

IMMERSED ELECTRODES HUMIDIFIERS EASYSYSTEM



Use and Maintenance Manual

READ AND KEEP

Thank you for choosing a sunk-electrode PEGO EASYSTEAM humidifier

Read this manual carefully: doing so will ensure that installation is carried out correctly and that the machine is used properly and efficiently.

You are therefore advised to store the manual near the humidifier so that it can be consulted for maintenance and/or modification purposes as and when necessary.

How to read the manual.

To aid comprehension the manual contains the following symbols:



Note to be read carefully.



Indicates procedures that must be followed with due care and attention so as to prevent damage to the humidifier, injury or malfunctions



Indicates forbidden practices and procedures which could cause damage to the humidifier, injury or malfunctions.



Useful tip.



Indicates that the PEGO 2 HUMIDIFIER DIVISION customer service centre (phone number given at the end of the manual) should be contacted.

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CHAP.1 INTRODUCTION

1.1

GENERAL

Pego EASYSTEAM sunk-electrode humidifiers are the latest family of humidifiers to be released onto the market: they are characterised by outstanding completeness of performance and extremely simple maintenance.

The range includes 3 Kg/h and 6Kg/h humidifiers with single-phase power supply and 6 Kg/h, 12 Kg/h, 24 Kg/h and 48 Kg/h humidifiers with 3-phase + neutral power supply; they all feature proportional control mode (with 4-20 mA, 0 – 10 V signal) or a simpler ON/OFF control mode.

EASYSTEAM humidifiers feature software with an extensive programming range, full personalisation and completely automatic operation

This means that the user can set steam output to maximum or some intermediate percentage, regulate de-concentration emptying frequency or have all the water emptied automatically when the machine has been idle for a set time.

The EASYSTEAM line also features a display that shows real-time room humidity, the current being absorbed by the electrodes, working hours, various warnings/alarms, water filling/emptying status and a full range of user-friendly programming parameters.

EASYSTEAM humidifiers also incorporate a buzzer to warn the user of any faults; the internal software evaluates the seriousness of the problems and shuts down or continues steam generation accordingly.

A key advantage of the EASYSTEAM range is that the cylinder with the stainless steel electrodes is easily changed when normal wear makes such replacement necessary.



EASYSYSTEM humidifiers are covered by a 24-month warranty against all manufacturing defects as from the date indicated on the product ID code or from the date of product registration card, if present.

In the event of a defect the product must be appropriately packaged and sent to our factory or any authorized Service Center by authority RMA number received.

Customers are entitled to have defective products repaired, spare parts and labour included. Transport expenses and risk shall be met entirely by the customer.

Repairs carried out under warranty do not prolong or renew the warranty expiration date.

The Warranty does not cover:

- Damages resulting from tampering, impact or improper installation of humidifier and its accessories.
- Behaviour inconsistent with Manufacturer's prescriptions and instructions.
- Damages caused by repairs made by unauthorized persons.
- Spare parts (immersed electrodes steam cylinder)
- Damages caused by natural phenomena as lightning, natural calamities, etc.

Warranty cover may be refused if the device is modified or changed.

Under no circumstances **Pego S.r.l.** will be responsible for possible loss of data and information, costs of substitutive goods or services, damages to things, people or animals, non-sale or non-gain, activity interruption, possible direct, indirect, accidental, property, covering, punitive, special or consequential damages anyhow caused, whether they are contractual, extra-contractual or due to negligence or other responsibility, derived from product use or from its installation.

The wrong machine working caused by manumissions, shoves, inadequate installation automatically forfeits the warranty right. It is compulsory to respect all information of this user manual and device operating conditions.

PEGO S.r.l. declines any responsibility for possible errors or inaccuracies written in this manual as a result of printing or transcription errors.

PEGO S.r.l. reserves the right to modify its products as it deems necessary without altering its main characteristics. Each new release of a PEGO user manual replaces all the previous ones.

However not expressly indicated, the warranty follows the laws in force and particularly the section 1512 C.C. (Italian Civil Code)

For any controversy is elected by the parties and recognized the jurisdiction of the Court of Rovigo.

1.3

OPERATING PRINCIPLE

The sunk-electrode humidifiers in the EASYSTEAM range use the conductivity of potable water to produce steam by boiling.

The cylinder electrodes are sunk in the water: a current is generated between the electrodes and this heats the water to boiling point.

Current intensity (expressed in amperes) varies according to the quantity of in-cylinder water that is in contact with the electrode surfaces and the conductivity of the water.

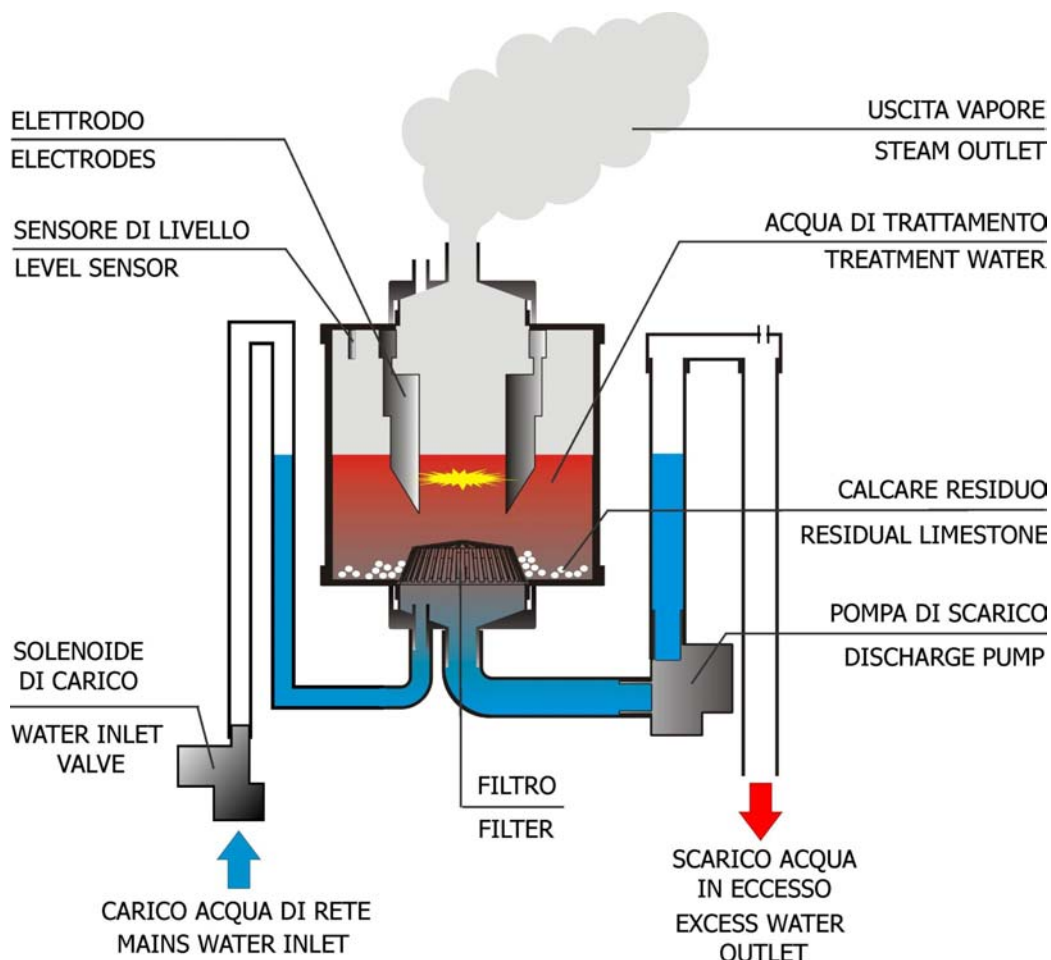
The electronic controller measures, via an amperometric transformer, current intensity and controls the water inlet valve (to raise the water level) or the discharge valve (to lower it) accordingly. This system is fully automatic.

Combined use of the microprocessor and a humidity sensor also makes it possible to effect proportional control: this optimizes water and electricity consumption according to required humidity levels.

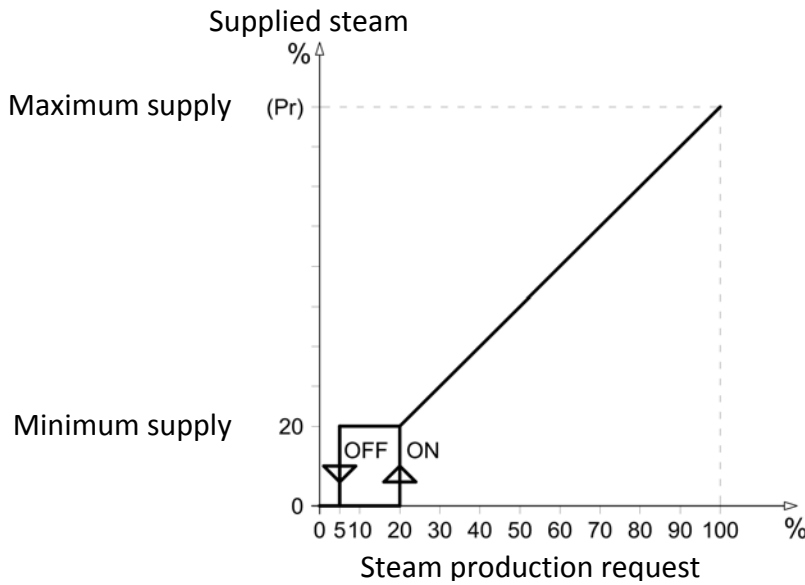
In addition to ensuring that the humidifier works properly the discharge pump also empties the cylinder completely when the unit had been idle for a set time: this prevents limescale or other particles created during the boiling process from depositing.

The humidifiers in the EASYSTEAM range are fully automatic and require only replacement of the cylinder when the electrodes are worn.

The diagram below illustrates the operating cycle.



The supplied steam is managed proportionally to steam production request that the electronic control computes on the basis of functioning selected between the available five described at chap. 2.4. The minimum steam supply is fixed at 20% and it is managed by an activation hysteresis; the maximum supply obtained with the maximum steam production request, corresponds to first level variable set percentage (Pr). For example if the steam production percentage Pr, on ES6 humidifier that produces 6Kg/h of steam, is set to 100%, the maximum supply will be 6Kg/h; but if the maximum supply will be 3Kg/h.



To ensure proper humidifier performance use only mains drinking water; this is because it is free from any harmful content and is compatible with the conductivity range needed for optimal humidifier performance. Note that in some areas mains water may be unsuitable for optimal performance owing to very low conductivity or very hard or too much aggressive; the following table summarizes the parameters required for correct humidifier operation.

WATER SUPPLY OPERATING RANGE		LIMITS	
PARAMETER	UNIT OF MEASURE	MIN	MAX
* Conductivity of water at 20° C	μS/cm	250	1300
Hardness	mg/l CaCO ₃	160	450
Chlorine	mg/l Cl	0	0,2
Chlorides	ppm Cl	0	25
Calcium sulphate	mg/l CaSO ₄	0	95
Metalline impurities / Solvents / Soaps / Lubricants	mg/l	0	0
Temperature	°C	+1	+40

* Stated conductivity refers to water at 20° C; bear in mind that conductivity diminishes as water temperature falls and so water may not be very conductive in winter when mains water is particularly cold.



To avoid this inconvenience, diminish the produced steam percentage described in chapter 3 PROGRAMMING of this manual.



Do not fill the humidifier with water from wells or water that has been treated with osmosis/demineralising/softening purifiers.

1.4

ES SERIES HUMIDIFIER ID CODES

- ES3-M** single-phase covered humidifier with steam output capacity of 3 Kg/h, on/off work mode with external enabling, proportional mode with inbuilt humidity switch and 4-20mA humidity sensor, proportional mode with 0-10 V signal

- ES6-M** single-phase covered humidifier with steam output capacity of 6 Kg/h, on/off work mode with external enabling, proportional mode with inbuilt humidity switch and 4-20mA humidity sensor, proportional mode with 0-10 V signal.

- ES6** three-phase covered humidifier with steam output capacity of 6 Kg/h, on/off work mode with external enabling, proportional mode with inbuilt humidity switch and 4-20mA humidity sensor, proportional mode with 0-10 V signal.

- ES12** three-phase covered humidifier with steam output capacity of 12 Kg/h, on/off work mode with external enabling, proportional mode with inbuilt humidity switch and 4-20mA humidity sensor, proportional mode with 0-10 V signal.

- ES24** three-phase covered humidifier with steam output capacity of 24 Kg/h, on/off work mode with external enabling, proportional mode with inbuilt humidity switch and 4-20mA humidity sensor, proportional mode with 0-10 V signal.

- ES48** three-phase covered humidifier with steam output capacity of 48 Kg/h, on/off work mode with external enabling, proportional mode with inbuilt humidity switch and 4-20mA humidity sensor, proportional mode with 0-10 V signal.

1.5

ES SERIES HUMIDIFIERS TECHNICAL DATA

TECHNICAL DATA and OPERATING CONDITIONS	ES3-M	ES6-M	ES6	ES12	ES24	ES48
STEAM PRODUCTION (Kg/h)	3	6	6	12	24	48
ELECTRICAL POWER SUPPLY	230V 50-60HZ		400V 3/N 50-60HZ			
POWER (KW)	2	3	4,5	9	18	35
ABSORBED CURRENT (A)	9	13,5	6,5	13	25	51
TYPE OF CONTROL	SLIM EASYSTEAM					
ELECTRONIC CONTROL POWER SUPPLY	230V 50-60HZ					
STEAM OUTLET DIAMETER (mm)	25	25	25	25	40	40
NUMBER OF CYLINDERS	1	1	1	1	1	2
WEIGHT (EMPTY) (Kg)	10	10	10	12	19	38
WEIGHT OF WORKING UNIT (Kg)	12	13	13	18	37	74
WATER SUPPLY PRESSURE	1-10 bar					
WORKING AMBIENT TEMPERATURE	+1 ÷ +40 °C					
WORKING AMBIENT HUMIDITY.	< 60 %RH (90 %RH not condensing)					
STORAGE TEMPERATURE	-10 ÷ +70 °C					
PROTECTION RATING	IP20					

1.6

OEM SERIES HUMIDIFIER ID CODES

- ES3-M-OEM** single-phase custom humidifier complete with electronic kit with steam output capacity of 3 Kg/h, on/off work mode with external enabling, proportional work mode with in-built humidity switch and 4-20mA humidity sensor, proportional operation with 0-10 V signal.
- ES6-M-OEM** single-phase custom humidifier complete with electronic kit with steam output capacity of 6 Kg/h, on/off work mode with external enabling, proportional work mode with in-built humidity switch and 4-20mA humidity sensor, proportional operation with 0-10 V signal.
- ES6-OEM** three-phase custom humidifier complete with electronic kit with steam output capacity of 6 Kg/h, on/off work mode with external enabling, proportional work mode with in-built humidity switch and 4-20mA humidity sensor, proportional operation with 0-10 V signal.
- ES12-OEM** three-phase custom humidifier complete with electronic kit with steam output capacity of 12 Kg/h, on/off work mode with external enabling, proportional work mode with in-built humidity switch and 4-20mA humidity sensor, proportional operation with 0-10 V signal.
- ES24-OEM** three-phase custom humidifier complete with electronic kit with steam output capacity of 24 Kg/h, on/off work mode with external enabling, proportional work mode with in-built humidity switch and 4-20mA humidity sensor, proportional operation with 0-10 V signal.

1.7

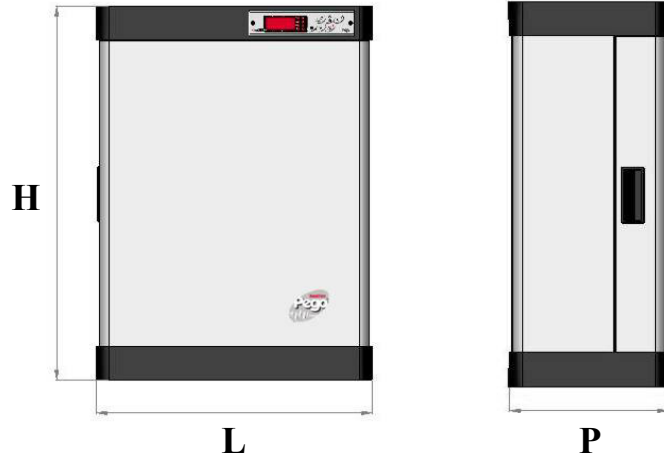
OEM SERIES HUMIDIFIERS TECHNICAL DATA

TECHNICAL DATA and OPERATING CONDITIONS	ES3-M-OEM	ES6-M-OEM	ES6-OEM	ES12-OEM	ES24-OEM
STEAM PRODUCTION (Kg/h)	3	6	6	12	24
ELECTRICAL POWER SUPPLY	230V 50-60HZ		400V 3/N 50-60HZ		
POWER (KW)	2	3	4,5	9	18
ABSORBED CURRENT (A)	9	13,5	6,5	13	25
TYPE OF CONTROL	SLIM EASYSTEAM				
ELECTRONIC CONTROL POWER SUPPLY	230V 50-60HZ				
STEAM OUTLET DIAMETER (mm)	25	25	25	25	40
NUMBER OF CYLINDERS	1	1	1	1	1
WEIGHT (EMPTY) (Kg)	6	6	6	9	11
WEIGHT OF WORKING UNIT (Kg)	8	9	9	15	23
WATER SUPPLY PRESSURE	1-10 bar				
WORKING AMBIENT TEMPERATURE	+1 ÷ +50 °C				
WORKING AMBIENT HUMIDITY	< 60 %RH (90 %RH non-condensing)				
STORAGE TEMPERATURE	-10 ÷ +70 °C				
PROTECTION RATING	IP00				
AMBIENT TEMPERATURE OF ELECTRONIC CONTROL OPERATION	+0 ÷ +60 °C				
AMBIENT HUMIDITY OF ELECTRONIC CONTROL OPERATION	< 60 %RH (90 %RH non-condensing)				
ELECTRONIC CONTROL PROTECTION RATING	IP20				

1.8

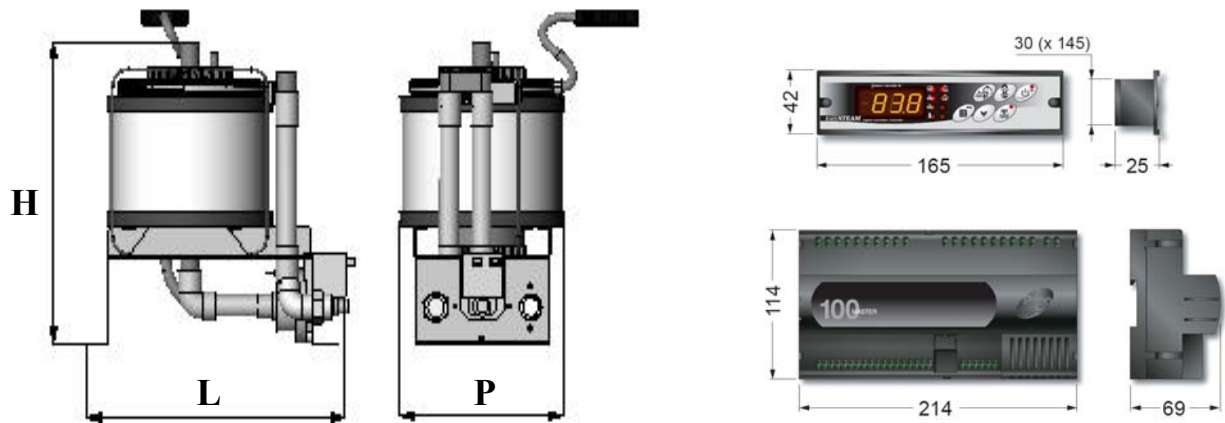
OVERALL DIMENSIONS

ES SERIES



TYPE	ES3-M	ES6-M	ES6	ES12	ES24	ES48
L	430	430	430	430	430	610
P	240	240	240	240	240	290
H	525	525	525	625	710	710

OEM SERIES



STEAM GENERATING UNIT

ELECTRONIC KIT

TYPE	ES3-M OEM	ES6-M OEM	ES6 OEM	ES12 OEM	ES24 OEM
L	340	340	340	340	340
P	210	210	210	210	210
H	380	380	380	480	565

Measurements in mm.

1.9

IDENTIFICATION DATA

The unit described in this manual has, on its side, an ID plate showing all the relevant identification data:

- Name of Manufacturer
- Unit model
- Serial number
- Power supply voltage
- Rated current



1.10

STANDARD ASSEMBLY KIT

EASYSTEAM humidifiers come complete with:

N° 1 gas connector, $\frac{3}{4}$ ", for water inlet.

N° 1 discharge connector, external diameter 40 mm, with fixing clip on ES models, external diameter 25 mm on OEM models.

N° 1 steam pipe connector, external diameter 25 mm, for models from 3 to 12 Kg/h and external diameter of 40 mm for models from 24 to 48 Kg/h with relative fixing clip.

N° 1 user's manual.

N° 1 Final Test checklist showing:

- Humidifier model
- Default configuration
- Steam production at 100%
- Type of electrical power supply
- Absorbed power in kW
- Rated current absorption

N° 1 ELECTRONIC KIT (for OEM series models only)

- MASTER 100 (electronic control board with PEGO EASYSTEAM software)
- SLIM (electronic controller with screen for control and display)
- TOROIDAL (current absorption sensor)
- CONNECTOR (connector for cylinder connection)

CHAP. 2 INSTALLATION**2.1****IMPORTANT INFORMATION FOR THE INSTALLER**

1. The installation, maintenance and use of the equipment must be performed by qualified personnel capable of executing all the operations required in complete safety. Read this manual carefully before performing any task and follow all directions
2. Install the unit as close as possible to the point at which you wish to emit steam (i.e. a position that minimises the length of the steam tube: this should not be more than 5 m long)
3. Install at a height which gives easy access to the control unit used to set the parameters. An above-ground height of about 1 metre is advised.
4. Install at a height that allows easy access to the humidifier interior for cylinder replacement purposes.
5. Some humidifier's parts, during operation, can exceed 60°C temperature. Make sure the surfaces in contact with them are consistent with those values.
6. Do not install and use the humidifier near to products and objects that can be damaged by water or produced humidity.
7. Do not fit power supply wiring and signal wiring (probes/sensors and digital inputs) in the same raceways or ducts.
8. Minimise the length of connector wires so that wiring does not twist into a spiral shape as this could have negative effects on the electronics.
9. Place a general magneto-thermal cut-off switch upstream from the electronic controller.
10. All conductors used in wiring must be proportionate to support the load that they have to supply.
11. When it is necessary to make a probe/sensor extension, the wires must have a cross-section of at least 1 mm².
12. Connect up the water discharge point to a hose with a diameter of at least 40 mm: make sure the hose does not have any narrow passages and does not at any point exceed the level of the discharge coupling.
13. Fill with potable water only at a pressure of 1 - 10 bar.

14. Check that the ON/OFF, 4-20 mA, 0-10 V default setting given on the attached CHECK LIST sheet is applied before starting the humidifier; if the default setting is different from your needs adjust the machine software settings , with the machine on, as indicated at chapter 3 and according to the connections indicated at chap. 2.4.
15. To function correctly humidifier needs enabling at digital input 1 with a free-voltage contact (terminal blocks 1 and 2 on 100 Master card) indifferently from selected functioning mode.
16. In case it's unnecessary using of external enabling just make bridge on terminal blocks 1 and 2 on 100 Master.
17. If enabling is missing the display will show OFF alternate to normal visualization.

2.2

INSTALLING THE ES SERIES HUMIDIFIER

1. Remove the humidifier from the packaging: keep it vertical as you do so. Remove the nylon cover bag and check that the unit is in good condition.
2. Fix the humidifier to the wall, preferably 1 m above the ground and perfectly level (fig. 1); use the 4 slots at the rear to insert the fixing screws (fig. 2 and 3).

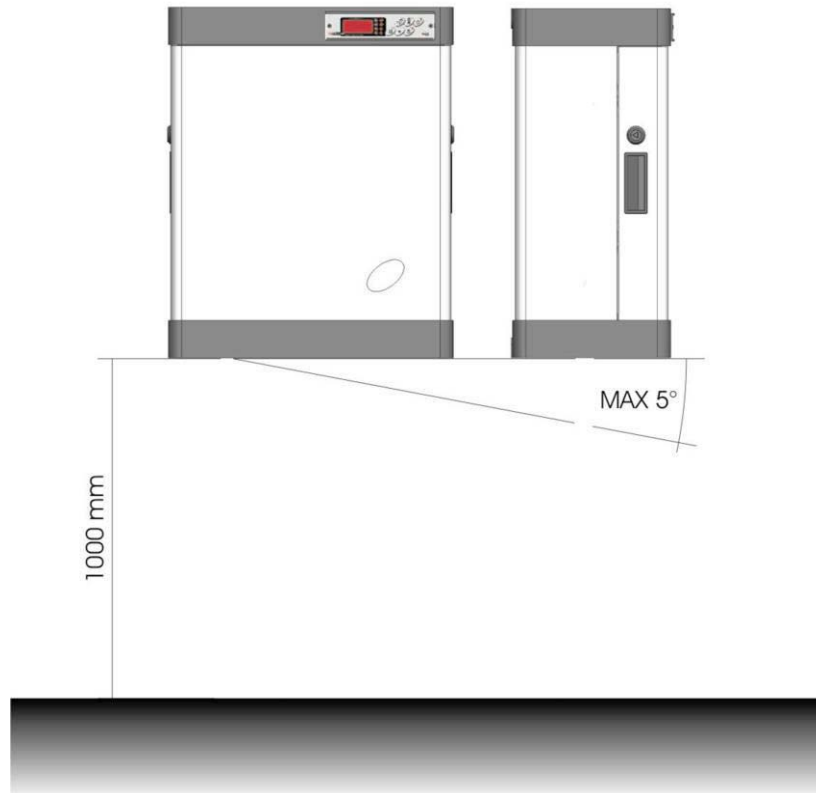


Fig. 1

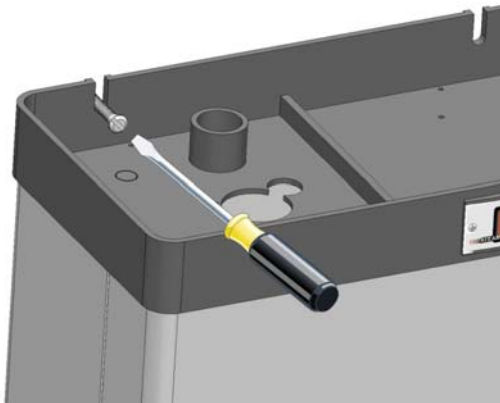


Fig. 2

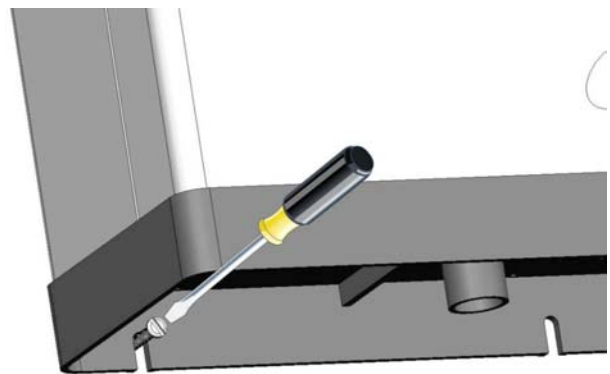


Fig. 3

3. Using a screwdriver, release the safety locks at the sides of the front cover (fig. 4, 5 and 6).

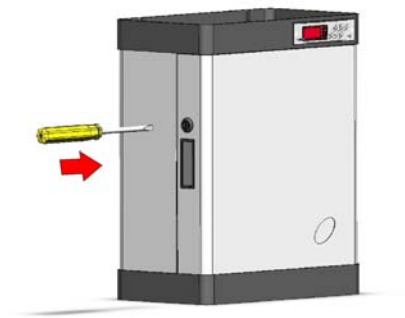


Fig. 4



Fig. 5

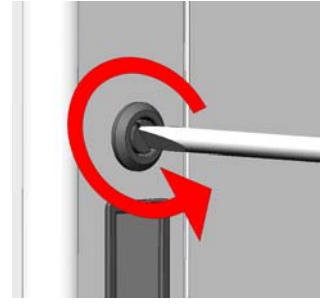


Fig. 6

4. Extract the front cover: grip the two side handles and pull outwards gently (fig. 7).

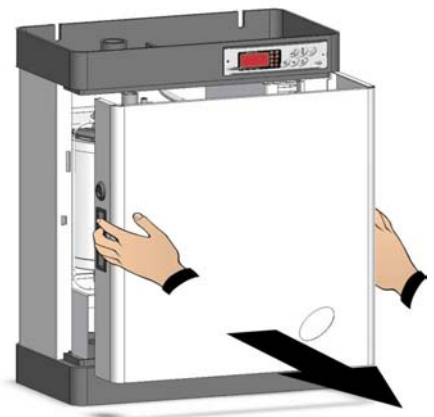


Fig. 7

5. Remove the protective cardboard above the cylinder (fig. 8).

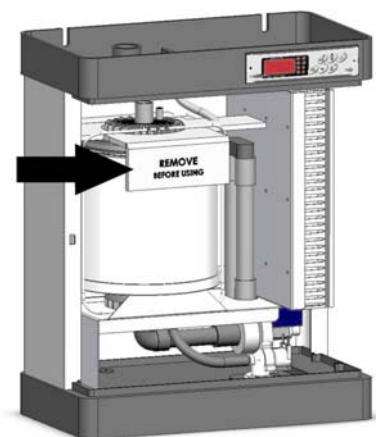


Fig. 8

6. Connect the water drainage discharge pipe to the manifold (40 mm diameter) and fix it in place with the supplied clip (fig. 9 e 10).

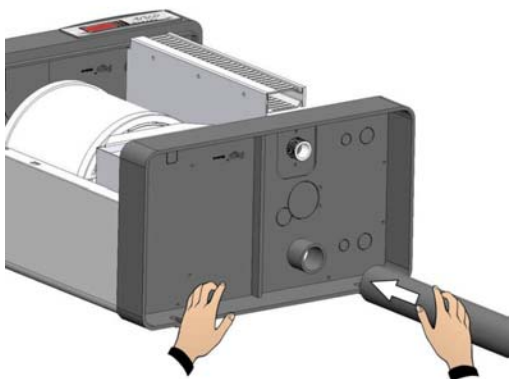


Fig. 9

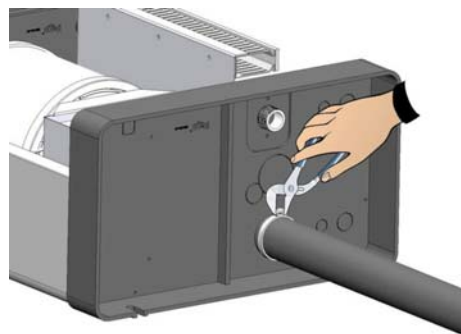


Fig. 10



Only connect the discharge with pipes that are suitable for temperatures of 100 °C and only use pipes with a diameter of at least 40 mm; do not, at any point along the line, exceed the height of the humidifier.



NEVER USE THE HUMIDIFIER WITHOUT THE DISCHARGE LINE CORRECTLY CONNECTED!

7. Connect the water inlet line to the $\frac{3}{4}$ GAS connector of the solenoid valve underneath the humidifier (fig. 11 e 12).

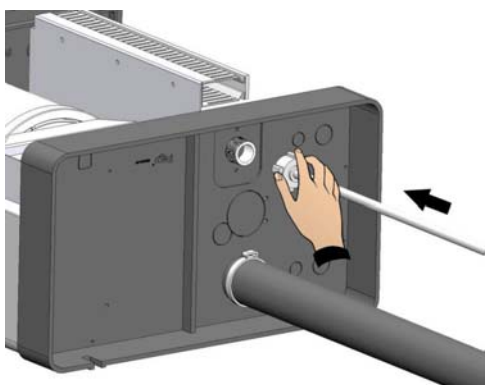


Fig. 11

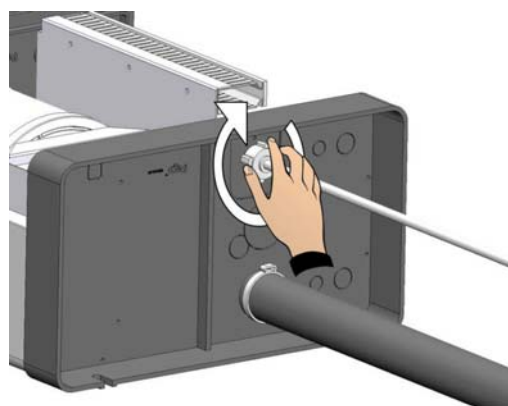


Fig. 12



Connect up the water inlet using a non-metal pipe (use e.g. rubber, PVC, polypropylene, nylon etc.).

8. Connect the steam pipe to the cylinder flange sleeve and fix in place with the supplied clip (fig. 13, 14 e 15).



Fig. 13

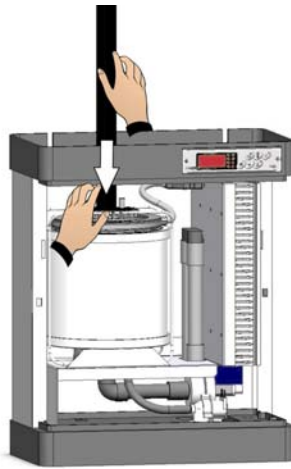


Fig. 14

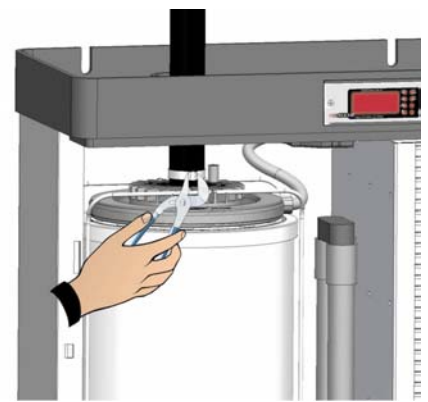


Fig. 15



Use only PEGO HUMIDIFIER steam hoses or others that are certified to withstand high temperatures without any internal vulcanisation or release of harmful substances occurring!



THE HOSE MUST NOT BE CHOKED, HAVE ANY WATER TRAPS (SIPHONS) OR BE LONGER THAN 5 METRES!



For instructions on correct connection of the steam distribution line read Chapter 7 STEAM DISTRIBUTION carefully.

ES SERIES HUMIDIFIER ELECTRICAL POWER CONNECTIONS AND SECURITY

2.3



Connect power supply to the humidifier terminal block linking 230V to R and N terminals for single-phase models and 400V + neutral to terminals RST and N for 3-phase models.

It is mandatory to connect the terminal marked by the yellow/green and by PE mark to power supply earth. If necessary, verify the efficiency of the ground system.

Leave the bridge between terminals 60 and 61 or change it, if necessary, with an emergency normally open contact.

Terminal blocks 62 and 63 are predisposed for fan unit power supply, in case you install that, please refer to the user manual attached to the fan unit.

2.4 ES AND OEM SERIES CONTROL SIGNALS AND SENSORS CONNECTIONS

Humidifier works in five functioning modes set by software parameter S9, described at chap. 3 and by specific electrical connections.

Moreover it is required the enabling of digital input terminal blocks 1 and 2 on 100 Master card for all functioning modes. (in case it's unnecessary using of external enabling just make bridge on terminal blocks 1 and 2 on 100 Master). If enabling is missing the display will show OFF alternate to normal visualization.

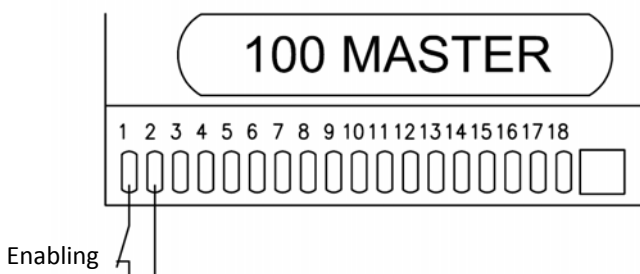
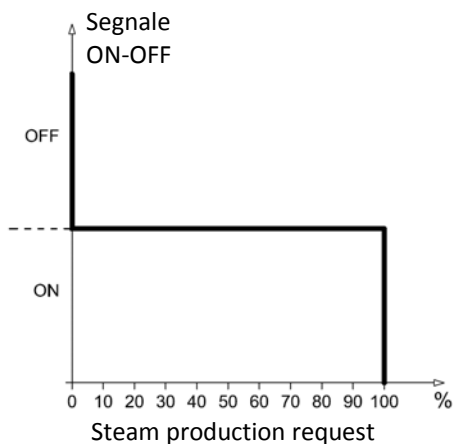
Below description of specific connections for each functioning mode.



In case it's needed to connect 4-20mA probes not supplied by PEGO S.r.l. please call the technical dept. to verify hardware compatibility of the probe with humidifier.

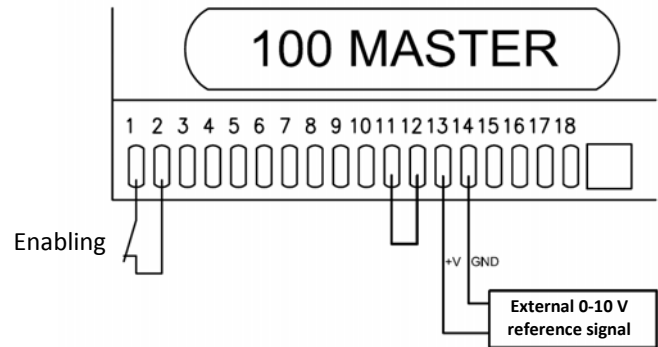
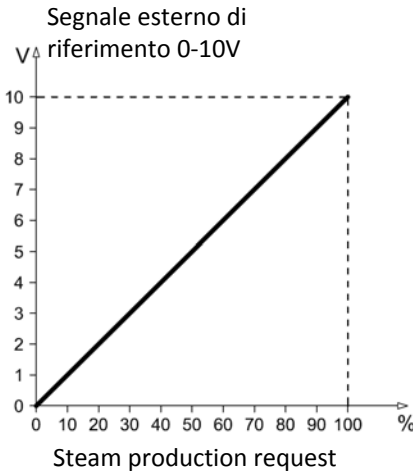
- ON/OFF MODE:

This kind of functioning allows steam production in only 2 modes: total lack of production or production at maximum. Enabling is generally provided by a free-voltage contact coming from an electrical panel controlled by a humidity sensor. To set the second level variable **S9=0** and connect the enabling (normally open free-voltage contact) to terminal blocks **1** and **2** on 100 Master.



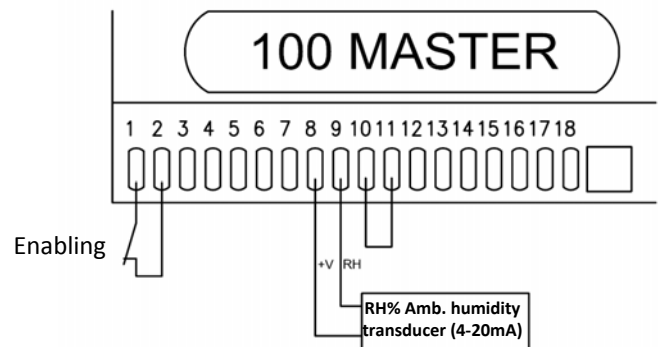
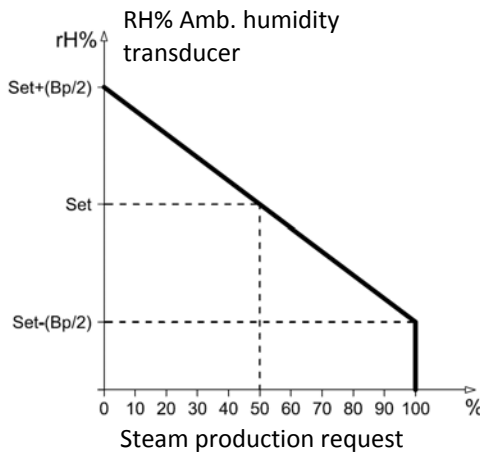
- **PROPORTIONAL mode with 0-10Vdc reference signal:**

This kind of functioning allows steam production proportionally to reference signal 0-10V. Example: a 6V reference signal will lead humidifier to produce 60% of steam referring to software variable Pr. So if Pr= 70% will be 42%. To set the second level variable **S9=2** and make a bridge between terminal block **11** and **12**, connect 0-10V reference signal to terminals **13** and **14**, +V to terminal **13**, GND to terminal **14**.



- **PROPORTIONAL mode with 4-20mA humidity probe:**

This kind of functioning allows steam production in proportional mode, humidifier will regulate automatically the production of steam as per ambient request. Enabling is provided by a 4-20mA humidity probe that regulates steam production, also allowing visualization of ambient relative humidity, directly on humidifier display. To set the second level variable **S9=1** and make a bridge between terminal block **10** and **11**, connect 4-20mA humidity probe signal to terminals **8** and **9**, signal RH to terminal **9**, +V to terminal **8**.



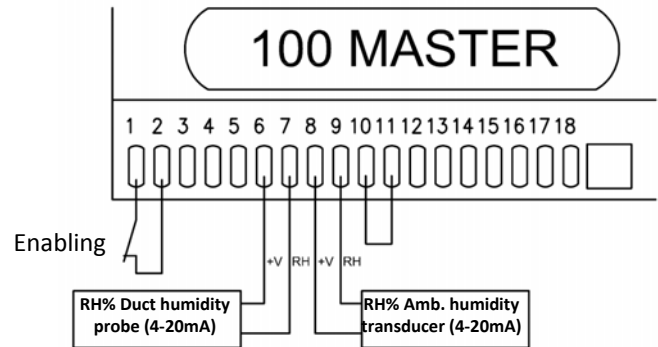
The proportional band Bp is the percentage value of humidity near to the set point, inside this value the humidifier works in proportional mode. Example: if the proportional band is set on default value 10% (-5% / +5% set point value) and the humidity is set to 50%, under 45% the humidifier will works to 100% of steam production; over 55% of humidity the humidifier will not produce steam. Between 45% and 55% the humidifier will adjust the steam production optimally.

- **PROPORTIONAL mode with 4-20mA humidity ambient probe + limit duct probe (4-20mA):**

This functioning mode allows steam production in proportional mode, humidifier will regulate automatically the production of steam as per ambient request and the measured value into duct.

To set the second level variable **S9=3** and make a bridge between terminal block **10** and **11**, connect 4-20mA humidity probe signal to terminals **8** and **9**, signal RH to terminal **9**, +V to terminal **8**. Connect 4-20mA duct probe signal to terminals **6** and **7**, signal RH to terminal **7**, +V to terminal **6**.

For more explanations about duct probe see chap. 3 “PROGRAMMING” (StC, r0, t1 variables).

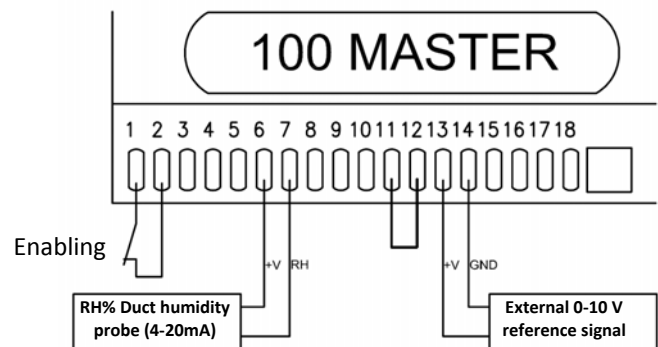


- **PROPORTIONAL mode with 0-10Vdc reference signal + limit duct probe 4-20mA:**

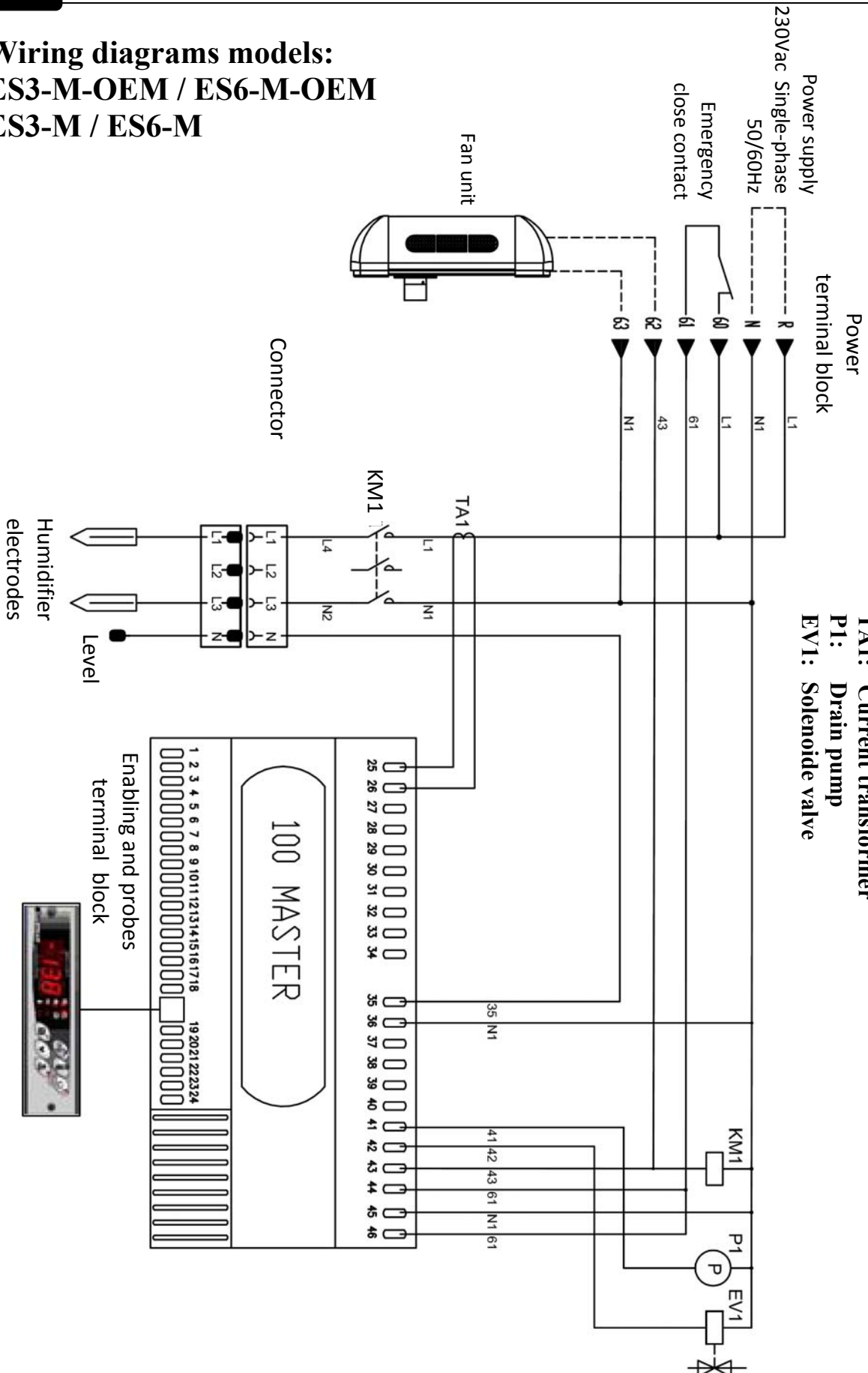
This functioning mode allows steam production in mode proportional to 0-10V reference signal and the measured humidity into duct.

To set the second level variable **S9=4** and make a bridge between terminal block **11** and **12**, connect 0-10V reference signal to terminals **13** and **14**, +V to terminal **13**, GND to terminal **14**. Connect 4-20mA duct probe signal to terminals **6** and **7**, signal RH to terminal **7**, +V to terminal **6**.

For more explanations about duct probe see chap. 3 “PROGRAMMING” (StC, r0, t1 variables).

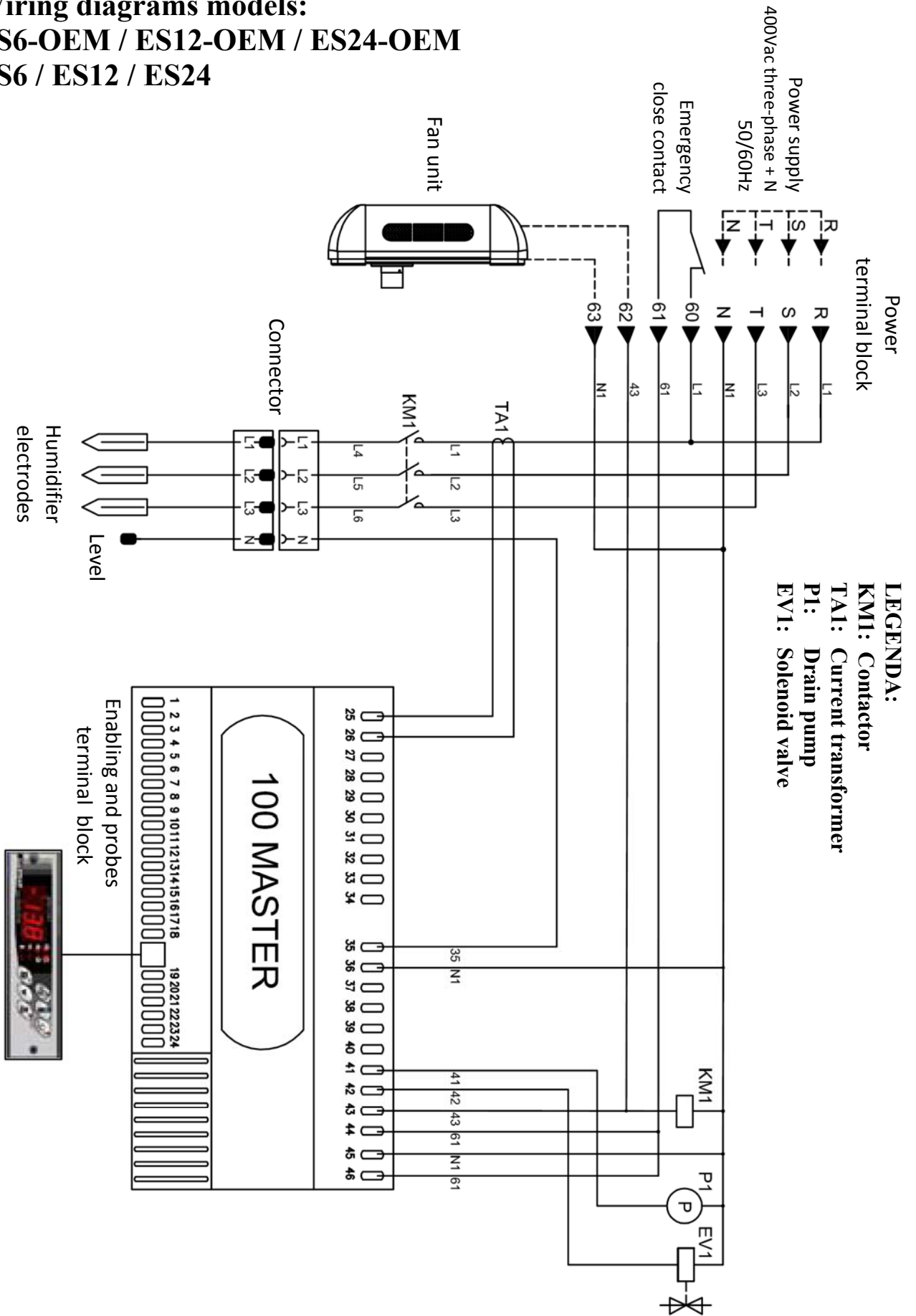


- **Wiring diagrams models:**
ES3-M-OEM / ES6-M-OEM
ES3-M / ES6-M

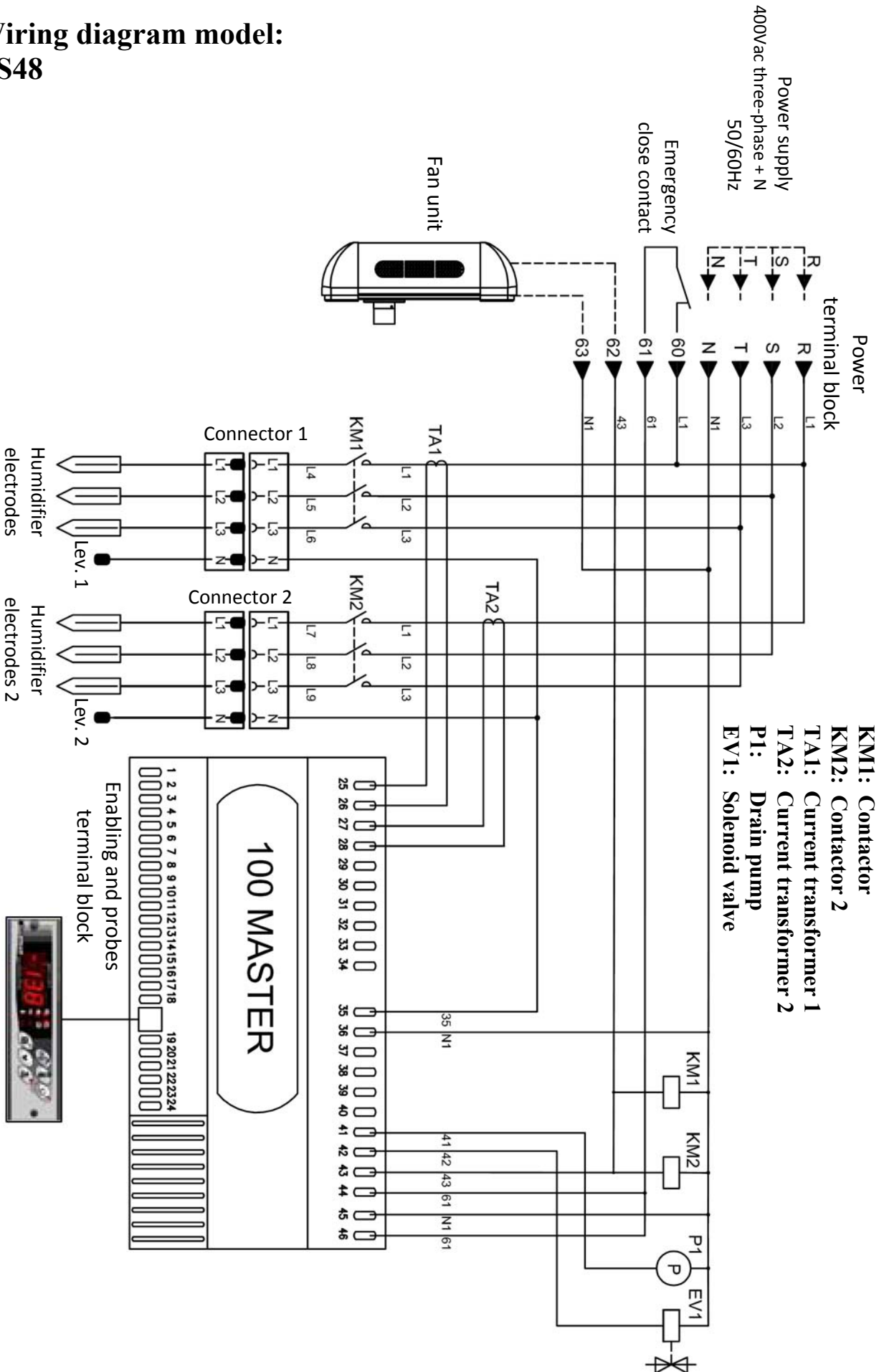


LEGENDA:
 KM1: Contactor
 TA1: Current transformer
 P1: Drain pump
 EV1: Solenoid valve

- **Wiring diagrams models:**
ES6-OEM / ES12-OEM / ES24-OEM
ES6 / ES12 / ES24



- Wiring diagram model:
ES48



- LEGENDA:**
 KM1: Contactor
 KM2: Contactor 2
 TA1: Current transformer 1
 TA2: Current transformer 2
 P1: Drain pump
 EV1: Solenoid valve

2.6

INSTALLING THE OEM SERIES HUMIDIFIER

1. Remove the humidifier from the packaging: keep it vertical as you do so. Remove the nylon cover bag and check that the unit is in good condition.
2. Fix the humidifier so it is level above the cell or base by inserting the fixing screws in the 4 holes of the support base (fig. 17).

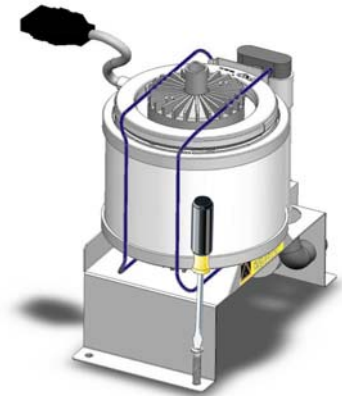


Fig. 17

3. Connect the water discharge (emptying) pipe to the manifold (25 mm diameter) and fix it in place with the supplied clip (fig. 18 and 19).

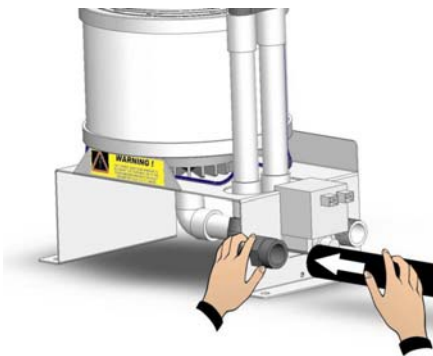


Fig. 18

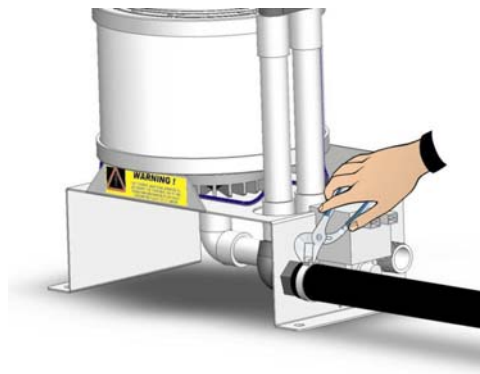


Fig. 19



The discharge hose must not be choked/pinched or create pressure: if it does the installation of a vent on the discharge line (as shown in fig. 20) is essential.

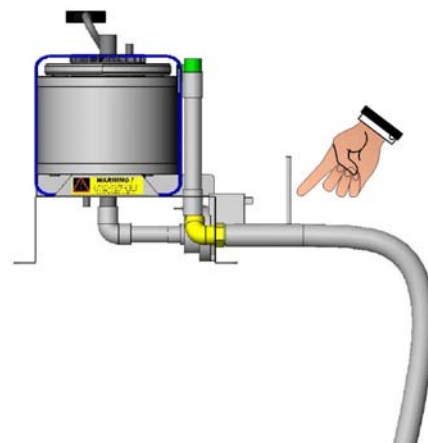


Fig. 20



Only connect the discharge with pipes suitable for temperatures of 100 °C and only use pipes with a diameter of at least 25 mm; do not, at any point along the line, exceed the height of the humidifier.



NEVER USE THE HUMIDIFIER WITHOUT THE DISCHARGE LINE CORRECTLY CONNECTED!

4. Connect the water inlet line to the $\frac{3}{4}$ GAS connector of the solenoid valve (fig. 21 and 22).

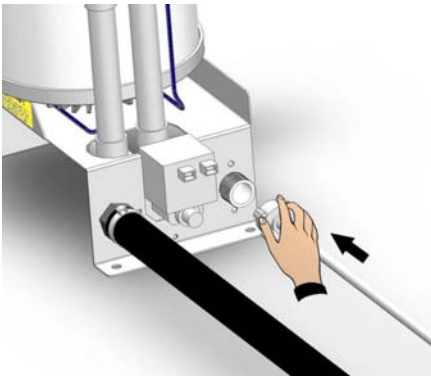


Fig. 21

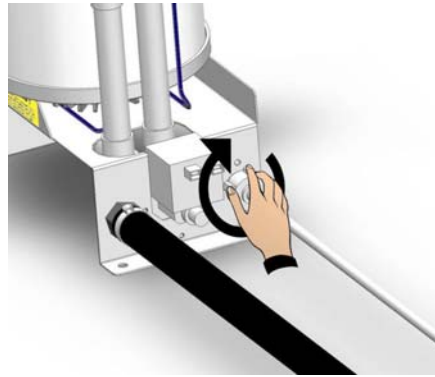


Fig. 22



Connect up the water inlet using a non-metal pipe (e.g. rubber, PVC, polypropylene, nylon etc.)

5. Connect the steam pipe to the cylinder flange sleeve and fix it in place with the supplied clip (fig. 23 and 24).

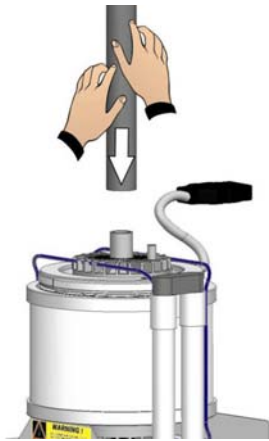


Fig. 23

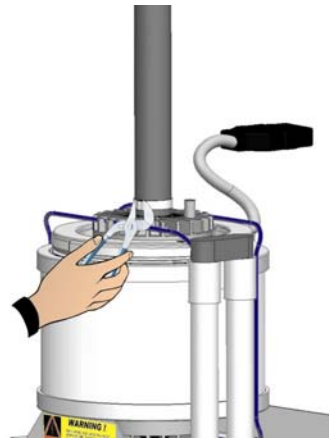


Fig. 24



THE HOSE MUST NOT BE CHOKED, HAVE ANY SIPHONS OR BE LONGER THAN 5 METRES



For instructions on correct connection of the steam distribution line, read Chapter 8 STEAM DISTRIBUTION carefully.

2.7

OEM SERIES ELECTRICAL HUMIDIFIER CONNECTION



Humidifiers belonging to the OEM series are characterised by a steam generating unit and a separate electronic kit. Electrical connections are the responsibility of the customer and they are the same described at paragraphs 2.3, 2.4, 2.5.

If you wish to make settings different from the default ones, carry out the procedures given at paragraph 2.4.

CHAP. 3 PROGRAMMING

3.1

DESCRIPTION OF SLIM CONTROLLER

1. The SLIM CONTROLLER is the control unit on the front of the humidifier. It consists of an 8-LED display to visually check values (fig. 25) and 6 keys to adjust display and modify settings (fig. 26).

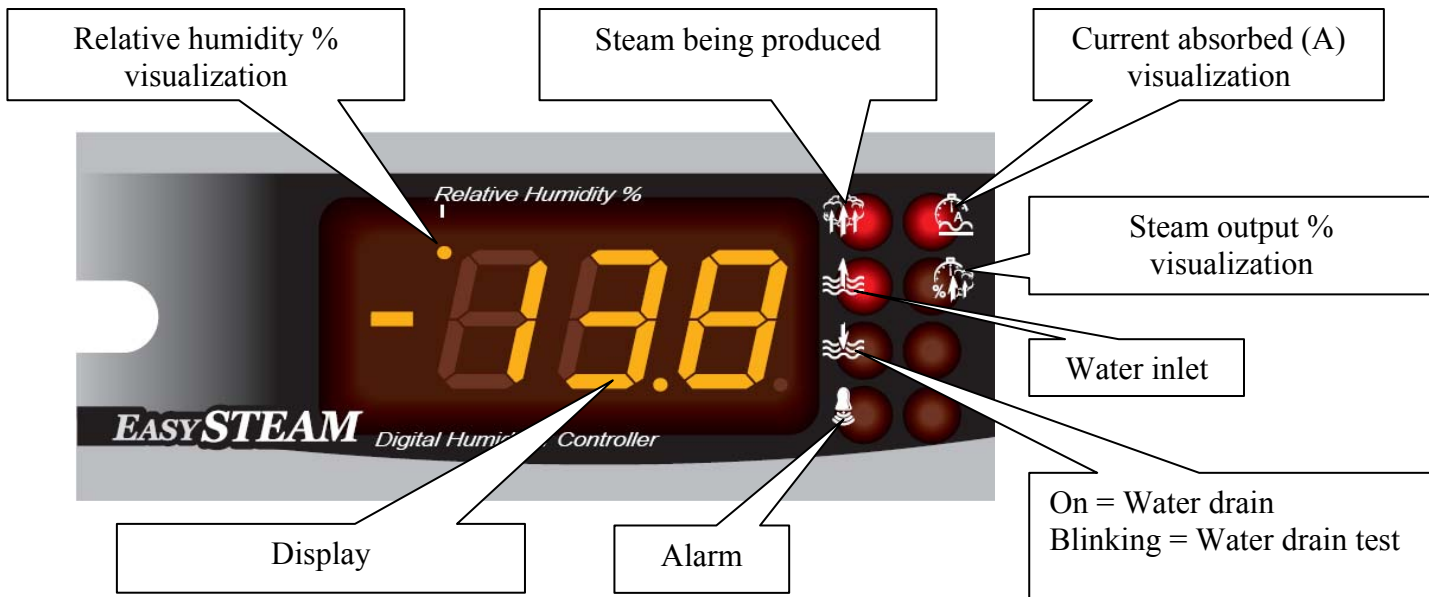


Fig. 25

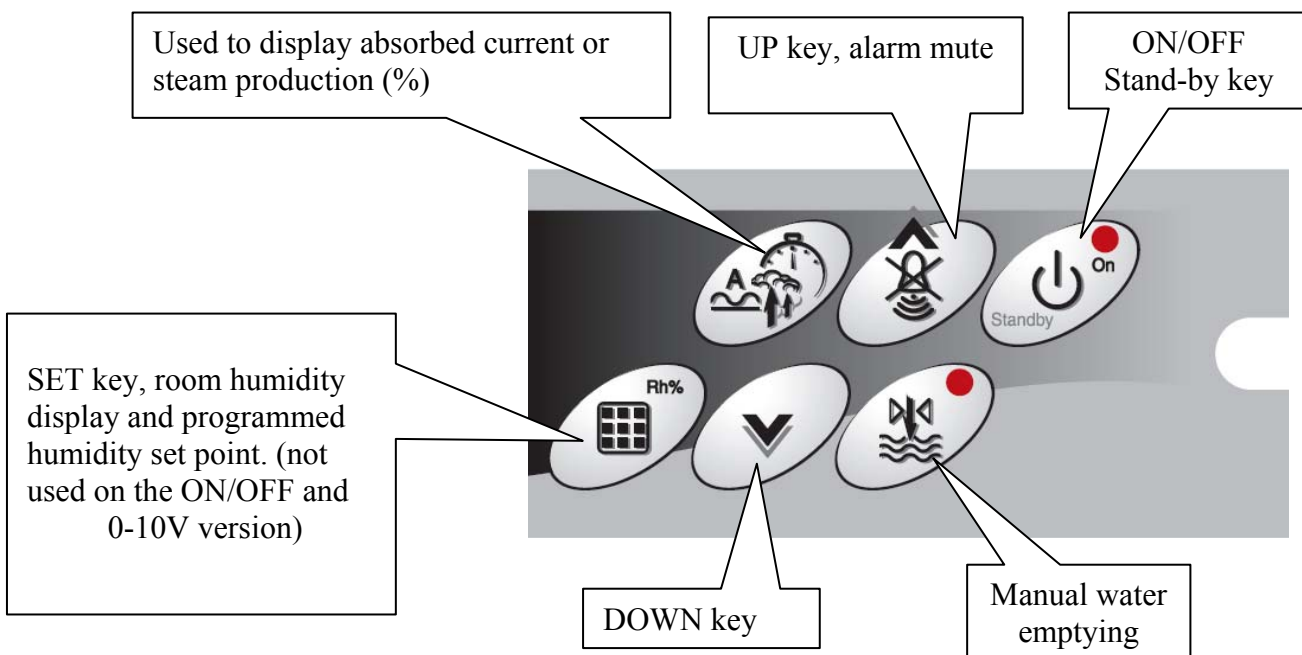


Fig. 26

3.2

LEVEL 1 PROGRAMMING

- Level 1 programming allows the user to modify 2 important parameters, the proportional band Bp and the steam production percentage Pr.

VAR.	MEANING	VALUES	DEFAULT all models
Pr	Steam production percentage	20 ÷ 100 %	100 %
Bp	Proportional band (not used on the ON/OFF versions)	1 ÷ 20 Rh%	10 %
StC	Max humidity set point in duct Outgoing set point value humidifier will switch off and start functioning again when humidity into duct will go below the value StC – r0 adding t1 time, following the logic sent by 0-10V signal or by ambient humidity sensor	25 ÷ 99 Rh%	99%
r0	Max humidity set point in duct differential	1 ÷ (StC – 20) Rh%	50%
UrC	Humidity duct sensor value	0-100%	only read



The proportional band Bp is a percentage humidity value around the set point; within this band the humidifier works in proportional mode.

Example: if proportional mode is set to the default value of 10% (-5% / +5% with reference to the set point) and humidity is set to 50%, then below 45% the humidifier works at 100% steam output; above 55% the humidifier does not produce any steam at all. Between 45 and 55% the humidifier will optimise steam output.

The steam percentage value Pr is the value the humidifier is able to reach at maximum output. For example, leaving the setting at 100% on an ES6 rated at 6 Kg/h will give 6 Kg/h of steam output; if the Pr setting is reduced to 50% the humidifier will produce 3 Kg/h at most.



The Pr variable is highly useful where water conductivity is poor and when you need to make the most of the cylinder when it is nearing replacement; for further information consult chapter 6 TROUBLESHOOTING of this manual at page 25.

The humidity duct set point (stC) is an humidity limit into duct. If the humidity in duct is higher the humidifier stop steam production and restart when the duct humidity is less than StC-r0. Consider an additional time delay (t1 on second programming level) before the steam production start again.

To gain access to the Level 1 programming menu proceed as follows:

- Press the (▲) and (▼) keys simultaneously and keep them pressed for a few seconds until the first programming variable appears on the display.
- Release the (▲) and (▼) keys.
- Select the variable to be modified using the (▲) or (▼) key.
- When the variable has been selected it is possible:
 - to display the setting by pressing SET
 - to modify the setting by pressing the SET key and the(▲) or (▼) keys.
- When configuration values have been set you can exit the menu by pressing the (▲) and (▼) keys simultaneously for a few seconds until the parameter shown before programming was accessed (e.g. steam production or absorbed current) reappears.
- The new settings are saved automatically when you exit the configuration menu.

3.3

LEVEL 2 PROGRAMMING

- Level 2 programming allows the user to modify a number of advanced humidifier settings. These parameters should not be modified without guidance from a PEGO assistance centre or a specialised technician

VAR.	MEANING	VALUES	DEFAULT			
			ES3-M ES6-M ES-12	ES-6	ES-24	ES-48
S0	Duration time for de-concentration pump drain	0.1 ÷ 12.7 s	2	2	3	5
S1	Working hours	Ten hours	-	-	-	-
S2	De-concentration discharge interval Interval, in working (steam production) minutes, for de-concentration discharge	1 ÷ 250 min	15	15	15	15
S3	Delay time on electrodes current-flowing start after a pump drain This parameter, if increased, allows in some particular installation conditions to avoid problem of differential intervention delay on power supply line affecting speed of restarting after water draining	1 ÷ 12 s	2	2	2	2
S4	Water discharge following period of non-use Cylinder emptied completely because machine has been idle for the set period	1 – 24 h	1	1	1	1
S5	Minimum current differential between one water fill and the next	0.2 ÷ 10 A	1	0,7	1	1
S6	Pump activation overcurrent percentage	1 ÷ 50 %	25	25	20	15
S7	Pump discharge time overcurrent	0.1 ÷ 5.0 s	0.5	0.5	0.5	0.5
S8	Minimum current differential for water feed during total or partial cylinder filling S8=0.0 set the cylinder filling step-by-step	0.0 ÷ 5.0 A	0.1	0.1	0.3	0.5
S9	Settings: S9=0 ON-OFF S9=1 PROPORTIONAL WITH SENSOR 4-20mA S9=2 PROPORTIONAL WITH INPUT 0-10V S9=3 PROPORTIONAL WITH SENSOR 4-20mA and max limit in duct (4-20mA) S9=4 PROPORTIONAL WITH INPUT 0-10V and max limit in duct (4-20mA)	0-1-2-3-4	0	0	0	0
CA1	Humidity sensor calibration (not used on ON/OFF versions)	-20 % ÷ 20 %	0 %	0 %	0 %	0 %
CA2	Humidity duct sensor calibration	-20 % ÷ 20 %	0 %	0 %	0 %	0 %
t1	Time delay humidity duct (in seconds). This time delay start when there are the condition to produce steam in the duct (duct humidity < StC-r0) (used only with S9=3 and S9=4)	0-240 s	10 s	10 s	10 s	10 s
Ad	Lan address for connection to TeleNET supervision system or master-slave configuration	0 ÷ 31	0	0	0	0
MS	Master-Slave functioning setting 0= Single 4= Master + 3 slave 1= Slave 5= Master + 4 slave 2= Master + 1 slave 6= Master + 5 slave 3= Master + 2 slave	0-1-2-3-4-5-6	0	0	0	0
rEL	Release software	only read	5	5	5	5

2. To access the second programming level press the UP (▲) and DOWN (▼) keys and the WATER DISCHARGE key simultaneously for a few seconds. When the first programming variable appears the system automatically goes to stand-by.

- Select the variable to be modified by pressing the UP (▲) or DOWN (▼) keys.
- When the parameter has been selected it is possible to:
 - View the setting by pressing the SET key.
 - Modify the setting by holding the SET key down and pressing the (▲) or (▼) key.
- When configuration settings have been completed you can exit the menu by pressing the (▲) and (▼) keys simultaneously and keeping them pressed until the room humidity value (0.0 on ON/OFF versions) reappears.

Changes are saved automatically when you exit the configuration menu.

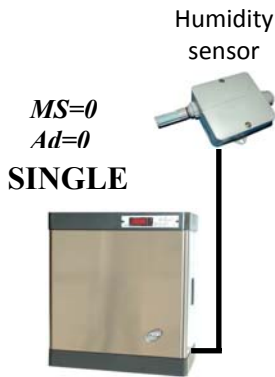
Press the ON/OFF - STAND-BY key to enable electronic control (when you enter Level 2 programming the humidifier automatically goes to STAND-BY mode).

CHAP. 4 MASTER SLAVE CONFIGURATION

4.1

SINGLE HUMIDIFIER CONFIGURATION (default configuration)

The humidifier is set as "single" ($MS=0$) and works in autonomous way following the setting given in S9 variable.



4.2

MASTER + SLAVE HUMIDIFIERS CONFIGURATION

In this configuration the humidifiers (up to 6 units) work as if they were a one unit producing steam according to a common reference given from Master unit.

Moreover the Master manages the precedences of de-concentration discharge or of various humidifiers test (included its own) with FIFO (First In First Out) modality (one single de-concentration discharge at a time) thus ensuring continuity in steam production.

Connection between Master and slave:

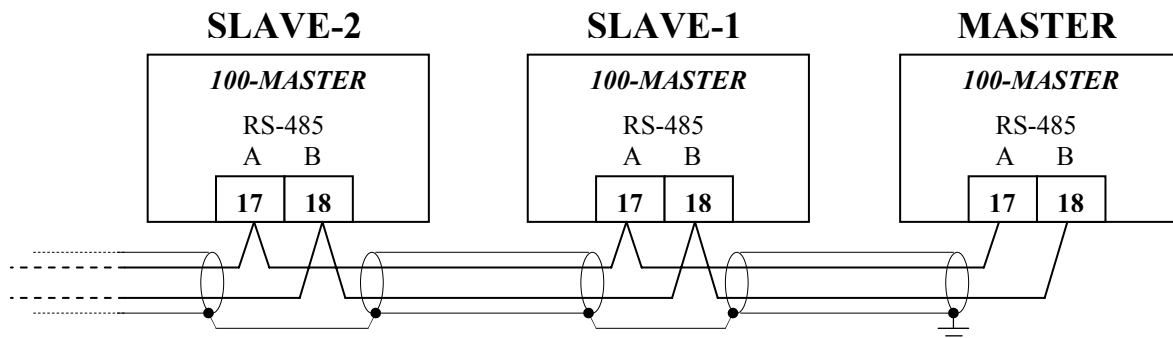
The humidifier set as master communicates with various slave humidifiers through a serial connection RS-485 between various 100-Master electronic controls.

Maximum connection length is not definite but it depends by cable quality and by relation signal/noise. The length is fixed at about 500 meters.

The connection cable can be shieldless if distance is few meters in an electrically little "noisy" ambient. For distances included between 15 and 100 meters it is possible to use a shielded and twisted cable without particular features, whereas for connections over 100 meters it is suggested to use, for example, **BELDEN 8762** cable.

Communication line should be chain-type avoiding star connection.

The shield of used cable should be put to earth to one side. To avoid of lodging the serial connection RS-485 in the same ducts (or hoses) of supply or power cables.



Master/slave addressing:

Parameters **MS** and **Ad** setting of various units in this configuration is fixed and follows this rule:

Parameters configuration in Master unit:

- Ad = 0 Address of control Master
- MS= 2 With control Master + slave1
- 3 With control Master + slave1+ slave2
- 4 With control Master + slave1+ slave2+ slave3
- 5 With control Master + slave1+ slave2+ slave3+ slave4
- 6 With control Master + slave1+ slave2+ slave3+ slave4+ slave5

Parameters configuration in slave1 unit:

- Ad = 1 (Ad Master +1)
- MS= 1 slave

Parameters configuration in slave2 unit:

- Ad = 2 (Ad Master +2)
- MS= 1 slave

Parameters configuration in slave3 unit:

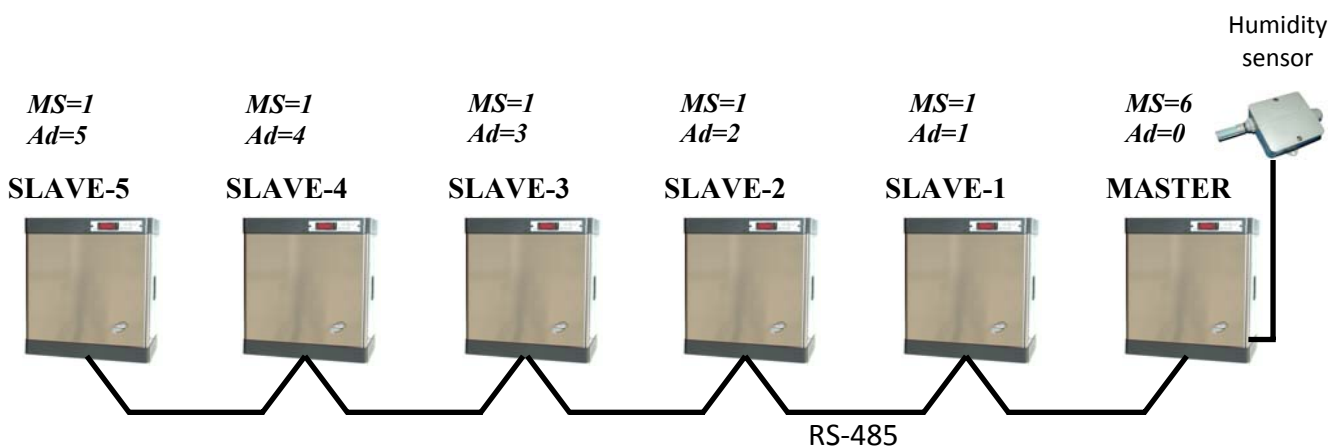
- Ad = 3 (Ad Master +3)
- MS= 1 slave

Parameters configuration in slave4 unit:

- Ad = 4 (Ad Master +4)
- MS= 1 slave

Parameters configuration in slave5 unit:

- Ad = 5 (Ad Master +5)
- MS= 1 slave



Functioning description:

The unit set as Master talks constantly with connected slaves through RS485 sending them the information about quantity steam to produce (0-100%) and managing various units priorities related to de-concentration discharges or test.

Functioning mode of Master/Slave whole of units is set only on Master through variable S9 as the eventual connection of ambient humidity sensor, of duct humidity sensor, of 0-10V reference signal, the ON-OFF enabling and desired humidity value setting.

Pr variable, that represents the steam production percentage to maximum running, is instead set on every single unit.

The enabling lack (terminal blocks 1 and 2 open on 100Master card) generates the following actions:

- On Master unit stops the same Master unit and all connected slave units (displaying OFF blinking).
- On Slave units stops only the concerned slave unit (displaying OFF blinking).

Stand-by inserting through dedicated key, generates the following actions:

- If actuated on Master unit, it puts the humidifier in stand-by (stand-by led blinking) and brings to 0 the steam production request of connected slaves.
- On Slave units stops only the concerned slave unit putting in stand-by the humidifier (stand-by led blinking).

If the Master does not find a slave, after a 15 sec. timeout time, signals the problem with a silencing alarm message (E7). This alarm does not stop the normal functioning. The slave polling continues and, if the communication starts again, the error is reset automatically.

If the Slave has not polled by the Master within a 15 sec. timeout time, it considers the connection interrupted and it leads the steam production to 0 disconnecting the electrodes and signaling the fault with silencing alarm (E8). In the case the connection starts again, the error is reset automatically and the system starts its normal working.

On set Slave (mS=1) humidifiers S9 variable is not considered, steam production follows in proportional mode the information sent to RS485 by Master.

De- concentration discharge and test priorities management:

De-concentration discharge and diagnostic tests priorities are managed as follow:

Slave units, when polled, send the eventual discharge request to the Master that manages them FIFO (first input / first output).

The Master waits for 3 minutes before giving the next enable to pending unit following the FIFO priority; this procedure permits to currently discharging unit to start again the steam production.

The Slave unit that has requested a discharge wait for Master enable for 45 minutes and when they are passed the discharge will still be executed (Time out).

CHAP. 5 SWITCHING ON THE HUMIDIFIER

5.1

INITIAL START-UP



1. Check that default setting is compatible with signal connection; if it is different, set the jumpers correctly before powering up as described on chapter 2.3 and 2.4.

2. Before powering up the humidifier check for correct connection of phases and signal type (humidity sensor, N.O. contact or 0 - 10V); check for correct connection of the water mains, excess water discharge and steam pipes.



If the mains water feed line consists of piping that might contain oily residues or other foam-generating substances it is essential that it be washed out by letting water flow through for several minutes.

3. To verify the absence of water loss internally the humidifier
4. Power up the humidifier.
5. The humidifier will carry out a water discharge for several seconds as it emits a prolonged beep.
6. At this point the humidifier is in STAND-BY mode; to switch it on press the ON/OFF – STAND-BY key. On models configured in 4-20 mA PROPORTIONAL mode the humidifier will display the humidity level detected by the sensor. For models configured in ON/OFF and PROPORTIONAL 0-10V mode current absorption is displayed.
7. To function correctly humidifier needs enabling at digital input 1 with a free-voltage contact (terminal blocks 1 and 2 on 100 Master card) indifferently from selected functioning mode. If enabling is missing, the display will show OFF alternate to normal visualization

5.2


STEAM PRODUCTION



1. Set the required humidity by pressing the SET key. On PROPORTIONAL 4-20 mA models increase the value with the UP key (if the setting is higher than that detected by the sensor steam will be produced); on ON/OFF or PROPORTIONAL 0-10 V models give ON/OFF enable.
2. Let the cylinder fill until the water starts to boil; empty the cylinder completely using the MANUAL DISCHARGE key to prime the pump and repeat the procedure once or twice.
3. At this point the humidifier is operative and will work autonomously.

CHAP. 6 TROUBLESHOOTING

EASYSTEAM humidifier in case of any faults alerts the operator through alarm codes, visual and acoustic signaling.

Upon the occurrence of an alarm is turned on the display icon , activated the alarm relay, activated the internal buzzer and displayed one of the following alarm codes.

Anytime pressing "Mute" key it is possible to silent the internal buzzer and inhibit the display of the alarm code. A next key press resets the alert sound and codes display (for serious alarms it is not possible the silencing).


Alarm relay is a free-voltage and CO contact on board of 100-Master card
Electrical specification: 250 Vac; I_{max}: 8A resistive 1A inductive.

It switches over in case of alarm and it is on following terminal blocks:

- 22:** Normally closed contact
- 23:** Common contact
- 24:** Normally open contact



FAULTS	CAUSE	TASKS TO BE CARRIED OUT
Humidifier is on but alternately display OFF and normal visualization and it doesn't fill water	Missing enabling signal	Verify enabling on terminal blocks 1 and 2 on 100 Master card
Humidifier blocked with En alarm	Lack of connection between SLIM controller and TLD electronic	Verify right connection between the two boards
The humidifier is on but alarm E0 is tripped	Sensor connection inverted or faulty	Restore sensor enable
Block of the humidifier with E0 alarm	Functional fault of humidity sensor	Verify humidity sensor condition
The humidifier is on but alarm E0 is tripped	Software setting of S9 variable is incorrect	Check variable S9 setting
Water level high, triggering maximum level alarm E1	Incorrect connection of cylinder feed connector	Check for proper connection
Water level high, triggering maximum level alarm E1	Water conductivity below 200 $\mu\text{S/cm}$	Diminish steam output % production Pr
Water level high, triggering maximum level alarm E1	Cylinder electrodes worn	Change cylinder
Water level high, triggering maximum level alarm E1	One of the phases is interrupted	Check absorption on all phases
Foam production, triggering maximum level alarm E1	Suspended particles produced by oils or greases in the inlet line	Carry out several complete cylinder flushes with manual emptying immediately after complete filling
Foam production, triggering maximum level alarm E1	Water conductivity above 1300 $\mu\text{S/cm}$	Diminish the de-concentration discharge time by setting S2 to a lower

		interval
FAULTS	CAUSE	TASKS TO BE CARRIED OUT
Water level high, triggering level alarm E1 with high absorption	Damaged electronics	 Contact the assistance centre
Block of the humidifier with E2 alarm	Functional fault of humidity duct sensor	Verify humidity duct sensor condition
The humidifier produces not much steam	One of phases is interrupted	Check absorption on all phases
Block of the humidifier with E3 alarm	Lack of water more than 30 minutes of continuous request	Check that water supply system is working
Block of the humidifier with E3 alarm	Lack of water more than 30 minutes of continuous request	Make sure there is no leaking from damaged pipes
Block of the humidifier with E3 alarm	Lack of water more than 30 minutes of continuous request	Check the solenoid valve was not damaged or disconnected
Humidifier is on and functioning but display E5 error	Drain control autotest failed (pre-alarm). Solve the problem before next test which is executed every 10 hours of electrode functioning.	Verify that drain of bottom of cylinder is not obstructed and pump is not broken or disconnected. Alarm is automatically resetted at next drain control autotest which happens every 10 hours of electrode functioning or when humidifier is switched off.
Unit block with E6 alarm (not stoppable sonorous signalation)	Drain control autotest failed for second time. Humidifier enters in stand-by mode to avoid damaging of the unit. Switch off the humidifier, solve the problem and then switch on again.	Verify that drain of bottom of cylinder is not obstructed and pump is not broken or disconnected. Alarm is resetted when humidifier is switched off.
In a Master/slave humidifiers configuration the MASTER unit is on and working but signals E7 alarm	In a Master/slave humidifiers configuration the Master unit do not find a connected slave. This alarm does not stop the normal working.	Check connections between master unit and slave unit. Check second level parameters MS e Ad related to Master/slave configuration. In case of connection restore the alarm is automatically reset.
In a Master/slave humidifiers configuration the slave unit is blocked and signals E8 alarm	In a Master/slave humidifiers configuration slave unit has lost the communication with connected Master. This alarm blocks the slave unit.	Check connections between master unit and slave unit. Check second level parameters MS e Ad related to Master/slave configuration. In case of connection restore the alarm is automatically reset.
Humidifier differential protection upstream the line intervenes	Water presence on lower part of humidifier because of a fault or after a maintenance that cause an earth leakage of the unit.	Lead the unit to safety following the instructions at chap. 7.2. To wipe carefully all wet parts and reactivate the unit.

CHAP. 7 MAINTENANCE

7.1

MAINTENANCE

To ensure working safety, correct functioning and an optimal output of EASYSTEAM humidifiers, it is necessary to execute maintenance operations according to following instructions.

7.2

GENERAL SAFETY RULES



Every type of maintenance has to be done exclusively by experienced and qualified technical staff, conscious about necessary safety.

Before starting any maintenance procedure, to proceed as follows:

1. If unit is out of service because of an alarm condition, to note the displayed error code.
2. To close the valve of water supply.
3. To put the humidifier in stand-by using the proper key and discharge completely the water contained in the cylinder using the key “Manual water emptying” on Slim Controller (see chap. 3).
4. To disconnect the unit from the electric system sectioning the power input permanently padlocking it on OFF.
5. To wait the cylinder and the humidifier have cooled or to use protection gloves.
6. Each unit element, if it is defective, has to be replaced exclusively with original spare parts.

7.3

MAINTENANCE INTERVALS

Following are indicated the maintenance operations to execute and their suggested frequency. Being electrodes consumption and incrustations and solid deposits formation into the cylinder variables according to the type of water (also with the same conductivity), it could be necessary to modify these intervals.

To verify this need checking the deposits quantity into the cylinder; a quickly accumulation of incrustations and deposits requires to increase the suggested maintenance frequency and/or the de-concentration discharges parameters variation.



To minimize residual formation on the bottom of cylinder it's advisable to increase deconcentration drain frequency reducing value of **S2** parameter. This trick has disadvantage of bigger water and energy consumption.

MAINTENANCE INTERVENTION	FREQUENCY
To verify there are not water losses internally the humidifier.	after 1 hour of working
To verify electrical connections clamping.	after 4 weeks of working
To verify there are not water losses internally the humidifier. To verify the cylinder state, to remove incrustations and deposits if present. To replace the cylinder if necessary.	monthly or every 500 hours of working
To verify cylinder electrodes consumption and the absence of deformations or darkening on their surface; to replace the cylinder if worn and torn and if it shows manifets faults.	quarterly or every 1000 hours of working
To replace the cylinder. To verify electrical connections clamping and water and steam connections good state.	yearly or every 2500 hours of working
To verify there are not water losses internally the humidifier. To verify cylinder state, to verify electrodes consumption, to remove incrustations and deposits if present and to replace the cylinder if necessary.	with alarm code E1
To verify there are not water losses internally the humidifier. To verify that the solenoid valve is not disconnected or broken and to replace it if necessary.	with alarm code E3
To verify that the drain pump is not disconnected or broken and to replace it if necessary. If present to remove incidental obstructions on cylinder bottom and/or in draining pipes.	with alarm code E5 or E6



The only part of the humidifier subject to wear is the electrode cylinder. This wears according to how much the machine is used or it is not possible to remove the internal incrustations.

The EASYSTEAM range features stainless steel electrodes to maximise durability: however, durability will largely depend on the quality of the water (conductivity and hardness) and on how much the machine is used.

When the electrodes are worn the water level will rise excessively and trip the maximum level alarm **E1** several times: the cylinder must, at this point, be replaced.

Once you have checked that this alarm does not have other causes (see Chap. 6 – Troubleshooting) change the cylinder. Proceed as follows:



NEVER CHANGE THE CYLINDER WITH THE MACHINE HOT AND WITH WATER INSIDE IT. EMPTY ALL THE WATER FROM THE CYLINDER USING THE MANUAL DISCHARGE KEY FIRST! IT IS COMPULSORY TO FOLLOW THE INSTRUCTIONS REPORTED AT CHAPTER 7.2.

1. Open the humidifier by removing the front cover as indicated on page 14 (on OEM models this is not necessary).
2. Unhook the frontal retainer spring from the upper steam flange and slide it off (Fig. 27, 28, and 29).

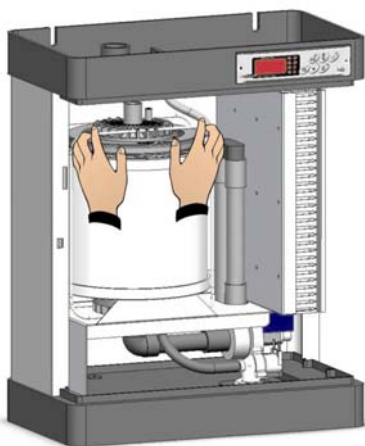


Fig. 27

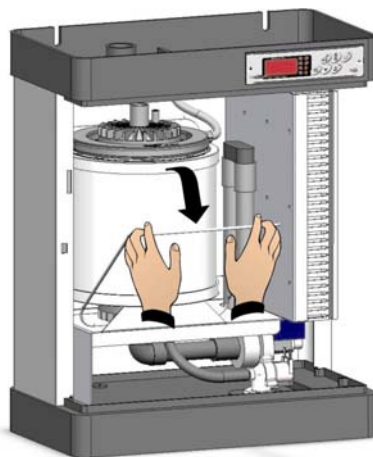


Fig. 28

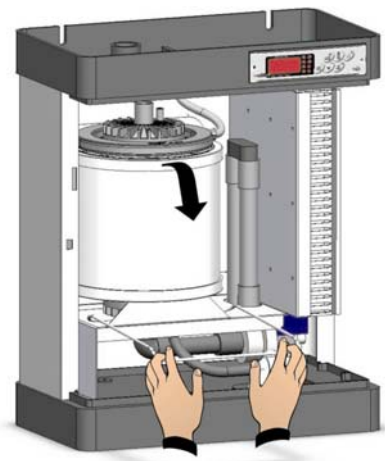


Fig. 29

- Unhook the rear retainer spring from the upper steam flange and slide it off (Fig. 30).

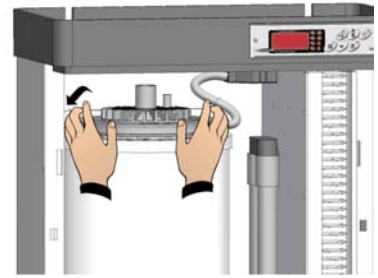


Fig. 30

- Raise the upper steam flange, detaching it from the cylinder (fig. 31).

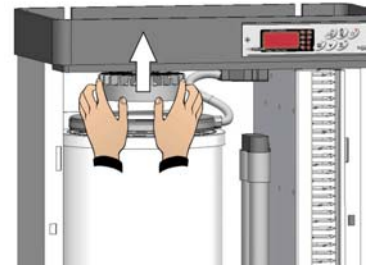


Fig. 31

- Detach the electrical connector from the cylinder (fig. 32)

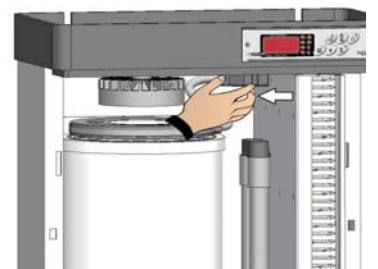


Fig. 32

- Remove the cylinder from the lower flange by raising it (fig. 33) and then remove it from the humidifier (fig. 34).

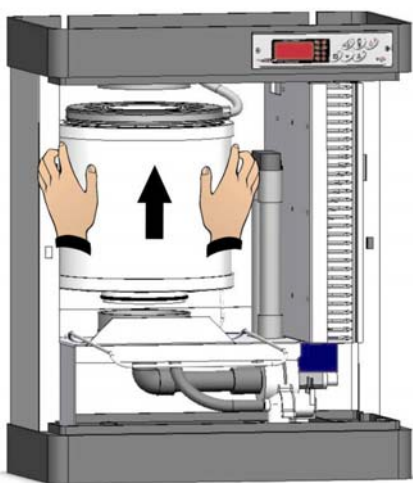


Fig. 33

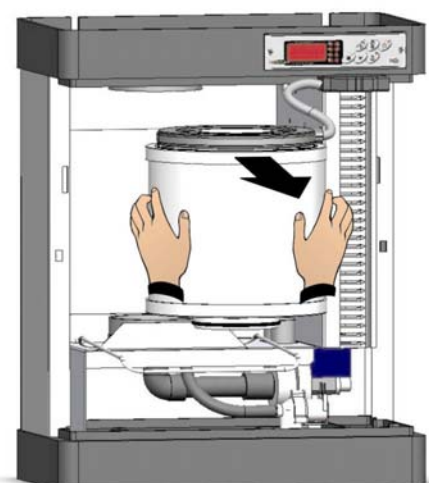


Fig. 34

7. Insert the new cylinder by repeating the above procedure in reverse order; check that the new cartridge has the 2 supplied O-rings and that they are positioned correctly. If necessary to use on O-rings and flanges the lubricating issued with the humidifier for making their insertion easier (fig. 35 and 36).



Fig. 35



Fig. 36

8. Flush the cylinder completely 2 – 3 times immediately after replacement: do this by pressing the “manual empty” key
9. To verify there are not water losses internally the humidifier after 1 hour of working from cylinder replacing.



If there is a power supply failure during cylinder replacement empty the cylinder by detaching the filling hose from the relevant solenoid valve (fig. 37).

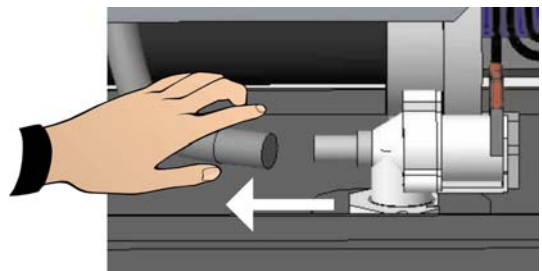


Fig. 37



When presence of incrustations and deposits into the cylinder prevents an adequate passage of current between electrodes or thwarts the water discharge, it is necessary a cleaning operation of cylinder.



NEVER CHANGE THE CYLINDER WITH THE MACHINE HOT AND WITH WATER INSIDE IT. EMPTY ALL THE WATER FROM THE CYLINDER USING THE MANUAL DISCHARGE KEY FIRST! IT IS COMPULSORY TO FOLLOW THE INSTRUCTIONS REPORTED AT CHAPTER 7.2

1. Remove the cylinder from humidifier following steps from 1 to 6 described at chapter 7.4
2. Utilizing the hole on upper side of cylinder, to clean and remove the incrustations on the electrodes and on accessible parts with a mechanical action using a plastic spatula and running water or with a solution of water and 20% acetic acid (fig. 38). Execute the same operation on slits of lower filter (fig. 39). During clearing operations do not damage or scrape coupling parts that assure hydraulic seal as O-ring housing or flanges' entrance. During clearing operations do not wet the connector or cables holder ring UM-CA-01 (fig. 40).



Fig. 38



Fig. 39



Fig. 40

3. Clean and control the two O-ring integrity, replace them if necessary and verify their correct positioning in the two predisposed housings on cylinder. Insert the cylinder by repeating the above procedure in reverse order and verify its correct positioning. In coupling use the lubricating issued with the humidifier for making readjustment operations easier.
4. Flush the cylinder completely 2 – 3 times immediately after replacement: do this by pressing the “manual empty” key.
5. To verify there are not water losses internally the humidifier after 1 hour of working from cylinder replacing.

CHAP. 8 STEAM DISTRIBUTION

8.1

GENERAL



Attainment of good steam distribution and therefore the desired humidity level in any environment depends on two key factors: the quantity of steam introduced into that environment and how it is distributed.

If, in fact, the steam is introduced into an environment in a heterogeneous manner there will be zones of excessive humidity and zones that are too dry: this can lead to excessive condensation and problems in controlling steam production due to the triggering of a “pendulum” feedback effect.

It is advisable to introduce steam by inserting a PEGO distribution lance in the air duct or in front of a ventilation unit (where the steam is introduced directly into a room and not through a duct).

8.2

EXAMPLE OF IN-DUCT STEAM DISTRIBUTION

The PEGO distribution lance must be inserted perpendicularly to the direction of air flow in the duct.

To optimise distribution efficiency the lance must cover as much of the effective air flow width as possible (fig. 41).

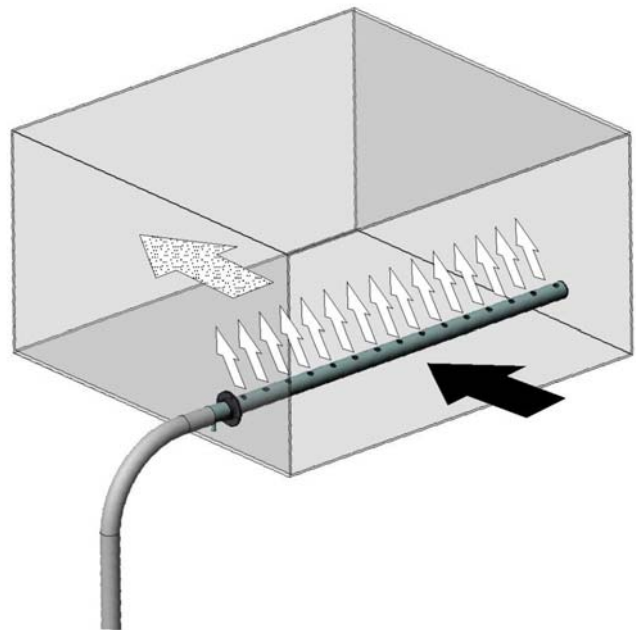


Fig. 41

8.3

EXAMPLE OF IN-ROOM STEAM DISTRIBUTION

The PEGO distribution lance must be inserted perpendicularly in front of the air outlet vents of a ventilation unit. To optimise distribution efficiency the lance must cover as much of the effective air flow width as possible (fig. 42).

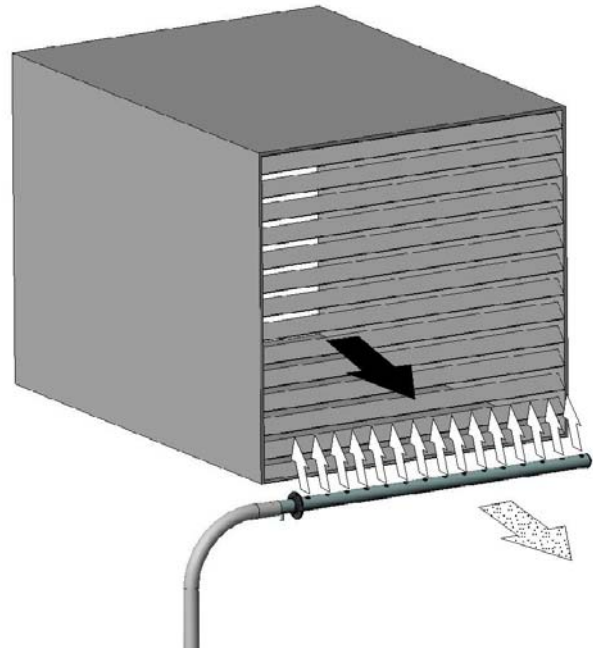


Fig. 42

8.4

CHOOSING THE DISTRIBUTION PIPE

CODE	TOTAL LENGTH	STEAM DISTRIBUTOR LENGTH	DIAMETER
UMILAN25X200	300 mm	200 mm	25
UMILAN25X250	350 mm	250 mm	25
UMILAN25X350	450 mm	350 mm	25
UMILAN25X500	600 mm	500 mm	25
UMILAN25X650	750 mm	650 mm	25
UMILAN25X800	900 mm	800 mm	25
UMILAN25X1000	1100 mm	1000 mm	25
UMILAN25X1050	1150 mm	1050 mm	25
UMILAN25X1100	1200 mm	1100 mm	25
UMILAN40X200	300 mm	200 mm	40
UMILAN40X250	350 mm	250 mm	40
UMILAN40X350	450 mm	350 mm	40
UMILAN40X500	600 mm	500 mm	40
UMILAN40X650	750 mm	650 mm	40
UMILAN4025X800	900 mm	800 mm	40
UMILAN40X1000	1100 mm	1000 mm	40



The PEGO 2 HUMIDIFIER DIVISION can supply custom-sized distribution lances. To request a lance different from those given in the table above indicate.

8.5

CONDENSATE RECOVERY

1. Independently of the type of application, a certain amount of condensation will be generated inside the distribution lance.

This condensation must be discharged so as not to obstruct the flow of steam. If the lance is positioned at a point higher than the humidifier and the steam pipe has no water traps (siphon-like bends) then the condensate recovery device need not be installed (e.g. fig. 43).

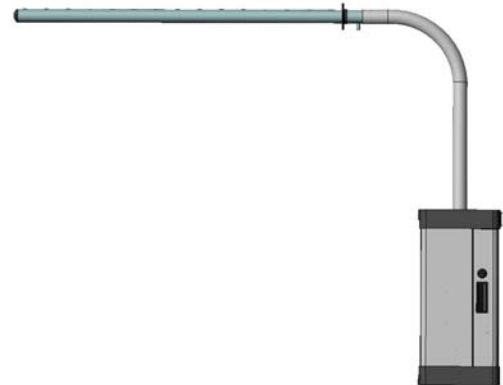


Fig. 43

2. If the lance is positioned at a point higher than the humidifier and the steam pipe does have siphon-like bends (e.g. fig. 44) it will be necessary to install a condensate recovery device. This is a special hose that connects to the relevant cylinder manifold and carries the condensate directly into the humidifier cylinder (fig. 45). The condensate can also be carried to a drain. Recovery is effected by connecting the special hose (PEGO UMITUBODN10) to the 10 mm diameter lance manifold. When routing the recovery hose from lance to humidifier or from lance to drain it is necessary to create a water trap: do this by making a complete turn with a minimum diameter of 200 mm; the siphon must also be filled with water prior to installation. This will stop steam from exiting the condensate recovery hose (fig. 44).

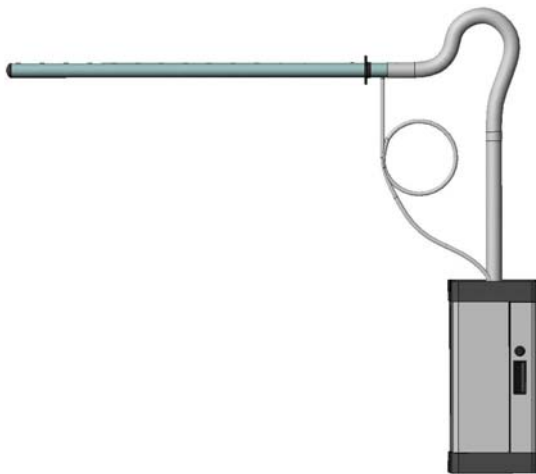


Fig. 44

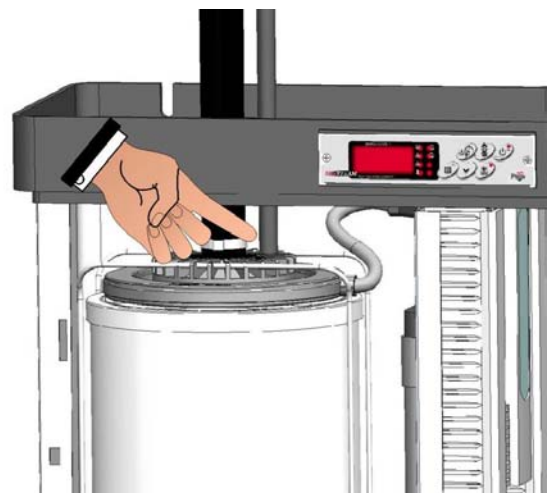


Fig. 45

3. If the lance is positioned below the humidifier as is generally the case on OEM humidifier installations the condensate must be recovered by directing it into a drain.

CHAP. 9 APPENDICES**9.1****EC DECLARATION OF CONFORMITY****COSTRUTTORE / MANUFACTURER**

PEGO S.r.l. Via Piacentina, 6/b 45030 Occhiobello (RO) – Italy –
Tel. (+39) 0425 762906 Fax. (+39) 0425 762905

DENOMINAZIONE DEL PRODOTTO / NAME OF THE PRODUCT

MOD.: ES3-M ; ES6-M ; ES6 ; ES12 ; ES24 ; ES48

MOD.: ES3-M-OEM ; ES6-M-OEM ; ES6-OEM ; ES12-OEM ; ES24-OEM

IL PRODOTTO E' CONFORME ALLE SEGUENTI DIRETTIVE CE

THE PRODUCT IS IN CONFORMITY WITH THE REQUIREMENTS OF THE FOLLOWING EUROPEAN DIRECTIVES:

2006/95/CE **Direttiva del Consiglio per l'unificazione delle normative dei Paesi CEE relativa al materiale elettrico destinato ad essere utilizzato entro certi limiti di tensione e successive modificazioni**

2006/95/EC **Concil Directive on the approximation of the laws of the Member States relating to electrical equipments employed within certain limits of tension and following modifications**

2004/108/CE **Direttiva del Consiglio per l'unificazione delle normative dei Paesi CEE relativa alla compatibilità elettromagnetica e successive modificazioni**

2004/108/EC **Concil Directive on the approximation of the laws of the Member States relating to the electro-magnetical compatibility and following modifications**

93/68 CEE **Direttiva del consiglio per la marcatura CE del materiale elettrico destinato ad essere utilizzato entro taluni limiti di tensione.**

93/68 EEC **Council Directive for the CE marking of electrical materials to be used within certain limits of voltage**

LA CONFORMITA' PRESCRITTA DALLE DIRETTIVE E' GARANTITA DALL'ADEMPIMENTO A TUTTI GLI EFFETTI DELLE SEGUENTI NORME:

CONFORMITY WITH TH REQUIREMENTS OF THIS DIRECTIVE IS TESTIFIED BY COMPLETE ADHERENCE TO THE FOLLOWING STANDARDS:

NORME ARMONIZZATE / HARMONIZED EUROPEAN STANDARDS

EN 61000-6-1

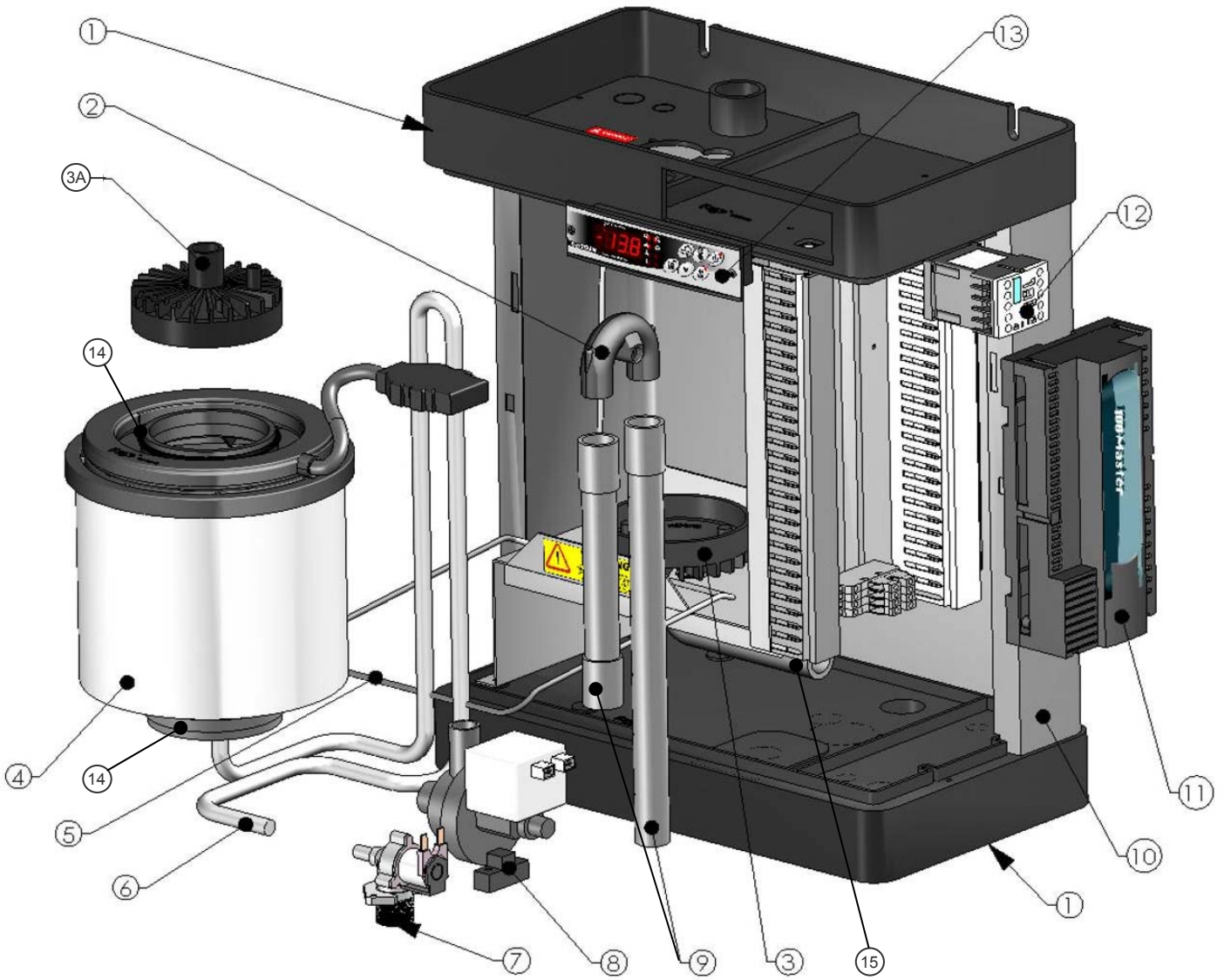
II Edition

EN 61000-6-3

II Edition

EN 60335-1

Paolo Pegorari



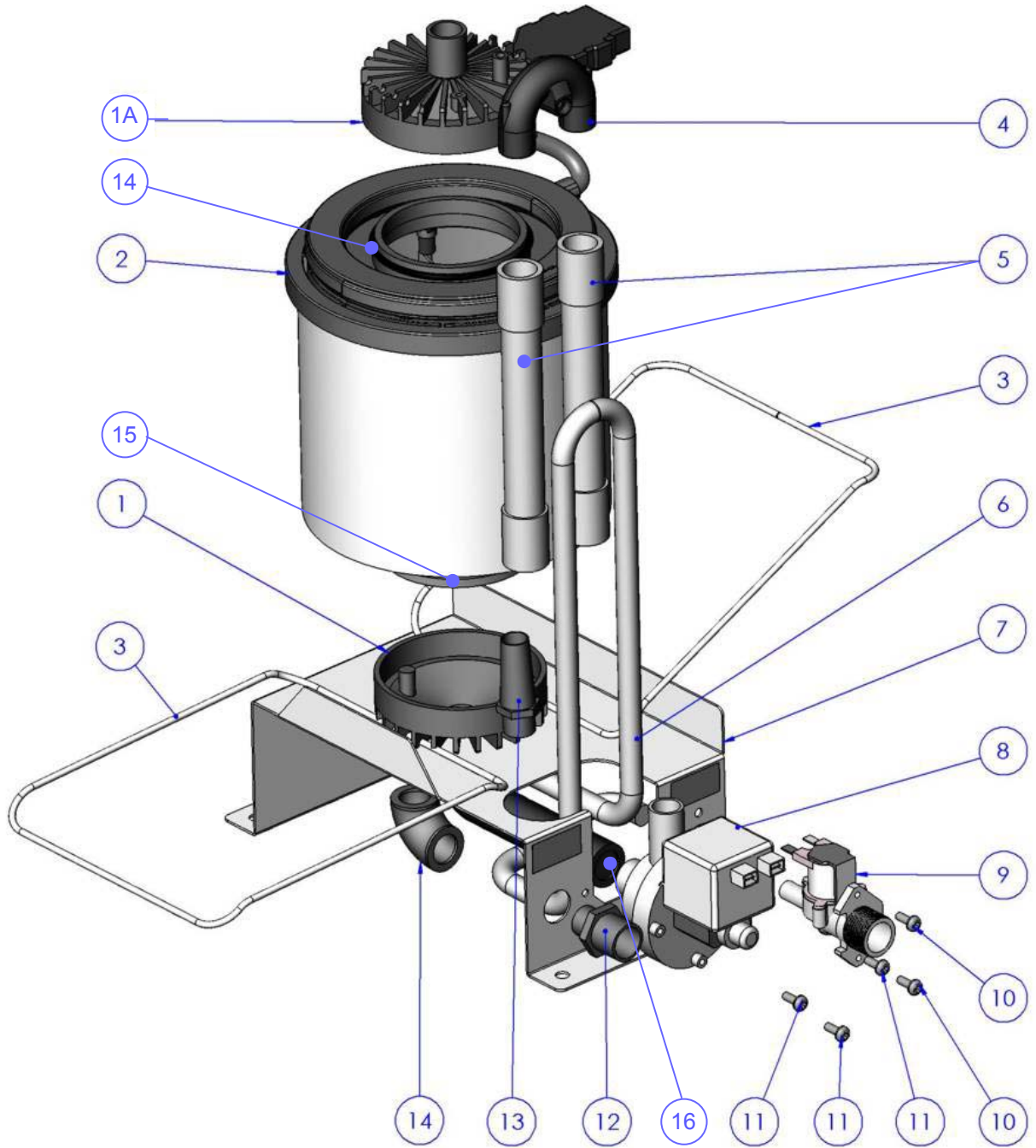
ES SERIES SPARE PARTS LIST

Ref.	Code	Description
1	UMIBA01	ABS support base
2	UMISIFONE1	Water drain siphon (exceeding water or deconcentration drain)
2 + 9	400UMSIF01	Complete siphon kit + water drain pipes for ES3-M, ES6, ES6-M
	400UMSIF02	Complete siphon kit + water drain pipes for ES12
	400UMSIF03	Complete siphon kit + water drain pipes for ES24 e ES48
3	UMICO25	DN25 lower flange
3A	UMICO25	DN25 steam output flange for ES3-M, ES6, ES6-M, ES12 models
	UMICO40	DN40 steam output flange for ES24 e ES48 models
	UMICO40	DN40 steam output flange in case fan unit is present
4	400UMCL01	Electrodes cylinder for ES6
	400UMCL02	Electrodes cylinder for ES12
	400UMCL03	Electrodes cylinder for ES24, ES48
	400UMCL04	Electrodes cylinder for ES3-M
	400UMCL05	Electrodes cylinder for ES6-M
5	UMIMOLLA1	Cylinder fixing spring for ES6, ES6-M
	UMIMOLLA2	Cylinder fixing spring for ES12
	UMIMOLLA3	Cylinder fixing spring for ES24, ES48
	UMIMOLLA4	Cylinder fixing spring for ES3-M
6	UMITUBO10-2	Tap water inlet pipe (L=1250mm) for ES3-M, ES6, ES6-M
	UMITUBO10-3	Tap water inlet pipe (L=1600mm) for ES12, ES24
7	400UMIVALV	230V 50/60 Hz solenoid valve for water filling for ES3-M, ES6, ES6-M, ES12, ES24
	400UMIVALV48	230V 50/60 Hz solenoid valve for water filling for ES48
8	UMIPOMPA943	230V 50/60 Hz asynchronous drain pump
10	UMIBACK1	Stainless steel case for ES3-M, ES6, ES6-M
	UMIBACK2	Stainless steel case for ES12
	UMIBACK3	Stainless steel case for ES24
11+13	400SLIMES3M	Control electronic kit 100 Master + Slim display for ES3-M
	400SLIMES6M	Control electronic kit 100 Master + Slim display for ES6-M
	400SLIMES6	Control electronic kit 100 Master + Slim display for ES6
	400SLIMES12	Control electronic kit 100 Master + Slim display for ES12
	400SLIMES24	Control electronic kit 100 Master + Slim display for ES24
12	CON10161AP01	Contact for electrodes power supply for ES3-M, ES6, ES6-M, ES12
	CON10241AL20	Contact for electrodes power supply for ES24, ES48
14	UMIOR1	O-Ring diameter 88,49 X 3,53 SILICON 60Sh.
15	UMICURVA90°	24mm joint elbow 90°



Request spare parts from your dealer.

9.3 OEM SERIES EXPLODED VIEW



OEM SERIES SPARE PARTS LIST

Ref.	Code	Description
1	UMICO25	DN25 lower flange
1A	UMICO25	DN25 steam output flange for ES3-M-OEM, ES6-OEM, ES6-M-OEM, ES12-OEM models
	UMICO40	DN40 steam output flange for ES24-OEM model
	UMICO40	DN40 steam output flange in case fan unit is present
2	400UMCL01	Electrodes cylinder for ES6-OEM
	400UMCL02	Electrodes cylinder for ES12-OEM
	400UMCL03	Electrodes cylinder for ES24-OEM
	400UMCL04	Electrodes cylinder for ES3-M-OEM
	400UMCL05	Electrodes cylinder for ES6-M-OEM
3	UMIMOLLA1	Cylinder fixing spring for ES6-OEM, ES6-M-OEM
	UMIMOLLA2	Cylinder fixing spring for ES12-OEM
	UMIMOLLA3	Cylinder fixing spring for ES24-OEM
	UMIMOLLA4	Cylinder fixing spring for ES3-M-OEM
4	UMISIFONE1	Water drain siphon (exceeding water or deconcentration drain)
4+5	400UMSIF04 (*)	Complete siphon kit + water drain pipes for ES3-M-OEM, ES6-OEM, ES6-M-OEM (new version)
	400UMSIF05 (*)	Complete siphon kit + water drain pipes for ES12-OEM (new version)
	400UMSIF06 (*)	Complete siphon kit + water drain pipes for ES24-OEM (new version)
4+5	400UMSIF04V (*)	Complete siphon kit + water drain pipes for ES3-M-OEM, ES6-OEM, ES6-M-OEM (old version)
	400UMSIF05V (*)	Complete siphon kit + water drain pipes for ES12-OEM (old version)
	400UMSIF06V (*)	Complete siphon kit + water drain pipes for ES24-OEM (old version)
6	UMITUBO10-2	Tap water inlet pipe (L=1250mm)
7	UMILAMCUST	aisi 316 stainless steel sheet panel bracket
8	UMIPOMPA943	230V 50/60 Hz asynchronous drain pump
9	UMIVALV1	230V 50/60 Hz solenoid valve for water filling
10	-	Solenoid fixing screws
11	-	Pump fixing screws
12	UMIMAN12	DN25 hose for water drain
13	UMIGOM12	½ gas elbow
14	UMIPOINTGOM12	½ gas hose bracket
15	UMIOR1	O-Ring diameter 88,49 X 3,53 SILICON 60Sh.
16	UMICURVA90°	24mm joint elbow 90°

(*): New water drain part differs from old one on the stainless steel drain components instead plastic. On the new version 12, 13 and 14 reference are not present.



Request spare parts from your dealer.



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Dealer: