

APCECOTH

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Specs

Input voltage	120 Volts AC
Maximum amperage	14.5 amps @ 120 VAC
Remote COMBO probe cable length	15 ft
Temperature control range	41° to 113° F
Temperature accuracy	+/- 2° F
Temperature dead-band (hysteresis)	adjustable
Humidity control range	5% to 95% rH
Humidity accuracy	+/- 3% rH
Humidity dead-band (hysteresis)	adjustable
CO2 control range	380-2500 PPM
CO2 accuracy	+/- 75 PPM
Weight	5 lbs
Waterproofing grade	IP20
Dimensions	9" x 7" x 4"

Basic description

The APCECOTH is designed to control humidity, temperature and CO2. The controller has four (4) receptacles and a remote combination probe with highly accurate temperature, humidity, light and CO2 sensors. The fan-ventilated remote combination sensor is designed to quickly react to changes in the growing area and to resist EMI / EMI from electronic ballasts. The remote sensor can be placed up to 15 feet from the controller.

Note: An optional 15 ft extension cable can be purchased to allow the user to place the remote sensor up to 30ft from the controller.

Installation

Secure the unit to a wall.

Determine the best location for the remote probe. Place the probe in an area with good air movement preferably at plant height. Avoid placing the probe in direct sunlight or under direct HID Lighting.

NOTE: Do not place the sensor probe where it will come in to contact with water. The probe is not water proof!

The remote probe has a quick disconnect to easily remove or connect the probe. Secure the quick disconnect to the unit by securing the QD screw to the unit.

Plug the power cable into a standard 120 volt NEMA 5-15 wall outlet. A 120 volt power supply is required.

Turn the power on and allow the unit to warm up. This process takes about 5 minutes. During the warm up period, the display will read **CO2 heat**.

Note: Now is the time to customize your settings prior to connecting any equipment.

Ensure that all of the devices being connected to the controller have the proper voltage and will not exceed the maximum amperage rating of this unit.

NOTE: If using a large amperage device such as an Air Conditioner or De-humidifier is used, a power expansion module may be required.

Button Functions

Fifteen (15) buttons located on the front face plate of the unit control all functions. Pressing each button will display a function and/or current setting(s) in the green LED window. Some buttons perform more than one function.

Several small green LED lights or status indicators located on the front panel will light up to show selected function when certain buttons are pressed.

Up - Press button to increase setting

Down - Press button to decrease setting

Enter/Reset - Press button, hold for 3 seconds to enter new setting and to reset the Min/Max range.

Temperature buttons

DAYTIME SETTING - Press button to set day cooling and heating Set point.

NIGHT SETTING - Press button to set night cooling and heating Set point.

DEAD BAND - Press button to set the cooling and heating dead-band setting.

Humidity buttons

HUMIDITY SETTING - Press button to set Day and Night humidity Settings.

HUMIDITY MODE - Press button to select the humidification (rH Incr) or de-humidification (rH decr) mode.

DEAD BAND - Press button to set the humidity dead -band setting.

CO2 buttons

CO2 PPM SETTING - Press button to display and/or change CO2 Parts Per Million (PPM) setting.

CO2 DEAD BAND - Press button to set the CO2 dead-band set-point.

CO2 PPM CALIBRATE - Press button to re-calibrate the CO2 sensor.

Note: Refer to How to recalibrate CO2.

Split Mode buttons

TEMP/HUMIDITY LOCK - Press button to lock or split the humidity and temperature functions. The user has the option to run both at the same time or independently.

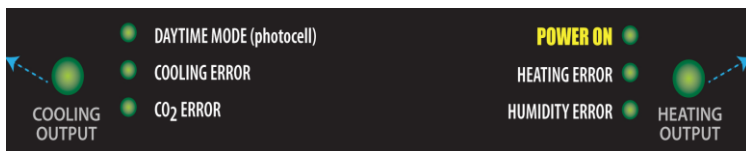
TEMP/CO2 LOCK - Press button to lock or split the temperature and CO2 functions. The user has the option to disable CO2 during exhaust fan operation, or to allow CO2 and temperature controls to function independently.

MIN/MAXIMUM RECALL - Press this button repeatedly to recall the stored high and low recorded levels for Temperature, Humidity and CO2. Press and hold the Enter/Reset button while the recorded value is displayed to reset the Min/Max values.

***To change the temperature reading from F to C, press and hold the UP and DOWN buttons for 2-3 seconds.**

Error LEDs

The APCECOTH is smart enough to monitor each of the environmental conditions and to alert the user to a problem with any of the devices connected to the controller. Here is how it works.



As the unit functions normally, the environmental conditions (temp, humidity & CO₂) will be slowly but steadily changing. These small changes are detected by the controller.

If the controller does not detect a slight change in one (or more) environmental conditions within a 1-hour period, the unit will deactivate the affected output and the appropriate green Error LED will be flashing to indicate which device may have a problem.

This safety feature is extremely important and useful to eliminate “runaway” conditions which could result in crop damage or other more serious problems.

If any of the Error LEDs are blinking, the user should refer to the example below to help identify the actual cause of the error.

*** EXAMPLE:** The Cooling error LED is flashing, it means that the device connected to the Cooling output either did not turn on OR that there is a problem with the temperature sensor. Check the cooling device for proper operation and verify the remote sensor is reading properly.

Note: To reset an error, press the Enter / reset button.

Factory Settings

The APCECOTH comes pre-programmed with factory settings. These settings may be adjusted by the user. For best results verify any changes after adjusting settings. The controller can be easily reset to factory settings. (see below)

Temp day settings	Cool 80°F / Heat 55°F
Temp night setting	Cool 70°F / Heat 55°F
Temp dead-band	3°F / Heat and Cool
Humid settings	50 % rH
Humid mode	Rh decr
Humid dead-band	3 %
CO2 PPM setting	1250 PPM
CO2 dead-band	50 PPM
Calibrate CO2 PPM	380 PPM
Temp & humid lock	Split
Temp & CO2 lock	Split

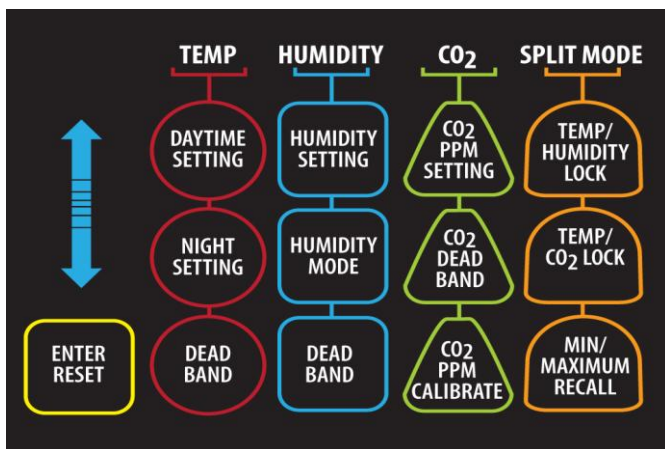
Reset Factory Settings - Press and hold the Enter / Reset and down buttons for 3 seconds. The display will read **f.Set**. Press the Enter/reset button again to restore the factory default settings. When the factory reset is complete the unit will say **doNE**.

Note: To change the temperature reading from F to C, press and hold the UP and DOWN buttons for 2-3 seconds.

Overview

The individual push-buttons on the APCECOTH makes changing settings EASY.

- * Press a button, the display shows the current setting.
- * To change the settings, use the UP and DOWN buttons.
- * Then press ENTER to accept the new setting.



How to customize settings...

Up - Press button to increase setting

Down - Press button to decrease setting

Enter/reset - Press button, hold for 3 seconds to restart timer or to adjust the setting. The timer will always start in the "ON" cycle.

Temperature Display - Press and hold both the Up and Down button for 3 seconds to change display. C for Celsius and F for Fahrenheit

Temp daytime setting - There is a Day Cooling set point and a Day Heating set point.

1) To set the Day Cooling press DAYTIME SETTING, **COOL__F** will be displayed. To change settings press the Up and Down buttons. Press Enter to accept new setting.

2) To set the Day Heating press DAYTIME SETTING twice, **HEAt__F** will be displayed. To change settings press the Up and Down buttons. Press Enter to accept new setting.

Temp night setting - There is a Night Cooling set point and a Night Heating set point.

1) To set the Night Cooling press NIGHT SETTING, **COOL__F** will be displayed. To change settings press the Up and Down buttons. Press Enter to accept new setting.

2) To set the Night Heating press NIGHT SETTING a second time **HEAt__F** will be displayed. To change settings press the Up and Down buttons. Press Enter to accept new setting.

NOTE: To avoid both the heating and cooling device turning on at the same time, the heating and cooling settings must be greater than the combined dead band settings.

Temp dead-band - There are two (2) dead band settings. One for cooling and one for heating.

1) To set the cooling dead band, press Temp DEAD BAND. **COOL__F** will be displayed. To change the set points press the UP and DOWN buttons. Press Enter to accept new setting.

2) To set the heating dead band, press Temp DEAD BAND a second time. **HEAt__F** will be displayed. To change the set points press the Up and Down buttons. Press Enter to accept new setting.

Humid setting - There is a day humidity setting and a night humidity setting.

1) To set the day time humidity, press the HUMIDITY SETTING button. **day_rH** will be displayed. Press the Up or Down button to change the day time humidity setting. Press Enter to accept the new setting.

2) To set the night time humidity, press the HUMIDITY SETTING button a second time **nit_rH** will be displayed. Press the Up or Down button to change the night time humidity setting. Press enter to accept the new setting.

Humid mode - Use this to select to humidify or to dehumidify. Press HUMIDITY MODE, the display will read the current setting, either Humidify (**rH Incr**) or dehumidify (**rH dEcr**). Press the Up and Down buttons to change the setting. Press Enter to accept new setting.

Humid dead band - Pressing the Humid DEAD BAND button and the display will read **05.0_rH** (or the current setting) Press the Up or Down buttons to change the setting. Press Enter to accept new setting.

CO2 PPM setting - Press CO2 PPM SETTING, The current PPM setting will be displayed. To change settings press the Up or Down buttons. Press Enter to accept new setting.

CO2 dead band - Press CO2 DEAD BAND button and the display will read current setting. Press the up or down button to change setting. Press Enter to accept new setting

TEMP/HUMIDITY LOCK - use this function to interlock (**COnnEct**) or split (**SPLit**) humidity and temperature. Press Temp/Humidity lock button to display the setting. Press the Up and Down buttons to change the setting. Press Enter to accept new setting.

1) Select connect (**COnnEct**) if using ventilating fans only for cooling and removing humidity. The fan will turn on when the sensor detects a rise above the setting in either the humidity or temperature.

2) Select split (**SPLit**) if using a ventilating fan or AC unit as a cooling device and a dehumidifier to remove humidity. Each device is controlled independently. The cooling device will turn on when the temperature rises above the setting and the dehumidifier will turn on when the humidity rises above the setting.

3) Select split (**SPLit**) if using a fan or AC unit as a cooling device and a humidifier to add humidity. Each device is controlled independently. The cooling device will turn on when the temperature rises above the setting and the humidifier will turn on when the humidity lowers below the setting.

TEMP/CO2 LOCK - Use this function to interlock (**COnnEct**) or split (**SPLit**) the CO2 and temperature functions. They can activate at the same time or independently. Press the Temp/CO2 lock to display the setting. Press the Up or Down buttons to change the setting. Press Enter to accept new setting.

1) Select connect mode (**COnnEct**) if using ventilating fans (inside-to-outside growing area air exchange) for cooling and a compressed CO2 setup. This will turn off the CO2 when the fans are activated. The fans will exchange the warm-humid inside air

with the cooler-drier outside air while the CO₂ is off to prevent excess loss of CO₂.

2) Select split mode (**SPLit**) if using a recycling air-conditioner for cooling and compressed CO₂ in the growing area where there is no exchange of outside air. This will activate the air conditioner independently from the CO₂ allowing them to both run at the same time.

3) Select split mode (**SPLit**) if using ventilating fans (inside-to-outside growing area air exchange) for cooling and a CO₂ generator. If set-up this way, the ventilation fans AND the CO₂ generator will be allowed to operate simultaneously.

4) Select connect mode (**COnnEct**) if using a recycling air-conditioner for cooling and a CO₂ generator. This turn off the CO₂ generator when the air conditioner is operating to reduce the amount of heat that needs to be removed by the air conditioner.

MIN/MAXIMUM RECALL - Press to “recall” or display the minimum and maximum temperature, humidity, and CO₂ recorded values. Each time the button is pressed, the next setting will be displayed.

The order of the recorded values is as follows:

Max temp, Min temp, Max humid, Min humid,
Max CO₂, Min CO₂

To reset the Min / Max values - Press the Enter / Reset button and hold for 3 seconds.

Photocell Sensitivity

The sensitivity of the photocell may be adjusted.

- * Press both **Enter/Reset** and **Up** buttons and hold for 3 seconds. The current photocell setting will be displayed.
- * Press **Up** to increase the number displayed and the sensitivity. (requires less light to activate photocell)
- * Press **Down** to decrease the number and the sensitivity. (requires more light to activate photocell)

Fuzzy Logic CO2 mode

“Fuzzy Logic” CO2 mode allows the user to more precisely control the CO2 levels inside the growing area. Fuzzy Logic works by monitoring the rising or falling CO2 level and reacting to it by quickly activating ON / OFF the CO2 solenoid valve. This function can ONLY be used with compressed CO2.

Fuzzy Logic mode can be activated or deactivated by pressing Enter/Reset and holding for 5 seconds. Press Up or Down to select generator mode (**gEnErAt**) if using CO2 generator or Fuzzy logic mode (**Loglcon**) if using compressed CO2. Press Enter to accept new setting.

Note* To prevent the CO2 regulator from “freezing” or not closing when using the “fuzzy logic” mode, we recommend using the Hydrofarm CO2 regulator designed to work with the Autopilot controllers.

Note: Do not use Fuzzy logic mode if operating a CO2 generator!!!

HOW TO CALIBRATE CO2 (PPM)

1) Place the controller outdoors in a shaded area. Do not place in direct sunlight. Keep away from people, animals and other CO2 emitting areas.

Note: If calibration will be in a high traffic (vehicles) area or a highly populated area a slightly increased calibration to around 400-475 PPM is recommended.

3) Plug in the controller and allow to “warm up” for a minimum of 30 minutes. For best results, allow to “warm up” for an hour or longer.

4) Press CO2 PPM CALIBRATE to activate the automatic calibration. The new CO2 level (**380_PP**) will be displayed. Press the up or down button to change the calibration setting. DO NOT exhale or breathe on the unit while activating the calibration function.

5) Press Enter / Reset to start the calibration sequence, (**Co2_CAL**) will be displayed. Leave controller alone for about 10 minutes.

6) When calibration is complete the display window will return to normal display and functions. Place the sensor back into the grow area. All other functions remain as they were prior to calibration.

Sulfur vaporizer warning!

If a sulfur vaporizer is used, first remove the remote sensor from the affected area or turn the controller OFF and cover the remote sensor probe with a protective plastic bag. Remove the bag before turning the power back ON.

APCECOTH remote probe assembly



Note: Failure to protect the sensor during Sulfur use will result in damage to the infrared CO2 sensor and void warranty

Q & A

How can I tell if my CO2 reading is accurate? You can check the calibration of the CO2 sensor by placing the sensor outdoors for 30 minutes. It should read close to 380 PPM. *See Calibrate CO2 PPM in the “How to set...” section.

What if my temperature is reading high? Make sure the remote probe is not in direct lighting from HID lights or sunlight. The probe also requires good air flow around it in order for the internal ventilation fan to quickly sample the air.

Do I need to calibrate my humidity sensor? No. Like the temperature sensor, the humidity sensor is digital and does not require calibration. Refer to the above if the humidity reading does not seem accurate.

Why is the display reading Err SEn? The remote probe is not connected and/or communicating with the controller. Check the quick-connect cable and that the remote probe is getting power. *Contact the factory for more info.

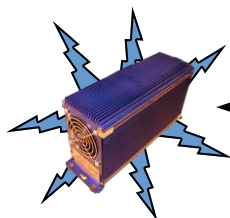
What if one of the small green Error LEDs are on? One or more environmental conditions are not acting correctly. Refer to the Error LEDs sections to diagnose the problem.

Why isn't the CO2 outlet turning on? Verify the correct CO2 mode has been selected and/or verify the photocell daytime green led is turned ON.

What if there is no power? Reset the power switch (circuit breaker). If this continues reduce the number of devices connected or use a power multiplier / expander to control devices with larger amperage.


IMPORTANT MESSAGE

1. **Save these instructions.** These safety and operating instructions must be kept in a safe place for future reference.
2. **Heed all warnings.** All warnings on this product and in the instructions must be observed closely.
3. **Follow all instructions.** All operating instructions must be followed..
4. If the instructions as provided by the manufacturer are not followed damage to the product may result.
5. Install your controller at least 8 ft away from any devices that produce large amounts of electronic noise, such as electronic ballasts or ozone generators.



← 8 ft
minimum →



6. The  symbol on the enclosure represents that the receptacle beside it may have an output voltage, which can be dangerous. The output voltages are the same as the input voltage. This receptacle can only be inserted with standard Nema 1-15P and Nema 5-15P plugs. **Don't insert any other plug in it.**
7. **Do not use this Controller near water.** For example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, and the like. The controller shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on this product. The product is not water-proof, or shock-proof.
8. Any factory serviceable parts of the product only can be checked or replaced by the manufacturer or authorized agencies. An unauthorized person is NEVER allowed to open the enclosure.
9. If the power cable insulation is broken, please stop using the product! Immediately unplug the unit and contact the retailer you purchased it from.

10. The product is equipped with a circuit breaker for short circuit or over current situations. The circuit breaker will automatically shut down the product at once. All outlets of the product all have the safety ground.

11. Do not install the enclosure near any heat source.

12. Do not block any ventilation openings.

13. This product is a Safety Class I Controller. The main plug should be inserted in a power socket outlet only if provided with a protective earth contact. Any interruption of the protective conductor inside or outside of the product is likely to make the product dangerous and is prohibited.

MESSAGE IMPORTANT

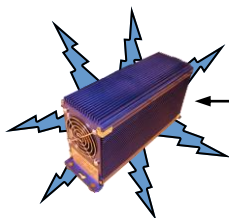
1. Conservez ces instructions. Ces consignes de sécurité et d'exploitation doivent être conservées dans un endroit sûr pour référence future.

2. Respectez tous les avertissements. Tous les avertissements sur ce produit et dans les instructions doivent être observés de près.

3. Suivez toutes les instructions. Toutes les instructions doivent être suivies.

4. Si les instructions fournies par le fabricant ne sont pas suivies d'endommager le produit peut entraîner.

5. Installez votre contrôleur au moins 8 pieds loin de tous les appareils qui produisent de grandes quantités de bruits électroniques, tels que les ballasts électroniques ou des générateurs d'ozone.



8 ft
minimum



6. Le symbole sur le boîtier représente que le récipient à côté il peut avoir une tension de sortie, qui peut être dangereux. Les tensions de sortie sont les mêmes que la tension de tension d'entrée. Cette prise

ne peut être inséré à la norme NEMA 1-15P et NEMA 5-15P bouchons. Ne pas insérer d'autres plug en elle.

7. Ne pas utiliser ce contrôleur près de l'eau. Par exemple, près d'une baignoire, baignoire lavabo, évier de cuisine ou la lessive, dans une cave humide, ou près d'une piscine, etc. Le contrôleur ne doit pas être exposé à des éclaboussures et aucun objet rempli de liquides, tels que des vases, doit être placé sur ce produit. Le produit n'est pas étanche à l'eau, ou antichoc.

8. Toutes les pièces d'usine Paré réparable du produit ne peut être vérifiée ou remplacée par le fabricant ou autoriser les agences. Une personne non autorisée n'est jamais permis d'ouvrir le boîtier.

9. Si l'isolation du câble d'alimentation est cassée, s'il vous plaît arrêtez d'utiliser le produit! Débranchez immédiatement l'appareil et contactez le revendeur vous l'avez acheté.

10. Le produit est équipé d'un disjoncteur pour un court-circuit ou sur des situations actuelles. Le disjoncteur se fermera automatiquement le produit à la fois. Toutes les sorties du produit ont tous la terre de sécurité.

11. Ne pas installer l'enceinte à proximité de toute source de chaleur.

12. Ne pas bloquer les ouvertures de ventilation.

13. Ce produit est une classe de sécurité I contrôleur. La fiche principale doit être insérée dans une prise électrique que s'ils sont fournis avec un contact de terre de protection. Toute interruption du conducteur de protection à l'intérieur ou à l'extérieur du produit est susceptible de rendre le produit dangereux et est interdit.

Warranty and Liability

1.Limited Warranty

Hydrofarm, Inc doing business as Hydrofarm, Inc (collectively HYDROFARM) warrants that for a period of three years from the date of purchase, this product will be free from defects in material and workmanship. HYDROFARM, at its option, will repair or replace this product or any component of the product found to be defective during the warranty period. Replacement will be made with a new or remanufactured product or component. If the product is no longer available, replacement may be made with a similar product of equal or greater value. This is your exclusive warranty. DO NOT attempt to repair or adjust any electrical or mechanical malfunctions on this product. Doing so will void this warranty and may cause serious injury/death/damage.

This warranty is valid for the original retail purchaser from the date of the initial retail purchase and it not transferable. Keep the original sales receipt. Proof of purchase is required to obtain warranty performance. HYDROFARM dealers, distributors, service centers and retail outlets selling HYDROFARM products do not have any right to alter, modify or in any way change the terms and conditions of this warranty.

This warranty does not cover normal wear of parts or damage resulting from the following: negligent use or misuse of the product, use on improper voltage or current, use contrary to the operating instructions, use contrary to any and all applicable local, state, provincial or federal laws, disassembly, repair or alteration by anyone other than HYDROFARM or an HYDROFARM authorized service center. Future, the warranty does not cover: Acts of God, such as fire, flood, hurricanes, tornadoes, nor Acts of War or Acts of Terrorism.

What are the limits on HYDROFARM's liability?

HYDROFARM shall not be liable for any incidental or consequential damages cause by the breach of any express, implied or statutory warranty or condition.

Except to the extent prohibited by applicable law, any implied warranty or condition of merchantability or fitness for a particular purpose is limited in duration to the duration of the above warranty.

HYDROFARM disclaims all other warranties, conditions or representations, express, implied, statutory or otherwise.

HYDROFARM shall not be liable for any damages of any kind resulting from the purchase, use or misuse of, or inability to use the product including incidental, special, consequential or similar damages or losses of profits, or for any breach of contract, fundamental or otherwise, or for any claim brought against the purchaser by any other party.

Some provinces, states or jurisdictions do not allow exclusion or limitations on how long an implied warranty lasts, so the above limitations or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights that vary from province to province, state to state or jurisdiction on jurisdiction.

This warranty is offered by HYDROFARM,INC., If you have any other problem or claim in connection with this product, please write our Consumer Service Headquarters, HYDROFARM,INC.

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autopilot

Environmental Controllers

This product conforms to USA and Canada standards as listed below.



Made in China