

INCORPORATION MANUAL V1-V2-V3 BOILERS



PULITECNO

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Attention!!



**Do not use the appliance until you have read
the Incorporation manual**



- **Model: V1-V2-V3**
- **Serial number:**
- **Year of manufacture:**

THIS MANUAL IS INTENDED FOR ALL MODELS V1-V2-V3

NOTES FOR THE CONSULTATIONS OF THE MANUAL

This manual contains the information and anything else considered necessary for the knowledge, good use and normal maintenance of the V1-V2-V3 Boilers, hereinafter also referred to as machine or Vertical Boiler, manufactured by PULITECNO s.r.l. of Piacenza (PC) - Italy, hereinafter also referred to as Manufacturer.

This manual does not provide a complete description of the various parts nor a detailed description of their operation; the user will find that it is normally useful to know what to do in order to use the machine safely and keep it in good condition.

On the observance and fulfilment of the above, together with careful maintenance, depend the smooth running, the duration and the economy of operation of the machine.

This manual is supplied in single copy with the purchase of the machine. In the event that the Customer needs more copies, it must be requested from the Manufacturer, specifying the model and serial number of the machine in question (the information is on the nameplate).

This manual was written in Italian by the Manufacturer's Technical Department and is translated into all the languages of the European Community countries where the machine is sold. In the event of disputes or incorrect translation and interpretation, the manual in the language of the machine Manufacturer's country applies.

The use of the machine question necessarily requires that the User is a person with good professional skills and work experience with similar machines. If this is not the case, it is essential that the user attends a course on how to use the machine at the manufacturer's premises or at a dealer's or, in any case, by personnel qualified by the manufacturer.

This manual is an integral part of the machine and, therefore, must be stored so that it is always available for consultation, in a protected and dry place away from direct sunlight.

Throughout this manual there are several safety guidelines that aim to make using the machine easier and safer. To facilitate understanding they have been divided into:

- **WARNING**: this term identifies events that may compromise the integrity of the machine.
- **CAUTION**: this term identifies events that may compromise the safety of operators. In some cases they are shown in bold.
- **NOTE**: this term identifies general information on the machine and important information for a successful production cycle.

ATTENTION



ALL REQUESTS OR ORDERS FOR ACCESSORIES AND/OR SPARE PARTS FOR THE MACHINE SHOULD BE FORWARDED TO THE MANUFACTURER'S SALES OFFICES.

The manufacturer reserves the right to make changes to the dimensions, shapes and characteristics of the machine at any time and without prior notice.

ATTENTION

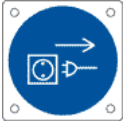


The manual must be kept close to the operator's station and re-read periodically. THE MANUAL MUST ALWAYS ACCOMPANY THE MACHINE, EVEN IN THE EVENT OF RESALE.

MAIN WARNINGS FOR MACHINE USE



It is mandatory to read this Use and Maintenance Incorporation Manual before carrying out any work on the machine: its initial operation by unqualified persons could cause serious injuries to people and damage to property.



All maintenance, adjustment and replacement operations described in this Operation and Maintenance Incorporation Manual must only be carried out after the machine has been stopped. Do not work on the machine before stopping the moving parts that make it up.



The keys for opening the guards must be kept by the person in charge of the machine. Leaving the key inserted in a lock may cause a danger that an unauthorised person will come into contact with hazardous moving parts.



The operations that require direct contact with machine parts that heat up during processing, such as adjustment, assembly and replacement, must only be carried out using protective gloves to avoid any risk of accident.



The guards have been fitted by the Manufacturer in order to safeguard the operator's safety. During operation the guards must not be removed for any reason.



It is forbidden to tamper with, alter or modify, even partially, the machine, the equipment of the command and control system and the relative devices for interfacing with the operator, as well as the protections provided for the safety of persons.



It is extremely important that no unauthorised person passes through the working area of the machine or, worse still, intervenes on a component of the machine during its operation, in order to avoid possible accidents.



Before starting the MACHINE make sure that all protective devices are in place and fully functional.



Smoking is strictly forbidden in the vicinity of the machine during refuelling and in all phases of work, maintenance and cleaning of the machine.



Before carrying out any adjustment, maintenance and/or replacement operations, the operator is required to wait a certain period from when the machine is stopped: this period, in fact, is necessary to let the areas that heat up during normal operation cool down. It is always necessary to pay utmost attention to all areas of the machine where there is a hazard of burns, due to contact with parts that heat up during the operating cycle.



When carrying out adjustment, maintenance and/or replacement operations within the working area of the machine, pay the utmost attention to all potentially hazardous elements.



Be extremely careful in areas of the machine where there is a risk of contact with moving parts, in order to avoid crushing/dragging of the upper limbs.



During lifting and transport operations, special lifting devices and ropes or chains with a load capacity greater than the sum of their own weight and that of the item to be lifted must be used.

NOTE

IN THE NEXT CHAPTERS, AT THE END OF THE PARAGRAPH, SUITABLE “CAUTION” NOTICES WILL BE LISTED REGARDING THE SPECIFIC RISKS APPLICABLE TO THE CHAPTER. THIS DOES NOT EXEMPT YOU, HOWEVER, FROM CONSIDERING ALL THE MAIN WARNINGS DESCRIBED ABOVE APPLICABLE.

IMPORTANT NOTE PLEASE NOTE THAT THE USER IS REQUIRED, IN ACCORDANCE WITH ITALIAN LEGISLATIVE DECREE NO. 81/2008, TO UNDERTAKE A PROPER ANALYSIS OF THE RISKS RELATING TO THE MACHINE / PERSONNEL OPERATIONS UPON COMMISSIONING THE MACHINERY IN THE WORKPLACE.

NOTE

ALL FORESEEABLE ACTIVITIES WITH THE MACHINE, WHETHER FOR TECHNICAL WORK OR PRODUCTION USE, HAVE BEEN CAREFULLY ANALYSED FROM THE INITIAL DESIGN STAGE THROUGH TO THE DRAFTING OF THIS MANUAL. DESPITE THIS, RESIDUAL HAZARDS MAY EMERGE OVER TIME. IN PARTICULAR, HAZARDS MAY EMERGE THAT, ALTHOUGH IDENTIFIED, CANNOT BE ELIMINATED OR SUFFICIENTLY REDUCED BY DESIGN AND AGAINST WHICH SAFEGUARDS ARE NOT FULLY EFFECTIVE.

THE OPERATOR MUST THEREFORE TAKE SERIOUSLY THE HAZARD SIGNS ON THE MACHINE AND EVERYTHING IN THE MANUAL.

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CHAPTER 1 - GENERAL INFORMATION ON THE INCORPORATION MANUAL

1.1 INTRODUCTION

This manual will help you get to know your machine and use it correctly, so please read it carefully before using it.

This manual is defined as Incorporation, for the purposes of the Machinery Directive 2006/42/EC, as the V1, V2, V3 boilers are defined as "Quasi-Machine" for the purposes of Article 2(g), i.e. they are only intended to be incorporated into or assembled with other high-pressure cleaning machines.

As a Partly-completed Machine, this manual defines the ways of incorporating it safely and meeting the relevant essential safety requirements of the Directive.

Each machine is marketed with its own incorporation manual. The user is responsible for the management of this manual throughout the life of the machine and will only dispose of it if it is destroyed.

The manufacturer shall not be liable for any tampering with this manual or for any changes made to the machine by the user after delivery which are not covered in this document.

The Manufacturer reserves the intellectual property rights to this Manual and prohibits its dissemination in whole or in part, in any form whatsoever (print, photocopy, microfilm, or other means) and also its processing, reproduction or dissemination by electronic systems, to legal or natural persons without its approval and registration.

1.2 STANDARDS OF REFERENCE

The indications contained in the documents have been used in drafting the Manual:

- **DIRECTIVE 2006/42/EC OF 17/05/2006 - ITALIAN LEGISLATIVE DECREES 17 OF 27/01/2010** concerning:
WORK SAFETY AND HYGIENE - Machinery Directive.
- **DIRECTIVE 2014/35/EC** on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits.
- **DIRECTIVE 2014/30/EC** concerning:
ENVIRONMENT - Radiation pollution - Radio frequencies and magnetic fields.
- **UNI EN ISO 13857 :MARCH 2008** concerning:
Safety of machinery - Safety distances to prevent reaching hazardous areas with upper and lower limbs.
- **UNI EN 981 : 2009** concerning:
Safety of machinery - Systems of auditory and visual hazard and information signals.
- **UNI EN ISO 13850: 2015** concerning:
Safety of machinery - Emergency stop - Design principles.
- **UNI EN 12100 :2010** concerning:
Machinery safety - General principles of design - Risk assessment and risk reduction.
- **UNI EN ISO 14119 :2013** concerning:
Safety of machinery - Interlocking devices associated with guards - Principles of design and selection.
- **UNI EN ISO 60335-1:2014** concerning:
Safety of household and similar electrical appliances - Part 1: General part.
- **UNI EN ISO 60335-2-79 :2012** concerning:
Safety of household and similar electrical appliances - Part 2: Special regulations for pressurewashers and steam cleaning appliances.

1.2.1 UK MARKET COMPLIANCE



The machine complies with current UK legislation.

By affixing the UKCA mark, you assume full responsibility for the product's compliance with the requirements of the relevant legislation.

The UKCA mark is only used to demonstrate that the product complies with UK legislation.

The UKCA mark is only affixed to the product by the manufacturer or authorised representative (where permitted by legislation); on the machine covered by this instruction manual it is affixed directly by Pulitecno, which ensures conformity.

By the act entitled The Product Safety and Metrology etc.. (Amendment etc.) (EU Exit) Regulations 2019 No. 696, which entered into force on 1 January 2021, a number of changes have been introduced with a general impact on all product safety legislation. Including, of course, machine regulation.

In particular, in Regulations 2019 Act No. 696 the UK Declaration of Conformity is defined, the Ukca mark is inserted in place of the CE mark, as is the replacement of the Low Voltage Directive by The Electrical Equipment (Safety) Regulations 2016 No. 1101. In addition, all references to EU legislation have been removed and the definitions amended to make them specific to the movement of products in the UK. This manual is translated into English for export to the UK.

As of 1 January 2021, the rules for importation into the UK by economic operators are the same, except for the drafting of the UK Declaration of Conformity and the drafting of the manual and technical file in English.

1.3 COMPLIANCE WITH LEGISLATION

In addition to the rules of this Manual, the specific legal provisions in the field of accident prevention at work must be observed.

1.4 DECLARATION OF ABSENCE OF HARMFUL SUBSTANCES

We hereby declare that our products, including hot-melt adhesive used during processing the machine, are produced with materials that comply with the limits established by the regulations in force on the protection of health and the environment and do not contain substances classified as SVHC (Substance of Very High Concern) in accordance with EC 1907/2006 regulation (REACH, i.e. **Registration, Evaluation, Authorisation and Restriction of Chemical substances**).

Although the above mentioned substances are not employed in processing cycles of raw materials and our products, their presence cannot however be ruled out in the order of ppm (parts per million), due to the micro-pollution of the raw materials.

1.5 PURPOSE OF THE DOCUMENT

The purpose of this manual is to provide the user with the indications and information to be followed scrupulously for the correct use of the machine and for the protection and safety of the operator called upon to interact with it.

For this reason, the User is invited to:

- make this document available in the workplace and explain it to all operators,
- passing on the manual to subsequent owners of the machine.

1.6 MARKING DATA AND MACHINE IDENTIFICATION PLATE

The nameplate on the machine shows the manufacturer's data, the model, the serial number and the year of construction.

For any communication regarding the machine (problems encountered, warranty work, spare parts, etc.) always refer to this and the data contained therein.

In addition, any warning signs attached to the machine must not be removed for any reason whatsoever and must be strictly observed.

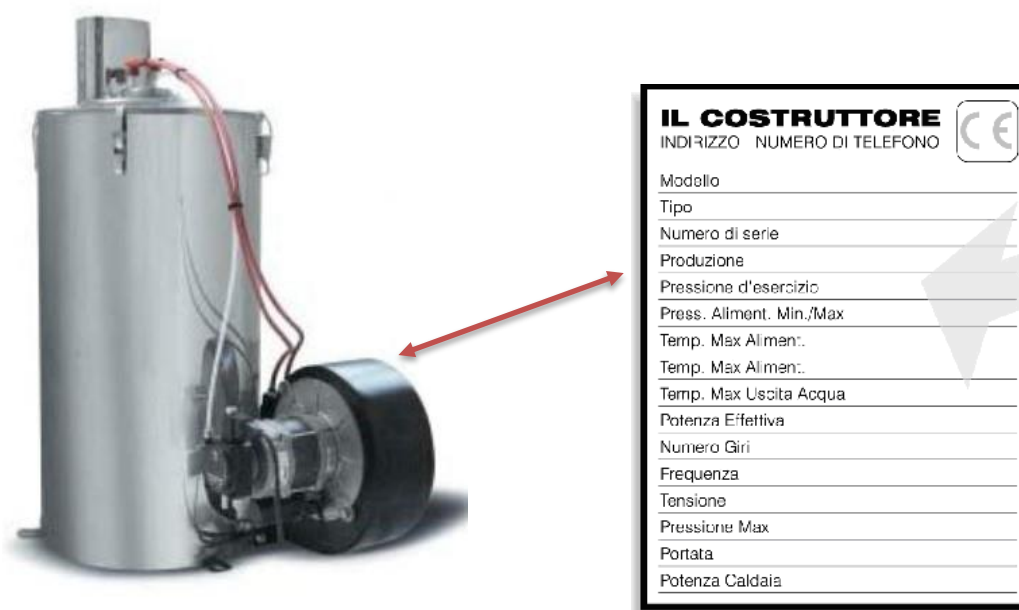


FIGURE 1 SECTION 1.6 - Marking data and machine identification plate

1.7 USE AND STORAGE OF THE MANUAL

This manual is intended for the user of the machine, those responsible for moving, installing, using, monitoring and final dismantling.

The manual serves to indicate the intended use of the machine in accordance with the design assumptions and technical characteristics; it provides instructions for moving, appropriate and safe installation, assembly, adjustment and use; it provides information to direct maintenance work, facilitates the ordering of spare parts and provides information about any residual risks.

In particular, the following information must be constantly available for consultation:

- Conditions of use envisaged for the machine;
- Workstation occupied by the operator;
- Instructions on:
commissioning, operation, transport, installation, assembly and disassembly, adjustment, maintenance and repair work, any training instructions;

The manual is considered to be an integral part of the machine and must be kept in good condition until it is finally scrapped.

The manual must be stored in a protected, dry place, protected from sunlight and must always be available for consultation near the machine.

1.8 DOCUMENTS ACCOMPANYING THIS MANUAL

The machine is supplied complete with:

- EC" declaration of incorporation of the machine;
- Incorporation manual for the installation, use and maintenance of the machine;

1.9 USER INFORMATION

This manual reflects the current state of the art of the machine and cannot be considered to be a guide inadequate only because it has been updated on the basis of new experience; the manufacturer reserves the right to update production and manuals, without being obliged to update previous production and manuals.

The characteristics of the materials may be changed at any time, according to technical development, without prior notice.

The manufacturer is relieved of any responsibility in the event that the machine is used:

- misuse;
- use by untrained personnel;
- use contrary to the provisions of this Manual;
- use contrary to applicable laws and regulations;
- use with primary power failure;
- use with serious deficiencies in planned maintenance;
- use with modifications or interventions not explicitly authorised by a written note from the manufacturer;
- use with non-original spare parts or not specifically defined by model;
- use with total or partial disregard of the instructions contained in this Manual.

1.9.1 DEFINITION OF WARRANTY

The machine is subject to warranty in accordance with the agreed contractual terms which form an integral part of the order or regulations in force, in all cases for a maximum period of twelve (12) months from the date of dispatch from the factory. The guarantee only covers faults that may be due to mechanical or assembly defects. The warranty does not cover wear parts and electrical parts.

The general sales warranty is void in the event of:

- poor conservation;
- inexperience of use;
- exceeding performance limits;
- excessive mechanical and/or electrical and pneumatic stress;
- improper use of the machine, failure to observe the rules of use;
- use of non-original spare parts, i.e. not sold directly by the manufacturer or authorised dealer;
- modifications to the machine or maintenance work not carried out by personnel recommended by the manufacturer or the dealer.

Any requests for further copies of this document must be settled with a purchase order sent to the Manufacturer.

1.9.2 TARGET AUDIENCE

This manual is the basic tool for personnel who, in various capacities, deal with the machine in various tasks, such as:

- Transport and machine handling workers.
- Operators of the Vertical Boiler.
- Maintenance operators.
- Final demolition workers.

Before proceeding with the various operations, the persons listed above must have carefully read and memorised this manual.

1.9.3 PERSONNEL TRAINING

Ordinary use does not require the use of particularly specialised personnel, provided that they are adequately trained and instructed in the operations to be carried out, are familiar with this manual and are aware of the general safety regulations.

Please follow the instructions carefully, for your own safety, for the safety of others, for the protection of your machine and for the protection of the environment.

1.9.4 HOW TO REQUEST TECHNICAL ASSISTANCE

PULITECNO s.r.l. is at the complete disposal of its customers to ensure prompt and accurate technical assistance and anything else that may be useful for the best operation and maximum yield from the machine. For each service request, the data on the identification plate and the type of fault detected must be communicated.

The costs of disassembly and assembly and of transport or packaging of the parts to be repaired or replaced shall be borne by the Customer.

1.10 TERMINOLOGY USED

To complete the description of the various levels of danger, specific situations and definitions which may directly affect the machine and/or persons are described below.

- **USER:** It is the person, or the body or company, who has purchased or rented the machine and who intends to use it for the purposes intended.
- **TRAINING:** Phase enabling the operator to learn the necessary knowledge of the machine to carry out the production activity independently, correctly and safely.
- **WORKING AREA:** Any area in which operators can carry out machine operations.
- **DANGER ZONE:** Any area inside and/or around machinery where the presence of an exposed person constitutes a risk to the safety and health of that person.
- **RESIDUAL RISK:** This is the risk that remains, especially during maintenance, installation and cleaning, even after the application of design and construction safety measures, safety devices and deterrents.
- **EXPOSED PERSON:** Any person who is wholly or partly in a hazardous area.
- **OPERATOR:** The person(s) in charge of installing, operating, adjusting, maintaining, cleaning, repairing and transporting the machine.
- **ROUTINE MAINTENANCE:** Combination of actions and technical checks, to be carried out periodically as specified by the manufacturer, aimed at maintaining the machine in conditions of maximum efficiency and safety.
- **EXTRAORDINARY MAINTENANCE:** Interventions required in the event of anomalies or faults, or to maintain maximum functionality and efficiency of the machine. Such interventions must be carried out by specialised personnel.
- **SPECIALISED PERSONNEL:** These are the people who are trained and authorised to carry out repair or maintenance work requiring special knowledge of the machine and who are able to recognise the hazards arising from incorrect or improper use of the machine.

CHAPTER 2 - GENERAL MACHINE DESCRIPTION

The V1-V2-V3 hot-water boilers referred to in this manual have been designed primarily to PRODUCE HOT water and can be used with any pressure washer TO PRODUCE hot water.

The equipped boiler is intended exclusively for cleaning and washing with hot water of objects or surfaces that are suitable for mechanical treatment by the high-pressure water jet and the possible chemical action of detergents.

Hot water is heated inside the boiler, which is equipped with heating coils, thanks to an oil burner operated by a pump with a solenoid valve and an ignition transformer



ATTENTION



During operation, no-one other than the operators in charge must stand near the machine or, worse still, intervene on it.

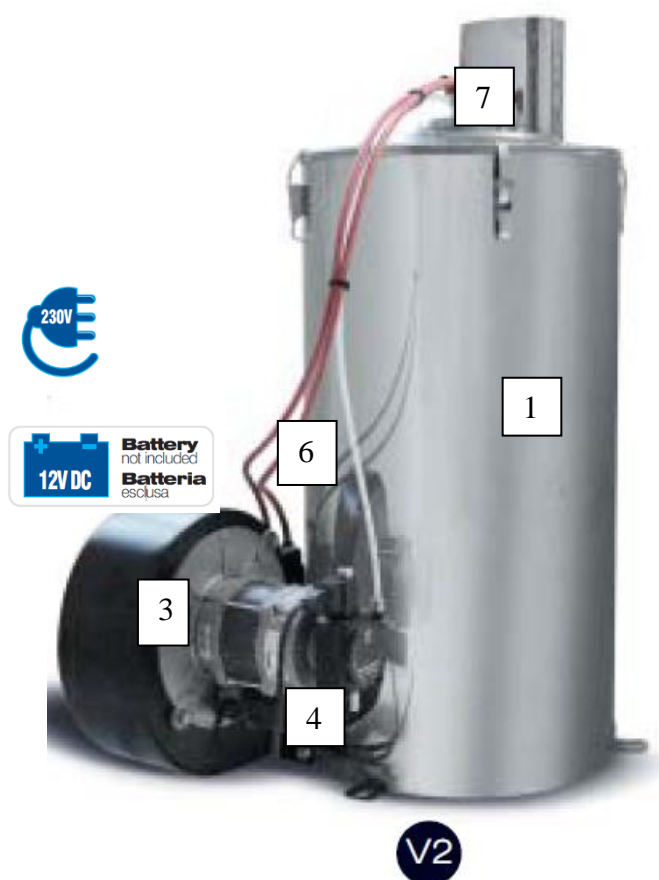
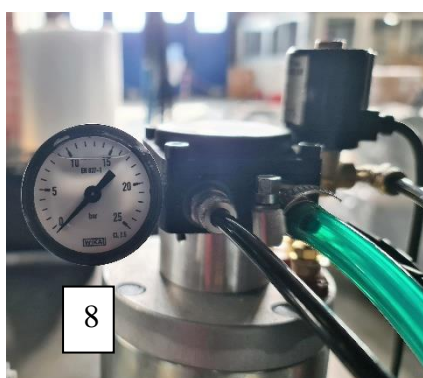


The protections have been designed by the manufacturer in order to safeguard the safety of the operators while carrying out their tasks. During operation, the guards must not be removed for any reason.

Description of the machine elements

The Vertical Boiler consists of the following main components (see figures in this section):

1. Stainless steel shell
2. High efficiency vertical boiler with refractory cement bottom and stainless steel head. (Optionally available with photocell for flame control).
3. Diesel pump with solenoid valve
4. Burner engine 230V/50Hz. - 12V DC Std.-24V DC Std
5. Ignition transformer
6. Ignition cables and electrodes
7. Diesel nozzle
8. Manometer on pump for diesel pressure control
9. Lever interrupting Diesel inflow.



2.1 CONSTRUCTION TECHNOLOGY

Pulitecno products are always up-to-date, both in design and technology, to make the use of high pressure washers safer, simpler and more reliable, both from the user's point of view and from the technical assistance point of view.

ATTENTION



During operation, no-one other than the operators in charge must stand near the machine or, worse still, intervene on it.



The protections have been designed by the manufacturer in order to safeguard the safety of the operators while carrying out their tasks. During operation, the guards must not be removed for any reason.



Before intervening in the working area of the machine (for maintenance, adjustment or replacement operations), the operator must wait a certain period necessary to bring the heated elements back to a temperature close to the ambient temperature. The operations must be carried out using protective gloves in order to avoid any risk of injury (heater).



Use protective gloves in order to avoid any type of injury due to the hazardous elements of the machine.

CHAPTER 3 - MACHINE SAFETY AND PROTECTION

3.1 SAFETY RULES FOR ELECTRICAL RISK

- Do not use the machine outdoors in the rain.
- If, despite all the precautions taken, the cable is damaged, do not carry out temporary repairs. A new cable is much cheaper than repairing the damage caused by a possible electric shock, not to mention the danger that a defective cable would pose to people and animals.
- Do not carry out any maintenance while the plug is plugged into an electrical outlet.
- Take care not to hit the machine with water jets, as this could cause a short circuit
- If an extension cable is to be used for the electrical cable, ensure that the connection between the supplied cable and the extension cable is made in a stable manner and in accordance with current safety regulations.
- The plug and socket must be watertight.
- Do not use the electrical plug to switch the machine on or off; only use the appropriate switches.
- Keep the machine out of the reach of children and/or unauthorised persons and make sure that nobody can touch it when it is connected to the mains.
- It is strictly forbidden for the operator to carry out any operation with the machine if he is barefoot.
- Do not operate the machine with defective components.
- Do not use the machine in the presence of people on the working line.
- Do not direct the water jet at electrical sources.

3.2 SAFETY RULES FOR THERMAL RISK (BURNS)

- If the machine is used in petrol and filling stations or other dangerous places, the relevant safety regulations must be observed.
- Do not touch the engine, chimney, boiler or other parts when the machine is switched on or immediately after it is switched off.
- Diesel refuelling must only be carried out when the machine is switched off.
- Do not use fuels other than those specified by the manufacturer.
- It is strictly forbidden to carry out any work on the machine unless you are equipped with personal protective equipment (protective goggles, gloves, overalls, etc.) in accordance with current regulations.
- During the winter and in the event of frost, it is advisable to have antifreeze sucked in or empty the water in the internal circuits by closing the tap on the water mains and running the machine until it is completely drained.
- If the machine is left idle for a long period of time, limescale build-up may form on the valve seats and cause starting problems, so pay close attention to any abnormal noises and consult your local technical service.

3.3 SAFETY STANDARDS FOR ENVIRONMENTAL RISK

- It is strictly forbidden to wash engines in unsuitable spaces, this operation must only be carried out in places where, for environmental protection, a suitable oil separator is installed.




3.3.1 SAFETY SIGNS AND STICKERS ON THE MACHINE

REFERENCE	P1
DESCRIPTION	Safety pictogram for high temperature risk (yellow background).
HAZARD EXPLANATION	<ul style="list-style-type: none">▪ Generic HAZARD Do not remove safety devices for any reason. Always keep them in good condition. Ensure that all guards, covers and shrouds are properly in place, particularly after machine repairs. Have any damaged guards repaired immediately.▪ Burn HAZARD Pay attention to high temperature surfaces. Stay away from hot surfaces such as boiler, chimney.▪ HAZARD when refuelling Diesel fuel Avoid fuel drips in the chimney area and on the machine when refuelling.
LOCATION AND/OR PHOTO IDENTIFICATION	

3.4 SAFETY RULES FOR TOXIC-HARMFUL HAZARDS

- It is strictly forbidden to use the boiler in enclosed spaces, as the hot water is heated by the combustion of fuel oil, which causes toxic-harmful fumes containing particulates, NOX and sulphur oxide. Use the boiler outdoors. When used in closed rooms, an exhaust gas collection system must be connected.

REFERENCE	P2
DESCRIPTION	Pictograms on the control panel providing safety instructions on the risks involved in using the pressure jet
HAZARD EXPLANATION	<ul style="list-style-type: none"> ▪ Generic HAZARD Read the manual before using the machine ▪ Electrocution HAZARD Do not direct the jet towards electrical equipment
LOCATION AND/OR PHOTO IDENTIFICATION	

HAZARD SIGNALS	SIGNAL DESCRIPTION
	THERMAL HAZARD (BURNS) This signal is applied to the carpentry in the vicinity of the discharge pipe areas
PROHIBITION SIGNS	SIGNAL DESCRIPTION
	PROHIBITION OF REMOVAL OF PROTECTIVE EQUIPMENT This sign is applied in the vicinity of the guards or protective devices and indicates the prohibition of their removal while the line is in use.
OBLIGATION SIGNALS	SIGNAL DESCRIPTION
	OBLIGATION TO READ THE INCORPORATION, USE AND MAINTENANCE MANUAL This sign is attached to the clamps and obliges the operator to read the instructions in the operating and maintenance manual.

ATTENTION



It is **ABSOLUTELY FORBIDDEN** to remove or damage the safety signs on the machine.

CHAPTER 4 - RESIDUAL RISKS

Despite the safety precautions taken by the manufacturer during the design and production phases, during the normal production cycle the machine still presents certain risks that are considered residual.

This chapter lists the residual risks and the rules to be observed in order to avoid situations that are hazardous for the operator, the machine and the surrounding environment due to the presence of these residual risks.

In order to deal with these residual risks, the end user must have suitable PPE (Personal Protective Equipment) available and follow the instructions for use in this manual.

The residual risks are indicated directly on the machine by means of warning signs:



HIGH TEMPERATURES

Thermal risk due to contact with hot parts



FIRE

Fire hazard if fuel escapes from the tank during use or refuelling



BURST FLUID UNDER PRESSURE

Risk of high-pressure water leakage. A leak or rupture in a pipe can create a risk of injury and skin infection



HANDLING THE MACHINE

The handling and lifting of the machine, during installation, must only be carried out by personnel trained and qualified by the Manufacturer.



HAZARD combustion gas exhaust;

Exhaust fumes are toxic. Do not breathe exhaust fumes. Never obstruct the exhaust gas openings

NOTE



THE OPERATOR WHO IS TO WORK ON THE MACHINE *MUST RECEIVE* ADEQUATE INFORMATION ON THE RESIDUAL RISKS TO HEALTH AND SAFETY AT WORK ASSOCIATED WITH THE ACTIVITY IN ORDER TO AVOID POSSIBLE ACCIDENTS.

CHAPTER 5 - PERSONAL PROTECTIVE EQUIPMENT

When operating the machine or during maintenance, personal protective equipment must be worn, such as:

- Safety overalls;
- Protective gloves against thermal and mechanical hazards;
- Eye protection;
- Face shield;
- Safety shoes;
- Use of hearing protectors for sound levels above 80 dB.

Before use, check that all personal protective equipment is in good condition.

CHAPTER 6 - INTENDED AND UNINTENDED USE

The Vertical Boilers V1-V2-V3 are intended exclusively for pressure washers for cleaning and washing with hot water (also coupled to cold water pressure washers) of objects or surfaces that are suitable for mechanical treatment with the high-pressure water jet.

Any use other than that for which the machine was designed represents an abnormal condition and may cause damage to the work equipment and constitute a serious hazard to the operator.

Improper use means the use of our machines for operations for which they have not been constructed, i.e:

- washing objects or vehicles that have come into contact with flammable, aggressive, noxious or explosive dusts, gases or liquids or that otherwise give rise to dangerous reactions in contact with water;
- use in places with a risk of explosion or increased risk of fire;
- use for cleaning animals of all sizes;
- use by non-adult persons, i.e. under 16 years of age;
- use in rain or thunderstorms;
- use for washing any device powered by electricity;
- use by untrained personnel.
- Use in closed rooms

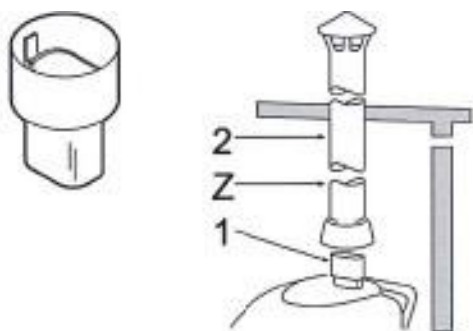
NOTE



THIS MANUAL IS AN INTEGRAL PART OF THE MACHINE AND MUST ALWAYS ACCOMPANY IT, EVEN IN THE EVENT OF TRANSFER OF OWNERSHIP.

6.1 USE IN CLOSED ENVIRONMENTS

If the machine is located in an enclosed area, the adapter for the smoke exhaust chimney (code 5000030) must be fitted.



If the machine is located in an enclosed area, it must be well ventilated and it must be ensured that exhaust gases are adequately eliminated



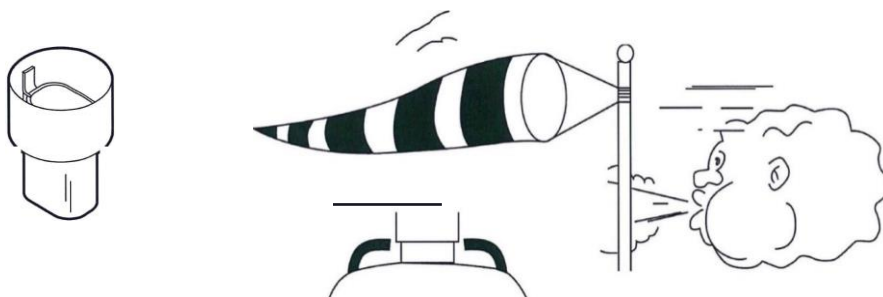
ATTENTION



The diameter (Z) of the chimney (2) must not be smaller than that of the adapter (1). It is advisable to install a chimney for exhaust gas extraction as shown in the figure.

6.2 USE IN LOCATIONS SUBJECT TO WIND OR STRONG AIR CURRENTS

If the machine is positioned in a place subject to wind or strong air currents, the adapter for the smoke exhaust chimney (code 5000030) must be fitted as in Figure



WARNING



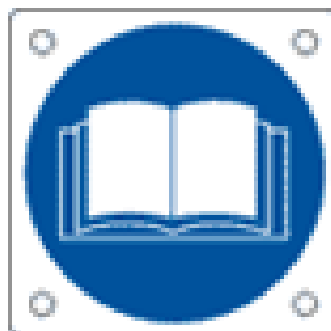
This precaution will prevent serious damage to the machine

6.3 CONTRAINDICATION AND HAZARDS DUE TO UNINTENDED OR MISUSE

1. Any operation not mentioned in this manual is considered to be an improper use of the machine which could cause damage to persons and/or property.
2. The machine has not been built to work in an explosive environment, **SO IT IS ABSOLUTELY FORBIDDEN TO USE THE MACHINE IN AN EXPLOSIVE ATMOSPHERE.**
3. During machine operation, never remove or circumvent the protective systems fitted to the machine.
4. All the elements which are not described in this manual may only be adjusted or modified by the manufacturer's personnel or by qualified personnel working under the supervision of the manufacturer's technicians. With regard to components to be traded, please observe the relevant instruction manuals.
5. For any unintended use of the machine, or in any case for any work to be carried out on it, the user is obliged to contact the manufacturer to find out about any contraindications or hazards deriving from improper use of the machine.
6. It is absolutely forbidden to modify the functional and performance characteristics of the machine and/or its main components in order to increase its production potential.

Incorrect use of the machine can be:

- incorrect connection and/or use of the supplied or optional accessories,
- incorrect sequence of commissioning manoeuvres,
- failure to use original spare parts,
- repairs carried out by unauthorised personnel,
- maintenance work carried out by unqualified personnel,
- uses for which the machine was not designed (see improper use),
- lack of maintenance,



CHAPTER 7 - TECHNICAL DATA

7.1 ENVIRONMENTAL REQUIREMENTS

The Vertical Boiler V1-V2-V3 has been designed and manufactured for use in the following environmental conditions.

- Maximum temperature +90°C
- Minimum temperature +1°C
- Relative humidity 80%

7.2 DIMENSIONS AND TECHNICAL DATA

Table 1 - DIMENSIONS AND TECHNICAL DATA (*) = 60 Hz version available on request

7.2.1 V1 MODEL

Line		230 V Single- phase	12 V DC	24V DC
Technical Data (I)	Units	V1	V1 12v	V1 24V
Power	kW	0.5		
Max. outlet temperature H2O	°C	140		
Burner power	Kcal/h	52.000		
Type of fuel for heating water	-	Diesel		
Maximum H2O input pressure (water mains or system)	MPa	0.5		
Engine insulation	-	Class F		
Engine protection	-	IP54		
Voltage / Frequency (*)	V/Hz	230V/50 Hz	12V/ 50Hz	24V/ 60Hz
Sound emission level:				
Sound pressure at operator: LpA (EN 3744) K = 3 dB(A)	dB (A)	-	-	-
Sound Power: LwA (EN 3744) K = 3 dB(A)	dB (A)	85		
Hand-arm vibrations K=1.5 M/s2	M/s2	1.22		
WEIGHT	Kg.	51	55	55
DIMENSIONS (WxDxH)	mm	520X330X600		

7.2.2 V2 MODEL

Line		230 V Single- phase	12 V DC	24V DC
Technical Data (I)	Units	V2	V2 12v	V2 24V
Power	kW	0.5	0.5	0.5
Max. outlet temperature H2O	°C	140		
Burner power	Kcal/h	52.000		
Type of fuel for heating water	-	Diesel		
Maximum H2O input pressure (water mains or system)	MPa	0.5		
Engine insulation	-	Class F		
Engine protection	-	IP54		
Voltage / Frequency (*)	V/Hz	230V/50 Hz	12V/ 50Hz	24V/ 60Hz
Sound emission level:				
Sound pressure at operator: LpA (EN 3744) K = 3 dB(A)	dB (A)	-	-	-
Sound Power: LwA (EN 3744) K = 3 dB(A)	dB (A)	85		
Hand-arm vibrations K=1.5 M/s2	M/s2	1.22		
WEIGHT	Kg.	60	64	64
DIMENSIONS (WxDxH)	mm	520X330X750		

7.2.3 V3 MODEL

Line		230 V Single- phase	12 V DC	24V DC
Technical Data (I)	Units	V3	V3 12v	V3 24V
Power	kW	0.5	0.5	0.5
Max. outlet temperature H2O	°C	150		
Burner power	Kcal/h	47.000		
Type of fuel for heating water	-	Diesel		
Maximum H2O input pressure (water mains or system)	MPa	0.5		
Engine insulation	-	Class F		
Engine protection	-	IP54		
Voltage / Frequency (*)	V/Hz	230V/50 Hz	12V/ 50Hz	24V/ 60Hz
Sound emission level:				
Sound pressure at operator: LpA (EN 3744) K = 3 dB(A)	dB (A)	-	-	-
Sound Power: LwA (EN 3744) K = 3 dB(A)	dB (A)	85		
Hand-arm vibrations K=1.5 M/s2	M/s2	1.22		
WEIGHT	Kg.	34	38	38
DIMENSIONS (WxDxH)	mm	520X330X500		

CHAPTER 8 - COMMISSIONING THE MACHINE

8.1 PREVENTIVE CHECKS AFTER RECEIPT

Upon receipt of the goods, check the condition of the package; if any damage is found, refrain from any installation procedure and notify the carrier and supplier immediately.

Ascertain the good condition of the package, proceed to unpack the goods and check that the delivery is complete (check correspondence with the delivery note); ensure that the general condition of the machine is good and that there are no breaks or dents.

In the event of shortages or damage, notify the dealer and/or manufacturer immediately after making any legal reservations with the carrier or companies authorised for this purpose; it is strictly forbidden to dispose of the material in the environment.

8.2 CHECKING THE MACHINE STATUS

Following the document check, in order to detect any damage caused by transport, it is advisable to carry out a thorough check of the condition of the machine.

If the packaging is damaged, take the following action:

- ❑ **EXTERNALLY RECOGNISABLE DAMAGE OR MISSING INDIVIDUAL ITEMS:** these must be declared immediately after delivery to the courier or carrier, etc., and confirmed in writing in the consignment note;
- ❑ **DAMAGE THAT IS NOT IMMEDIATELY RECOGNISABLE:** this must be declared to the carrier, or transporter, etc., within the time limits permitted by law.
- ❑ **SERIOUS DAMAGE:** an expert's report by a technical expert appointed by the carrier, the courier or the respective insurance company is required.

ATTENTION



It is forbidden to tow the machine by the power supply cable and/or by the high-pressure water outlet rubber hose.

WARNING



Complaints about missing equipment must be made within the time limits set out in the purchase contract.



If the machine has to be moved manually from one place to another, you must disconnect the plug from the power socket, then, using the special handle and taking care not to make any sudden movements that may compromise your safety, that of others and the integrity of the machine itself, proceed to move it.

NOTE



The machine is normally sent with non-returnable packaging. Packaging materials should be collected and disposed of separately and sent to specialised waste disposal companies (wood, plastic, metal, etc.) and not left within reach of children or animals.

CHAPTER 9 - HANDLING AND INSTALLATION OF THE MACHINE

9.1 PRELIMINARY OPERATIONS

The machine was tested in the manufacturer's factory to verify the correct functioning of all components according to the specifications in force. No preliminary operations are required.



9.2 LIFTING

If the machine is to be transported, it must be secured by means of straps, ropes or other suitable means in a stable and safe manner to prevent accidental movement from causing damage to persons or property as well as to the machine itself.

If the machine has to be lifted, it must be attached to the lifting equipment by means of straps or suitable equipment that safeguards its integrity. Ensure that the equipment used has a capacity greater than the weight and volume of the machine; it is recommended that efficient equipment be used in accordance with the safety operating rules in force.

ATTENTION



It is absolutely forbidden to stand under or in the immediate vicinity of the machine while it is being lifted and moved.

Be wary of bent and shrivelled chains or ropes, always use thick work gloves.

Chains or ropes must be firmly attached.

Make sure that the attachment is strong enough to support the intended load....

ATTENTION



The floor of the place where the machine is to be installed or operated must be even, well levelled and suitable for bearing the loads of the machine.

CHAPTER 10 - CONNECTIONS TO EXTERNAL ENERGY SOURCES

10.1 ELECTRICAL CONNECTION ONLY FOR 230V VERSION

It is compulsory to connect the machine to an earthing system with a resistance value that guarantees a contact voltage of no more than 25V.

The installation must be carried out in such a way that the connections are not damaged by people or things and, as far as possible, must be carried out away from transit routes.

Check that the electrical outlet has the required characteristics of conformity and suitable differential protection in accordance with current standards.

IMPORTANT NOTE:

.Depending on the country where it will be used, the user should check on site what type of network is present (TN, TT, IT system) and if necessary, install a differential.

- *TT system: Protection against contact voltages is only ensured by using the residual current device.*
- *tN system, earth leakage circuit breakers should only be used in special cases, such as in small cross-sections and very long circuits where the above condition cannot be met.*
- *the IT system does not require earth leakage circuit breakers, as they can compromise the continuity of operation that led to the choice of the IT system.*

WHEN MAKING THE ELECTRICAL CONNECTION, OBSERVE THE VOLTAGE AND FREQUENCY VALUES AS STATED IN THIS MANUAL AND ON THE CE LABEL.

THE ELECTRICAL CIRCUIT DIAGRAM IS ATTACHED TO THE DOCUMENTATION SUPPLIED WITH THE MACHINE.

ATTENTION



Connection to the electrical power supply and the earthing system should be carried out by qualified and experienced personnel, in accordance with the regulations in force.



The electrical power network must be fitted with a circuit breaker suitable for the machine's power rating.

In addition, a high-sensitivity residual current circuit breaker with trip threshold $I_{dn}=0.030$ A must always be installed.

ATTENTION



All work on the connection of the machine to external energy sources must be carried out by qualified personnel, in compliance with current regulations and under the supervision of the manufacturer's technicians.

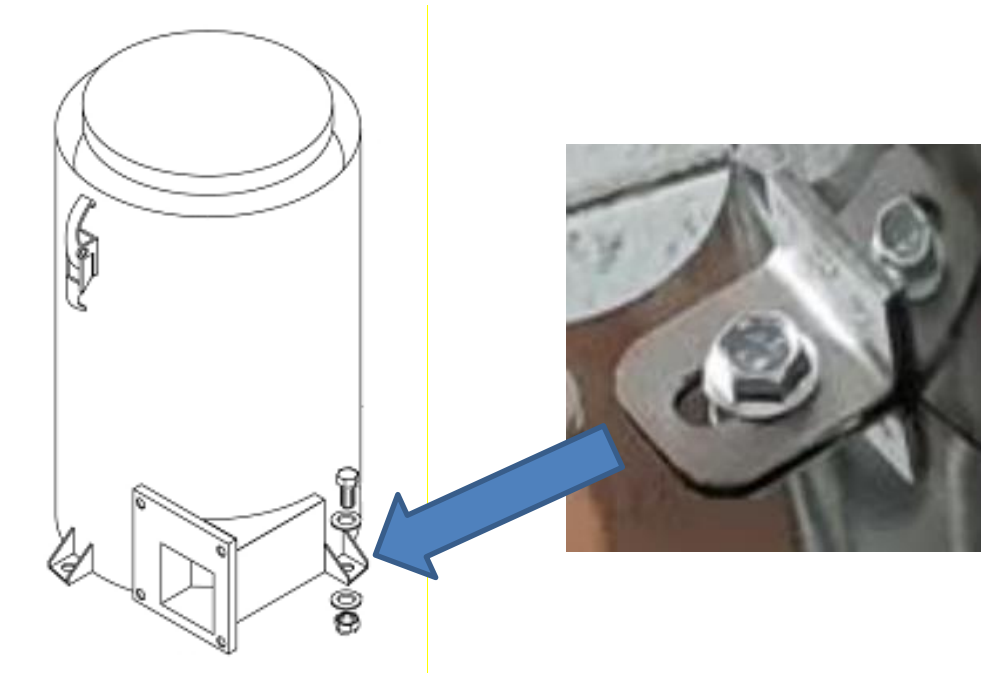


Pneumatic hoses sized for the same or higher pressures should be used for connection.

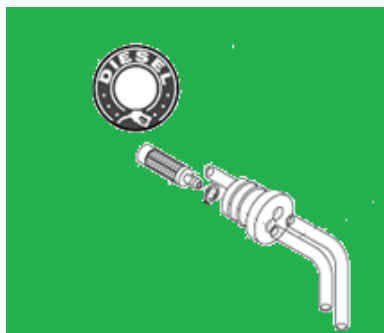
CHAPTER 11 - INSTALLATION AND USE OF THE MACHINE

11.1 INCORPORATION ON BOARD MACHINE

- Position the boiler close to its fixing holes (X4) and secure with TE 8x25 screws and a knurled flange nut.



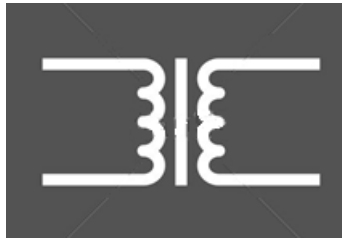
- Insert the GREEN diesel tube (V) with filter into a fuel tank;



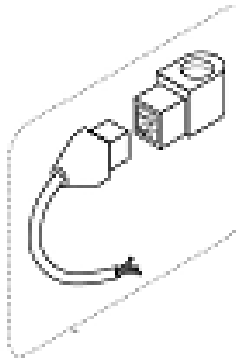
- Connect the burner engine (230v or 12v depending on the boiler chosen) to the machine control panel;



- Connect the transformer (230v or 12v depending on the model chosen) to the machine control panel



- Connect the solenoid valve on the machine control panel and the temperature control thermostat

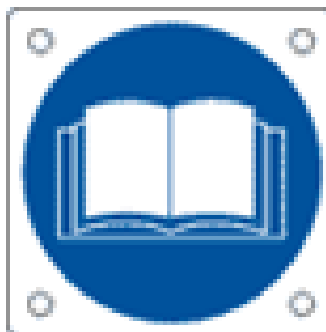


Direct connection:

The engine, burner and transformer are connected directly to the ignition switch (where a wire also comes from the line), in this case the solenoid valve is attached directly to the thermostat.

Connection with electronic board (not supplied):

Engine, burner and transformer are connected according to the board used, for wiring refer to the attached wiring diagram.



11.2 DESCRIPTION OF THE OPERATING CYCLE

- The boiler is to be used as a construction component of water pressure washers.
- Check that the diesel tank is full; if not, fill it up using diesel fuel only.



- The flow of diesel is controlled by an ON-OFF switch
- The pump sucks in diesel and pressurises the fuel (8-10 bar), which is then sprayed through an injector into the combustion chamber, where there is a coil in which water is heated as it passes through.



- The pressure is controlled by a pressure gauge mounted directly on the diesel pump.



- the burner can be supplied with a photoresistor/safety flame monitor, which verifies the presence of flame inside.



BURNER OPERATION ASSEMBLED WITH A PRESSURE WASHER:

- Open the tap connected to the water supply;
- Check that the thermostat (tr) is set to 0°C.
- switch on the burner with the burner switch (br), the corresponding indicator light will light up, wait 30 seconds for the oil pump to fill up,
- Using the thermostat (tr), turn the knob to the desired temperature (once the required temperature has been reached, the burner will automatically stop and then switch on again whenever the temperature drops).
- At the end of the job, reset the thermostat (tr), keep the gun open and let the water cool down;
- Act on the burner Br off switch



Example of boiler control panel

- close

engine/pump unit;



- then, activate

(4).

ATTENTION:

When filling the fuel tank (diesel fuel), do not approach it with open flames, cigarettes or other objects that could start a fire.

The use of personal protective equipment is absolutely essential during washing work. Failure to use the protective equipment releases the production company from any physical damage caused by the machine in use.



11.3 CONTRAINDICATIONS TO USING THE MACHINE

Full compliance with the Machinery Directive 2006/42 EC and the efforts made by our engineers during the design phase have resulted in a machine that can be placed at the highest safety level for its category. Each of the mechanical, electronic, control, etc. parts, devices or arrangements with which the machine is equipped has been designed taking into account all possible risks that could potentially arise.

Wherever possible, using the best technological resources available today, these risks have been eliminated by applying appropriate protection or technical measures.

Furthermore, in order to avoid machine malfunctions and further risks of injury, it is recommended that the following provisions be scrupulously observed:

- Do not use the machine for purposes other than those for which it has been built
- The machine must be stopped normally using the controls on the panel.
- Do not approach the machine with explosive or flammable materials.
- Do not operate the machine while wearing loose clothing or objects such as scarves, necklaces, ties, etc., which may become entangled or close to potentially hot surfaces
- The protections provided by the manufacturer have been designed to protect the safety of the operator and it is therefore recommended not to tamper with or remove them for any reason.



ATTENTION



The operations described in this chapter must be carried out **ONLY** by qualified and authorised personnel.



The use of protective equipment is **MANDATORY** during the operations described in this section.

CHAPTER 12 - MAINTENANCE

Maintenance is a set of periodic and predefined operations aimed at maintaining the functionality of the machine in all its aspects, as a result of the wear and tear inherent in its use.

The various routine maintenance operations are described below. Please note that lower operating costs and a long service life of the machine depend on continuous compliance with this manual.

For extraordinary maintenance operations not covered in this manual, contact the manufacturer.

CAUTION: *all the operations described in the following paragraphs must be carried out with the machine switched off and the electrical system disconnected.*

12.1 CLEANING THE VERTICAL BOILER

Wash with neutral products and water only, then dry thoroughly to remove any water pockets.

Plastic parts should be cleaned in a normal washing procedure.

If there are still traces of dirt, we recommend the use of specific products, carefully observing the manufacturer's instructions.



Do not use products containing solvents, methanol or hydrocarbons.

12.2 MAINTENANCE INTERVALS

AFTER 500 HOURS or ONCE A YEAR:

Have the appliance serviced by the service department

ATTENTION



The operations described in this chapter must be carried out **ONLY** by qualified and authorised personnel.



The use of protective equipment is **MANDATORY** during the operations described in this section.

12.3 TROUBLESHOOTING

The tables below list the main malfunctions, with their causes and recommended remedies, that the machine may present during operation.

Any work required must only be carried out by experienced and qualified operators after having read this manual.

PROBLEM	CAUSE	SOLUTION
The burner switches off.	No diesel.	Fill the diesel tank.
	Oil-gas pump with plastic coupling, blown fan engine, damaged diesel pump, damaged fan engine	Replace plastic coupling, diesel pump or fan engine
The machine switches off	Diesel fuel tap closed.	Check and open the diesel tap
The boiler produces excess smoke.	Presence of water in the diesel tank.	Empty the tank and fill it with pure diesel fuel.
	The diesel pressure is not correct.	Restore the correct pressure by turning the adjusting screw to approximately 10 bar.
	The ignition electrodes are not in the correct position.	Adjust the distance between the electrodes.
	The diesel fuel nozzle is dirty.	Clean the diesel fuel nozzle.
	The diesel fuel nozzle is worn.	Replace the diesel nozzle.
	The coil is clogged.	Clean the coil.
	The diesel pump is dirty.	Clean the diesel pump.
	The diesel solenoid valve does not work.	Replace the diesel solenoid valve.
The burner switches off.	The diesel tank is empty.	Fill the tank.
	The filter on the diesel suction pipe is dirty.	Clean the diesel fuel filter.
	Presence of water in the diesel tank.	Empty, clean and fill the tank with pure diesel fuel.
	The pressure switch does not work .	Replace the pressure switch.
	Ignition transformer failure.	Replace the ignition transformer.
	Incorrectly positioned ignition electrodes.	Reposition the ignition electrodes in the correct position.
	The diesel fuel nozzle is dirty.	Clean the diesel fuel nozzle.
	The diesel fuel nozzle is worn.	Replace the diesel nozzle.
	The diesel pump is damaged.	Replace the diesel pump
	The diesel solenoid valve is damaged.	Replace the diesel solenoid valve.

PROBLEM	CAUSE	SOLUTION
Insufficient water temperature.	Thermostat not adjusted to the required temperature	Set the thermostat to the required temperature.
	Thermostat failure.	Replace the thermostat.
	Scale deposits in the hydraulic circuit.	Clean.
	Boiler partially clogged with soot.	Clean.
	Worn water nozzle.	Replace the water nozzle.

CHAPTER 13 - DISPOSAL

13.1 DISPOSAL OF THE VERTICAL BOILER (DEMOLITION OF THE MACHINE)

If you decide to scrap the machine, to prevent it from posing an hazard to people and the environment, it is necessary:

- disconnect the machine from the mains power supply and from the water supply network
- cut the power supply cable and piping
- remove the wand and gun
- cutting electrical wiring
- Disassemble and disconnect the pump and engine from each other
- destroy the identification plate of the machine and that of the pump and engine unit.
- Sheaths, flexible conduits and components made of plastic or non-metallic material must be dismantled and disposed of separately.
- Electrical components such as switches, power supplies, cards, etc., must be dismantled for reuse if they are still in good condition or, if possible, overhauled and recycled.
- The structure, and in any case all the metal parts of the machine, must be dismantled and grouped by type of material. The various parts thus obtained can then be dismantled and melted down to allow the recycling of the original machine material.

All fluids used in the machine's piping must be removed and disposed of in accordance with current regulations. The machine must be dismantled by specialised personnel. The components of the Vertical Mobile Boiler must be disassembled and separated according to the nature of the materials that compose it, and must be disposed of in compliance with the laws in force regarding the collection and separate disposal of waste.



If the machine is dismantled, comply with the anti-pollution regulations in force in the country of use. Failure to comply with these provisions can cause considerable damage to people, animals and the environment.

The End-customer is responsible for any failures and non-compliance with these rules.

13.2 DISPOSAL OF CONSUMABLES OR MATERIALS SUBJECT TO WEAR AND TEAR

With regard to the disposal of parts subject to increased wear, which may have been replaced, no particular recommendations are necessary other than to follow the regulations in force at the place of operation of the machine regarding the separate collection of waste.

Waste oil must be disposed of through the waste oil consortium, in accordance with the law.

13.3 . DISPOSAL OF PACKAGING

Packaging materials and maintenance waste should be collected separately and sent to specialised waste disposal companies (wood, plastic, metal, etc.) and not left within reach of children or animals.

CHAPTER 14 - TEMPORARY SHUTDOWN OF THE VERTICAL BOILER

If you decide to keep the machine idle for a long period of time, it is advisable to carry out some operations to keep the machine in good condition.

It is necessary to:

- End a work cycle.
- Switch off the machine and remove the connections to the water supply and the connection to the power socket (if any)
- Empty the hydraulic circuits and the diesel tank.
- Store the machine in a place protected from the elements
- cover with a cloth to protect against dust.

Carry out these operations with care so that the equipment is in optimum condition when the work is resumed.

CHAPTER 15 - SUMMARY OF THE MAIN WARNINGS

- The safety devices have been designed by the manufacturer to safeguard the operator's safety while performing his tasks. The devices must not be tampered with under any circumstances during operation.
- Work on the switchboard may only be carried out by qualified electricians.
- Never run the machine with no load.
- During operation, when the machine is running, its surfaces are at high temperature, they **must never be touched with bare hands!!!**.
- **Never direct the water jet at yourself or other people: the jet may be at high pressure and cause serious injury**
- It is absolutely forbidden, during machine operation, to remove or tamper with the protective covers provided by the manufacturer in order to safeguard the operator's safety.

CHAPTER 16 - SPARE PARTS

16.1 ORDERING RULES

The various components of the machine can be obtained from your local dealer. Insert in the request:

- **Model and serial number of the machine.** These data are printed on the identification plate of each machine
- The **code number of the required** part can be found in the spare parts catalogue available from your local dealer.
- **Description of the part and quantity required.**

Please note that the manufacturer is always available for any assistance and/or spare parts.



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16.2 PERSONAL DATA

An exact description of the model, serial number and any installed accessories will facilitate quick and effective responses from the manufacturer or service centre. Always state the type, model and serial number of the machine whenever you contact the service centre. As a reminder, we suggest that you enter the machine data in this box.

MODELLO	MATRICOLA N°
ANNO DI FABBRICAZIONE	TIPO DI POMPA
TIPO DI MOTORE	

NOTES



The responsibility for any re-use of parts of the machines, e.g. engines or pumps, lies exclusively with the user.



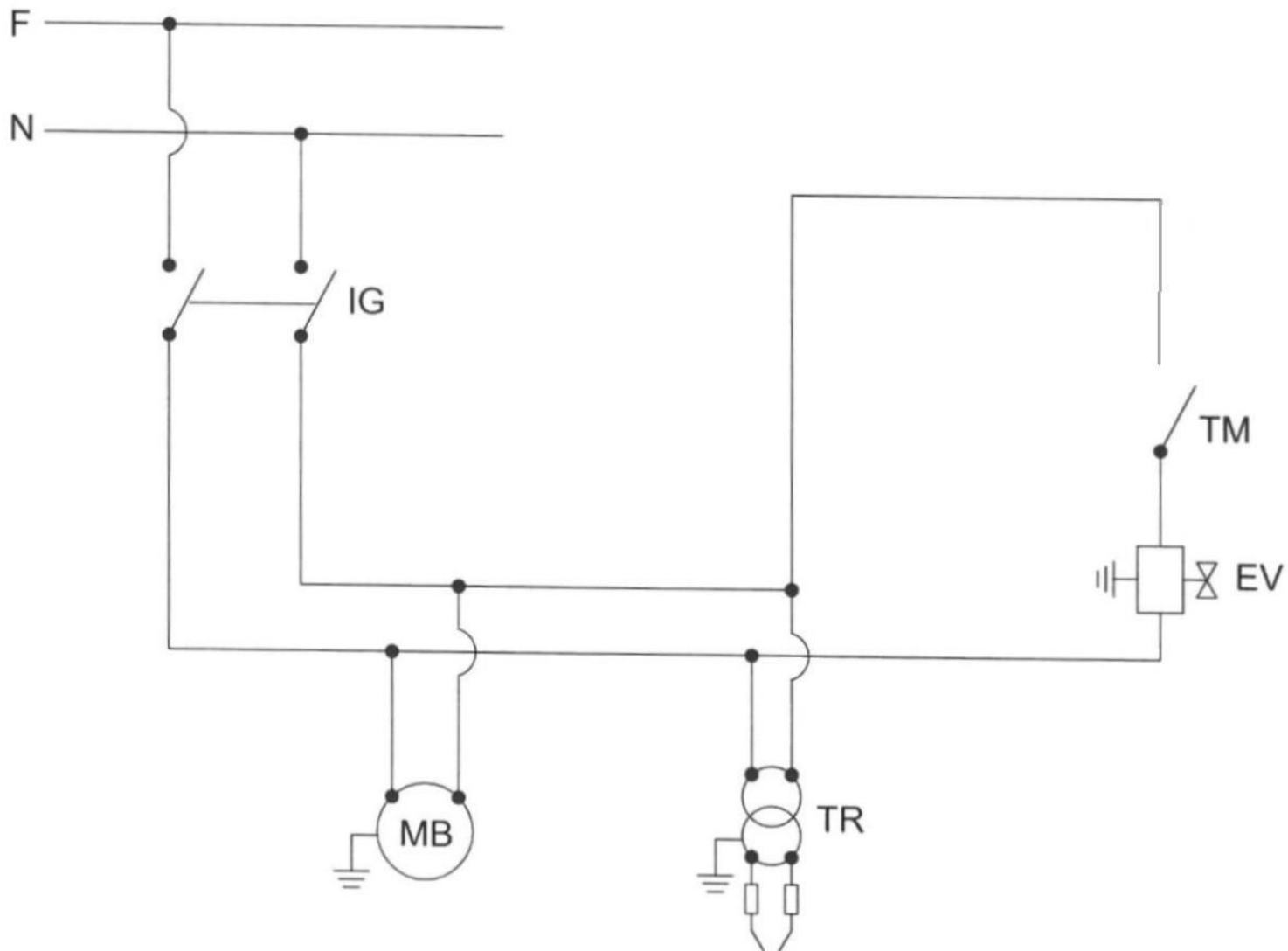
The manufacturer is in no way liable for damage caused by the machine if it is used without certain components or for a purpose not expressly specified in this manual.

ALL RIGHTS RESERVED.

NO PART OF THIS MANUAL MAY BE REPRODUCED IN ANY FORM WHATSOEVER (PRINT, PHOTOCOPY, MICROFILM OR ANY OTHER MEDIUM), OR PROCESSED, REPRODUCED OR DISTRIBUTED BY ELECTRONIC MEANS.

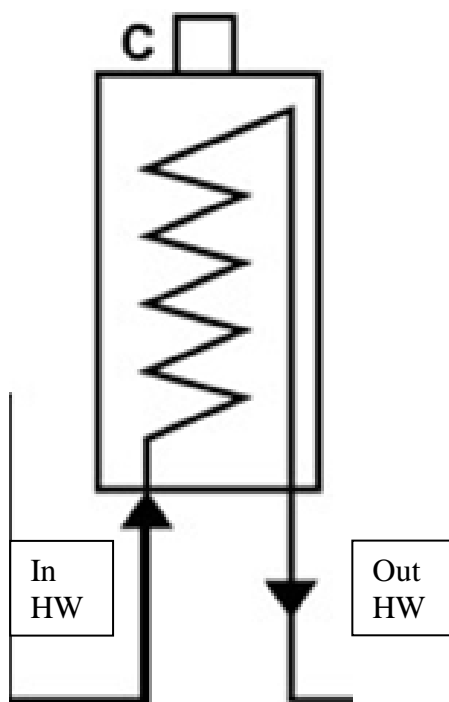
ATTACHMENT - A ELECTRICAL SYSTEM DIAGRAM

230V BURNER/ 12V BURNER ASSEMBLY DIAGRAM



ATTACHMENT - B

HYDRAULIC SYSTEM DIAGRAM



Key:

Out HW = Hot water outlet

In HW = cold water inlet

C = boiler



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