Instruction manual

Cyclic temperature controller

Version 1.5

Card Ctrl_cy_v1

2021/03/18

Groupe Horticole Ledoux inc. | 785 rue Paul Lussier, Ste-Hélène-de-Bagot, Québec, Canada J0H 1M0 | Tél. sans frais : 1-888-791-2223 | Disponible en ligne sur *boutiquepro.ghlinc.com*

TABLE OF CONTENTS

GENERAL OPERATION

The cyclic controller is an independent climate control unit allowing two operating modes: **1st mode**: opening / closing a greenhouse roof vents, starting / stopping a heating system as well as contacting an alarm. **2nd mode**: Start / stop of a ventilation system, start / stop of a heating system as well as the contact of an alarm.

WARNING

For the two programming modes (opening / closing greenhouse openings / starting / stopping the two ventilation units), it is very important to check the selection of the correct mode desired according to the equipment connected to the cyclic controller in order to avoid malfunctions of it.

Opening / closing greenhouse roof vent(s)

Allows the opening and closing of greenhouse roof vents in timed cycles to reach a target.

Example : by entering the following parameters:

- Opening target of 25°C
- Closing target of 23°C

If the temperature exceed 25°C: the roof vents will be activated according to a timed cycle (ex: 3 SECONDS of opening and 5 MINUTES wait.
If the temperature pass under 23°C: roof vent will close on a timed cycle.
(ex: 8 SECONDS of closing for 3 MINUTES wait).
If the temperature drops between 25°C et 23°C the roof vents will remain motionless. This means that the temperature of the greenhouse is between these two points.

The closing and opening times can be adjusted separately (example: in winter, open slowly and close quickly).

In addition, to control the size of the opening (ex: not to open too wide in the spring), it is a matter of manually adjusting the limit switch of the opening.

The opening / closing can also be operated manually with the controller.

Start / stop of a ventilation system

Allows the start and stop of two ventilation system units at programmable intervals and temperatures for two different temperature stages.

Example ; by entering the following parameters:

• Starting target for the **1st fan** unit at **23 ° C.** Nominal duration of a **60 second** operating cycle of the fan, which will remain on in start and stop sequences, up to a maximum temperature of **28 ° C**. Minimum duration of the time on period: **15 seconds**. Minimum length of the time off period: **30 seconds**. Automatically, the cyclic controller will determine the cycle of inactivity of the fans according to a descending linear curve between the minimum temperature value **(23 ° C**) and the maximum temperature value **(28 ° C)**. This in combination with the duration of activity.

• E.g.: at **25.5 ° C** (the median between the minimum target temperature of **25 ° C** and the maximum target temperature of **28 ° C**), the duration of activity would be equal to the duration of inactivity, so **30 seconds** for each .

• Ex.: at **27 ° C**, the duration of activity would be equal to **48 seconds ((27 ° C - 23 ° C) / 5°C** for temperature gap for min. and max. = **0.8 * 60 seconds** of nominal cycle time = **48 seconds** for time on). The expected duration of time off would normally have been **12 seconds** (nominal **60 seconds - 48 seconds** for time on) but the default setting for the time off cycle of fan unit # 1 being **30 seconds**, it is this duration which will prevail. So, for this example, the full cycle time would be **78 seconds.**

There is consequently a linear increase in power of the active sequence of the fans in opposition to the duration of the inactive sequence as the temperature increases and vice versa.

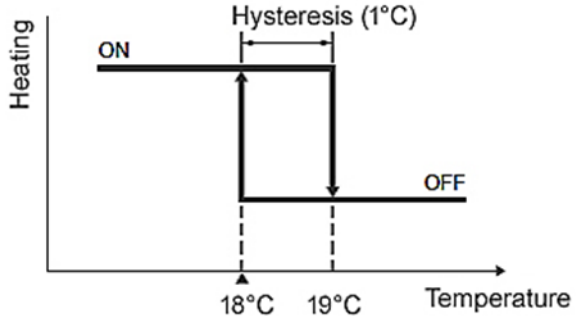
• Starting target of the second fan unit at **25 ° C.** Nominal duration of a **60 second** operating cycle of the fan, which will remain on in start and stop sequences, up to a maximum temperature of **28 ° C**. The following parameters repeat the same scheme as the first fan unit.

• Beyond the threshold of **28 ° C**, the two ventilation units will operate without stopping as long as the temperature has not fallen below this threshold.

Therefore, the speed of the power increase is configured by the temperature difference and by the duration of the active and inactive sequence. So you can configure how quickly you want the fan on and off sequence duration change with temperatures and times.

Start / stop of a heating system

An "ON / OFF" type heating unit can be operated by the controller. The setting allows you to choose a target heating temperature and temperature hysteresis.



Heating hysteresis is the difference between the on and off temperature. It is generally set at 1 ° C. Example: for a setpoint temperature of 18 ° C, the heating will turn on at 18 ° C and turn off at 19 ° C.

Send alarm

The alarm contact in the form of a 12 VAC signal is activated by several conditions:

- temperature too low in the greenhouse
- temperature too high in the greenhouse
- loss of power (power failure)

TECHNICAL SPECIFICATIONS

- Input voltage : 12/24 VAC
- Output voltage : 12/24 VAC
- Maximum amperage : 2 A
- Fuse inside : 2 A
- Temperature display unit : degrees Celsius (°C).
- Time display unit : seconds and minutes

Type de contrôle
Auto / manual

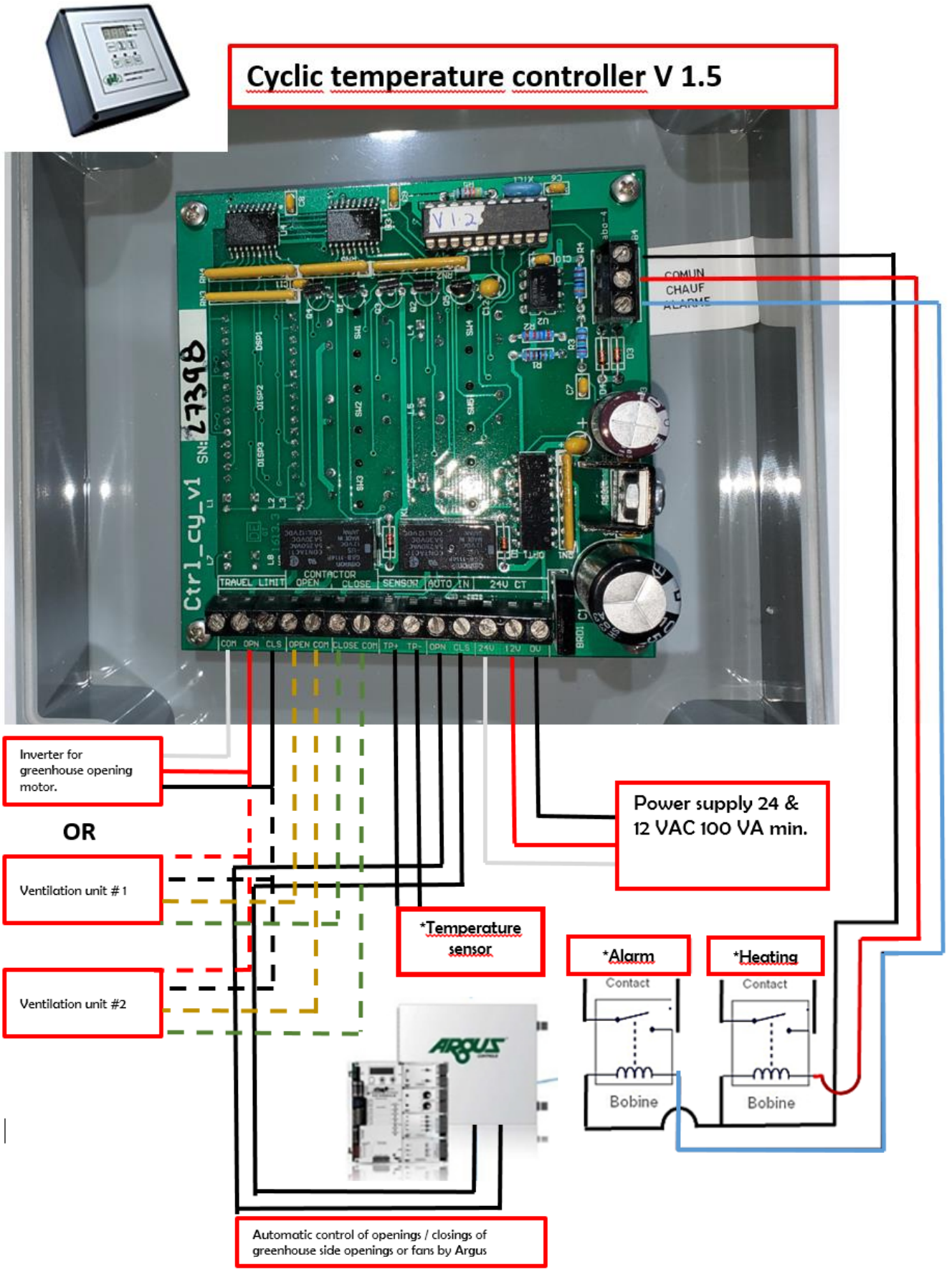
Branchement	
3 inputs	12/24 VAC (minimum 100VA) supply Limit switch supply Dry contact (open/close)
3 outputs	Open vent roof / start fan signal 24 VAC Alarm signal 12 VAC Heat signal 12 VAC

Boîtier	
Case dimension	16 cm x 16 cm x 9 cm

NOTE :

*** Requires use of 120v/24v transformer (sold separately) ***

ELECTRICAL WIRING PLAN

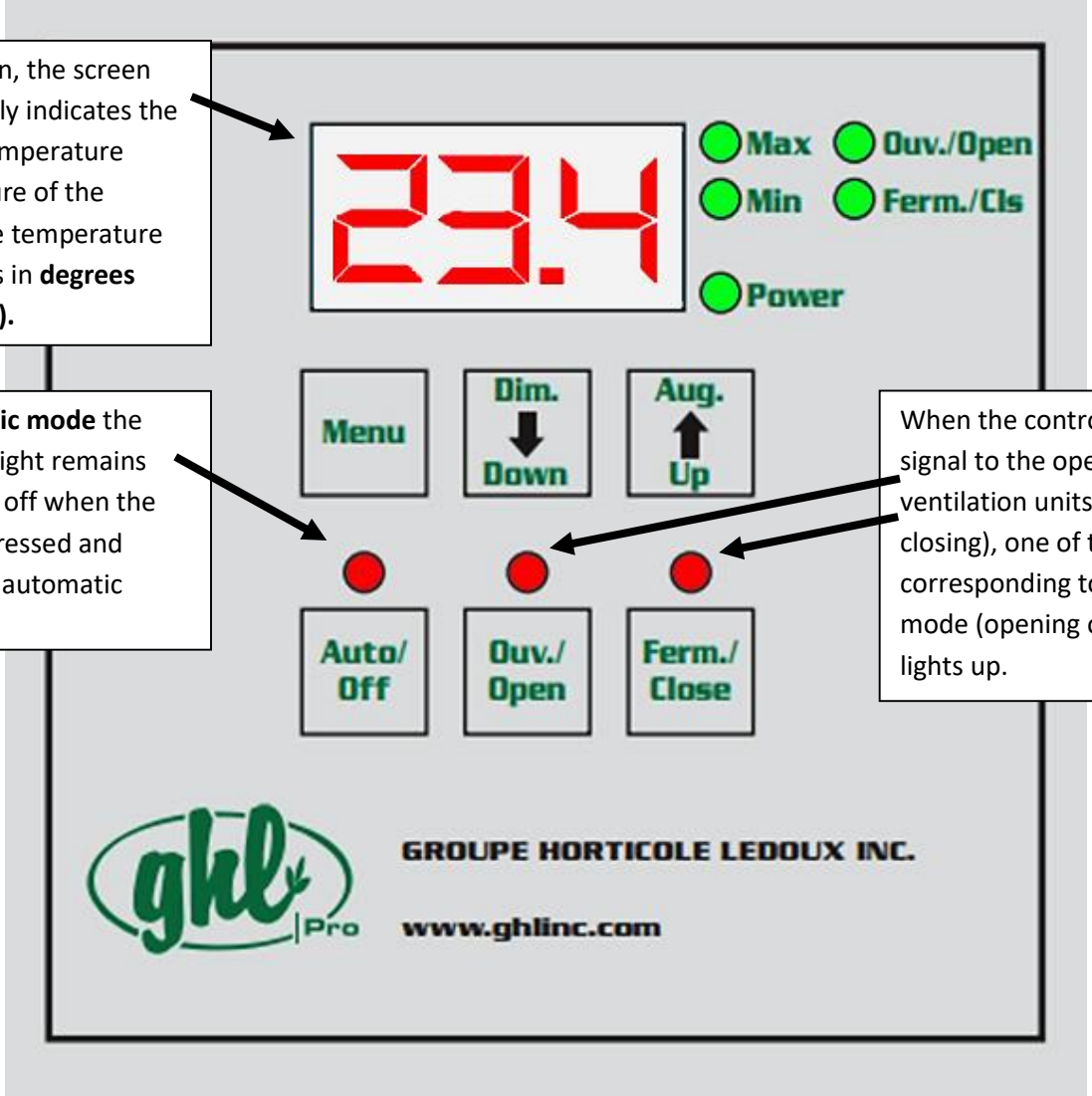


DISPLAY SCREEN

In operation, the screen continuously indicates the ambient temperature (temperature of the probe). The temperature displayed is in **degrees Celsius (° C).**

In **automatic mode** the Auto / Off light remains on. It turns off when the button is pressed and changes to automatic mode.

When the controller sends a signal to the opening or to the ventilation units (opening or closing), one of the red lights corresponding to the current mode (opening or closing) lights up.



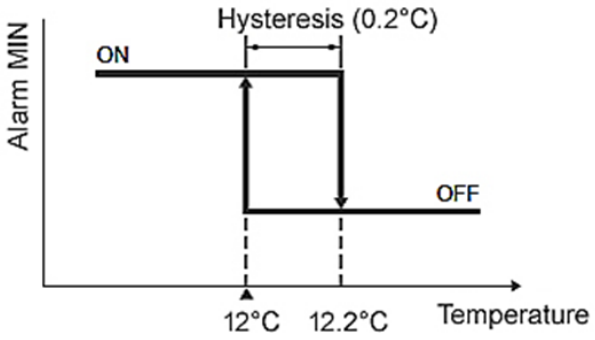
BASIC SETTINGS FOR GREENHOUSES WITH FAN

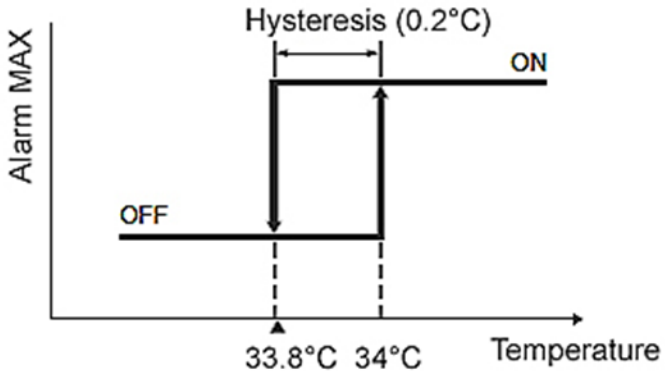
Step	*Parameter*	*Default value*	*Identification code*
4	High temperature alarm temperature	34.0°C	**Max** green light flashes quickly
5	Low temperature alarm temperature	12.0°C	**Min** green light flashes quickly
6	Heat temperature target	18.0°C	Red light **Auto/Off** flashes slowly
7	Heating target temperature hysteresis	01.0°C	**Auto/Off** red light flashes quickly
9	Fan unit # 1 start temperature	23.0°C	**Max** green light flashes slowly
10	Temperature difference for cyclic operation of fan unit # 1	05.0°C	**Min** green light flashes slowly
11	Fan unit # 1 nominal time interval (in seconds)	60.0 secondes	**Auto/Off** red light flashes slowly
12	Minimum activity time of ventilation unit # 1 (seconds)	15.0 secondes	**Ouv./Open** red light flashes slowly
13	Minimum duration of inactivity of ventilation unit # 1 (in seconds)	30.0 secondes	**Ferm./Close** red light flashes slowly
14	Fan unit # 2 start temperature	25.0°C	**Max** green light flashes quickly
15	Temperature difference for cyclic operation of fan block # 2	03.0°C	**Min** green light flashes quickly
16	Fan unit # 2 nominal time interval (in seconds)	60.0 secondes	**Auto/Off** red light flashes quickly
17	Minimum duration of activity of ventilation unit # 2 (seconds)	15.0 secondes	**Ouv./Open** red light flashes quickly
18	Minimum duration of inactivity of ventilation unit # 2 (in seconds)	30.0 secondes	**Ferm./Close** red light flashes quickly

BASIC SETTINGS FOR GREENHOUSES WITH ROOF VENTS

Étape	*Paramètre*	*Valeur par défault*	*Code d'identification*
4	High temperature alarm temperature	34.0°C	**Max** green light flashes quickly
5	Low temperature alarm temperature	12.0°C	**Min** green light flashes quickly
6	Heat temperature target	18.0°C	Red light **Auto/Off** flashes slowly
7	Heating target temperature hysteresis	01.0°C	**Auto/Off** red light flashes quickly
9	Roof vent opening temperature	25.0°C	**Max** green light flashes slowly
10	Roof vent closing temperature	23.0°C	**Min** green light flashes slowly
11	Roof vents opening time (in seconds)	05.0 secondes	**Ouv./Open** red light flashes quickly
12	Opening roof vents waiting time	03.0 minutes	**Ouv./Open** red light flashes slowly
13	Roof vents closing time(in seconds)	05.0 secondes	**Ferm./Close** red light flashes quickly
14	Closing roof vents waiting time	03.0 minutes	**Ferm./Close** red light slowly

Note: The high and low temperature alarm temperatures have a fixed hysteresis of 0.2 ° C. Example: For a low temperature alarm temperature of 12 ° C, the alarm will turn on at 12 ° C and turn off at 12.2 ° C. Then for a high temperature alarm temperature of 34 ° C, the alarm will turn on at 34 ° C and turn off at 33.8°C.





PROGRAMMATION

At any time

It is possible at any time to view / modify a parameter while the device is in operation. To do this, press the Menu button (for about 1 second) and press the Menu button again several times, scrolling through the parameters until the end (with or without modifications) to end the programming cycle and return to the display of base (room temperature) and when the instructions on the devices in the greenhouse are activated.

When opening the device :

When the device starts up, each parameter scrolls in turn while turning on a light that acts as an identification code (this process takes about 1 minute).

(Note: To immediately activate the instructions on the devices in the greenhouse, press the Menu button several times while scrolling through the parameters until the end (with or without modifications) to end the programming cycle and return to the display of base (room temperature).)

When opening the controller, the inscription "U1.5" which means "version 1.5" appears on the screen. Then the value of each parameter is displayed in turn at approximately 10 second intervals and can be changed. Here's how to change each of the settings from the first:

1. **Start the device.**
2. **Choose HEAT or FAN program with UP and MENU buttons.**
3. **Show PRG.**

4. High temperature alarm temperature

While the **Max** light is flashing rapidly, press the Dim. or Aug. arrow, according to the desired temperature. Then press the Menu button to go to the next step.

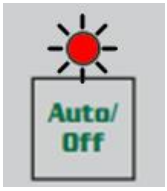
*** WARNING: The high temperature alarm value cannot be lower than the sash opening temperature. Ex: if 25 ° C is requested for opening, the high temperature alarm can be 25°C and + ***

5.Low temperature alarm temperature

While the **Min** light is flashing rapidly, press the **Dim** or **Aug** arrow. according to the desired temperature. Then press the Menu button to go to the next step.

*** WARNING: The value of the low temperature alarm cannot be greater than the sash closing temperature. Ex: if 23 ° C is requested for closing, the low temperature alarm can be 23 ° C and - ***

6.Heating target temperature



While the **Auto / Off** light **is flashing slowly**, press the **Dim** or **Aug** arrow. according to the desired temperature. Then press the Menu button to go to the next step.

7. Heating target temperature hysteresis

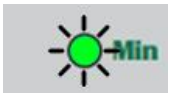
While the **Auto / Off** light is **flashing rapidly**, press the **Dim** or **Aug** arrow. according to the desired temperature. Then press the Menu button to go to the next step.

8. Show PRG – HEAT mode (greenhouses with roof vents)

9.Roof vents opening temperature

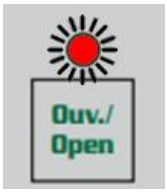
In programming mode, while the **Max** light is flashing slowly, press the **Dim.** Or **Aug**. arrow. according to the desired temperature. Then press the Menu button to go to the next step

10. Roof vents closing temperature



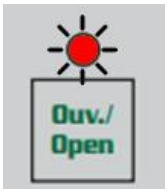
While the **Min** light is **flashing slowly**, press the **Dim**.or **Aug** arrow. according to the desired temperature. Then press the **Menu** button to go to the next step.

11. Roof vents opening time (in seconds)



While the **Ouv. / Open** light is **flashing rapidly**, press the **Dim** or **Aug** arrow. according to the desired time in **seconds**. Then press the **Menu** button to go to the next step.

12. Roof vents opening time (in minutes)

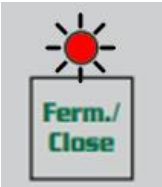


While the **Ouv./ Open** light is **flashing slowly**, press the **Dim**. or **Aug** arrow. according to the desired time in **minutes**. Then press the **Menu** button to go to the next step.

13. Roof vents closing time (in seconds)

While the **Ferm./ Close** light is **flashing rapidly**, press the **Dim**. or **Aug** arrow. according to the desired time in **seconds**. Then press the **Menu** button to go to the next step.

14. Roof vents closing waiting time (in minutes)



While the **Ferm. / Close** light is **flashing slowly**, press the **Dim**.or **Aug** arrow. according to the desired time in **minutes**. Then press the **Menu** button to go to the next step and you will go into automatic mode.

15. You have switched to automatic mode.

---

8. Show PRG – mode FAN (greenhouses with fans)

9. Fan unit # 1 start temperature

In programming mode, while the **Max** light is **flashing slowly**, press the **Dim.** Or **Aug.** arrow. according to the desired temperature. Then press the **Menu** button to go to the next step.

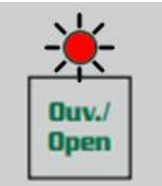
10. Temperature difference for cyclic operation of fan unit # 1

While the **Min** light is **flashing slowly**, press the **Dim**. or **Aug** arrow. according to the desired temperature difference. Then press the **Menu** button to go to the next step.

11. Fan unit # 1 nominal time interval (in seconds)

While the **Auto / Off** light is **flashing slowly**, press the **Dim** or **Aug** arrow. according to the desired time in **seconds**. Then press the **Menu** button to go to the next step.

12. Minimum activity time of ventilation unit # 1 (seconds)



While the **Ouv. / Open** light is **flashing slowly**, press the **Dim**. or **Aug** arrow. according to the desired time in **seconds**. Then press the **Menu** button to go to the next step.

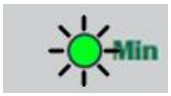
13. Minimum duration of inactivity of ventilation unit # 1 (in seconds)

While the **Ferm. / Close** light is **flashing slowly**, press the **Dim.** or **Aug** arrow. according to the desired time in **seconds**. Then press the **Menu** button to go to the next step.

14. Fan unit # 2 start temperature

In programming mode, while the **Max** light is **flashing rapidly**, press the **Dim**. Or **Aug.** arrow. according to the desired temperature. Then press the **Menu** button to go to the next step.

15. Temperature difference for cyclic operation of fan block # 2

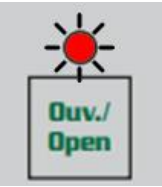


While the **Min** light is **flashing rapidly**, press the **Dim**. or **Aug** arrow. according to the desired temperature difference. Then press the **Menu** button to go to the next step.

16. Fan unit # 2 nominal time interval (in seconds)

While the **Auto / Off** light is **flashing rapidly**, press the **Dim**. or **Aug** arrow. according to the desired time in **seconds.** Then press the **Menu** button to go to the next step.

17. Minimum duration of activity of ventilation unit # 2 (seconds)



While the **Ouv. / Open** light is **flashing rapidly**, press the **Dim**. or **Aug** arrow. according to the desired time in **seconds**. Then press the **Menu** button to go to the next step.

18. Minimum duration of inactivity of ventilation unit # 2 (in seconds)

While the **Ferm. / Close** light is **flashing rapidly**, press the **Dim**. or **Aug** arrow. according to the desired time in **seconds**.Then press the **Menu** button to go to the next step.

19. You have switched to automatic mode.

OPENING/CLOSING ROOF VENTS IN MANUAL MODE

Here's how to switch to manual mode:

Press the **Auto / Off** button to remove or return the controller to automatic or manual mode.

When the device is in manual mode, you can open the doors manually by pressing the **Ouv. / Open** button and pressing a second time to stop opening.

When the device is in manual mode, you can close the doors manually by pressing the **Ferm./Close** button and pressing a second time to stop closing.

To switch back to automatic mode, just press the **Auto / Off** button.

IN CASE OF FAILURE

In the event of a power failure, **the alarm relay drops to idle, so the active alarm position.**

When power returns, if no action is taken on the device, it will restart with the last configuration entered.

A delay of approximately 1 minute (the time it takes for the display to scroll through all programming settings) will elapse before the sash / ventilation / opening / closing and heating are restarted. As for the sending of the high and low temperature alarm signal, it is activated without delay as soon as the controller is restarted.