

CO2 Controller User Manual

(Pre-release 22.05.25)

Preface

Thank you for purchasing the CO2 Controller.

The CO2 ventilation controller is a multifunctional device offering the following features:

- Speed controller for ventilated rooms to control an exhaust fan or both intake and exhaust fans, as well as to dose CO2 gas.
- Light controller to manage and continuously dim lighting.
- Programmable sockets that can be controlled based on sensor values (e.g., heating, cooling, humidifying, dehumidifying, as a timer, or to control a CO2 valve).

The main purpose of the CO2 controller is to maintain room temperature and humidity—day and night, with separate target values—and to create a slight negative pressure to prevent odors from escaping the room.

Warranty

The warranty is valid only if:

- A warranty card issued by the seller with stamp, signature, and sales date is included, **or**
- A purchase receipt or invoice with the printed serial number is available, **or**
- An electronic registration has been made at <http://g-systems.eu/warranty/>

If none of these documents are available, please contact your point of sale.

Legend

1. Socket 1 (Variable)
2. Socket 2 (Variable)
3. Socket 3
4. Socket 4
5. Navigation knob
6. Screen
7. EC intake fan
8. Power cable 1 (left side)
9. CO2 sensor connector
10. Lighting
11. Temperature sensor connector
12. Power cable 2 (right side)
13. EC exhaust fan

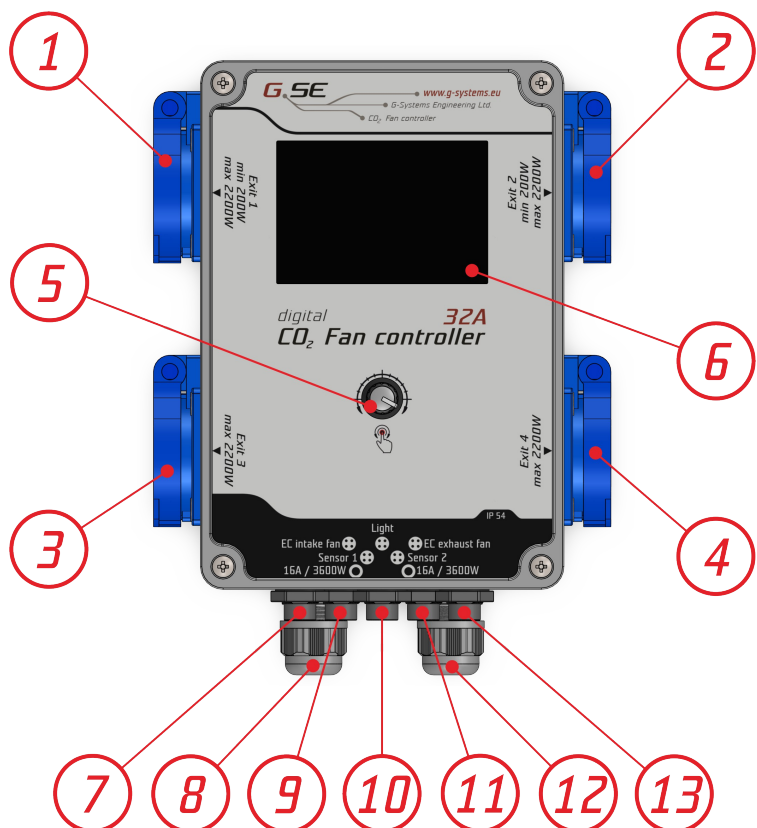


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Installation

Mount the device using the mounting bracket on a non-flammable surface such as brick or concrete —never on wood, plastic, cardboard, or similar materials.

When choosing a location, ensure it is well-ventilated and that any generated heat can be dissipated effectively. Avoid installing the device in small, poorly ventilated rooms or enclosed cabinets.

Warning: Improper installation may lead to overheating of the controller!

Technical Specifications

- **Operating Voltage:** 230 V / 50 Hz

Maximum cable connection values (depending on country):

- VDE Type L (Schuko): max. 16 A
- VDE Type F (France): max. 16 A
- VDE Type E (Switzerland): max. 13 A
- VDE Type U (UK): max. 13 A

Output load capacities:

- Output 1 (variable): min. 200 W / max. 10 A (2300 W, $\cos \varphi = 1$)
- Output 2 (variable): min. 200 W / max. 10 A (2300 W, $\cos \varphi = 1$)
- Output 3: max. 10 A (2300 W, $\cos \varphi = 1$)
- Output 4: max. 10 A (2300 W, $\cos \varphi = 1$)

Signal outputs for control:

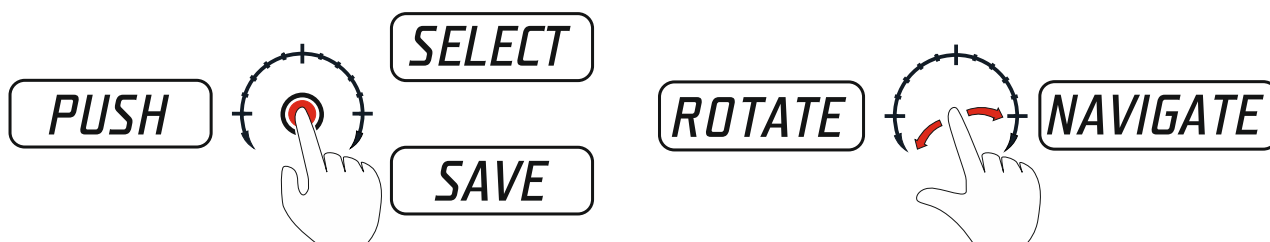
- Intake fan: 0–10 V or PWM
- Exhaust fan: 0–10 V or PWM
- Light control: 0–10 V

Manual

Navigation

You can navigate through the menu using the rotary/push knob:

- Turn clockwise to go to the next option or to increase a setpoint.
- Turn counterclockwise to decrease a setpoint.
- Press the knob to confirm a selection or to save a value.



Display

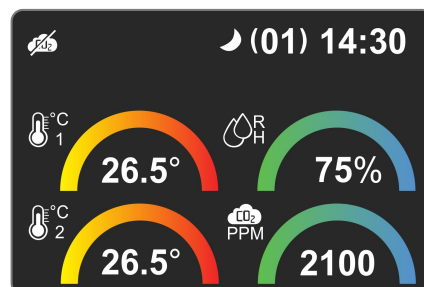
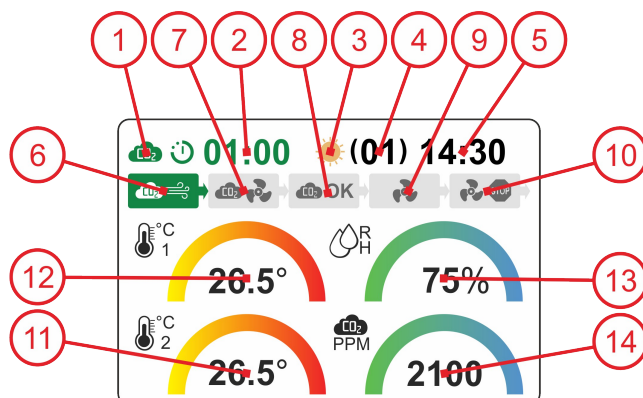
The main screen is divided into three sections and is used solely for displaying current measurement values. Settings are made via the menu, which consists of several individual configuration areas.

Main Screen – Part 1

Display of Actual Values

This screen shows the current system values:

1. CO₂ cycle active
2. Countdown time of the CO₂ function
3. Day/Night indicator (also shown by a dark background – see figure below)
4. Day counter
5. Current time
6. CO₂ dosing
7. CO₂ distribution
8. CO₂ target value reached
9. CO₂ ventilation
10. Fan overrun time (standstill time)
11. Temperature display – temperature sensor
12. Temperature display – CO₂ sensor
13. Humidity
14. CO₂ concentration

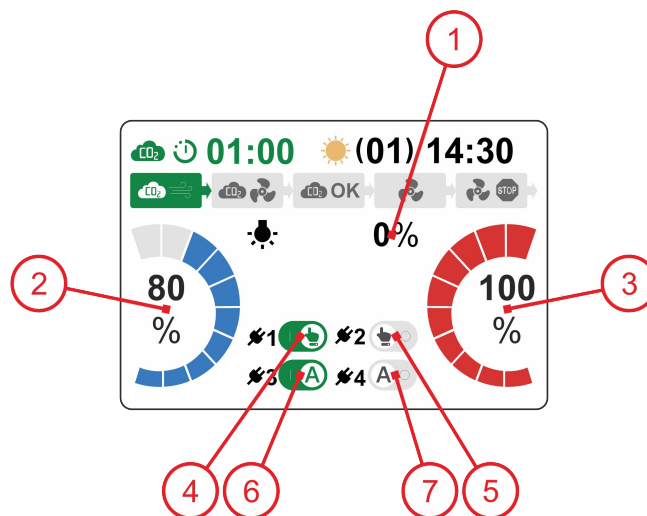


Main Screen – Part 2

Display of Outputs

This screen shows the current statuses of the outputs:

1. Light intensity
2. Supply fan speed
3. Exhaust fan speed
4. Output 1 – Manual ON
5. Output 2 – Manual OFF
6. Output 3 – Automatic ON
7. Output 4 – Automatic OFF

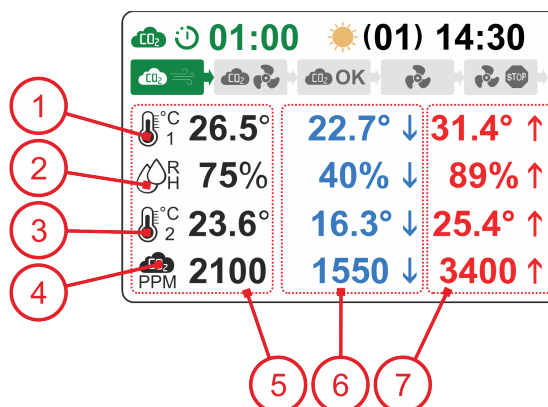


Main Screen – Part 3

Display of Measured Maximum and Minimum Values and Alarm Messages (Events)

This section displays current actual values as well as their recorded limits and alarms:

1. Temperature (gas sensor)
2. Humidity (gas sensor)
3. Temperature (temperature sensor)
4. CO₂ value
5. Current actual display
6. Minimum recorded values
7. Maximum recorded values



Alarms (Events)

Alarm(s):

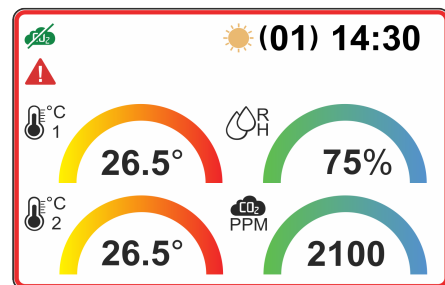
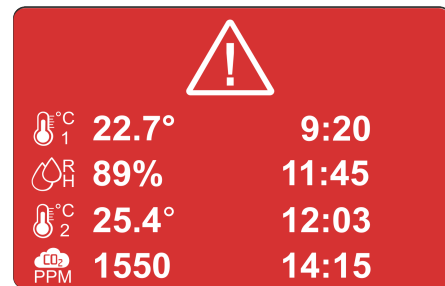
This screen appears in red when a value is outside the configured and activated minimum or maximum limit – or when the CO₂ bottle is empty.

- Press the knob once to acknowledge the alarm.
- If the alarm remains active after acknowledgment, a red border will appear on the screen. The device can still be used normally.
- The red border disappears automatically once all values return to the acceptable range.

Note on the CO₂ bottle alarm:

If an alarm is triggered due to an empty CO₂ bottle, the CO₂ function is deactivated. After replacing the bottle, the function must be manually reactivated.

If you want to acknowledge the alarm without replacing the bottle, manually switch the CO₂ function off and on again.



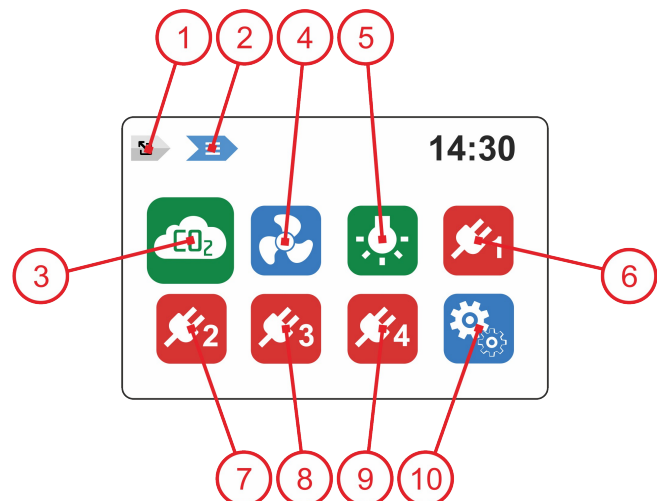
Settings

Main Menu

To access the settings menu, press the rotary/push knob once.

Menu Items

1. Return to main screen
2. Main menu display (current position)
3. CO₂ settings
4. Ventilation settings
5. Lighting settings
6. Output 1 – Settings
7. Output 2 – Settings
8. Output 3 – Settings
9. Output 4 – Settings
10. Device settings (submenu)

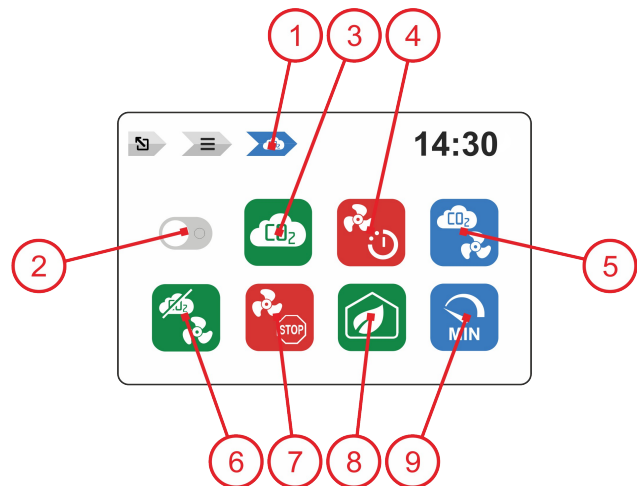


Navigate by turning the knob left or right to select a setting or to go to **item 1: Return to Main Screen**. The currently selected option is highlighted with a **larger icon**. Press the knob to confirm your selection and enter the corresponding submenu.

CO₂ Menu

Navigate to **item 3: CO₂ Settings** and press the knob to open the menu.
The following options are available in this menu:

1. CO₂ Menu Display (You are here)
2. Enable or disable CO₂ dosing during daytime
3. Set CO₂ values
4. Set CO₂ gas distribution time
5. Start conditions for CO₂ dosing
6. Stop or exhaust conditions for CO₂
7. Fan overrun time
8. Room settings and dosing parameters
9. Minimum speed setting for for CO₂ time



Navigate to the desired option and confirm your selection by pressing the knob.

Note on item 2:

Press the knob to toggle CO₂ dosing on or off during the daytime.

Set CO₂ Value

Press the knob to set the desired **CO₂ target value** and the corresponding **hysteresis**.

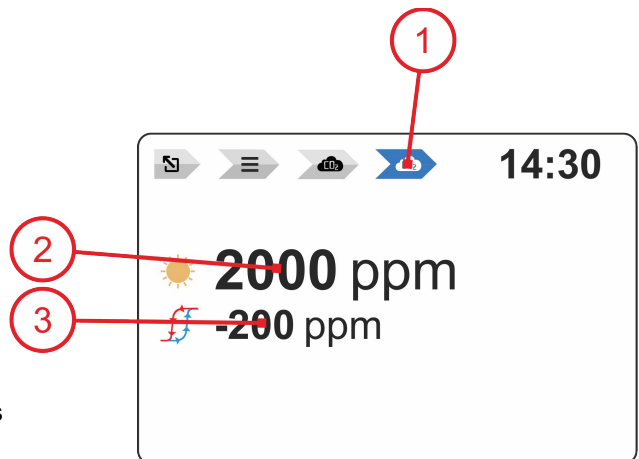
1. **Set CO₂ Value** (current position)
2. **CO₂ Target Value** – Enter the desired setpoint in ppm (e.g., 2000 ppm).
3. **CO₂ Hysteresis** – Defines the difference between the switch-on and switch-off thresholds.

Example – Hysteresis:

With a CO₂ target value of 2000 ppm and a hysteresis of -200 ppm, the controller will begin dosing only when the CO₂ level drops below 1800 ppm. Dosing continues until the level reaches 2000 ppm again.

Press the knob again to save the values.

Then return to the CO₂ menu and select the next option: **4. CO₂ Gas Distribution Time**.



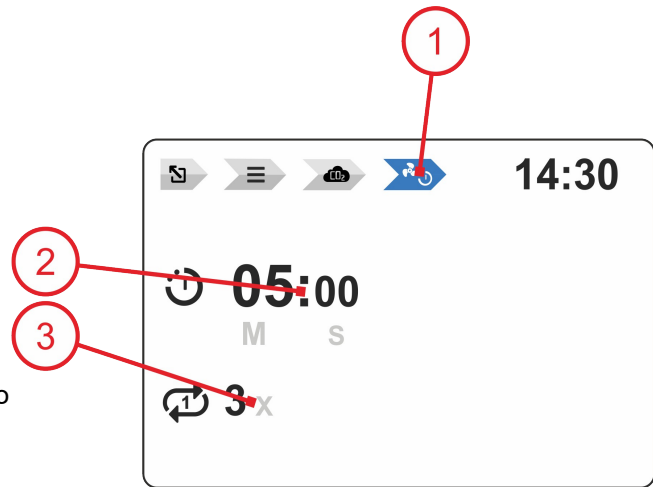
CO₂ Gas Distribution Time

After dosing, a so-called **distribution time** follows, during which the CO₂ disperses evenly throughout the room before any potential follow-up dosing. This time should be set according to the room size to allow the CO₂ level to stabilize properly.

1. **CO₂ Distribution Time**
2. **Time format** in minutes : seconds – e.g., 01:30 (1 minute 30 seconds)
3. **CO₂ Dosing Repetitions** – Specifies how many times the dosing/distribution cycle is repeated

Note:

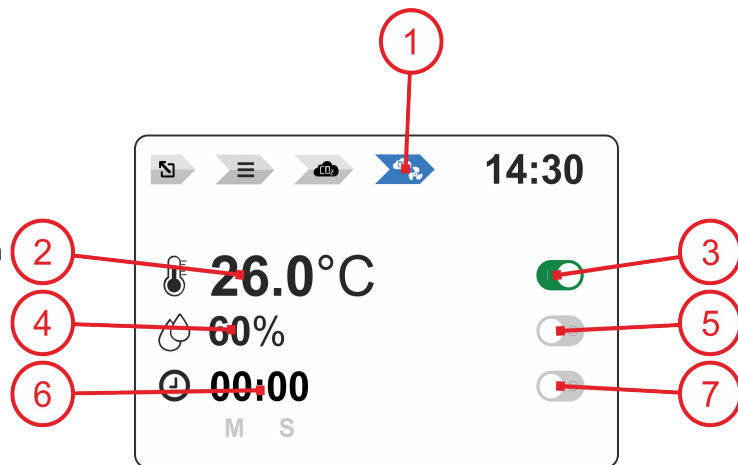
After the set number of repetitions, CO₂ dosing stops. If the CO₂ level remains below the target value and no further dosing occurs, the alarm “**CO₂ bottle empty**” is automatically triggered, and the CO₂ mode is deactivated.



Start CO₂ Time (Ventilation Stop Time)

In this menu, you define the **start conditions** for CO₂ dosing. Multiple conditions can be activated—all **activated conditions must be met simultaneously** for the dosing process to begin. At least one condition must be enabled.

1. **Start CO₂ Time** – Overview and activation of the start menu
2. **Temperature** – Threshold value for the condition
3. **Enable Temperature** – Toggle ON/OFF for the temperature condition
4. **Humidity** – Threshold value for the condition
5. **Enable Humidity** – Toggle ON/OFF for the humidity condition
6. **Time (minutes : seconds)** – Time-based start condition
7. **Enable Time** – Toggle ON/OFF for the time condition



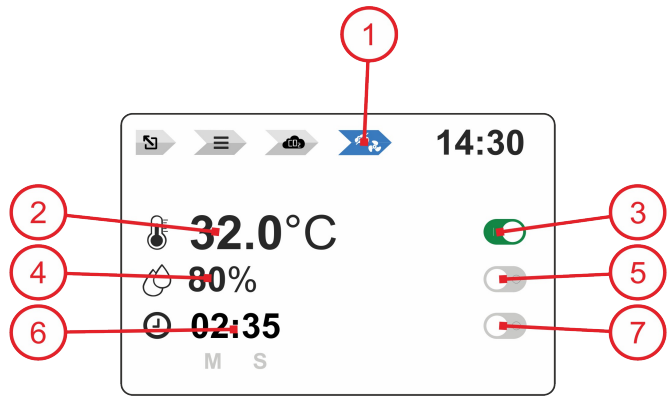
Example:

If both temperature and humidity are activated, the dosing process will only start when **both conditions are met simultaneously**.

Start of Ventilation Phase (CO₂ Stop Time)

In this menu, you define the stop conditions for CO₂ dosing. When any of the activated conditions is met, CO₂ injection will stop and the exhaust phase will begin. At least one condition must be activated.

1. **Start of Ventilation Time** – Overview and activation of this menu
2. **Temperature** – Upper temperature threshold
3. **Enable Temperature Condition** – Toggle ON/OFF for temperature control
4. **Humidity** – Upper humidity limit
5. **Enable Humidity Condition** – Toggle ON/OFF for humidity control
6. **Time (Minutes : Seconds)** – Time-based stop condition
7. **Enable Time Condition** – Toggle ON/OFF for time control



Example:

If the temperature exceeds the limit, humidity rises above the set value, or the countdown reaches zero, the CO₂ dosing process is interrupted and the exhaust fans start automatically.

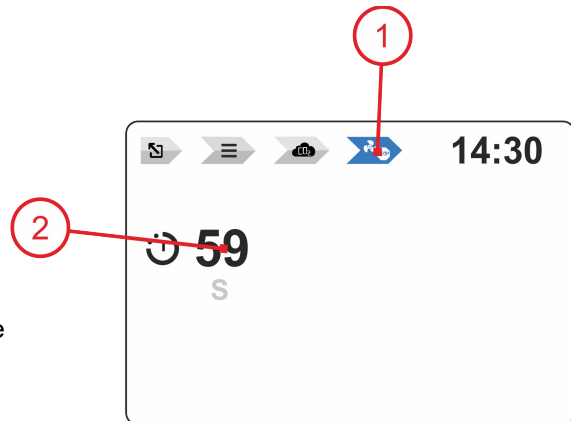
Fan Run-Off Time

After the exhaust phase ends (*Start of Ventilation Time*), the fan continues spinning for a short period due to mechanical inertia before coming to a complete stop.

In this menu, you can configure the fan's run-off time:

1. **Stop Fan – Overview of the stop behavior**
2. **Fan Run-Off Time** – Adjustable time in seconds

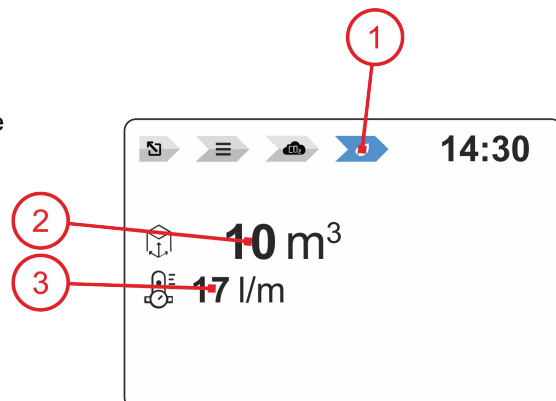
Depending on the fan's size and type, it may take a few seconds to come to a complete stop. The run-off time defined here determines how long the system waits after the exhaust phase ends before allowing a new CO₂ dosing cycle to begin.



Room Settings

This menu allows you to configure the essential parameters for CO₂ dosing:

1. **Room Settings** – Overview of room configuration
2. **Room Volume (m³)** – Enter the room's volume in cubic meters
3. **Gas Flow Rate (liters/minute)** – Set the CO₂ supply rate according to your system



Calculation and Installation Notes:

- **Room Volume:** Calculate the volume as Length × Width × Height
- **Flow Rate:** Enter the CO₂ system's gas flow rate in liters per minute (l/min)

- **Unit Conversion – SCFH to l/min:**

$$1 \text{ SCFH} = 0.471 \text{ l/min}$$

Installation Tip:

Ideally, mount the CO₂ hose behind a recirculating fan.
This ensures the heavier CO₂ gas distributes evenly across the room.
Effective air circulation is critical for accurate CO₂ readings.

CO₂ Dosing Test Procedure

1. Set **CO₂ minimum flow** to **0%**
2. Start the CO₂ dosing process

On the main screen (Part 1), the following will be displayed:

- **Step 6:** CO₂ dosing starts (with countdown)
- **Step 7:** CO₂ distribution begins (also with countdown)
After the distribution phase, the CO₂ target value minus the hysteresis must be reached
- **Step 8:** “CO₂ Level Reached” should light up

Troubleshooting Guide

1. CO₂ level not reached

- Check if the distribution time is set long enough
- If CO₂ rises too slowly, increase distribution time

2. CO₂ level is too low, immediate re-dosing starts

- Increase the gas flow rate at the CO₂ valve
- Alternatively: Reduce **Gas Flow Rate (l/min)** in the regulator settings
- Or adjust the **Room Volume (m³)**:
 - Smaller volume = shorter gassing time
 - Larger volume = longer gassing time

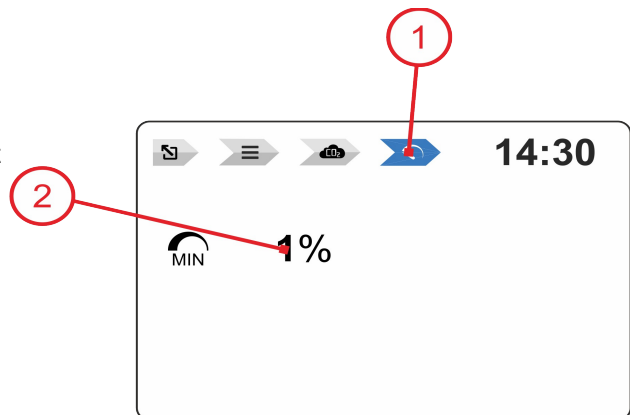
3. CO₂ level too high

- Decrease the gas flow rate at the valve
- Or increase the **Flow Rate (l/min)** in the regulator — depending on whether the CO₂ system is under- or over-delivering

Minimum speed setting for for CO₂ time

This menu allows you to configure the **minimum speed of the exhaust fan** during the active CO₂ function (daytime operation).

1. **Minimum CO₂ Fan Speed** – Overview of this setting
2. **Minimum Speed** – Adjustable value in percent (%)



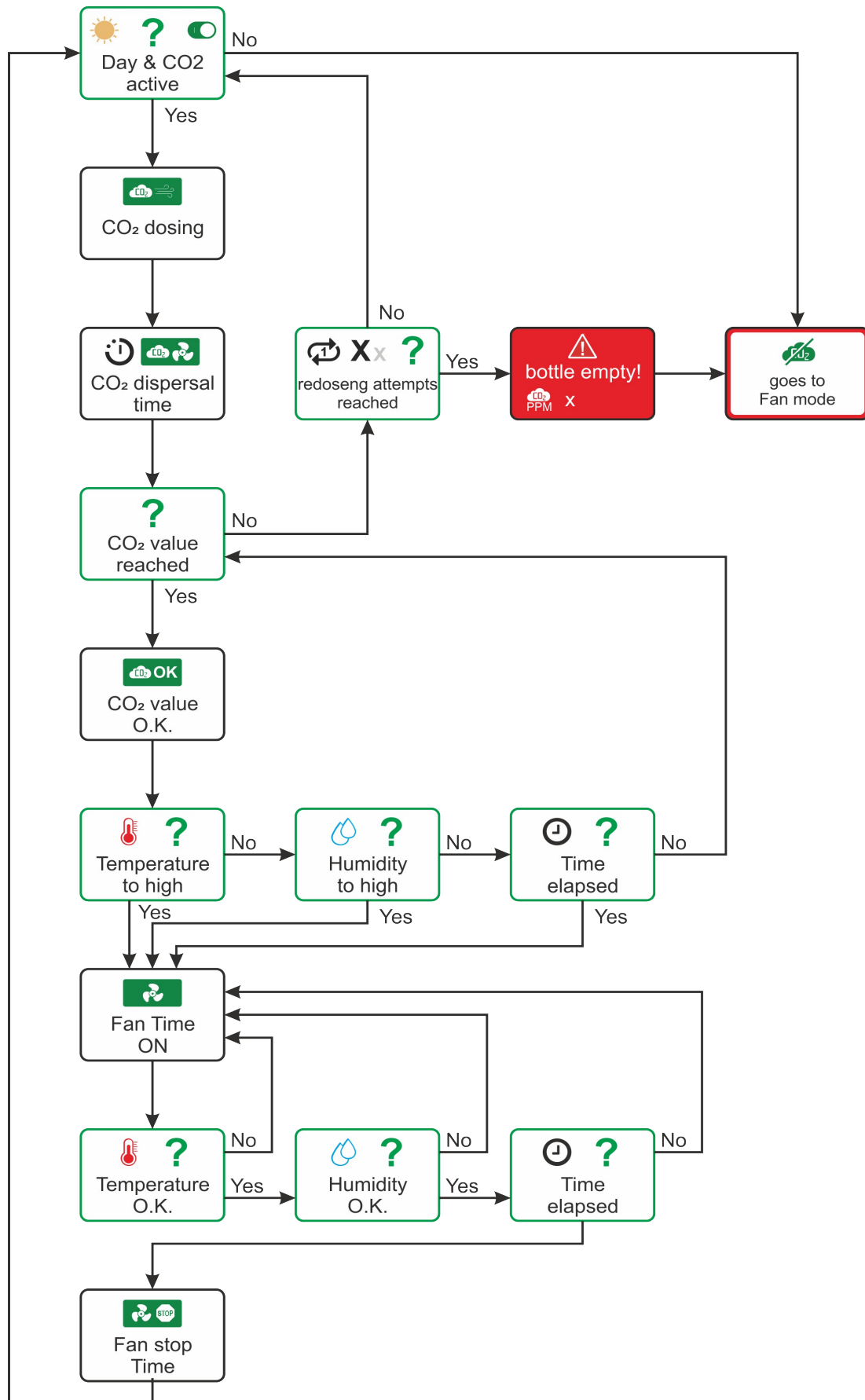
Recommendation:

Ideally, this value should be set to **0%** (fan off) to avoid unnecessary loss of CO₂ gas.

However, if **odor control** is required and a slight **negative pressure** must be maintained in the room, a minimum fan speed can be set — typically between **10% and 30%**.

To configure additional ventilation parameters, return to the main menu and select:

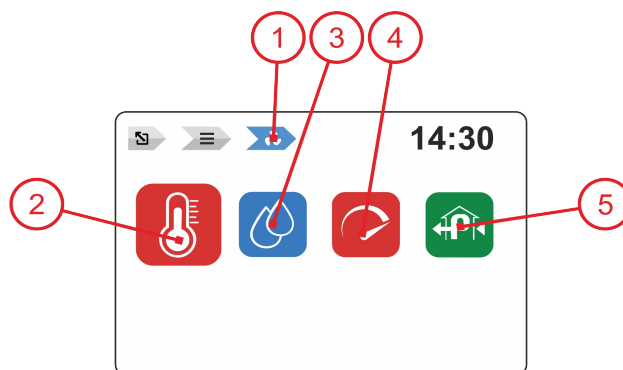
CO₂ dosing flow chart



Ventilation Settings

This menu allows you to configure the parameters for room ventilation:

1. **Ventilation Menu** – Main overview
2. **Temperature Settings** – Configure ventilation based on temperature thresholds
3. **Humidity Settings** – Configure ventilation based on humidity thresholds
4. **Minimum and Maximum Fan Speeds** – Set the operational range of the fan
5. **Negative Pressure Setting** – Maintain a slight underpressure for odor or air control



Note:

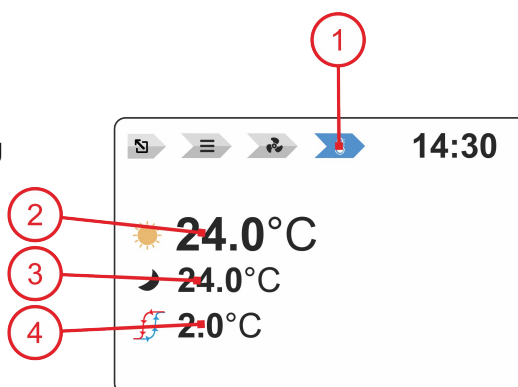
These settings are only active during the **daytime** when **CO₂ dosing is deactivated** or the “**CO₂ bottle empty**” alarm is triggered.

During **nighttime operation**, ventilation is always regulated according to these settings.

Temperature Settings

In this menu, you can define the desired daytime and nighttime temperature setpoints, as well as the temperature hysteresis range.

1. **Temperature Settings** – Overview of this menu
2. **Day Temperature** – Target temperature during daytime operation
3. **Night Temperature** – Target temperature during nighttime operation
4. **Temperature Hysteresis** – Range used for smooth fan speed modulation



Adjustment Guide

Set the desired **day and night temperatures** here, along with the **positive hysteresis** value.

Example:

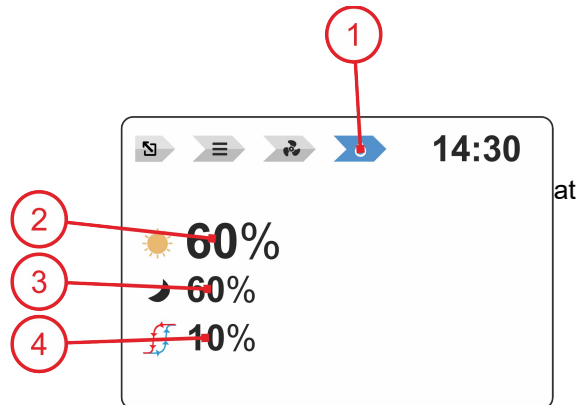
If the **day temperature** is set to **24.0 °C** and the **hysteresis** is **+2.0 °C**:

- Up to **24.0 °C**, the fans remain off or operate at **minimum speed**
- Between **24.0 °C** and **26.0 °C**, fan speed **increases linearly**
- At **26.0 °C** and above, fans operate at the **maximum configured speed**

Humidity Settings

In this menu, you can define the desired **humidity setpoints** for daytime and nighttime operation, as well as the **hysteresis range** for smooth fan control.

1. **Humidity Settings** – Overview
2. **Daytime Humidity** – Target relative humidity during the day
3. **Nighttime Humidity** – Target relative humidity night
4. **Humidity Hysteresis** – Tolerance range for gradual fan speed adjustment



Adjustment Notes

Set the desired **daytime and nighttime relative humidity** values along with the **positive hysteresis**.

Example:

If the target is **60% RH (Relative Humidity)** and the hysteresis is set to **+10% RH**:

- Up to **60% RH**: Fans remain **off** or run at **minimum speed**
- Between **60% and 70% RH**: Fan speed **increases gradually**
- From **70% RH and above**: Fans operate at **maximum speed**

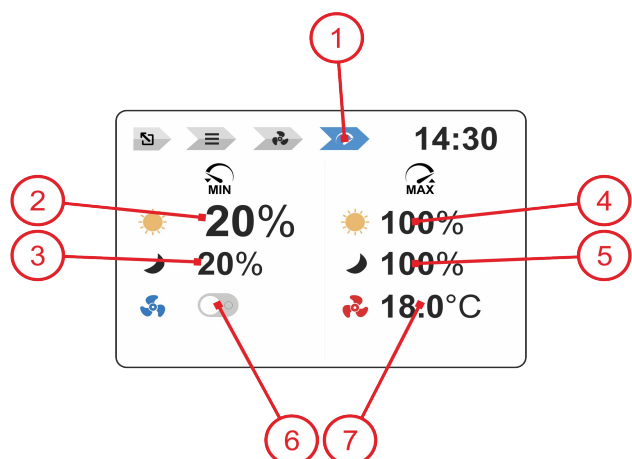
Important:

The **higher deviation** — whether from the **temperature** or **humidity** setpoint — determines the fan speed.

Minimum and Maximum Fan Speed Settings

In this menu, you define the **limits** for fan speeds that must not be exceeded or undercut – separately for **daytime and nighttime operation**.

1. **Max. & Min. Fan Speeds** – Overview
 - **Minimum Fan Speed (Day)**
 - **Minimum Fan Speed (Night)**
 - **Maximum Fan Speed (Day)**
 - **Maximum Fan Speed (Night)**
 - **Intake Fan Behavior** – Off or set to minimum
 - **Exhaust Fan Cut-Off Temperature**



Explanation:

Settings 2–5 define the **permitted range** of fan speeds based on time of day. Each value sets the **operating window** for speed modulation.

Setting 6 – Intake Fan Behavior:

When both **temperature and humidity are below** their setpoints, this setting controls how the **intake fan** responds:

- **Off** – Intake fan is completely shut off
- **On** – Intake fan runs at the **exhaust fan's speed minus the defined pressure differential**

Setting 7 – Exhaust Fan Cut-Off Temperature:

If the **room temperature** drops below this value, the **exhaust fan** is automatically switched off to prevent the room from overcooling.

Negative Pressure Setting

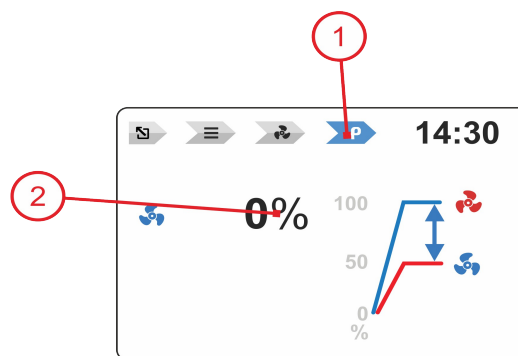
In this menu, you can define the **pressure difference** between the intake and exhaust fans to maintain a **constant negative pressure** inside the room.

1. **Negative Pressure Menu** – Overview
2. **Negative Pressure Setting** – Pressure difference in percent (%)

Purpose

To prevent **unwanted odors** from escaping the room, the **exhaust fan** must extract **more air** than the intake fan supplies.

This creates a slight **negative pressure**, ensuring that potentially contaminated air stays inside.



Practical Setup Tip

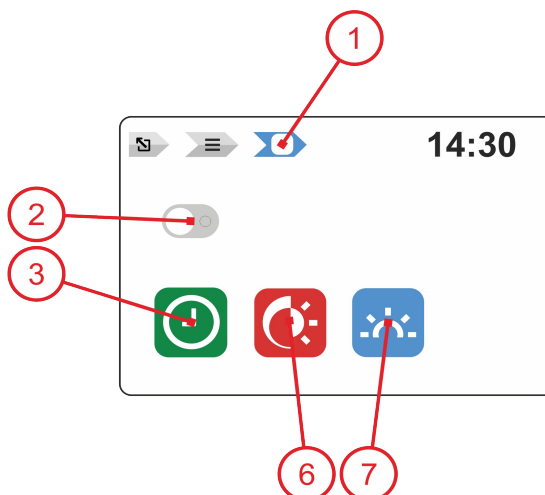
- Run both intake and exhaust fans at **maximum speed**.
- Check airflow behavior, e.g., by observing air movement through a **keyhole** or **door gap**:
 - Air should be **drawn into** the room — not pushed out.
- Adjust the **negative pressure setting** until there's a **slight inward draft**, but **not so strong** that it makes the door hard to open.

To configure the lighting settings, return to the main menu and select: **5. Lighting Settings**

Lighting Settings

Main Menu → Lighting Settings

1. **Lighting Settings Menu** – Overview
2. **Enable/Disable Lighting** – Turn the lighting function on or off
3. **Lighting Schedule** – Define on/off times
4. **Maximum and Minimum Brightness** – Set brightness limits
5. **Sunrise and Sunset Simulation** – Enable



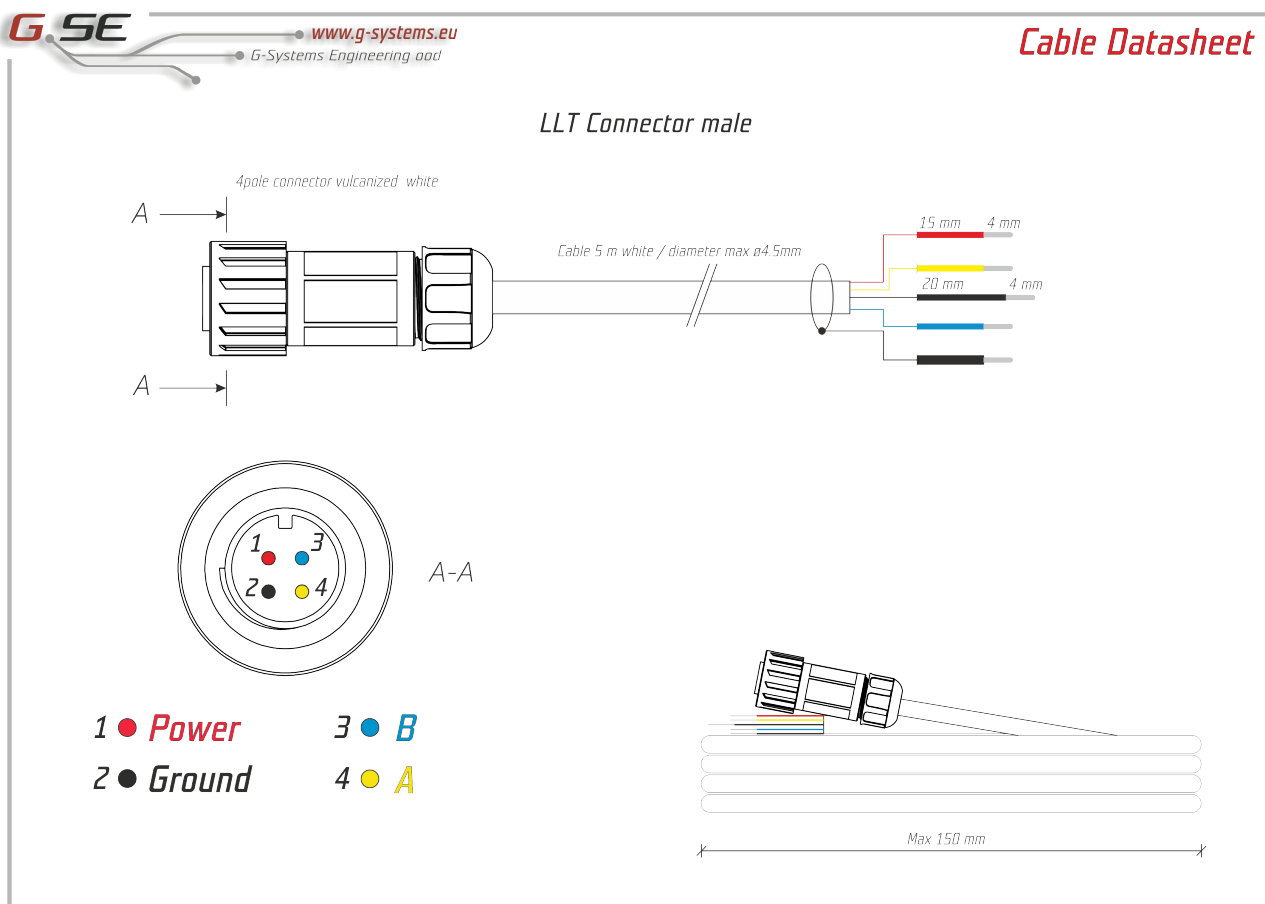
soft transitions in light intensity

Installation Note

Lighting is controlled via a **signal output** and should be connected to your lighting system using the port labeled “**Light.**”

Adapters & Accessories

A range of **adapter cables and connectors** is available at: www.growshopping.com or from your local distributor.



Lighting Connection

To connect the lighting system, the following **pins** are required:

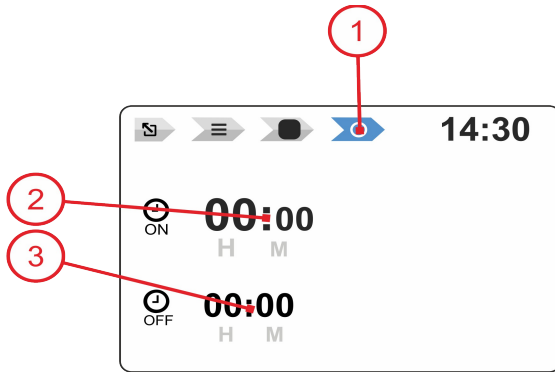
- **Pin 2:** GND (Ground)
- **Pin 4:** Signal (Control signal output)

Lighting Schedule

1. **Lighting Schedule Menu** – Overview
2. **Lighting ON Time** – Set the switch-on time
3. **Lighting OFF Time** – Set the switch-off time

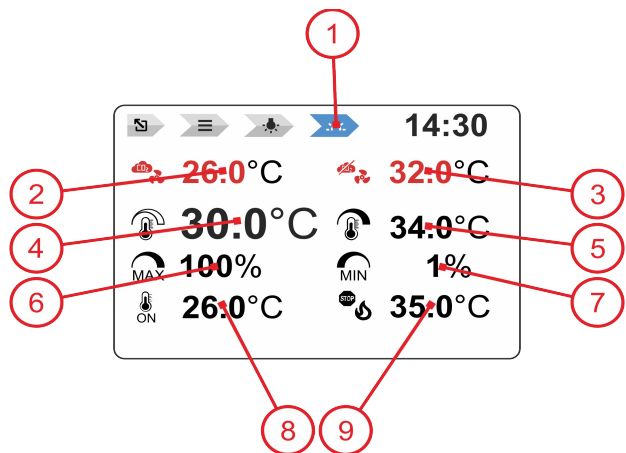
Note:

Set the lighting **start and end times in hours and minutes**.



Maximum and Minimum Light Intensity Settings

1. **Light Intensity Menu** – Overview
2. **Start CO₂ Time – Temperature** (for reference only)
3. **Stop CO₂ Time / Start Exhaust – Temperature** (for reference only)
4. **Start Dimming Temperature** – Temperature at which dimming begins
5. **Stop Dimming Temperature** – Temperature at which dimming ends
6. **Maximum Light Intensity**
7. **Minimum Light Intensity**
8. **Lighting Re-Enable Temperature**
9. **Lighting Cut-Off Temperature**



Function Description:

- **Items 2 and 3** (marked red in the UI) are **for reference only**.
- **Start Dimming Temperature (4):**
This is the point where lamps begin to **dim** in response to increasing heat.
→ As long as the measured temperature remains **below this value**, lamps operate at **maximum intensity (6)**.
- **Stop Dimming Temperature (5):**
The point at which dimming ends. Once this temperature is reached, the system sets the **minimum light intensity (7)**.
- The **minimum intensity** remains active **until the room reaches the lighting cut-off temperature (9)**.
- If the temperature continues to rise and **overheating persists**, the system fully **switches off the lights** at the cut-off point (9).
- **Lights will only turn back on** once the temperature falls **below the re-enable temperature (8)**.

Adjustment Note:

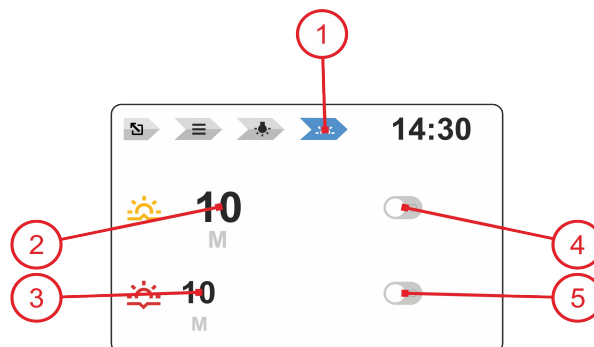
Set the **minimum light intensity (Option 7)** to a level where the lamps **continue operating reliably even at the lowest dimming level**.

→ They should **not turn off completely**, unless this behavior is **explicitly intended**.

Sunrise and Sunset Simulation

This menu allows you to **activate and configure soft dimming** for sunrise and sunset transitions.

1. **Sunrise & Sunset Menu – Overview**
2. **Sunrise Duration** – Duration in minutes
3. **Sunset Duration** – Duration in minutes
4. **Enable Sunrise Simulation**
5. **Enable Sunset Simulation**



Example – Sunrise (10 minutes):

- At the **lighting ON time**, the system starts the **sunrise simulation**.
- The lights begin at the **minimum intensity**.
- Over the next **10 minutes**, the brightness gradually **ramps up** to the **maximum intensity**.

Example – Sunset (10 minutes):

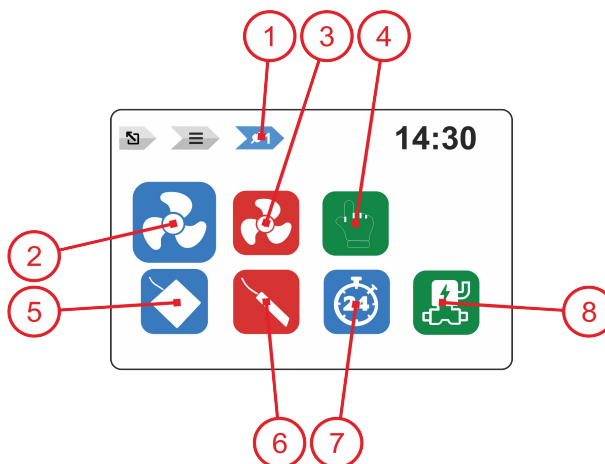
- **10 minutes before the lighting OFF time**, the **sunset simulation** begins.
- The brightness dims smoothly from the current level down to the **minimum intensity**.
- After the countdown, lighting is fully dimmed.

To configure the switching logic for Output 1, return to the main menu and select: **6. Output 1 – Settings**

Outputs 1–4

Outputs 1 and 2 – Configuration Overview

1. **Output 1 – Menu**
2. **Intake Fan (AC)**
3. **Exhaust Fan (AC)**
4. **Manual Switching**
5. **CO₂ / Temperature / Humidity / Light Sensor (Gas Sensor)**
6. **Temperature Sensor**
7. **Timer (Time Switch)**
8. **CO₂ Solenoid Valve**



You are now configuring Output 1.

This output can operate in one of the following two modes:

- **Variable Control**
via **phase-angle control** (only suitable for **AC fans**) → options **2–3**
- **Relay-based ON/OFF switching**
for all other devices → options **4–8**

The currently active function is visually indicated with a **green frame** around its icon in the menu.

Important Notes for Variable Outputs (1 & 2):

- Connect a **minimum load of 200 W** to ensure stable operation.
- Ensure that the fans **truly stop at 0%**.
→ Some small fans with large suppression coils may continue spinning even when set to 0%.

How to Activate a Function:

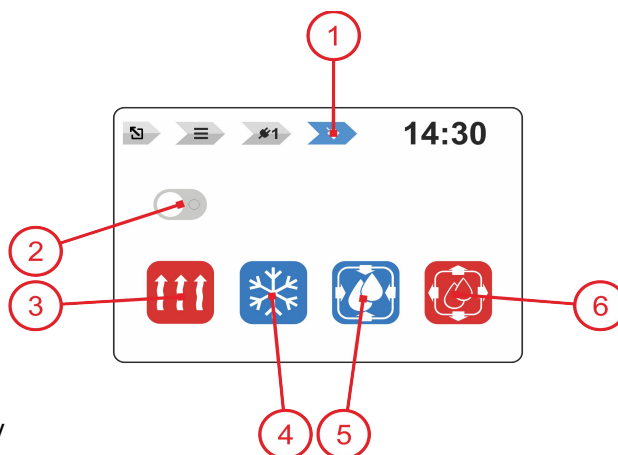
1. Select the desired function (e.g. fan, sensor, relay).
2. **Activate it using the toggle switch.**
3. Only **one function per output** can be active at a time.

Manual Switching (Option 4)

- Enable this mode to control the output manually.
- Use the provided **toggle** to switch the output **ON or OFF**.
- *(Note: No graphical representation is available for this mode.)*

5. Gas Sensor (CO₂, Temperature, Humidity, Light)

1. **Gas Sensor Menu – Overview**
2. **Enable/Disable Sensor** – Turn the sensor module on or off
3. **Heating** – Activate output when temperature is too low
4. **Cooling** – Activate output when temperature is too high
5. **Humidifying** – Activate output when humidity is too low
6. **Dehumidifying** – Activate output when humidity is too high



Usage Instructions:

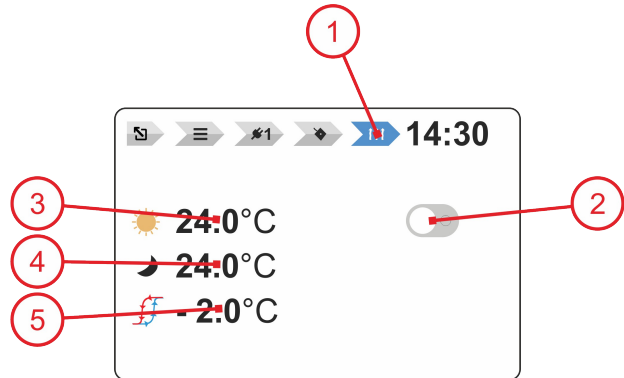
1. **Activate the sensor** using option 2.
2. Then **select one of the four control functions**:
 - **Heating** (3)
 - **Cooling** (4)

- **Humidifying** (5)
- **Dehumidifying** (6)

Each function uses the sensor's readings to control the output relay accordingly.

3. Heating Control

1. **Heating Menu – Overview**
2. **Enable/Disable Heating** – Turn the heating output ON or OFF
3. **Daytime Temperature** – Set target temperature for daytime
4. **Nighttime Temperature** – Set target temperature for nighttime
5. **Temperature Hysteresis** – Define the switching buffer range (negative value for heating)



Configuration Instructions:

Set a **target temperature** for both **day and night**, along with a **negative hysteresis** value.

Example – Heating:

- **Target Temperature:** 24.0 °C
- **Hysteresis:** -2.0 °C
 - ➔ Heating turns **ON** at 22.0 °C
 - ➔ Heating turns **OFF** at 24.0 °C

6. Temperature Sensor

- Select the **temperature sensor** to be used.

Configuration:

The settings and behavior are **identical to the gas sensor** when used with the “**Heating**” function.

→ See the *Heating* section for configuration instructions regarding:

- Day/Night target temperatures
- Negative hysteresis
- On/off switching behavior based on measured temperature

7. Timer (Time Switch)

1. **Timer Menu – Overview**
2. **Enable/Disable Timer**
3. **Step(s)** – Program step number (up to 24 steps)
4. **Start Time (Hours/Minutes)**
5. **End Time (Hours/Minutes)**



6. **End Time (Seconds)**
7. **Enable/Disable Step**

How to Use the Timer:

1. **Enable the timer function** via option 2.
2. Use the rotary knob to scroll through up to **24 programmable steps**.
 ► The **currently selected step** is indicated by **two bars** on the left and right.
3. Press the knob to enter edit mode and set the time:
 - → **Start Hour**
 - → **Start Minute**
 - → **End Hour**
 - → **End Minute**
 - → **End Second**
4. **Enable the step** once it's configured, then move to the next step if needed.

8. CO₂ Solenoid Valve

If you want to use the **CO₂ solenoid valve** on this output, select this function and **enable it using the toggle switch**.

Outputs 3 and 4

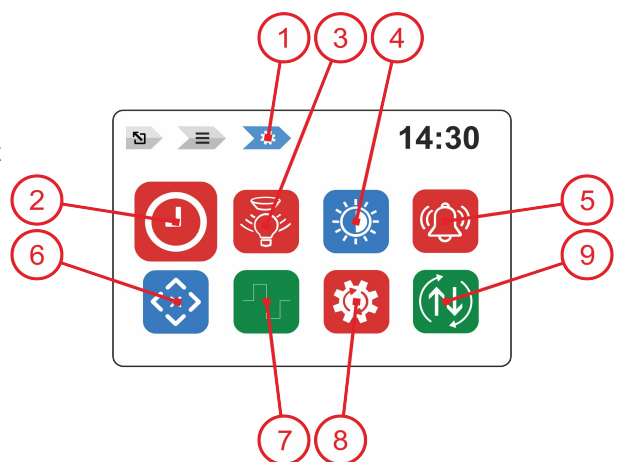
Outputs 3 and 4 operate based on the same principle as Outputs 1 and 2, with the following key differences:

- **✗ No variable control** (no phase-angle regulation)
- **✓ Relay switching only** (ON/OFF control)

Submenu – Device Settings

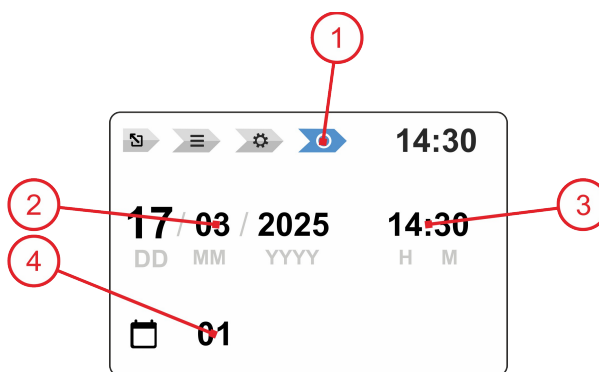
In this submenu, you can configure all **core system parameters** of the device, such as time, backlight, alarm behavior, and sensor offset.

1. **Device Settings Menu – Overview**
2. **Time and Date** – Set system clock and calendar
3. **Light Sensor** – Automatic brightness adjustment via ambient light
4. **Screen (Display)** – Adjust brightness, contrast, and screen timeout
5. **Alarms** – Enable/disable alarms, set volume and alert behavior
6. **Sensor Signal Offset** – Fine-tune sensor readings
7. **Output Signals** – Configure output signal behavior
8. **Reset to Factory Settings** – Restore all settings to default state
9. **Reset Min/Max Values** – Clear all stored extreme measurement values



Time and Date Settings

1. **Time and Date Menu – Overview**
2. **Date** – Set in the order: **Day** → **Month** → **Year**
3. **Time** – Set in: **Hours** → **Minutes**
4. **Day Counter** – Tracks usage days



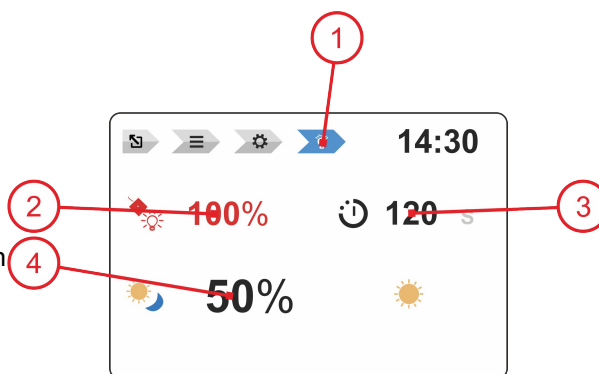
Explanations:

- **Date:**
Set the current date using the sequence: **Day** → **Month** → **Year**
- **Time:**
Enter the current time in **hours and minutes**
- **Day Counter:**
 - On the first day of use, the counter starts at **1**
 - It **automatically increases by +1 at 23:59:59** each day
 - **Important:**
If the device is **powered off at that time**, the counter **will not increment**

Light Sensor

In this menu, you configure the **light intensity detection** feature of the gas sensor to allow **automatic switching between day and night modes**.

1. **Light Sensor Menu – Overview**
2. **Light Intensity** – Currently measured brightness (in %)
3. **Switch Delay** – Delay time before switching occurs
4. **Switch Threshold** – Light intensity level at which the system switches modes



How It Works

1. **First**, turn on your lighting at the **minimum intensity setting**.
2. The **Light Intensity** value will show the current brightness detected by the gas sensor.
 - Ideally, when lighting is on, this value should be close to **100%**, which the controller automatically interprets as **“Day Mode.”**

Switch Delay:

This setting prevents **immediate switching** when there is a **brief change in lighting** (e.g., when the door opens).

- When the **switch threshold** is exceeded, the **switch timer** starts.
- Only if the brightness **remains stable** for the entire delay period, the system switches between **Day** and **Night** modes.

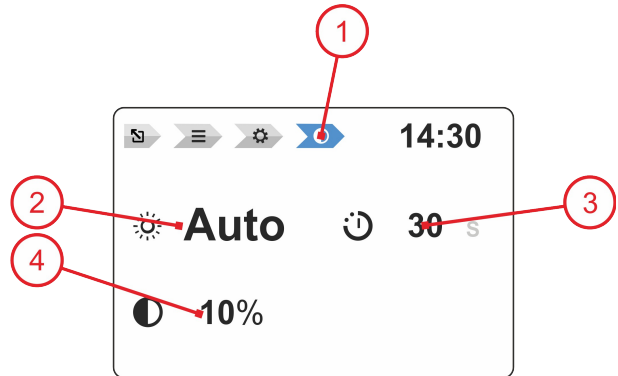
Switch Threshold:

Here you define the **light intensity level (in %)** that triggers the transition between **Day Mode** and **Night Mode**.

Display Settings

In this menu, you can configure the **display behavior** of the device.

1. **Display Menu – Overview**
2. **On / Automatic** – Display operating mode
3. **Timeout Duration** – Time before automatic screen shutdown
4. **Brightness** – Adjust screen brightness



Recommendation:

To **prolong the display's lifespan**, it is recommended to set the screen to “**Automatic**” mode when not in use.

How Automatic Mode Works:

- In **Option 3: Timeout Duration**, you define how long the display stays on **without user interaction**.
- After the set time passes:
 - The display **dims for 10 seconds**
 - Then it **turns off completely**

To **wake up the screen**, simply **rotate or press** the control knob.

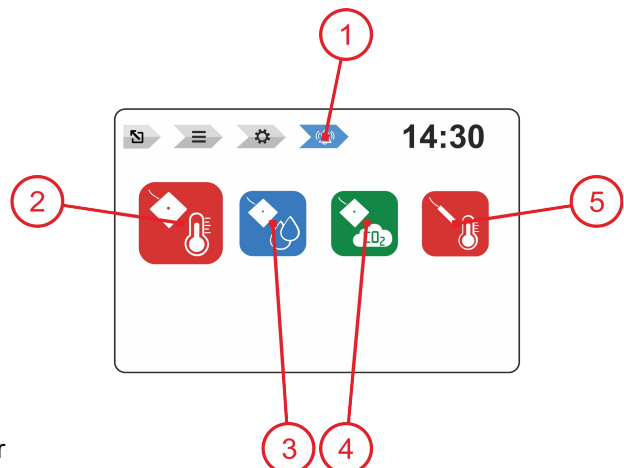
Brightness:

- Under **Option 4**, set the screen brightness according to your **ambient lighting conditions** or **personal preference**.

Alarms

In this menu, you can define **which sensor values will trigger alarms**.

1. **Alarms Menu – Overview**
2. **Temperature (Gas Sensor)**
3. **Humidity (Gas Sensor)**
4. **CO₂ (Gas Sensor)**
5. **Temperature Sensor (External Sensor)**



How to Set Alarms:

1. Select the sensor parameter you wish to monitor

→ e.g. **"Temperature (Gas Sensor)"**

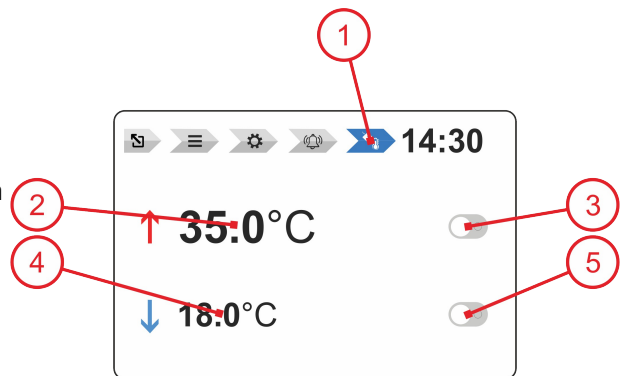
2. In the corresponding **submenu**, you can configure:
 - **Threshold values** (upper/lower limits)
 - **Hysteresis** (optional)
 - **Alarm behavior** (e.g., acoustic, visual, both)

Important Note:

Alarms are crucial for identifying **critical conditions early**, such as:

- Overheating
- Excessive CO₂ concentration
- Humidity levels outside the safe range

1. **Temperature (Gas Sensor) – Menu Overview**
2. **Maximum Temperature** – Threshold for overtemperature alarm
3. **Enable/Disable Maximum Temperature Alarm**
4. **Minimum Temperature** – Threshold for undertemperature alarm
5. **Enable/Disable Minimum Temperature Alarm**



Procedure – Setting Up Temperature Alarms

- **Set the desired threshold value at which you want to be alerted.**
→ **Example: 2. Maximum Temperature = 35.0 °C**
- **Enable the alarm** function under **Option 3**.

What Happens When an Alarm Is Triggered?

- If the measured value **exceeds or falls below** the set limit, a **red alarm screen** will appear on the device.
- If **Wi-Fi is enabled** and you are using the **GSE smartphone app**, a **push notification** will be sent to your phone.

Repeat the same steps for:

- **4. Minimum Temperature** – e.g., for **frost protection**
- **3. Humidity (Gas Sensor)**
- **4. CO₂ (Gas Sensor)**
- **5. External Temperature Sensor**

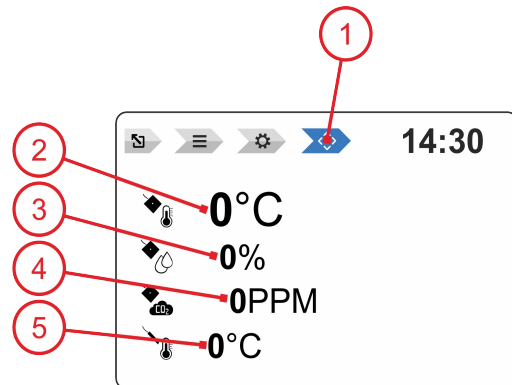
Tip:

Only **activate the alarms that are truly relevant** for your application to avoid unnecessary notifications.

Sensor Offset Adjustment

In this menu, you can manually correct **displayed sensor readings** by adjusting the values shown on the screen.

1. **Offset Menu – Overview**
2. **Temperature Offset (Gas Sensor)**
3. **Humidity Offset (Gas Sensor)**
4. **CO₂ Offset (Gas Sensor)**
5. **Temperature Offset (External Sensor)**



How to Use:

If the values shown on the screen **differ from a reference device**, you can enter a **positive or negative offset** here to match the display to your reference.

Important Note:

This function does **not perform an actual calibration** of the sensor. It only adjusts the **displayed value** – the internal measurement logic and sensor readings remain unchanged.

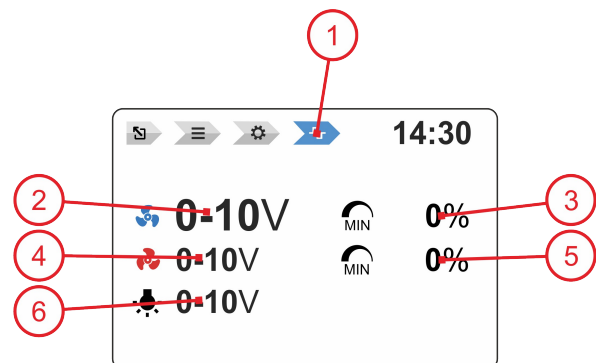
Example:

- Your reference thermometer shows: **22.5 °C**
- The display shows: **21.5 °C**
➔ Enter a **+1.0 °C offset** under **Temperature Offset**

Output Signals

In this menu, you configure the **signal output types** and **minimum speeds** for EC fans as well as the **lighting control output**.

1. **Output Signal Menu – Overview**
2. **EC Intake Fan – Signal Type**
3. **EC Intake Fan – Minimum Speed**
4. **EC Exhaust Fan – Signal Type**
5. **EC Exhaust Fan – Minimum Speed**
6. **Lighting – Signal Type**



Configuring the EC Intake Fan

1. In **Option 2**, select the desired **signal type**:
 - **0–10 V (analog)** or
 - **PWM (pulse-width modulation)**
2. Go to the **Ventilation → Min/Max Speeds** menu and set the **maximum speed** of the intake fan to **1%**.
3. Check on the **main screen (Section 2)** whether the 1% value is actually applied.

Test Run:

- Observe whether the EC intake fan starts spinning at **1%** speed.
- If the fan does not rotate or just shakes slightly, increase **Option 3 – EC Intake Fan Minimum Speed** by **+1%**.

Repeat this process until the fan **reliably starts spinning on its own** when switched on.

Configuring the EC Exhaust Fan

Repeat the same procedure for:

- **Option 4 – EC Exhaust Fan Signal Type**
- **Option 5 – EC Exhaust Fan Minimum Speed**

Tip:

Some EC fans require a **higher minimum speed** to run stably.
→ Depending on the model, this is usually between **5% and 15%**.

Configure Lighting Signal

To configure the lighting control output:

- Go to **Option 6: Lighting – Signal Type**
- Select the desired output type:
 - **0–10 V (analog)**
 - or **PWM (pulse-width modulation)**

Reset to Factory Settings

This function restores the device to its **original factory state**.

→ All custom settings will be erased and replaced with default values, as if starting the device for the first time after purchase.

1. **Factory Reset Menu – Overview**
2. **Select Reset Option: YES / NO**

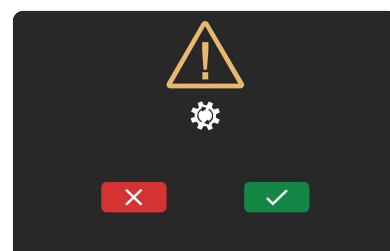
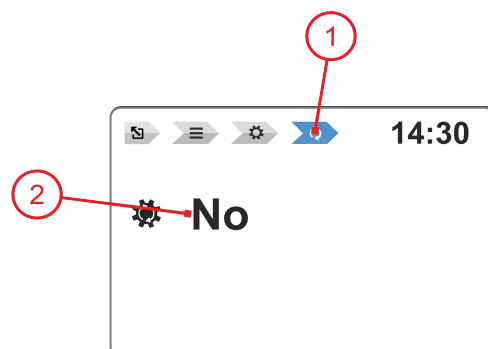
Procedure:

1. Select **"YES"** to initiate the reset process.
2. A **black confirmation screen** will appear with a **second safety prompt**.
3. Confirm the reset by selecting the **green checkmark symbol** ("✓").

The controller will then **restart**, and all data will be reset to factory defaults.

Warning:

This action **cannot be undone**.
All personal settings, timers, sensor values, and calibrations will be **permanently deleted**.



Reset Minimum and Maximum Values

This function clears all **previously stored minimum and maximum readings** of the measured values (e.g. **temperature, humidity, CO₂**) from **Main Screen – Section 3**.

Procedure:

Follow the **same steps** as for the “**Reset to Factory Settings**” function:

1. Navigate to this menu
2. Select “**YES**” to confirm
3. A confirmation prompt will appear
4. Confirm with the **green checkmark symbol** (“✓ ”)

Once confirmed, all recorded **extreme values** will be deleted.

→ The controller will automatically **begin recording new min/max values** from that point onward.

Note:

This function **only affects recorded extreme values**.

➔ **All other device settings remain unchanged.**