

Instruction manual

GROWBASE EC^{PRO}

Multifunctional digital climate and CO₂ controller
with timer functions



•GROWCONTROL

Schlosserstr. 25
60322 Frankfurt – Germany
Mail: info@growcontrol.de
Web: www.growcontrol.de

GROWBASE EC^{PRO}

Dear customer,

Thank you for choosing one of our products. Our name stands for innovative and reliable products that always guarantee the best conditions for your plants. We know how closely the environmental conditions in which you grow your plants are associated with the end result.

We hope that you enjoy using this product!

- Please read these instructions carefully and observe the relevant information.
- Store this instruction manual and make it accessible to all users.
- Ensure that you include this instruction manual when handing over the device to third parties.

With kind regards,
GrowControl

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1 Safety instructions

Please observe the following information besides the safety instructions of this manual. As with all electrical devices, use this digital environmental controller carefully and cautiously to avoid hazards due to electric shock.

Electric shock



Warning!

- Please note that the integrated power sockets of the device are enabled once the device is connected to an electrical supply.
- Only operate the device at the voltage indicated on the device.
- Do not connect defective equipment to the device.
- Protect yourself from electric shock by avoiding body contact with earthed or grounded surfaces such as pipes or radiators.
- Check all device parts including the power cable and extension cables as well as plug connections for their proper condition prior to each use. Check the proper status of all parts connected to the device. Do not use the device if it is damaged.
- Do not pull on the cables to disconnect the plug from the power socket. Hold the device plug sockets with one hand while removing electrical equipment by pulling the plug.
- Do not use the device if it has sustained a fall or if water has penetrated the device interior.
- Do not use the unit during a thunderstorm.
- In the event of defects or operational faults, switch off the device immediately and disconnect it from the power socket.
- Never hold or carry the device by the power or sensor cable.
- Maintain a distance between all device parts and warm surfaces.
- Only use the unit in dry and heated rooms.
- Never reach for a device that has been submerged in water. In such cases, pull the plug out of the power socket immediately.
- Do not subject the device to any impact or drop the device.

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Repairs



Warning!

- Do not open the device.
- Only specialist personnel may perform repairs on electrical devices. Improper repairs may subject users to considerable danger. For repairs, please contact our customer service or an authorized customer service point.
- If the device or parts of it are damaged, it must be repaired by the manufacturer or an authorized customer service point.

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Risk of fire



Warning!

- There is a risk of fire if the device is used improperly or these instructions for use are ignored!
- Never use the device near highly flammable substances.

Operation



Warning!

- The device is only intended for the purpose described in these instructions. The manufacturer is not liable for damage resulting from improper or careless use.
- Do not connect any technical equipment that exceeds the maximum output indicated on the device or according to this instruction manual.
- Specifications concerning maximum power output are meant to be nominal power output (no “dimmed power” at controlled outputs).
- Do not place any objects on the device.
- Do not expose the device to high temperatures.

2 Specified normal operation

This digital environmental controller is designed for speed controlling of fans and switching a number of other devices. Depending on the mode of operation, the controller's power sockets may be used for connecting devices below:

- Power sockets labeled "Multifunctional Out 1-3":
 - Regular duct fans with running capacitor*
 - Humidifier/dehumidifier
 - Lights
 - Water pumps
 - Circulation fans
 - CO₂ valves/generators (230V)
 - Heating mats
- Power sockets labeled "Multifunctional Out 4":
 - Humidifier/dehumidifier
 - Lights
 - Water pumps
 - Circulation fans
 - CO₂ valves/generators (230V)
 - Heating mats
 - Electric heaters
- RJ45 jacks labeled "In/Out":
 - CO₂ sensor
 - Negative pressure sensor
 - Temperature sensor for heating matt
 - Output extender
- RJ45 jacks labeled "EC Fans":
 - Voltage controlled EC fans

The device is not suitable for controlling any other equipment.

- ⚠ Always ensure that the maximum output power of the individual outputs is not exceeded. Please find further information on the device's label or section 11 (page 24, Table 4) of this manual.
- ⚠ **Warning!**
If the "intake" mode is selected for the "Multifunctional Out 1" output, only standard fans may be connected. Other devices may be damaged in the "intake" mode. When shipped, the functions of "Multifunctional Out 1 and 2" are set to "intake" and "exhaust".
- ⚠ To meet the European EMC directive, the technique used to control the regular duct fans may be used up to a maximum 600W. Do not connect devices with a power above 600W in "intake" or "exhaust" mode.
- 🚫 Avoid exposing the temperature and humidity sensor to humidity above 95% RH as the sensor may become damaged.
- ⚠ *When driving S&P® fans of the "TD-Silent" series, problems may occur. Do not connect fans with an integrated rpm control.

3 Device description

The digital climate controller *GROWBASE EC^{PRO}*

- is the control center for the ambitious indoor gardener. A number of different devices and sensors can be connected, which guarantees maximum flexibility. In addition, the number of power outputs can be extended with an extra device.
- is similarly able to control standard duct fans as well as EC fans, offering maximum flexibility.
- keeps grow room temperature at the desired value by varying the air flow of the fans.
- keeps the humidity in the grow room at the designed value by switching a humidifier or dehumidifier.
- can additionally reduce the humidity in the grow room by increasing the air flow.
- is able to control the CO₂ level in the grow room with a CO₂ sensor connected or without a CO₂ sensor.
- is designed for the connection of the following devices: EC fans (intake, exhaust), standard duct fans (intake, exhaust), lights, humidifiers, dehumidifiers, water pumps, circulation fans, heating mats, electric heaters as well as CO₂ valves or generators, CO₂ sensors, negative pressure sensors, additional temperature sensors for a water tank or a heating mat and an output extension.

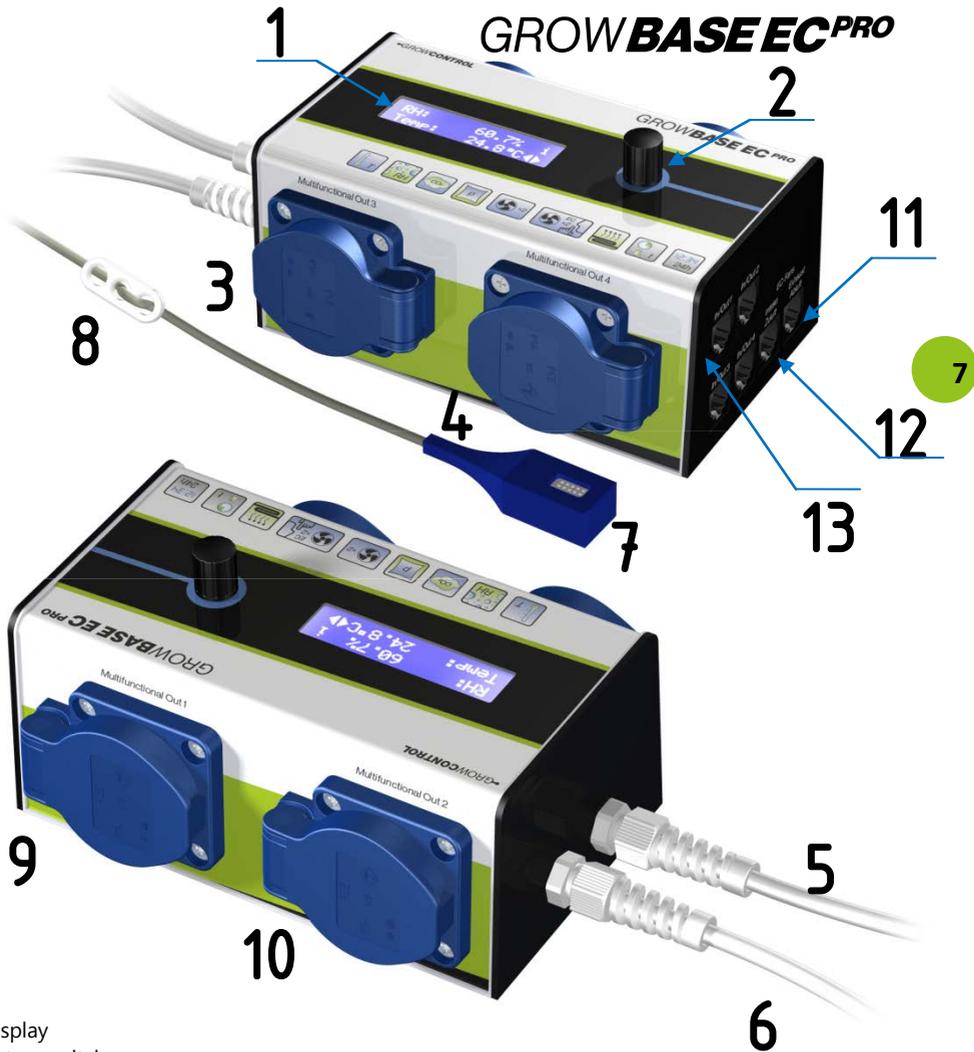
The last measured temperature and humidity values are used to calculate the expected values in the future. This enables the controller to quickly react to changes and achieve the desired value.

- is able to regulate the temperature and humidity as precisely as $\pm 0.5^{\circ}\text{C}/\pm 1\% \text{RH}$.*
- ensures a constant negative pressure in the grow room, avoiding the escape of odors from the grow room. To maintain an accurate negative pressure, a pressure sensor can also be connected.
- supports the option to adjust the length of a day cycle, providing equal yield with less time required.
- can control the temperature of a heating mat. The temperature can be set to a certain value or a temperature relative to the room temperature.
- is equipped with an easy-to-use multilingual (English, German) menu. Many different setups can be achieved, e.g. adjusting the minimum and maximum fan speed separately for day and night. It offers a range of information including the current temperature, CO₂ concentration, current humidity, min/max temperature values and humidity, current fan speeds and other information regarding the operating condition.
- saves the settings permanently to ensure that they remain available after a power breakdown or after the controller has been temporarily out of use.

*Provided that the sizing of the connected utilities is appropriate and the fresh air temperature is sufficiently low. The tolerance is related to the repeat accuracy rather than the absolute accuracy. The absolute accuracy is $\pm 3\%$.



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- 1 Display
- 2 Rotary switch
- 3 Programmable power socket (Multifunctional Out 3, 1200W)
- 4 Programmable power socket (Multifunctional Out 4, 2300W)
- 5 Mains plug for "Multifunctional Out 4"
- 6 Mains plug for supplying the controller and the other power outputs
- 7 Digital sensor for humidity and temperature
- 8 Hanger for the sensor
- 9 Programmable power socket (Multifunctional Out 1, 1200W)
- 10 Programmable power socket (Multifunctional Out 2, 1200W)
- 11 RJ45 jack for exhaust EC fan
- 12 RJ45 jack for intake EC fan
- 13 4xRJ45 jack for Humidity/Temperature sensor, CO₂ sensor, negative pressure sensor, temperature sensor for a heating mat, output extension

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4 Initial use

Warning!

If the "intake" or "exhaust" mode is selected for an "Multifunctional Out 1-3" output, only standard duct fans may be connected. Other devices may be damaged in the "intake" or "exhaust" modes. When shipped, the functions of "Multifunctional Out 1 and 2" are set to "intake" and "exhaust".

1. Place the humidity and temperature sensor **(7)** in an appropriate position inside the grow room, usually at the top ends of your plants. Please use the hanger **(8)** on the sensor cable. The sensor should not be directly exposed to the fog stream of the humidifier. Connect the humidity and temperature sensor to any of the RJ45 jacks labeled "In/Out 1" to "In/Out 4" **(13)**.
2. Connect the mains plugs **(5)**, **(6)** to the power supply (regular power socket). The device has two mains plugs, offering the option to share the load (current) to two different circuits.
3. Set the function of the "Multifunctional Out 1-4" outputs and set up all other functions according to your requirements.
4. If using regular duct fans, we recommend disconnecting the mains plug **(6)** first. Subsequently, connect the fans to the corresponding power outlets on the controller and then reconnect the mains plug.
5. Connect appropriate devices to the other power outputs.
6. Connect the EC fans to the RJ45 jacks labeled "intake" and "exhaust" **(12)**, **(11)** using a suitable cable.
7. Connect other accessories (sensors, output extender) to the RJ45 jacks labeled In/Out 1-4 **(13)**.

 Always ensure that the maximum output power of the individual outputs is not exceeded. Please find further information on the device's label or section 11 (page 24, Table 4) of this manual.

-  Avoid exposing the temperature and humidity sensor to humidity above 95% RH as the sensor may become damaged.
-  EC fans have their own power supply cable, which should be plugged to a regular power socket (always on). It should not be connected to a power socket on the climate controller. The fan's rpm control and turn off is made via the signal cable from the RJ45 jack on the controller to the EC fan.

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5 Operation

The controller is operated via a menu, which is divided into two levels. It is controlled by turning or pressing the rotary switch **(2)**.

- On **Level 1 "Info"**, different information is displayed.
- On **Level 2 "Setup"**, all settings – except CO₂ settings – can be configured.
- On **Level 3 CO₂ "Setup"**, all settings for the CO₂ functions can be configured.

In the right area of the display, currently available menu options are displayed by these symbols:



Enter (Press)



Go to next menu page (rotate)



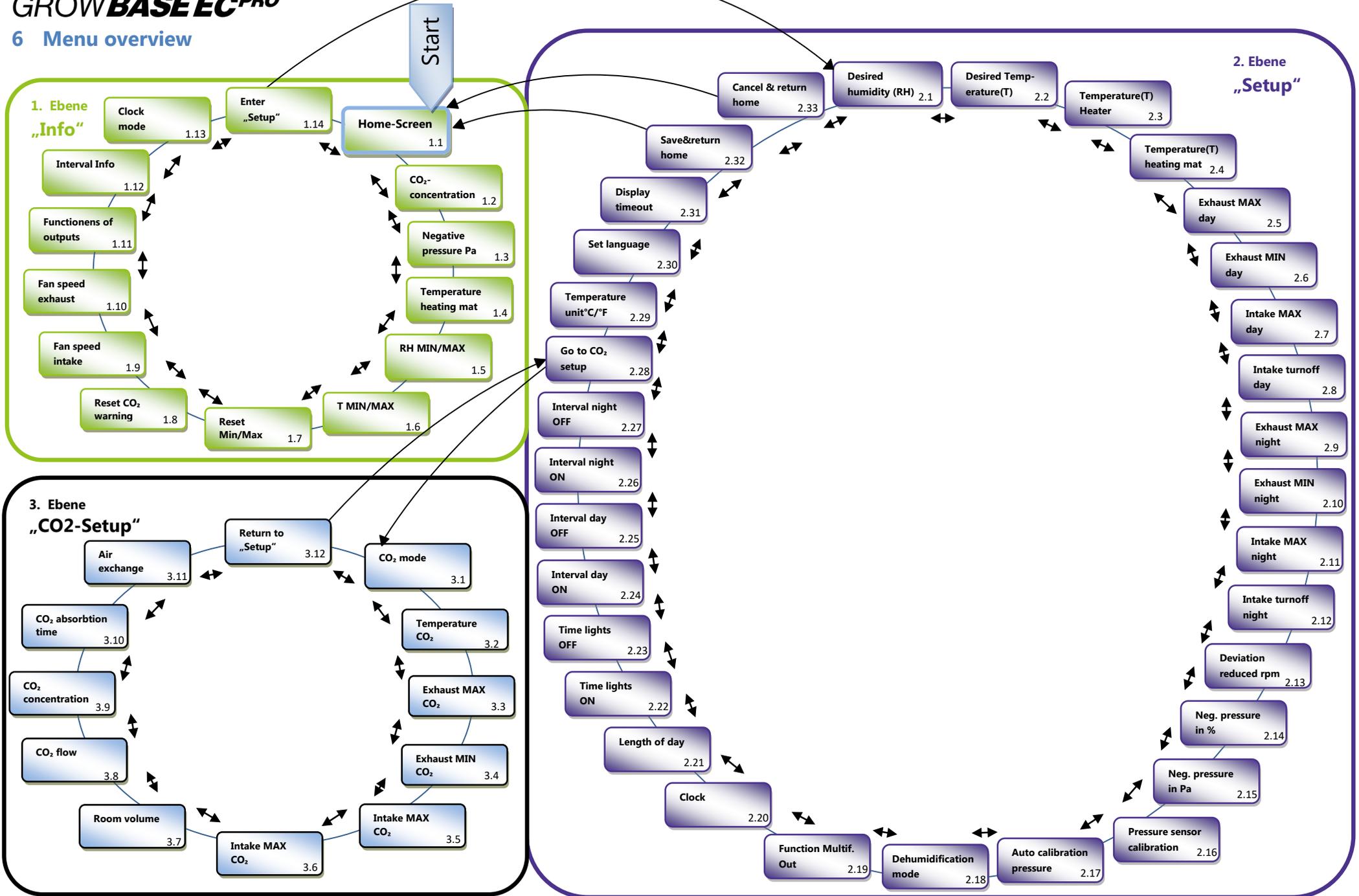
Change value (rotate)



Info screen

6 Menu overview

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RH = relative Luftfeuchtigkeit in % (relative humidity) T = Temperatur in °C

7 The menu and its features in detail

1. Level "Info"

1.1 Home screen



RH: 60.7% i
Temp: 24.8°C ◀▶

This screen is the home screen. It shows the **current temperature (Temp) and relative humidity (RH)**.

1.2 CO₂ concentration



CO₂ concentr.: i
1589ppm ◀▶

This display shows the current CO₂ concentration detected by the CO₂ sensor (available as an accessory).

ppm = parts per million

1.3 Negative pressure



Neg. pressure: i
7Pa ◀▶

This display shows the current negative pressure (vacuum) detected by the pressure sensor (available as an accessory).

Pa = Pascal

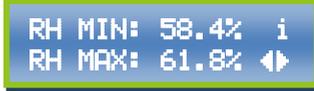
1.4 Heating mat



T heating mat: i
28.8°C ◀▶

This display shows the current temperature detected by the additional temperature sensor. This function is designed for controlling a heating mat. It also can be used for controlling the temperature of a water tank (this temperature sensor is achievable as an accessory).

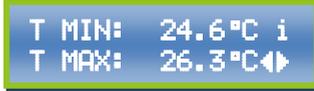
1.5 RH MIN/MAX



RH MIN: 58.4% i
RH MAX: 61.8% ◀▶

This display shows the **minimum and maximum humidity values (RH)** that have occurred since the last reset or start-up.

1.6 T MIN/MAX



T MIN: 24.6°C i
T MAX: 26.3°C ◀▶

This display indicates the **minimum and maximum temperature values (temp)**, that have occurred since the last reset or start-up.

1.7 Reset MIN/MAX



Press for
reset MIN/MAX ◀▶

To **reset** the saved **minimum and maximum values**, press the rotary switch while this display is shown. After resetting, the home screen will be displayed.

1.8 CO₂ warning



Press to reset
CO₂ warning ◀▶

If the desired CO₂ concentration cannot be achieved within 10 minutes in the "sensor controlled" CO₂ mode, this suggests that there is a problem with the CO₂ supply, such as an empty CO₂ bottle. The higher temperature in CO₂ mode can be harmful for your plants without a sufficient CO₂ concentration. Therefore, the controller will switch to the regular "day mode" without CO₂ dispensing and the warning "check CO₂ supply" will be

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displayed.

To delete the warning and return to operation in CO₂ mode, press the button while this screen is displayed.

1.1 Current fan speed intake



This screen shows the current rpm/power of the intake fan. The "percent value" represents the power transmitted to the fan. The "rpm value" indicates the fan's actual rpm. The rpm is detected from EC fans only. If the percent value alternates between a number (e.g. 15%) and "off", it means that a connected EC fan is driven on 15% and a standard duct fan is turned off. Please find further details in sections "2.8 Intake fan turnoff day" and "2.12 Intake fan turnoff night".

rpm = revolutions per minute

1.2 Current fan speed exhaust



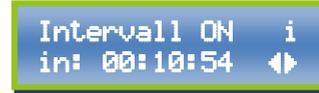
This screen shows the current rpm/power of the exhaust fan. The "percent value" represents the power that is transmitted to the fan.

1.3 Functions of outputs



This displays shows the chosen output **functions** of the **sockets** "Multifunctional Out 1-4" (Out1-Out4). If an output extender is connected, additional outputs are displayed according to the number of outputs.

1.9 Interval info



This display shows the **remaining time** for switching an output for which the function "interval" is selected to switch-on or switch-off.

1.10 Info Clock/Mode



This display shows the **current time** and whether the current mode is on "day" or "night". This is determined by the time set for "lights on" and "lights off" for the clock timer.

(See also menu "Setup" "2.22/2.23 Lights ON/OFF") ON=Begin of day, OFF=Begin of night.

While the CO₂ control is active, "CO₂" is displayed. The CO₂ function only operates during "daytime".

1.11 Enter "setup"



To enter **menu level 2 "setup"**, press the rotary switch while this screen is displayed.

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2. Level "Setup"

The changing of a certain setting is explained below with the desired humidity value as an example:

1. In the menu, choose the display "2.1 desired humidity (RH)" (see menu overview).



2. Press the rotary switch. Now the symbol  appears and the value to be set blinks.



3. Choose the desired value by turning the rotary switch.



4. Enter the chosen value by pressing the rotary switch.



In order to save all of the changes made, press the rotary switch while the screen "2.23 save & return home" is displayed.

2.1 Desired humidity (RH)



Set the **desired humidity value** (RH).

2.2 Desired temperature (T)



Set the **desired temperature value** (T).

2.3 Temperature heater ON



Set the temperature to switch on a heater. When this temperature is undercut, a heater connected to "Multifunctional Out 4" will be turned on. Maximum power: 2300W(10A).

In addition, a CO₂ generator (gas burner) connected to any of the power outputs will be activated when the specified temperature is undercut.

2.4 Temperature heating mat



Set the temperature for a heating mat. You can set a fix temperature or a temperature relative to the ambient temperature.

"fix" means a fixed temperature

"amb +" means a temperature relative to the ambient temperature

2.5 Exhaust fan MAX day



Set the **maximum fan speed** of the **exhaust fan** during the "day period". This fan speed will never be exceeded. Please find additional information in chapter 8.

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2.6 Exhaust fan MIN day



Set exhaust
day MIN: 50%

Set the **minimum airflow** of the **exhaust fan** during the “**day**” period. This set fan speed will never* be undercut. Please find additional information in chapter 8.

*during pressure, sensor calibration is in process, all fans are turned off.

The minimum fan speed is 10%. Additionally, “OFF” can be selected. This means that the intake fan will be switched off as long as the measured temperature is below the desired temperature.

Ensure that the fan is still rotating at the set minimum fan speed and the airflow is sufficient for cooling the motor.

2.7 Intake fan MAX day



Set intake
day MAX: 50%

Set the maximum fan speed of the intake fan during the day period. The specified value will never be exceeded.

2.8 Intake fan turnoff day



Set intake off
day: < 30%

Set the **minimum fan speed** of the intake fan for a standard duct fan during the **day period**. If this value is undercut in the controller’s operation, the intake fan will be switched off to maintain the negative pressure inside the grow room. The minimal possible fan speed is 10%. Additionally, “OFF” can be selected, whereby the fresh air fan will always be disabled during the daytime.

This value is only relevant for standard duct fans. EC fans always turn off at 10%.

⚠ Ensure that the fan is still rotating at the set minimum fan speed and the airflow is sufficient for cooling the motor.

2.9 Exhaust fan MAX night



Abluft
Nacht MAX: 100%

Set the **maximum fan speed** of the **exhaust fan** during the “**night**” period. This fan speed will never be exceeded. Please find additional information in chapter 8.

2.10 Exhaust fan MIN night



Set exhaust
night MIN: 50%

Set the **minimum airflow** of the **exhaust fan** during the “**night**” period. This set fan speed will never* be undercut. Please find additional information in chapter 8.

*during pressure, sensor calibration is in process, all fans are turned off.

The minimum fan speed is 10%. Additionally, “OFF” can be selected. This means that the intake fan will be switched off as long as the measured temperature is below the desired temperature.

⚠ Ensure that the fan is still rotating at the set minimum fan speed and the airflow is sufficient for cooling the motor.

2.11 Intake fan MAX night



Set intake
night MAX: 50%

Set the maximum fan speed of the intake fan during the night period. The specified value will never be exceeded.

2.12 Intake fan turnoff night

```
Set intake off ↓
night: < 30%↔
```

Set the **minimum fan speed** of the intake fan for a standard duct fan during the **night period**. If this value is undercut in the controller's operation, the intake fan will be switched off to maintain the negative pressure inside the grow room. The minimal possible fan speed at 10%. Additionally, "OFF" can be selected, whereby the fresh air fan will always be disabled during the daytime.

This value is only relevant for standard duct fans. EC fans always turn off at 10%.

⚠ Ensure that the fan is still rotating at the set minimum fan speed and the airflow is sufficient for cooling the motor.

2.13 Deviation for reduced rpm

```
Deviation rpm ↓
reduced: 0.2°C↔
```

To avoid the fans running on full speed with only a small exceedance of the desired temperature, an **allowed deviation** can be set.

The actual fan speed within this allowed deviation depends on the minimum and maximum fan speeds set on the previous screens.

Some other manufacturers call this function hysteresis.

2.14 Negative pressure in %

```
Set negative ↓
pressure: 10%↔
```

This setting has two different meanings depending on whether a pressure sensor is connected:

Without a pressure sensor connected:

With different fan speeds of the intake and exhaust fans, a vacuum is maintained inside the grow room, which avoids the escape of odors from the grow room. With this value, the amount of negative pressure can be set. Furthermore, the intake and exhaust fans can be balanced if different fans are used. For example, if a value of 10% is set, this means that the intake fan will always turn 10% less compared to the exhaust fan. Please find additional information in section 8.

With a pressure sensor connected:

The setting limits the speed of the intake fan compared to the exhaust fan. For example, with a value of 0%, the intake fan will at a maximum go as fast as the exhaust fan. With this setting, having positive pressure in case the pressure sensor is calibrated inappropriately can be avoided.

2.15 Negative pressure in Pa

```
Set negative ↓
pressure: 5Pa↔
```

Set the desired negative pressure in Pa. This setting is only relevant when a pressure sensor is connected.

Pa = Pascal

One Pa is equivalent to the pressure difference of approximately 7cm altitude in the earth atmosphere.

2.16 Pressure sensor calibration



Press the button while this screen is shown to calibrate the pressure sensor. During calibration (which takes about one minute_ all fans will be turned off. Further information can be found in the pressure sensor's manual.

2.17 Auto calibration



If "ON" is selected, the pressure sensor will be automatically calibrated 10 minutes before the "day period" starts (only when a pressure sensor is connected).

2.18 Dehumidification mode



When the **desired humidity** (RH) is **exceeded**, depending on the selected mode the fan speeds can be increased. This will extract the humidity from the grow room, given that the humidity of the fresh air is lower when inside the grow room.

This function is independent of whether a humidifier or dehumidifier is connected to one of the power outputs.

Three modes are available:

Off – The airflow will not be increased when the desired humidity is exceeded.

Medium – When the desired humidity is exceeded by 10% RH, the air flow will be increased. A deviation of 1.5°C compared to the desired temperature will be tolerated.

High - When the desired humidity is exceeded by 5% RH, the air flow will be increased. A deviation of 3°C compared to the desired temperature will be tolerated.

High&heating – In addition to the "high" mode, the connected heater will be turned on when the desired humidity is exceeded by 5% RH as long as the current temperature is below the desired temperature.

The relative humidity is physically coupled to the temperature in the way that the RH drops when heating.

Off – The airflow will not be increased when the desired humidity is exceeded.

2.19 Function for "Multifunctional Out"



Choose the functions for the output labeled "Multifunctional Out 1" to "Multifunctional Out 4". When an output extender is connected, additional outputs will be displayed.

The following functions are available:

Multifunctional Out1-3:

- Exhaust fan
- Intake fan
- Humidifier
- Dehumidifier
- Clock timer
- Interval timer
- Heating mat
- CO₂ valve
- CO₂&heating*
(Generator/gas burner (230V))

GROWBASEC^{PRO}**Multifunctional Out4:**

- Humidifier
- Dehumidifier
- Clock timer
- Interval timer
- Heating mat
- CO₂ valve
- CO₂&heating*

(Generator/gas burner (230V))

*With CO₂&heating selected, the controller will use the generator for heating and increasing the CO₂ level. When the CO₂ generator will be activated depends on the settings.

2.20 Clock

The clock can be set on this menu screen. Tipp: To set the clock to the split second, choose the current time + 1 minute and press the rotary switch (enter) when the next minute starts.

2.21 Length of day

Set the length of a day cycle (day + night) on this screen. In some phases of plant breeding, it can make sense to adjust the length of a day cycle, which provides equal yield in less time requirement. For example, if "23:25" is selected, it means that a day cycle takes 23 hours and 25 minutes. The last 35 minutes compared to a regular 24h day is missing and the clock will directly proceed from 23:24:59 to 00:00:00. Please pay attention to this fact when setting up the time of "Lights ON/OFF" and the clock time.

2.22 Lights ON

Set the time to switch the lights on. An output in "clock timer" mode will switch on according to the set time.

2.23 Lights OFF

Set the time to switch the lights off. An output in "clock timer" mode will switch off according to the set time.

Function of interval timer:

Please find further information in section 8. An output in "interval timer" mode will be switched on and off according to the set times.

2.24 Interval day ON

Set the interval time (period) to switch on the output during daytime.

2.25 Interval day OFF

Set the interval time (period) to switch off the output during daytime.

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2.26 Interval night ON



Set the interval time (period) to switch on the output during night time.

2.27 Interval night OFF



Set the interval time (period) to switch off the output during night time.

2.28 CO₂ Setup



Press the rotary switch to enter the “CO₂ Setup” menu.

2.29 Temperature unit



Choose the preferred temperature unit (°C/°F).

2.30 Language



Choose the preferred language for the menu (English/German).

2.31 Display timeout



Here you can set the display timeout. The time set for the display timeout determines the time to switch off the display illumination. The home screen is displayed

20 seconds after this time has expired. When “ON” is set, the display elimination will be activated at all times. After a period of 180 seconds, the home screen will be displayed.

2.32 Save & return home



Press the rotary switch when this screen is displayed to save the changes made and return to the home screen.

2.33 Cancel & return home



When this screen is displayed, press the rotary switch to discard the changes made and return to the home screen.

3. Menu level “CO₂ Setup”

To increase the CO₂ concentration, CO₂ can be dispensed from a CO₂ bottle or by generating CO₂ by burning gas. A suitable CO₂ armature can be sourced from our website or another specialized shop.

3.1 CO₂ function



The CO₂ concentration can be controlled exactly by using a CO₂ sensor, or it can be increased timing controlled without a sensor. Furthermore, the CO₂ regulation can be turned off.

If “**sensor controlled**” is selected, the controller will calculate the required amount of CO₂ to reach the desired CO₂ level based upon the current measurement. Therefore,

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the CO₂ flow on the CO₂ armature, the room dimension and the desired CO₂ concentration must be set in the menu. By repeatedly dispensing CO₂ to the room air, the CO₂ concentration will be kept at the desired level. To compensate inaccuracy regarding the actual CO₂ flow and the entered room dimensions, the controller will learn from previous CO₂ dispensing. Thus, it will automatically rectify the mentioned inaccuracies.

If “**sensor&generator**” is selected, the CO₂ regulation will operate similar to the description above. The only difference is that the minimum time for a CO₂ dosing is higher given that it does not make sense to trigger the CO₂ generator for only a second, for example.

The exact procedure of the “**time controlled**” function depends on the following settings. The procedures principal is shown in the graph on page 21.

When “OFF” is selected, the CO₂ function is turned off.

While one of the CO₂ functions is active, the fans will run according to the settings below. Furthermore, the “desired temperature CO₂” will be used.

The CO₂ dispensing will only occur during daytime.

3.2 Desired temperature CO₂



Set the desired temperature for CO₂ mode. When this temperature is exceeded, the fan speeds will be increased as long the settings following MIN/MAX settings allow..

To avoid high CO₂ wastage, it makes sense to turn off the fans during the CO₂ mode. If a negative pressure has to be maintained, its also a good idea to let the exhaust fan run on a very low speed.

3.3 Exhaust fan MAX CO₂



Set the **maximum fan speed** of the **exhaust fan** during the “**CO₂ period**”. This fan speed will never be exceeded. Please find additional information in chapter 8.

3.4 Exhaust fan MIN CO₂



Set the **minimum airflow** of the **exhaust fan** during the “**CO₂ period**”. This set fan speed will never* be undercut. Please find additional information in chapter 8.

*during pressure, sensor calibration is in process, all fans are turned off.

The minimum fan speed is 10%. Additionally, “OFF” can be selected. This means that the intake fan will be switched off as long as the measured temperature is below the desired temperature.

 Ensure that the fan is still rotating at the set minimum fan speed and the airflow is sufficient for cooling the motor.

3.5 Intake fan MAX CO₂



Set the maximum fan speed of the intake fan during the CO₂ period. The specified value will never be exceeded.

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3.6 Intake MIN CO₂

Set intake off ↓
CO₂: < 30%↔

Set the **minimum fan speed** of the intake fan for a standard duct fan during the “CO₂ period”. If this value is undercut in the controller’s operation, the intake fan will be switched off to maintain the negative - pressure inside the grow room. The minimal possible fan speed is 10%. Additionally, “OFF” can be selected, whereby the fresh air fan will always be disabled during daytime.

This value is only relevant for standard duct fans. EC fans always turn off at 10%.

⚠ Ensure that the fan is still rotating at the set minimum fan speed and the airflow is sufficient for cooling the motor.

3.7 Room volume

Room volume: ↓
18m³↔

Set the volume of the room to which you wish to dispense CO₂.

Unit: (length * height * width) m*m*m = m³

3.8 CO₂ flow

Flow ↓
CO₂: 10l/min↔

Enter the flow set on the CO₂ armature or specified for your CO₂ generator.

Unit: l/min = liter / minute

3.9 CO₂ concentration

Concentration ↓
CO₂: 1200PPM↔

Set the desired CO₂ concentration. (ppm = parts per million)

The next two screens are only relevant when the time controlled CO₂ function without a sensor is used.

3.10 CO₂ absorption period

CO₂ absorption ↓
period: 240sec↔

Set the time to wait until the plants have absorbed the CO₂

This value is **only** relevant in the **time controlled** CO₂ function.

3.11 Air exchange

Air exchange: ↓
30sec↔

Specify how long the fans should run in “day mode” to exchange the room air after a CO₂ period. If you do not want the air to be replaced, a time of zero seconds can be set.

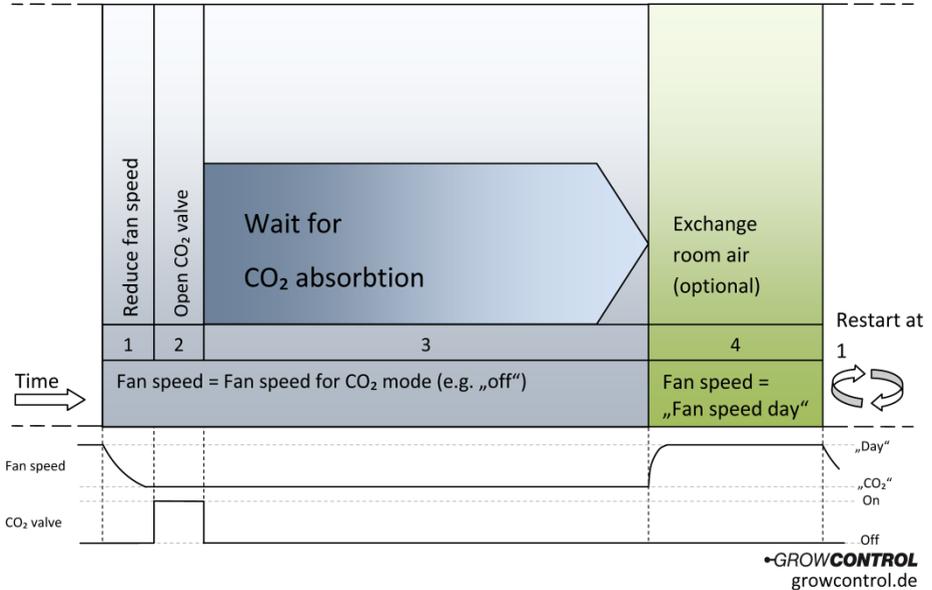
This value is **only** relevant in the **time controlled** CO₂ function.

3.12 Return to “1. Setup”

Press to ↓
return ↔

Press the rotary switch while this screen is displayed to **return** to menu level “2 setup”.

This graph shows procedure of the timing controlled CO₂ function **without** a CO₂ sensor.



8 Appendix for chapter 6

To keep the menu descriptions clear, additional information is provided in this appendix:

Regarding 2.14 Negative pressure in %:

For better understanding, here two examples are given.

Example 1: When using equal fans for intake and exhaust, a negative pressure of 20% means that the intake fan will generate an air flow 20% smaller compared to the exhaust fan.

Example 2: When operating a very small intake fan, a negative "negative pressure" can be chosen. This will increase the fan speed of the intake fan compared to the exhaust fan. When a negative pressure of -30% is set and the exhaust fan is operating

at 60%, the intake fan will operate at 90% of its maximum speed.

Please also pay attention to the information below.

Regarding "Exhaust fanMAX":

Please note that this value cannot be smaller than the value set in "Exhaust fan MIN".

To always turn off the exhaust fan, "OFF" can be selected. This is possible if "Exhaust fan MIN" is also set to "OFF".

Please note that his value cannot be larger than 100% + "negative pressure in %". This means that the maximum possible value can be below 100% in case a negative "negative pressure" is set. (e.g. -10%)

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Example: for a negative pressure of -15%,
the maximum possible value would be 85%

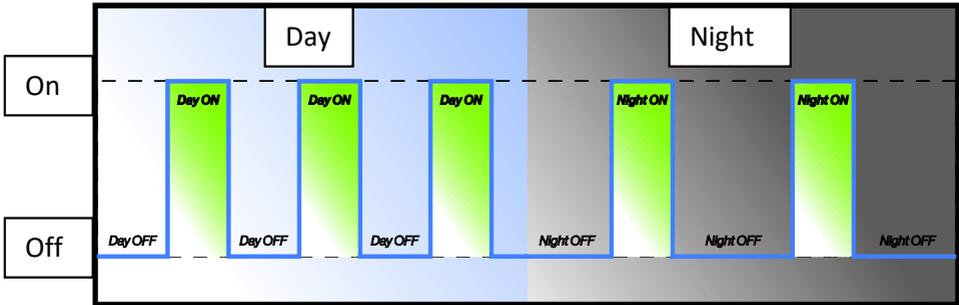
$$(100\% + (-15\%) = 85\%).$$

9 Description of the interval timer

The interval timer is a recycling timer that can be used to switch devices like water pumps or circulation fans on and off according to the times set in the menu. The time for each period (ON/OFF) can be chosen to the split second and separately for day and night (0 seconds – 168 hours). When it switches according to the settings for day or night is determined by the clock timer ("Lights ON"/"Lights OFF").

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This diagram shows the method of operation of the interval timer.



10 What to do if there are problems?

Problem	Reason	Advise/ Workaround
No display	The mains plug is not connected to a power socket.	Connect the mains plug to a power socket.
The maximum exhaust fan speed “ Exhaust fan MAX ” cannot be changed or the value rang is limited.	This value cannot be smaller than the “ Exhaust fan MIN ” setting. Additionally, this value cannot be smaller than 100% + negative pressure.	Please observe the instruction on pages 13, 14 or 19 regarding the “ Exhaust fan MAX ” menu screen.
The measured humidity values are inaccurate or the humidity is permanently displayed as 99.9%.	The sensor has been exposed to high humidity or wetness.	The sensor should be replaced. Alternative: 1) Keep the sensor at a temperature of 50 to 60°C and a humidity <10%RH for 2 hours; 2) Following the previous step, keep the sensor at a temperature of 20 to 30°C and a humidity >70%RH for 5 hours.
One or more power outlets on the controller are not activated, even if the display is illuminated.	The power output was overloaded by a faulty or unsuitable device.	The controller must be repaired. Please contact customer service or an authorized customer service point.
The display is frequently or permanently showing “Sensor error code X”.	The sensor is broken.	The sensor should be replaced.
One or more regular duct fans do not run as expected or they only run for a short time.	The device is disturbed by an electronic ballast.	Ensure that a distance of a couple of centimeters is maintained between the cables of the ballast and ALL other cables.

Table 3

11 Technical data

Dimensions (LxWxH)	170mm x 100mm x 90mm
Length of sensor cable (T/RH)	ca. 5m
Length of mains cables	ca. 1.4m
Power supply 1	100-240V~ 10A 50-60Hz
Power supply 2 (for "Multifunctional Out 4")	100-240V~ 10A 50-60Hz
Maximum power per output "Multifunctional Out 1, 2, 3"	1200W@230V 630W@120V
Maximum power "Multifunctional Out 1+2+3"	2300W@230V 1200W@120V
Maximum power "Multifunctional Out 4"	2300W@230V 1200W@120V
International protection marking/Protection class	IP42/□
Repetitive sensor accuracy T/RH	±0.1%RH/±0.2°C
Absolute sensor accuracy	±3%RH/±0.2°C
Allowed ambient temperature	10-40°C

Table 4

12 Disposal

Observe the local regulations for material disposal. Dispose of the device in accordance with EC Directive 2002/96/EC – WEEE (Waste Electrical and Electronic Equipment). If you have any questions, please contact the local authorities responsible for waste disposal.



13 Service

GrowControl wants to provide you the best level of service. To contact the customer service, please send an email to info@growcontrol.de.



Deutschland:	https://www.growland.net
Europe:	https://www.growland.biz
France:	https://www.growland.fr
España:	https://www.growland.es
Österreich:	https://www.growland.at
Nederland:	https://www.growland.nl
Italia:	https://www.growland.it
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