VentPlus CO2 Controller
Model: 202

Introduction

VentPlus CO2 Controller Model 202 is a useful device for homes, offices, gyms, school classrooms, banquet halls, and other enclosed spaces where it is important to maintain carbon dioxide levels within healthy limits.

Carbon dioxide levels in fresh outdoor air are typically around 420 ppm (parts per million). In enclosed spaces such as bedrooms, offices, and conference rooms, this level rises rapidly because humans continuously exhale carbon dioxide while breathing.

Earlier, ventilators near the ceiling were a standard feature in most Indian homes and offices. These allowed fresh air to enter and helped keep indoor carbon dioxide levels under control. However, with modern airtight windows and the absence of ventilators, CO2 levels can rise significantly. In a fairly large bedroom with just two people sleeping, CO2 levels can easily reach 1650 ppm or even higher.

According to commonly accepted indoor air quality guidelines, CO2 levels up to 1000 ppm are generally considered acceptable, while levels above 1500 ppm can begin to affect alertness, comfort and health.

VentPlus CO2 Controller continuously monitors the carbon dioxide level in the surrounding air. When the CO2 level rises above a preset threshold, the device automatically switches on power to a connected fresh-air or exhaust fan.Once the fan starts, fresh air enters the room and the carbon dioxide level gradually decreases. When the CO2 level falls below a preset lower limit (for example 800 ppm), the fan automatically switches off.

This ensures that the room receives just the required amount of fresh air to maintain healthy indoor air quality while avoiding unnecessary air-conditioning energy losses.

Front Panel

Typical Set-up

Display Information

The graphical display provides the following information:

- Current carbon dioxide level in large font
- Air CO2 category
  - Below 600 ppm: Excellent
  - 600 - 999 ppm: Good
  - 1000 - 1499 ppm: Moderate
  - 1500 - 2499ppm: Poor
  - 2500 - 3999 ppm: Very Poor
  - Above 4000 ppm: Severe
- Maximum CO2 level recorded since the last historic data reset
- Fresh air fan turn on and turn off thresholds
- Temperature (°C) and humidity (%)
- Number of times the fan has operated and total fan running time since the last historic data reset

Keyboard and Settings

The device includes a convenient keyboard for modifying the settings.

Press the SEL key for more than 1 second to enter the Settings Menu.

Using the settings menu, the user can:

- Display device Firmware version
- Reset historic data (maximum CO2 level, fan operation count, and fan running time)
- Edit the following settings:
  - Set fan ON and OFF levels
  - Set LCD brightness
  - Enable or disable the warning beeper
  - Set warning beeper on / off level
  - Enable or disable automatic backlight OFF at night
- Restore factory default settings
- Calibrate the CO2 sensor (After several months of use, the sensor baseline may drift slightly. To re-calibrate the sensor, place the unit in open outdoor air, and choose ‘Calibrate CO2 sensor’ option. The unit will wait for 20 minutes and then set the new baseline based on the fresh air CO2 level of about 420 ppm.

The device uses a high-quality NDIR (Non Dispersive Infra Red) CO2 sensor.

Effects of Carbon Dioxide Levels on Health

Carbon dioxide is a natural by-product of human metabolism and is continuously produced by the body during breathing. However, when CO2 concentration in surrounding air rises beyond normal levels, it can affect cognitive performance, comfort and long-term health.

Typical CO2 levels:

Normal outdoor air: ~420 ppm

Indoor levels are often higher because people continuously exhale CO2.

Excellent air (CO2 level: 400–600 ppm)

- The air is as good as outside fresh air

Good air (CO2 level: 600 - 1000)

- No noticeable adverse effect on mind or body

Moderate air (CO2 level: 1000–1500 ppm)

- Reduced attention
- Slower decision making

Poor air (CO2 level: 1500–2500 ppm)

- Reduced attention
- Slower decision making
- Yawning, feeling sleepy

Very Poor air (2500 - 4000 ppm)

- Reduced attention
- Slower decision making
- Yawning, feeling sleepy
- Mild fatigue
- Feeling of “stuffy air”
- Mild Headache

Severe air (Above 4000 ppm)

- Feeling of “stuffy air”, Breathing discomfort
- Fatigue
- Headache
- Possible long term health effects

For good indoor air quality, many ventilation standards recommend maintaining indoor CO2 levels below 1000 ppm in bedrooms and below 1500 ppm in offices, gyms, banquet halls, waiting rooms etc.

Technical Specifications

S No	Item	Description
1	**Measured parameters**	1. CO2 concentration level in ambient air 2. Temperature 3. Humidity
2	**Measurement range and accuracy:**	
	CO2 concentration level	Range: 400 - 5000ppm. Accuracy: +/- (50 ppm + 5% of the reading) after 10 minutes warm up period
	Temperature	Range: 0 - 50 deg C. Accuracy: +/- 0.2 deg C
	Humidity	Range: 0 - 95% RH. Accuracy: +/- 2% (from 10% to 90% RH), 4% outside this range.
3	**Programmable Settings:**	Fresh air fan turn on CO2 level (Above this the fan output is On) (Default: 1000 ppm)
		Fresh Air fan turn off CO2 level (Below this the fan output is off) (Default: 800 ppm)
		Warning beeper on/off level (Default: 1500 ppm)
		Beeper Enable / Disable (Default: Enabled)
		LCD backlight brightness (Default: 75%)
		LCD backlight off at NIGHT (Default: Yes)
4	**Input power**	230V +/- 15% 50 Hz A.C.
5	**Output**	Relay operated AC supply to power a fresh Air Fan / Exhaust. Max. Current 5A
6	**Display:**	128x64 pixel back-lit graphic display which can display 8 rows of about 22 characters each for display of running parameters during operation and setting parameters while modifying the settings
7	**Keyboard**	4 Keys: ESC, INCR, DECR, SEL (for help in editing Settings). (Some older models have NEXT key also which has the same function as SEL)
8	**LED indicators**	Output fresh air fan / Exhaust relay on
9	**Working temperature range**	-5 to 50 deg C
10	**Working Humidity range**	0 ~ 95% RH (No condensation)
11	**Microcontroller controller**	ARM-based 32-bit advanced microcontroller

*Specifications may change without notice as part of continuous product improvement.

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