{}$ 3 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 that the warning lamp (FIG. C/3) on the panel of the machine lights to indicate the presence of power.
- Verify the efficiency of the main switch

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

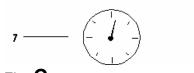


Fig. **C**



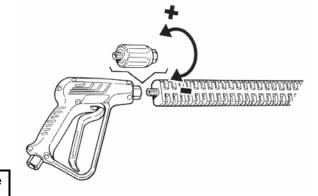
CAUTION: high pressure jet of water . Grip the lance with both hands. Never direct the jet of water toward people or animals.



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 on the lance (when present). The pressure is indicated by the pressure gauge (FIG. C/7)
- C) Press the starting switch ON (FIG. C/5)





CAUTION: grip the lance and the spray gun with both hands

- D) Hold the gun in the open position for a few seconds to allow the air to escape from the hoses.
- E) At this point adjust the machine to your pressure requirement by turning the pressure regulating knob on the lance (when present)
- F) Select the temperature of the water by turning the starting knob of the burner (FIG. C/4). In position 0 the burner is OFF and water is cold

2) USE

The machine can (by low pressure or even by high pressure according to models - see table "Equipment") 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 (FIG. A/16)

The quantity of detergent can be regulated by turning the intake knob (FIG. A/7)

We suggest proceding 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.

When the fuel inside the burner (gas-oil) reaches the minimum level, the warning light for lack of gas-oil (2) lights up (only on prepared machines). In this case fill the gas-oil tank (FIG. B/21)

If the burner does not start the warning light "burner lock" (FIG. C/1) lights up. In this case turn the burner adjusting knob (FIG. C/4) up to 0 and wait at least 20 seconds before trying to restart the burner.

3) SWITCHING OFF

When finished using the machine act as follows:

- A) Close the spray gun
- B) Turn the knob (FIG. C/4) 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).

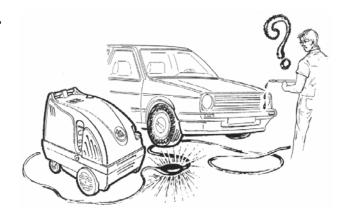


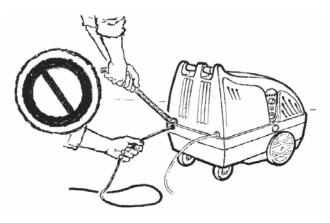
CAUTION: be sure that water is cold before stoping the machine

- D) Press the OFF switch (FIG. C/6)
- E) Turn off the water tap
- F) Open the spray gun for a few seconds to allow the water tocome 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

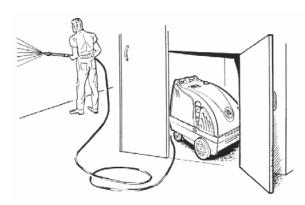




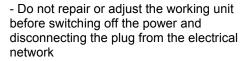
- Do not pull the machine by its electrical cable or by the water hose
- Do not use the electrical plug to execute the starting and switching off stages
- Do not use the machine on tilted surfaces
- Do not use the machine bare-footed

- Do not touch the exaust device until it is completely cool
- Never leave the machine unattended when it is running. In case of long stops it is compulsory to switch it off.
- To protect against parts rebounding, it is necessary to wear protective clothes (especially during sandblasting or descaling operations, etc.)
- If the machine is used in a danger zone (for example petrol pumps) act according to the safety rules
- Thanks to a safety device, the machine automatically stops if it is inactive for more than one minute. To use it again, it is enough to open the spray gun



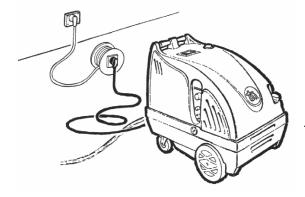


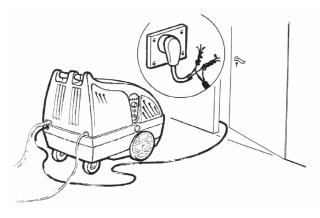
- Do not store the unit in closed rooms or in places with insufficient ventilation. The machine must have the possibility to blow off gas exaust and to restore air





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

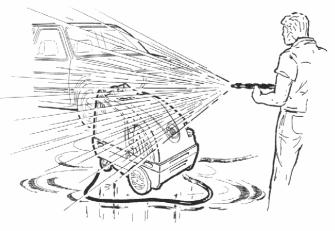




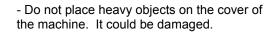
 Avoid using the extension, or use extensions according to rules to avoid damages to the operator

- 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 infilterate into the pump







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

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.

MAINTENANCE

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

- 1) Check that the oil level is always over the dipstick cut. Change the oil after 50 working hours, use oil type SAE 20/30. To check the oil level, unscrew the handles (FIG. A/18) of the machine, unscrew the cap of the detergent tank (FIG. A/16) and the cap of the gas-oil tank (FIG. B/21), then lift the cover (FIG. A/19). 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. Vice versa, high temperatures may overload the motor.
- 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) From time to time check the coil; it is enough to take off the lance nozzle and let the pump run. Than verify that pressure on the pressure gauge does not exceed 40 bars. If it is higher, it is necessary to clean the coil as follows (IMPORTANT: on the SYMBOL METAL the coil must be cleaned by qualified personnel):
 - fill the chemical tank (FIG. A/16) with about 2 Kg. of descaling liquid
 - take off the lance nozzle
 - open the detergent intake regulator (FIG. A/7)

- now let the pump work and open the spray gun for a few seconds to allow the circulation of the liquid and verify it flows from the lance
- to make the descaling easier let the burner operate for about 30 seconds
- stop the machine for about 3-4 minutes
- operate the pump, open the spray gun and let all the descaling liquid flow
- close the detergent intake regulator
- rinse putting clean water into circulation



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

- carefully clean the detergent tank filling with clean water
- clean the lance nozzle and retighten it
- 6) From time to time check the wear of electrodes, the right distance from one end to the other is 3 mm.
- 7) Replace the high pressure water hose every 2 working years or when it is necessary. Before use verify that the pressure features of the new hose correspond to those of the machine.

DEMOLITION OF THE MACHINE

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

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

ECOLOGICAL INFORMATION:

The elimination 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 information.

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.

TROUBLESHOOTING

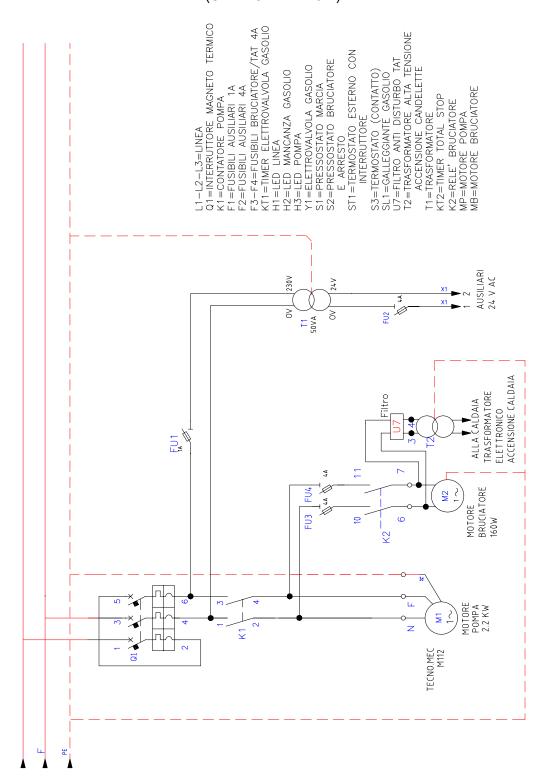
In case of operating difficulties, please check the following table. If difficulties persist, contact a technician authorised by the manufacturer.



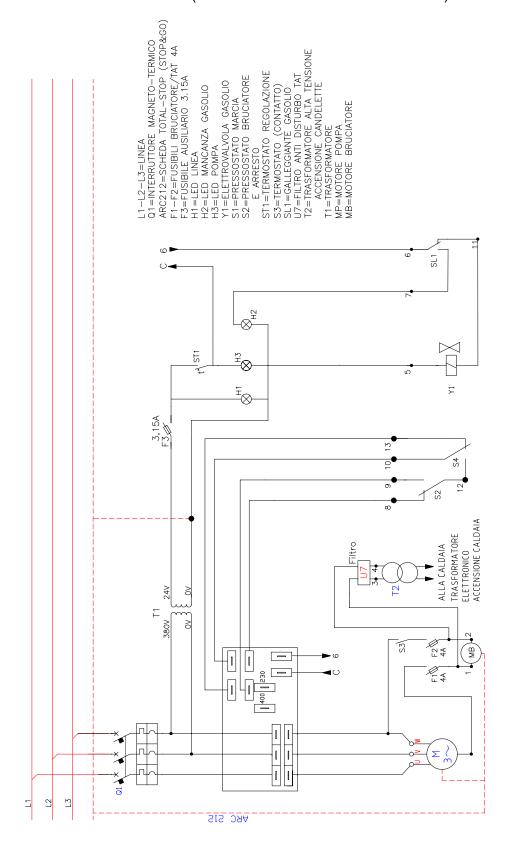
WARNING: Before doing any kind of maintenance, disconnect the machine from the electric mains

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 bl	ack square must be done only by qua	lified personnel

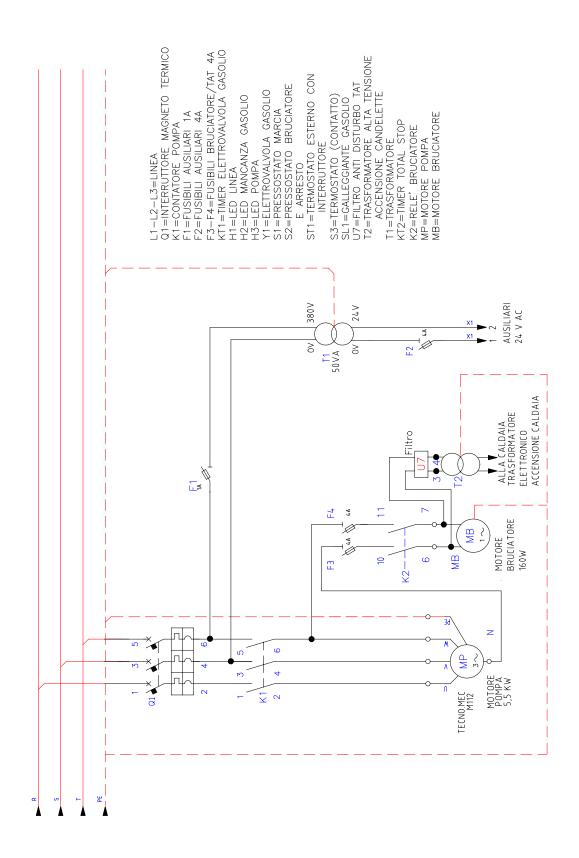
WIRING DIAGRAM - SYMBOL SINGLE-PHASE (SYMBOL 11/110M)



WIRING DIAGRAM - SYMBOL THREE-PHASE "A" VERSION (STANDARD) (SYMBOL 11/110T - 15/150 - 13/170)

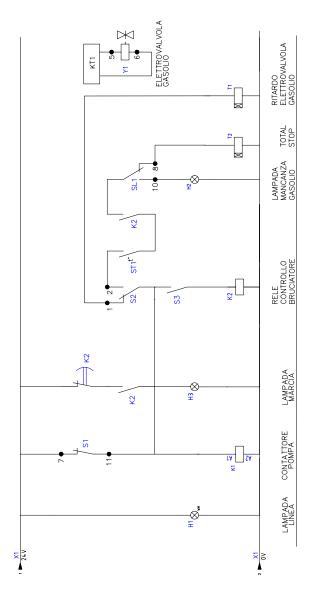


WIRING DIAGRAM - SYMBOL THREE-PHASE "B" VERSION (SYMBOL 15/200 - 21/200 - 21/150)



AUXILIARY WIRING DIAGRAM

(ALL VERSIONS)



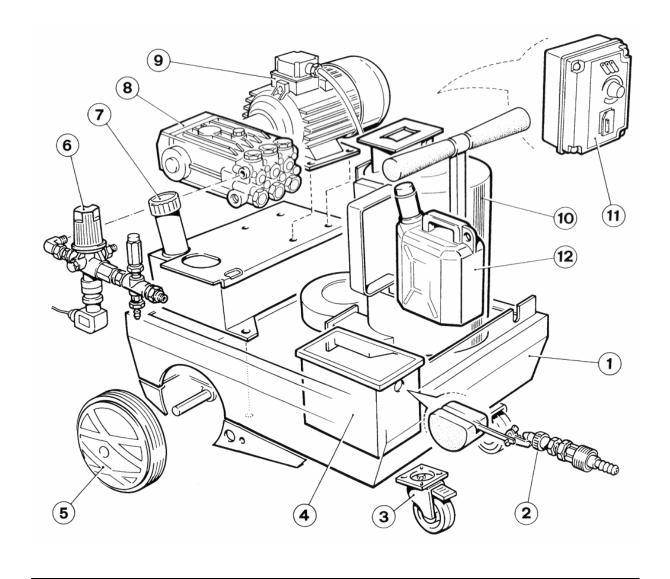
WIRING DIAGRAMS LIST

L1 – L2 – L3 = LINE	SL1 = GAS OIL FLOAT
Q1 = MAIN SWITCH	S1 = PRESSURE SWITCH (run)
K1 = PUMP SWITCH	S2 = PRESSURE SWITCH (burner)
F1 = FUSE 1A	ST1 = EXTERNAL THERMOSTAT with SWITCH
F2 = FUSE 4A	S3 = THERMOSTAT (contact)
F3-F4 = FUSE BURNER/TAT 4A	K2 = BURNER RELAY
Y1 = GAS OIL SOLENOID VALVE	KT2 = TOTAL STOP TIMER
KT1 = GASOIL SOLENOID VALVE TIMER	T2 = HIGH VOLTAGE TRANSFORMER
H1 = LINE LED	T1 = TRANSFORMER
H2 = GAS OIL LACK LED	MP = MOTORE POMPA
H3 = PUMP LED	MB = MOTORE BRUCIATORE
U7 = ANTINOISE TAT FILTER	ARC212 = TOTAL STOP DEVICE

MAIN INTERNAL VIEW

- 1) Chassis
- 2) Float
- 3) Rotating wheel
- 4) Water tank

- 5) Fixed wheel
- 6) Vlave group
- 7) Fuel tank
- 8) High pressure pump
- 9) Electric motor
- 10) Boiler
- 11) Control board
- 12) Detergent tank



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