

NT FOG

User manual

Rev.1.0



Congratulations, you have chosen a NT FOG high-pressure misting pump, a reliable appliance that is simple to use.

The NT FOG high-pressure pump will assist you professionally for all misting purposes.
NT FOG high-pressure pumps are recommended for use in all fields of industry, agriculture, building, trade and tourism.

NT FOG can meet all your misting requirements, both hobby and professional, being light and handy, easy to use and to service.

The wide range of models perfectly fits each kind of use.

Thanks to their top-quality components, NT FOG high-pressure pumps will maintain an excellent performance for a considerable period of time if used correctly and serviced as recommended.

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MANUFACTURER IDENTIFICATION DATA

MANUFACTURER

- ☐ **NAME:** Tecno.mec / Tecnocooling
- ☐ **ADDRESS:** Via Canale, 114 - 42013 – Casalgrande- RE

IDENTIFICATION LABEL

The machine is identified from the manufacturer with the IDENTIFICATION LABEL, see sample:



On the label are printed the name of the manufactures, the model, type, year of construction and all the main data of the unit. The **CE** label is fixed on the frame of the machine.

USE AND CARE OF THE MANUAL



These instructions are an integral and essential part of the product. Carefully read the warnings given in these instructions before using the machine since they provide important information concerning the safety, use and maintenance

Read the manual to work in safety.

For every kind of question or advice contact us directly.

Our machines are designed and built to supply the better services and the easiness of use in safety. Our equipment are carefully monitored and tested before the delivery to guarantee to the user a secure and reliable product. To maintain the appliance always in excellent conditions and to guarantee a safety exercise is fundamental to carry out the operations of maintenance programmed described in this manual.



It is indispensable to know the limits in which the equipment works in safety to protect the operators and the environment from any risk. The manufacturer accepts no liability for the use of non-genuine spare parts that could damage the

pump or cause physical damage to the operator.

The equipment is guaranteed by agreements taken at the supply; the guarantee nevertheless is not valid if the terms and conditions of use reported on this manual are not respected.

REVISION OF THE MANUAL

This document is subject to change without notice following the continuous improvement of products.





CARE OF THE MANUAL

- Take care of this manual and keep it in an easy and rapid place to approach.
- Keep this manual together with the equipment until its scrap.
- In case of loss or destruction of this manual, ask immediately the manufacturer for a new copy specifying the identification data of the machine.


HOW TO READ THE MANUAL

- The parts of the manual that require particularly attention are evidenced by "**Bold text**".
- "*Italics text*" is used for references at norms or other texts from other documents.
- **NOTES:** the "NOTE" supplies to the reader other information about the argument.

Typical diagram of the messages of WARNING

WARNING: triangle with the exclamation point, signal of WARNING, is usually followed by a symbol that explains his mean and by other round shaped signals that specify obligations or prohibitions.



WARNING: This symbol indicates the operator a potential danger to people, animals or things with the possibility of damage or serious injuries.
It refers to compliance with rules of use and maintenance.
It highlighted practices and working procedures dangerous or prohibited.
Report to the risk of damage to the equipment.
Failure to comply with the instructions preceded by this symbol can cause serious injuries or damage to the equipment.

ADDITIONAL DOCUMENTATION

The additional documentation of parts or groups manufactured by third parties, when available, is attached to this manual to make widest possible source of information available to operators and maintainers.

DESCRIPTION OF THE SYMBOLS ON THE INSTRUMENTATION

On the equipment you will find a series of signals that show the residual risks, hazards and situations where we must act with caution, operations compulsory and those that are prohibited.



DANGER signals are shown in black on a yellow; symbol in TRIANGULAR frame.



PROHIBITION signals are presented in black on a white background behind a crossed red circle; symbol in crossed circular frame.

OBLIGATION signals are presented in white on a blue background; symbol in CIRCULAR frame.



WARNING signals are presented in black on white; symbol in SQUARE frame.

The following are several signs that you might find in our equipment or in this book:

DESCRIPTION	SYMBOL
DANGER, WARNING or CAUTION , depending on different colours and it is usually attached to one of the following symbols.	
DANGER OF ELECTRIC HAZARD	






DESCRIPTION	SYMBOL
DANGER OF CUTTING OF HANDS OR FINGERS, ENGINE FAN, BELTS, BODIES IN ROTATION (It can be accompanied by the following sticker  .	

GENERAL ECOLOGICAL INFORMATION

	This symbol precedes indication about the general environment and the way to operate in safety for its safeguards
	This symbol precedes indication about the general environment and the harmful recycling of elements for the environment for its safeguards

You must observe the current local regulations regarding water supply. This must be fitted directly on the water tap.

Disposal of the machine's packaging, extracted dust, parts replaced, the machine altogether and the various liquids must be done in an environment friendly manner, without polluting earth, air and water, and in any case complying with the relevant regulations in force.

 	Do not disperse in the atmosphere (rivers, ground, net sewer,...) the lubricants, the liquid of cooling, the fuels, the acids, the hydraulic oil or any other substance polluting
	Do not increase the pressure of pressurized system: that could produce an explosion of components or pipelines and the harmful disposal of substances for the environment.
 	Follow the instructions in the section of this manual to dismount the unit and any of its component.

RESPONSIBILITY

This booklet is an integral and essential part of the product that, as provided by the 2006/42/CE, must be delivered to the user in order to ensure fulfilment as regards training/information the personnel assigned to using the equipment.

The manufacturer shall not be held liable for any injury or damage if the machine is used incorrectly with respect to the instruction given.

Repair carried out by unauthorized technicians shall not be reimbursed. If said repairs cause damage to the machine, this is not covered by warranty.

The manufacturer shall not be held liable for any injury or damage caused by hidden defects.

At the time of delivery, check that the equipment has not suffered any damage during transportation and that the required accessories are present. Any complaints may only be accepted in writing within 8 days of the date of delivery.

The manufacturer is exempted from any responsibility in case the user:

1. Does not read entirely the present manual before the use of the equipment
2. Uses the equipment out of the type of work it has been built for.
3. Makes any maneuver different from those described in the present manual
4. Does not carry out the preventive and/or periodical operations of maintenance described in the manual.
5. Voluntarily, or for carelessness, tampers or let tamper the machine or its parts, or entrust it to inexperienced people.
6. Does not inform adequately, in comprehensible and clear manner on the risks that from the improper use of the equipment can be derived to all the personal employee, even occasionally, to the use of the machine.
7. Employs non original parts, tools or any device that do not guarantee the safety according to the greatest attainable pressures of the equipment in the heaviest conditions.
8. Grimes, deteriorates or removes warnings, symbols, identification license plates and brand affixed on the appliance.
9. Does not cares to maintain in perfect efficiency the equipment, changing immediately the spare parts damaged.

PURPOSE

High-pressure cold-water pump composed of a steel chassis with anti-vibration rubber feet, motor-pump group to pressurize the water, main plug power supply, control panel, pressure gauge.

Standard accessories/equipment

- High pressure misting pump
- Operating and maintenance manual

Optional accessories

- | | |
|---------------------|--|
| - FILTERS KIT | inlet water filters |
| - MISTING LINE KIT | pipes, fittings and nozzles for line mounting |
| - FANS MOUNTING KIT | pipes, fittings, nozzles and fans for fans line mounting |

ENVISAGE CONDITIONS OF USE

Use

The pump has been developed and manufactured for the use in gardens, parks, bars and restaurants, swimming pools, greenhouses, workshops, factories, farms, etc. for misting and outdoor cooling applications.

Environment

The power supply with minimal IP X5 protection permits use:

- OUTDOORS ON FLAT SURFACES;
- IN DAMP CONDITIONS.

In any case, for safe and easy manual handling, it is necessary for the floor to be as flat and even as possible. The pump HAS NOT BEEN DESIGNED to be pushed or towed with mechanical facilities of any kind.

DESCRIPTION ON THE UNIT

GENERAL VIEW

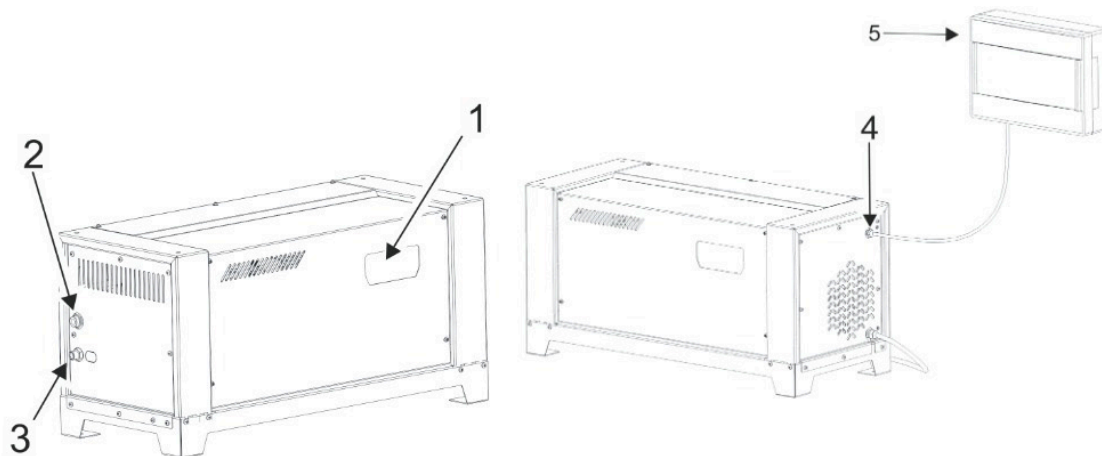


Fig.1

DESCRIPTION OF THE MAIN COMPONENTS

1	Control Panel
2	Water Inlet
3	Water outlet
4	Inlet remote control cable
5	Remote control (Optional)

The CE label previously described is fixed on the unit and describes the main data. Check that electrical data corresponds to the electrical mains in use.

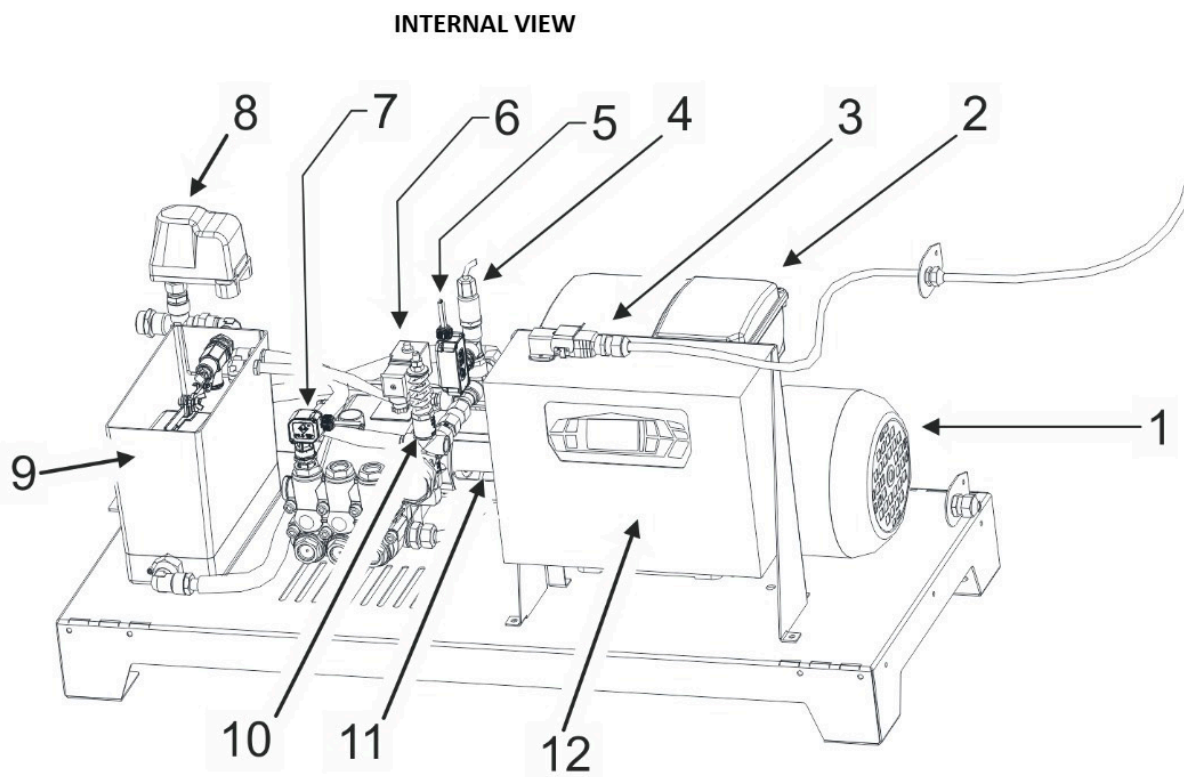


Fig. 2

1	Electric motor
2	Inverter (VAR version only)
3	Remote control connector (Optional)
4	Pressure transducer (VAR version only)
5	Pressure switch (VAR version only)
6	Drain solenoid valve
7	Water leaks pressure switch (not present in VAR version)
8	Water feeding pressure switch
9	By-pass water tank (optional)
10	Pressure regulator valve
11	Flexible coupling
12	Control panel

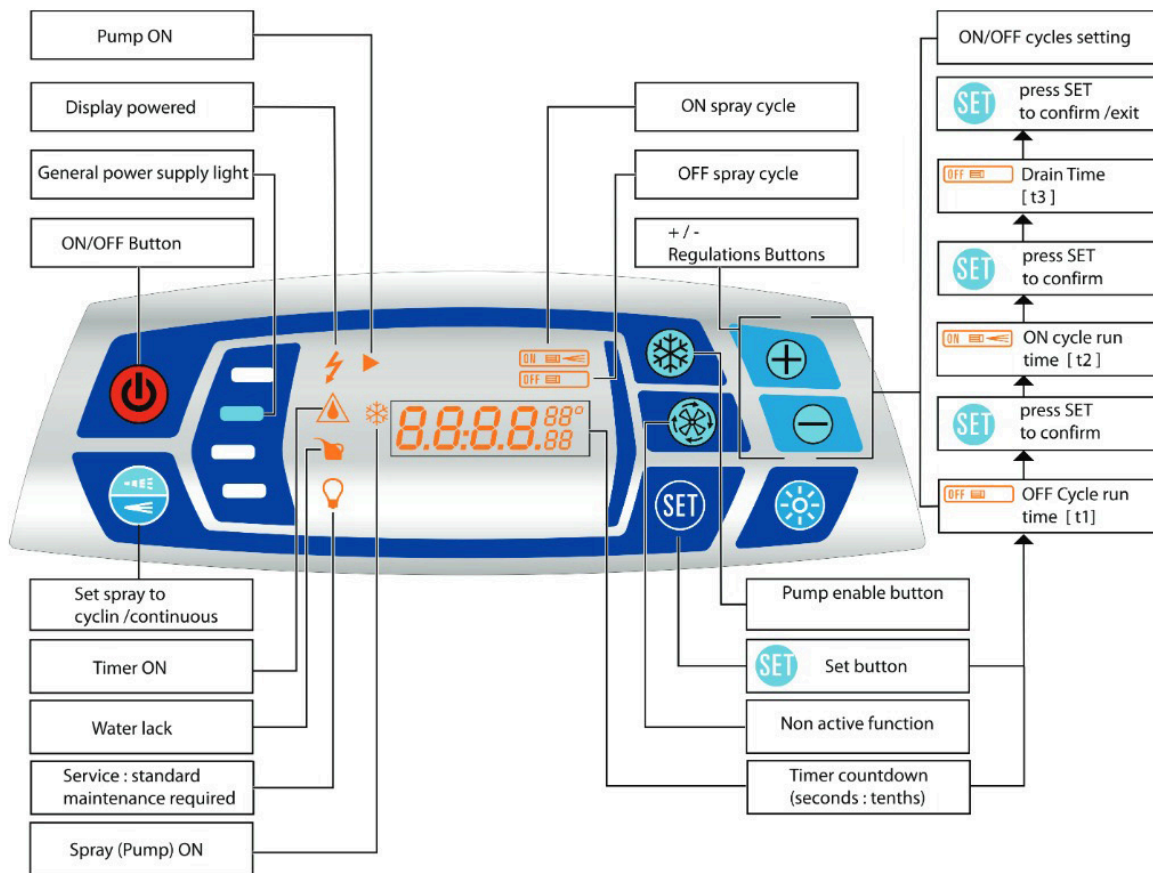
OPERATING FEATURES

- Maximum ambient temperature: +40°C
- Minimum ambient temperature: +5°C
- Maximum humidity: 95%
- Sound pressure level (max): 65 dB(A)

Technical features

max. pressure (Bar/kPa)	70/7000	70/7000	70/7000	70/7000	70/7000	70/7000
Flow rate	15 l/min	18 l/min	21 l/min	27 l/min	35 l/min	43 l/min
Engine power	kW 4	kW 4	kW 4	kW 5.5	kW 5.5	kW 7.3
Voltage (V/Hz)	400v 50hz	400v 50hz	400v 50hz	400v 50hz	400v 50hz	400v 50hz
Absorption (A)	10A	10A	10A	11A	11A	16°
Capacitor	uF 60	---	---	---	---	---
RPM	1450	1450	1450	1450	1450	1450
Engine protection	IP X5	IP X5	IP X5	IP X5	IP X5	IP X5
Insulation class	F	F	F	F	F	F
Engine protection	TERMIC	TERMIC	TERMIC	TERMIC	TERMIC	TERMIC
Max filling water temperature	15° C	15° C	15° C	15° C	15° C	15° C
Max filling pressure (Bar/kPa)	5/500	5/500	5/500	5/500	5/500	5/500
Min filling pressure (Bar/kPa)	2/200	2/200	2/200	2/200	2/200	2/200
Empty weight	83 Kg	83 Kg	83 Kg	90 Kg	90 Kg	90 Kg
Oil capacity	1,2 l	1,2 l	1,2 l	1,2 l	1,2 l	1,2 l
Oil type	SAE 20-30	SAE 20-30	SAE 20-30	SAE 20-30	SAE 20-30	SAE 20-30
Dimensions LxPxH (cm)	100x44x50	100x44x50	100x44x50	100x44x50	100x44x50	100x44x50

CONTROL PANEL



We shall renew your attention on the need of the meticulous compliance with the instructions accompanying our products is a primary condition for the use in full safety conditions.

We disclaim any responsibility on improper or erroneous ways of using our appliance.

In order to provide for a suitable guide for users here we give some examples of risky behaviours.

VERSIONS

1. **NT FOG Series:** The series is designed with electric motor and pump coupled with flexible coupling. Options available for this version are: the by-pass water tank and the remote control switch.
2. **NT FOG TIME series:** the series is only available for 15, 18 and 21 l / min flow rate. Time versions are equipped with by-pass water tank.
3. **"VAR" series:** the "VAR" series of spray pumps is characterized by its wide modularity able to greatly expand the possible applications. In fact this series is equipped with a three-phase inverter that allows managing automatically and accurately the rpm of the pump to reach and maintain the parameters set.

The "VAR" system is equipped with a pressure control that by means of microprocessor mounted on the inverter acts directly on the motor raising down the rpm of the pump proportionately to the deactivation of the users till the complete switch off of the motor in the event that all the lines are closed. The system starts by adjusting the flow rate of the pump when one or more lines are opened.

This variation of the flow has considerable advantages in terms of reduction of the noise emitted, energy saving, reduction of by-pass water temperature and of parts subject to wear with an increase of the useful life of the machine.

The "VAR" series pumps are designed to manage multiple independent misting sectors: it is possible to section the flow line into several lines by means of electro valves of control (not included) that can close the line and simultaneously unload the excess of pressure. Such a system of electro valves can be driven by humidity and / or temperature controls. This system automatically work to reach and maintain the set parameters opening and closing the lines. The rpm of the pump will be adjusted automatically to optimize the flow.

"VAR" system parameters are preloaded at the factory before delivery of the machine. It is possible to change factory parameters in case of special application by means of a programmer to be connected to the inverter. This programmer must be performed by trained personnel and only after the authorization of the manufacturer.

"VAR" SAFETY

In addition to the standard safety on the water supply line and thermal protection for the motor the "VAR" machines are equipped with:

- Protection of the pump in case of failure in reaching the pressure set. In fact the pump start operating but if within 60 seconds does not reach the correct pressure the engine is stopped.

- Timer OFF until the complete filling up of the line. The counter of the timer for the spray phase is not activated during the filling of the line and starts only when the minimum working pressure is reached.
- The electric motor stops during the pause time.

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IMPROPER USE

Improper use of our machines means to use them in operations they were not made for. Improper uses therefore comprise:

- USE IN THE RAIN OR DURING THUNDERSTORMS
- USE BY PEOPLE WHO ARE NOT ADULTS
- WETTING ANY ELECTRIC-POWERED OBJECT
- USE FOR NON-MISTING APPLICATIONS

INCORRECT USE

Incorrect use of our machines means to use them without complying with the operating and maintenance manual (see also section "Prohibited Operations"). Failure to comply with these instructions may cause injury to the operator and damage the machine. We shall now give some examples of incorrect use:

- WRONG CONNECTION/USE OF THE ACCESSORIES SUPPLIED
- WRONG SEQUENCE OF STEPS FOR COMMISSIONING
- FAILURE TO USE GENUINE SPARE PARTS
- MAINTENANCE WORK BY UNQUALIFIED PERSONNEL
- USES FOR WHICH THE MACHINE HAS NOT BEEN DESIGNED (see improper use)
- MAINTENANCE WORK NOT CARRIED OUT

PACKING - TRANSPORTATION

Transportation or transfer takes place in corrugated cardboard packing.

The materials used for packing are particularly sensitive to atmospheric agents such as rain, fog, sunshine, etc.

The packed machine can be lifted manually or with forklift of no less than 40 kg capacity: **check that the capacity of the lifting equipment is suitable.**

Should you transport the machine without its original packaging, make sure it is properly secured to prevent it from moving. Put the machine on even floors. During periods when it is not used, keep your high-pressure pump under shelter.

COMMISSIONING

Commissioning must take place in clean and well-lit areas. For the machine parts, refer to "General view" of this manual.

1 - After removing the packaging, make sure the machine is not damaged. Should you have any doubt, do not use the machine and call your supplier's technical support service.

The packaging materials (cardboard, wood, etc.) must be put away in special containers and kept out of the reach of children as they are a potential source of hazard.

2 - Put the pump on a properly arranged place, in any case on an even surface.

The workstation must be equipped with:

- Main plug 230V/16A 2+PH single-phase according to the model (see technical features on the rating plate - see section "Marking and identification")
- Clean water inlet 10 mm, pressure 0.3 Mpa, with a stop valve and minimum flow rate of 6.5 litres/minute (water temperature must be no more than 15° C).
- Connection to the drainage system for the treatment of the wastewater.

3 - Connect the pump water inlet to the filters using a 10x8 mm PA hose; connect the filters to the water supply tap. This connection must be made with a suitable hose, which must be as short as possible to avoid tripping.



4 - **CAUTION!** - Before wiring, turn the main switch to OFF and make sure the rating plate data correspond to those of the mains power supply. Wiring must be carried out by qualified personnel in compliance with current national and local regulations.



5 - **CAUTION!** - Verify that the cross-section of the system cables, their condition and their current carrying capacity are suitable for the power absorbed by the appliance, indicated on the rating plate. Protect the supply

line by using thermomagnetic releases coordinated with the machine protection device. The data can be seen on the device itself.



6 - CAUTION! - Connection to the mains power supply must be made with plugs complying with IEC 309 standards and preferably without any extensions. The machine type of protection against electric shock is Class 1. The mains supply must be connected to the machine by a single-pole switch with minimum 3 mm-gap between contacts and suitable rating.

If the grounding is not correct, there is a risk of an electric shock. In case of doubt, a qualified electrician must check the socket. Do not make any changes to the plug provided with the machine - if this statement will not be respected it will not be possible to claim the responsibility of the manufacturer and the warranty - If the plug does not fit into your socket, do not use any adapter, but let the socket be changed by an electrician.

7 - The electrical safety of this machine is only achieved when it is correctly connected to an efficient earthing system and there is an automatic power supply cut-off device with such features as to ensure contact voltage no greater than 25V. Use a differential switch with sensitivity ≤ 30 mA of class A.

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



CAUTION! When there is no power the machine stops. If it is not disconnected, it switches back on automatically when the power supply is restored.



CAUTION! When there is no water the machine stops. If it does not switch on automatically when water supply is restored, press the pressure-switch button.

- The machine's asynchronous motor causes no interference to radio or TV transmissions or any other high-frequency appliances of any kind.

INSTALLATION AND USE

Connect the 3/8" (9,52mm) high-pressure pipe (not supplied) to the delivery union (fig. 1), fully tightening the ring nut and the other end to spraying device(s). In the event of water leakage, do not use the machine and contact your supplier or a technical service center.



If the features of the electrical current of your system correspond to those prescribed on the rating plate secured to the pump, you can plug in. If it is necessary to use an extension, it is essential to comply with these instructions: you must use a TUV/VDE/OVE/IMQ/UL homologated winding reel, the cable must be fully unreeled: otherwise, it could overheat and melt. A rolled cable can lead to losses in voltage and therefore non-operation of the appliance due to the increased resistance.

The cross-section of the cable must correspond to the indications of the table below.

CAUTION: DO NOT USE EXTENSIONS NOT SUITABLE TO THE POWER OF THE UNIT.

Connect the water supply pipe, of diameter 10 mm to the water inlet connection (fig. 1 pag 11).



The supply pipe must be thoroughly clean inside; a suitable filter must be applied upstream from the pump.

Make sure the filters are always clean. A dirty filter does not allow correct water supply and this is a cause of poor pump operation with the inevitable risk of quickly wearing and breaking the internal mechanisms.

Check that the oil level is above the oil dipstick.

START UP IN CONTINUOUS MODE

Caution: Your new machine needs a short running-in period for the motor/pump unit. Running-in consists of using the machine for no longer than 1 hour and waiting for 1 hour for it to cool; this should be done for 4 or 5 times.

1. Turn on the water-feeding tap.
2. Press the start button ;
3. Press the button  to enable the pump; the pump will start the feeding of the nozzle line increasing the pressure and then starts spraying in continuous mode. During the filling phase the display shows:





4. Check that the spraying devices or nozzles operate correctly.
5. In case of the need to adjust the pressure fix it up to 70 bar acting on the Allen screw (fig.1) by means of an Allen wrench d.4. Qualified person must carry out this operation. Turn slowly the Allen screw while the unit is working. It is necessary to insert in the outline a pressure gauge to check the pressure.


STAND-BY OF THE PUMP

6. Press  to disable the pump of the unit.

STOP OF THE UNIT






7. Press the button  to disable the pump or push the stop button .
8. Turn off the water-feeding tap.
9. Wait for a few seconds to release water and pressure trapped in the hoses.

The appliance is supplied with an S1 motor, set for continuous service and equipped with protection against overloading. If the protection comes into operation for extended machine overload, overheating or other reasons, the supply of current to the motor is automatically cut off.

In this case, immediately press the button  to stop the unit, wait for a few minutes to allow the motor to cool down. Only after the motor has cooled down can you switch it back on. Contact the service center to point out the problem.

INTERMITTENT FUNCTIONING




Proceed as per continuous operation.

1. Press  to enable the intermittence.
2. Keep pressed  to enter in time programming
3. Set the pause time **t1** using the keys   and press  to confirm.




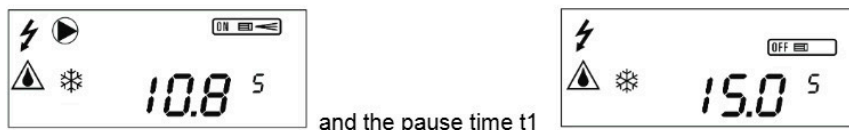
4. Set the Spray time **t2** using the keys   and press  to confirm.



5. Set the Drain time **t3** using the keys   and press  to confirm. Note that **t3** time must be set as per difference to the pause time **t1** (ex: if the pause time **t1** is 10 seconds and you want to drain the line for 2 seconds then **t3** has to be set = 8 seconds).



6. Press  to confirm settings
7. The unit starts the countdowns as set alternating spray time **t2**



Note: During the transition from spray time to pause time the line is drained from the pressure and some water is released in the drain line. The drain line must be insert in a sewer duct or in a tank.

CLEANING AND REPLACING THE MISTING NOZZLES

It is essential that the spray nozzles (not supplied) operate perfectly in order to safeguard the correct operation of your high pressure pump.

Debris, residuals and deposits can clog the nozzles and cause your high pressure pump to malfunction owing to loss of pressure and leaking of water.

WARNING: the operations described below must only be carried out when the machine is switched off.

NOZZLES CLEANING

If the nozzle is clogged, it is necessary to clean it with scale preventer. To clean it correctly dismount all parts of the nozzle and keep it submerged it in scale preventer liquid for few minutes. Rinse with clean water then mount the nozzle and operate the system to check the spray is even.

Replace the nozzle polyethylene water filter.

NOZZLES REPLACING

If the spray is still uneven despite cleaning of the nozzle, it must be replaced. The spray nozzle must be replaced with one that is identical to the original installed.

Contact your service centre in case of any doubt.

PROHIBITED OPERATION



CAUTION! - The following instructions must be observed meticulously in order to avoid physical injury to the operator and irreparable damage to the machine. Carrying out prohibited operations invalidates warranty; the manufacturer disclaims all responsibility for any damage or injury deriving from carrying out prohibited operations.

- Do not stop water coming out of the high-pressure hose. This may cause the hose to burst, which is dangerous for the operator.
- Do not remove the protective cover of the internal equipment while operating the pump.
- Do not use the supply cable or the connecting hoses to move the machine.
- Do not use the power plug for switching ON and OFF.
- Do not use the machine on sloping surfaces
- Do not use the machine when barefoot.
- The machine must never be left unattended while operating.
- Do not use the machine in dangerous areas.
- The machine can be used only with clean water: never draw water from sinkhole, ponds, etc., because impurities, even of minimum dimensions, may destroy the seals and cause irreparable damages to the pump and nozzles.
- It is prohibited to spray liquid products not approved by the manufacturer they cause health hazard.
- Do not cover or store the machine in insufficiently ventilated areas.
- Do not repair the pump when operating or powered up.
- Do not carry out makeshift repairs on the power cable and prevent it from being damaged. In the case of damage, the entire cable must be replaced by the technical support service.
- Do not direct the misting jet against the machine or any powered components (cable, plugs, etc.). This can cause electrical damage and danger for the operator.
- Avoid using the pump under the rain or in thunderstorms and whenever water or other liquids may come into contact with the appliance. Every electrical component must be protected against water splashes to avoid short-circuiting.
- Do not place heavy objects on the top cover.
- Avoid dry running the pump as it could damage its internal parts.
- Never touch the electric plug or socket with wet hands.
- Never put the following detergents into the tank or through the water suction pipe: solvents, paint thinners, colours, oils, fuels, etc. or any inflammable liquid, even if dissolved or diluted in water, the mist that would form during high-pressure spraying is

highly inflammable and poisonous. In addition, the machine's seals could be irreparably damaged.

Warning:

If the machine is out of order or malfunctions, such as oil or water leak, immediately switch it off using the main switch, and inform the qualified personnel. Switch off the machine and disconnect the water and power supply and do not carry out any repair. Immediately contact qualified personnel. The repairs must be carried out by an authorised technical support service, always using genuine spare parts.

PRECAUTIONS FOR THE USE OF THE HIGH PRESSURE PIPE

The high-pressure hose (not supplied) has undergone strict safety testing. Damage to the hose can easily be avoided by observing the following precautions:

- Lay out the hose before starting work.
- Do not pull on knots that may form, lay the pipe out.
- Do not crush or bend the hose with any means.
- Do not move the appliance by pulling the pipeline.

In addition, avoid using the hose in the case of the outer covering swelling or being damaged. Never try to repair the pipe and replace it with a new one in case of trouble.

ACCESSORIES

Should you use accessories other than those provided by us, carefully follow their instructions. Always check that the accessories are suitable to the appliance.

The manufacturer accepts no liability for the use of non-genuine spare parts or accessories that could damage the machine or cause physical damage to the operator.

ROUTINE MAINTENANCE

TROUBLESHOOTING

In the event of anomalous operation, refer to the following table. Should trouble persist, refer to an expert technician authorized by the manufacturer.


CAUTION:

Before taking any action, cut off the machine from the electric current.

TROUBLE	CAUSES	REMEDIES
The pump turns but fails to reach the prescribed pressure	The pump draws in air	Clean or replace the drain valve
	Worn or dirty suction/delivery valves	Clean or replace
	Inadequate or worn nozzle	Check and/or replace
	Worn gaskets	Check and/or replace
	Clogged suction filter	Clean or replace
	Adjustment valve core	Clean or replace
Irregular swings in pressure	Worn or dirty suction/delivery valves	Check/clean or replace
	Air intake	Check the suction pipes
	Worn gaskets	Check and/or replace
Drop in pressure	Worn nozzle	Change nozzle
	Suction/delivery valves dirty	Check/clean or replace
	Adjustment valve core worn or jammed	Check and/or replace
	Worn gaskets	Check and/or replace
Noise level	Air intake	Check suction pipes
	Suction/delivery valves worn, dirty or jammed	Check clean and/or replace
	Worn bearings	Check and/or replace
Water in oil	Worn water-oil seal rings	Check and/or replace
Water leakage from head	Worn gaskets	Replace
	Worn O-rings	Replace
Oil leakage	Worn oil seal rings	Replace
Motor fails to start	Plug not inserted properly	Check plug, cable, switch
	No current	Check plug, cable, switch
Motor hums but fails to start	Voltage lower than prescribed	Check the electrical system is adequate
	Pump is jammed or frozen	Turn the motor by hand (see MAINTENANCE section)
	Electrical extension of inadequate cross-section	Replace the extension
The motor stops suddenly	The thermal cut-out has tripped due to overheating	Check the voltage is as required. Turn off the switch and leave it to cool for a few minutes
Operations marked with a black box must be carried out exclusively by technical personnel		

PREVENTIVE MAINTENANCE

The unit has an internal Hour counter that signs when it is needs to carry out the ordinary maintenance.



Each maintenance is pointed out by the symbol showed on display.

Once the maintenance is carried out the authorized workshop will reset the hour counter.



CAUTION:

The following operations should be carried out in order to avoid damage to the highly stressed mechanical parts and to preserve the performance of your high-pressure pump. For all maintenance work on the high-pressure pump and the machine in general, it is necessary to call specialized personnel or one of our authorized technical support services.

Before any maintenance work on the machine:

- 1 - Switch off the pump (turn to OFF/0 position).
- 2 - Disconnect the machine (unplug it).
- 3 - Shut off the water tap.
- 4 - Discharge the residual pressure.

Preventive maintenance table

DESCRIPTION	Hour of work								
	Every day	First 50	every 50	first 100	Every 200	Every 300	Every 500	Every 800	Every 1000
Oil of the pump	1	3						3	
Water filter	2								
High pressure hose (winter time)	6								
Pressure of the line				1					
Leaks of the line			1						
Pump seals								3	

Preventive maintenance operation codes

Code	Operation
1	Check

2	Clean
3	Replace
4	Lubricate
5	Tighten
6	Empty

NOTE: Follow the instruction of this manual or additional documentation to carry out the maintenance.

PUMP MAINTENANCE

1) The pump oil level should be regularly checked; it must always be above the marker. Replace the oil after 50 working hours, and successively every 800 hours; use oil type SAE 20/30. To check the oil level, unscrew the grips and lift the cover vertically upwards. Unscrew the oil cap and check that the oil level is above the minimum marker). If the quantity of oil is not enough, do not start the machine.

2) Do not leave the pump exposed to very low temperatures as it may freeze. Stopping the machine at temperatures below 0°C can cause damage or breakage to the pump and hoses; conversely, very high temperatures can cause the motor to overheat when the machine is operating. **DAMAGE CAUSED BY FREEZE ARE NOT COVERED BY WARRANTY.**

3) When the pump is not used for a long period, scale may form and make instant start of the electric motor difficult. In this case, to avoid anomalous current absorption with consequent voltage drop, we advise moving the driving shaft by using a screwdriver before starting the motor (Important: this must be done when the machine is not connected to the power supply). This will let you check why the motor jammed (if caused by frost, scale, or anything else) and take appropriate measures.

4) Replace the high-pressure water pipe if it is damaged or raddled. The new hose must be clearly marked, i.e. with the maximum allowed pressure and the manufacturer's name or a suitable symbol. Before use, check the pressure values of the new hose as they must correspond to those of the pump.

WATER FILTER MAINTENANCE

The filter cartridges must be replaced whenever it denotes a reduction of the flow of water in output line. Therefore, check (by means of the pressure gauge) that the pressure of the output of the filter is equal to the pressure of the supply line. A lower pressure denotes that the cartridge must be replaced.

INACTIVE UNIT

When the pump is not used for a long period of time:

- Close the water supply line
- Empty and clean the water tank (if present).
- Dismount the nozzles from the line
- Check that the hose is empty from water. Blowing compressed air inside the hose will help to remove all the water inside.
- Empty the inlet and outlet water line of the pump.
- Insert in the head of the pump some antifreeze solution to avoid ice damages.
- Run the motor **FOR FEW SECONDS** to empty completely the head of the pump.
- Recover the unit in a dry and safe place.

DOSING PUMP

In the GM-FOG series it is possible to mix products based on natural essences without alcohol to the spray. To connect follow the instructions

- Install the dosing pump in the near of the machine
- Connect the dosing pump to the power supply as specified in the accompanying manual: using timer or flow meter
- Place the suction tube into the container of the product to be mixed
- Insert the pressure hose through the front slot of the housing of the machine directly into the hole of the inner water tank
- Lock the pipe forcing it into the carved slot on the front of the machine

Note: To use the dosing pump, please refer to the manufacturer's manual.

GUIDE TO THE PROPER SYSTEM INSTALLATION

Recall that the installation and execution of the systems must be carried out by trained personnel according to local regulations.

OUTDOOR COOLING

TecnoCooling system uses high pressure water misting to create an ultra-fine mist. For best results, it is helpful to understand some basic physical principles behind this process.

Evaporation occurs when water turns into steam. Our system initially creates an ultra fine mist using an electric high-pressure nozzles and patented, technologically advanced.

The cooling occurs later when the fog evaporates, it is a process in which heat energy is absorbed when water turns into steam.

With the use of TecnoCooling fans (optional), the systems can work even in the presence of high humidity, ventilation, because this speeds up the evaporation process and simultaneously helps to eliminate the air saturated with moisture from the work concerned .

Although it may seem cool mist in the epidermis, which is installed in optimal conditions, our system lowers the temperature of the air through evaporation (the process of adiabatic cooling) without wetting people and things.

Because the environments are very different climatic conditions and ventilation for a useful suggestion is therefore to design the facilities taking into account that climatic factors are variable and then perform the necessary tests in the area concerned, to check the number and type of nozzles and possibly the type of fans or speakers necessary.

HUMIDIFICATION AND OTHER APPLICATIONS

Our pumps can be used successfully for many more applications, such as humidity, dust, air conditioning greenhouses. Consult ns. technical department for information on fittings, pipes and accessories are recommended for your application.

HYDRAULIC EQUIPMENT TO BE USED FOR THE MISTING PIPELINE

For plumbing fittings may be used only in brass or stainless steel, never use galvanized steel pipe fittings, subject to rust, which would cause damage to the pump and nozzles.



Always use an ordinary pencil sharpener to smooth the ends of the tube before inserting it into polyamide quick coupling so as not to damage the seals thereof.

BLEEDING THE SYSTEM

Before pressurizing the system, bleed the hydraulic lines to the bottom and spray to clean your system from any residue. When you use Teflon tape on the threads of the fittings, left uncovered one or two of the initial thread. This will prevent pieces of tape from entering the plant and contaminate it.

QUALITY OF WATER

You should pay close attention to the quality of water used for misting system. For proper operation, water must be treated before being pumped through the nozzles. Avoid to use water from wells, reservoirs, lakes, rivers and generally non-chlorinated. Avoid the use of sea water or salt water and acids, since they corrode the pump and accessories.

INLET LOW PRESSURE WATER CONNECTION

The water supply hose must be of an appropriate size as to ensure the required flow to the pump.

A shut-off valve before filters is mandatory, to quickly resolve any leakage.

Shut-off valve must be turned OFF / CLOSED to prevent leakage even if the system is not in operation but remains, even temporarily, without supervision.

INLET WATER FILTER

Water supply filters (at least a pair of 5 and 1 micron filters are recommended) should be checked once a week or more often as needed. The filter life depends solely on the purity of the water flowing through them. The filters must be changed at least once every year. You should never allow dirty filters to such an extent as to restrict the flow of water and / or limit the supply pressure.

ADDITIONAL FILTRATION PLANT

For cooling and humidification systems we recommend to use nozzles with filter.

If nozzles are used without a filter, you must install the high pressure filter after the pump output.

ANTIBACTERIAL FILTER

It is recommended to filter the water with a antibacterial filter in case the system is intended to humidification of food and in any case in which the water source is not from public water supply (not chlorinated).

WATER SYSTEM CONNECTION

The hose connecting the high pressure pump to spray lines should be as short as possible. When water (and other fluids) are sent through a pipe, the pressure drop increases with distance. This is due to friction between the inner surface of the pipe and the liquid. If the distribution lines are very long or too small in diameter it will result in an excessive pressure drop and nozzles will not be able to produce a good atomization. So the pump should always be located as close as possible to the lines of spraying. It is recommended not to install pipes longer than 80/100 meters considering that the maximum capacity of the pipe is 11 liters per minute (data related to 3/8"-9.52mm polyamide pipe)

HEIGHT

The pump must never be located below ground level or where there is not a system for water drainage, because, in case of leakages, water would not be free to flow and the area could be flooded, damaging the pump and other equipment. This could also involve the risk of fire or short circuit.

SPRAY DIRECTION

Nozzles should never be aimed directly towards a surface or object. This would lead to condensation and moisture on the surface. If condensation occurs, the problem can be remedied in the following ways:

- By adjusting the height of the nozzles
- By adjusting the angle of the nozzles
- By adjusting the pressure of the pump (useful in some cases only)

PIPELINE DRAINING

All pipes must be installed according to the proper slope to allow for the automatic discharge. When you turn off the system the water pipes should drain to the pump or where the drain valve is placed. Normally the spray lines should drain to the ending part of the plant where it should be installed a second automatic valve. When the system is switched off, the drain valve opens automatically at the end of the line and pump out the remaining water. So for the flow of

wastewater, the end of the line should preferably be connected to a gutter or released to the outside through a hose at low pressure. To obtain an optimum drain, you should install a drain valve at the lowest point of the system. This valve will allow the entry of air in the system and maximizes the effects of siphoning and thus reduce the time of discharge. When the system is being filled with water, the valve will allow air to flow out by reducing the filling time.

SUGGESTIONS FOR THE INSTALLATION AND ASSEMBLY OF THE PIPELINE

Useful Tips

- 1) The spray line should be placed around the perimeter of the area to be cooled. This line forms a curtain of fog, a barrier between the affected area and the heat outside.
- 2) Place the nozzle at a distance of 80 cm. each other for systems installed between 2.4 and 3 m. height and increase the distance when mounted lower than 2.4 m.
- 3) Install automatic drain valves in an area that can accept drain water. Make sure the valve is positioned at the lowest point of the line to ensure that all water is drained from the system.
- 4) The pump should be positioned as close as possible to the water supply.

Assembly and installation of the pipeline

Line mounting - Measure the outside perimeter of the facility or area to be cooled. This is the total length of spray line that you will need to mount. Be sure to surround with fog all open sides of the patio and pool area.

Measure the height at which you want to install the fog line. Using the table below, you will be able to adjust the distance required between nozzles.

Installation height nozzles	Recommended distance between
From 2,0 up to 2,4 m	80 cm
From 2,4 up to 3,0 m	75 cm
From 3,0 up to 3,6 m	65 cm

Assembly and installation of the spray line with polyamide hose

Using the tube roll and/or the pre-cut tube rods, prepare the necessary amount of components in order to provide sufficient pipeline to surround all sides of open area to be cooled. Push one end of each section of pipe into a fitting with a nozzle with quick "push and turn" movement. The tube should be inserted after the O-ring, inside the fitting ring, to form a leak proof joint. Continue this procedure until it has completed with all the required parts of the misting line. The line should begin and end with appropriate fittings.

Assembly and installation of the spray line with Noxide or Inox pipe

Cut the pipe at 90 ° with a pipe cutter verifying the absence of internal and external burrs.

Plug one end of each section of pipe into a fitting. The tube should be inserted after the O-ring, inside the ring, to form a joint leak-proof. After verifying the correct placement of the tube screw the nut by hand until you feel some resistance, using a wrench tight the nut about ¼ - ½ rotation depending on the type of pipe (10-12 Nm). In some cases it is advisable for the only purpose of verification to lose the nut and check that the spinner has taken hold evenly on the tube and then tight again the nut.

Note: This application can be made only on straight sections of pipe.

Inserting the end plug

Place the engraved side of the end cap into the last nozzle holder, or use an end fitting. This closes the pipeline circuit.

Assembly of spray line

Fix the fog tubing on the support structure around the perimeter of the area to be misted, using rubber or plastic clamps. Fix the line with the use of screws or masonry anchors to about 10 cm on both sides of each nozzle holder. Make sure the terminals are not overly tight. Nozzle holder should be oriented horizontally to allow better evaporation. Use the remaining hose to connect the outlet fitting on the pump and fix tubing with hose clamps.

Connecting the pump to the water supply line

Choose the best location where to install the pump, then connect it to the water supply. Using the hose supplied with the filter kit, connect the filter inlet to water supply and the filter outlet to the pump. Inlet and outlet are marked with arrow sign on the filter. Fix the filter assembly in a convenient location that allows any future maintenance.

Installing Automatic Mechanical Drain Valve (Premium versions only)

Cut the pipeline at the lowest point, insert a **nozzle holder and tighten the valve**. **This valve will release water whenever the system is turned on or off, allowing to drain the pipeline. Drainage reduces the formation of limestone that is causing the clogging of nozzles. Pumps fitted with BPS system** will automatically drain the pipeline on their built-in storage tank, without the need for and external drain valve.

Purging the hydraulic circuit

The hydraulic circuit (pipeline and pump) should be cleaned by removing one nozzle from the pipeline end. To clean your system, open water supply, switch on the pump and let water flow with zero pressure from nozzle holder hole for at least 30 seconds in order to free the line from any impurities.

Then, turn off the pump, close the water supply and install all nozzles, screw them by hand, in their nozzle holder. Do not use wrenches or other tools to tighten the nozzles, to ensure better tightening you can optionally use the special "nozzle screwdriver". **IMPORTANT:** tighten nozzles very softly to avoid the risk of breaking the thread of the nozzle.

Complete the installation

Open water supply and switch on the pump. Make sure the tubes are fully inserted in the quick couplers and check for leaks on the pump and tubing.

Make sure each fitting and each nozzle are properly inserted and tight. If a leak occurs, remove the clamps, remove fittings from the pipes and assemble them again, making sure the tubes are fully inserted into the fittings.

Let run the system for a few minutes. You will notice that the tube will start to flex between the terminals. This is normal and is the result of the expansion and locking of the fitting. Turn off the pump. Go back to the end of the pipeline and tighten each fitting as you pull the tube, this will help to remove any curve. Continue until all fittings are fixed.

Starting the system

You are now ready to run your misting system. Always start by opening the water supply, and then turning on the pump. To stop, switch off the pump first and then close the water supply.

***** IMPORTANT*** Indoor or unattended installation**

If the system is installed indoor or in proximity of equipment or materials that cannot be wet, especially if the system is used without supervision, to prevent incidental damages resulting from any failure of the system, we strictly recommend to install the pump in a location having a water drain and to install alarm and security systems that can automatically stop the system.

Maintenance

NOZZLES - Nozzles and automatic drain valve can get clogged periodically because of limestone if you have not adopted a water treatment system. To clean it, remove the nozzle from the nozzle holder, dismount it completely and soak it for 20 minutes in phosphoric acid solution. If cleaning the nozzle does not help, replace it with a new one.

INLET FILTER – we recommend to replace filters at least once every year. Do not let the filters clog otherwise the inlet water flow and pressure will be reduced. If the filter is equipped with a pressure gauge, check the pressure, it must not be less than 2 bar.

OIL PUMP - Check the oil level after the first 500 hours of work, then regularly every 1000 working hours by means of the oil dipstick or control and. Oil changes should be made sucking the old oil by means of a special syringe.

PUMP GASKETS – It is compulsory to replace pump seals every 1500 working hours or when pressure drops occur.

PUMP CHECK VALVES - must be cleaned or replaced every 1500 working hours or when pressure drops occur.

WINTER SEASON - Always remove nozzles and drain valve system during the winter months or when the system is not used for a long time. Keep them in a dry place until you use the system again. Do not leave the pump exposed to frost.

STORAGE TANK CLEANING - On pumps equipped with a storage tank system (BPS), it is compulsory to periodically clean it every 6 months. Remove the metal cover of the machine and the plastic cover on the tank. Suck all water with a syringe and clean the tank inside. Sanitize the tank by introducing 3 / 4 liters of previously chlorinated water (use chlorine tabs if needed). The chlorinated water must not be sprayed through nozzles to avoid health hazards.

Troubleshooting

The system can be disassembled if necessary, for example to replace a pipe or fitting. To remove a tube, put a 10 mm spanner on the tube and slide it until you're up against the fitting. Keep the key in one hand and pull the rod away from the junction with the other. It should slip off easily. Always cut the pipe so as to achieve a net margin, not scratched or damaged, before installing. If there is a leak close to the nozzle thread, turn off the pump and remove the nozzle. Make sure the O-ring is not damaged. If necessary, replace the O-ring and replace the nozzle with a new one. If the pump runs but does not reach the set pressure, try to adjust the pressure by turning the control valve (refer to the pump manual). If the pump works but the system does not spray mist, turn off the pump, remove one or more nozzles, then turn on the pump and check that water is coming out from the nozzle holder hole.

GENERAL WARRANTY TERMS

Congratulations on your purchase of a TecnoCooling appliance.

By purchasing this household or professional appliance you have acquired specific warranty rights regulated as follows:

The warranty is issued in the country where the machine was purchased, in accordance with local laws.

1. Tecno.Mec Srl guarantees that the products it manufactures are free from defects and comply with the technical specifications declared by the Seller. For Product parts not manufactured by the Seller, only the relative supplier's guarantee shall apply.
2. The warranty will not be applied in case of improper or abnormal use, careless during the use or recovery (ex: in case of failure to comply manual instructions), improper installation, maintenance or repairs performed by unauthorized persons, damages due to transportation, defects not attributed to faulty production but rather to the wear and tear that occurs during normal use of the appliance (in particular, limestone and deterioration of parts subject to wear, such as gaskets, grinder disks or water filters); inefficiently performance due to the use

of non original spare parts and accessories; damages due to lightning discharges, humidity, fire, incompatible voltages, or any other cause not objectively ascribable to the manufacturer, any damage due to the poor maintenance :in particular, if descaling is not performed regularly and all components and connections are not cleaned properly.

Note: Please note that the appliance settings and calibrations (ex: working pressure, timer settings, humidity controller settings) have been standardized for all countries; therefore, we shall not accept claims in connection with any request to modify these settings. In addition, no warranty claims will be accepted due to improper use and/or operation outside the usage parameters stated in the directions for use.

3. This warranty is valid for 1 years from the date you purchased the appliance from your dealer located within the European Union.
4. During the warranty period, the user has the right to request service under the warranty only if she/he notifies Tecno.Mec Srl of the defect within two months of its first appearance.
5. In all countries outside the European Union, the warranty conditions specifically provided under the respective national laws will apply.
6. The guarantee only covers the replacement or repair of Products featuring manufacturing faults acknowledged by the Seller, with the exclusion of any further and different obligation. The warranty service is subject to delay, if servicing is performed in a country other than the one in which the appliance was purchased, due to variable product distribution timing in different countries, and a specific version may be sold in a country.
7. Any servicing performed on the appliance under the warranty will not result in an extension or renewal of the warranty period. Any replaced parts will automatically become property of Tecno.Mec Srl.
8. Should you require warranty service, arrange for the appliance to be delivered to the nearest authorized service center or to your dealer. Please ensure that the packing container is in perfect condition and is suitable for safely transporting the appliance. Inside the packaging, please enclose your complete address together with a brief description of the problem. Please also include the original purchase document (sales receipt, invoice) and the warranty certificate, duly completed, to prove that you are entitled to warranty service.
9. Manufacturer will not be liable for any direct or indirect injury or damage to persons, pets, or property as a result of failure to observe the instructions provided in the instruction booklet, especially those concerning installation, use and maintenance of the appliance.
10. If you need more information or if you have problems obtaining service, please visit www.tecnocooling.com or contact the Consumer Care Centre in your country.
11. Appliances to be repaired must be sent to our repair center: TECNOMECH-TECNOCOOLING, Via A. Volta 10, 42024 CASTELNOVO SOTTO (RE).

For all disputes the competent court is that of Reggio Emilia.

DISPOSAL OF THE MACHINE

When you decide to scrap the pump, please take the following steps:

- disconnect the machine from the mains;
- cut the external supply cable;
- cut the motor supply cable;

ECOLOGICAL INFORMATION

You must observe the current local regulations regarding water supply. Pursuant to the pollution standards, the appliance cannot be connected directly to the public drinking water supply network in order to prevent chemicals from entering the water mains. The Water and Gas Board does however allow connection to the public water supply for a short time only if a check valve is fitted in the piping. This must be fitted directly on the water tap.

Disposal of the machine's packaging, extracted dust, parts replaced, the machine altogether, and the various liquids must be done in an environmentally friendly manner, without polluting earth, air and water, and in any case complying with the relevant regulations in force.



INSTRUCTIONS FOR SUITABLE WASTE TREATMENT:

- ☐ Ferrous materials, aluminium, copper: recyclable materials to be given to an authorized collection centre.
- ☐ Plastic materials: materials to be taken to a landfill, incinerator or a special recycling centre.
- ☐ Used oils: give these to an authorized collection centre.

DICHIARAZIONE DI CONFORMITA'

DECLARATION OF CONFORMITY
(ai sensi della Direttiva Macchine 2006/42/CE, allegato II/A)

Tecno.Mec Srl

Divisione



Sede legale e amministrativa:

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

Dichiara, sotto la propria esclusiva responsabilità, che la macchina

Declares, under its exclusive responsibility, that the machine

Identificazione del prodotto <i>Product identification</i>	Gruppo Motopompa <i>Motor-pump group</i>
Funzione <i>Function</i>	Pompa nebulizzatrice per raffreddamento esterno /interno, abbattimento polveri, controllo umidità, controllo odori, disinfezione, pre-cooling <i>Misting pump for outdoor / indoor cooling, dust suppression, humidity control, odor control, disinfection, pre-cocoling</i>
Modello <i>Model</i>	NT FOG – NT FOG TIME
Tipo <i>Type</i>	FOG UNIT

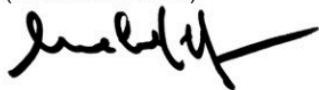
è conforme a tutte le disposizioni pertinenti della direttiva 2006/42/CE

is in conformity with the provisions of the directive 2006/42/CE

Tecno.Mec Srl

Amministratore - Direttore generale

(MELIGA PIETRO)



Il fascicolo Tecnico è custodito presso
The technical booklet is stored at

Tecno.Mec srl via Canale,114- 42014- Casalgrande (RE)

Persona Incaricata
Person responsible

Stefano Meliga

SCHEMI ELETTRICI / WIRING DIAGRAM

NT FOG "VAR"

