

‘How to’ Use CO₂ monitors in education and childcare settings



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The DfE's CO₂ monitor programme

- CO₂ monitors will be rolled out to state-funded education settings throughout the Autumn term. You can expect to receive your full allocation of monitors from the DfE in one delivery.
- Special, Alternative Provision and Residential settings will be prioritised for first deliveries from September.
- **You will receive an email directly from our supplier** once your monitor allocation is dispatched. You should only contact the supplier if the delivery has not been made after the date indicated on your email.
- These monitors are portable so you can easily move them around your full estate. Not all spaces are suitable for CO₂ monitoring. **You will receive sufficient monitors to take representative readings from across the indoor spaces in your estate; roughly 1 monitor for every 2 teaching rooms.** Precise numbers will vary according to different setting types.

Introduction

This guide sets out how education and childcare settings can use CO₂ monitors most effectively to help identify poor ventilation.

Good ventilation can help reduce the risk of spreading coronavirus, so a focus on improving general air flow, preferably through fresh air or effective mechanical systems, can help to create a safer environment for staff and students. You can generally maintain and increase the supply of fresh air by opening windows and doors – **although fire doors must remain closed.**

CO₂ levels as measured by monitors are a proxy for good ventilation. You can use CO₂ monitors to help you:

- 1 assess how well ventilated your spaces are
- 2 balance good ventilation with thermal comfort

It is important to remember that CO₂ monitors are an indicator of ventilation status and not infection risk.

There are many different types of CO₂ monitors available. The most effective portable devices to use are non-dispersive infrared (NDIR) CO₂ monitors. This is the type provided by DfE to eligible education settings over the autumn term 2021.



Remember: you should continue with basic preventative measures such as regular handwashing and cleaning regimes.



What is in the box with the CO₂ monitor and how do I set it up?

A CO₂ monitor looks like this:



In the box with the monitor you should find the following:

1. CO2 Monitor Unit



2. USB Cable for Power



3. User's Manual



Or relevant
QR code

4. AC Adapter (Optional)



! Some monitors may come with batteries instead of a USB cable and an AC adapter.

Where should you use CO₂ monitors?

CO₂ monitors are best suited to spaces which are densely occupied for approximately one hour or more.

In education and childcare settings this includes, but is not limited to:

- ✓ teaching spaces (including lecture rooms, classrooms and practical teaching spaces)
- ✓ indoor play spaces (e.g. rooms in nurseries)
- ✓ staff rooms, large offices, meeting rooms, group or breakout rooms

Monitoring is not recommended for use in areas where CO₂ monitors are unlikely to give reliable readings, including:

- ✗ large, open internal spaces and spaces with higher ceilings, such as sports halls or atriums
- ✗ spaces that are densely occupied for shorter periods, such as corridors or lobbies
- ✗ areas with low occupancy density including kitchens and toilets, or offices with one or two occupants

! Rooms that already have CO₂ monitoring integral to their building management system will not require additional standalone monitors. Your facilities management team should know if monitoring is already in place.

Guide to placement and rotation of monitors & measuring

Placement

When deciding where to place monitors, you should initially prioritise spaces that feel constantly stuffy or smell unpleasant as these are likely to be under-ventilated. Using a monitor in these spaces first can help you prioritise action effectively. You should place CO₂ monitors:

- at head height when seated
- away from ventilation outlets, such as grilles or windows
- at least 0.5 m away from occupants (closer than this could give inaccurate readings)

Rotation of monitors

- You can rotate monitors around the building and the spaces that are suitable for monitoring, so that you can identify ventilation needs across your setting.
- Rooms should be monitored for at least one full day before rotating them to a different space.
- You can keep your rota simple: start with potentially under-ventilated rooms as set out above and then move your monitors to other rooms (prioritise those most used/with the highest occupation density).
- If you find that rooms are consistently well ventilated there is no need to continue keeping them on your rota for monitoring CO₂ levels.
- If placed in a new room, the monitor might need to refresh (produce a new measure) a few times before settling on a new reading.

Measuring

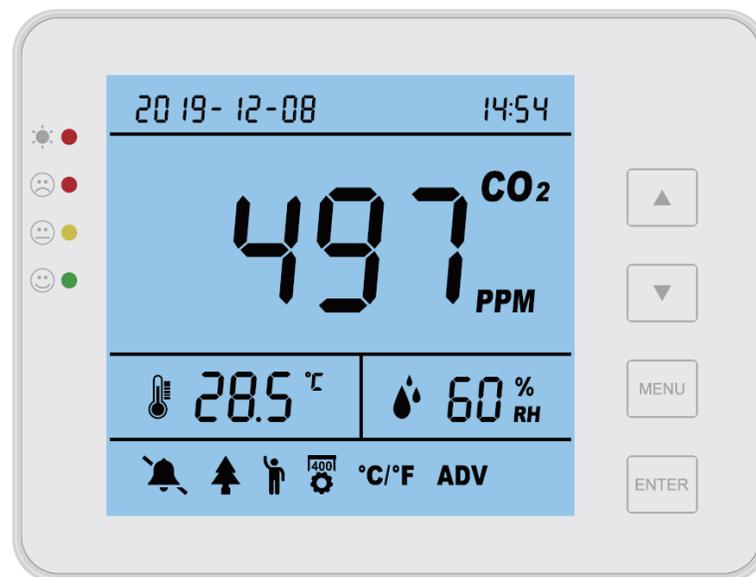
- Depending on the model, your CO₂ monitor will refresh and show a new reading anywhere from every few seconds to every 10 minutes.
- **When to measure:** Depending on how the room is being used, staff may wish to check the measure shown on screen mid-way during class and at the end, or ask someone in class to do so. There should be no need to interrupt a lesson to take a reading.

Understanding CO₂ monitor readings

A consistent value under 800ppm will show as green and does not require any action and implies that a space is particularly well ventilated. A consistent value of over 800ppm will show as amber/orange and should be seen as an early indicator to increase ventilation.

A consistent value over 1500ppm CO₂ concentration in an occupied space is an indicator of poor ventilation. This will also be indicated by a red light on the CO₂ monitors supplied by DfE. Monitors not supplied by DfE may be calibrated so that the red light comes on at a lower or higher level.

You should take action to improve ventilation where CO₂ readings are consistently higher than 1500ppm. There is no need to stop using the room.



This monitor shows a CO₂ concentration of **497ppm**

- **Remember to look out for consistently high values:** Because many factors influence the level of CO₂ measured in a space, a single snapshot reading is unlikely to be reliable. We therefore recommend waiting for 5 minutes before taking action, to allow for a reading to settle.

Advice on improving ventilation

 It is important to remember that high CO₂ levels in a room are **not a direct proxy for infection risk**. CO₂ monitors are intended to help you identify areas that are poorly ventilated, so that you can explore what steps you can take to improve ventilation. **There is no need to stop using the room.**

Comprehensive advice on how to improve ventilation in your setting is available from PHE, HSE, and DfE. Please consult:

- Public Health England's (PHE) guidance on [ventilation of indoor spaces to stop the spread of coronavirus \(COVID-19\)](#)
- The Health and Safety Executive's (HSE) guidance on [ventilation and air conditioning during the coronavirus \(COVID-19\) pandemic](#)
- The [CIBSE COVID-19 advice](#)
- [Operational guidance](#) for your sector
- The [contingency framework for education and childcare settings](#).

Note on risk assessments

- Your setting risk assessment should cover identifying any poorly ventilated spaces, including through the use of CO₂ monitors if available. If you do not already address ventilation in your assessment, you should add this as soon as you receive your CO₂ monitors.
- For more information on what leaders must do in relation to health and safety risk assessments and managing risk, see [health and safety: responsibilities and duties for schools](#). HSE provides more information on this [here](#).
- You should note that health & safety law says that employers, including education and childcare settings which are the employers for their settings, must make sure there is an adequate supply of fresh air (ventilation) in enclosed areas of the workplace. This has not changed during the COVID-19 pandemic.

Questions & Answers

? **Question: My CO₂ monitor delivery hasn't arrived, or my monitor is faulty, what can I do?**

Answer: Please contact the supplier of your device directly; they will be able to assist on all questions relating to deliveries and faults (see slide 13 for contact info).

? **Question: I haven't got enough CO₂ monitors, how can I access more?**

Answer: Not all spaces are suitable for CO₂ monitoring. You will receive sufficient monitors to take representative readings from across the indoor spaces in your estate. We recommend creating a rota plan and move monitors around the premises as needed. If you have fewer devices than this and you suspect there has been a mistake please [get in touch with the DfE](#) coronavirus helpline on 0800 046 8687.

? **Question: I have taken the suggested remedial actions but my CO₂ monitor is still reading over 1500ppm, what should I do?**

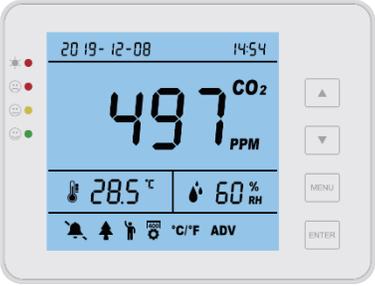
Answer: We expect the vast majority of fixes to be relatively minor. There should not be any need to stop using the room while you are conducting remedial work. Please consult PHE and HSE guidance as set out on slide 9.

? **Question: I already have CO₂ monitors in my school/college, should I continue to use them?**

Answer: Yes, if you already have CO₂ monitors installed you should continue to use them. Any additional CO₂ monitors you receive can be used to check rooms that are not fitted with monitors.

Contact information

- 1 For any queries about faulty devices or missed deliveries, please contact the supplier directly:**

| | |
|---|--|
|  | <p>Rexel</p> <p>Tel: 0330 0450 606</p> <p>Monday to Friday from 7am to 7pm.</p> |
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|  | <p>CEF (Flamefast)</p> <p>Tel: 01926 350018</p> <p>Monday to Friday from 9am to 5pm.</p> |
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- 2 For any further queries about your DfE-provided CO₂ monitors, you can call the DfE coronavirus helpline**

Telephone: 0800 046 8687

Monday to Friday, 8am to 6pm

Saturday to Sunday, 10am to 6pm

[Find out about call charges](#)

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