

DATASHEET

maher

clima



Climate control and fogging





MAHER CLIMA® is the most innovative, easy-to-use and versatile climate controller. It can record sensor readings and control some environmental parameters in closed areas, such as greenhouses, farms, warehouses, etc.

WINDOW CONTROL AND FOGGING
Control windows and fogging in closed areas

LINUX
Maher Clima and Maher Smart are the only controllers that have the Linux operating system

EASY TO USE
Thanks to its 7" colour touch screen

REPORTS
Reading of sensors, graphs, etc. (USB Download)



*Inquire about the possibility of adding **IRRIGATION** to your **CLIMATE** equipment!*

WHAT DOES IT CONTROL? ☒

- | | |
|---|--|
| <p>1- Window control</p> <p>2- Control of thermal or shading covers</p> <p>3- Fogging control</p> <p>4- V.P.D. Calculation</p> <p>5- Heating control</p> <p>6- Recirculation control</p> <p>7- Exhaust fan control</p> <p>8- Artificial light control</p> | <p>9- Communication with external modules</p> <p>10- Up to 8 control zones</p> <p>11- Record outdoor sensor readings (weather station): RH probe, temperature probe, anemometer, wind vane, solar radiation and rain detector</p> <p>12- Record reading of interior sensors (zone sensors): RH probe and temperature probe</p> |
|---|--|



TYPICAL APPLICATIONS ☒

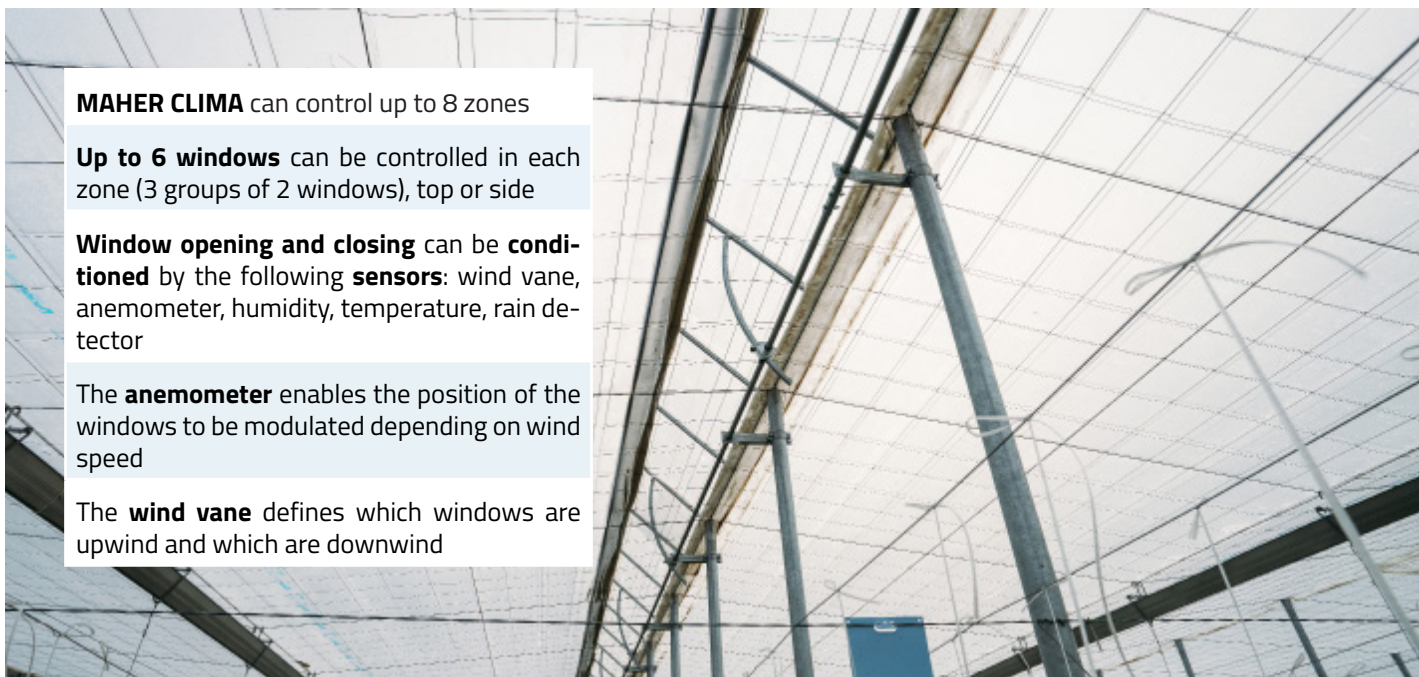
Greenhouses, farms, wineries, dryers...





WINDOW CONTROL

MAHER CLIMA is used to control the opening and closing of the top and side windows of a greenhouse



MAHER CLIMA can control up to 8 zones

Up to 6 windows can be controlled in each zone (3 groups of 2 windows), top or side

Window opening and closing can be **conditioned** by the following **sensors**: wind vane, anemometer, humidity, temperature, rain detector

The **anemometer** enables the position of the windows to be modulated depending on wind speed

The **wind vane** defines which windows are upwind and which are downwind

SCHEDULE

Up to 5 different schedules can be defined with different control instructions:

Day schedule. The time can be set by the user or by the controller automatically using an astronomical clock (it calculates the sunrise and sunset time every day)

Night schedule. The time can be set by the user or by the controller automatically using an astronomical clock (it calculates the sunrise and sunset time every day)

Special schedule 1. The schedule is set by the user

Special schedule 2. The schedule is set by the user

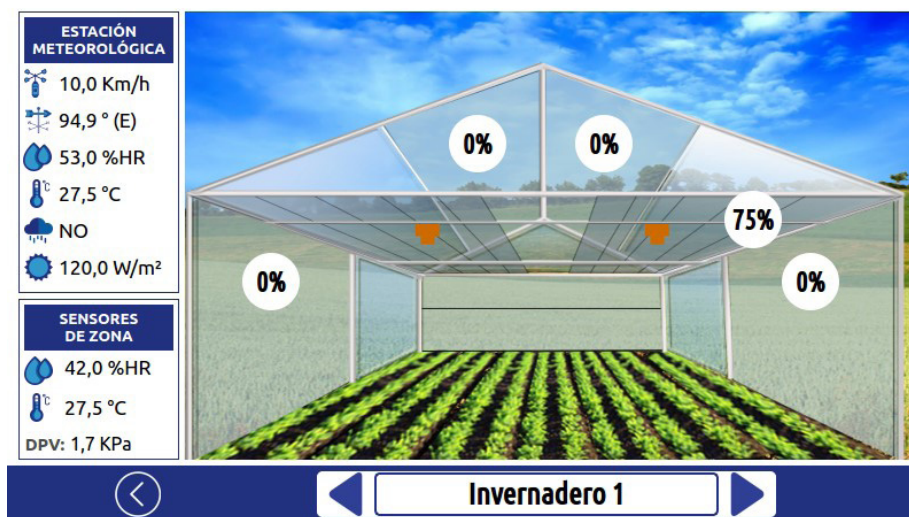
Thermal inversion schedule. A schedule established by the user with which the temperature inside the greenhouse can be increased with respect to the outside by opening windows, as long as the inside temperature is lower than the outside





SHADE CLOTH / THERMAL CLOTH CONTROL

The equipment can regulate shade cloths or thermal cloths. A cloth is displayed in the greenhouse window if the selected control area has a cloth configured. The cloth will be represented according to its current state, indicating its percentage of extension.



In the programming of the cloths, we can edit the parameters for controlling the cloth of each control zone. For each control zone:



SHADE CLOTH

SHADE CLOTH BY SOLAR RADIATION

Programming the position of the shade cloth based on the received **solar radiation** at any given time

SHADE CLOTH BY SCHEDULE

Indicates the positioning of the shade cloth at **specific hours**.

You can also use the option '**Use astronomical clock**' to have the controller calculate and set the daily sunrise and sunset times



THERMAL CLOTH BY SOLAR RADIATION

This is a screen that prevents the escape of the heat that accumulates inside the greenhouse during the hours of highest solar radiation. For this type of cloths, control is carried out by programming solar radiation references.



THERMAL CLOTH BY TEMPERATURE

This is a thermal screen where **temperature** is used as a reference for control.



FOGGING CONTROL

The controller enables humidity and temperature control inside closed rooms by managing a **humidification or fogging system**.

Fogging can be managed in **8 control zones** (8 different fogging groups)

Up to **8 fogging pumps** can be defined

Up to **8 fogging masters** can be defined

One to eight **fogging sectors** can be configured for each **fogging group**

The desired **pump and fogging master** can be configured for each sector

The fogging programming for each ZONE indicates:

ACTIVE SCHEDULE

PAUSE TIME

FOGGING OPERATION TIME

START TYPES: CYCLICAL, MANUAL
OR BY REFERENCE



FOGGING CYCLE



1- Cyclical (multiple starts per day per program)

2- Manual. The user can start a fogging cycle for a fogging group at any time

3- By relative humidity (RH) reference

4- By temperature reference

5- By V.P.D. reference

V.P.D. CONTROL

It can calculate the VPD in **8 different zones**

An RH probe and a temperature probe need to be configured in order to calculate the V.P.D. for a zone

The fogging of an area can be started **by reference** of the V.P.D. calculated for that area





HEATING CONTROL

Controls **4 independent heater groups per control zone** (up to **8 control zones maximum**).

Programación calefacción N° Zona de control: 01

GC1 N1 GC2 N1 GC3 N1 GC4 N1

Día Noche Especial 1 Especial 2 Manual

Activo: ☒ ON Horario: 07 : 54 : 00 18 : 57 : 00

Prioridad: 00 Reloj astronómico: ☒ ON

Referencia de Ta (°C): +12, 0 +18, 0

Marcha-Paro: ☒ ON ON: 01 : 30 : 00 OFF: 00 : 15 : 00

Recirculadores: ☐ OFF Extender manta: ☐ OFF Cerrar ventanas: ☐ OFF

Nave 1 Grupo 1

- The operation of each heating group can be programmed based on **temperature reference**: the group will start when the temperature drops below a defined minimum value and will stop when it reaches a defined maximum value.
- Heaters can operate in **continuous mode or ON/OFF mode**. In ON/OFF mode, the operating time (ON) is programmed and, once this time has elapsed, the heater will stop for a programmed time (OFF) to prevent **overheating**.
- During heating operation, the operation of **recirculation fans can be forced** to accelerate the heating process by circulating the warm air generated by the heater.
- The extension of the **thermal screen/blanket can be forced** during heating operation, helping to retain warm air within the zone.
- It is possible to **force the closing of windows** during heating operation, thereby retaining warm air in the zone.

SCHEDULES



For the programming of each heating group, several **schedules** are available:

Programación calefacción N° Zona de control: 01

GC1 N1 GC2 N1 GC3 N1 GC4 N1

Día Noche Especial 1 Especial 2 Manual

Activo: ☒ ON Horario: 14 : 00 : 00 17 : 00 : 00

Prioridad: 04

Marcha-Paro: ☒ ON ON: 00 : 30 : 00 OFF: 00 : 10 : 00

Recirculadores: ☒ ON Extender manta: ☐ OFF Cerrar ventanas: ☐ OFF

Nave 1 Grupo 1

Day schedule. Can be set by the user or automatically by the controller using an astronomical clock (calculates sunrise and sunset times daily).

Night schedule. Can be set by the user or automatically by the controller using an astronomical clock (calculates sunrise and sunset times daily).

Special schedule 1. Schedule set by the user

Special schedule 2. Schedule set by the user

Manual operation schedule. User-defined schedule that allows the heating group to be started regardless of the zone temperature (temperature reference fields are not available in this mode)

Programación calefacción N° Zona de control: 01

Día Noche Especial 1 Especial 2 Manual

Activo: ☒ ON Horario: 18 : 30 : 00 07 : 30 : 00

Prioridad: 08 Reloj astronómico: ☐ OFF



RECIRCULATION AND EXHAUST FAN CONTROL

Controls up to **4 independent recirculation fan groups per control zone.**

Controls up to **4 independent exhaust fan groups per control zone.**



BY TEMPERATURE

The group will start when the programmed maximum temperature is exceeded and will stop when the temperature drops below the programmed minimum temperature.

BY RELATIVE HUMIDITY

The group will start when the programmed maximum relative humidity is exceeded and will stop when it drops below the programmed minimum relative humidity.

Both control modes can operate in **continuous mode or ON/OFF mode**. In ON/OFF mode, the operating time (ON) is programmed and, once this time has elapsed, the recirculator or exhaust fan will stop for a programmed time (OFF) to prevent overheating.

Programación recirculadores		Nº Zona de control: 01	
GR1 N1	GR2 N1	GR3 N1	GR4 N1
Día	Noche	Especial 1	Especial 2
Activo: ☒		Horario: 07:49:00 19:01:00	
Prioridad: 01		Reloj astronómico: ☒	
Ref. HR (%HR): 040, 0 060, 0		Ref. Ta (°C): +25, 0 +30, 0	
Marcha-Paro: ☒		ON: 00:30:00 OFF: 00:05:00	
Nave 1 < > Grupo 1			

Programación extractores		Nº Zona de control: 01	
GE1 N1	GE2 N1	GE3 N1	GE4 N1
Día	Noche	Especial 1	Especial 2
Activo: ☒		Horario: 07:44:00 18:07:00	
Prioridad: 01		Reloj astronómico: ☒	
Ref. HR (%HR): 030, 0 050, 0		Ref. Ta (°C): +25, 0 +30, 0	
Marcha-Paro: ☒		ON: 00:30:05 OFF: 00:05:00	
Nave 1 < > Grupo 1			

SCHEDULES



For the programming of each group, the following **schedules** is available:

Day schedule. Can be set by the user or automatically by the controller using an astronomical clock (calculates sunrise and sunset times daily)

Night schedule. Can be set by the user or automatically by the controller using an astronomical clock (calculates sunrise and sunset times daily)

Special schedule 1. Schedule set by the user

Special schedule 2. Schedule set by the user

Manual operation schedule. User-defined schedule that allows the recirculation or exhaust fan group to start independently of the zone temperature or relative humidity (temperature or RH reference fields are not available in this mode)



ARTIFICIAL LIGHT CONTROL

Up to **8 independent lighting sectors** can be controlled per control zone.

For each control zone, the lighting sectors to be activated during the control schedule are programmed.

SCHEDULES

The **schedule** can be set using the **astro-nomical clock**. In this case, the schedule is **automatically** updated daily by the controller (sunrise and sunset times are calculated using the astronomical clock).

The **ON and OFF times** of the lighting sectors can be programmed within the **control schedule**.

ASTRONOMICAL CLOCK

The controller can calculate the **sunrise** and **sunset** time of each day

To obtain this astronomical data, the **time zone and the coordinates** of the unit's location must be configured.

The controller enables **automatic updating** of the start time and end time of the day schedule and night schedule in window control programs. This optimises the window control and avoids the user having to continually update the schedules

DATALOGGER

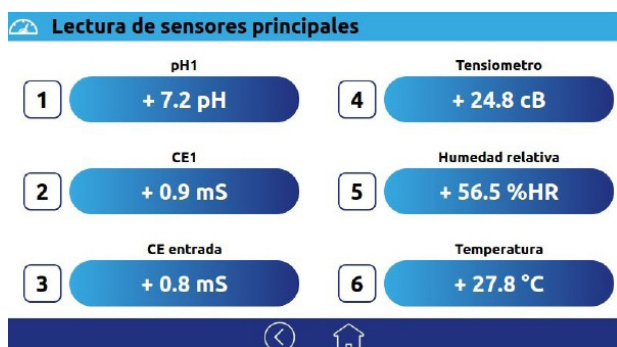
The readings of the sensors connected to the controller can be viewed **in real time**: weather station sensors, internal sensors for each zone and V.P.D. calculated in each zone.

The **recorded readings** of the sensors can be consulted through graphs

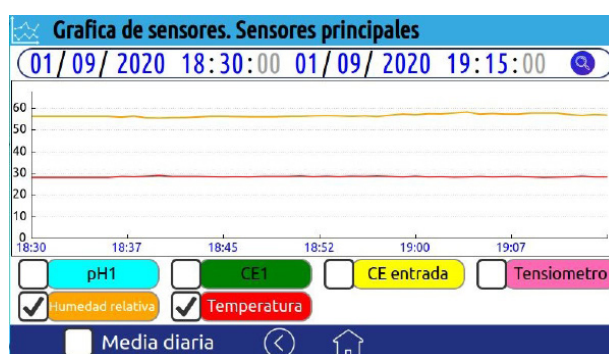
The graphs of several sensors can be viewed **simultaneously** and the sensors to be viewed at each moment can be selected

The sensor graphs can be viewed for a **certain period** (maximum one year)

See the **statistics** for the selected sensors: maximum value, minimum value and the average for the period consulted



Sensor reading screen



Graphic sensor screen



USB PORT

The controller has a USB port through which the touch **module software** can be updated and data downloaded from the unit to a USB memory.

The following can be downloaded:

- Backup of configuration and programming data
- A copy can be recovered to restore the unit's data
- Sensor reading
- Statistics

OUTPUTS

- The unit outputs are relays with capacity of up to 10 A at 24 V_{AC}. The function of each of them is fully configurable from the unit.
It is available with 16 outputs, expandable up to 250

- **Different voltages can be used in the outputs.** Each module can use a different voltage. For example, to start a generator set, 12 V_{DC} outputs can be used and, once it is running, 24 V_{AC} will be available to use in the rest of the output groups

POWER AND CONSUMPTION

- Touch screen power: 12V_{DC} 3A
- Power relay outputs: 12V_{DC} 3A

MODELS

- **Number of outputs:** from 16 relay outputs to 250 (expandable in groups of 8 outputs)
- **Supply voltage and outputs**
+ 12V_{DC} power and relay outputs / 12V_{DC} Latch 2 wires (configurable in the unit)
- **Format:** built-in controller, cupboard and control box



Built-in controller



Control box with methacrylate synoptic



Cupboard with methacrylate synoptic



MANUAL ACTIONS

Some actions can be performed manually through the controller:

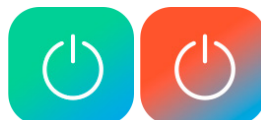
- Change the state of the controller: set it to STOP or ACTIVE
- Change the state of the window control: set the window control to STOP, ACTIVE or RESTART or position the windows manually using the AUTOTEST option
- Change the status of the fogging control: set it to STOP or ACTIVE
- Manually start a fogging cycle of a group



Start the fogging program



Reset running window control state



Active - Stop



INPUTS

ANALOG INPUTS



- **6 configurable analog inputs** for connecting 0-5 Vdc or 4-20 mA signal analog sensors to the unit. More sensors can be connected to the controller using up to 8 analog input expansion boards

- Possibility of **expansion** through external panels with 6 analog inputs. A maximum of 8 expansion boards can be connected, so up to 54 sensors could be connected to the controller.

DIGITAL INPUTS



- **10 opto-coupled digital inputs** for connecting digital sensors, such as a rain detector





OPTIONAL APPLICATIONS

SOFTWARE

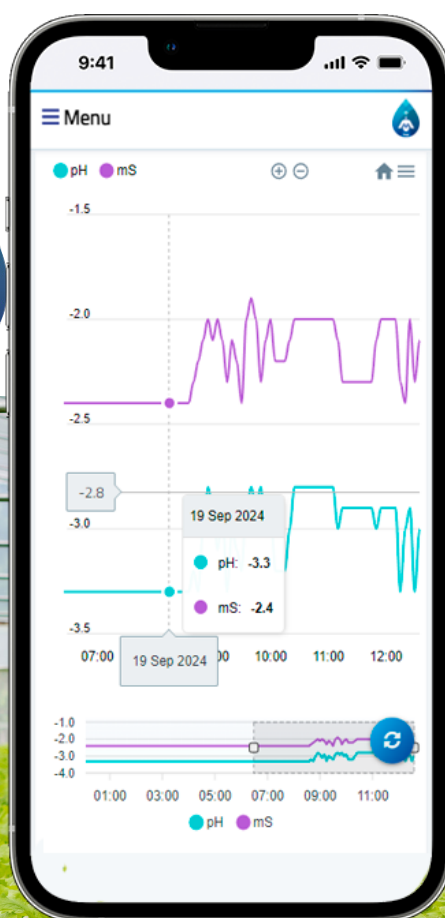


- **Maher App.** With a GPRS or Ethernet modem, the controller can be managed from an electronic device with internet connection and a web browser such as a smartphone, tablet, PC or Smart TV. Messages can also be sent by e-mail, configuring the controller to notify anomalies or sensor warnings

HARDWARE



- **Expansion of outputs.** The controller has 16 outputs as standard and the number of outputs can be increased up to a maximum of 250
- **Expansion of analog inputs.** The controller has 6 analog inputs as standard and the number of analog inputs can be increased up to a maximum of 54
- **GPRS or Ethernet modem.** The GPRS or Ethernet modem enables the controller to connect to the Maher App server.



maher
app
Controller remote control



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Climate control par excellence

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