

Electric Steam Humidifier ERS-LC 3 to 30 kg/h Installation and Operation Manual



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1.1 INTRODUCTION

You recently purchased the ElectroVap ERS-LC, and we hope you enjoy this product. Thank you for the trust you place in us. The safety instructions contained in this manual are intended for specialized, qualified and authorized personnel.

To get the best results from the device, we recommend to:

- Read carefully the assembly and installation instructions in this manual;
- Keep this manual in a safe place for future reference;
- Transmit this manual in case of sale or transfer of the device, in order to guarantee the transmission of information about it;

SAFETY WARNINGS AND SYMBOLS USED IN THE MANUAL



Danger! Caution.

General safety instruction, whose violation could lead to malfunctions and / or bodily harm to person and / or property damage.



Danger! High voltage.

There are high voltages inside the device or one of its components, the negligence of this warning can lead to serious bodily injury or death to people and / or significant material malfunctions.



Danger of scalding !

The ExpressPack® uses steam during the operation and therefore surfaces and pipe-work become very hot. Ensure that equipment not sustaining high temperatures is kept away.



Electrostatic hazard.

The components of the device may be subject to deterioration as they are very sensitive to electrostatic discharge.



Möbius strip.

Some components of the device are recyclable, the user is responsible for the removal of these.

- If your package is damaged or missing, please make a complaint to your carrier with a receipt acknowledgment letter within 24 hours, and make a declaration to your Armstrong agent.
- Pictures, graphics, and values may be subject to technical changes without notice.
- Keep this instruction manual carefully, and if you have any questions that are not answered in this manual, do not hesitate to contact us or consult your Armstrong agent.

Our team will be pleased to be of assistance !

1.2 IMPORTANT NOTES

<p>GENERAL</p>	<p>This manual contains all the details concerning the commissioning, operation and maintenance of the device.</p> <p>Maintenance, service, repairs, as well as the study of the risks and dangers associated with these operations must be carried out by qualified, competent and authorized personnel.</p> <ul style="list-style-type: none"> - Make sure that all risks or dangers are defined beforehand by an authorized person, especially for works-at-height. - We also recommend installing a security perimeter. - Make sure that the power supply is switched off before performing maintenance. - Please screw periodically all the connection terminals of the power cable.
<p>INTENDED USE</p>	<p>This device is manufactured by Armstrong is intended solely for humidification purpose, in air treatment station or in ambiance. The user undertakes to use it according to the safety instructions given in this manual.</p> <p>Improper use could result in serious hazards and damages to the user, third parties and materials.</p>
<p>STORAGE</p>	<p>The device must be stored in a dry, frost-free place, protected from shocks and vibrations.</p>
<p>WATER</p>	<p>Steam humidifiers can be used with potable, demineralized or softened water. It is absolutely forbidden to inject a chemical into the hydraulic system. Make sure that the water supply pressure does not exceed 6 bar. Always be careful that the installation meets local standards.</p>
<p>ELECTRICITY</p>	<p>The user ensures that electrical installation will be carried out by an authorized technician in this field. The installer has to provide the correct cable section as well as the magnetothermic circuit breaker protection.</p>
<p>WARRANTY</p>	<p>Armstrong guarantees that its devices are one (1) year warranty.</p> <p>Armstrong's liability will be limited exclusively to Armstrong's repair or replacement of the part or product, excluding labor, disassembly or installation costs. Armstrong may also decide to refund the purchase price of the product or part of it, at its discretion. The non-compliance of these above recommendations, additional mounting and / or transformation with components other than those provided with the device or any use other than what is explicitly stated, shall be considered as not in compliance with the prescriptions, and will invalidate the warranty.</p>
<p>LIABILITY</p>	<p>Armstrong shall be not made liable for the consequences of incorrect installation, improper use of the devices and/or their components.</p> <p>We are committed to provide you the most complete manual, although, in the air treatment field, variations are so common that the information found in this document may be subject to changes without notice.</p>



ERS-LC

1.3 DECLARATION OF CONFORMITY

This device meets the requirements of the following European Directives :

It is certified according to the following European standards :

89/336/EEC
98/37/EEC
73/23/EEC
2006/95/EEC
2004/108/EEC
2006/42/EEC

EN 60335-1
EN 60335-2-88
EN 55022 classe B
EN 60204-1
EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
EN 61000-6-2
EN 61000-6-3

DEVICE TYPE	Humidifier
MODEL NAME	ElectroVap ERS-LC
MODEL YEAR	2007
CONSTRUCTOR	Devatec 185 Boulevard des Frères Rousseau 76550 Offranville - FRANCE

We the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

FRAMBOT Jean-François
General Manager
16.10.2018

1.4 RoHS DECLARATION

Armstrong,

Confirms that the BlowerPack fan unit is manufactured in compliance with the European regulations :

2002/95/EU (RoHS)

This guideline regulates, after July 1st 2006, the use of mercury, cadmium, lead (soldering processes), chrome VI as well as PBB and PBDE.

MINFRAY Jean-Marie
R&D Engineer
16.10.2018

2.1 CHARACTERISTICS

The ERS-LC is an electric humidifier, designed for air humidification in air handling unit. Like all the others humidifiers of the range, it is compatible with the Blower Pack.

1. One steam humidifier with a stainless steel tank supplied with an on/off or proportional control and technical documentation
2. 500 mm long flexible braided hose with 3/4" FF thread (with washers) for tap water connection
3. 1 m long Ø25 mm drain hose
4. 3 hose clamps (2 for the steam hose and 1 for the drain hose)
5. Cardboard drilling template
6. 1 Limescale collecting bag supplied with each order.



Do not throw away the **cardboard drilling template** supplied with the unit.

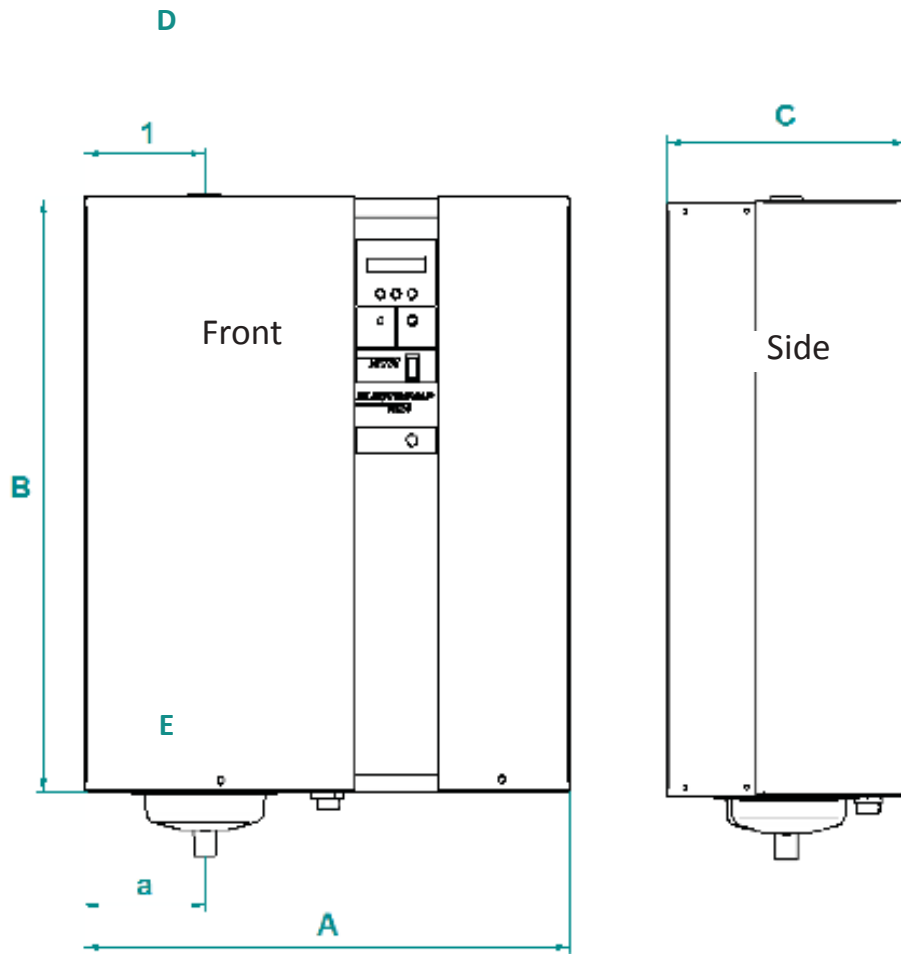
ACCESSORIES

- Steam distribution pipe(s)
- Steam and/or condensate hoses
- BlowerPack fan unit
- Humidity sensor for room or duct applications
- Humidistat
- ExpressPack

OPTIONS

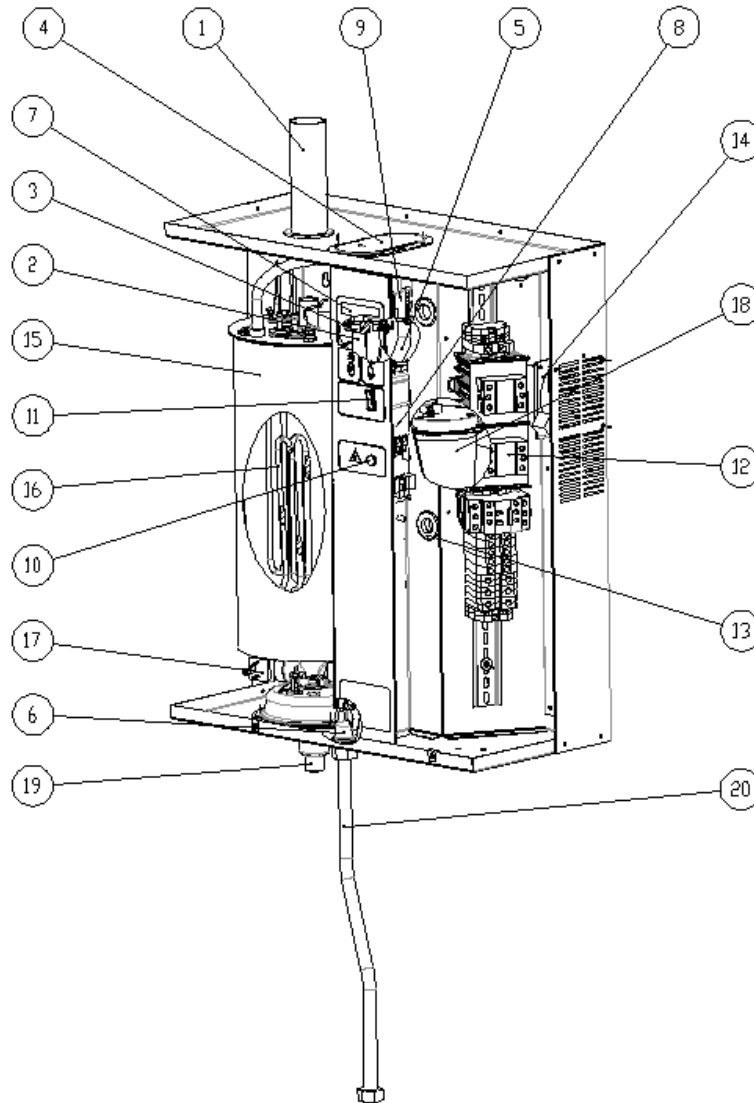
- Remote information board
- Filling cup platform
- 400/230V transformer (for installation without neutral)
- Water draining cooling kit
- External protective enclosure (1500 x 500 x 1470 mm)
- Ground holder

2.2 DIMENSIONS



Marks	mm
A Width	550
B Height	680
C Depth	272
D Overflow draining - Front view	140
E Steam outlet	140
	kg
Weight in operation	35
Gross weight (packed)	25
RAL7035 powder coated metal case	

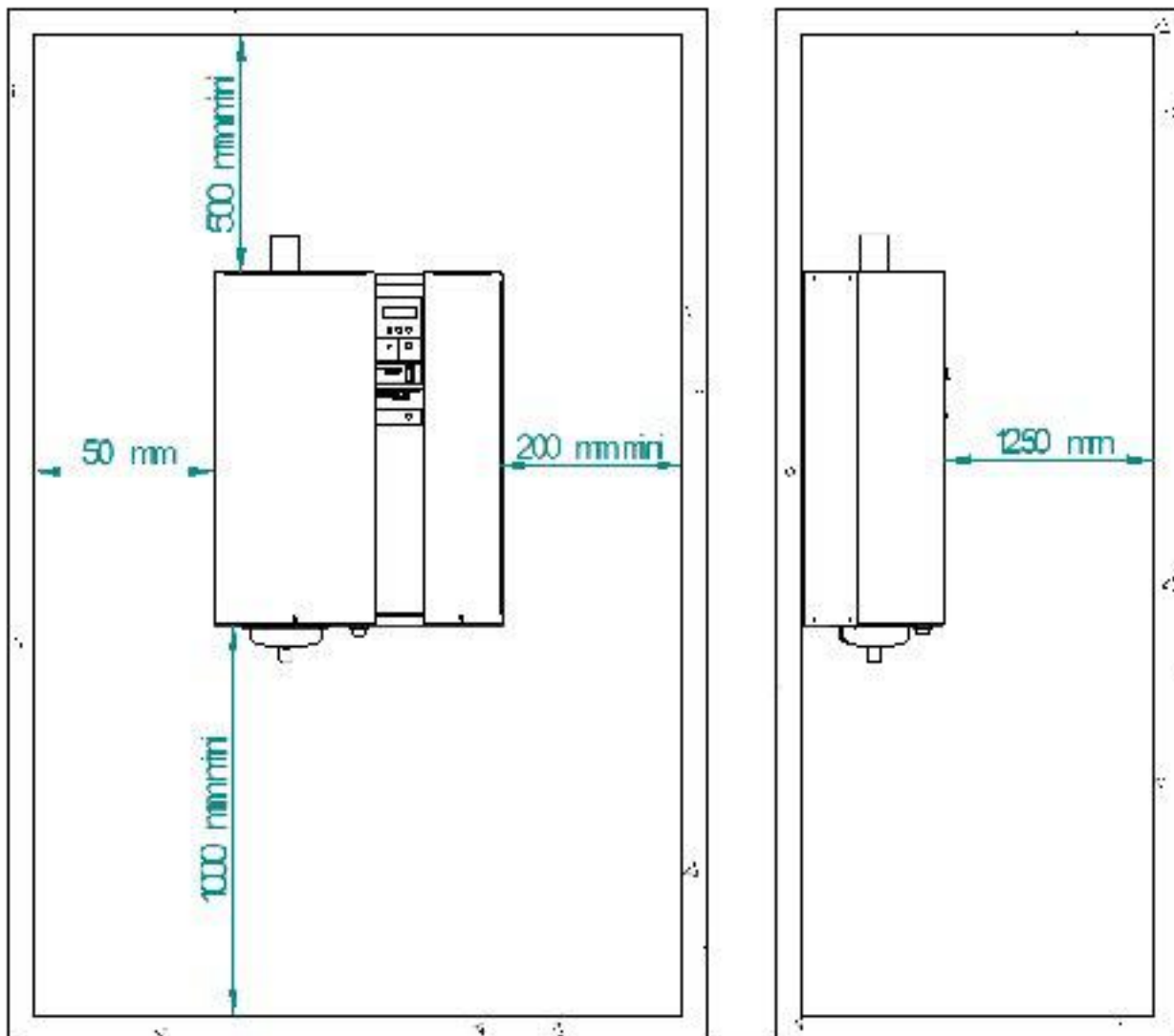
2.3 HUMDIFIER COMPONENT PARTS



1	Steam hose	11	On/ Off switch
2	Ø12x16 mm water feed hose	12	Power contactor
3	Ø16x27 mm hose clamps	13	Wire tunnel
4	Filling cup	14	Fan
5	Ø18x22 mm overflow hose	15	Tank
6	Water inlet valve	16	Resistor
7	Display board	17	Anti-limestone system
8	Main PCB board & Transformer	18	Drain valve
9	Water level management board	19	Water level detector
10	Stand-by lamp	20	Flexible braided hose with 3/4" FF thread

2.4 IMPORTANT INSTRUCTIONS

- Ambient temperature : between 5 and 40°C
- Ambient humidity : < 80% Relative humidity
- Back side : this component heats during operation (up to 60°C). Make sure that the support of the device is not made of a heat-sensitive material.
- Wall mounting : Please be careful that the support material receiving the device (pillar, wall, etc.) is able to support it.
- Fixation : use a fastening system adapted to the support material.
- Make sure that the mounting distances are met.



Please read and follow the enclosed safety information and the warning labels inside the humidifier before installation or maintenance.

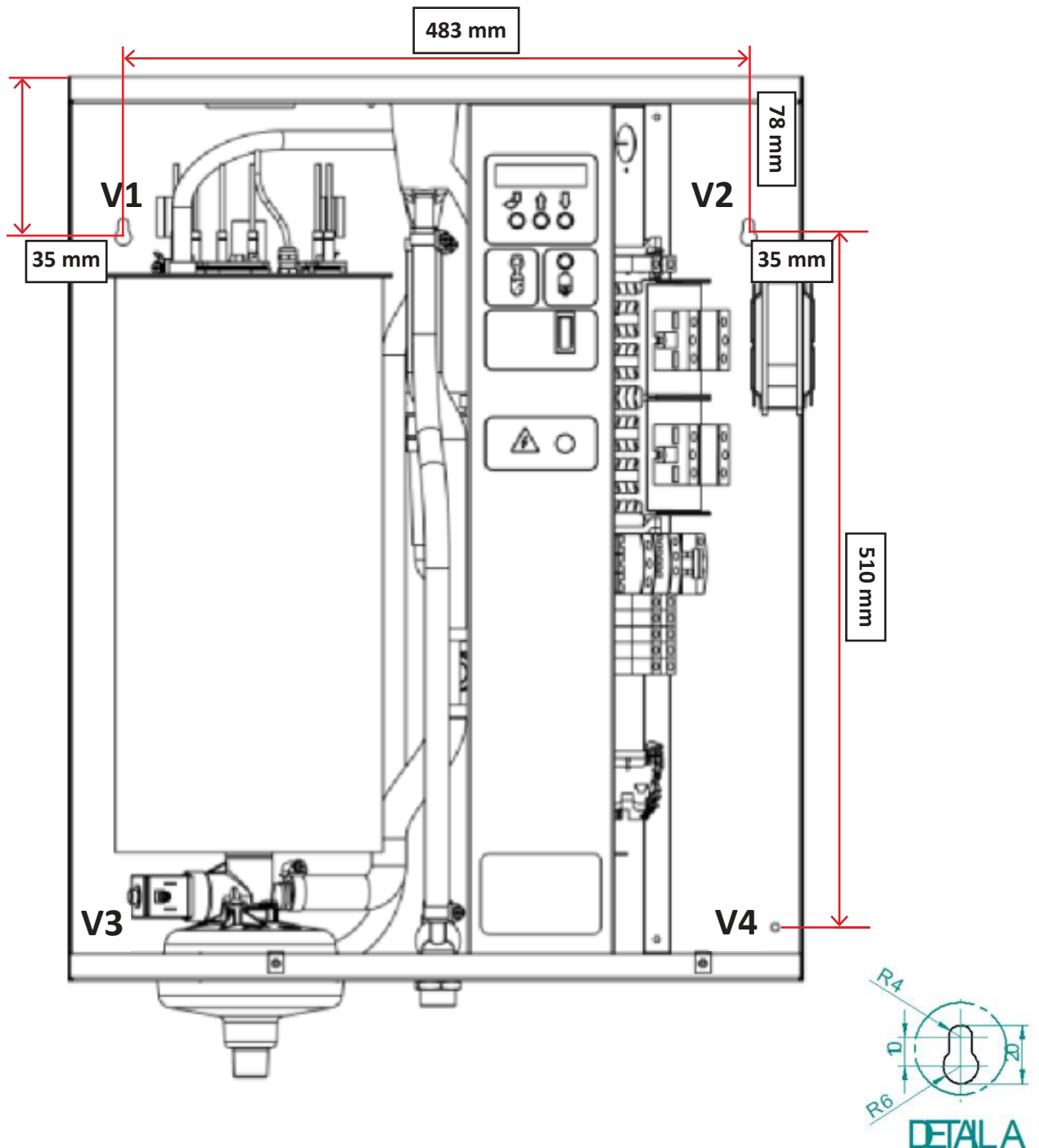
Some steps can be dangerous.

Visit our website or contact our operators for technical support.

3.1 PROCEDURE

- Using the drilling template that came with the device, mark and drill where indicated (holes depending on the selected dowels and support materials).
- Put the dowels in the holes.
- Screw the top screws into the dowels ($\varnothing 6\text{mm}$), let them protrude by about 10 mm.
- Hang the device on the upper screws, and align it vertically and horizontally with a spirit level. Insert screws on V1, V2, V3 & V4 and tighten up all the 4 screws.

For a floor installation, you can optionally use our mounting bracket for ERS-LC (See page 6-Options).



3.2 WATER SUPPLY

3.2.1 Water recommendations

The device is designed to be used with :

Potable water : According to 98/83/EEC directive, TH must be less than 40°FH and higher than 30 μS/cm.

(Natural) Soft water :

- If water conductivity is higher than 30 μS/cm, use an electrode level sensor (standard potable water).
- If water conductivity is lower than 30 μS/cm, use a float water level sensor.

Demineralized water : water conductivity is lower than 30 μS/cm. To ensure water level detection, it is imperative to install a float water level sensor. This installation can be done at the factory if the purchase order specifies this option or on existing devices (an installation kit is then available).

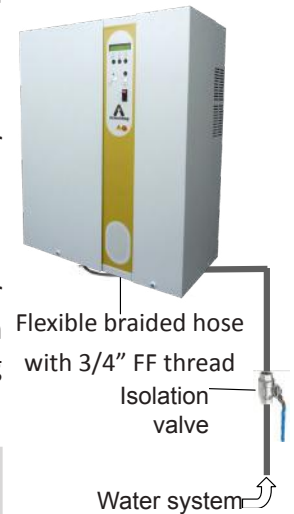


The demineralized water is corrosive; use appropriate piping material : stainless steel, PVC.

Softened water : its use is not recommended, but possible. TH 12 °fH minimum. Water analysis is recommended to determine the level of sodium chloride. Do not hesitate to contact our services for support.



An excess of sodium chloride may generate foam which disturbs the correct running of the humidifier. It is essential to install a duplex softener.



3.2.2 Connection guidelines

Water pressure : between 2 bar & 6 bar MAX.

Water temperature : < 40°C.

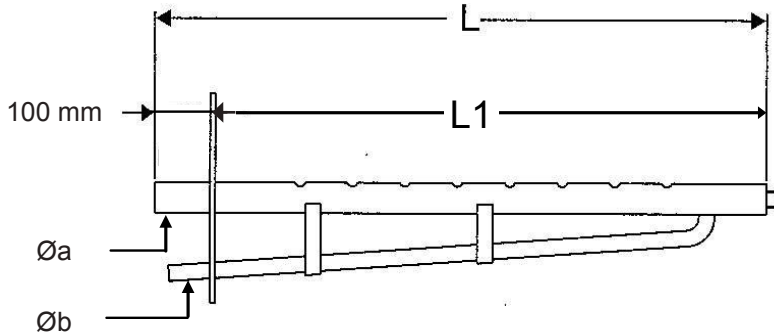
The water supply connection is under the unit. The humidifier is delivered with a water inlet hose of 50 cm long with a 3/4" female fitting to the cold water supply. **A direct copper connection is PROHIBITED.**

For the maintenance, an isolation valve should be installed close to the humidifier.



OVERFLOW RISKS : it is recommended to install a retention container under the humidifiers to prevent overflow. This is essential if the unit is installed in false ceilings or above important rooms (example: museum room, showroom, laboratory etc ...). Make sure the container is connected to the waste water system.

3.3 DISPERSION TUBE POSITIONING



Steam dispersion tubes :

the steam from the humidifier is injected in a duct or an air handling unit via a steam dispersion tube.

In order to obtain the best performance of the humidifier, select the longest pipe.

3.3.1 Selection of steam dispersion tube

Dispersion tube for ERS-LC 3-15 a=Ø25 mm / b=Ø8 mm	L1 mm	Duct width	
		MIN	MAX
D25-L290	290	300	599
D25-L590	590	600	799
D25-L790	790	800	1009
D25-L1000	1000	1010	1259
D25-L1250	1250	1260	1509
D25-L1500	1500	1510	

Dispersion tube for ERS-LC 20-30 a=Ø40 mm / b=Ø8 mm	L1 mm	Duct width	
		MIN	MAX
D40-L290	290	300	599
D40-L590	590	600	799
D40-L790	790	800	1009
D40-L1000	1000	1010	1259
D40-L1250	1250	1260	1509
D40-L1500	1500	1510	

3.3.2 Dispersion tubes mounting

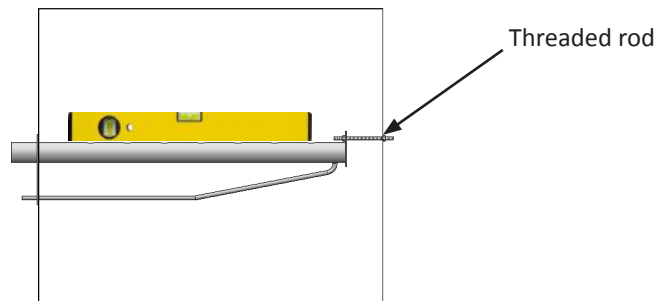
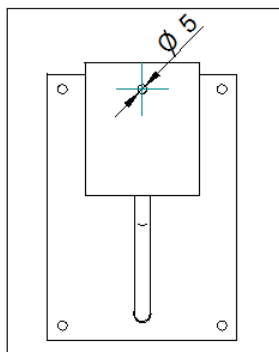
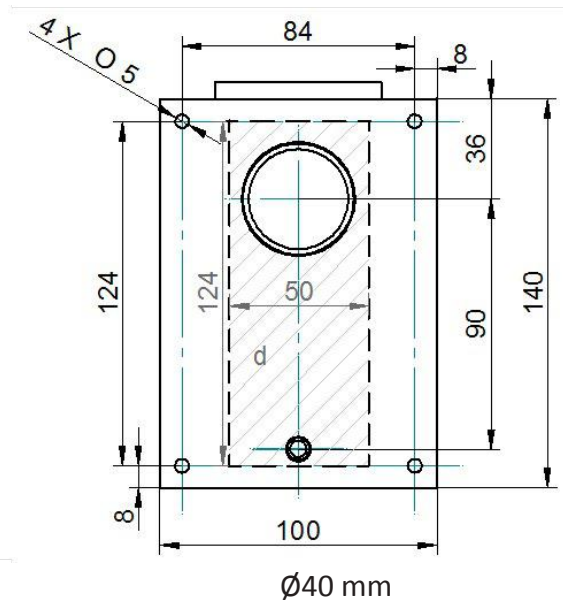
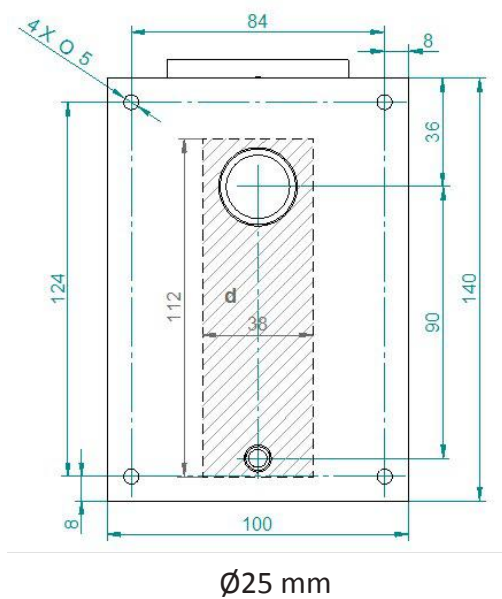
For ensuring the best steam dispersion possible, we would recommend installing the steam tubes in either diameter as in the two methods described underneath (valid for both $\varnothing 25$ mm, $\varnothing 40$ mm).

Step 1 - Installation into a duct

Make the "d" cut in the wall of the duct. Then insert the dispersion tube in this cut. Put a large silicone gasket between the flange and the duct wall to seal the fixation. Fix the pipe on the duct wall with 4 M5 screws and 4 nuts. The length of the screws will depend on the thickness of the ventilation duct wall.

Step 2 - Installation at the end of the tube (into the duct)

Fixed by a $\varnothing 5$ mm threaded rod passing through the hole provided for this purpose and passing through the duct wall. To fix the whole structure, 2 $\varnothing 5$ mm nuts will be enough (Fig. 3).



3.3.3 Absorption distance « D »

Make sure that the absorption distance is met in order to let the air absorb the steam dispersed by the tubes. In this absorption distance, the steam is still visible in the air stream in the form of fog. If any furnitures are placed in this area, condensate may form on them. For this reason, it is imperative to take into account this absorption distance when placing the humidifiers.

3.3.4 How to calculate absorption distance « D »

In order to determine the evaporation distance, the attached calculation table can be used:

- HR1 = relative humidity of air before humidification in %.
- HR2 = relative humidity of air after humidification in %.
- D mini = minimum humidification distance in meters (m).

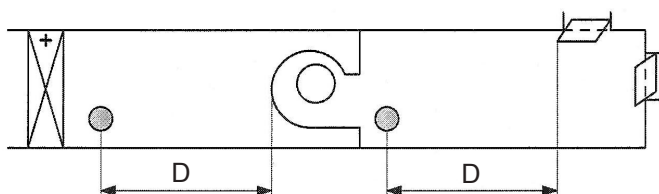
	% RH1 inlet air							
	5	10	20	30	40	50	60	70
% HR2 outlet air	Minimum Absorption distance «D» in meters							
40	0,9	0,8	0,7	0,5	-	-	-	-
50	1,1	1	0,9	0,8	0,5	-	-	-
60	1,4	1,3	1,2	1	0,8	0,5	-	-
70	1,8	1,7	1,5	1,4	1,2	1	0,7	-
80	2,3	2,2	2,1	1,9	1,7	1,5	1,2	0,8
90	3,5	3,4	3,2	2,9	2,7	2,4	2,1	1,7

This calculation table is to be used for temperatures between 20°C and 25°C (Maximum air speed 5m/s). For calculated distances, contact your Armstrong agent.

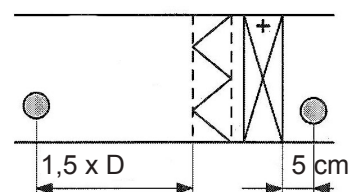
3.3.5 Minimal humidification distance

The steam dispersion pipes must be positioned after the minimum specified absorption distance. Please follow the guidelines depending on the configuration of your air handling unit.

before / after a fan

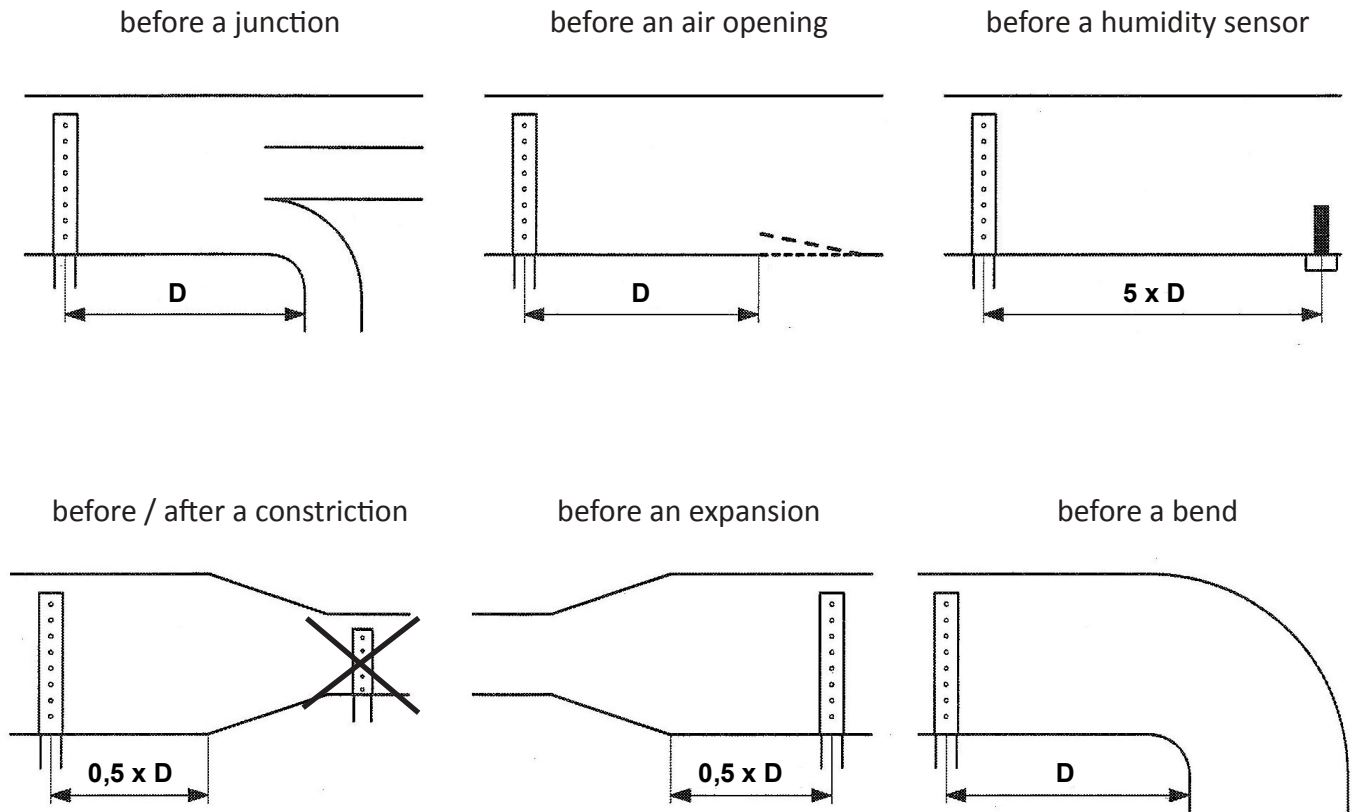


before / after a heater or filter



2,5 x D before thin particle filter

3.3.6 Minimum installation distance



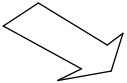
- A high humidity limit humidistat must be installed in the duct to stop the humidifier in case the level of humidity exceeds the preset value.
- If the recommended distances cannot be met, please contact Armstrong or their authorized agent for an alternative solution.
- Make sure the distances are met, if this is not possible, please contact your Armstrong agent.

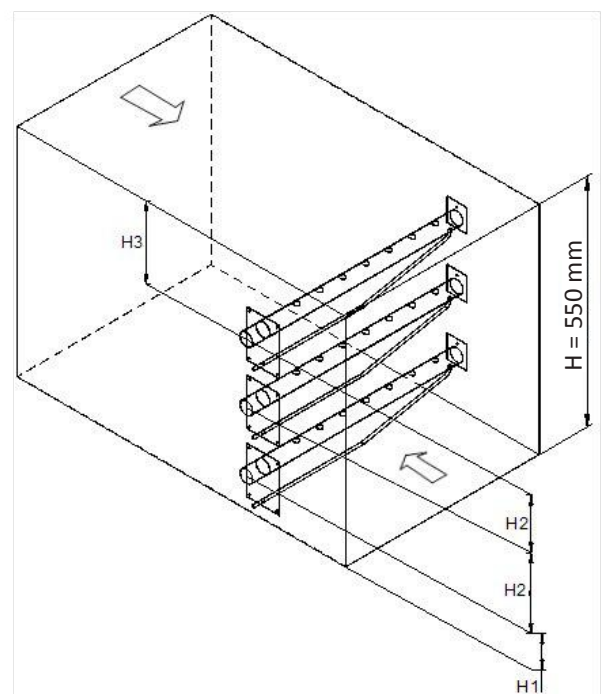
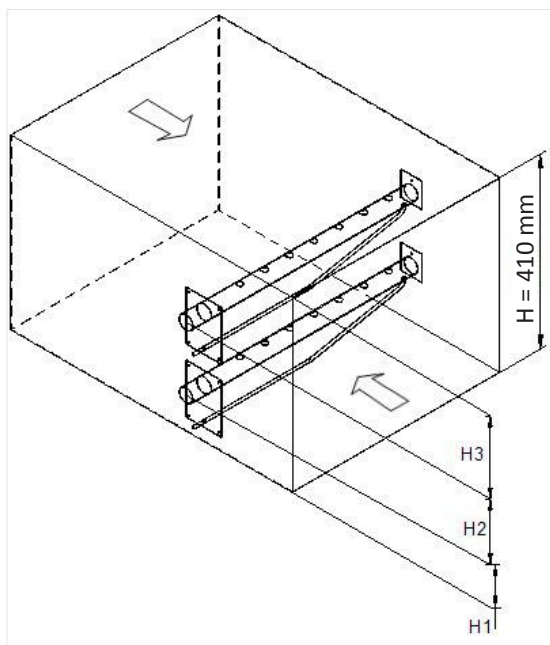
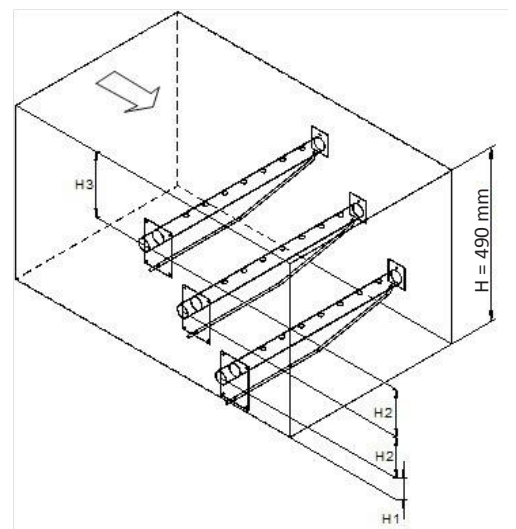
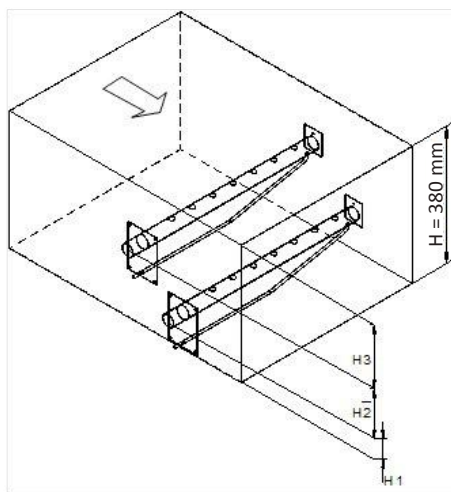
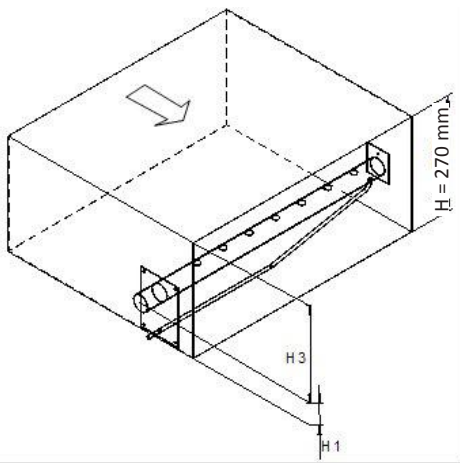
H1 = 110 mm = Minimum height between the duct floor and the axle of the steam pipe.

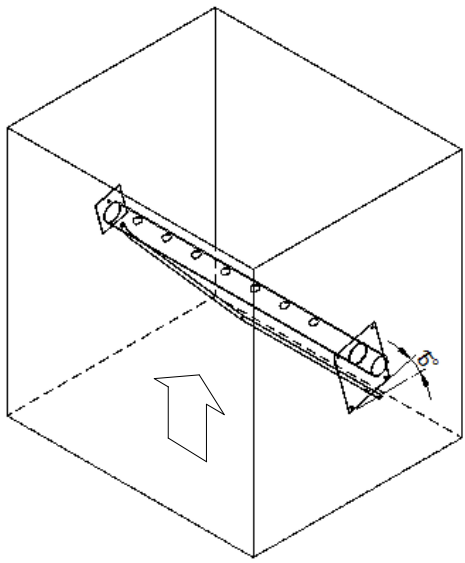
H2 = 140 mm minimum for a standard mounting / 110 mm minimum for a stair mounting.

H3 = 160 mm = Minimum height between the axle of the dispersion tube and the top of the duct wall.

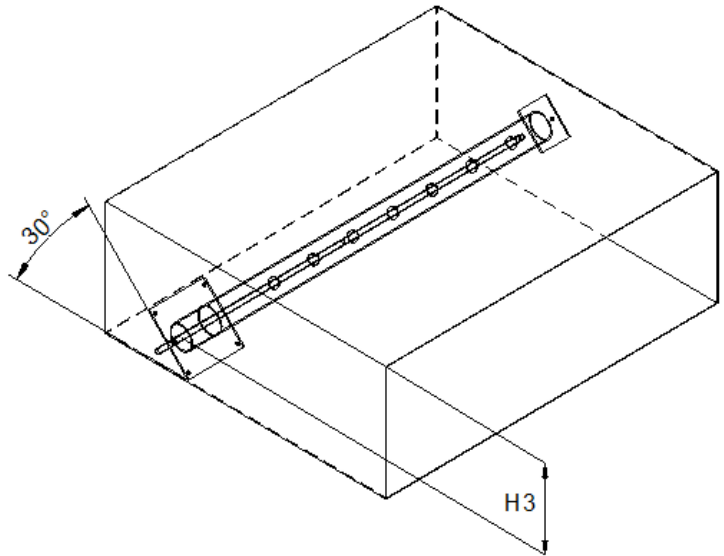
The H3 distance can be 80 mm at the shortest, if the steam pipe is installed at a 30° angle.

 The arrow shows the direction of the air flow.

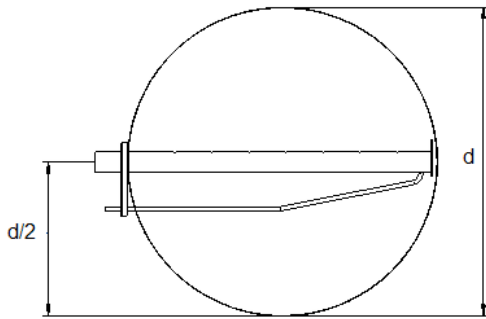




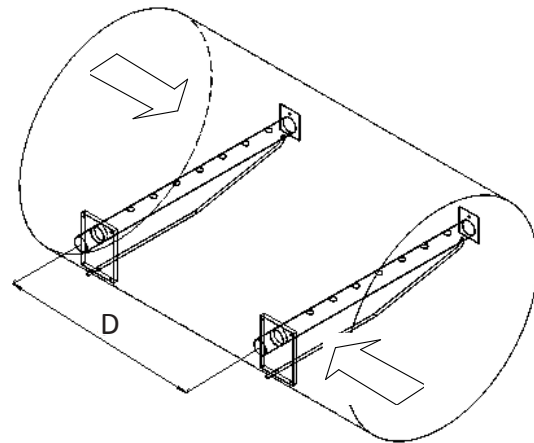
In vertical ducts where the air flow is upward or downward, the steam distribution pipe(s) must be tilted by 15° sideways.



In duct with limited height, the distribution pipe(s) can be tilted by 30° to get the 80 mm minimum height.



d = Duct diameter



D = Humidification distance

3.4 STEAM OUTLET

1. Use preferably hose from our supply.

NB : when new hoses are installed, a smell of burnt plastic may be smelt during the first running of the steam humidifier. This is normal and will eventually diminish.

2. Selection of the steam pipe:

ERS-LC Model	ERS-LC 3-15	ERS-LC 20-30
Number of steam outlets	1	1
Steam outlet diameter	Ø 25 mm	Ø 40 mm

3. The ERS-LC humidifier can be used with pressure ducts (P) having the following characteristics :

- If P is inferior to 220 mm CE (Water column) i.e. 2157 Pa.
- If P is between 220 mm CE and 370 mm CE (3627 Pa.), options available for 700 mm CE.

4. Please adhere to the recommendations given underneath for the installation of the steam hose. A set of hose clamps is supplied for ensuring a correct installation.

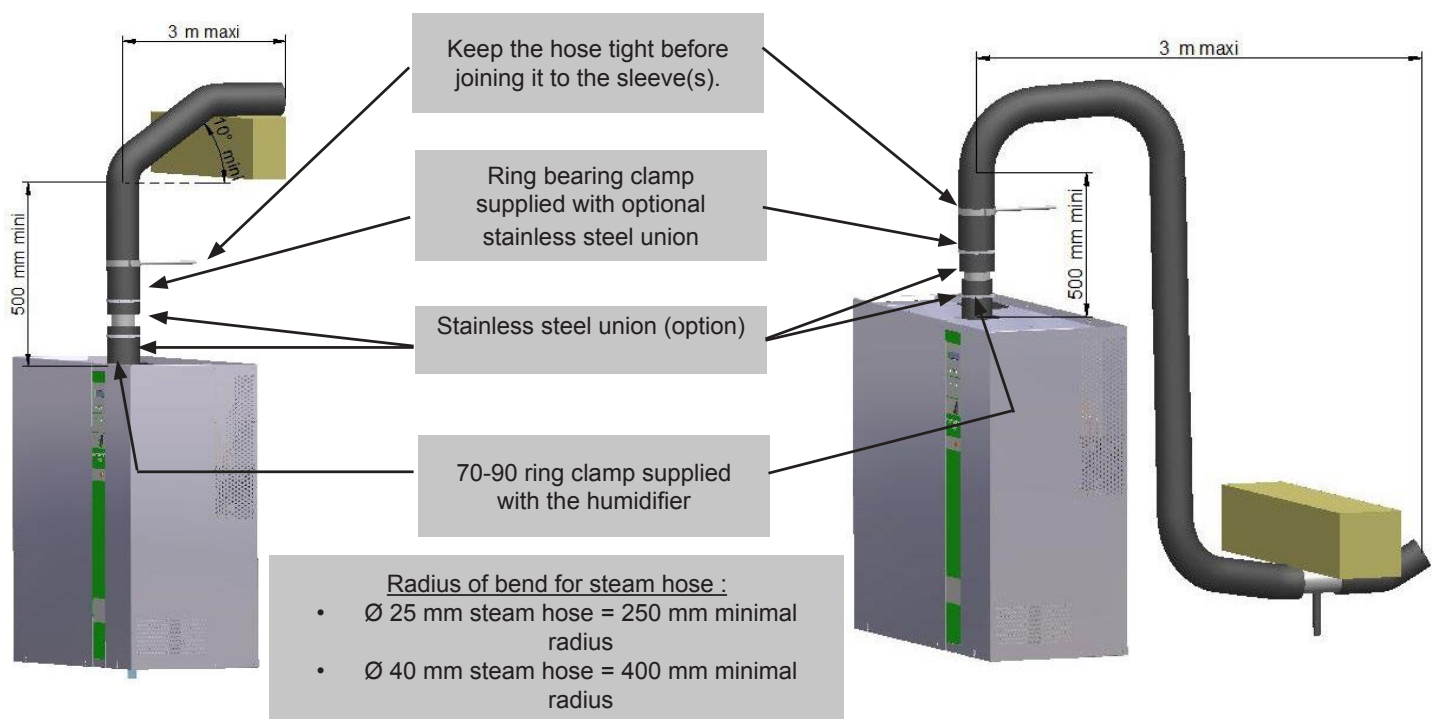
- Ø25 or Ø40 mm steam hose : max 3 m length.
- Stainless steel or copper pipe with a slightly larger diameter, connected to the ground. Use a flexible steam hose cuff to connect the humidifier to the steam distribution pipe. The length of the hose must not exceed 6 m and must be insulated.



Make sure that the steam hose is not leaky / or does not form a water pocket. Failure to follow these instructions can lead to serious malfunctions.

Example a

Example b



3.5 BLOWERPACK FAN UNIT

If there is no ventilation system, there are 3 types of fan units to disperse steam in the area type :

- BP 10 for flow rates up to 10kg/h
- BP 30 for flow rates up to 33kg/h
- EHF-3 for flow rates up to 54kg/h

The EHF-3 can not be placed directly on the device (see image below).
The distance between the fan unit and the humidifier must not exceed 3 m.

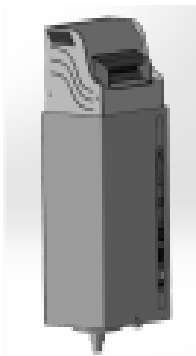
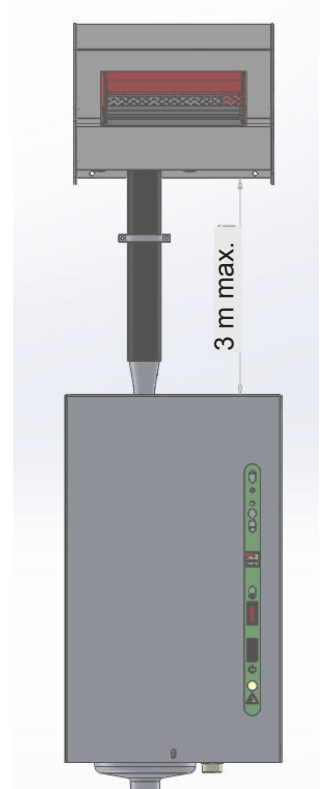
A reducer must be used for connecting the BP 10 or BP 30 to the humidifier while a $\varnothing 40/50$ mm or $\varnothing 25/50$ mm reducer must be used for connecting the EHF-3 to the humidifier.

BlowerPack electrical wiring must be done on terminals 3 & 4 on the DIN rail of the humidifier.

As far as the EHF-3 is concerned, please revert to the recommendations given on the EHF-3 information sheet. Never connect the EHF-3 unit on the terminals 3 & 4 of the humidifier when a 100 VA transformer is installed inside the ElectroVap ERS-LC humidifier.

Allow a 3 m. distance ahead to the fan unit for a free dispersion of steam.

TO USE AND PROPERLY INSTALL YOUR FAN UNIT, PLEASE REFER TO THE TECHNICAL MANUAL SUPPLIED WITH IT.



BP 10 sur humidificateur



BP 10 et BP 30



EHF-3

DIMENSIONS & CHARACTERISTICS

	Width mm	Height mm	Depth en mm	Weight kg	dB	Output kg/h	m ³ /h	Steam connecting \varnothing	Compatible with
BP 10	270	220	198	3	30	10	110	$\varnothing 40$	ERS-LC 3-5
BP 30	270	220	198	3	40	33	160	$\varnothing 40$	ERS-LC 7-15
EHF-3	495	406	356	15	48	54	780	$\varnothing 50$	ERS-LC 20-30

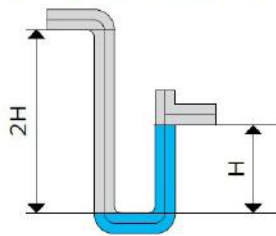
3.6 DRAIN WATER & CONDENSATE DRAINING

The following drawings show the water draining connections that should be made.

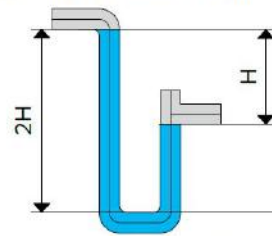
- The Armstrong supplied drain hose should be used :
 - ERS-LC : 1 m of \varnothing 25 mm drain hose with 2 hose clamps (supplied).
 - This hose is designed to be connected to the draining system. Regular replacement is recommended.
- If rigid piping is used, it must be a heat-resistant PVC material (up to 100°C) and have a 100 mm wide diameter.
- The discharge hose must be free from any obstacle. It is recommended that each humidifier has its own drain pipe and tank arrangement in case a number of humidifiers is installed.
- Use water tanks with a lid that has water collecting facilities (option on request) (s.a. drawings 1 & 2).
- A funnel can also be used (s.a. pict. 2), but it should be offset from the underside of the unit to prevent any steam and/or condensation from getting into the cabinet. The installation of a siphon (as per the draining hose) is recommended and arrangements for holding water spilling should also be made.
- CAUTION : keep a minimum pitch of 10° for both the draining & overflow hoses of the humidifier and for general drain pipe (s.a. pictures 1 & 2).**

The drain must be equipped with a siphon with water seal (see diagram) or be disconnected from the network and be drained off through a funnel.

POSITIVE PRESSURE SIPHON



NEGATIVE PRESSURE SIPHON



The drain hose must not be directly connected to the public sewerage network.

$$H \text{ min. (mm)} = P \text{ (Pa)} / 10$$

with P = absolute pressure of the air handling unit or the ventilation duct

Fig. 1

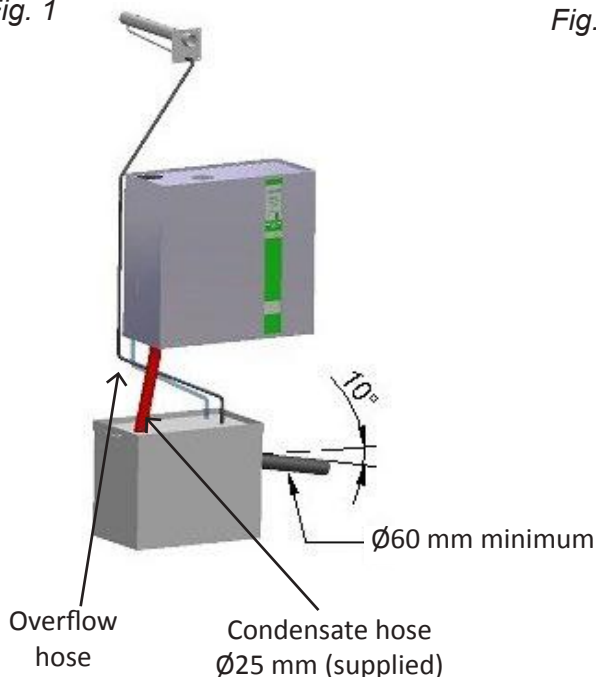
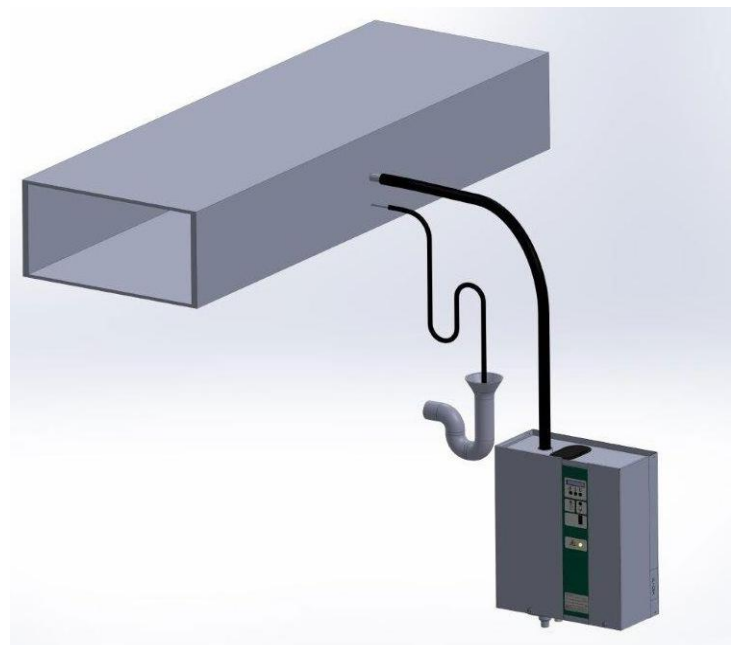


Fig. 2



3.7 WATER COOLING KIT OPTION

3.7.1 Functioning

This equipment cools the humidifier's drain water and provides an outlet temperature of 65°C with a supply water of 15 ° C at a distance of 1 m after the cooling kit.

Each time the humidifier is drained, the valve (7) of the cooling kit opens, and cold water is injected into the tube (11), allowing the drain water to cool.

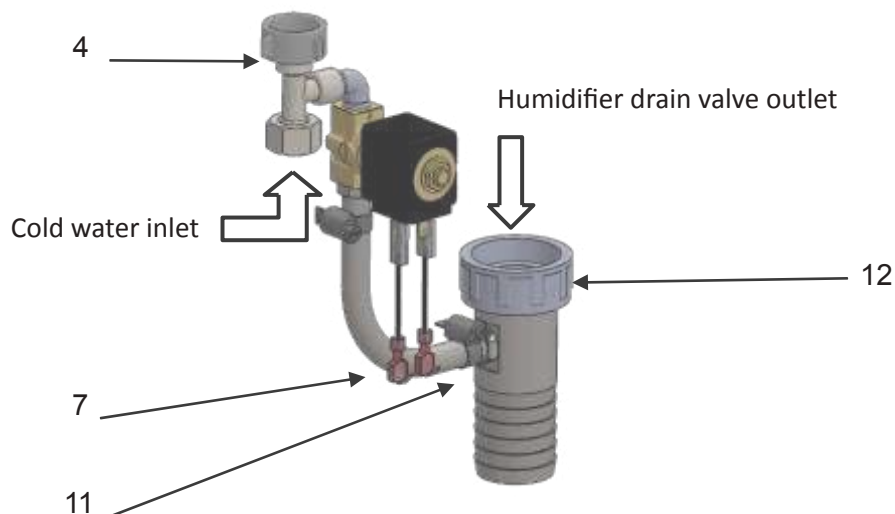


3.7.2 Installation

The water cooling kit option it is installed on the water inlet valve through a 3/4'' plastic connection (4), while the other side is installed on the drain valve through a 1'' 1/2 plastic connection (12), the electrical connection for the valve (7). The cooling inlet valve is electrically supplied by connection to the drain valve coil.

THIS OPTION CAN BE ADDED TO AN EXISTING INSTALLATION.

Option—Drain water cooling kit (ref: 311800540)



3.8 ELECTRICAL CONNECTIONS

All work on the electrical parts must be carried out by qualified and authorized personnel.

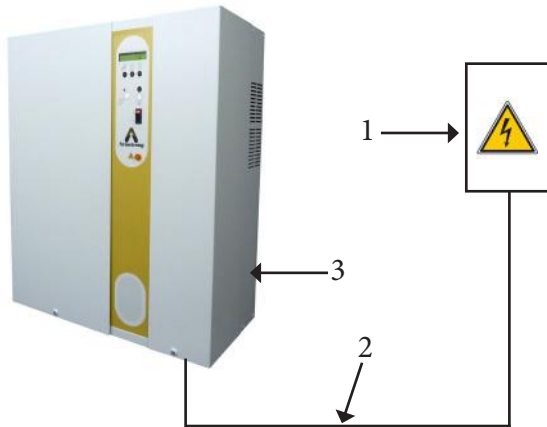
In addition, before making any electrical connections, check that your installation has been determined from the values in the table above.

3.8.1 Technical data

Supply (V)	380V - 3 ph		400V - 3 ph		415V - 3 ph		440V - 3 ph		460V - 3 ph		480V - 3 ph		Nb of tanks
	ERS	kg/h	kW (Pn)	kg/h	kW (Pn)	kg/h	kW (Pn)	kg/h	kW (Pn)	kg/h	kW (Pn)	kg/h	
5_3P	5	4	6	4	6	4	-	-	-	-	-	-	1
7	7	5	8	6	8	6	6	5	7	5	8	6	1
10	11	8	12	9	13	10	-	-	-	-	-	-	1
15	16	12	17	13	19	14	14	11	16	12	17	13	1
20	22	16	24	18	26	19	21	15	23	17	25	19	1
30	26	20	29	22	32	24	29	22	32	24	34	26	1

Supply (V)	575V - 3 ph			600V - 3 ph			Nb of tanks
	ERS	kg/h	lb/h	kW (np)	kg/h	lb/h	
7	7	15	5	8	17	6	1
15	16	35	12	17	37	13	1
20	23	51	17	25	55	19	1
30	32	70	24	34	75	26	1

Supply (V)	230V - 1 ph		208V - 3 ph		230V - 3 ph		Nb of tanks
	ERS	kg/h	kW (Pn)	kg/h	kW (Pn)	kg/h	
3	2.5	1.9	-	-	-	-	1
5	6	4	-	-	-	-	1
8	8	6	6	5	8	6	1



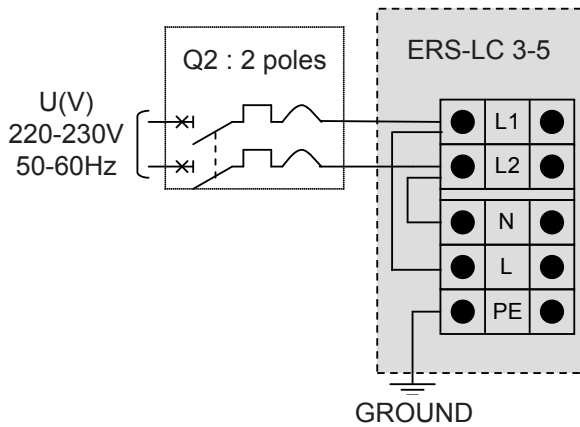
1. Power disconnector and circuit breaker
2. Power supply cable
3. Electrical compartment



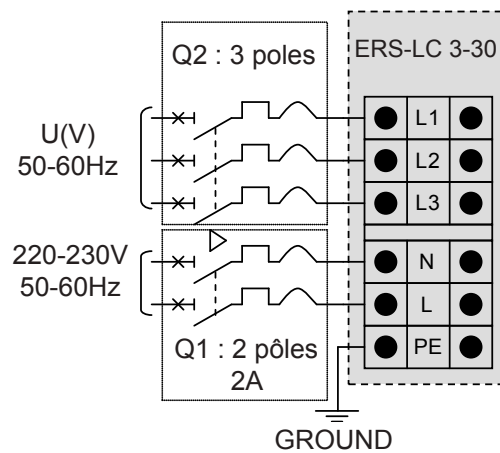
Since the risk of electric shock can be fatal, it is necessary to install circuit breakers.

Install a differential electrical circuit breaker at the top of the network supplying the humidifiers inside the general switchboard. In case of several humidifiers, we would recommend installing a differential circuit breaker per humidifier to prevent a total power cut off of all the humidifiers.

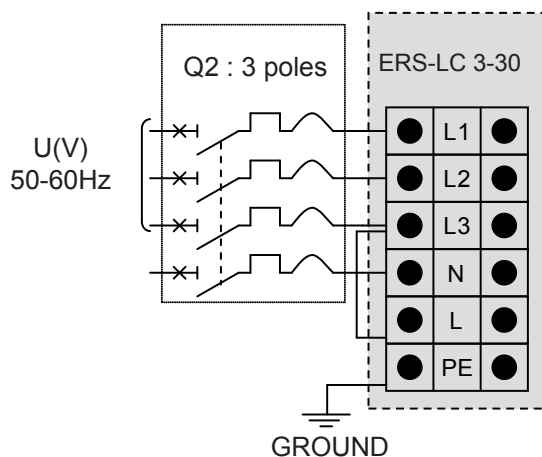
A) U= 2x220-230V



B) U= 3x380-400V sans neutre et 230V disponible



C) 3 phases + neutre

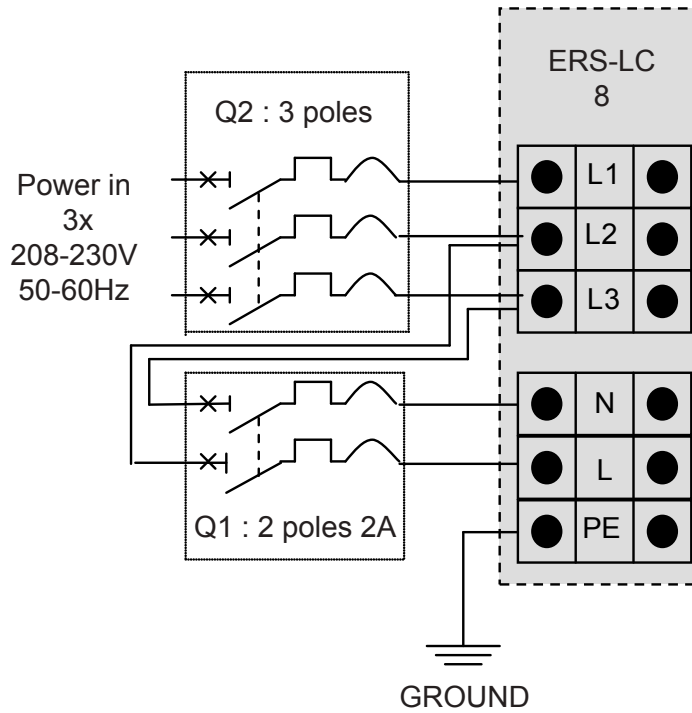


The symbol Δ between Q1 & Q2 means that these MCB are coupled. The power MCB Q2 and control MCB Q1 are mechanically linked together. So if a fault is detected, the power and the control circuits are switched off and there is no voltage on the unit. The unit is really off voltage.

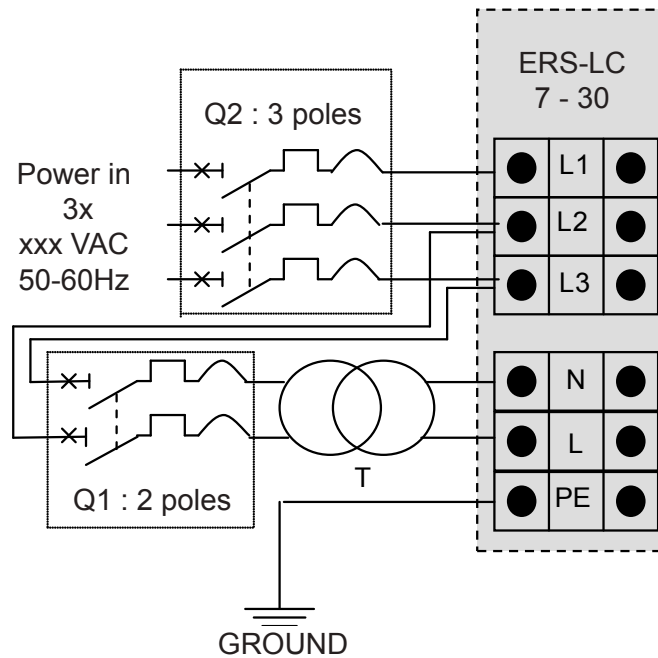
D) 3 phases without neutral: 3 x 380-400V

In this case, a transformer (option) must be installed (See page 27)

E) U=3x208-220-230V



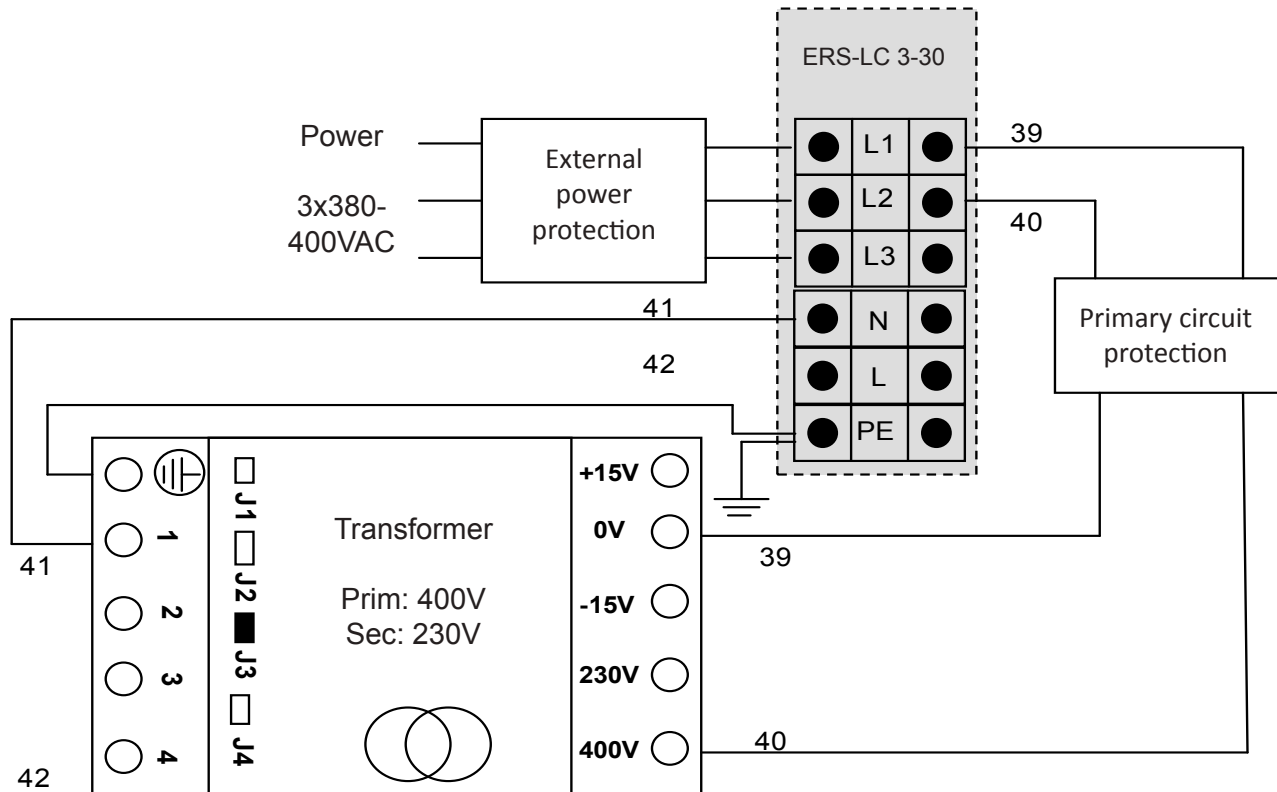
F) U=3x440-460-480-575-600V



T : Transformer
prim: 460V / sec:230V
S= 100 VA
(see next page)

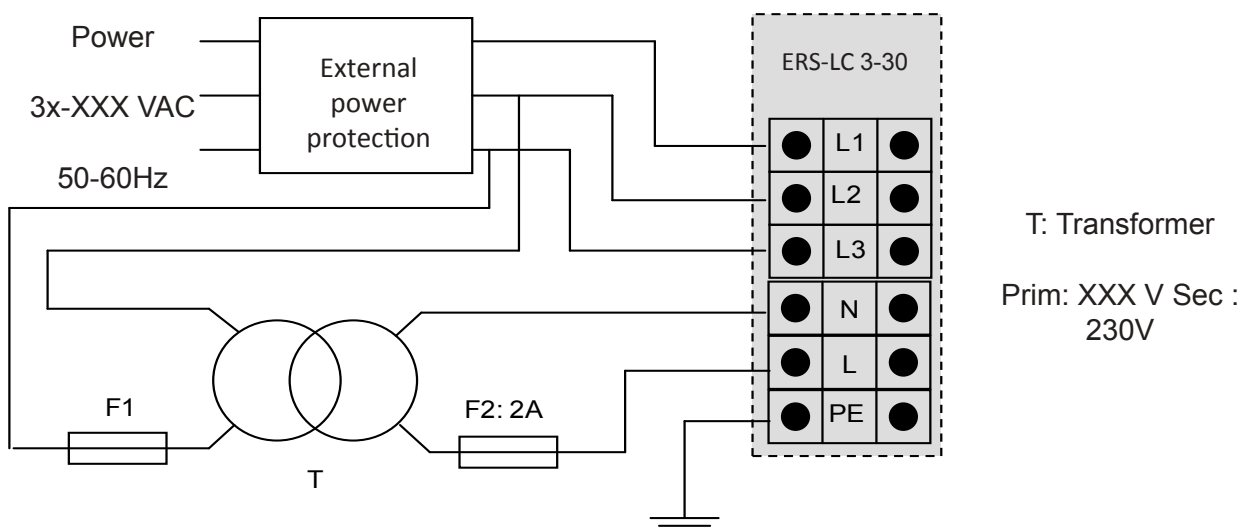
3.8.2 OPTIONAL TRANSFORMER

The ERS-LC humidifiers are electrically supplied in 3 x-XXX VAC + T + N. If your installation does not have a neutral, it is possible to add a transformer option that allows, at lower cost, to replace a neutral line.



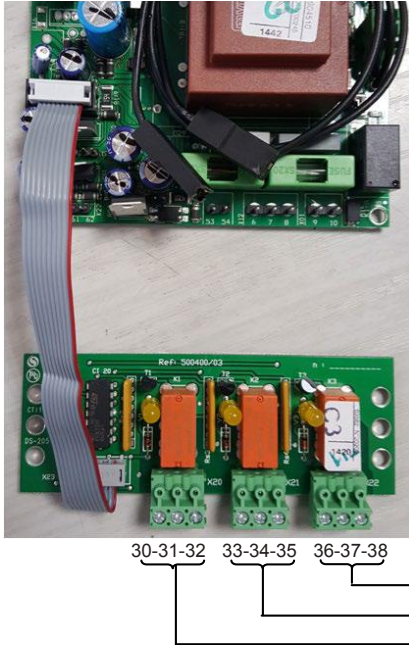
WITH NEUTRAL « I T »

The neutral is not earthed. In this case, we suggest the installation of a transformer.

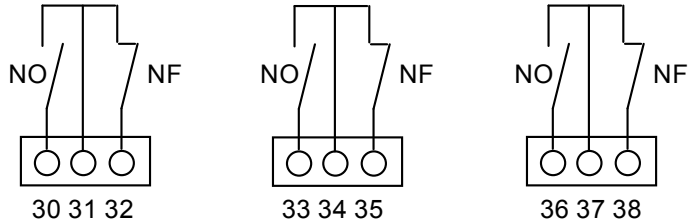


The connection of the options below must be done with a flexible cable of 0.75 mm² maximum.

3.8.3 REMOTE INFORMATION BOARD (OPTION)



Contact can be modified in NO or NF by wiring as per the following diagrams (ex: wiring on 30 & 31 = NO contact).



X22 connector (36-37-38): Remote steam production dry contact.

X21 connector (33-34-35): Remote general fault dry contact.

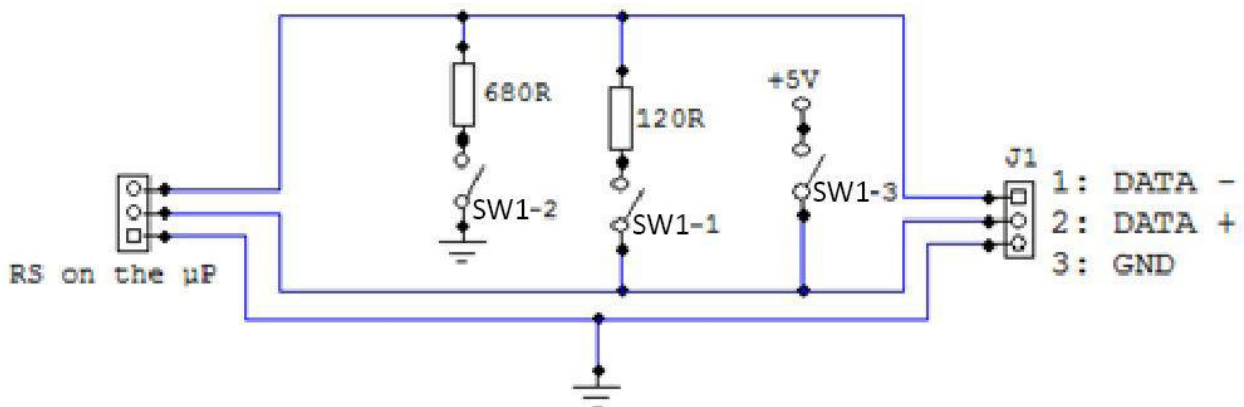
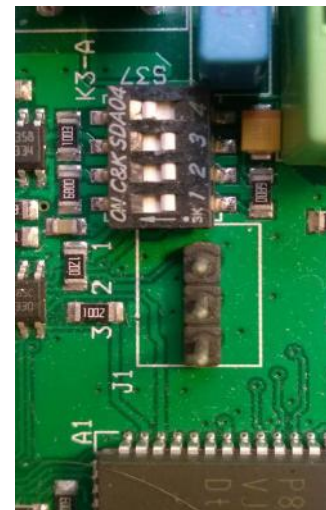
X20 connector (30-31-32): Remote tank maintenance dry contact.

3.8.4 RS485 - HARDWARE CONNECTION

The RS485 connection must be plugged on the J1 connector :

- Terminal 1 : Data –
- Terminal 2 : Data +
- Terminal 3 : Signal Ground

The S37 switch is used to enable or disable the line resistor. According to the situation, the resistor are useless and should be disabled.



3.8.5 MODBUS RTU & BACNET MSTP COMMUNICATION PARAMETERS

At the risk of communication errors, the network must consist exclusively of humidifiers. The requests passing on the BUS must in no case exceed 15 bytes.

	ModBus RTU	Bacnet MSTP
Communication speed	2400/ 4800/ 7200/ 9600/ 14400/ 19200/ 28800/ 38400/ 57600/ 115200/ 230400 bauds Defaut : 9600	
Packet size	8 bits	
Parity	NON	
Stop bit	2	1
Timeout response	5000ms (5sec)	
Time between requests (after response received)	Min. 100ms	standard
Nb of registers per request	5 maxi	

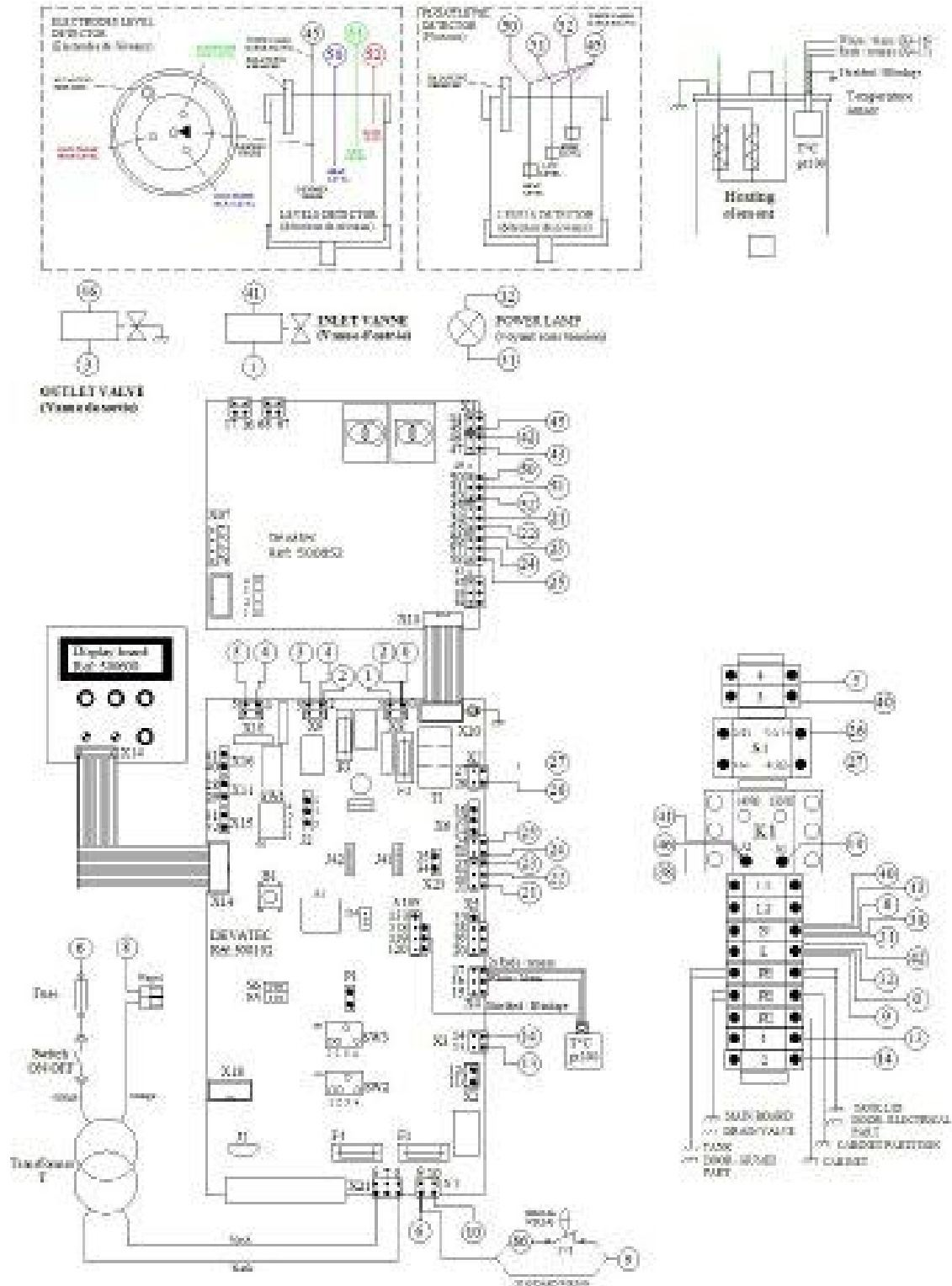
3.8.6 COMMUNICATION PROTOCOL FOR RS485 INTERFACE - MODBUS & BACNET

description	Value	Bacnet Object Type	Bacnet Instance #	Modbus Address
Fill (Inlet Valve)	1 = Fill Valve: ON – 0 = Fill Valve: OFF	AO	0	10001
Drain (Drain Valve)	1 = Drain Valve: ON – 0 = Drain Valve: OFF	AO	1	10002
K1 status	1 = Fill Valve: ON – 0 = Fill Valve: OFF	AO	2	10003
K2 status	1 = Drain Valve: ON – 0 = Drain Valve: OFF	AO	3	10004
BlowerPack status	1 = Blower: ON – 0 = Blower: OFF	AO	4	10005
Remote service status	1 is ON – 0 is OFF	AO	5	10006
Remote alarm Status	1 is ON – 0 is OFF	AO	6	10007
Remote on/off status	1 is ON – 0 is OFF	AO	7	10008
High limit (terminal block 1 and 2)	0 = Close -- 0 = Open	AO	8	10009
Alarm A1 status	1 is ON – 0 is OFF	AO	9	10010
Alarm A2 status	1 is ON – 0 is OFF	AO	10	10011
Alarm A3 status	1 is ON – 0 is OFF	AO	11	10012
Alarm A4 status	1 is ON – 0 is OFF	AO	12	10013
Alarm A5 status	1 is ON – 0 is OFF	AO	13	10014
Alarm A6 status	1 is ON – 0 is OFF	AO	14	10015
Alarm A7 status	1 is ON – 0 is OFF	AO	15	10016
Alarm A8 status	1 is ON – 0 is OFF	AO	16	10017
Alarm A9 status	1 is ON – 0 is OFF	AO	17	10018
Alarm A10 status	1 is ON – 0 is OFF	AO	18	10019
Rh sensor Error status	1 is ON – 0 is OFF	AO	19	10020
Stop the humidifier via the BMS	1 = ON : Start requested 0 = Off : Stop Unit	BO	0	1
EOS drain status	1 = ON – 0 = Off	BV	1	2

Type Unit	4 : RTH – 5 : RTH LC – 6 : ERS – 7 : ERS LC	AI	0	30001
RegVersion	1	AI	1	30002
Demand	(%)	AI	2	30003
Steam output	(kg/hr)	AI	3	30004
Run status	0: Idle season 1: Steam Gen 2: End of season 3: Maintenance drain 4: Manual 5: 6:Failure A1 7:Failure A2 8:Failure A3 9: 10:Failure A4 10:Failure A5	AI	4	30005
estimated time to service	(hours)	AI	5	30006
Production since last service (MSB)	(kg)	AI	6	30007
Production since last service (LSB)	(kg)	AI	7	30008
total production (MSB)	(kg)	AI	8	30009
total production (LSB)	(kg)	AI	9	30010
Total run time (MSB)	(hour)	AI	10	30011
Total run time (LSB)	(hour)	AI	11	30012
Remaining idle time to EOS drain	(Kg/hr)	AI	12	30013
Control signal value	10x(mA) or 10x(V) or (%)	AI	13	30014
Temperature tank 1	(°C)	AI	14	30015
Temperature tank 2	(°C)	AI	15	30016
Alarm A2 counter	(min)	AI	16	30017
Alarm A3 counter	(min)	AI	17	30018
Alarm A6 counter	(min)	AI	18	30019
Alarm A7 counter	(min)	AI	19	30020
Alarm A8 counter	(min)	AI	20	30021
Partial drain timer	if drain is off (min) if on (sec)	AI	21	30022
PWM main supply	(no unit)	AI	22	30023
PWM counter	(no unit)	AI	23	30024
ctrl signal 2 value (unused)		AI	24	30025
Max production capability	(kg/h)	AI	25	30026
number of tank		AI	26	30027
unit type ID		AI	27	30028
Unit voltage type		AI	28	30029
Water level status		AI	29	30030
Power consumed		AI	30	30031
max power rating		AI	31	30032
not used		AV	0	40001
not used		AV	1	40002
not used		AV	2	40003
Digital Rh value or digital demand	(%) (0-100)	AO	3	40004
Rh set point	(%) (10 - 99 D:50)	AV	4	40005
EOS drain timer	(hour) (0 - 72 D:72)	AV	5	40006
Service counter	100 x (kg) (1 - 65000)	AV	6	40007
Aquastat status		AV	7	40008
aquastat setpoint		AV	8	40009
Control signal type		AV	9	40010
not used		AV	10	40011
Control signal adjustment		AV	11	40012
not used		AV	12	40013
temperature 1 adjustment		AV	13	40014
temperature 2 adjustment		AV	14	40015
Proportional factor of PID		AV	15	40016
Integral factor PID		AV	16	40017
Derivative factor PID		AV	17	40018

3.8.7 WIRING DIAGRAMS

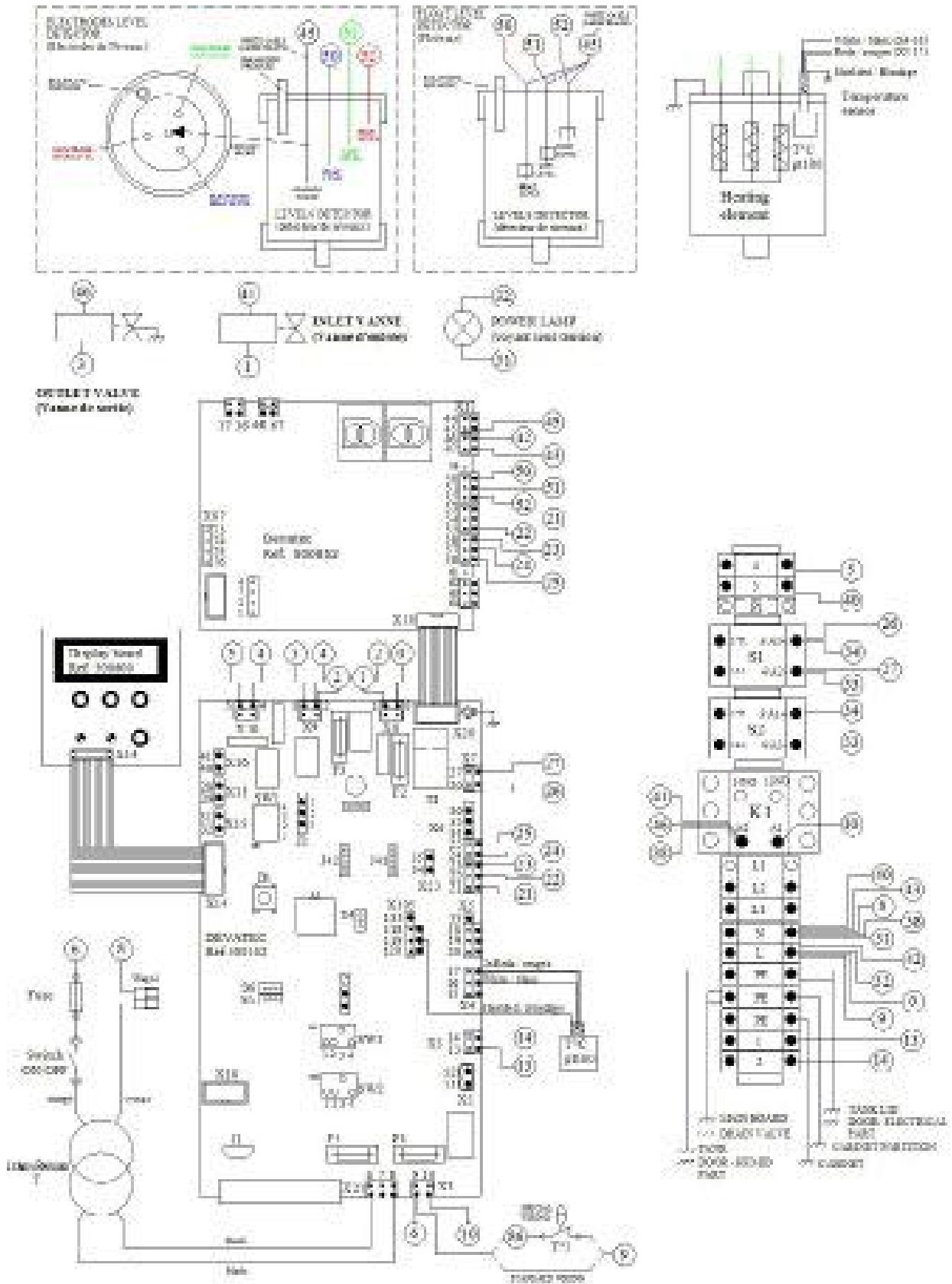
ERS-LC 3 - 5 (MONOPHASE)

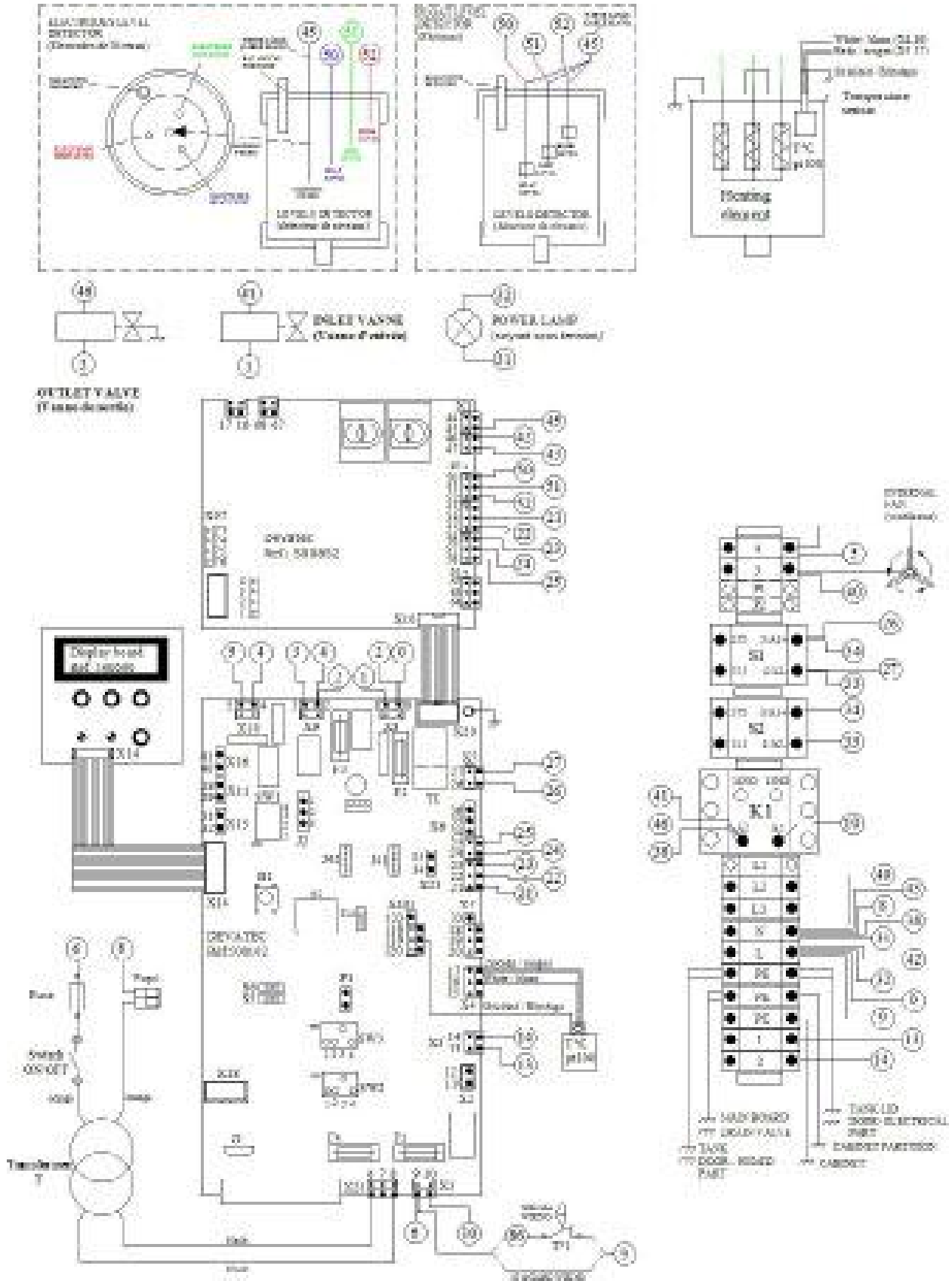


Rep	Amperage	Fuse function
F1	2AT	Protection of power contactor coil
F2	2AT	Protection of the inlet valve coil
F3	2AT	Protection of the drain valve coil
F4	2AT	Protection of the electronic boards

ERS-LC

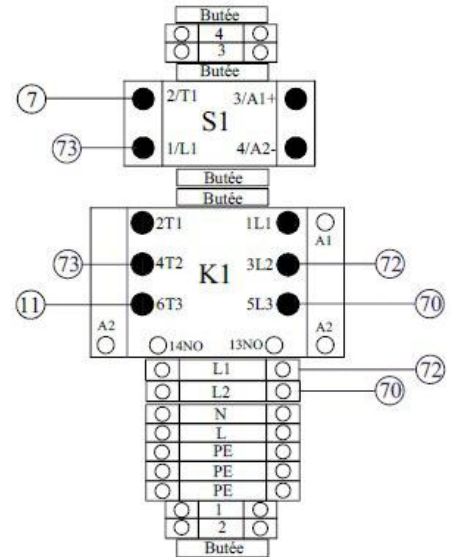
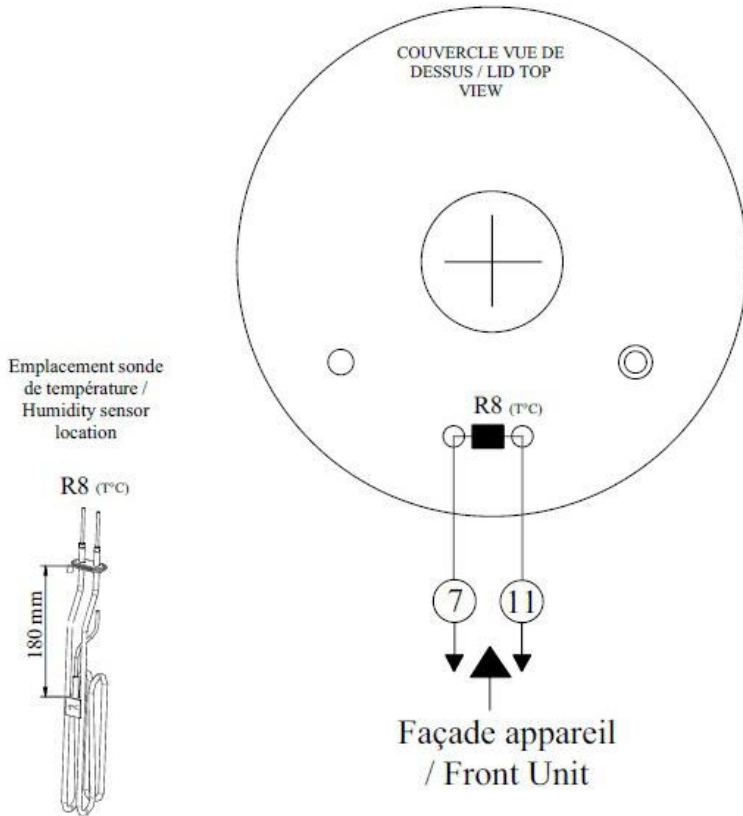
ERS-LC 5/3 - 15 (THREE-PHASES)





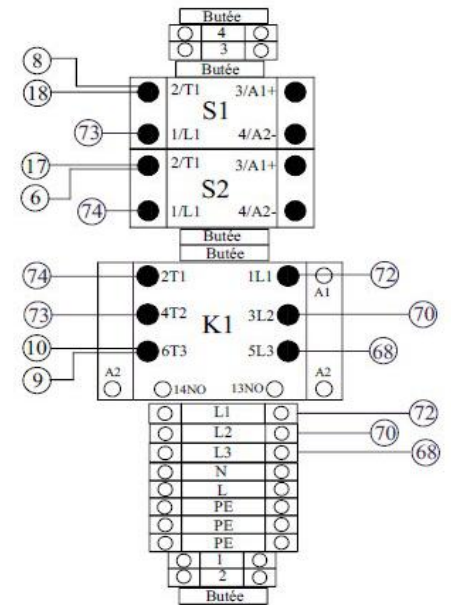
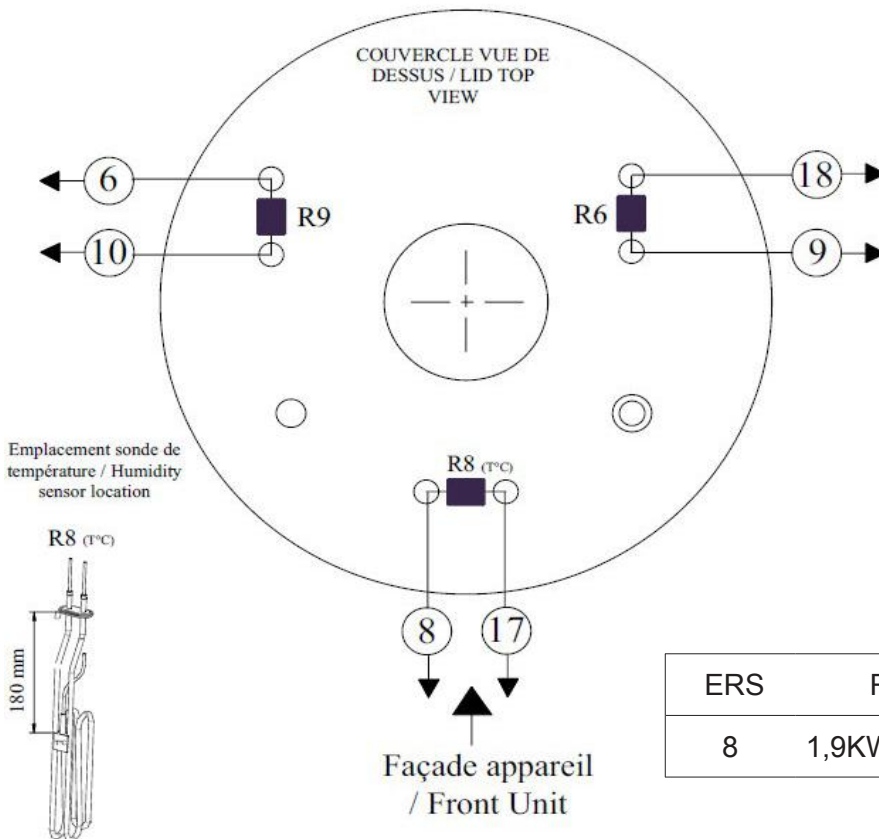
3.9 TEMPERATURE SENSOR CONNECTION

HUMIDIFIER ERS-LC 3 & 5 EN 1X230V

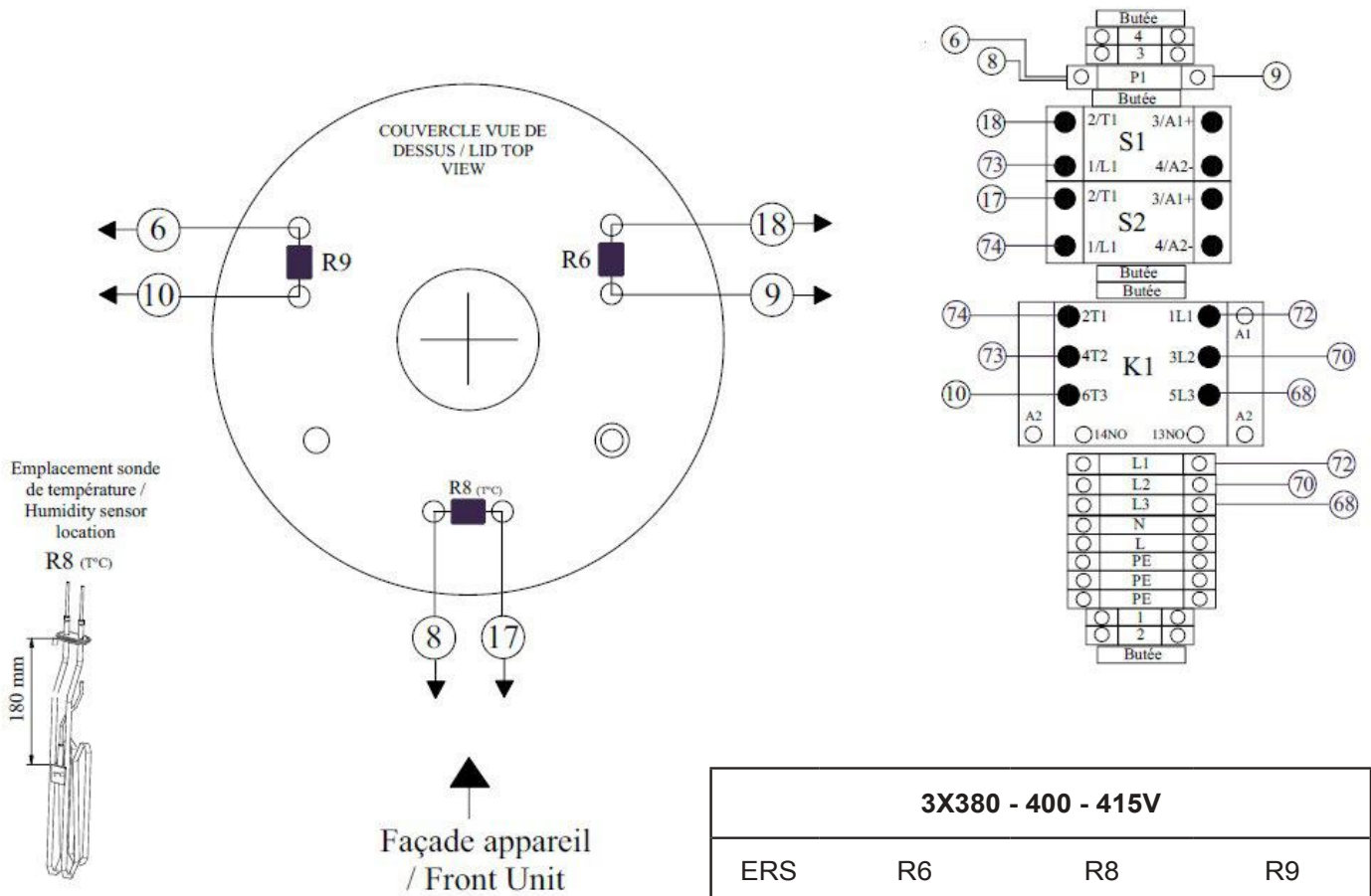


ERS	R8
3	1,9KW-230V
5	4,3KW-230V

HUMIDIFIER ERS-LC 8 EN 3X208-230V



ERS	R6	R8	R9
8	1,9KW-230V	1,9KW-230V	1,9KW-230V

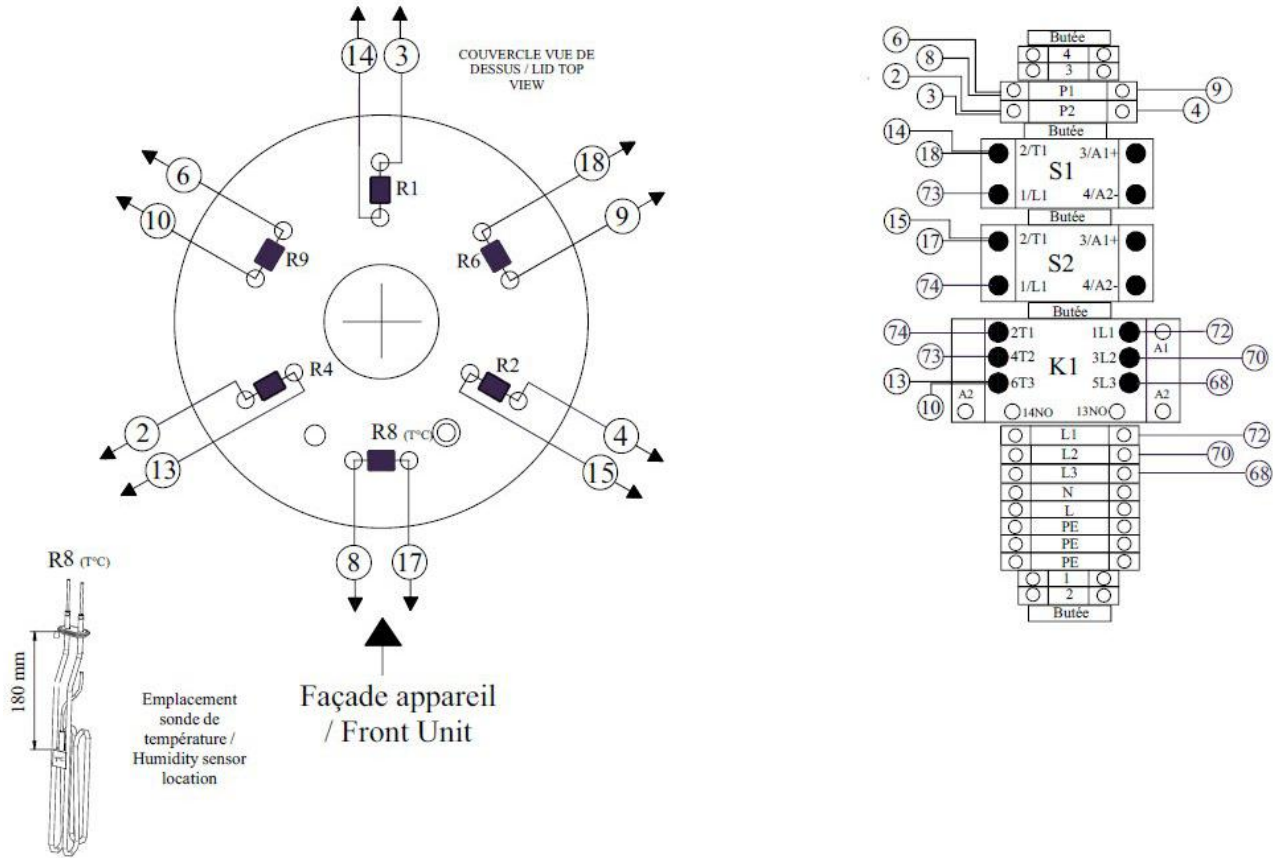


3X380 - 400 - 415V			
ERS	R6	R8	R9
7	1,9KW-277V	1,9KW-277V	1,9KW-277V
15	1,9KW-230V	1,9KW-230V	1,9KW-230V
10	4,3KW-277V	4,3KW-277V	4,3KW-277V
15	4,3KW-230V	4,3KW-230V	4,3KW-230V

3X440 - 460 - 480V			
ERS	R6	R8	R9
7	1,9KW-277V	1,9KW-277V	1,9KW-277V
15	4,3KW-277V	4,3KW-277V	4,3KW-277V

3X575-600V			
ERS	R6	R8	R9
7	1,9KW-346V	1,9KW-346V	1,9KW-346V
15	4,3KW-346V	4,3KW-346V	4,3KW-346V

HUMIDIFIER ERS-LC 20 & 30 EN 3X380V-600V

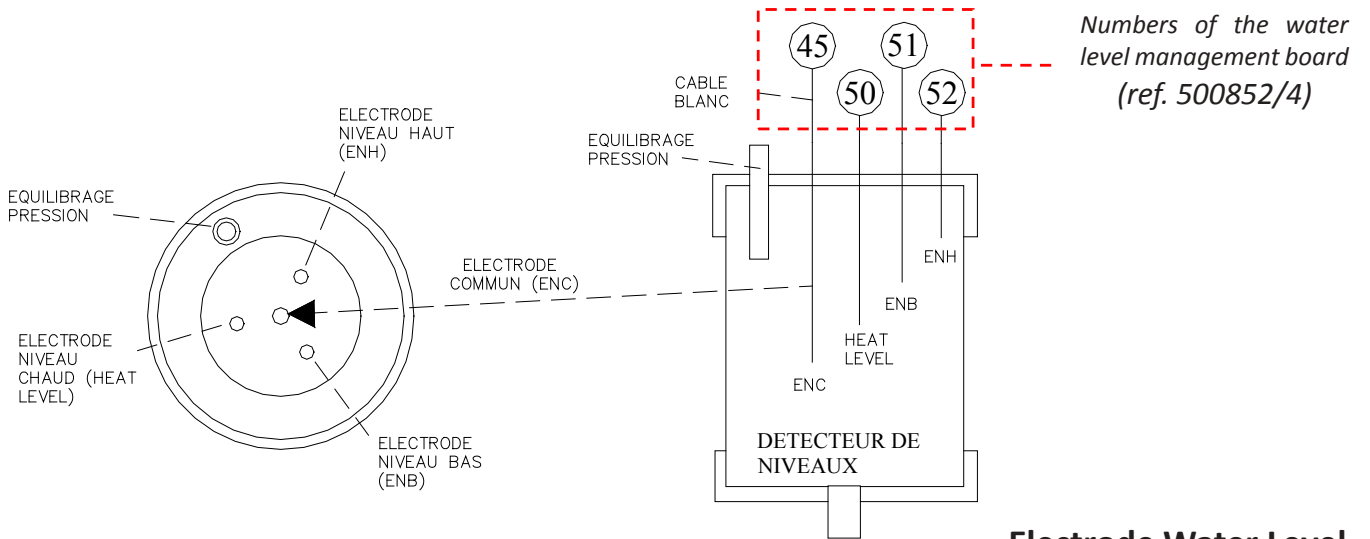
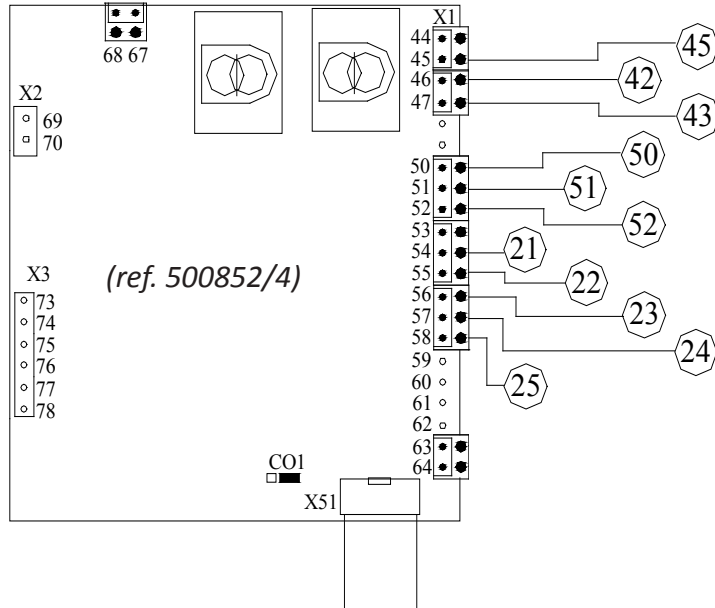


3X380 - 400 - 415V						
ERS	R1	R2	R4	R6	R8	R9
20	4,3KW-277V	4,3KW-277V	4,3KW-277V	4,3KW-277V	4,3KW-277V	4,3KW-277V
30	4,3KW-230V	4,3KW-230V	4,3KW-230V	4,3KW-277V	4,3KW-277V	4,3KW-277V

3X440 - 460 - 480V						
ERS	R1	R2	R4	R6	R8	R9
20	4,3KW-277V	4,3KW-277V	4,3KW-277V	1,9KW-277V	1,9KW-277V	1,9KW-277V
30	4,3KW-277V	4,3KW-277V	4,3KW-277V	4,3KW-277V	4,3KW-277V	4,3KW-277V

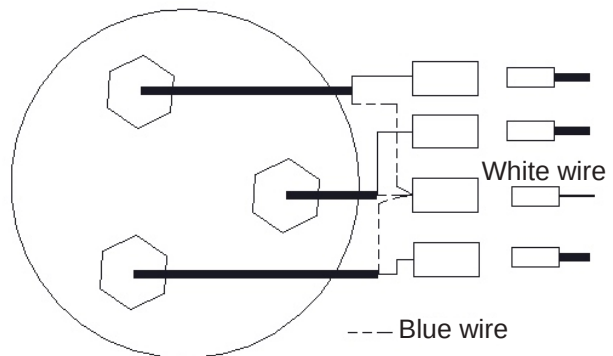
3X575 - 600V						
ERS	R1	R2	R4	R6	R8	R9
20	4,3KW-346V	4,3KW-346V	4,3KW-346V	1,9KW-346V	1,9KW-346V	1,9KW-346V
30	4,3KW-346V	4,3KW-346V	4,3KW-346V	4,3KW-346V	4,3KW-346V	4,3KW-346V

3.9.1 Water level management board



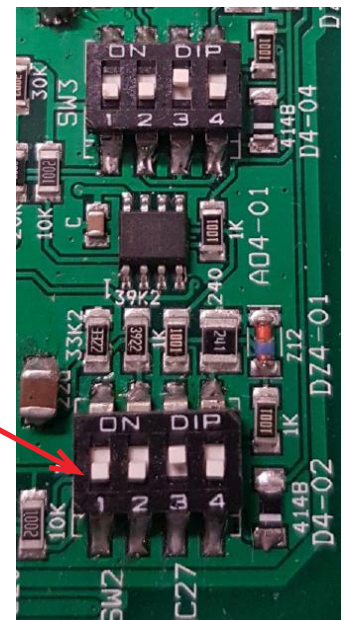
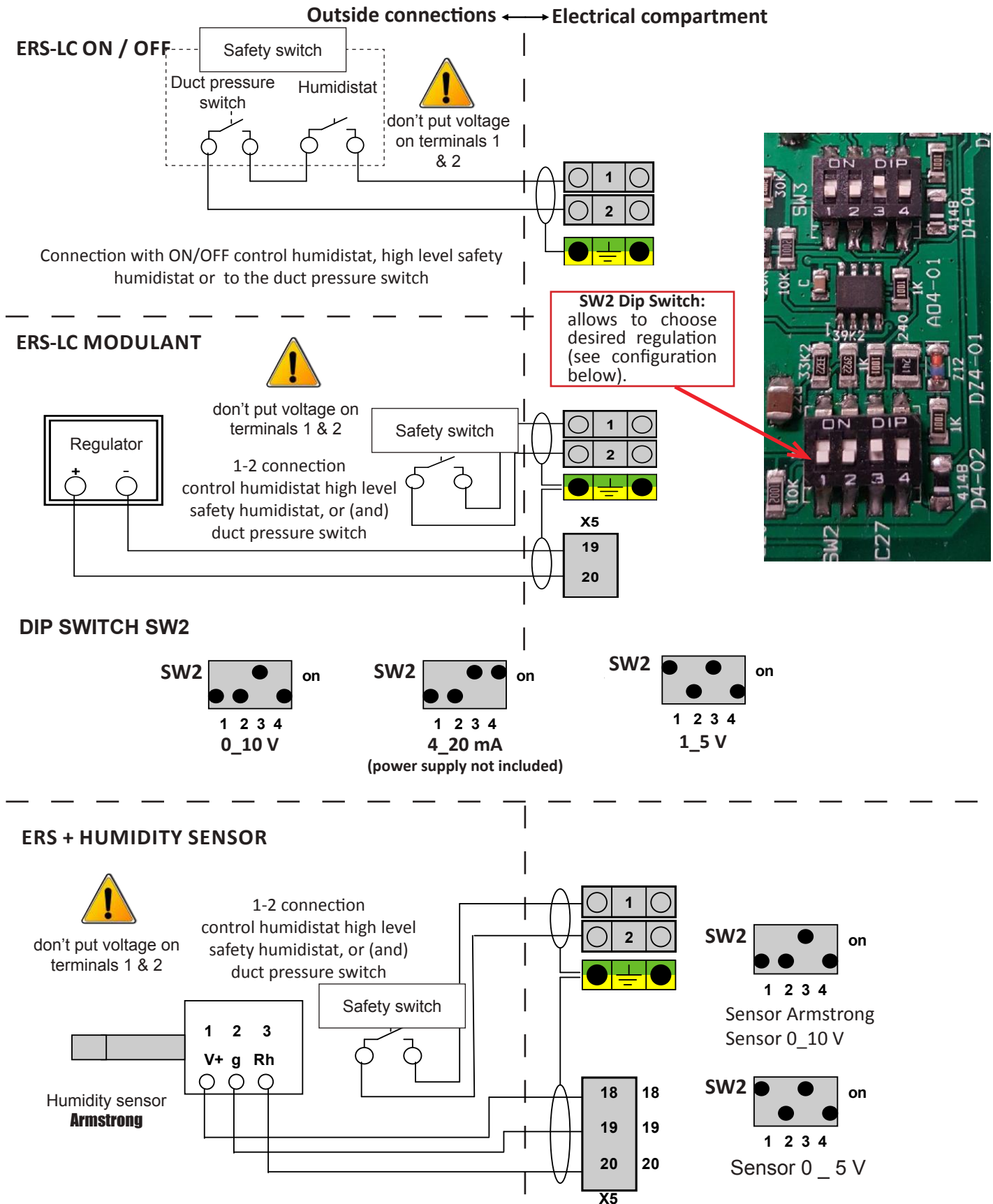
Electrode Water Level Sensor Connections

Float water level connection



3.10 CONTROL CONNECTION

The wiring of the optional equipment must be made with 0.75 mm² flexible cable. This control signal wire should not go along with a power cable.









4 - Setting up



Before putting the humidifier in operation, please make sure that your installation is in conformity with the manufacturer's technical specifications. Remove the blocking ring from the cylinder




The blue anti-bubble hose must be present

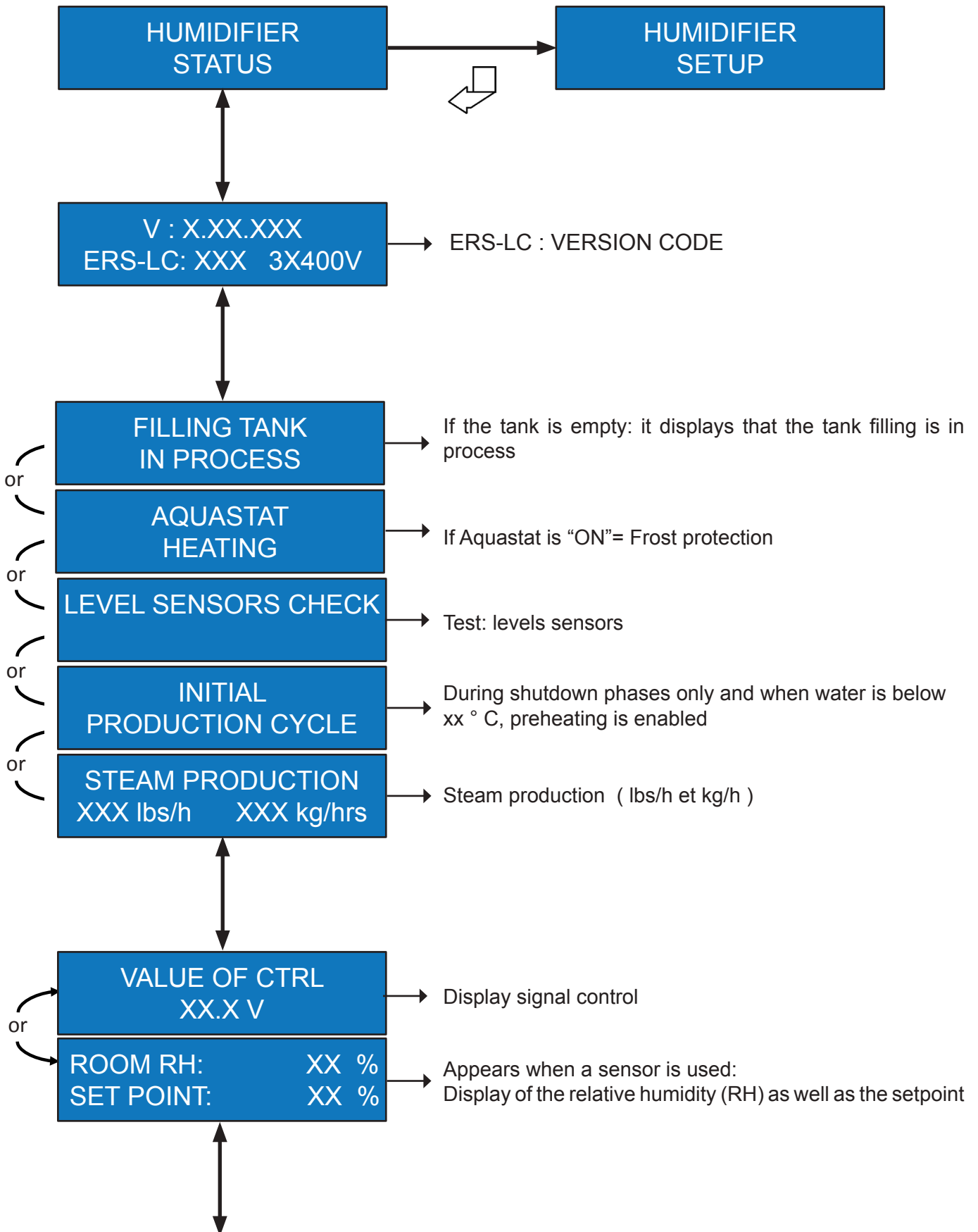
- Make sure that the blue anti-bubble hose is correctly set inside the filling cup
 - Open the water valve of the main water line.
 - Switch on the main power supply contactors (voltage and command).
 - The power-on light must be illuminated ①
 - Switch on I the **I/O** (on/off) rocker switch.
 - The display will default to show the rate of steam produced. You are in the user information menu.
 - Enter the 3-digit code as follows:
 - Press one of the button    and the display will show you OXX, with the flashing zero to eventually change it by pressing  or .
 - Once arrived at the digit, validate it by pressing the button  and the second digit flashing.
 - Repeat the previous 2 operations to display the last 2 digits.
- Very important: do not forget to validate the last digit.**
- Enter the water quality in the displayed menu.
 - The device is ready to respond to any production request.
 - When steam is produced, the LED ② lights up.

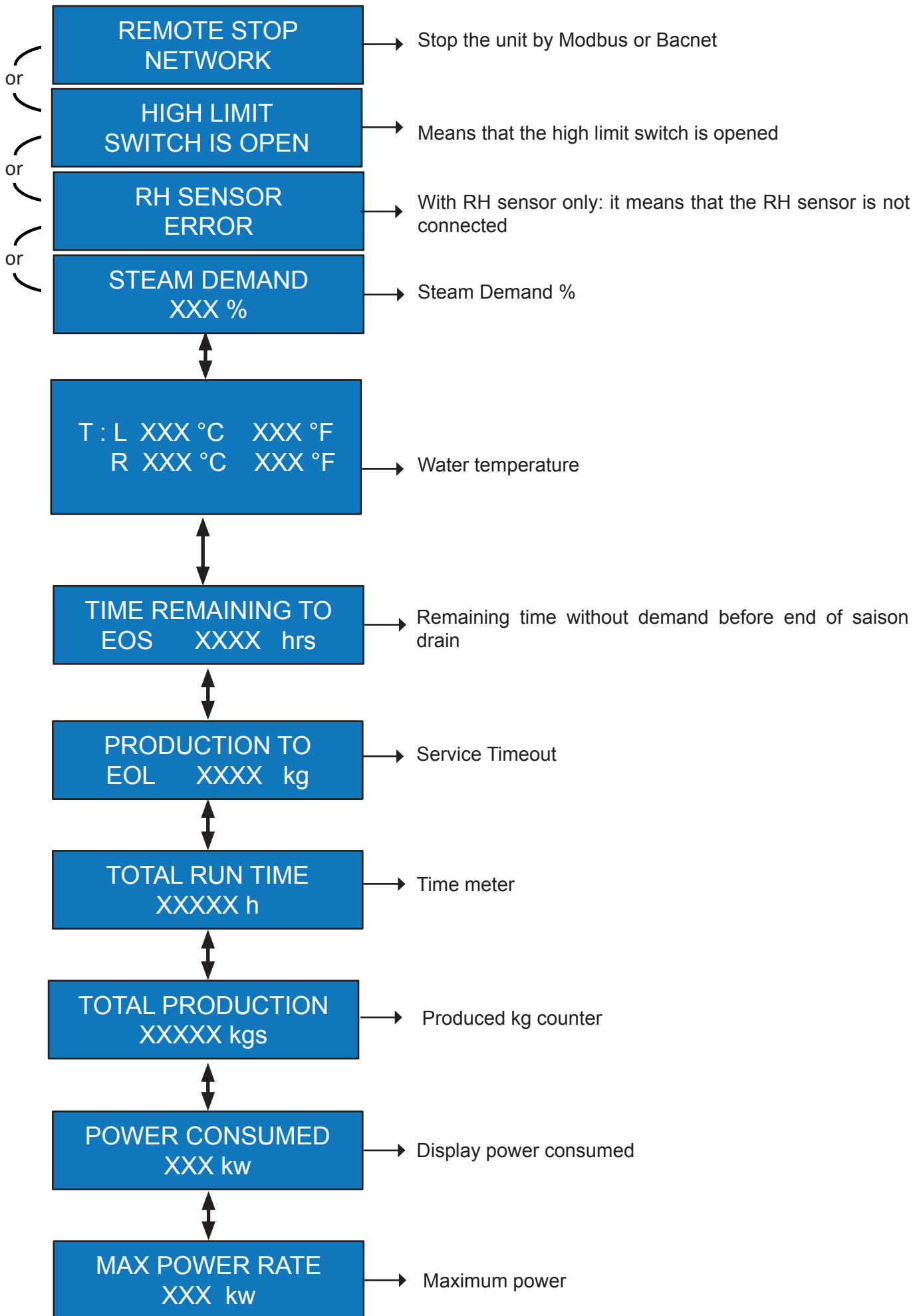


On the left, the front label of the device, protected by a waterproof polycarbonate coating, where all the necessary technical information can be found.

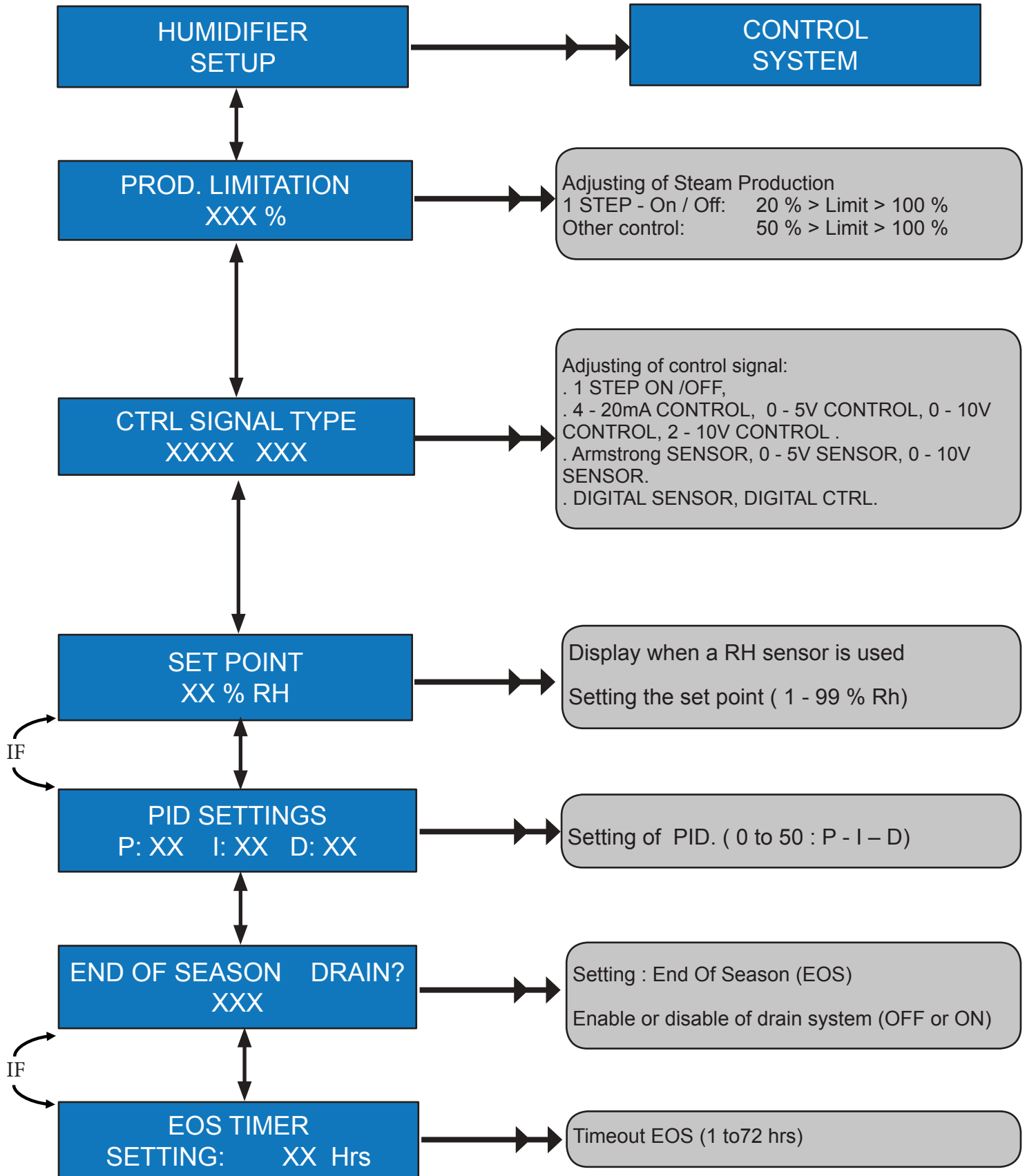
ERS 30-LC	n°
Model	Serial
35kg/h	208 - 240V
Steam output	Command voltage
480V	3
Power	Nb of phases
31A	26kW
Intensity	Max power
	
Armstrong International S.A. 185 bd des Frères Rousseau 78550 Offranville- France Made in France http://www.armstronginternational.com	

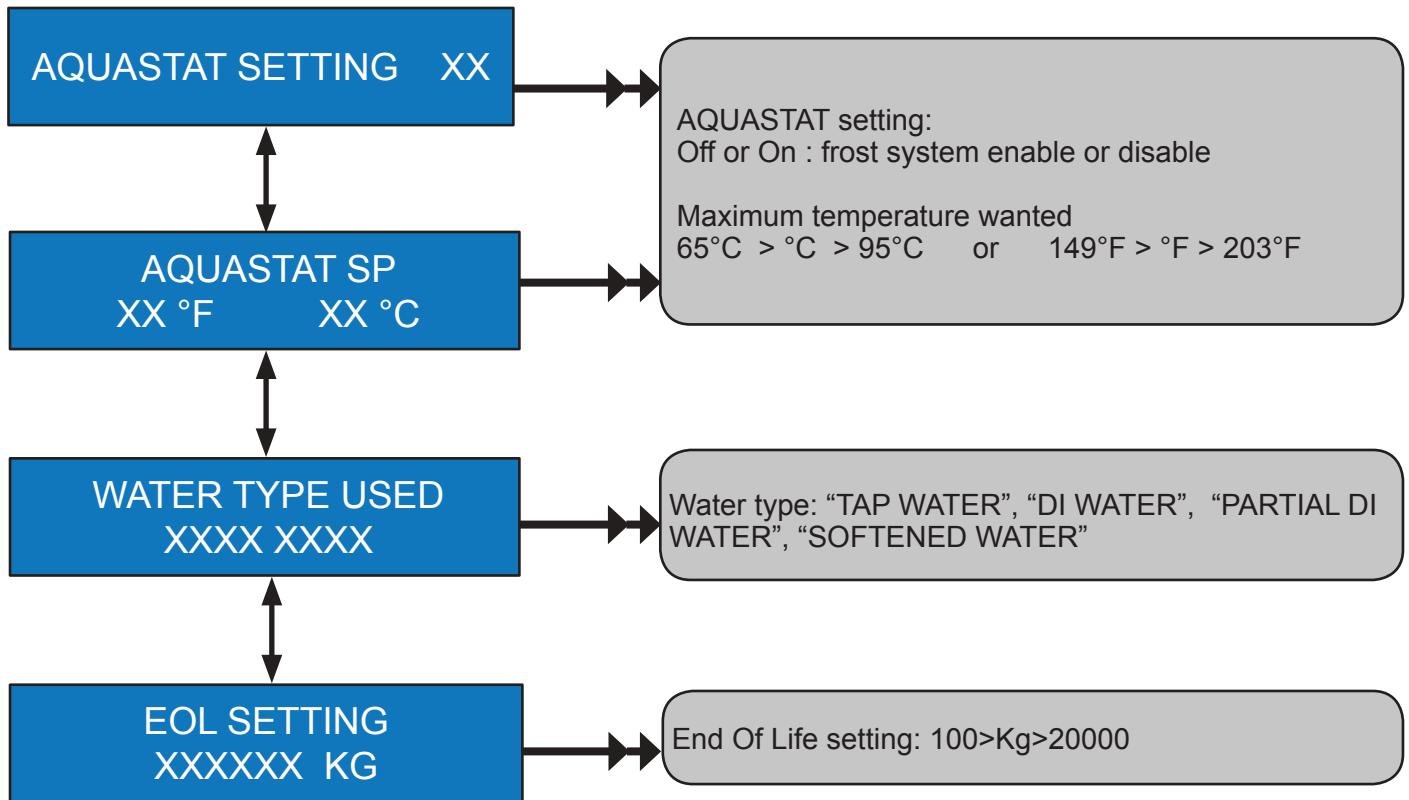
5.1 MENU INFORMATION (read only)



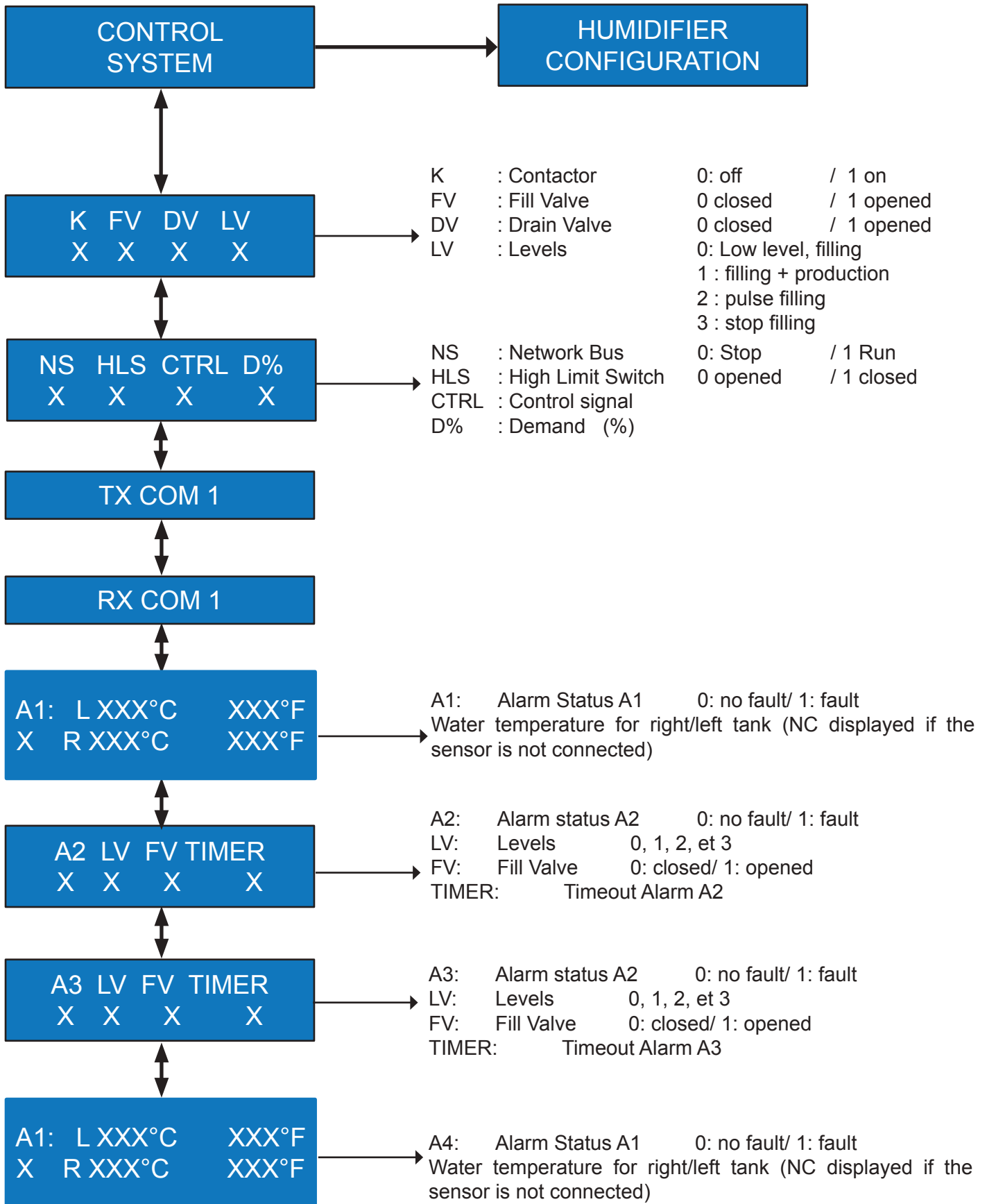


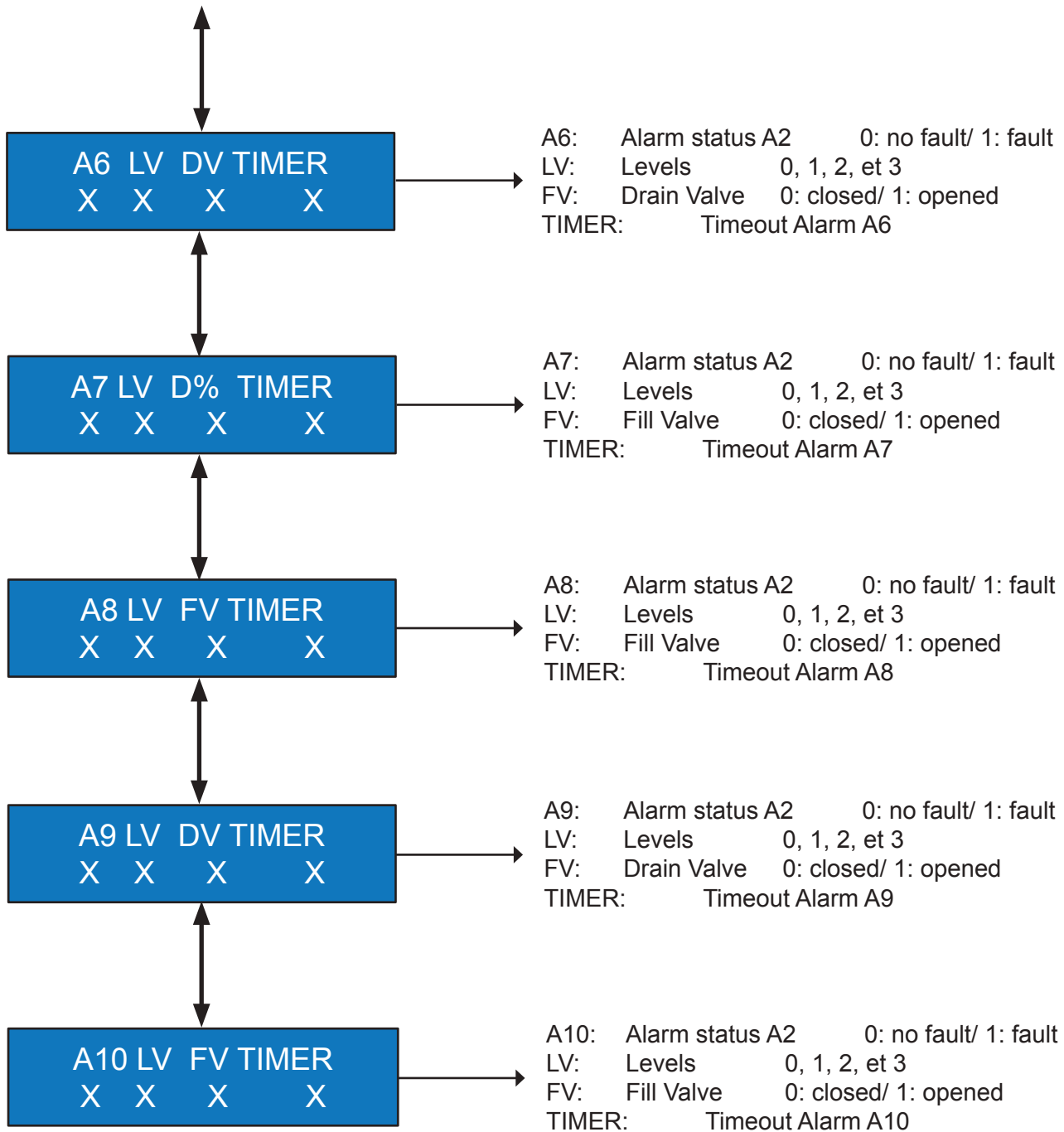
5.2 SETUP MENU





5.3 CONTROL SYSTEM MENU



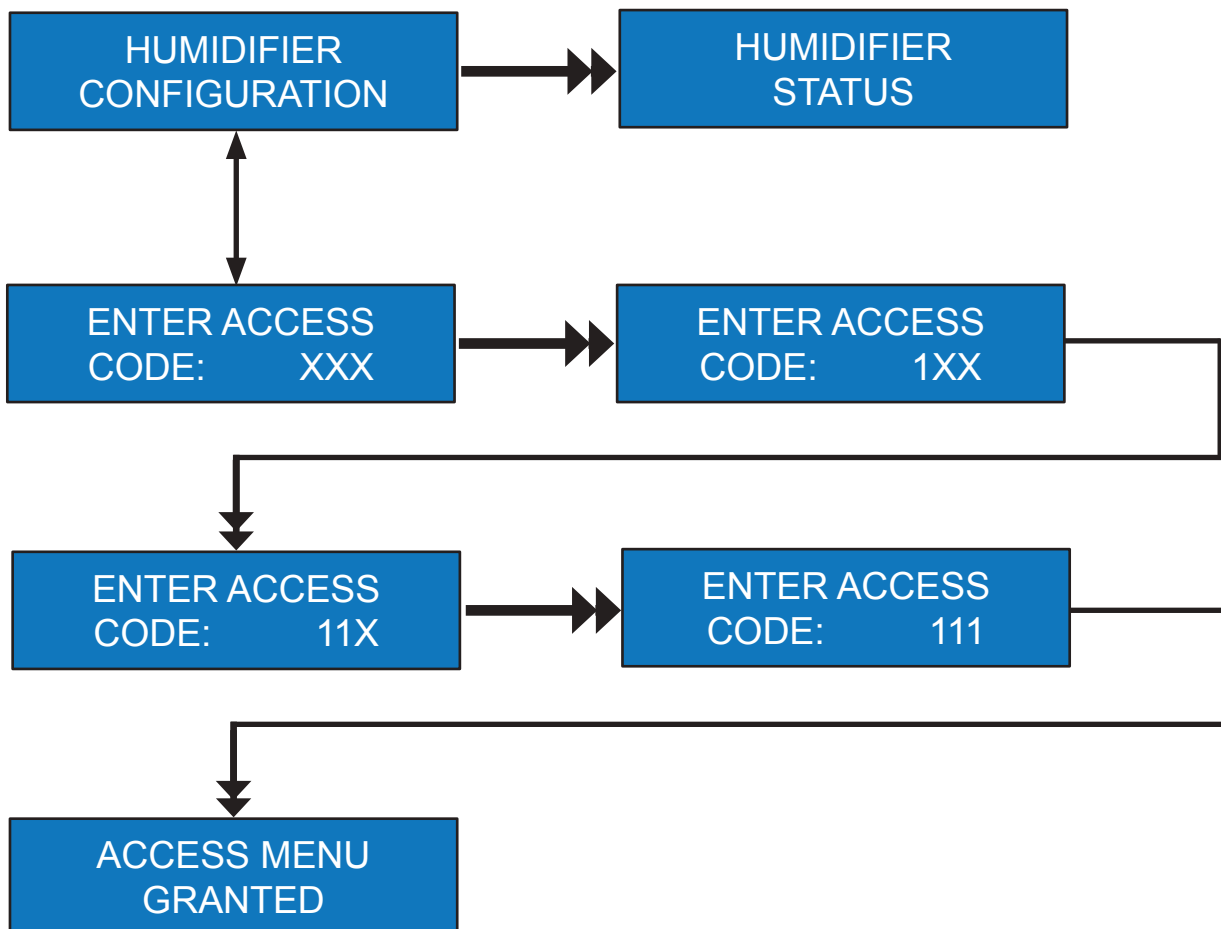


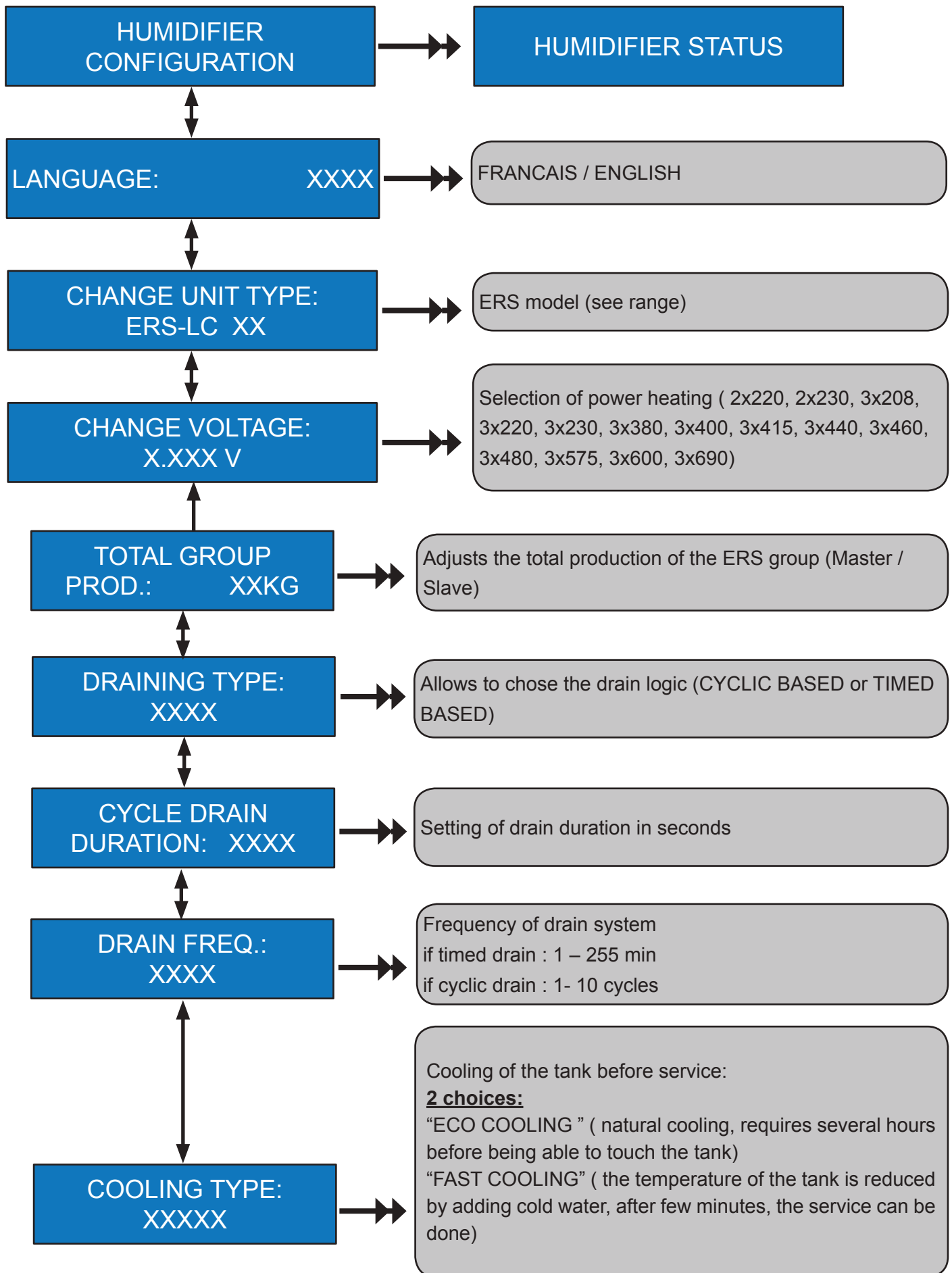
5.4 CHANGE SETTINGS MENU

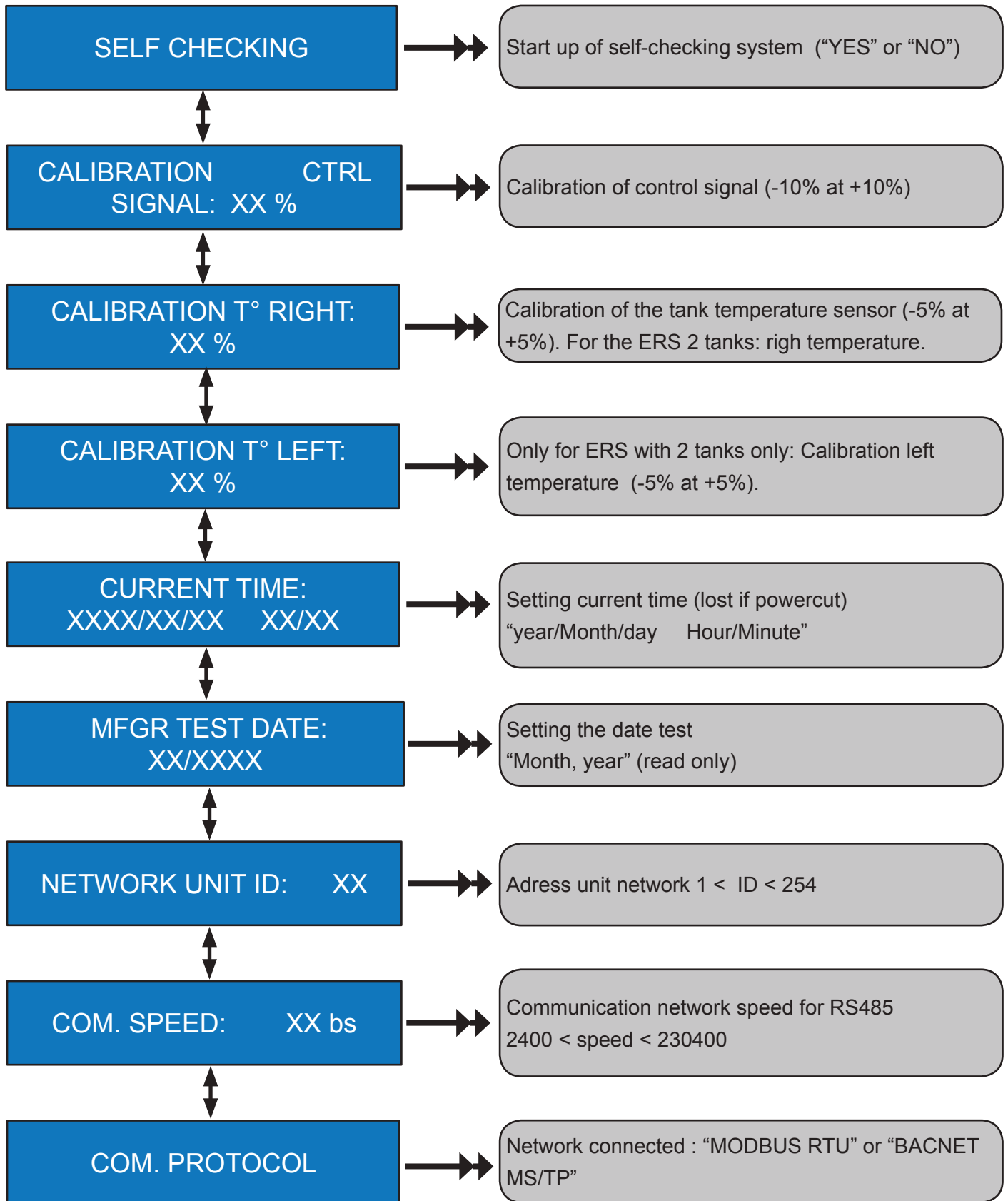


Procedure to enter the access code: :

- Press the "1" key: the first cross flashes.
- Press the "2" key to increase the number or the "3" key to decrease it.
- Once you have reached the desired number of the code, press the "1" key to validate it: the 2nd cross flashes.
- Proceed in the same way for the following numbers, and do not forget to validate the code by pressing the "1" key.







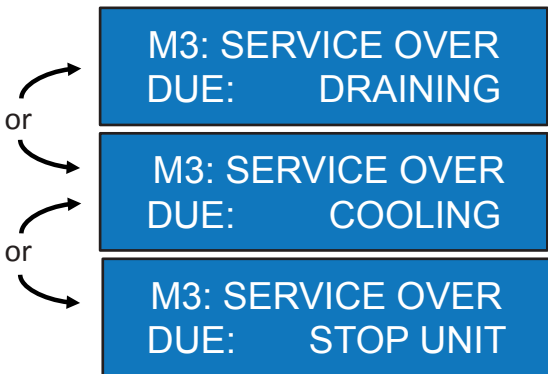
5.5 MAINTENANCE ALERTS

M1: CHECKING 50hr
DUE

This message is displayed 50 hours after the first start-up. It is then necessary to check the tightness of the electrical and hydraulic connections (steam pipe, drain circuit, water supply, etc.). The device is not stopped.

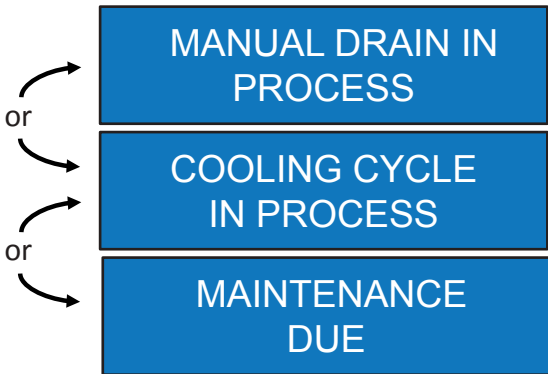
M2: MAINTENANCE
DUE

The maintenance timer has arrived at 0, it is necessary to maintain the device. The device is not stopped.



The message M3 is displayed when the M2 display is displayed and 100 hours have elapsed without maintenance.

Then the unit is shut down, drained, the tank cooled, and put on hold of mandatory maintenance.



This message is displayed once after pressing the manual drain button. The drain is activated.

This means that the manual drain is complete and you have to wait for the tank temperature to go down before servicing.

The tank is empty and cooled, maintenance can be done. See technical manual.

5.6 FAULT MESSAGES

A1: TANK TEMP. OVER-HEAT

Meaning :

The temperature inside the tank is too high: > 110 ° C.
The heating elements are no longer completely immersed.

In that case :

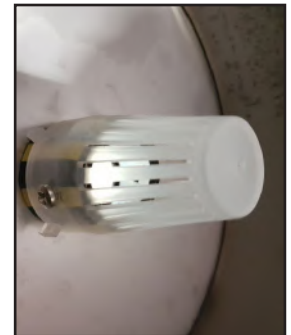
When this message appears, the tank is drained, the general fault contact is activated and the unit is then stopped.

Causes and remedies

- 1. Incorrect water supply.** Few or no water flushes the tank due to a piece of chalk clogging the inlet valve. All the water pipe must be cleaned up.



Water supply



Water filter inside the water tank

- 2. Malfunction of the water sensor.** Check that the wires of the level sensors are correctly connected to the electrodes, (see wiring diagram : wires 45, 50, 51, 52, 25, 24, 23, 22 and 21) there must be no short circuit between these. In addition, check the quality of these electrodes or floats, as well as the cleanliness of the bottom of the detector cover, nothing should connect the electrodes together.
In the case of a float water level detector (DI version, demineralized water), check that none of the floats fail.



- 3. Faulty temperature sensor or calibration to redo.** If this message appears while the tank is cold, then it is necessary to test and replace the temperature sensor (PT100). And then redo the calibration.
- 4. Water quality issue.** There is foam formation in the tank; it is necessary to increase the duration of the purges. From the menu "CHANGE PARAMETERS" find the menu "DRAIN TYPE" and activate the mode: "TIMED". Also, check regeneration time of the water softener.
- 5. Electronics.** Change the level management map. In case of malfunction, also replace the main board. Then check that there is no steam rise or water flow in the electrical compartment.

A2: DEFECTIVE TANK FILLING

Meaning :

The filling of the tank is not carried out correctly. The water level does not reach the low water detection level. (Maximum duration of filling before alarm: 20 min).

A3: FILLING PRODUCTION AREA

Meaning :

That the filling of the evaporation zone does not take place correctly.

A8: WATER RE-FILL DEFAULT

Meaning :

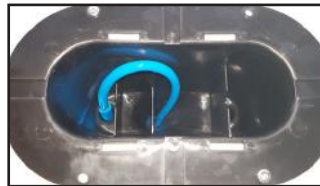
That the water filling of the tank is not done correctly.

In that case :

When this message appears, the tank is drained, the general fault contact is activated and the unit is then stopped.

Causes and remedies

1. **Check the water supply.** Water pressure - It must be between 1 & 6 bar and kept as constant as possible. If not, a water regulator valve must be installed on the supply line and adjusted at 2 bar. Also check the condition of the inlet valve, the electrical connection and the state of the F2 fuse (2AT). If out of service replace valve and fuse.
2. **The blue hose into the filling cup is incorrectly positioned or folded.** The blue hose must have one end in the water feed hole and the other in the middle hole. If the hose is folded, please change it.
3. **Check that the condensate is drained properly.** Condensate has to be evacuated otherwise it will cause water spitting by creating a pressure rise into the tank.



4. **Check the proper closing of the purge valve.** A piece of limestone keeps the valve open. Also check with an AK-Muller drain valve (white coil), the resistance R26 or RC3 has been removed.
5. **Water level detector.** Check that the level sensor, detector and the pressure balancing hose are clean and that nothing prevents the water from circulating. Also check the electrical connections between the level sensor, the level management board and the main board.
6. **Electronics.** Replace the main board. Also, check that there is no rising steam or water flow in the electrical compartment.

A4: TEMP. SENSOR DISCONNECTED

Meaning :

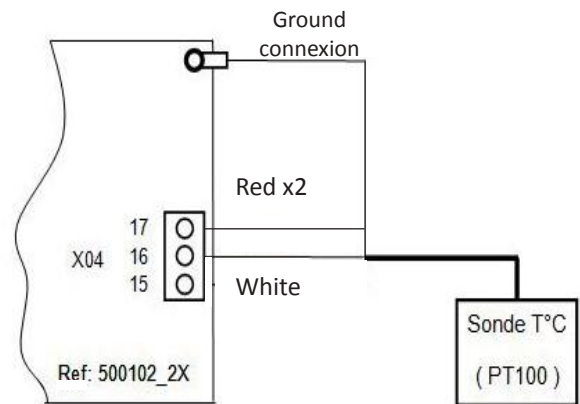
This means that the temperature sensor either fails or does not work correctly.

In that case :

When this message appears, the tank is drained, the general fault contact is activated and the unit is then stopped.

Causes and remedies

- 1. Check the electrical connections.** The temperature sensor must be connected to the X04 connector and to terminals 15 and 16 with the main board. The chassis ground lug is connected to the card fixing screw.



- 2. Faulty temperature sensor.** Disconnect the temperature sensor from the X04 connector and with a multimeter measure the ohmic value of the PT100.

For example: for a T° of 20° C, the resistance is 107.8 ohm. If the value seems to prove that the sensor is faulty, then replace it. In this case, it is necessary to check and maybe redo the calibration of this sensor. For this, from the menu "CALIBRATION SENSOR T°C" enter the code 1.1.1., visualize the temperature of the water, once the steam production is established, adjust the temperature in order to have: 99° C.

- 3. Electronics.** Replace the level management card or the main board.
Also, check that there is no rising steam or water flow in the electrical compartment.

A6: HIGH LEVEL BLOCKED

Meaning :

This means that the high level is continuously activated (time before detection: 14 minutes).

In that case :

When this message appears, the tank is drained, the general fault contact is activated and the unit is then stopped.

Causes and remedies

- 1. Problem with the level detector.** Check the electrical connection between the electrodes and the level control board (See the electrical diagrams). Check that there is no water on the sensor cover between the electrodes (e.g.: good fixation of the steam pipe). Disassemble the upper part of the detector and check the cleanliness (See below). Also check the cleanliness of the water supply port located at the bottom of the detector.



- 2. Electronics.** Replace the level management card or the main board. Also, check that there is no rising steam or water flow in the electrical compartment.

A7: VAPORIZATION TOO LONG

Meaning :

The vaporization time between level 3 and 1 is too long.

In that case :

When this message appears, the tank is drained, the general fault contact is activated and the unit is stopped.

Causes and remedies

- 1. Faulty power supply.** Using a voltmeter, check the presence of the supply voltage (Vac) of the heating elements, terminals L1, L2 and L3.
- 2. Continuous water supply.** Check the supply pressure ($1 > P \text{ (bar)} > 6$), replace the inlets valve if necessary.
- 3. Water level detector.** Check that the level sensor, detector and the pressure balancing hose are clean and that nothing prevents the water from circulating. Also check the electrical connections between the level sensor, the level management board and the main board.
- 4. Disjunction of the power circuit 'OFF'.** Two possible causes:
 - Differential switching off : in this case, check and replace the defective heaters.
 - Shutdown by an overload current: make an electrician check the entire electrical part (cables, terminals, contactor, heating resistors ...):
- 5. Electronics.** Replace the level management card or the main board.
Also, check that there is no rising steam or water flow in the electrical compartment.



A9: COMPLETE DRAIN TOO LONG

Meaning :

The drain valve is defective.

In that case :

When this message appears, the tank is drained, the general fault contact is activated and the unit is then stopped.

Causes and remedies

1. **The drain circuit is clogged.** Press the "MANUAL DRAIN" button and check if the water is flowing. Clean the inside of the tank, the pressure balancing hose and the water level sensor. Also remember to check that nothing obstructs the sewer pipe. Replace the tank gasket and, if necessary, the filter inside the drain valve.



Drain valve

2. **Electronics.** Replace the level management card or the main board.
Also, check that there is no rising steam or water flow in the electrical compartment.

6.1 STAINLESS STEEL TANK

1



Drain the tank out by pressing the manual drain button (s.a. picture n°1). Wait for complete draining and allow the tank to cool down (if this feature has been enabled). Cut off the power supply at the power switch-board and power off the ERS-LC humidifier (s.a. picture n°1).



2



Screw off the front door, lift it a little and take it away. Untighten the clamp (a) and then take off the steam hose (s.a. picture n° 2) and remove the steam boiler.

3



Remove the boiler by lifting it up to get it free from its base (s.a. picture n°3).

4



Pull the clamp handle towards you till the top of the boiler becomes free (s.a. picture n° 4).

5



Grasp the body and remove the top with the heating elements (s.a. picture 5).

After making an alignment mark on both the body and the cover, put the heating element assembly on the top of the humidifier (s.a. picture n° 6).



6

Put a container or the optional flexible lime collecting bag on ground and empty the boiler contents in it (s.a. picture n° 7).



7



Take care : **the tank gasket should be changed whenever the boiler is maintained** (s.a. picture n° 8). Retighten all the collar clamps.



Do not scratch harshly, hit or use corrosive liquids on the heating elements.

Uncap the water level tank and clean the 4 sensors (s.a. picture n° 9).



8



Do not use any solvent to clean the water level tank nor special glues if the tank needs being attended but use teflon. Use a scraper on sensor electrodes if needed.

Set back the high water level tank cap.



9



Reassemble the boiler cover assembly and the boiler in the same position. **Pay particular attention that no power wires be jammed between the tank and the bottom and gathered them in the insert bundleclips as shown in picture 3.**

Make sure there is still the O ring in the drain valve body before putting back the steam boiler (s.a. picture n° 10-b).



10

Tighten up all the screws of the boiler top and reconnect the steam hose.

6.2 DRAIN VALVE



The drain valve should be maintained whenever the steam cylinder is maintained or changed.



Once the steam cylinder has been pulled out (please refer to the « cleaning of the steam cylinder » page), disconnect the drain valve supply wires.



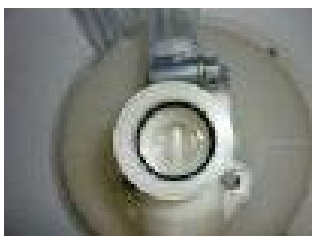
Unscrew the solenoid retaining nut and remove the washer. Put them on the cylinder compartment tray.

Remove the coil from the valve steam.



Unscrew and remove the valve steam and the filling hose from the valve body.

Important : Apply some soap on the O-ring and the cylinder draining outlet



Remove the « O » ring and the drain valve collar. Remove any pieces of limescale, rinse the steam and the body with fresh water.

Assemble in reverse order.

Once the drain valve has been cleaned up, put the boiler back in its compartment in proceeding this way : set the maintaining clip on the steam cylinder outlet, engage the drain outlet into the drain valve and push the cylinder downward. Locate the steam hose and fasten the clamp.



Ensure that all the clamps are properly tightened whenever the humidifier is maintained.

6.3 INLET VALVE



The inlet valve should be maintained every 6 months as a minimum and after 50 hours operation.

Isolate the water supply and remove the water supply hose from the valve.



Disconnect the electrical wires from the coil.



Untighten the collar clamp and remove the water feed hose.

Unscrew the black nut 1 and lay it on the cylinder compartment tray.



Take the valve out and remove the basket filter from the base of the valve with a pair of long nose pliers. Pull the coil out with a flat screw driver.



Wash the basket filter under clean water to remove any dirt and debris.

Replace whole valve if cleaning is not practical or replace coil if necessary.

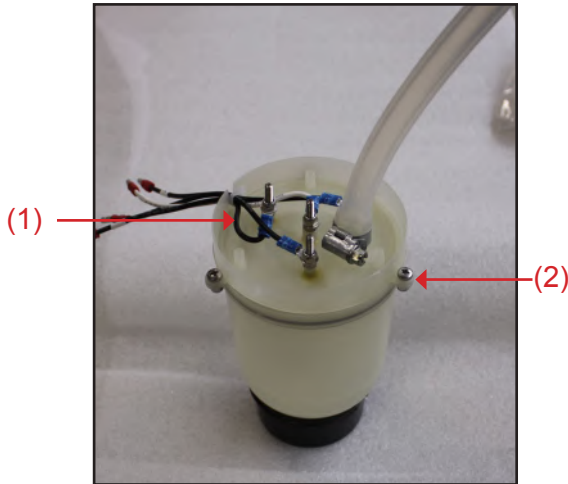
Assemble in reverse order taking care to replace collar clamp if necessary.

Ensure that everything is correctly assembled and switch the humidifier on.



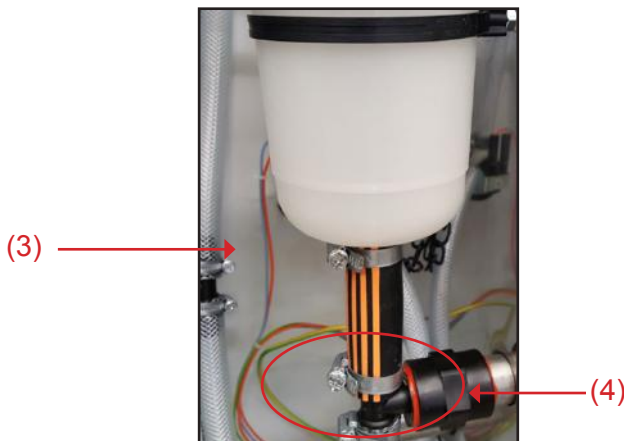
Ensure that all the clamps are properly tightened whenever the humidifier is maintained.

6.4 WATER LEVEL DETECTOR

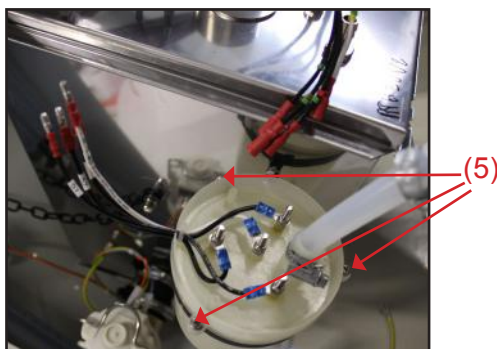


DETECTOR MAINTENANCE HAS TO BE DONE DURING EACH TANK MAINTENANCE:

- Disconnect the cables from the water level sensor (1), unscrew the retaining collar from the pressure equalizing tube (2) and disconnect it from the tank cover.



- To take the detector out, untighten the clamps (3) and remove it. **Take care : do not attempt to unscrew the black fluted tee assembly (4)** (watertightness originally ensured by sealing glue).
- Without unscrewing, clean the water supply circuit between the detector and the tank (4).

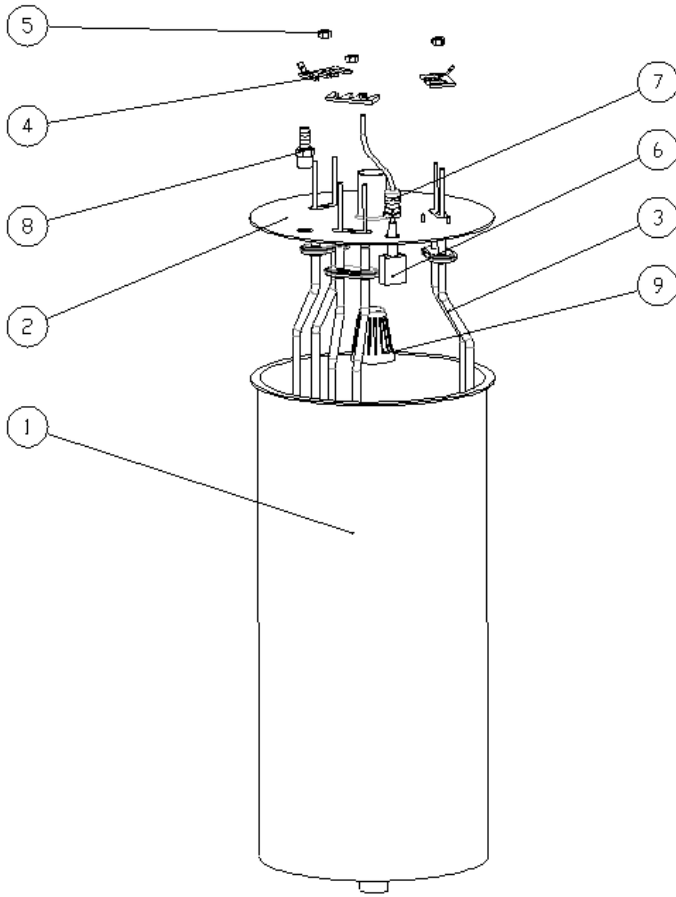


IN CASE OF A WATER LEVEL DETECTOR HAVING ELECTRODE SENSORS:

- Unscrew the 3 screws (5) to get access to the sensor elements.
- **Notice :** do not use solvent to clean up the water level housing. If needed, a scraping tool can be used to clean up the elements.
- Once done, put back the detector and retighten the clamp (3). Put back the water leveling hose (2) onto the steam tank cover. And plug back the water detector wires (1).

6.5 SPARE PARTS

6.5.1 Stainless steel tank

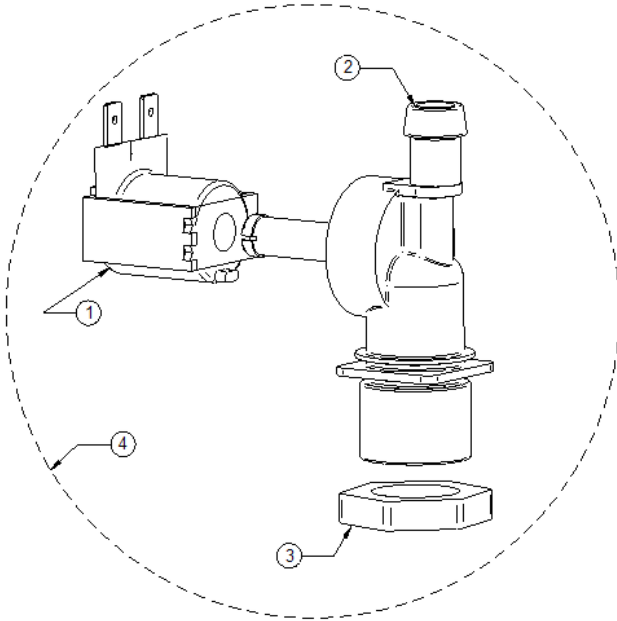


Rep	Code	Description
1		Stainless steel cylinder
2		S.S. cover with $\varnothing 25$ or $\varnothing 40$ mm outlet
3	D36279 930547 930543 D36280 930548 930544	Heating element 1,9KW (230V) Heating element 1,9KW (277V) Heating element 1,9KW (346V) Heating element 4,3KW (230V) Heating element 4,3KW (277V) Heating element 4,3KW (346V)
4	*	Heating element bracket
5	*	Stainless steel nut $\varnothing 6$ mm
6	930592	ERS-LC temperature sensor (attached to element)
7	930505	Metal grommet
8	*	M1/4 $\varnothing 8$ mm tip
9	930558	PPH inner bottom filter

* Not for retail sale

For heating elements selection, please refer to the tables on the pages of the wiring diagrams corresponding to the humidifier (Installation - Chapter 3).

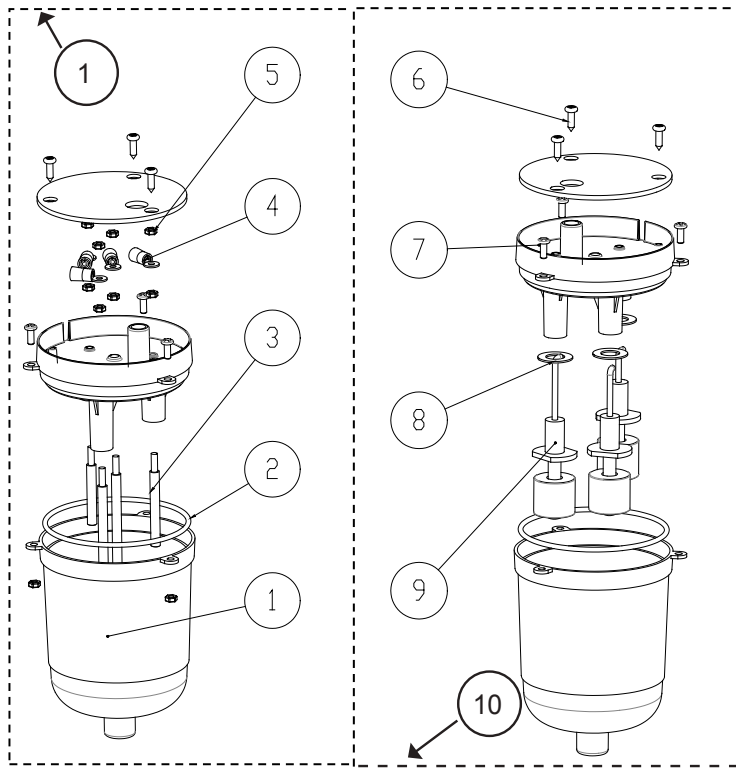
6.5.2 Inlet valve



Rep	Code	Description
1	930160	Water inlet valve coil
2	*	Water inlet valve body N2
3	D83496	3/4" nut
4	D36284	Water inlet valve

* Not for retail sale

6.5.3 Water level detector



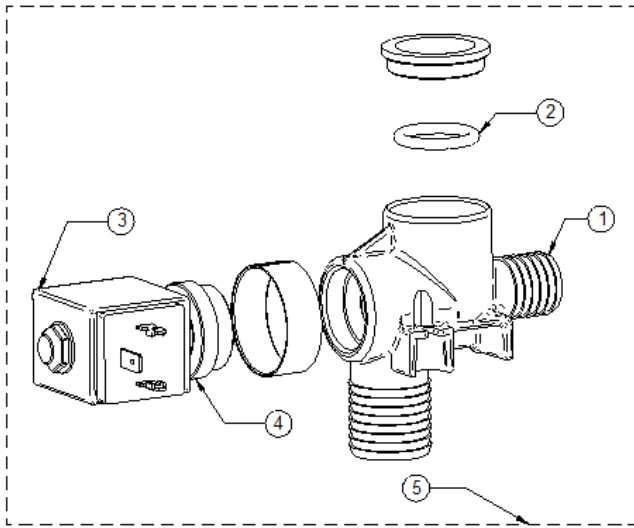
with electrodes

with floats (DI)

Rep	Code	Description
1	D94062	Water level assembly ERS-LC
2	930588	EPDM70 « O » ring Ø88x3 mm
3	930587	Water level sensors (set of 4)
4	*	eyelet terminal
5	*	Stainless steel bolt Ø4 mm
6	*	Self thread screw Ø3,9 - L.13 mm
7	*	Stainless steel screw Ø4 - L. 8 mm
8	*	Fiber gasket
9	*	Float sensor
10	930583	Water level setERS-LC DI

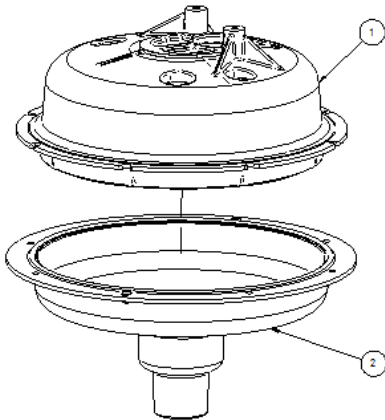
* Not for retail sale

6.5.4 Drain valve



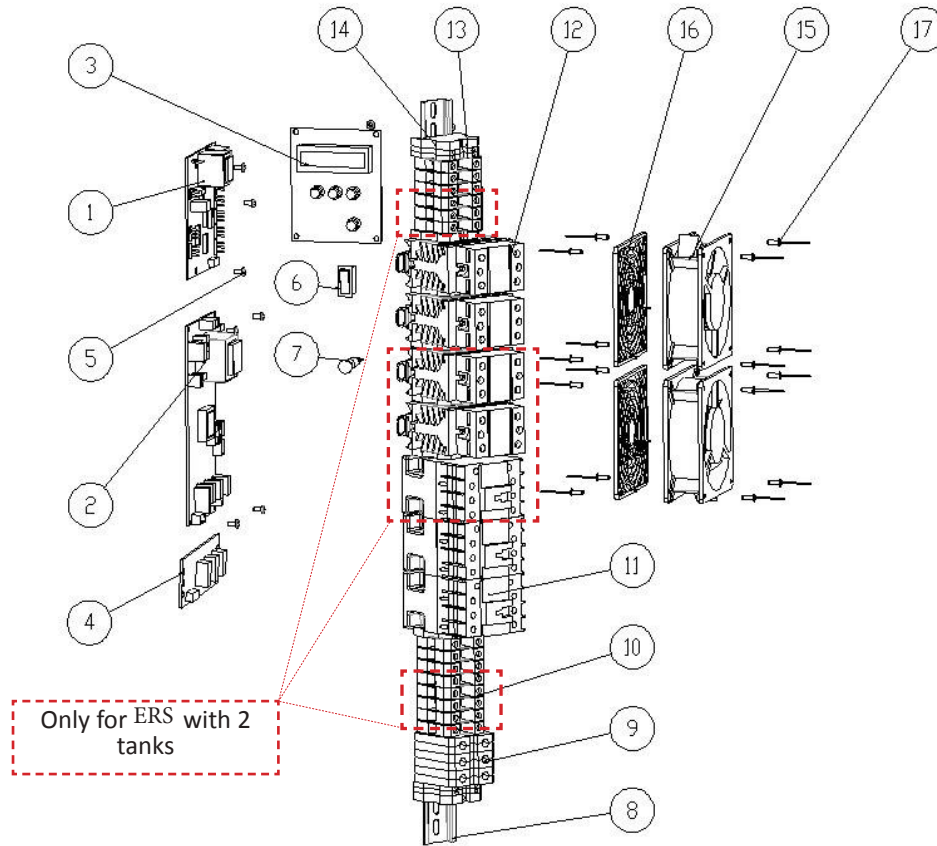
Rep	Code	Description
1	930307	Drain valve body
2	930189	Drain valve O ring (bag of 10)
3	930161	Drain valve solenoid coil
4	930220	Insert (+ drain valve coil)
5	D92436	Complete drain valve

6.4.5 Drain cups



Rep	Code	Description
1-2	930359	ERS-LC upper & lower drain cups

6.4.7 Electrical part



Rep	Code	Description
1	D92442	Water level control board
2	D92949	ERS main CMS-0T1 board
3	D27109	Display board
4	D50931	Remote information board (option)
5	*	Ø4 - L8mm stainless steel cylindrical head screw
6	930100	On/off rocket switch
7	930099	Stand-by light
8	*	DIN Rail
9	930096	Earth terminal JEK 35/35
10	930095	Electrical terminal JSAK 35 EN
11	930093	Power contactor LC1-D32
12	930528	Static relay ERS -V2 5 to 15
	930529	Static relay ERS -V2 20 to 50
	930549	ERS -LC Static relay
13	930097	Electrical terminal JSAK 2.5 EN
14	*	Stop terminal JSAK 35 EN
15	930531	Helicoidal ventilation fan
16	*	Plastic grid
17	*	Ø4x10mm rivets

* Not for retail sale



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