Project: School in Berkshire
Date of report: 17/04/2019
Quarter 1 report: January – March 2019

Introduction

This report shows the recorded data of the Ventive PVHR ventilation units, it identifies key performance parameters including indoor and outdoor temperature as well as indoor air quality. This report demonstrates how Ventive's PVHR units maintain a comfortable learning environment.

The data in this report is from a school located in Berkshire. In 2016 various parts of the school were refurbished and three new classrooms were added, Ventive were chosen for the ventilation strategy.

Installation & Operation

Twelve Ventive PVHR units were installed, one for each classroom as well as additionally installed in the library and the IT suite. In the three new classrooms Ventive Purge louvres were also included as part of the package to allow for purge ventilation. The classrooms that under went refurbishment did not have Ventive Purge louvres installed, a manual open window strategy was selected for those rooms to aid purge when the CO2 levels rise.

The PVHR units are mounted within the roof, with fresh tempered air being supplied to the rooms via the heat exchanger built within each unit and the stale air is exhausted out through the terminal to the outdoors. Each unit is provided with a controls system and once installed the systems connect automatically to the Ventive cloud.

Occupants in a room fitted with a Ventive system will notice a white CO2 sensor installed on the wall, displaying a reading of the CO2 levels, represented as parts per million (ppm). The screen is colour-coded to make it easy for occupants to understand the numbers and what mode the system is operating in.

- Green: CO2 levels are below 1500ppm and standard heat recovery mode is engaged
- Orange: CO2 levels are between 1500ppm and 2000ppm and bypass mode is engaged, extra dampers have been opened to increase the rate of air flow in the room
- Red: CO2 levels are above 2000ppm and purge mode is engaged, all dampers have been opened to maximise the rate of air flow and rapidly decrease the amount of CO2 in the room

Data Collection & Analysis

Ventive's control system is supplied with a GSM router which is connected to the Ventive cloud. We are able to collect data on air quality, temperatures and operation modes. Data from the sensors is recorded over 5-minute intervals each day, including weekends.

We review school data weekly; this allows us to build a usage profile for the building and help you to optimise ventilation performance for the best results. Connection to the cloud enables us to alert you whenever data in the system is out of place. Please note this is for a period of one-year from handover.

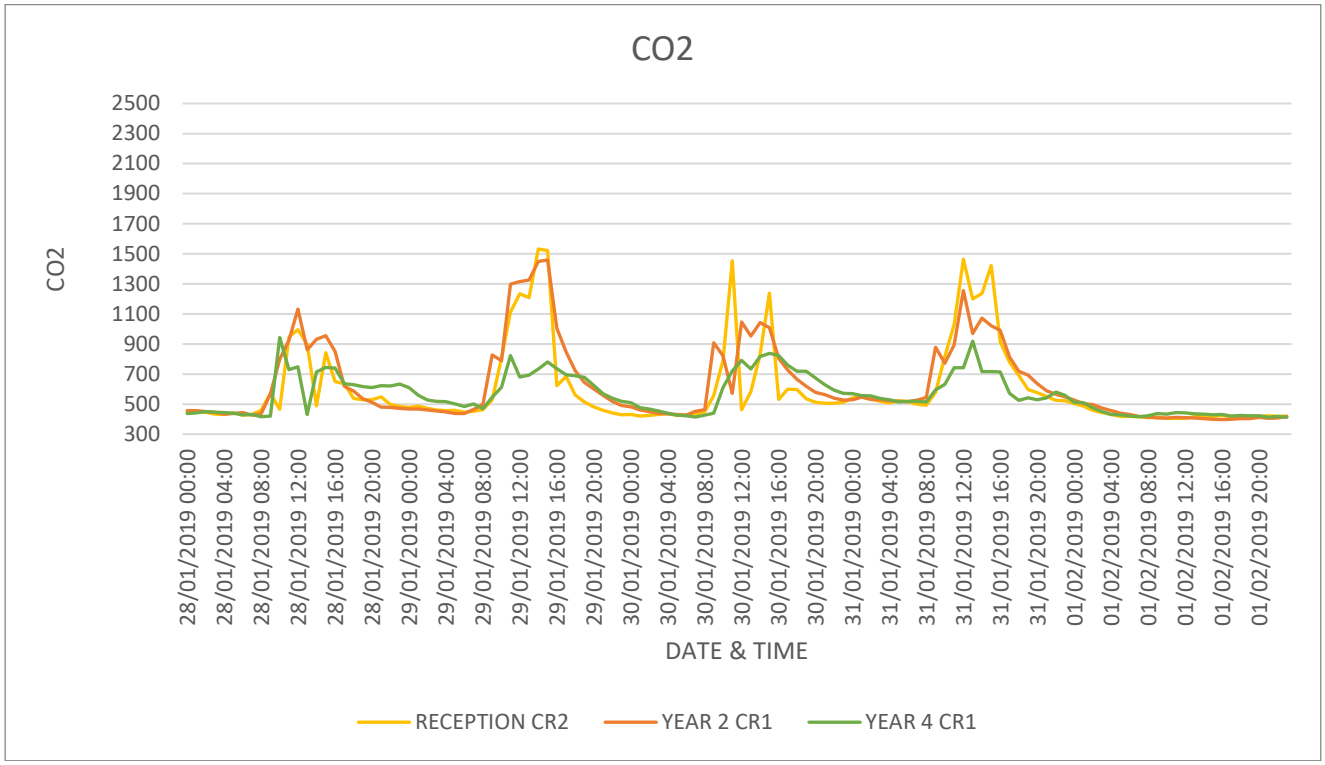
The graphs below show a typical week from January, February and March, when the classrooms would have been occupied. The aim was to establish that the PVHR units kept CO2 levels below the recommended daily average specified in BB101 ensuring a comfortable learning condition was created for the students.

January

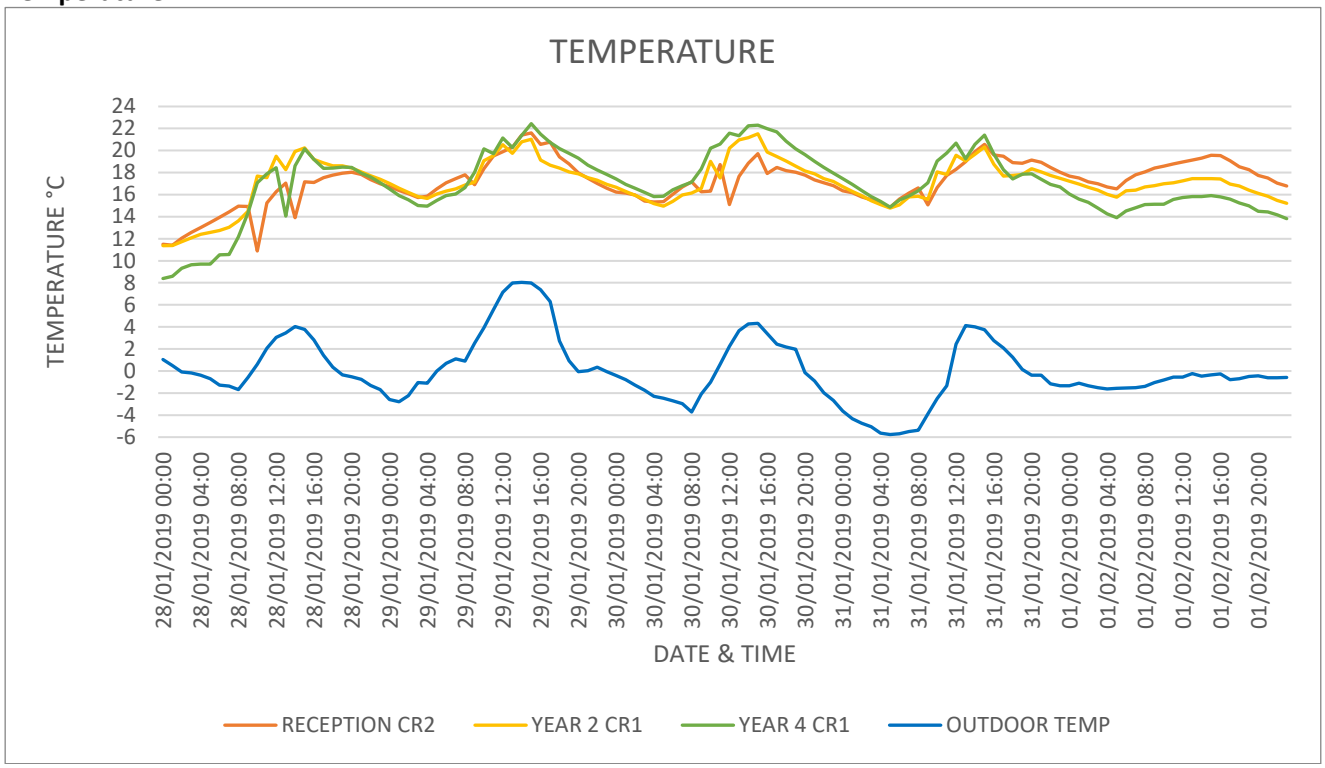
We have selected data from week commencing 28th January.

Classrooms with Ventive Purge louvres installed.

CO2

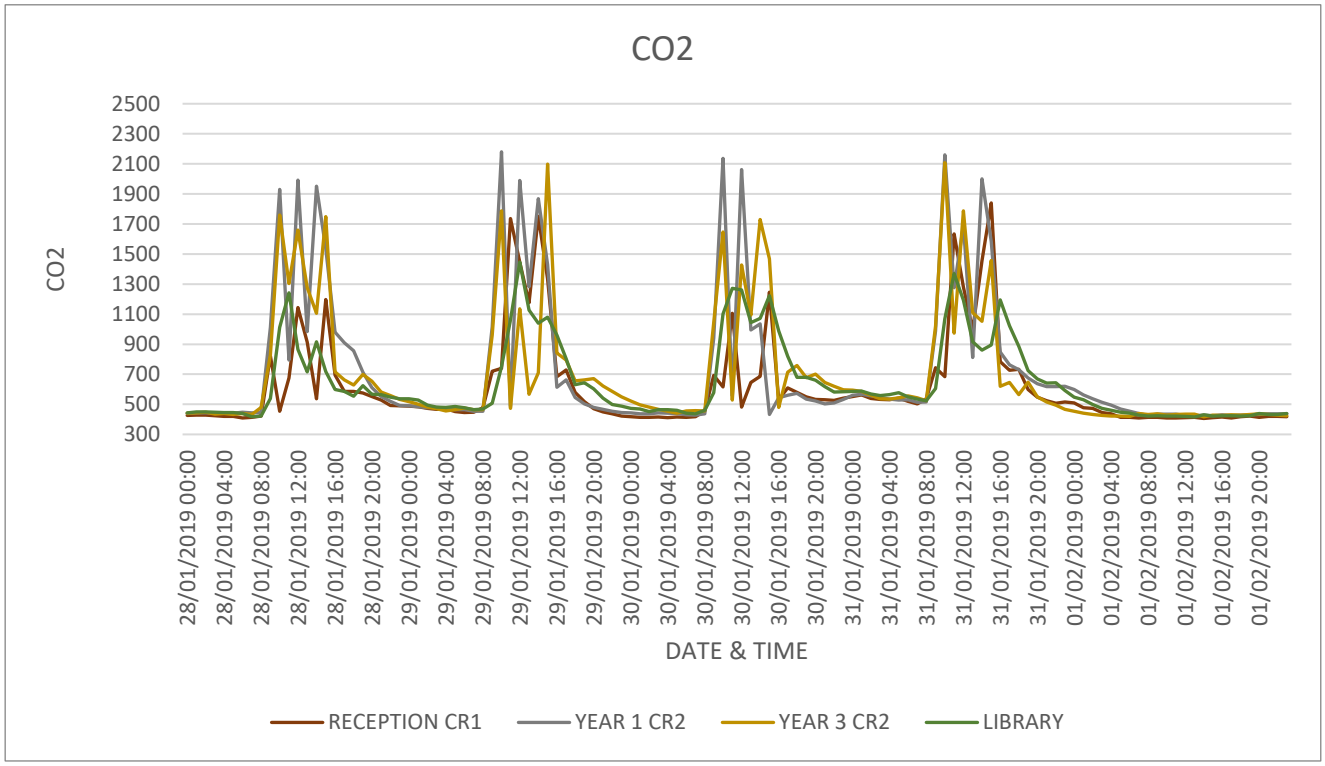


Temperature

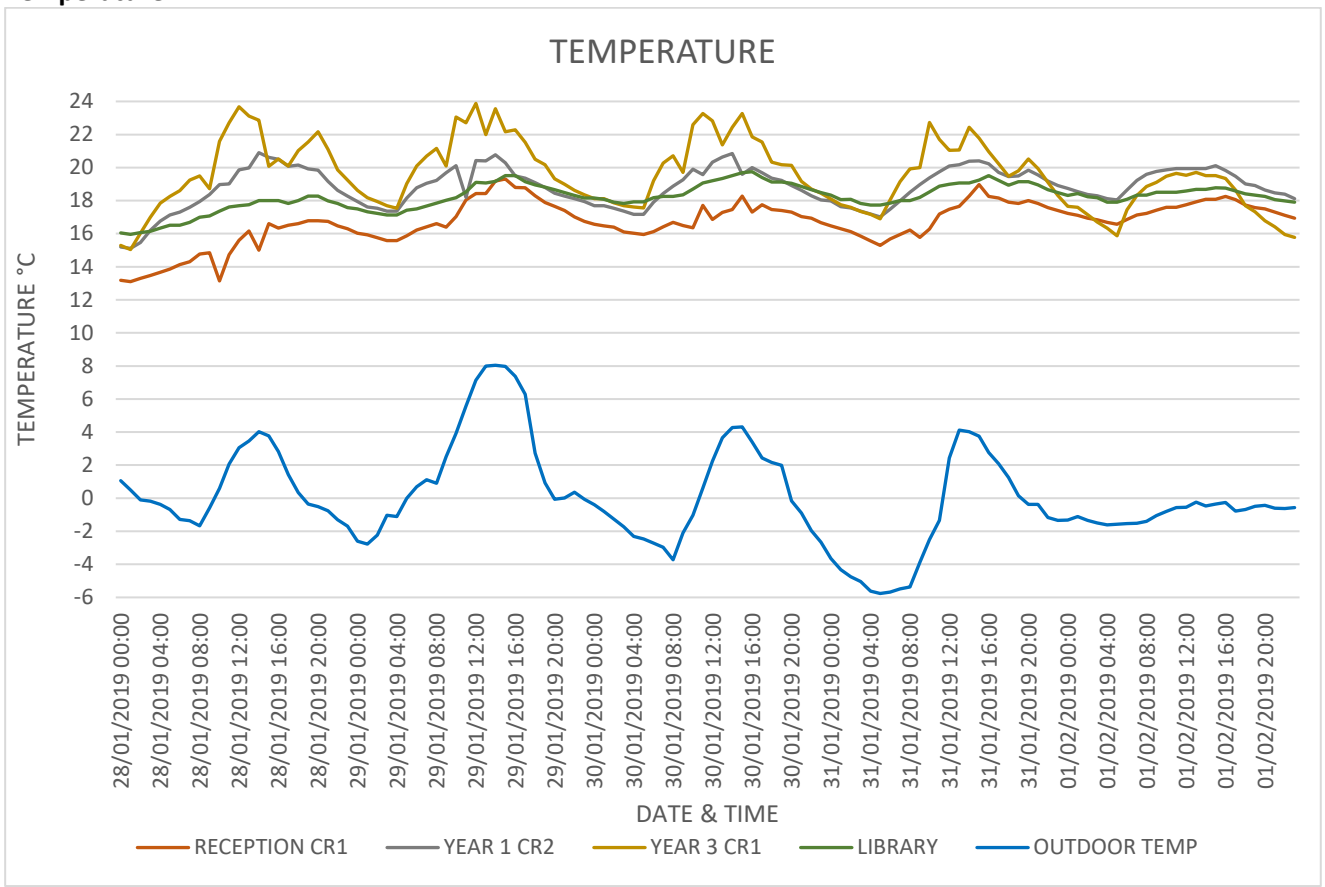


Classrooms without Ventive Purge louvres installed.

CO2



Temperature

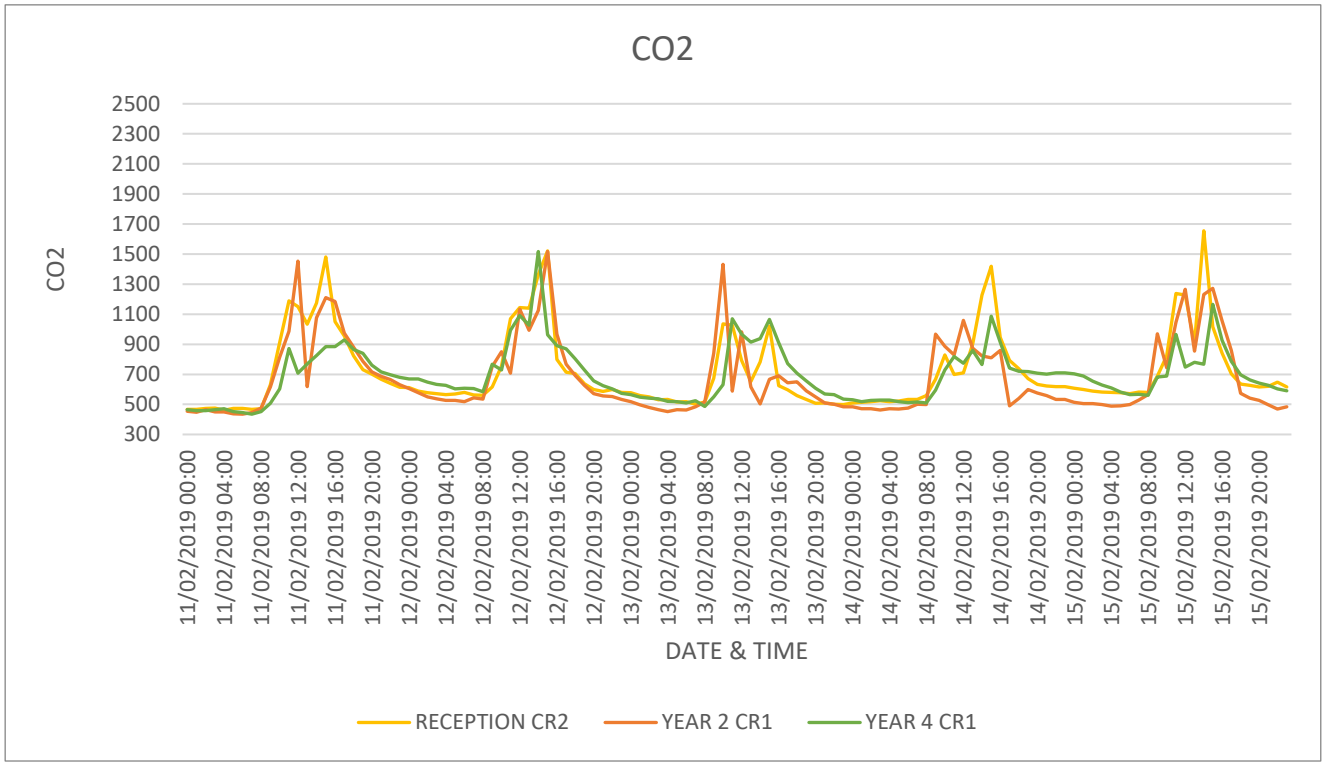


February

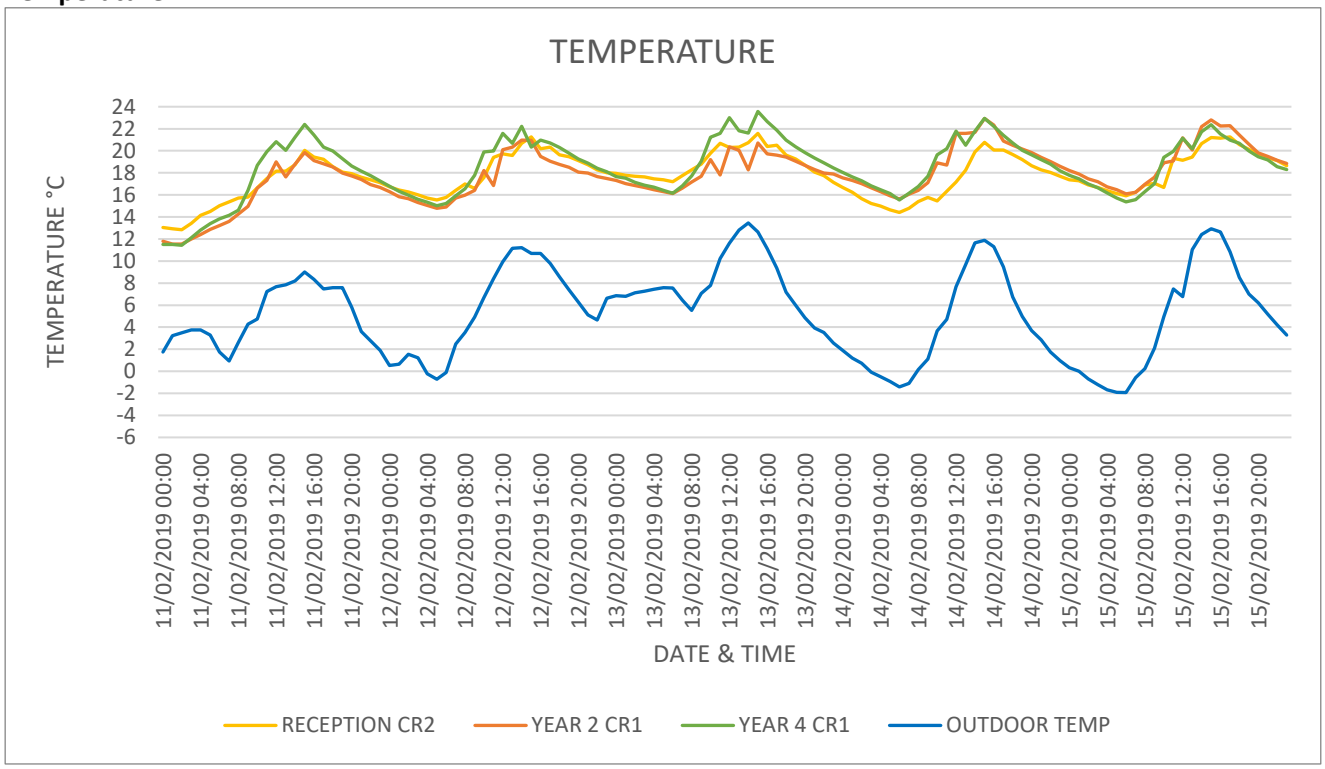
We have selected data from week commencing 11th February.

Classrooms with Ventive Purge louvres installed.

CO2

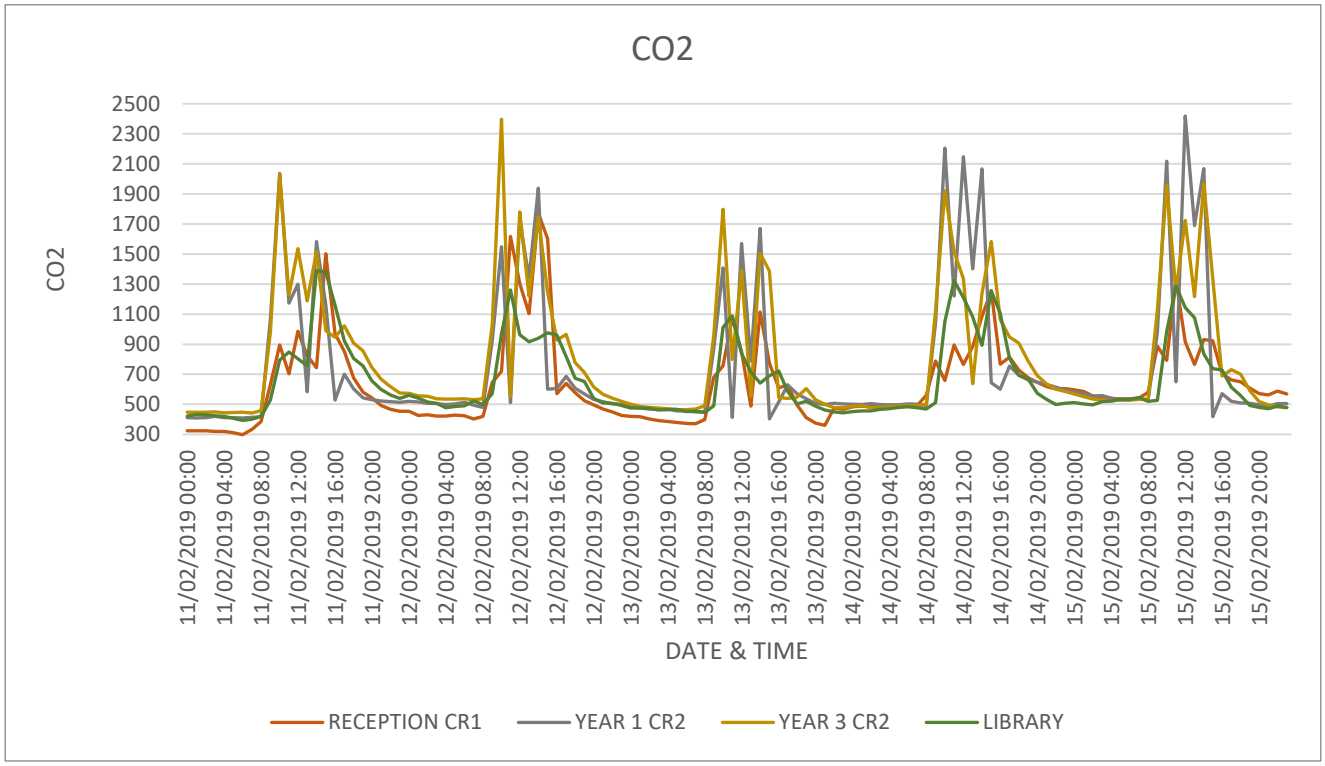


Temperature

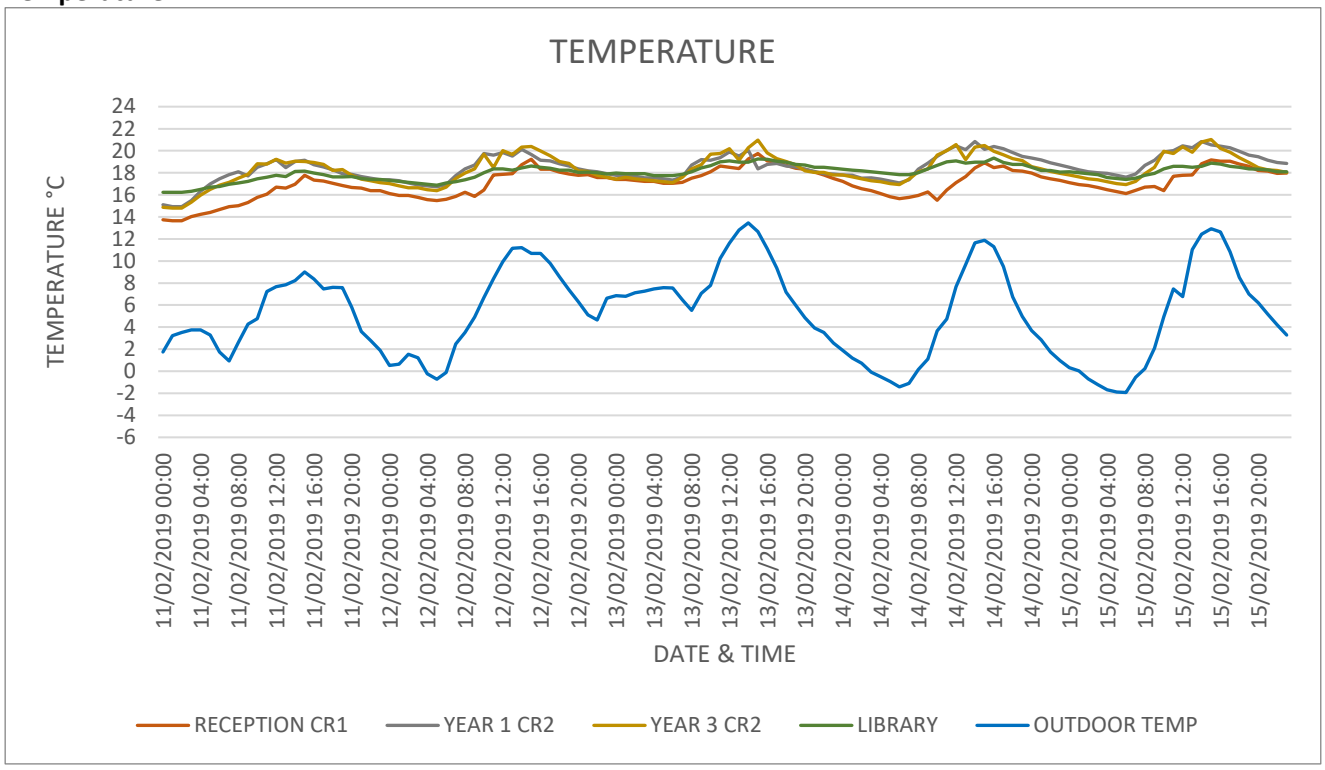


Classrooms without Ventive Purge louvres installed.

CO2



Temperature

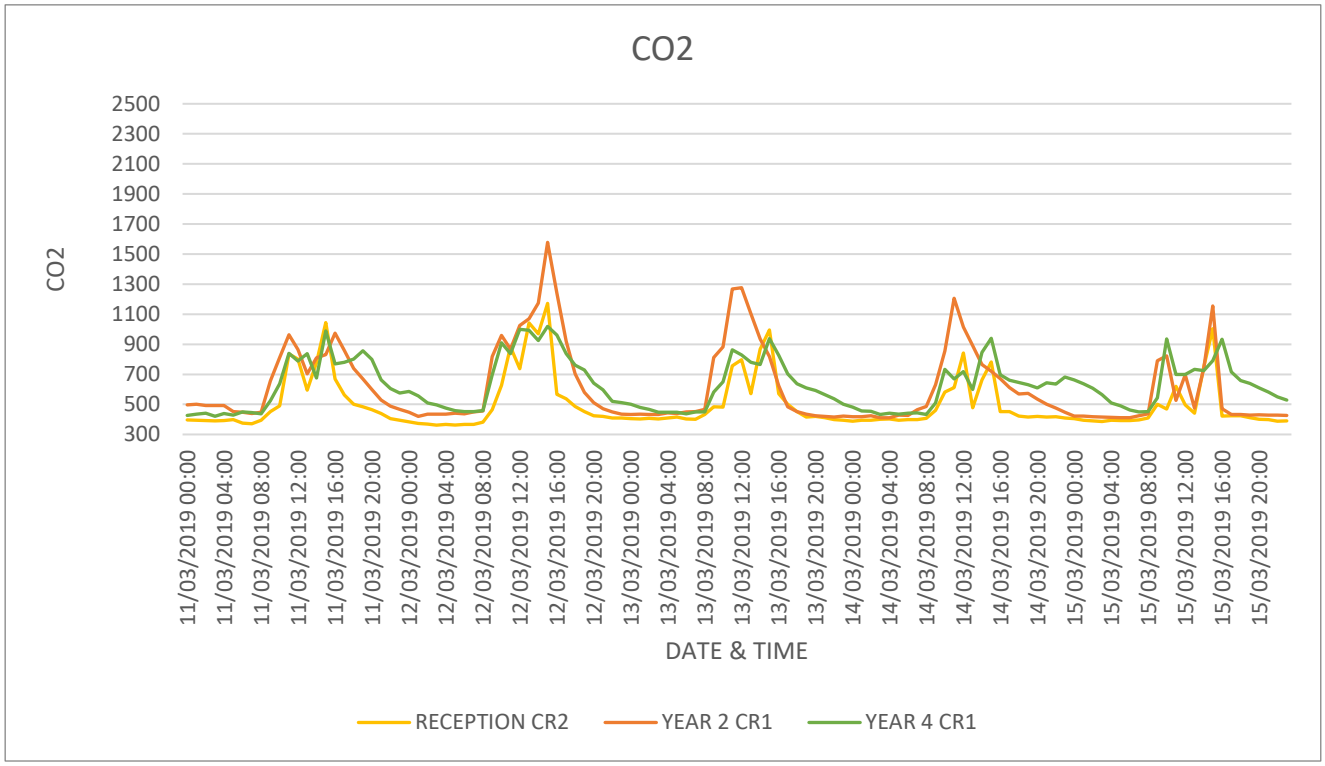


March

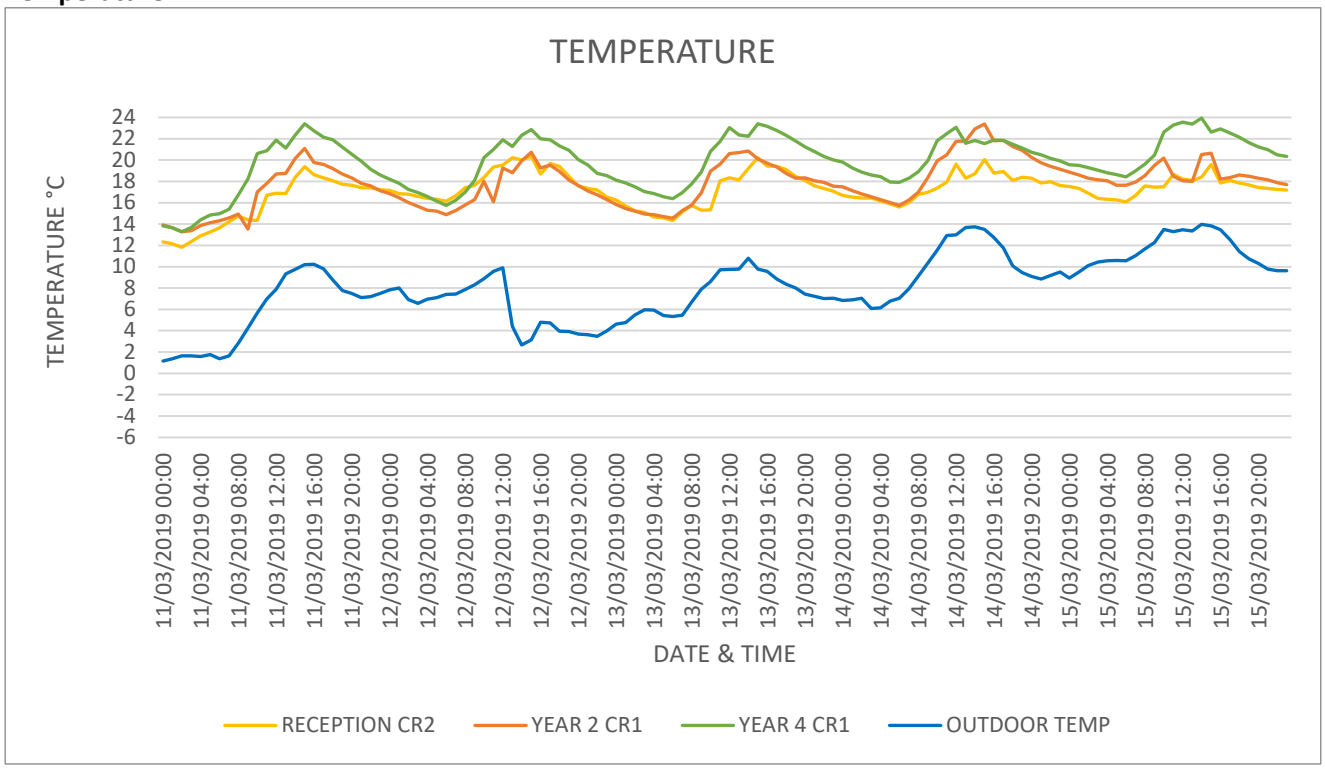
We have selected data from week commencing 11th March.

Classrooms with Ventive Purge louvres installed.

CO2

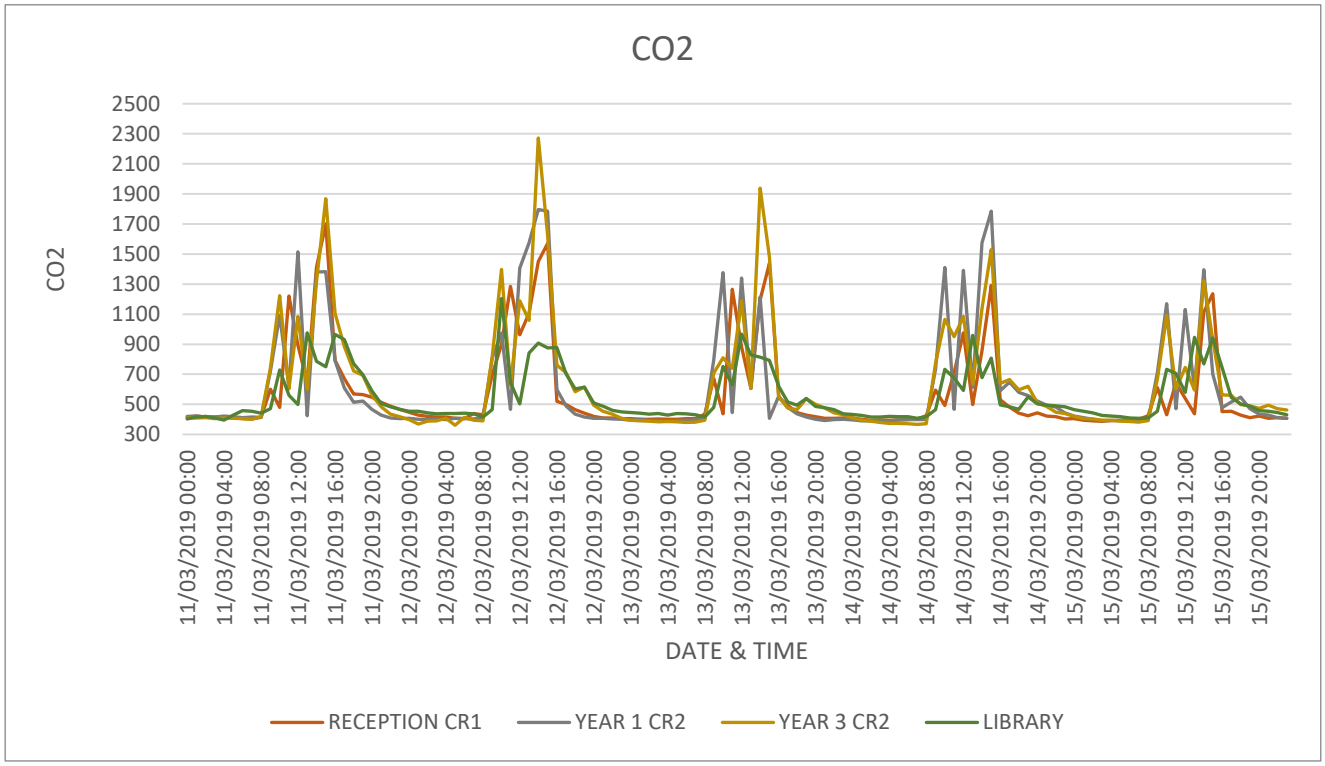


Temperature

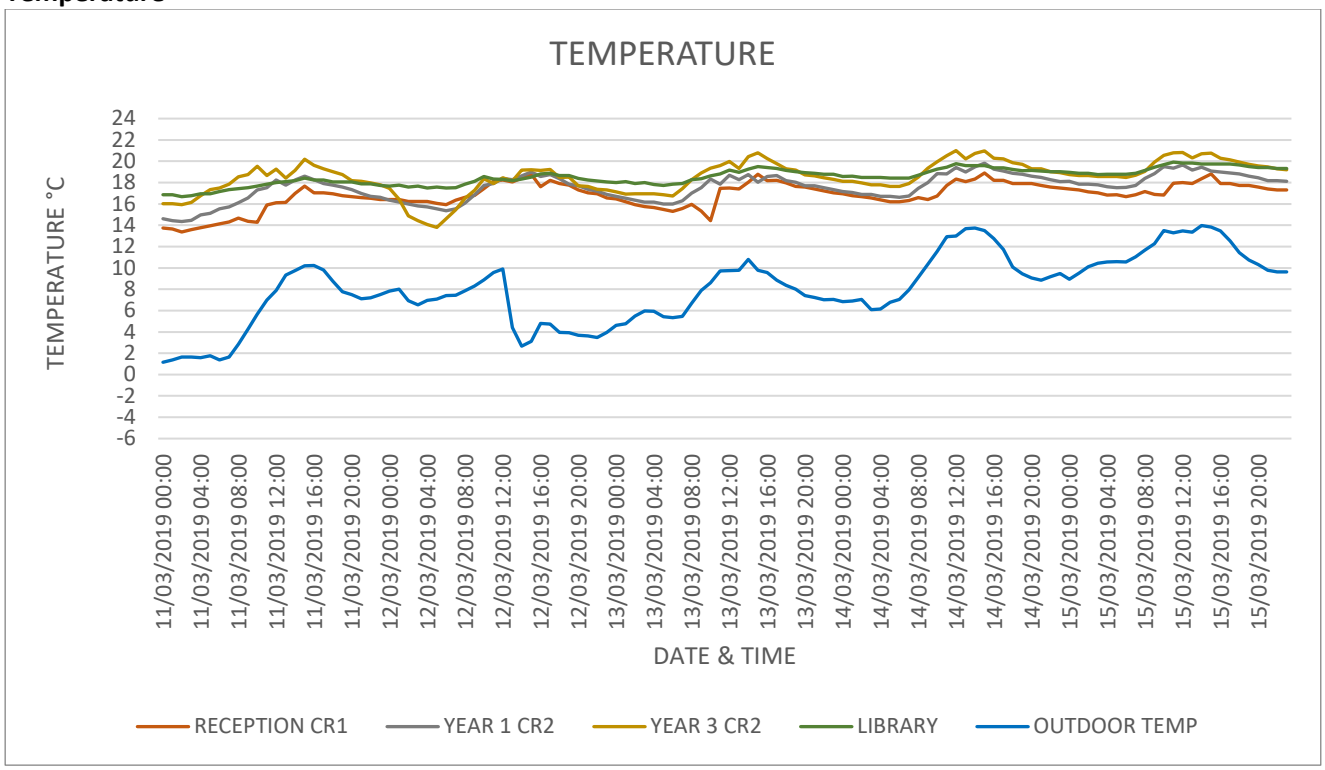


Classrooms without Ventive Purge louvres installed.

CO2



Temperature



Indoor Air Quality

The observed CO2 concentrations (key air quality and BB101 compliance indicator) within the classrooms following the installation of Ventive systems is well within the recommended daily average value. The maximum daily average recommended by BB101 is 1500ppm.

The overall average CO2 level for all classrooms for every day of the month, including weekends, for a 24-hour period is below:

January: 684ppm
February: 596ppm
March: 583ppm

The overall average CO2 level for all classrooms during occupied hours between 9am – 4pm is below:

January: 929ppm
February: 998ppm
March: 902ppm

The classrooms that have Ventive Purge louvres installed very rarely peak over 1500ppm and when they do you can also see that soon after the CO2 level reduced and was back within the recommended guidelines. This indicates that the Ventive Purge louvre would have been signalled to open to provide more fresh air into the classroom which in turn would have reduced the CO2 level.

The classrooms without Ventive Purge louvres tend to peak over 1500ppm more regularly. Ventive's sensor on the wall in the classroom will signal red to advise teachers that the CO2 level is higher than recommended and that a window should be opened. However, this rule may not always be followed.

Summary

From the data that has been collected and analysed it shows that all classrooms with Ventive PVHR units installed have maintained a comfortable indoor temperature and low CO2 level all within the guidelines of BB101.

System Maintenance

Please note the below fault has been reported:

	Date Reported	Reported to	Description	Status
Fault Report	• 27th February • 21st March	• Onsite caretake • Contractor	The sensor in Year 5 Classroom 1 is currently offline. Due to the sensor being offline we cannot currently monitor the air quality in this classroom.	Waiting update from caretake or contractor