MasterMind·Tech
Master the Future

NOVEMBER
2021

REPORT
AIR
QUALITY

Prepared For: ***Confidential Client***

CONTENTS OF THE REPORT

METHODOLOGY

MasterMind · Tech technology is aimed at improving the health and comfort of customers and employees in indoor facilities through air quality management. For this purpose, the system monitors four air parameters to generate an Air Quality Index (AQI).

The content of this report provides the client with a point-by-point view of the air quality in each space, allowing alert conditions to be identified in order to adopt the appropriate corrective measures.

This report does not replace other analysis procedures such as audits. However, it builds its indicator based on technical criteria from recognised sources in the field, applying specific legal regulations (RITE).

1. HISTORICAL RECORD OF DATA

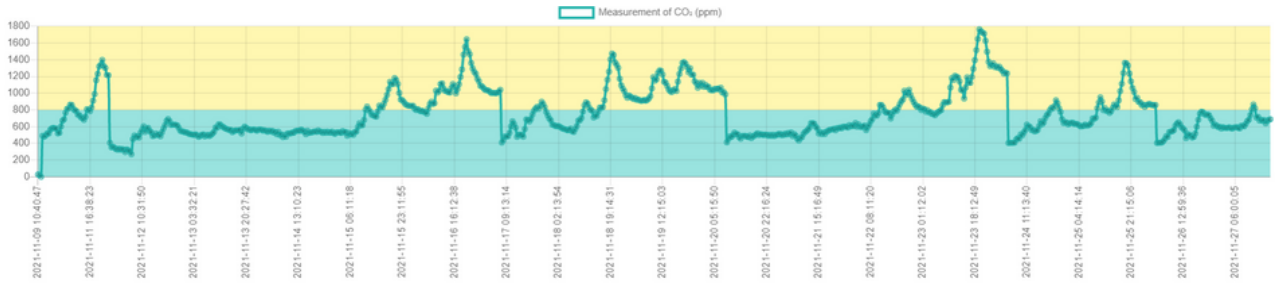
The data used for the analysis in the report have been obtained for 19 days by exporting them to the platform, taking 09/11/2021 as the start date and 27/11/2021 as the end date. These data are organised in tables (shown in the Annexes), consisting of four parameters (CO_2, VOCs, temperature and humidity) for each measurement and the exact date on which they were taken. An example table is shown in this chapter.

The data graphs shown in the following chapter are built from the tables mentioned in the previous paragraph, obtaining four graphs, one for each measured variable.

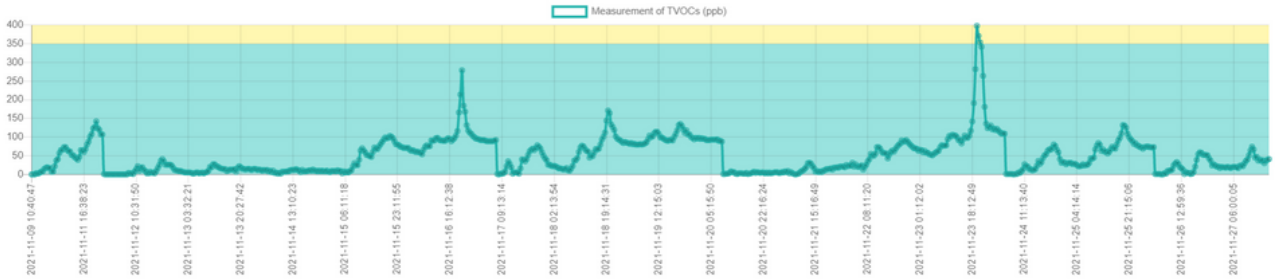
Date and Time	CO2 (ppm)	TVOC (ppb)	Temperature (°C)	Humidity (%)
2021-11-30 14:36:03	990.00	88.00	27.00	67.50
2021-11-30 14:06:01	1007.00	90.00	27.10	67.80
2021-11-30 13:35:59	996.00	89.00	27.30	67.70
2021-11-30 13:05:57	1082.00	95.00	27.00	68.80
2021-11-30 12:35:54	1098.00	97.00	27.20	69.00
2021-11-30 12:05:50	1251.00	111.00	26.80	72.80
2021-11-30 11:35:47	1292.00	117.00	26.80	74.20
2021-11-30 11:05:45	1254.00	111.00	26.90	73.00
2021-11-30 10:35:42	1146.00	100.00	26.50	72.30
2021-11-30 10:05:40	976.00	87.00	26.50	71.40
2021-11-30 09:35:38	867.00	74.00	26.90	66.50
2021-11-30 09:05:37	857.00	73.00	26.90	64.40
2021-11-30 08:35:35	850.00	71.00	26.90	65.70
2021-11-30 08:05:33	819.00	66.00	26.90	64.20
2021-11-30 07:35:32	759.00	55.00	27.10	60.90
2021-11-30 07:05:29	730.00	50.00	26.90	57.50
2021-11-30 06:35:29	728.00	49.00	27.00	59.80
2021-11-30 06:05:28	729.00	49.00	26.80	60.60
2021-11-30 05:35:24	727.00	49.00	26.80	59.50
2021-11-30 05:05:23	711.00	46.00	26.90	58.70
2021-11-30 04:35:23	713.00	46.00	27.00	59.10
2021-11-30 04:05:22	723.00	48.00	26.60	60.50
2021-11-30 03:35:20	726.00	49.00	26.60	61.50
2021-11-30 03:05:19	720.00	47.00	26.50	62.80
2021-11-30 02:35:18	724.00	48.00	26.60	67.00
2021-11-30 02:05:17	712.00	46.00	26.40	68.20
2021-11-30 01:35:16	732.00	50.00	26.80	65.20
2021-11-30 01:05:13	730.00	50.00	26.50	68.20
2021-11-30 00:35:11	748.00	53.00	27.00	65.90

2. DATA GRAPHS

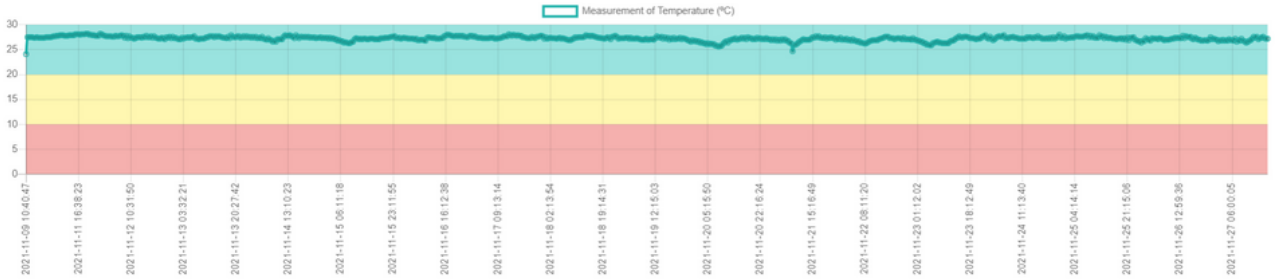
CO_2



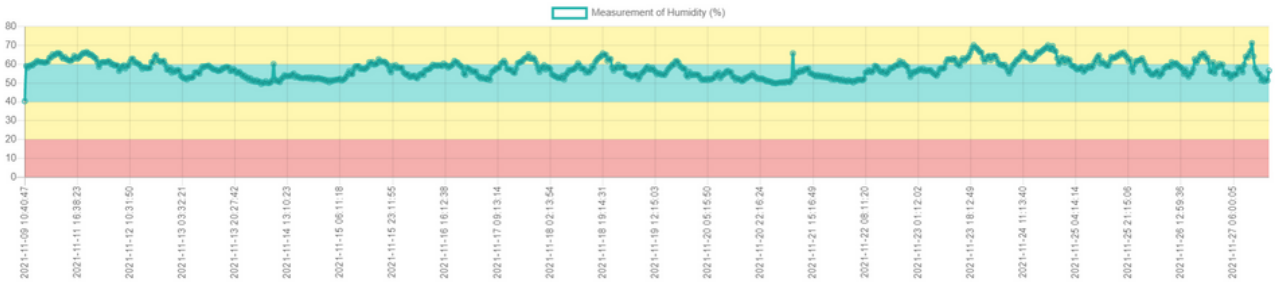
VOCs



Temperature



Humidity

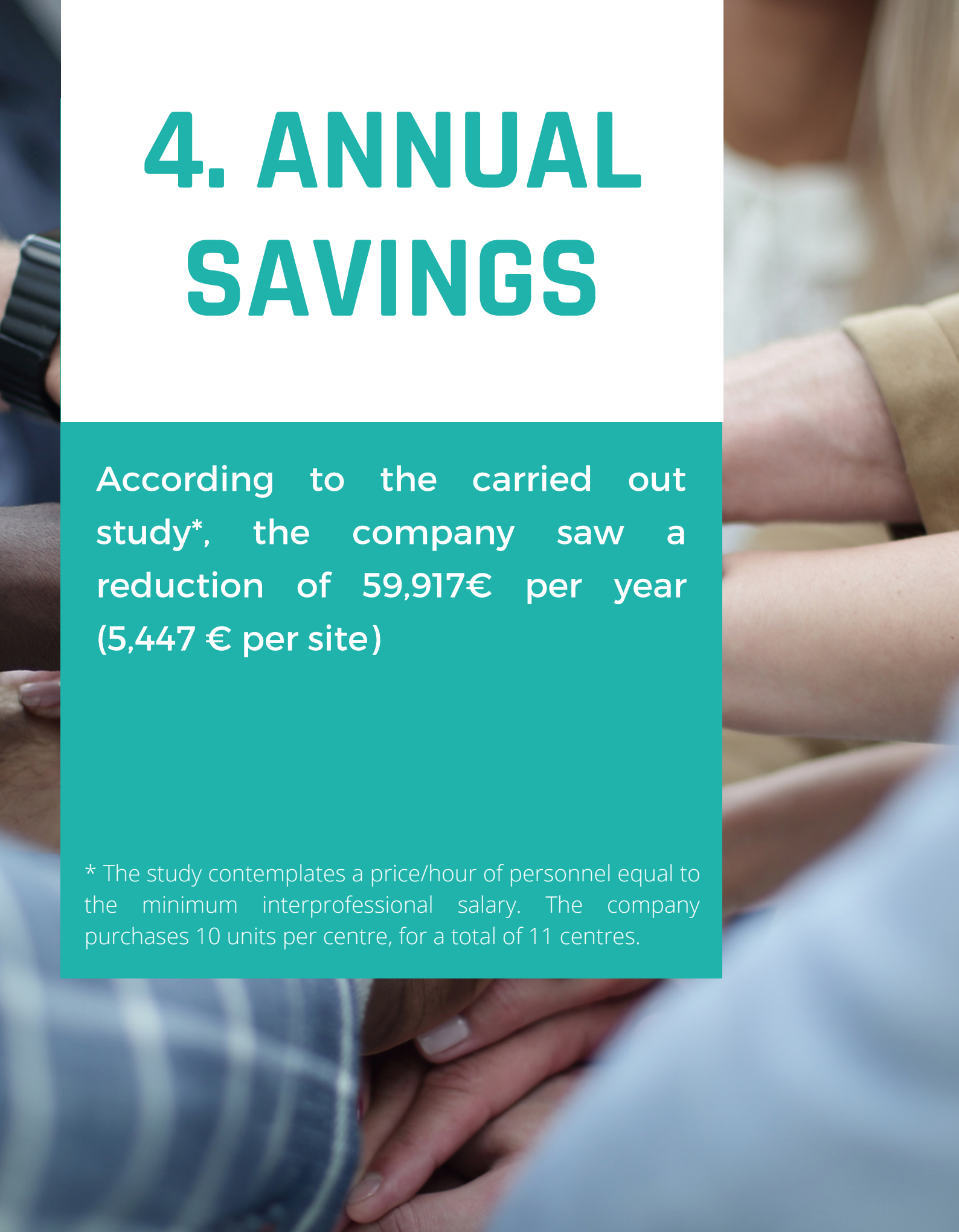


3. DATA ANALYSIS

WE HAVE ACHIEVED OUR GOAL, BUT ARE WE EFFECTIVE?

EQUIPMENT 1				
Code	*******	On-site systems:		
Installation date	2021-10-05 18:32:53	Ventilation	Natural / Heat pump	
Uninstallation date	-	Cooling	Heat pump	
Activity location	Swimming pool	Heating	Heat pump	
Equipment location	West wall	Dehumidification	Yes	
Authorised capacity	75 persons	Other	No	
Average number of people/day	50 persons	At peak times, the opening of windows is insufficient to reduce CO2 levels		
Average stay per person	30 minutes			
				GOOD
Parameters	**Maximum records**	**Minimum records**	**Average (30 days)**	**Index**
PPM CO2	1,764	358	761	Acceptable
PPB VOCs	398	0	50	Good
Temperature (º)	29	22	27	Good
Humidity (%)	70	36	60	Acceptable
Incidents (with or without system warning)				**Frequency**
PPM CO2	Maximum user attendance			Daily (17:00 - 21:00)
PPB VOCs	Maximum user attendance			Daily (17:00 - 21:00)
Temperature (º)	-			Never
Humidity (%)	-			Never
Corrective measures				**Efficiency**
PPM CO2	Opening windows			Insufficient
PPB VOCs	Opening windows			Insufficient
Temperature (º)	Thermostat increase			Sufficient
Humidity (%)	Dehumidifier			Sufficient

General observations: With the modification of the Regulation of Thermal Installations in Buildings due to Covid-19, it is mandatory to comply with the **IDA1** (**designed for hospitals and laboratories**) of **+350ppm** of CO2 and **neither** the **IDA2** (**swimming pools +500ppm**) **nor the IDA3** (**gymnasiums +800ppm**).



4. ANNUAL SAVINGS

According to the carried out study*, the company saw a reduction of 59,917€ per year (5,447 € per site)

* The study contemplates a price/hour of personnel equal to the minimum interprofessional salary. The company purchases 10 units per centre, for a total of 11 centres.

5. RESULTS

The data analysis shows that the highest CO_2 peak of the day occurs at approximately 20:00 hours. The pattern is repeated every day of the week, although at different intensities, with Tuesdays and Thursdays being the days with the highest CO_2 values. It is also observed that on Fridays, Saturdays and Sundays, CO_2 takes very uniform values, preventing the formation of the previously mentioned peak.

The ventilation of the spaces is observed to be significant and sufficient for most of the day, except at the points of maximum CO_2 concentration. Ventilation of the spaces on Tuesdays and Thursdays at 20:00 hours becomes insufficient, although CO_2 values decrease very considerably during this time.

Volatile Organic Compounds values increase and decrease in line with CO_2 values, which is logical and follows the expected behaviour.

As for temperature and humidity, the values of both parameters are significantly stable and are within the threshold of values considered to be correct, even though, in this case, the space is more prone to high humidity.

The study also detects a saving of approximately 1.5 hours per day per centre, compared to the manual methodology used previously. This time translates into a total saving of 59,917 € per year (11 centres) or 5,447 € per centre.

AIR QUALITY IMPROVEMENT

CENTRALISATION AND INCREASED DATA VALIDITY

ANNUAL TIME AND MONEY SAVINGS

ENHANCED CUSTOMER TRUST AND COMFORT

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