

# Air quality and installation of CO<sub>2</sub> sensors

## Note on carbon dioxide (CO<sub>2</sub>)

Carbon dioxide is **naturally produced by human respiration**. The presence of CO<sub>2</sub> in educational facilities **does not negatively affect the health of occupants**; however it is an indicator of the ventilation quality and is a comfort parameter.

- ❖ In **outdoor air**, CO<sub>2</sub> comes from various sources, especially the combustion of fossil fuels. The CO<sub>2</sub> concentration varies **around 400 ppm**. In **indoor air**, it mainly comes from air exhaled by the occupants. The concentration can vary and is **higher than 400 ppm**.
- ❖ Normal concentrations of CO<sub>2</sub> in indoor air generally **do not negatively affect the health of occupants**. They may vary based on factors such as the number of occupants, the size of the room, the type of activity involved, the length of time spent in the room and the effectiveness of ventilation.
- ❖ CO<sub>2</sub> levels are one possible air quality indicator. A high level of CO<sub>2</sub> may indicate air stagnation, meaning that ventilation in rooms may have to be improved. CO<sub>2</sub> levels are also a **comfort parameter**, like relative humidity and temperature.
- ❖ A daily CO<sub>2</sub> concentration average **of less than 1500 ppm** can be used as an indicator of **good ventilation**. For newer buildings (constructed after 2014), the average daily CO<sub>2</sub> level must not exceed 1000 ppm.
- ❖ The exchange of indoor and outdoor air, through both natural and mechanical ventilation, is the primary method used to modify CO<sub>2</sub> concentrations in occupied rooms.

## Installation of CO<sub>2</sub> sensors

- ❖ In line with the ministerial requirement, CO<sub>2</sub> sensors will be installed in **all** classrooms, specialized rooms, laboratories and libraries.
- ❖ **Real-time readings** will allow users to intervene quickly and directly in rooms.
- ❖ Whether or not the **windows are opened** can be adjusted based on the CO<sub>2</sub> levels displayed on the sensor. This allows for the best possible ventilation and a more comfortable temperature.

For more information, see [Québec.ca](https://www.quebec.ca).

<https://www.quebec.ca/en/education/preschool-elementary-and-secondary-schools/air-quality-schools>

## Actions to be taken based on the CO<sub>2</sub> reading displayed on the sensor

CO <sub>2</sub> concentration displayed (sensor or reader)	Action to be taken	
	Natural ventilation	Mechanical ventilation
< 1000 ppm Desirable measurement range	<p>Continue to open the windows as stated in the directive:</p> <ul style="list-style-type: none"> <li>➤ <b>Open windows on both sides of the building, including windows in hallways</b></li> <li>➤ <b>Open the door, if possible</b></li> <li>➤ <b>Air out rooms as much as possible between classes and over lunch</b></li> </ul>	No action is required.
Between 1000 and 1500 ppm Acceptable measurement range	In addition to the standard practices, open the windows and doors wider, based on the temperature.	If possible, open the windows and doors, if the temperature allows.
Between 1500 and 2000 ppm Upper limit of the measurement range	In addition to the standard practices, open the windows and doors wider, regardless of the temperature.	If possible, open the windows and doors.
> 2000 ppm Do not pass this threshold	<p>Air out the room more often by opening the windows and doors wider.</p> <p>Use breaks to air out the rooms.</p> <p>If the problem continues despite these actions, inform the school administration, who will apply the required corrective measures.</p>	If possible, open the windows and doors. Inform the school administration.