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INSTRUCTIONS

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# autopilot®

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DESKTOP CO2 MONITOR

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APCEM

# INSTRUCTIONS

## OVERVIEW

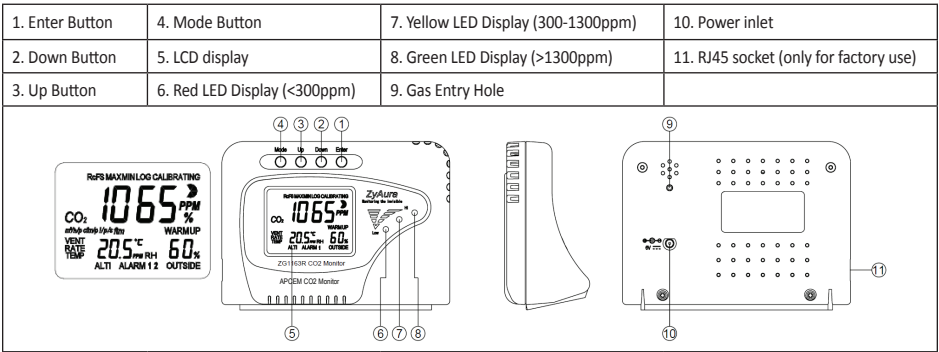
Thank you for selecting the APCEM desktop CO<sub>2</sub> monitor. It is smart, compact and easy-to-use. In addition to measuring the CO<sub>2</sub> concentration,

The APCEM can also measure the ambient temperature and the relative humidity. This product is developed to detect the presence of CO<sub>2</sub> in ambient air

and help plants to grow well. The APCEM can be used in greenhouse, hydroponics room and other place where plants need to grow well.

## FEATURES

- **The built-in Data logger** can store 48 sets of CO<sub>2</sub> and temperature and RH in the past 24 hours; one log per 30 minutes.
- **Max/Min mode** can record the maximum and minimum concentration of CO<sub>2</sub> since the device has been last turned on.
- **The RCFS Mode** can recover the original factory settings after the CO<sub>2</sub> device has been recalibrated, altered, or damaged.



## MODE FUNCTIONS

There are several Modes which can be adjusted by user. These modes are ALTI Mode, OUTSIDE Mode, CALI Mode, LOG Mode, MinMax Mode, and RcFS Mode in sequence .

<b>ALTI</b>	Compensate the pressure changes with appropriate altitude of location when measure		<b>OUTSIDE</b>	Modify the outside CO <sub>2</sub> concentration for calculating the ventilation rate	
<b>CALI</b>	Calibrate the sensor while the reading deviates from the actual CO <sub>2</sub> concentration		<b>LOG</b>	Show the past CO <sub>2</sub> , Temperature and RH records in the past 24 hours	
<b>MaxMin</b>	Show the Max and Min CO <sub>2</sub> reading before being cleared or after Power On		<b>RcFS</b>	RcFS Recover the factory setting to cancel customize setting	

# INSTRUCTIONS

## SAFETY INSTRUCTIONS

**⚠ WARNING:** Your safety is very important to us. To ensure to use the product correctly and safely, we would like to draw your attention to read the warning and entire User Manual before using the product. These are important safety information and should be observed at all times.

1. Please handle the devices lightly, do not subject the product to impact or shock.
2. Do not immerse the product in water. Water can cause electric shock, fire or malfunction which may result in damage.
3. Do not keep the product in a hot and moist environment. Keep the product away from the heat source or near water.
4. Please use only the included power adaptor. Improper power adaptor or power sources can cause serious damage to the product, or result in injury or death to the user.

## CARING FOR PRODUCT

To ensure you receive the maximum benefit from using this product, please observe the following guidelines.

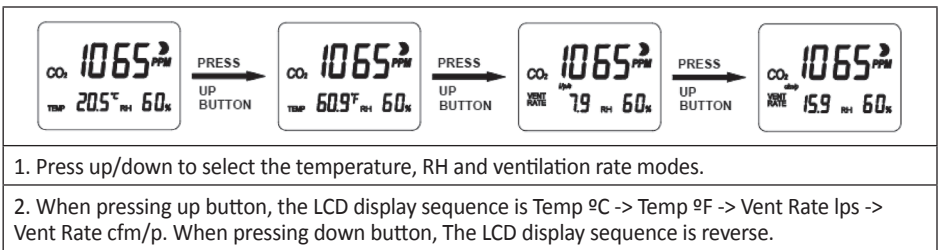
1. 1. Cleaning— Disconnect the power before clean. Use a damp cloth. Do not use the liquid cleaning agent, such as benzene, thinner or aerosols.
2. 2. Repair—Do not attempt to repair the product or modify the circuitry by yourself. Please contact with the local dealer or a qualified repairman if the product needs servicing.
3. 3. Air circulation—The vents allow the air circulation liquid for measurement of the CO<sub>2</sub> concentration and the ventilation should not be blocked. CUSTOMIZE SETTINGS

## CUSTOMIZE SETTINGS

When the power has been connected, the APCEM CO<sub>2</sub> monitor will begin to work. In order to meet your personal requirements, it is advisable to set up the customizing parameters.

WarmUp: It lasts approximately 1min before WARM UP disappears; all MODE functions will not response during warm up.

## TEMPERATURE (°C/°F) RH AND VENTILATION RATE:

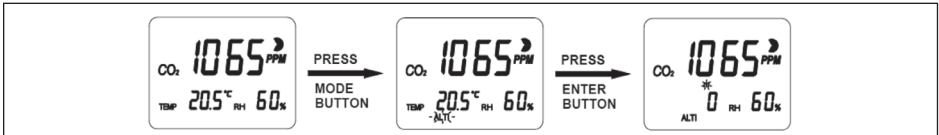


1. Press up/down to select the temperature, RH and ventilation rate modes.
2. When pressing up button, the LCD display sequence is Temp °C -> Temp °F -> Vent Rate lps -> Vent Rate cfm/p. When pressing down button, The LCD display sequence is reverse.

**\*NOTE:** Temp °C refers to Temperature in Celsius; Temp °F refers to Temperature in Fahrenheit. Vent Rate lps refers to Liter Per Second; Vent Rate cfm/p refers to Cubic Feet Per Minute. .

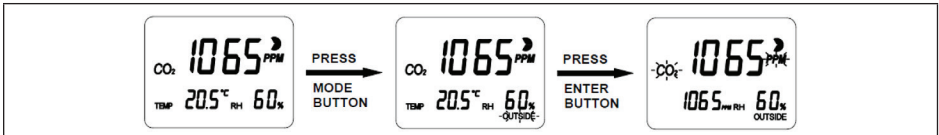
# INSTRUCTIONS

## USING THE ALTI MODE:



1. Press Mode, the ALTI icon flashes.
2. Press Enter, ALTI shows on the display, press the mode button to alter between the m (meter) and ft (feet).
3. Adjust altitude (step=100m/500ft) by up/down button.
4. Press Enter again to save the data.

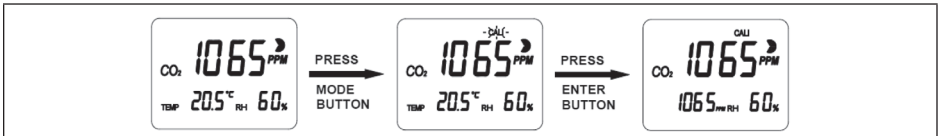
## USING THE OUTSIDE MODE:



1. Press Mode, the OUTSIDE icon flashes.
2. Press Enter, shows OUTSIDE, CO<sub>2</sub> and ppm flashes. Press the Up/Down to adjust the data.
3. Press Enter to save the setting. After the modification, the VENT Rate will change.

**\*NOTE:** Ventilation rate represents how much air is introduced into the indoor space from outside. Low numbers indicate low ventilation rates and potentially poor air quality. High levels indicate excessive ventilation and potential excessive energy usage. To obtain an accurate measurement, reading should be taken 2~3 hours after occupancy has stabilized in a space or at a peak in daily CO<sub>2</sub> concentrations. For indoor air quality control, CO<sub>2</sub> value is an indicator of ventilation rate. 400ppm (Parts Per Million) is the default CO<sub>2</sub> concentration outside according to ASHRAE: American Society of Heating, Refrigeration and Air conditioning Engineers.

## USING THE CALI (CALIBRATION) MODE:



1. Expose the unit to fresh air by bringing it outside. Avoid direct contact with automobile exhaust, furnace exhaust, etc. DO NOT BREATHE ON THE UNIT DURING THE CALIBRATION PROCESS. Connect the power supply.
2. Move away from the unit to allow the reading to stabilize for approximately 20 minutes.
3. Press Mode, the CALI icon flashes.
4. Press enter, the screen shows the CALI icon without flashing.

# INSTRUCTIONS

5. Press Mode for more than 10 seconds, CALIBRATING flashes. Calibration will be done automatically after about 3 minutes and the LCD will display "PASS" or "FAIL." If it shows "FAIL," please try again.
6. After calibration is complete, disconnect power supply for a few seconds.

## USING THE LOG MODE:



1. Press Mode, LOG icon flashes.
2. Press Enter, CO<sub>2</sub> reading and Temperature show on the LCD.
3. Press Up/Down to page up/down the reading.

**\*NOTE:** With the Built-in Datalogger, the APCEM can provide the past CO<sub>2</sub>, temperature and RH reading within the past 24 hours. The log interval is 30 minutes per data. APCEM is connected with power and used for the first time. If the working time is more than 30 minutes, the APCEM will have CO<sub>2</sub>, RH and temperature reading in datalogger, if the working time is less than 30 minutes, the LCD will display "NULL" while using the LOG function

## USING THE MAX MIN MODE:

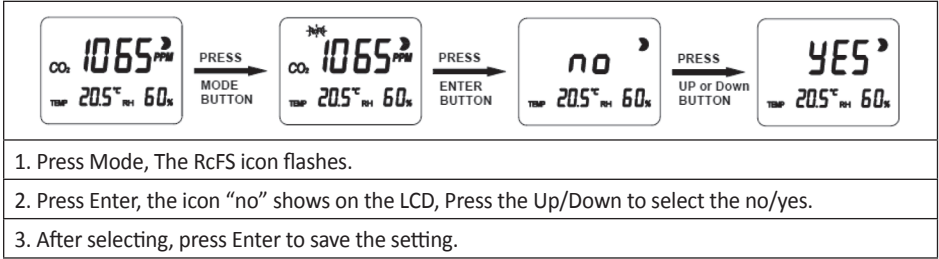


1. Press Mode, the MAX MIN icon flashes.
2. Press Enter, the MAX and MIN CO<sub>2</sub> reading alternatively shows.
3. Press Down and the "CLR" will flash on the LCD. Press Enter to CLEAR the MAX and MIN record.

**\*NOTE:** With the Built-in MAX MIN mode, the APCEM can provide the Maximum and Minimum CO<sub>2</sub> readings since the device has last been turned on. If users press up/down to clear the MAX and MIN CO<sub>2</sub> reading record, the APCEM will provide the new MAX and MIN CO<sub>2</sub> reading from that time.

# INSTRUCTIONS

## USING THE "RCFS" MODE:



*\*NOTE: If the user sets the data or calibrates the the APCEM incorrectly, use the RcFS (recover the factory Setting) to come back the default factory setting.*

# TROUBLESHOOTING & SPECS

## SPECIFICATIONS

### CO<sub>2</sub> SPECIFICATION

Measurement Range	0-3,000 ppm display		
Display Resolution	1ppm at 0~1,000ppm; 5ppm at 1,001~2,000ppm; 10ppm at 2,001~3,000ppm		
Accuracy	0~2,000ppm: ±70 ppm or ±5% of reading, whichever is greater; over 2000ppm: +/-7%		
Temperature Dependence	Typ. ±0.2% of reading per °C or ±2 ppm per °C, whichever is greater, referenced to 25°C		
Pressure Dependence	0.13% of reading per mm Hg (Corrected via user input for altitude)		
Repeatability	±20 ppm @ 400ppm	Response Time	About 2min for 63% of step change
Warm-Up Time	<60 seconds at 22°C	Zone LED Display	Red:<300ppm; Yellow 300~1300ppm; Green: >1300ppm

### TEMPERATURE SPECIFICATION

Temperature Range	0°C to 50°C (32°F to 122°F)display	Display Resolution	0.1°C (0.1°F)
Display Options	°C/°F	Response Time	20-30 minutes (case must equalize with environment)
Accuracy	±1°C( ±2°F) When the fan blows to the device directly, the accuracy of temperature is + / -1.5 degC		

### RH SPECIFICATION

Operating Conditions	
Measurement Range	20%-90% RH
Display Resolution	1%RH
Accuracy	±5%RH@23°C
Response Time	<5 min for 63% of step change
Storage Conditions	
Operating Temperature	0°C to 50°C (32°F to 122°F)
Humidity Range	0 ~ 95% RH non-condensing
Storage Temperature	-20°C to 60°C(-4°F to 140°F)

### POWER SUPPLY

Power Supply	100 ~ 240 VAC 50 / 60 Hz 6 VDC from external AC/DC adapter which is included in package (Use specified AC adapter only)
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## FAULT CODES & TROUBLESHOOTING GUIDE

FAULT ICON	DESCRIPTION OF THE FAULT	SUGGESTED ACTIONS
「Err3」	The ambient temperature has exceeded the operating temperature range 0°C to 50°C (32°F to 122°F)	This error will clear when the temperature returns to the range between 0°C to 50°C (32°F to 122°F).
「Err5」 「Err6」	EEPROM System problem	Please reconnect AC adapter to the APCEM CO2 Monitor. If the “Err5, Err6” still appears, please contact the Service Department for further assistance.

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# WARRANTY

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## LIMITED WARRANTY

Hydrofarm warrants the **APCEM** to be free from defects in materials and workmanship. The warranty term is for one year beginning on the date of purchase. Misuse, abuse, or failure to follow instructions is not covered under this warranty. Hydrofarm will, at our discretion, repair or replace the **APCEM** covered under this warranty if it is returned to the original place of purchase. To request warranty service, please return the **APCEM**, with original sales receipt and original packaging, to your place of purchase. The purchase date is based on your original sales receipt.

## GARANTÍA LIMITADA

Hydrofarm garantiza que **APCEM** no presenta defectos en los materiales ni la fabricación. La vigencia de la garantía es un año que comienza en la fecha de compra. Esta garantía no cubre el uso erróneo, el abuso o el incumplimiento de las instrucciones. Hydrofarm, según su criterio, reparará o sustituirá **APCEM** incluido en esta garantía si se devuelve al centro original de compra. Para solicitar el servicio de garantía, devuelva **APCEM**, con el tique de compra y el embalaje originales, a su centro de compra. La fecha de compra se basa en su tique de compra original.

## GARANTIE LIMITÉE

Hydrofarm garantit que **APCEM** ne présente pas de défauts de matériel ni de fabrication. La garantie est en vigueur un an à partir de la date d'achat. Cette garantie ne couvre pas l'utilisation incorrecte, l'abus ou le non respect de la notice. Hydrofarm, selon ses critères, réparera ou remplacera **APCEM** couvert par cette garantie s'il est renvoyé au centre original d'achat. Pour demander le service de garantie, renvoyer **APCEM**, avec le ticket d'achat et l'emballage originaux, au centre d'achat. La date d'achat est indiquée sur le ticket d'achat original.

## BEGRENZTE GARANTIE

Hydrofarm gewährleistet, dass **APCEM** ohne Material- und Herstellungsmängel geliefert wird. Die Garantiedauer beträgt ein Jahr und beginnt zum Kaufdatum zu laufen. Schäden, die aufgrund eines unsachgemäßen Gebrauchs oder der Nichteinhaltung der Anleitungen entstehen, sind von der Garantie nicht gedeckt. Hydrofarm wird den unter Garantie stehenden **APCEM** nach eigenem Ermessen entweder reparieren oder ersetzen, sofern die Rückgabe an der Verkaufsstelle, an der er erworben wurde, erfolgt. Für die Beantragung der Garantieleistungen ist der **APCEM** mit der Quittung und in der Originalverpackung an der Verkaufsstelle zurückzugeben. Als Kaufdatum gilt jenes Datum, das dem Kaufticket im Original zu entnehmen ist.