Fresh Air Controller

UT33-ACO2-ZW

UT33-ACO2-ZW is a color screen controller with built-in CO_2 control logic. It automatically controls the air valve based on CO_2 levels, maintaining the best indoor air quality continuously. It is one of the optimal solutions for achieving the goal of "continuous optimal air".

Features：

- Capacitive touch buttons
- Tempered glass panel, PC alloy enclosure
- Precise temperature calibration function
- Non-volatile Memory, working state saved even power failure
- Easily steel frame back plate installation
- Clear display, easy to operate

Specification

- Power Supply: AC90~250V, 50/60Hz
- Self Consumption：≤1W
- Built-in Temp. Sensor: NTC 10K
- Z-Wave 800 series, S2 encryption
- Working Environment：0～55℃; <95% RH（Non-condensation)
- Dimension：86* 86* 11.8mm
- Hole Pitch：60mm
- Modulating voltage output: 0 - 10V (maximum 15 milliamps), can be used to control the speed of the CMV fan or the percentage of the air valve, etc.
- Relay output: Maximum 3A (for resistive loads), maximum 0.8A (for inductive loads), suitable for switch control of CMV fans
  0-10V output → CMV regulation (fan speed control)
  0-10V output → Damper control (% opening)
  230V output → Remote On/Off control for CMV
- Z-Wave Frequency: Operating frequency range, defined by the regulatory bodies (for Z-wave in Europe: 868.0 - 868.6 MHz, 869.7 - 870.0 MHz)
- Over Current Protection: Required external 10A circuit breaker

- **Declaration of Conformity**

Hereby, we declare that the device is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.

- **WEEE Directive Compliance**

The device marked with this symbol should not be disposed of with household waste. It is the user's responsibility to deliver the used appliance to a designated recycling point.

- **Z-Wave Compliance**

The controller is a fully compatible Z-Wave Plus device.

Important Safety Instruction

Read the instructions before starting up the unit!

This product is not a toy. Keep out of reach of children and animals!

Do not expose the device to moisture, water or other liquids. Do not place liquids near or on the device!

Do not attempt to disassemble, repair or modify the device yourself!

This product is for indoor use only. Do not use outdoors!

CAUTIONS!
Flush-mount only into a UL/ETL/CE certified plastic junction box. The minimum size should be 65*65*45mm, minimum Volume is 190cm^3. Use Copper Conductors Only.

CAUTIONS!
Risk of Electric Shock - More than one disconnect switch may be required to de-energize the equipment before servicing.

Installation

Location:

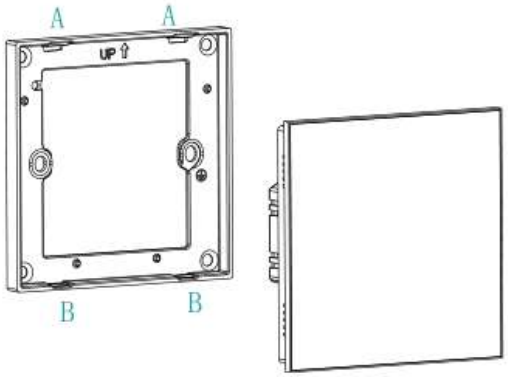
The device is suggested to be installed indoor, a place with around 1.5m height above the floor where represents the

average room temperature. It should be away from direct sunlight, any cover, or any heat source, to avoid false signal for temperature control.

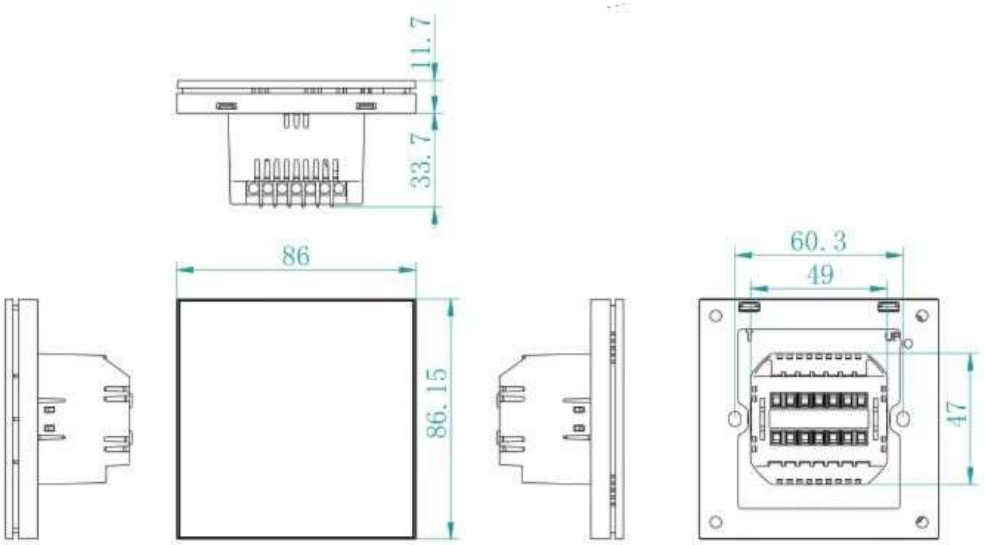
Important!

- A qualified electrician with the understanding of wiring diagrams and knowledge of electrical safety should complete installation following the instructions.
- Before installation, please confirm the real voltage complying with the device's specification. Cut off any power supply to secure the safety of people and device.
- During installation, protect the device from any physical damage by dropping or bumping. If happens, please contact the supplier for maintenance.
- Keep the device away from acid-base and other corrosive solids, liquids, gases, to avoid damage.
- Avoid overexertion during operation, to protect device from mechanical damage.
- Read all instructions and documentation and save for future reference.

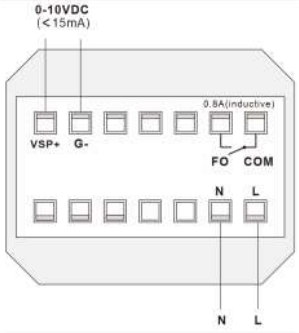
CAUTION: Cut off power supply at circuit breaker or fuse before installation to avoid fire, shock or death!



Step 1: Remove the steel frame from the device, and secure it onto the junction box with two screws.
Step 2: Insert all wires into the right terminals and tighten screws. The wiring diagram is shown below.
Step 3: Attach the wired device on "A" points of the steel frame as shown above, and then push the "B" point into junction box.
Step 4: Confirm the device is well mounted, power on and it is ready to operate.

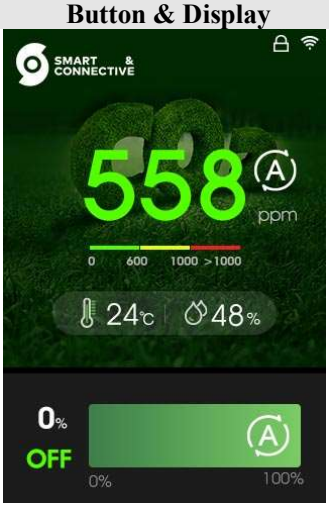


Wiring Diagram



Button & Display

Manual Mode



Auto Mode

Timer Mode

CO2 Sensor Description

1. Accuracy range:

Range: 380 ppm - 5000 ppm

Accuracy: ± (100 ppm + 10% of the reading)

2. Automatic calibration instructions:

To ensure the accuracy of CO2 detection, the sensor will automatically calibrate once a week. Please ensure that the sensor comes into contact with fresh air with a concentration of less than 400 ppm at least once within a week.

3. Power-On instructions:

After the device is powered off for more than 3 hours, the CO2 reading will have a relatively large error within the first hour after power-on. This is normal. After 1 hour, the accuracy range will automatically return to the normal range.

There are 5 buttons: "**Up**", "**Down**", "**Auto**", "**Timer**", "**Power**":

Icon	Button	Definition
	Up	Used for increasing the analog valve parameters from 0% to 100%
	Down	Used for decreasing the analog valve parameter from 0% to 100%
	Auto	Click to select, the main interface will display the auto icon and enter the auto mode.
	Timer	Selecting the timing option will set the time range from 0.5 to 24 hours, with a step size of 0.5 hours.
	Power	Power on: Display the main interface Power off: Turn off the screen and output "Off".

Function Description

Function	Operation
Power ON/OFF	When the device is powered off, short press the power button to enter the Power On display; When the device is powered on, short press the power button to enter the shutdown and screen-off mode.
Mode Setting	Press the "Auto" button to switch to the Auto mode and display the Auto icon: Auto mode: Based on the CO2 concentration settings in the menu, the green indicator represents the maximum value (default 600) and the red indicator represents the minimum value (default 1000). According to the internal control logic, the opening ratio of the fan valve is automatically adjusted to keep the indoor CO2 concentration below the green concentration value. In Auto mode, press the "Up" and "Down" adjustment keys, it will switch to manual mode. Manual mode: press the "Up" or "Down" adjustment keys, and the valve opening will automatically increase or decrease. The step size is 10% (the step size can be set in the menu).
Delay Shutdown Function	Press the timer button to enter the delay shutdown setting. Press once to increase by 30 minutes. The setting will take effect immediately. Short press the "Up"and "Down" adjustment keys to deactivate the delay and enter the Manual mode. Short press the mode button to deactivate the delay and enter the Auto mode.

Secret Menu	When the valve is in the closed state, simultaneously press the "Mode" and "Timer" keys to enter the Secret Menu settings (local parameter table): When the valve is in the open position, simultaneously press the “Mode” and “Timer” keys to enter the local operation lock settings.

Secret Menu

Number	Function	Description	Default	Possible Values
0	Standby brightness	Brightness after 30 seconds of no operation 0%：Screen off 10%,20%,35%,50%:brightness	0%	0%,10%,20%,35%,50%
1	Beep set	Off, Low, Medium, High	Medium	
2	Panel lock	ON: Local key operation is ineffective OFF: Local key operation is effective	OFF	
3	Power failure memory	Off/Manual/Auto/Memory	Memory	
4	Manually set the valve step size	1-20：unit %	10	1-20
5	CO2 concentration in green with the maximum value	400-900:unit ppm	600	400-900
6	CO2 concentration in red with the minimum value	800-1500：unit ppm	1000	800-1500
7	Minimum opening voltage	0-5：unit volt	0	0-5
8	Maximum opening voltage	0-10：unit volt	10	0-10
9	CO2 calibration value	n*1ppm,measurement value + calibration value = display value	0	-500-+500
10	Temperature calibration value	n*0.1 °C,measurement value + calibration value = display value	0	-99-+99
11	Humidity calibration value	n*1%，measurement value + calibration value = display value	0	-50-+50
12	Maximum timed value	The maximum hourly setting for the timing function	6	1-24

13	Execute CO2 calibration	When the CO2 detection value exceeds the accuracy range for a long time, use it as follows: 1. Set the calibration target value (i.e., the actual CO2 concentration value in the environment within 3 minutes) 2. Press the mode button to confirm the start of calibration. 3. Wait for the calibration to complete and the sensor's calibration RFC value will be displayed.	N/A	N/A
14	Factory restore	1. Restore the factory setting. 2. Restore the factory settings of the CO2 sensor.	N/A	N/A

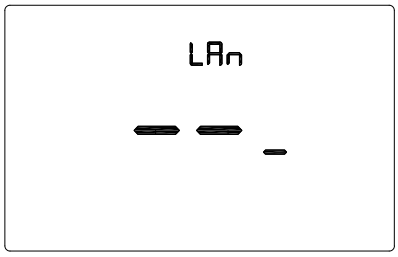
Z-Wave Operation

- **Including & Excluding of Z-Wave network**

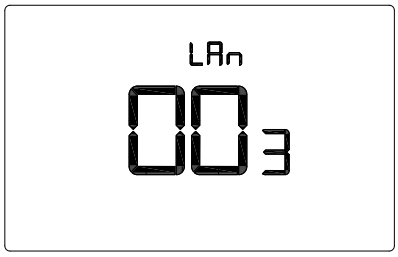
  In normal working interface, long press ∨+ ∧ enter interface for inclusion or exclusion of Z-Wave network.

  Before the device included into network, "- - -" will display on the screen. Then press Ⓐ once, device will enter learning mode to get a node ID. If inclusion is success, a node ID will display on the screen in a few seconds. Then, it will automatically return to the main interface after 1 second. A node ID can always inform us whether the device is in the network or not.

Note: Follow the same steps to exclude the device from the network. When removed, the device will restore its Z-Wave factory setting.



Before Inclusion (No Node ID)



After Inclusion (Node ID is 003)

- **Command Class supported by the device (support S2 encryption command):**

COMMAND_CLASS_VERSION,

COMMAND_CLASS_SWITCH_BINARY,

COMMAND_CLASS_CONFIGURATION,

COMMAND_CLASS_SCENE_ACTUATOR_CONF,

COMMAND_CLASS_SCENE_ACTIVATION,

COMMAND_CLASS_SWITCH_MULTILEVEL,

COMMAND_CLASS_SENSOR_MULTILEVEL,

COMMAND_CLASS_THERMOSTAT_MODE,

COMMAND_CLASS_ASSOCIATION,

COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION,

COMMAND_CLASS_ASSOCIATION_GRP_INFO,

COMMAND_CLASS_MANUFACTURER_SPECIFIC,

COMMAND_CLASS_DEVICE_RESET_LOCALLY,

COMMAND_CLASS_POWERLEVEL,

COMMAND_CLASS_FIRMWARE_UPDATE_MD

Command Class supported by the device (Not support S2 encryption command):

COMMAND_CLASS_ZWAVEPLUS_INFO,

COMMAND_CLASS_TRANSPORT_SERVICE_V2,

COMMAND_CLASS_SECURITY_2,

COMMAND_CLASS_SUPERVISION

- **Association Group**

AG Identifier	Max Node ID	Command Class	Trigger situation
1	1	COMMAND_CLASS_SWITCH_BINARY, SWITCH_BINARY_REPORT	The fan valves are fully opened or closed.
		COMMAND_CLASS_DEVICE_RESET_LOCALLY, DEVICE_RESET_LOCALLY_NOTIFICATION	Restore factory settings.
		COMMAND_CLASS_SWITCH_MULTILEVEL，SWITCH_MULTILEVEL_REPORT	When the proportion of the opening or closing of the fan

			valves changes
		COMMAND_CLASS_SENSOR_MULTILEVEL，SENSOR_MULTILEVEL_REPORT	1. The variation of the CO2 detection value is greater than the set value of parameter No. 4. 2. The variation of the temperature detection value is greater than the set value of parameter No. 2. 3. The variation of the humidity detection value is greater than the set value of parameter No. 3.
		COMMAND_CLASS_THERMOSTAT_MODE，THERMOSTAT_MODE_REPORT	When the working mode is turned off or on

- **Z-Wave Parameter Setting**

Number	Name	Size	Information	Default	Possible Values
2	Temperature difference reporting	2	Unit 0.1℃ 0: Disabled 3-255: n *0.1℃ automatically report the temperature to the gateway when temperature variation greater than this value	3	0, 3-255
3	Humidity difference reporting	1	0: Disabled 1-99：Automatically report the humidity to the gateway when humidity variation greater than this value	5	0-99
4	CO2 difference reporting	2	0: No change - automatic reporting. 1 - 255: Unit N * 10 ppm. If the difference between the current detection value and the value reported to the gateway last time is greater than this value, report the current detection value automatically.	10	0-255
5	Report CO2 value to gateway regularly	2	0: Uninterrupted automatic reporting. 30 - 30000: Units per second. Report the current value to the gateway every N*1 seconds.	600	0, 30-30000

6	Z-Wave lock	1	0: The gateway can control normally. 1: The gateway cannot control the fan valve.	0	0-1
10	Standby brightness	1	Brightness after 30 seconds of no operation 0：Screen off 1：10%，2:20%，3:35%，4:50%	0	0-4
11	Beep set	1	0:Off 1:Low 2:Medium 3:High	2	0-3
12	Panel lock	1	1:Local key operation is ineffective 0:Local key operation is effective	0	0-1
13	Power failure memory	1	0:Off 1: Auto 2: Memory	0	0-2
14	Manually set the valve step size	1	1-20：unit %	10	1-20
15	CO2 concentration in green with the maximum value	2	400-900: unit ppm	600	400-900
16	CO2 concentration in red with the minimum value	2	800-1500：unit ppm	1000	800-1500
17	Valve closing voltage	1	0-5：unit volt	0	0-5
18	Valve fully open voltage	1	1-10：unit volt	10	1-10
19	CO2 calibration value	2	n*1ppm,measurement value + calibration value = display value	0	-500 ~ +500
20	Temperature calibration value	1	n*0.1 ℃, measurement value + calibration value = display value	0	-99 ~ +99
21	Humidity calibration	1	n*1%, measurement value + calibration value = display	0	-50 ~ +50

	value		value		
22	Maximum timed value	1	When the timing function is enabled, set the maximum value for the timing hours.	6	1 ~ 24
254	Execute CO2 calibration	1	0: Invalid 1: When the detection value has a significant deviation, place the product outdoors (ensuring that the CO2 value in the clean air is less than 400ppm) for 3 minutes, and this will automatically correct the CO2 detection value.	0	0-1
255	Factory restore	1	0: Invalid 1: Restore factory CO2 2: Restore factory settings	0	0-2

1-Year Limited Warranty

We warrant this product to be free from defects in material and workmanship under normal and proper use for one year from purchase date of the original purchaser. We will, at its option, either repair or replace any part of its products that prove defective by reason of improper workmanship or materials. THIS LIMITED WARRANTY DOES NOT COVER ANY DAMAGE TO THIS PRODUCT THAT RESULTS FROM IMPROPER INSTALLATION, ACCIDENT, ABUSE, MISUSE, NATURAL DISASTER, INSUFFICIENT OR EXCESSIVE ELECTRICAL SUPPLY, ABNORMAL MECHANICAL OR ENVIRONMENTAL CONDITIONS, OR ANY UNAUTHORIZED DISASSEMBLY, REPAIR OR MODIFICATION. This limited warranty shall not apply if: (i) the product was not used in accordance with any accompanying instructions, or (ii) the product was not used for its intended function. This limited warranty also does not apply to any product on which the original identification information has been altered, obliterated or removed, that has not been handled or packaged correctly, that has been sold as second-hand or that has been resold contrary to Country and other applicable export regulations.