



**R.ESPINAR, S.L.**



# **INSTRUCTION MANUAL FOR USE AND MAINTENANCE**

## **STERILIZING AUTOCLAVES**

*MINICLAVE*

**Model:           AE-8**



It is very important to keep these instructions with the apparatus in case of doubt of use.

If this apparatus should be sold or transferred, ensure that this manual is given to the new owner, for correct use and understanding of the apparatus.

This manual has been written for safety reasons, read the instructions carefully before installing and use of this apparatus.

## **IMPORTANT! READ CAREFULLY BEFORE USING THE AUTOCLAVE.**

1) Never use the autoclave to sterilize any of the following hazardous materials or substances with alkali content. Sterilization of such objects can cause explosion, corrosion of the working chamber or chamber piping, and deterioration of gaskets.

### **List of Hazardous Materials:**

#### **Explosive substances**

- Nitroglycol, nitroglycerin, nitrocellulose, and other explosive nitric esters.
- Trinitrobenzene, trinitrotoluene, picric acid, and other explosive nitro compounds.
- Peracetic acid, methyl ethyl ketone peroxide, benzoyl peroxide and other organic peroxides.

#### **Ignitable substances**

- Metallic lithium, potassium, sodium, yellow phosphorous, phosphorous sulfide, and red phosphorous.
- Celluloids, calcium carbide (carbide), lime phosphide, and magnesium powder.
- Aluminum powder, magnesium powder, and metallic powders other than aluminum powder.
- Sodium dithionite (or sodium hydrosulfite).

#### **Oxidizing agents**

- Potassium chlorate, sodium chlorate, ammonium chlorate, and other chlorates.
- Potassium perchlorate, sodium perchlorate, ammonium perchlorate, and other perchlorates.
- Potassium peroxide, sodium peroxide, barium peroxide, and other inorganic peroxides.
- Potassium nitrate, sodium nitrate, ammonium nitrate, and other nitrates.
- Sodium chlorite and other chlorites.
- Calcium hypochlorite and other hypochlorites.

#### **Flammable substances**

- Ethyl ether, gasoline, acetaldehyde, propylene oxide, carbon disulfide, and other substances whose flash points range from -30 to 0°C.



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#### **Flammable substances**

- Ethyl ether, gasoline, acetaldehyde, propylene oxide, carbon disulfide, and other substances whose flash points range from -30 to 0°C.

- Methanol, ethanol, xylene, benzyl acetate (or amyl acetate), and other substances whose flash points range from 0 to 30°C.
- Kerosene, gas oil, turpentine oil, isopentyl alcohol (or isoamyl alcohol), acetic acid, and other substances whose flash points range from 30 to 65°C.

**Flammable gas**

- Hydrogen, acetylene, ethylene, methane, ethane, propane, butane, and other substances that are gases at temperature of 15°C under 1 atmospheric pressure.

- 2) When liquid with salt water and much salinity of salt agar, etc. spills in the chamber, blowing, discharge water in the chamber and wipe up drop of water around the lid gasket beautifully. It causes the corrosion of the chamber and the piping when leaving just as it is.
- 3) Absolutely do not attempt to remodel or alter this product.
- 4) Do not forcibly bend, twist, tie or extend the power cord. Do not place heavy objects on the cord. A damaged cord or exposed wire can cause fire or electric shock.
- 5) Never connect the power cord to a power supply other than one of the rated voltage. Connection to such a power supply can cause fire or electric shock.
- 6) If grounded socket is unavailable, ground the equipment using a separate ground wire before connecting the power cord to the power source.
- 7) Never ground to a gas pipe or vinyl chloride water service pipe.
- 8) Do not pour anything except for water.
- 9) Do not use the autoclave for the purpose other than sterilization and agar preparation (dissolution).
- 10) Close the lid after confirming that no foreign matter is adhering to the section contacting the lid gasket. Foreign matter in this section can cause vapor leaks.
- 11) When using a waste processing bag or other kind of bag and disinfecting, place the bag in the metal mesh holder and then insert it into the chamber. Using the bag "as is" can cause excessive temperatures, pressures, lack-of-water, etc.
- 12) Do not put your face or hands close to the chamber when lifting the lid after operations are complete; steam will gush out of the chamber.
- 13) The lid, chamber, gasket, and top casing are extremely hot immediately after the completion of operation. Do not touch the equipment or you may get burned.
- 14) Put on heat insulating gloves before removing a substance from the chamber. Do not put hands into the chamber until the steam has been vented.
- 15) Some time is required for liquids to cool. Be sure to check that the temperature has dropped sufficiently before unloading a liquid from the chamber or burns can result.
- 16) Never drain the chamber when the chamber is under pressure. Boiling water or steam may gush out causing burns.
- 17) If any abnormality occurs (e.g. abnormal sounds, smells, smoke), immediately shut the power off. After checking that the abnormal condition does not continue, call out authorized distributor in your region.

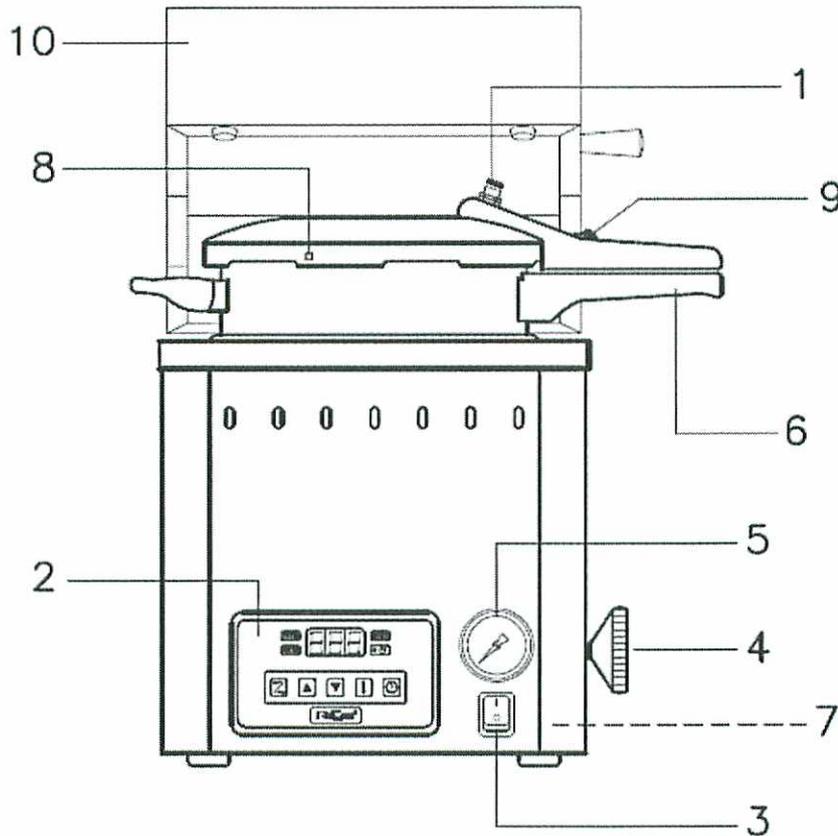
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## DESCRIPTION



1.- Safety valve.

It unloads the pressure of the autoclave in case of failure in the temperature regulation or by pressure exceeding.

2.- Microprocessor controller of time and temperature of the autoclave (see specific instructions below).

3.- Main switch.

When pressing it, it activates all the circuits of the autoclave and, at the same time, it lights up.

4.- Three position valve.

The “VAPOR” (steam) position it’s used for a quick devaporation of the autoclave.

The “CERRADO” (closed) position it’s used while the autoclave is sterilizing, to let it cool for itself, or at the end of the sterilization cycle, when the liquids have been sterilized.

The “DESAGÜE” (drainage) position is used to empty the water from inside the sterilization chamber.

#### 5.- Manometer.

It shows the pressure inside the autoclave.

#### 6.- Bayonet closure.

#### 7.- Drainage terminal.

It's situated at the rear of the autoclave. The vapor, and the water inside the autoclave, comes out through the drainage terminal when is worked the three position valve. During the automatic air purge period it also may come out drops of water and steam. It is recommended to connect to the terminal a flexible hose (heat resistant), and to bring it to a drain or to a recipient.

#### 8 – Mark of the pressure vessel lid.

#### 9 – Security lock of the pressure vessel lid.

#### 10 – Protection lid.

## TECHNICAL SPECIFICATIONS

Apparatus:	Autoclave steam sterilization.
Air purge:	Automatic, controlled by the microprocessor.
Maximum pressure:	1,5 bar.
Voltage:	230 V
Frequency:	50/60 Hz
Consume:	1000 W
Temperature:	adjustable up to 127 °C
Time:	adjustable from 0,00 to 99,5 hours

## CHARACTERISTICS

- AISI 304 stainless steel outer case, with protection lid painted with epoxy resin
- Pressure vessel tank and lid of 18/12 stainless steel
- Quick and safe bayonet locking device.
- Electric heating with reinforced resistance inside the chamber.
- Safety valve.
- Automatic air purge controlled by microprocessor.
- Manual valve for draining and unsteaming.

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- Manual valve for draining and unsteaming.

- Supplied with protecting perforated grid to protect the heating element and stainless steel basket.



## INSTALLATION

Install the autoclave on a stable and solid surface.

Don't install the autoclave in areas where there is danger of fire or explosion.

Connect a flexible hose to the rear terminal and to bring it to a drain or to a recipient. The hose must be heat resistant (latex, silicone,...). Do not use plastic tubes.



**During the sterilisation the cover of the autoclave heats up. Avoid touching it with your hands.**

## CONNECTION TO THE MAINS

There is a characteristics plate at the rear of the apparatus, this indicates the power and voltage. Check that the electrical installation coincide with the same conditions.

The plug of the apparatus is "SCHUKO" with central or lateral ground connection. For security reasons this apparatus must be installed to ground.

## START UP INSTRUCTIONS

### PRESSURE VESSEL OPENING AND LOCKING

#### *Lid opening*

When opening the lid, always deactivate the lock (9) moving it towards the middle of the tank. Maintain the lock switched on and turn the lid counter-clockwise (about 1/8 turn) until it can be lift.

**THE MANOMETER MUST DISPLAY 0 AND THE TEMPERATURE MUST BE UNDER 100 °C BEFORE OPENING THE LID.**

### *Lid locking*

When locking the lid, place it in the mark (8) on the apparatus frontal part. Interlock the lid with the inferior part of the tank and turn it clockwise until hearing “click”.

### TO FILL

Open the autoclave lid.

Fill the tank with distilled water up to the level of the bottom plate.

Make sure that the three-position valve (4) is in the position closed.

Avoid letting the water overflow the bottom plate.

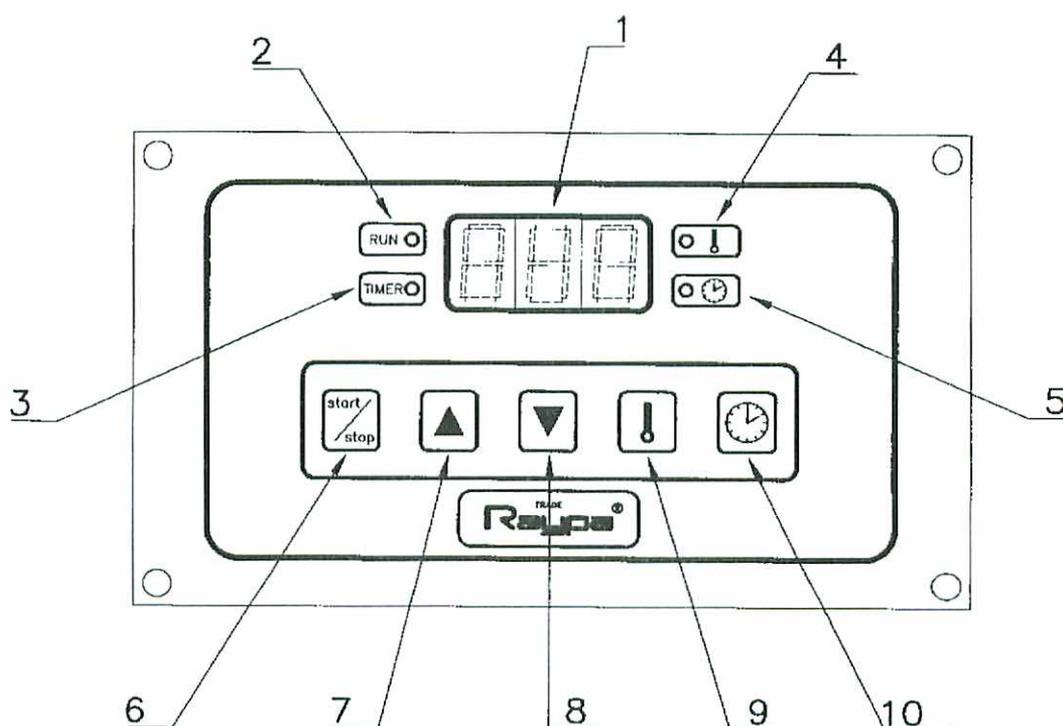
Place the material to be sterilized inside the tank, directly or in the basket. Make sure there is space for the steam to circulate.

Take care not to cover the opening at the top of the autoclave.

Close the lid.

Press the main switch (3) to the position | , the indicator will light up.

### MICROPROCESSOR'S DESCRIPTION



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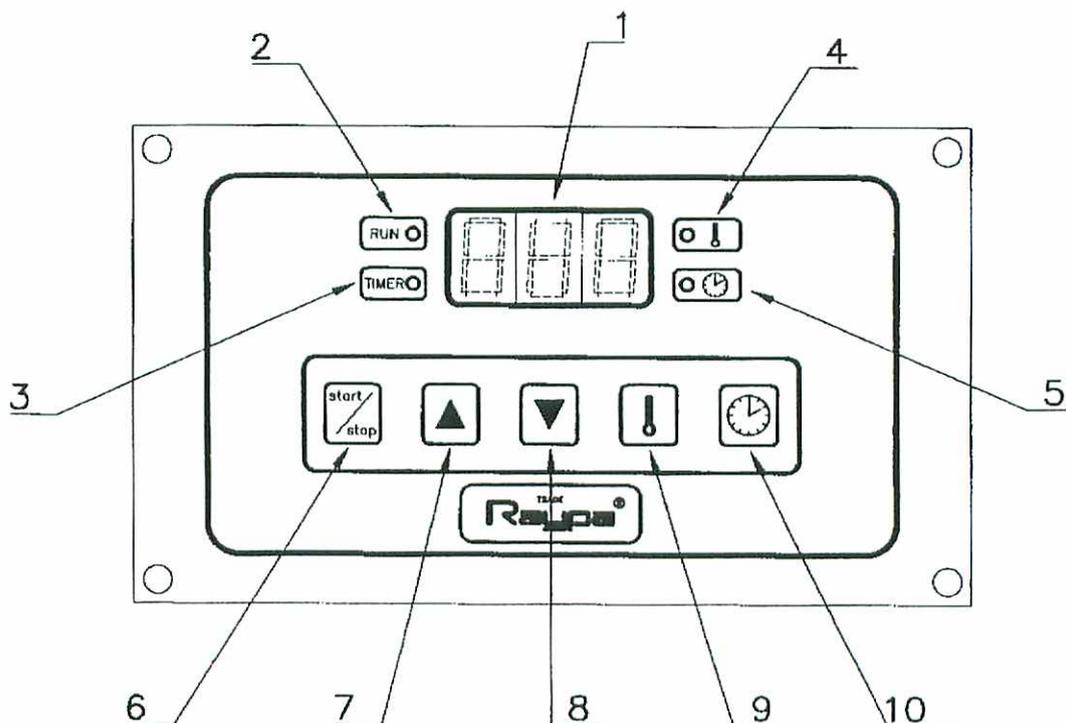
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Take care not to cover the opening at the top of the autoclave.

Close the lid.

Press the main switch (3) to the position | , the indicator will light up.

### MICROPROCESSOR'S DESCRIPTION



- 1.- **TEMPERATURE'S DISPLAY:** 3 green digits display of 7 segments of 12mm. for the visualisation of the temperature of the different messages and values of the edition and configuration variables.
- 2.- **RUN INDICATOR PILOT:** it will light up when the controller will be executing the program.
- 3.- **TIMER INDICATOR PILOT:** it will light up when, being the control on, the waiting time is being executed. It will light up intermittently, also, when editing the waiting time.
- 4.- **THERMOMETER INDICATOR PILOT:** it will light up when, being the control on, the exit control is activated. It will light up intermittently, also, when editing the order value.
- 5.- **CLOCK INDICATOR PILOT:** it will light up when, being the control on, the execution time is in process. It will light up intermittently, also, when editing the execution time.
- 6.- **“START/STOP” KEY:** key to start or to stop the execution program. It is, also, to leave the edition of the orders or variables of configuration without keeping the modified value.
- 7.- **UP KEY:** key to increase the values of the variables of edition and configuration.
- 8.- **DOWN KEY:** key to decrease the values of the variables of edition and configuration.
- 9.- **THERMOMETER KEY:** key to enter in the edition of the order of temperature and configuration parameters.
- 10.- **CLOCK KEY:** key to enter in the edition of the waiting time and execution and to edit the configuration parameters.

## **FUNCTION TYPES**

The equipment can work in four different types:

**1<sup>st</sup> NORMAL TYPE:** the equipment will work only with a temperature maintenance and during an indefinite time.

**2<sup>nd</sup> DELAYED STARTING TYPE:** work temperature and delay in the connection of the equipment to execute the selected program, can be programmed, and it will be executed automatically after passing the delayed time programmed.

### **3<sup>rd</sup> MAINTENANCE OF THE PROGRAMMED TEMPERATURE TIME TYPE:**

a time can be programmed maintain the programmed temperature during this programmed time. After passing it, the equipment stops.

### **4<sup>th</sup> WAITING TIME, MAINTAINING TIME AND TEMPERATURE**

**PROGRAMMED TYPE:** a waiting time can be programmed when switching on, a work temperature, a maintenance of programmed temperature time and stop the equipment.

Whichever of these types can be programmed by interest of the user.

## **FUNCTIONING TYPE EDITION**

The main switch (3) of the equipment must be activated and the temperature's control off (RUN pilot put out) to edit the selected values of temperature, waiting time and maintenance of temperature time. To put out the RUN pilot press the "START/STOP" key along one second.

**Order temperature's programming:** press the thermometer key to enter in the edition of the temperature's order. The pilot "thermometer" will light up intermittently and in the display will appear the selected value. To modify it, press the "UP" and "DOWN" keys until the wanted value in grades appear. The edition boundaries depend on the scale depth. If the order value has been modified, it will appear twinkling. To keep the modified value we will press again the thermometer key and we will go back to the initial situation. If we want to leave the order edition without keeping the modified value we will press the clock key, the start/stop key or we will let pass 10 seconds time.

**Delayed starting time programming:** press the clock key twice in a row to enter in the waiting time edition. The timer pilot will light up intermittently and in the display will appear the programmed value. To modify it, press the UP and DOW\_N keys until the wanted value will appear.

The boundaries of edition are compressed between 0,00 and 99,5 hours. If its value has been modified, it will appear twinkling. To keep the modified value we will press the clock key once again and we will go back to the initial situation. To leave the edition without keeping the modified value, we will press the thermometer key, the "START/STOP" key or we will let pass 10 seconds time.

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The boundaries of edition are compressed between 0,00 and 99,5 hours. If its value has been modified, it will appear twinkling. To keep the modified value we will press the clock key once again and we will go back to the initial situation. To leave the edition without keeping the modified value, we will press the thermometer key, the "START/STOP" key or we will let pass 10 seconds time.

**Maintenance time programming:** press the clock key once to enter in the maintenance time edition. The clock pilot will light up intermittently and in the display will appear the programmed value. It works as the “Delayed starting time programming”. But its edition boundaries are compressed between OFF, 0.00 and 99.5 hours. If the selected value is OFF the regulation will be done for an indefinite time and it will stop only if we stop the regulation pressing the start key.

When the control is on, the RUN pilot lighted, if we press the thermometer key the temperature order programmed will be showed. If the value is modified and kept it will only be operative during this execution because when finishing the execution the regulator recovers the order value programmed when the program was not on.

If the control is on, RUN pilot lighted, and at this moment the control is executing the waiting time, at pressing twice the clock key the remaining waiting time value will be visualised. If the clock key is pressed only once, the maintaining time programmed will be visualised. But if the control is executing the maintaining time, the waiting time will not be visualised. If any of these two values is modified and kept, it will only be operative during this execution because at finishing it the regulator recovers the value programmed when the program was not on.

## **STERILIZATION**

Set the three position valve (4) on “CERRADO” (closed) position.

Press main switch (3) and it will light up, and the microprocessor display will show the temperature of the equipment.

After programming time and temperature of sterilization, press the “START/STOP” key during one second, and the “RUN” pilot will light up.

If a delayed starting time has been programmed, while being executed the waiting time, the TIMER pilot will be lighted up. At finishing the time, the TIMER pilot and the controller will put down and the regulation will start to bring the temperature to the programmed order.

From this moment the autoclave starts increasing its temperature, this may be read on the display panel (1), at the same time the autoclave will start to release air from the inside of the tank.

Due to the air condensation, a few drops of water will fall from the rear terminal (7). Therefore, it's necessary to put under a small tray or to bring it with a flexible hose to a drain.

As soon as the selected temperature is reached, it will be maintained by itself.

Once the programmed time finishes, a whistle will sound, indicating the end of the sterilization, and the "RUN" (2) and "CLOCK" (5) pilots light will turn off.

**BEFORE OPENING THE LID THE MANOMETER MUST BE IN 0 POSITION, AND THE TEMPERATURE MUST BE BELOW 100°C.**

NOTE: To stop the cycle manually, press during one second the "START/STOP" key, and the "RUN" pilot will turn off.

### **PRECAUTIONS BEFORE OPENING THE LID**

If you have been sterilizing LÍQUIDOS (liquids), you must let the autoclave cool down until the manometer indicates 0, and that the temperature is below 100°C.

If you find difficulties in opening the lid, you must put the three-position valve to VAPOR (steam) position to break the vacuum inside the tank.

To open the autoclave, wait until the manometer shows 0.

Before performing other sterilization cycles check the water level, adding water if needs.

### **SHUT DOWN OF THE AUTOCLAVE**

Put the main switch (3) in 0 position, the indicator will go out.

Put the three-position valve to the VAPOR (steam) position to avoid a vacuum inside the autoclave.

### **CLEANING AND MAITENANCE**

Check regularly the steal of the lid, if you find any cuts or lacerations it must be replaced.

To clean the inside of the autoclave use soap and water.

To clean the autoclave tank, use neutral detergent mixed with water.

Do not use acid cleaning agents, chlorine solvents, saline solutions.

Due to the air condensation, a few drops of water will fall from the rear terminal (7). Therefore, it's necessary to put under a small tray or to bring it with a flexible hose to a drain.

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Do not use acid cleaning agents, chlorine solvents, saline solutions.

Always switch the autoclave off when repairing it.



## **REPARATION AND SPARE PARTS**

**Before any reparation disconnect the apparatus from the mains.**

**Please get in touch with your distributor if in doubt.**

**For safety reasons and a good function of the apparatus use original spare parts only.**

**If spare parts are needed state the serial number and the model of the apparatus, indicated on the characteristic plate at the back of apparatus.**

### **BEWARE !**

*R. Espinar, S.L. will not accept non-cleaned and non-disinfected apparatus, as well as apparatus with non-emptied tanks (sterilization chamber, dirty water tank according to the model) for repairing.*



## **GUARANTEE**

This apparatus is guaranteed for a one year period, against any fabrication failure or defective part. The guarantee does not cover any casualty produced by improper use of the apparatus or alien casualties to R.ESPINAR, S.L.

If the apparatus is manipulated by non-authorized personnel by R.ESPINAR, S.L., this guarantee is automatically expired.

The guarantee and claims are excluded if these instructions are not followed.

R. Espinar S.L. reserves all right to change technical specifications.

## DECLARATION OF CONFORMITY"CE"

The manufacturer: **R. Espinar, S.L.**

declares under its own responsibility that the apparatus:

Autoclaves for sterilization "MINICLAVE"

Model: **AE-8**

fulfill with the directives of security:

73/23 CEE "Low Tension"

89/336 CEE "Electromagnetic Compatibility"

According to International Regulations:

EN-61010-1

EN-61010-2-048

EN-50081-2

EN-50082-1



Ramón Espinar Aguilar

General Manager

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