

Air Flow Solutions



Susurre™

Mechanical Ventilation with Heat Recovery



RESIDENTIAL FANS



HEAT RECOVERY



INDUSTRIAL FANS



ACCESSORIES

Susurro

Ceiling mounted heat recovery unit for classrooms, offices and conference rooms



INDOOR ENVIRONMENT AIR QUALITY

Clean fresh air is vital for our wellbeing at home, school or work. However, it is not easy to ensure sufficient and effective ventilation. Ideally, the air in the rooms occupied should be exchanged every 2 hours.

Over 65% of those interviewed as part of a BESA study, stated that opening a window is their main form of ventilation. However, opening a window by particularly busy roads simply floods the room of toxic gases and noise which will affect the health, concentration and well-being of those inside.

INDOOR ENVIRONMENT QUALITY

Did you know that people spend 90% of their lives indoors? This fact has an immense impact on our health and wellbeing. There are many indoor effects that adversely affect us, above all: temperature, humidity, CO₂ level and inadequate ventilation.

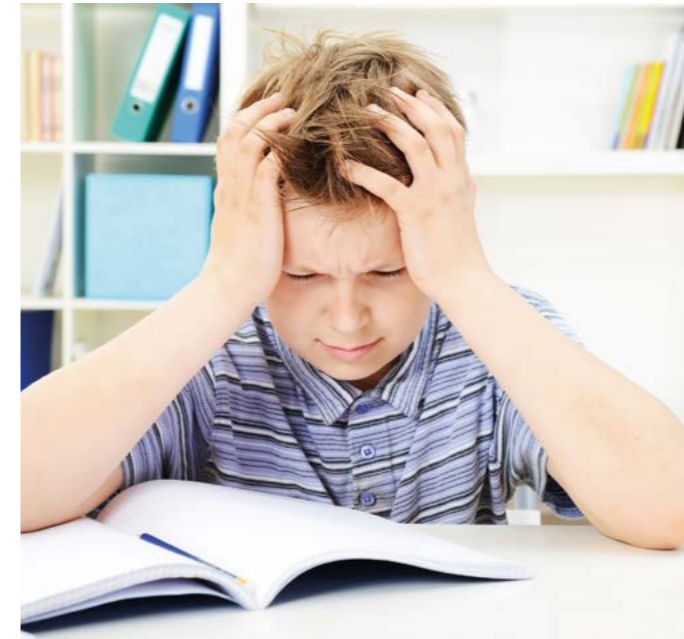
NEGATIVE EFFECTS OF STAYING IN POORLY VENTILATED AREAS:

- Fatigue
- Headache
- Poor concentration
- Allergies
- Compromised immune system

Effects of CO₂ on the human body

Approx. 350 ppm	Comparable to outdoor environment
Up to 1,000 ppm	Recommended optimum indoor CO ₂ level
1,200-1,500 ppm	Recommended maximum indoor CO ₂ level
1,000-2,000 ppm	Onset of the symptoms of fatigue and lower concentration
2,000-5,000 ppm	Possible onset of headache
5,000 ppm	Max. safe concentration without health hazards
> 5,000 ppm	Nausea and increased pulse rate
> 15,000 ppm	Breathing difficulties
> 40,000 ppm	Possible loss of consciousness

SCHOOL INDOOR AIR QUALITY



Indoor air quality has been found to negatively impact concentration and productivity levels within offices and classrooms. This issue is a particular problem in the UK, as 1000's of schools are situated in areas with illegal air pollution levels.

Children stay in classrooms for long periods of time, however classrooms often have insufficient ventilation that negatively impacts the child's concentration levels and ability to learn. In order to combat air pollution in schools, the government introduced Building Bulletin 101(BB101): Guidelines on Ventilation, Thermal Comfort and Indoor Air Quality in Schools.

INDOOR ENVIRONMENT QUALITY

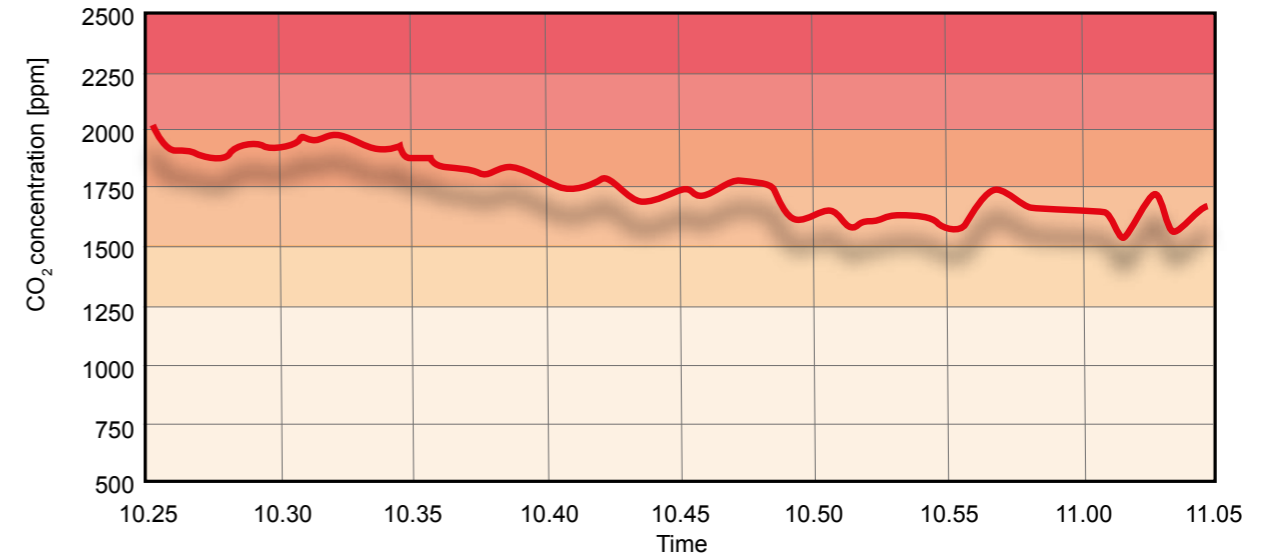
Did you know that it can be difficult to concentrate in a stuffy classroom? But in a properly ventilated classroom, children work faster and are better at solving tasks.

If you want to do better on an exam it's well worth getting some fresh air into the classroom first!

NEGATIVE EFFECTS OF INSUFFICIENT FRESH AIR IN CLASSROOMS:

- Fatigue
- Poor concentration
- Compromised ability to perceive new information
- Demotivation of children

CO₂ concentrations measured during lessons



Total air volume: 250 m³
Pupils in classroom: 30

Windows: tripled glass
Indoor temperature: 22.3 °C

Outdoor temperature: 27 °C,
sunny weather

Windows were closed. Ventilation was ensured by opening doors.

Susurro

Ceiling mounted heat recovery unit for classrooms, offices and conference rooms

TYPICAL APPLICATIONS

Susurro is the ideal unit for educational and professional premises including:

	<ul style="list-style-type: none"> Classrooms & Special Educational Needs Facilities <p>Ensure an indoor air environment that aids learning</p>		<ul style="list-style-type: none"> Nurseries <p>Protect the health of young children</p>
	<ul style="list-style-type: none"> Offices <p>Promote productivity within the workplace with fresh, filtered indoor air</p>		<ul style="list-style-type: none"> Dining Rooms <p>Prevent the build-up of damp and mould</p>
	<ul style="list-style-type: none"> Lecture Theatres <p>Improving the air without distractions</p>		<ul style="list-style-type: none"> Waiting rooms <p>Provide a comfortable indoor air environment</p>
	<ul style="list-style-type: none"> Libraries <p>Aid concentration with discrete ventilation</p>		<ul style="list-style-type: none"> Sports Halls <p>Enjoy temperate, healthy indoor air at all times</p>
	<ul style="list-style-type: none"> Seminar Rooms <p>Offering the ideal air environment for learning and discussion</p>		<ul style="list-style-type: none"> Board Rooms <p>Fresh air gives you the ideal environment to make business decisions</p>

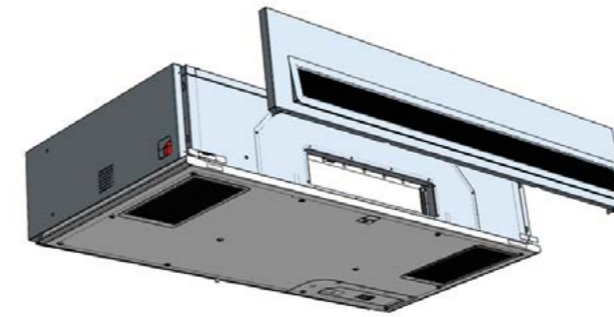


Susurro

Heat Recovery Ventilation

MODELS AVAILABLE

Susurro range includes two casing designs: **Susurro** and **Susurro Dezajno** with a stylish supply air grille and concealed fixings. The advanced electronics technology and high-quality components are identical in both models available.



- The same grille opening for both versions
- Angled supply air grille, so the air flow is directed slightly upwards for a greater Coanda effect
- Finished-look side panels
- Minimalist design with honeycomb stylish elements for a laminar air flow

The Susurro decentralised ventilation units with heat recovery offer the ideal solution for different requirements – both in new and existing buildings. The compact design and simple installation without an air distribution system also prove that Susurro is the perfect ventilation unit for renovation projects.

Two models available (Susurro and Susurro Dezajno),

Three unit sizes available for air flow rates up to 400, 700 and 1000 m³/h (111, 194 and 278 l/s)

One standard configuration available for each size unit (no pre-heater or post-heater coils)

Seven different configurations available for each size unit:

- Unit equipped with electric post-heater
- Unit equipped with water post-heater
- Unit equipped with change-over (C/O) 3-row coil post-heater (for heating and cooling)
- Unit equipped with electric pre-heater
- Unit equipped with electric pre-heater and electric post-heater
- Unit equipped with electric pre-heater and water post-heater
- Unit equipped with electric pre-heater and change-over (C/O) 3-row coil post-heater (for heating and cooling)

Susurro



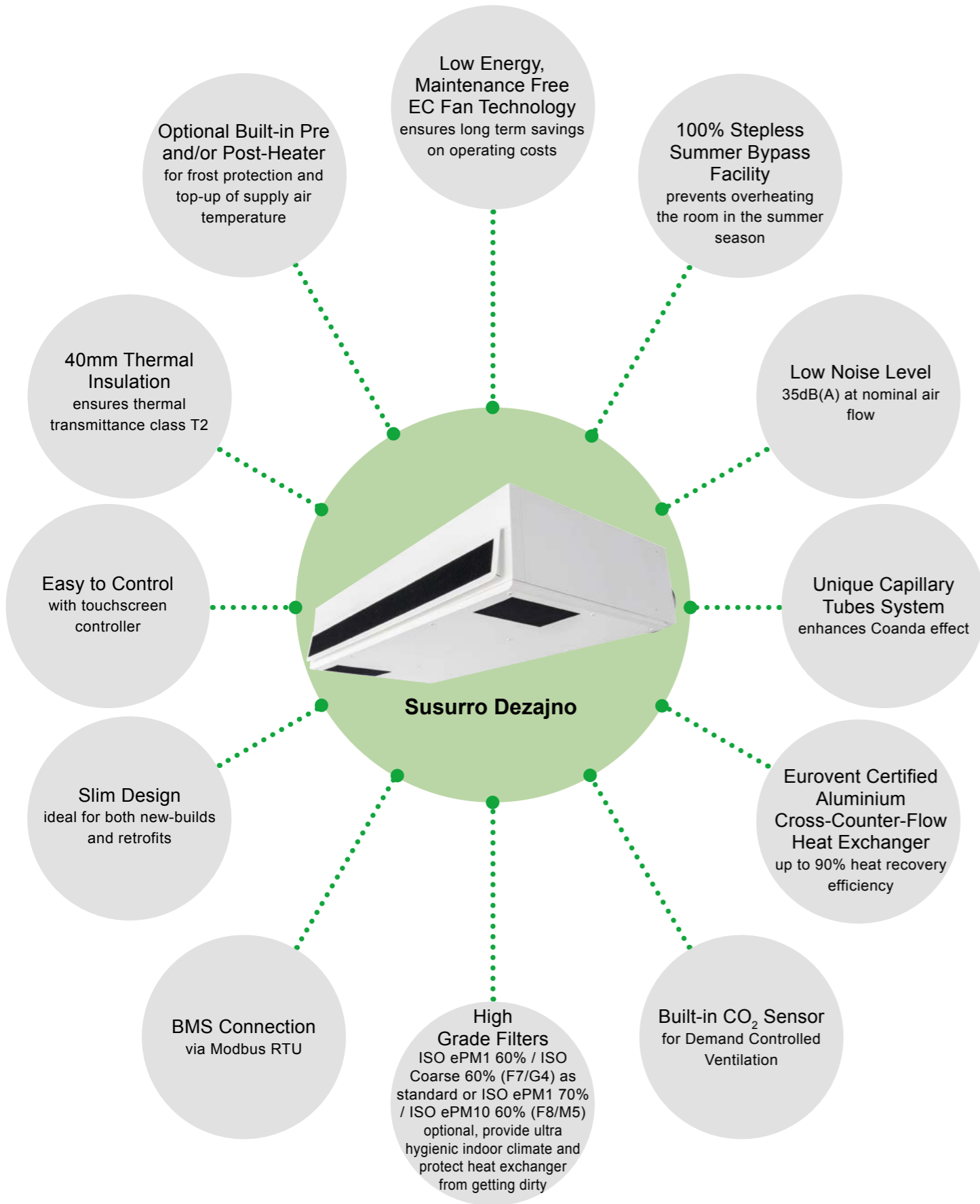
Susurro Dezajno



Susurro

Heat Recovery Ventilation

KEY COMPONENTS



Susurro

Ceiling mounted heat recovery unit for classrooms, offices and conference rooms

BENEFITS OF THE CO₂ SENSOR



The Susurro's integral CO₂ sensor actively monitors the indoor air quality inside the room or office and enables Susurro to automatically adjust its ventilation based on occupant demand; maintaining a healthy, fresh indoor air environment without the occupants having to open a window.

By maintaining healthy CO₂ levels, Susurro improves concentration and productivity levels of students and employees, lowers occupant fatigue, decreases the risk of long-term health issues and reduces the number of days lost due to illness.

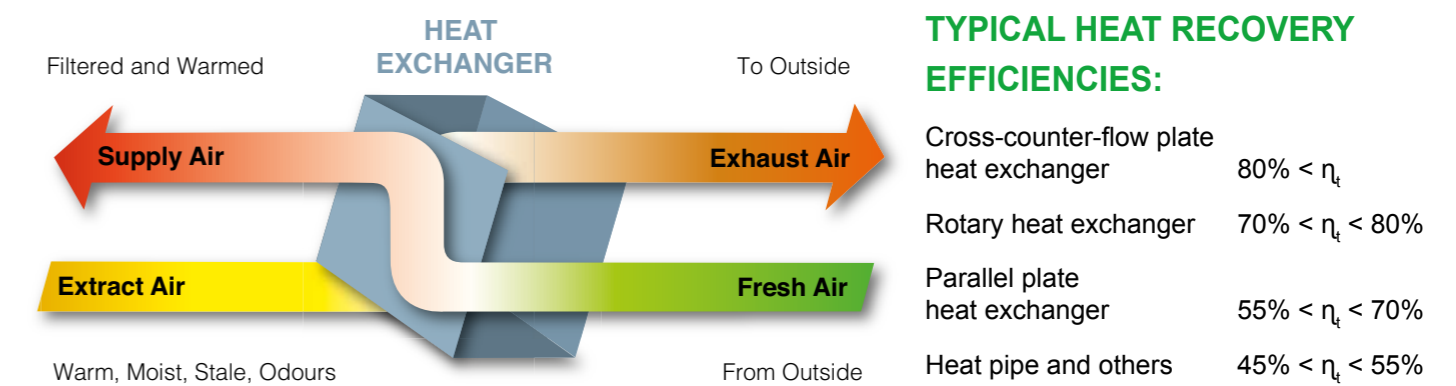
WHY IS INDOOR AIR QUALITY (IAQ) IMPORTANT?

The UK has the highest rate of asthma sufferers in Europe and the effects are worsened due to air pollution. The air pollution in the UK is so bad, that the UK government has been repeatedly taken to court over its failure to properly address the issue. But the issue isn't restricted to busy cities and industrial areas.

We spend up to 90% of our time indoors but indoor air pollution can be up to 50 times worse than outdoors and

can contain up to 900 different chemicals and pollutants.

Indoor air pollution can cause and worsen respiratory issues such as lung cancer, heart disease and even cause strokes. Ensuring adequate ventilation takes place within the built environment is one of the methods to minimise the health risks of indoor air pollution.



CROSS-COUNTER-FLOW HEAT EXCHANGER

Susurro use highly efficient cross-counter-flow heat exchangers to recover up to 90% of the heat from the extracted air. Susurro heat exchangers are tested in accordance with EN308 standards and have Eurovent certification.

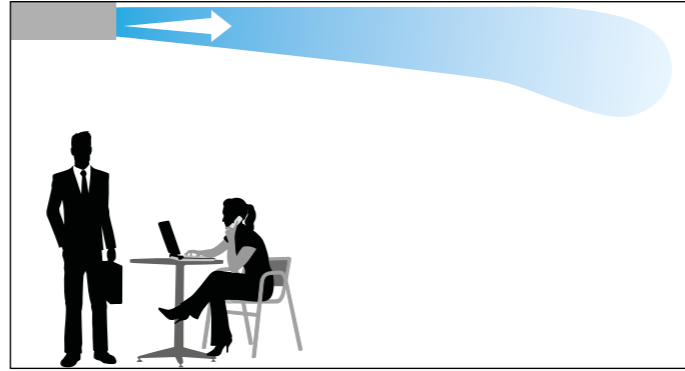


Incoming fresh air is warmed by the heat from the extract air in the heat exchanger. However, the two air streams do not mix. Cross-counter-flow heat exchangers achieve the highest thermal efficiency thanks to their increased surface area. This helps to reduce heating bills and accelerates return on the investment.

COANDA EFFECT

The Coanda effect occurs when the fresh inlet air runs along the ceiling before slowly descending into the room.

The Coanda effect causes the incoming air stream to stick to the ceiling. The incoming air is supplied at a high velocity into the room; ensuring effective mixing of the incoming air and the ambient room air. Mixing the ambient air with the supplied air ensures high quality air throughout the room. The result of the Coanda effect is a draught-free zone below ceiling height.



The ceiling-mounted units all ventilate using the mixing principle where fresh air is supplied into the room near the ceiling using the Coanda effect.

NOISE

Modern life has become loud, with people bombarded with noise on an almost constant basis from a variety of sources. Excessive noise impacts concentration levels, reduces productivity and affects your hearing.

To ensure that schools maintain an environment that encourages learning and helps students concentrate, a Building Bulletin was introduced. Building Bulletin 93 (BB93): Acoustic Design of Schools – Performance Standards lays out the acoustic criteria that appliances used in schools, including ventilation units, must adhere to.

Ventilation units in new build properties must not be louder than 35 dB(A) during normal periods and no louder than 40 dB(A) during summer bypass or boost modes in classrooms. Susurro meets this criteria for both new builds and refurbishments, with a virtually inaudible every day running rate of 35 dB(A); creating a healthy indoor air environment that aids concentration in lessons.

The Susurro also meets the sound criteria for rooms used for students with Special Educational Needs (SEN) outlined in BB93.

EC MOTORS

Susurro units are fitted with low energy, low maintenance Electronically Commutated (EC) fans. An EC fan is a brushless DC motor with intelligent integrated control, which enables the fan speed to be kept at the optimal level, ensuring maximum fan efficiency at all times.

Other advantages of EC fans are:

- Increased reliability and lifetime of the motor - reducing service costs
- Low power consumption reduces operating costs
- Stepless for easier control
- Low SFP values
- Silent operation
- More compact compared to an AC motor



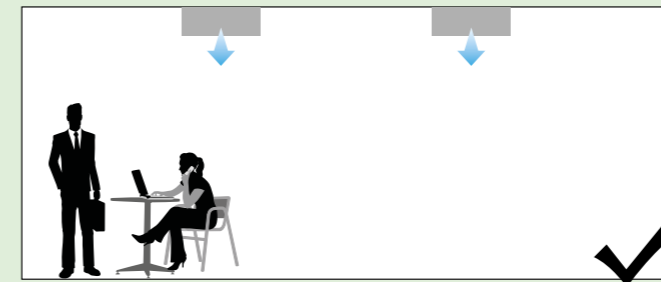
Susurro

Ceiling mounted heat recovery unit for classrooms, offices and conference rooms

CORRECT PLACING

To get the full benefits, Susurro must be located according to the physical geometry of the room.

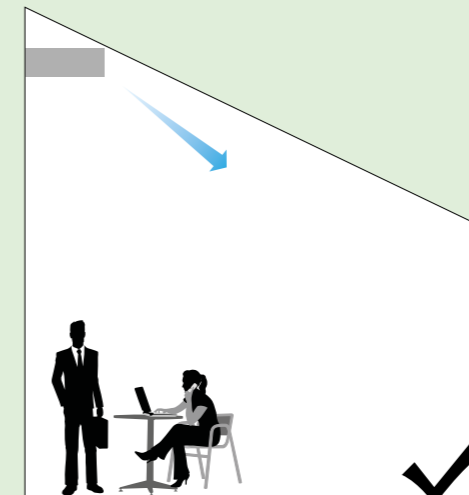
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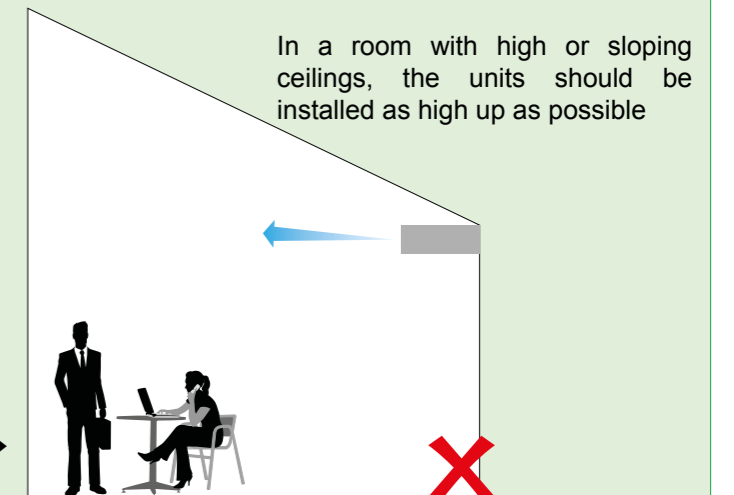
Two smaller units can be appropriate for a long, narrow room, where the throw length is too short longitudinally, yet too long laterally.



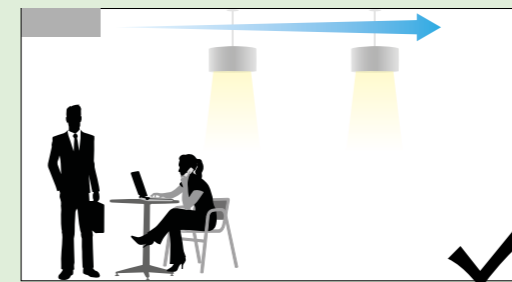
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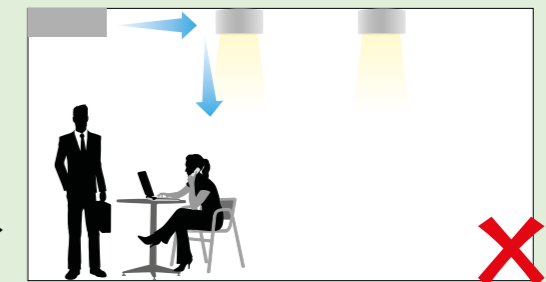
In a room with high or sloping ceilings, the units should be installed as high up as possible



3



To achieve the most efficient supply conditions, objects, such as light fittings installed directly in the ceiling, should be avoided. Light fittings should be lowered so that the inlet has free access to the room.



Susurro

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AIR FILTERS

Susurro are fitted with Coarse 60% (G4) and ePM1 60% (F7) air filters as standard. The ePM1 60% (F7) filter is fitted on the supply side of the unit before the air can enter the heat recovery core. The ePM1 60% (F7) filter prevents particulate matter as small as black carbon, typically created from diesel exhausts, from entering the built environment; protecting the health and well-being of the occupants inside and the long-term health of the unit.

A Coarse 60% (G4) filter is fitted at the extract side of the unit before the air can enter the heat exchanger. This type of filter prevents larger debris such as carpet fibres,

hair and insects from entering and damaging the unit.

Susurro have the option to be fitted with ePM10 60% (M5) and ePM1 70% (F8) air filters. M5 filters are beneficial where cement particles are present in the air. ePM1 70% (F8) air filters are similar to an ePM1 60% (F7)w filter but protect the occupants by preventing smoke, such as tobacco and oil, from entering the dwelling via the ventilation system. These filters are ideal for buildings that are situated near busy industrial areas or experience a lot of commercial traffic.

INDOOR AIR QUALITY IN SCHOOLS



The UK government introduced Building Bulletin 101 (BB101): Guidelines on Ventilation, Thermal Comfort and Indoor Air Quality in Schools to ensure that when schools are built and renovated, they provide a healthy indoor air environment for students. The document sets out regulations, standards and guidance on ventilation, thermal comfort and indoor air quality for school buildings.

The guidelines provide an introduction and describe the factors that affect the design of the indoor environment of schools (Section 1). Section 2 describes the regulatory framework for schools. It gives the recommended DfE performance standards for compliance with UK regulations. Section 3 provides a summary of regulations and recommended performance standards for school designers. Sections 4 to 5 provide detailed non-statutory guidance on how to design schools to achieve adequate performance for ventilation, indoor air quality and thermal comfort.

SUMMER BYPASS

All Mechanical Ventilation with Heat Recovery Systems must come with a bypass facility in order to comply with the ErP Ecodesign Directive. Bypass facilities in MVHR units are used to minimise overheating within the built environment and work by preventing heat recovery taking when the air temperature is too high.

Susurro uses an automatic, 100% summer bypass facility to prevent heat recovery from taking place during the hot summer months; minimising overheating within the classroom or office.

An automatic, 100% bypass facility works by isolating the heat exchanger by the use of a flap, which prevents the supply air reaching the heat exchanger. The supply air instead bypasses the heat exchanger and is merely filtered before entering the occupied area.

By utilising a 100% summer bypass, Susurro prevents unnecessary heat recovery taking place and risk of overheating.

Susurro

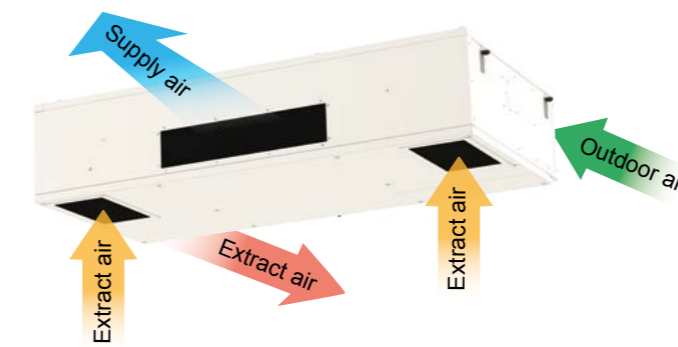
Ceiling mounted heat recovery unit for classrooms, offices and conference rooms

DECENTRALISED VENTILATION

An optimum indoor environment can be maintained through decentralised ventilation when supply air and exhaust air are managed with a suitable heat recovery unit.

VENTILATE INDIVIDUAL ROOMS AS NECESSARY

- Suitable for providing ventilation in a single larger room (classroom, meeting room, open office)
- The system can be installed in existing buildings without having to design a detailed ventilation system
- No air ducts
- High flexibility



DECENTRALISED VENTILATION	Advantage +
Only openings in the perimeter wall are required for ducts	+
Heat recovery efficiency	= 90%
Minimum cost of assembly; suitable for existing buildings	+
Easy access by maintenance staff	+

The Susurro units by Airflow feature a new generation of efficient, energy-saving and ultra quiet technologies that ensure the highest quality of indoor environments and are ideal for classrooms and offices.



DECENTRALISED VENTILATION WITH HEAT RECOVERY UNIT

The Susurro heat recovery unit is designed for decentralised ventilation. It provides an ideal solution in both new and existing buildings. Its minimum noise level makes it a perfect choice for schools, offices and conference rooms.

- 3 sizes with air flow rates of **400, 700 and 1,000 m³/h**
- High heat recovery efficiency up to **90%**
- Ultra-quiet operation – **35 dB(A)**
- Integrated **CO₂ sensor**
- Energy-efficient **EC motors**



FIRST CLASS CHOICE:

- Continuous supply of fresh air
- Optimum CO₂ levels
- Minimum noise level
- High heat recovery efficiency up to **90%**
- Energy saving
- Helps people with allergies and breathing difficulties
- Prevention of mould
- Prevention of fatigue and headaches that are caused by CO₂
- Elimination of outside noise due to open windows
- Suitable even for older buildings
- Easy to install
- NFC technology
- Complies with BB101 2017- Guidelines on ventilation, thermal comfort and indoor air quality in schools

Susurro

Ceiling mounted heat recovery unit for classrooms, offices and conference rooms



KEY FEATURES

- Decentralised heat recovery ventilation
- Two versions available: Susurro and Susurro Dezajno
- Compliant with BB101 2017 and BB93 2015
- NFC technology
- Up to 90% heat recovery efficiency
- Low energy EC fans
- Low noise level (35dB (A) at nominal air flow)
- Excellent thermal insulation (thermal transmittance class T2)
- Automatic 100% bypass
- Built-in CO₂ sensor
- Optional built-in pre or post heater
- Tubular system for optimal laminar air flow for efficient space usage
- Slim design with low installation height for efficient space usage
- Digital touch-screen controller
- 3 year warranty

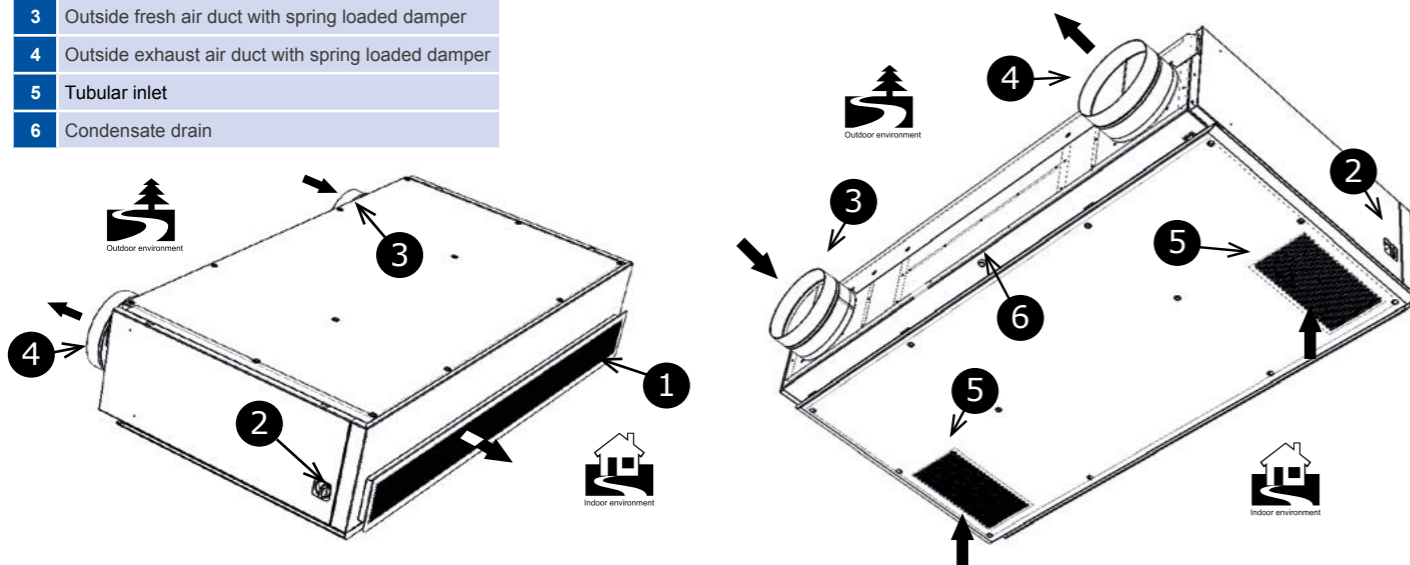
SUSURRO

The Susurro are highly efficient MVHR units designed for classroom and office use. They have an ambient temperature range of +5°C up to 40°C and provide fresh, healthy air, free from dust, chemicals and other pollutants to the occupied room. If the outdoor air temperature drops below freezing, the unit's optional pre-heater activates to warm the incoming air in order to prevent damage to the heat exchanger.

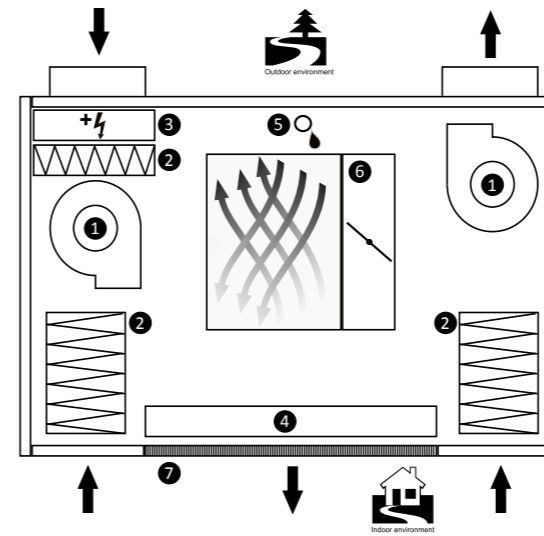
Susurro offers completely automated controls, which optimise the unit's operation in order to achieve maximum energy efficiency and minimal heat losses. It is important to ensure that the design and installation of any ventilation system using Susurro is carried out by a competent HVAC designer and installer.

The Susurro Dezajno models offer an aesthetically pleasing design and due to their unique tubular outlet, they further enhance the Coanda effect of the unit.

- 1 Tubular outlet
- 2 Main switch
- 3 Outside fresh air duct with spring loaded damper
- 4 Outside exhaust air duct with spring loaded damper
- 5 Tubular inlet
- 6 Condensate drain



OPERATIONAL DIAGRAM



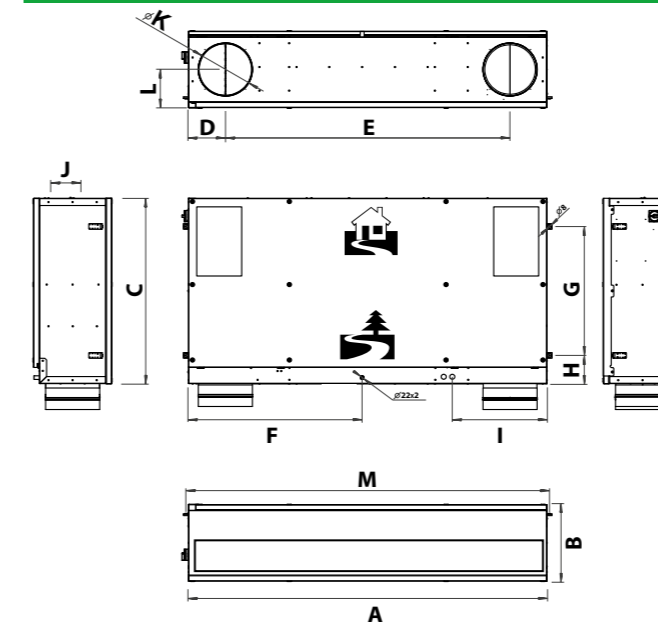
- 1 Fan
- 2 Filter
- 3 Preheater (optional)
- 4 Afterheater (optional)
- 5 Condensate drain
- 6 Heat exchanger with by-pass damper
- 7 Tubular outlet

PERFORMANCE TABLE

Duplexvent Susurro		400	700	1000
Max air flow at 0Pa	m ³ /hr / l/sec	500 / 139	850 / 236	1200 / 333
Heat recovery efficiency ¹	%	Up to 90	Up to 90	Up to 85
Fan type		EC		
Summer bypass		100% automatic		
Integral CO ₂ sensor	ppm	370 - 2000	370 - 2000	370 - 2000
Connection to BMS		Modbus RTU		
Sound pressure level at 3m ²	dB(A)	25.8	26.1	26.4
Spigot diameter	mm	250	315	315
Condensate discharge	mm	22		
Electrical supply		230V / 1ph / 50Hz		
Casing insulation	mm	40		
Filter class - ISO 16890 compliant		ePM1 60% (F7) at supply, Coarse 60% (G4) at extract		
Weight ³	kg	92	126	149
Max power input	kW	0.34	0.70	0.70
Heating output of built-in electric pre-heater (optional)	kW	1.50	2.00	3.00
Heating output of built-in electric post-heater (optional)	kW	1.50	2.25	3.00
Heating output of built-in water post-heater (optional) ⁴	kW	4.61	6.56	9.40

1. According to air volume
 2. For working points: Susurro 400 - 415m³/h at 0Pa, Susurro 700 - 747m³/h at 0Pa, Susurro 1000 - 1018m³/h at 0Pa
 3. Depending on equipment
 4. For water temperature 90/70°C and inlet air temperature 10°C

DIMENSIONS



Susurro	A	B	C	D	E	F	G
Susurro 400 mm	1806	397	942	183	1408	875	689
Susurro 700 mm	2076	452	1098	212	1648	1006	763
Susurro 1000 mm	2406	573	1263	241	1920	1203	962

Susurro	H	I	J	K	L	M
Susurro 400 mm	108	503	144	250	197	1835
Susurro 700 mm	167	548	146	315	228	2105
Susurro 1000 mm	150	604	140	315	287	2435

Susurro Dezajno	A	B	C	D	E	F	G
Susurro 400 mm	1870	394	965	214	1408	908	689
Susurro 700 mm	2141	455	1116	247	1648	1039	763
Susurro 1000 mm	2470	575	1281	275	1920	1235	962

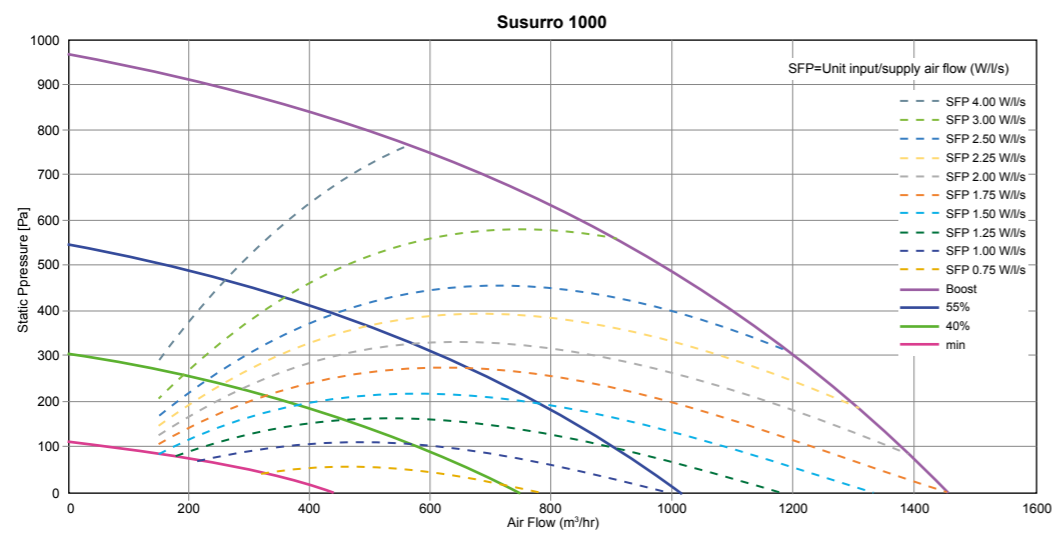
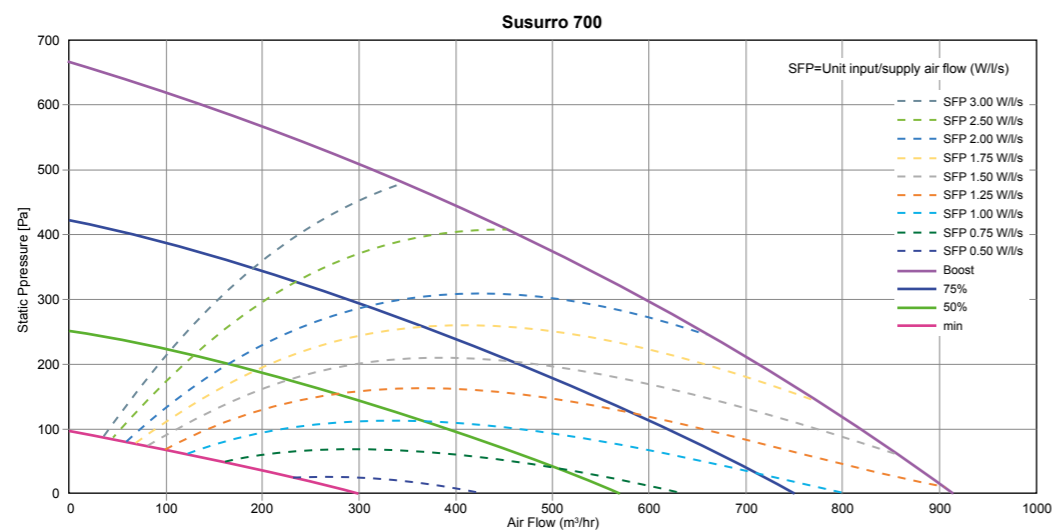
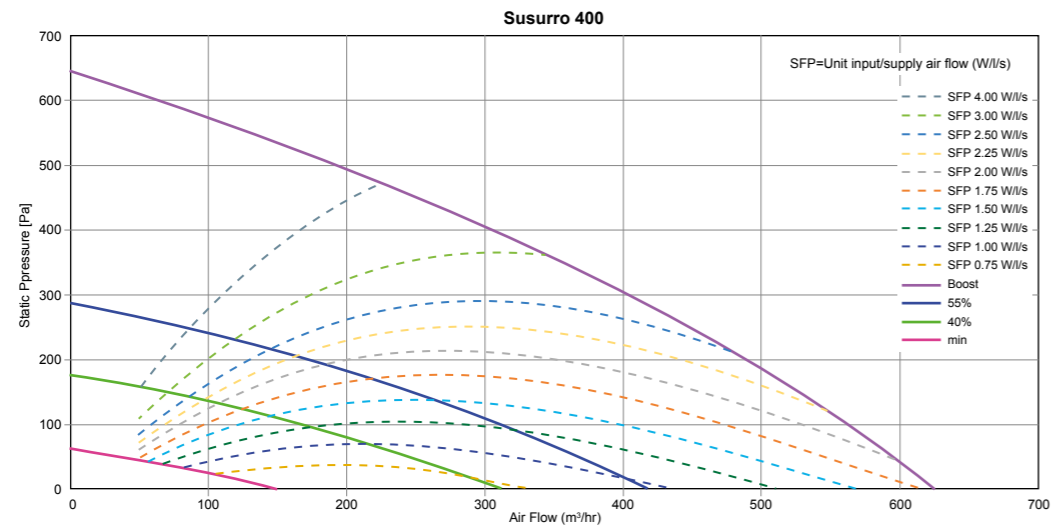
Susurro Dezajno	H	I	J	K	L	M
Susurro 400 mm	165	535	177	250	197	1835
Susurro 700 mm	185	581	224	315	228	2105
Susurro 1000 mm	150	637	224	315	287	2435



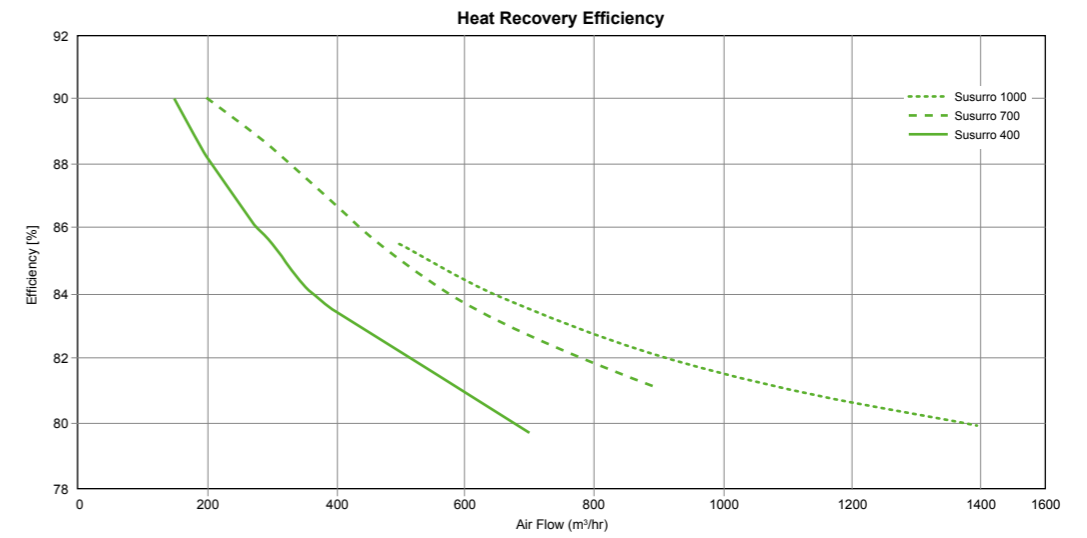
Susurro

Ceiling mounted heat recovery unit for classrooms, offices and conference rooms

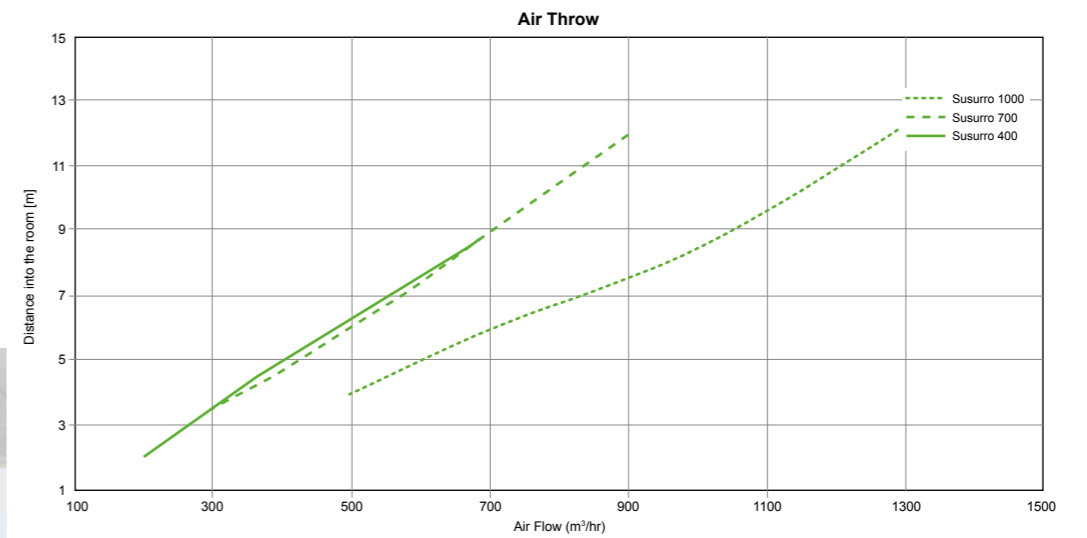
PERFORMANCE



THERMAL EFFICIENCY



ROOM CAPABILITY (COANDA EFFECT)



ELECTRICAL PARAMETERS OF THE UNITS

Model	Phase	Voltage	Frequency	Rated Input	Total Current	Weight
	Ph	V	Hz	W	A	kg
Basic Models						
Susurro 400	1	230	50	340	2.70	92
Susurro 700	1	230	50	340	2.70	126
Susurro 1000	1	230	50	700	5.00	149
With Electric Pre-Heater Only						
Susurro 400 EPRH	1	230	50	1840	9.22	93
Susurro 700 EPRH	1	230	50	2340	11.40	127
Susurro 1000 EPRH	3	400	50	3770	7.50	150
With Electric Post-Heater Only						
Susurro 400 EPOH	1	230	50	1840	9.22	93
Susurro 700 EPOH	1	230	50	2590	12.48	127
Susurro 1000 EPOH	3	400	50	3770	9.33	150
With Water Post-Heater Only						
Susurro 400 WPOH	1	230	50	340	2.70	93
Susurro 700 WPOH	1	230	50	340	2.70	127
Susurro 1000 WPOH	1	230	50	700	5.00	150
With Electric Pre and Post Heater						
Susurro 400 EPRH-EPOH	1	230	50	3340	15.74	94
Susurro 700 EPRH-EPOH	3	400	50	4590	9.78	128
Susurro 1000 EPRH-EPOH	3	400	50	6770	11.83	151
With Electric Pre-Heater and Water Post-Heater						
Susurro 400 EPRH-WPOH	1	230	50	1840	9.22	94
Susurro 700 EPRH-WPOH	1	230	50	2340	11.40	128
Susurro 1000 EPRH-WPOH	3	400	50	3770	7.50	151

SOUND PARAMETERS

Susurro 400

Fan speed	Pressure [Pa]	Air flow [m³/h]	Sound power level per frequency band								Overall		
			63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Sound power L _{WA} [dB]	Sound pressure at 1m L _{PA} [dB]	Sound pressure at 3m L _{PA} [dB]
min	0	169	31.0	37.1	29.2	26.3	26.3	25.5	26.5	25.0	39.6	26.9	17.7
40%	0	316	31.4	39.7	38.2	32.4	30.8	27.1	24.9	24.7	43.2	30.5	21.4
55%	0	415	36.1	43.1	44.0	36.8	34.5	30.1	25.8	25.1	47.7	35.0	25.8
Boost	0	500	41.3	46.7	48.6	40.7	38.0	33.6	27.6	26.0	51.8	39.1	29.9

SOUND PARAMETERS (continued)

Susurro 700

Fan speed	Pressure [Pa]	Air flow [m³/h]	Sound power level per frequency band								Overall		
			63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Sound power L _{WA} [dB]	Sound pressure at 1m L _{PA} [dB]	Sound pressure at 3m L _{PA} [dB]
min	0	307	19.1	31.7	35.4	29.7	22.4	21.9	28.1	27.0	38.7	25.4	16.6
50%	0	561	33.9	37.9	36.5	33.1	31.9	29.6	27.4	25.9	42.6	29.4	20.5
75%	0	747	39.2	41.9	43.4	39.1	38.6	36.0	29.0	26.3	48.2	34.9	26.1
Boost	0	850	42.0	45.2	48.5	43.7	42.5	40.0	31.5	27.1	52.3	39.1	30.2

Susurro 1000

Fan speed	Pressure [Pa]	Air flow [m³/h]	Sound power level per frequency band								Overall		
			63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Sound power L _{WA} [dB]	Sound pressure at 1m L _{PA} [dB]	Sound pressure at 3m L _{PA} [dB]
min	0	499	24.9	35.6	28.4	25.5	24.5	19.7	12.4	10.5	37.3	23.4	14.9
40%	0	772	29.3	38.9	37.3	34.1	35.6	29.4	23.8	21.6	43.2	29.3	20.9
55%	0	1018	37.2	42.3	43.7	40.2	41.4	36.2	31.3	27.7	48.8	34.9	26.4
Boost	0	1200	43.5	45.5	47.6	44.3	44.5	41.1	36.1	30.3	52.7	39.1	30.4

CHARACTERISTICS OF ELECTRIC PRE-HEATER

Model	Phase	Voltage	Frequency	Rated Input	Total Current
	Ph	V	Hz	W	A
Susurro 400	1	230	50	1500	6.52
Susurro 700	1	230	50	2000	8.70
Susurro 1000	2	400	50	3000	7.50

CHARACTERISTICS OF ELECTRIC POST-HEATER

Model	Phase	Voltage	Frequency	Rated Input	Total Current
	Ph	V	Hz	W	A
Susurro 400	1	230	50	1500	6.52
Susurro 700	1	230	50	2250	9.78
Susurro 1000	3	400	50	3000	4.33

CHARACTERISTICS OF WATER HEATING COIL

Model	Rated Input	Water Pressure Loss	Air Pressure Loss	Water Flow	Connection Diameter
	kW	kPa	Pa	l / sec / m³/hr	inches
Susurro 400	4.61	5.59	7.26	0.06 / 0.2	0.5
Susurro 700	6.56	10.3	19.13	0.08 / 0.29	0.5
Susurro 1000	9.40	4.32	14.42	0.11 / 0.41	0.5


For water temperature gradient 90/70°C and inlet air temperature 10°C

Susurro


Ceiling mounted heat recovery unit for classrooms, offices and conference rooms

CONTROLS


Check the status and adjust your Susurro with a few taps from the digital controller



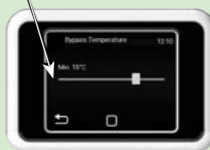
Adjust the flow rate of your Susurro



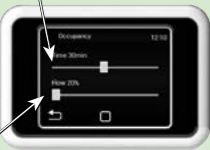
Adjust the required temperature of the room




Set the temperature at which the summer bypass activates




Adjust the ventilation rate based on occupancy levels



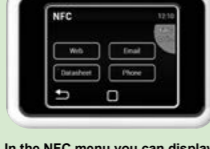
Schedule the unit's ventilation profiles with weekly and annual calendars



Protect the long-term performance of your Susurro with filter change notifications



Download key product information with NFC technology



- TOUCHSCREEN CONTROL PANEL**
 Susurro's control panel is intuitive and easy to use. The coloured display provides detailed information about unit's operation parameters and enables precise control.
- BUILDING AUTOMATION**
 You can connect Susurro to Building Automation Systems through the Modbus RTU / TCP, BACnet.
- CARBON DIOXIDE SENSOR**
 Susurro units are equipped with a CO₂ sensor as standard, which automates the ventilation process. The ventilation rate is automatically increased when the carbon dioxide levels rise. This helps to maintain an oxygen rich, healthy indoor air environment even if the room is full of people.
- ADDITIONAL SENSORS**
 Susurro units can be also equipped with an optional external humidity, motion or air quality sensors to enable fan speed control based on relative humidity, occupancy or air pollutants level.
- HEATERS**
 Optional electric pre/post-heaters and water post-heaters can be equipped to Susurro to top up the supply air temperature and protect the unit's heat exchanger from frost.
- ADDITIONAL SWITCHES**
 You can use external switches to control Susurro. For example, you can use a switch to manually boost the level of ventilation when required.

Susurro has a Near-Field Communication (NFC) facility that enables the user, by holding a compatible smartphone near the unit, to download the product datasheet and directly contact Airflow when undertaking maintenance of the unit.



Susurro

Ceiling mounted heat recovery unit for classrooms, offices and conference rooms

CONTROLS

The Susurro advanced operating system is intuitive and easily operated via freely definably air volume ensuring excellent air quality. The ventilation is demand-controlled and continuously variable via sensors or different weekly and daily programmes. The modern LCD touchscreen controller has a clear large display and user-friendly controls for the individual operations and thorough information on all operating statuses and ventilation modes.

This control system benefits from a number of functions available, such as e.g. timer, bypass control, night cooling, basic ventilation, CO₂ or RH - humidity-dependent air volume control and it is also building automation system-compatible and thus optimally ready for smart ventilation control.

SUSURRO CONTROLS MAIN BENEFITS:

- FREE-COOLING MODE**
 Night cooling ventilation is ideal in the hot summer months. If this mode is active and all selected conditions are met, this results in the complete opening of the summer bypass for directing cooler air into the room (heat recovery process does not take place).
- POST-HEATING**
 The optional integrated electrical or water post-heating coils ensure that the supply air is at a comfortable requested temperature when it flows into the room, even at negative temperatures. This feature provides a relaxing feel-good climate, even during the coldest winters.
- BOOST FUNCTION**
 Susurro units run at maximum fan speed for a pre-set period.
- OCCUPANCY MODE**
 This mode works the same as a time delay function to ensure that the units continue to operate for a pre-set period after people have left the room. Setting the time interval for which the mode will be active after the PIR sensor is activated in the 1-60 minutes range.



Main control functions

Touch control
Stepless fans (0-10V)
Stepless afterheating (internal electrical)
Stepless automatic regulation of preheating
Integrated timer (daily, weekly)
Optional connection of sensors: CO ₂ , RH, VOC (0-10V)
Stepless Bypass (temperature control: free cooling, antifreeze protection)
Offset fan adjustment (over-pressure and under-pressure)
Indication of filter clogging
CAV (Constant Air Volume) and DCV (Demand Controlled Ventilation) ventilation modes available
BOOST function - intensive air flow at maximum power for a set period
Freecooling functions - night ventilation (cooling)
Occupancy function - reducing ventilation according to the PIR sensor
BMS - connection via Modbus RTU / TCP, BACnet

Susurro Dezajno



As an option, the Susurro range is available with a built-in electric preheater; electric, water or change-over (C/O) 3-row water coil post heater.

The change-over (C/O) 3-row coil power for heating and cooling can be seen in the following table.

The change-over 3-row coil is a cooling coil using cold water, which can also be used as a heating coil by increasing the water temperature according to the demand temperature. The change-over working principle is to switch the demand supply between hot and chilled water transferring this energy into the air stream using the unit. Therefore, it improves the temperature control and facilitates the heat recovery unit to switch between higher or lower supply temperatures.

Unit size	Heating power	Cooling power
Susurro 400	4.17	2.88
Susurro 700	6.26	4.26
Susurro 1000	8.74	5.73

For water temperature gradient 60/40 and inlet air temperature 10°C

Unit size	Rated Input	Water Pressure Loss	Air Pressure Loss	Water Flow	Connection Diameter
	kW	kPa	Pa	l/sec / m³/h	inches
Susurro 400	4.28	0.49	19	0.05 / 0.19	0.75
Susurro 700	6.41	0.98	49	0.07 / 0.28	0.75
Susurro 1000	8.95	0.59	38	0.10 / 0.39	0.75

Correction coefficient of the powers of the hot water coil*

Air inlet temperature [°C]	Water temperature gradient			
	60/40	55/50	45/40	35/30
0	1.32	1.51	1.21	0.9
5	1.16	1.34	1.05	0.75
10	1	1.18	0.89	0.6
15	0.84	1.02	0.74	0.45
20	0.69	0.87	0.59	0.3

* To apply to the C/O coil rated input power

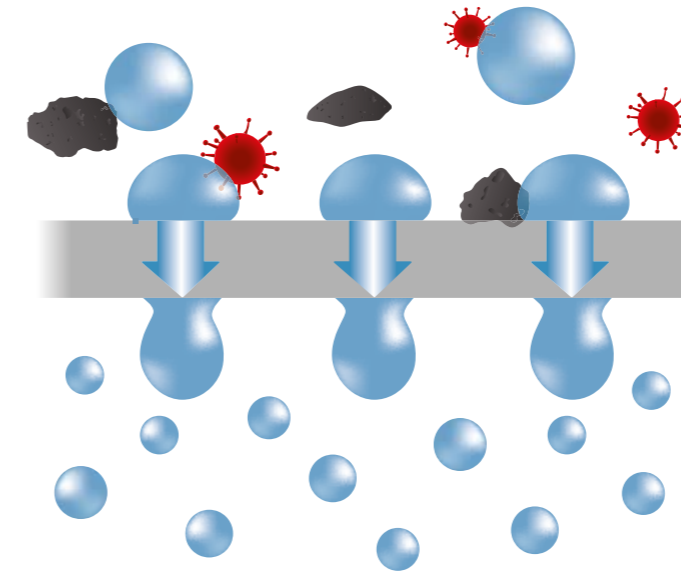
For water temperature gradient 7/12 and inlet air temperature 25°C

Unit size	Rated Input	Water Pressure Loss	Air Pressure Loss	Water Flow	Connection Diameter
	kW	kPa	Pa	l/sec / m³/h	inches
Susurro 400	2.84	3.34	20	0.13 / 0.49	0.75
Susurro 700	4.21	6.77	55	0.20 / 0.72	0.75
Susurro 1000	5.66	3.73	42	0.27 / 0.97	0.75

Correction coefficient of the powers of the hot water coil*

Air inlet temperature [°C]	Water temperature gradient		
	7/12	6/11	5/10
20	0.42	0.52	0.61
25	1	1.1	1.19
30	1.69	1.78	1.88

* To apply to the C/O coil rated input power

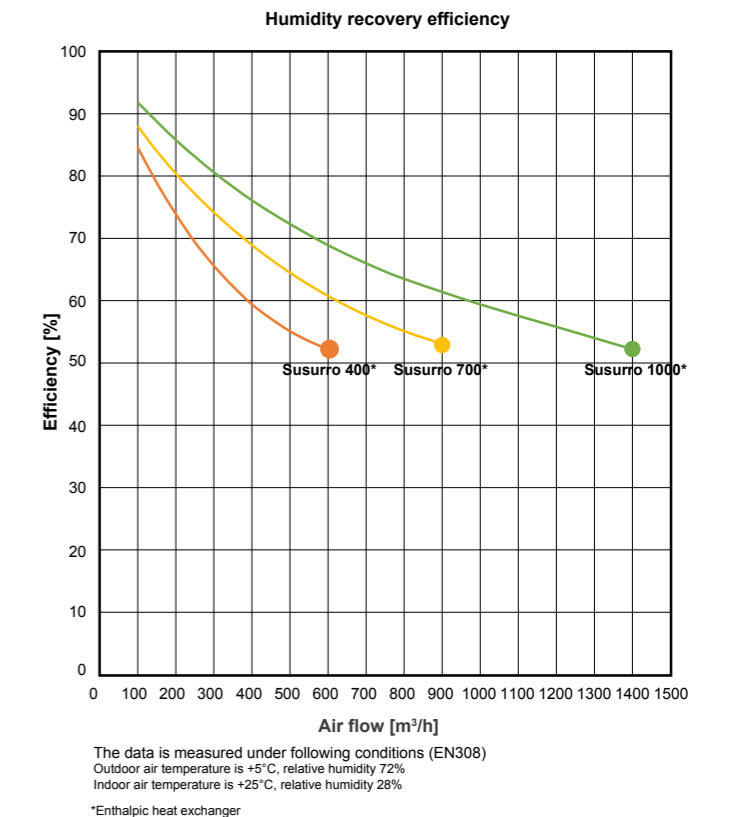
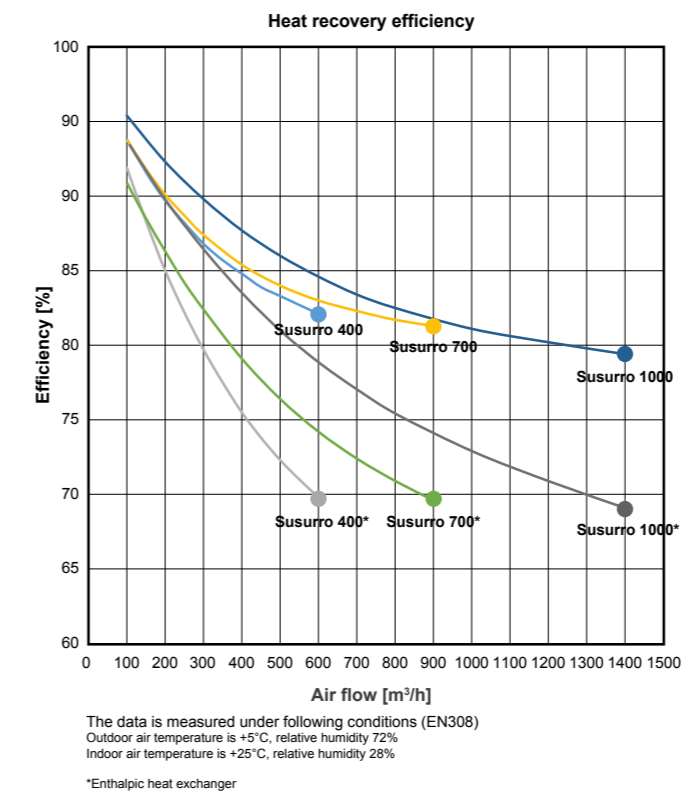


As part of the continuous research and development, the Susurro heat exchangers range has been extended throughout the heat exchanger type. Besides HRV (Heat Recovery Ventilation) features, Susurro range also has ERV (Energy Recovery Ventilation) features by adding the enthalpy heat exchanger option onto the range. ERV represents an upgrade for recovering not only the heat but also the moisture. Recovering the moisture within the air helps to prevent excess dryness during the cold season and reduce the air conditioning demand during the hot season.

As we spend approximately 90% of the time indoors during the winter, having ERV in certain buildings such as schools, hospitals, houses or apartments will help prevent dry throats, skin and irritated eyes.

The special polymer material used in the heat exchanger is semipermeable allowing the water vapours to go through, but other particles such as bacteria, odours, spores will not pass into the supply air stream. The enthalpy heat exchanger complies to ISO 846 and VDI 6022.

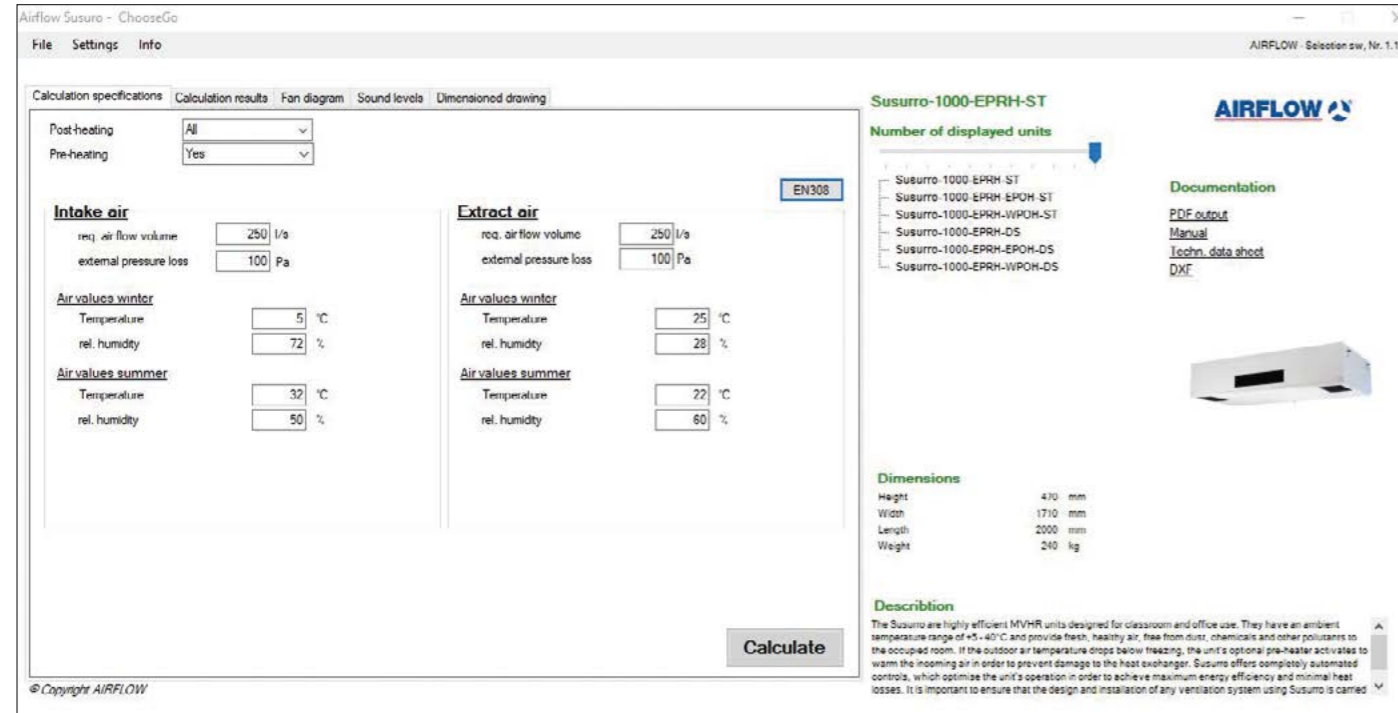
	HRV	ERV
Heat exchanger material	Aluminium heat exchanger	Coated paper semipermeable enthalpic heat exchanger
Heat transfer	Good sensible transference	Fair sensible transference
Humidity transfer	No latent transfer	Good latent transfer





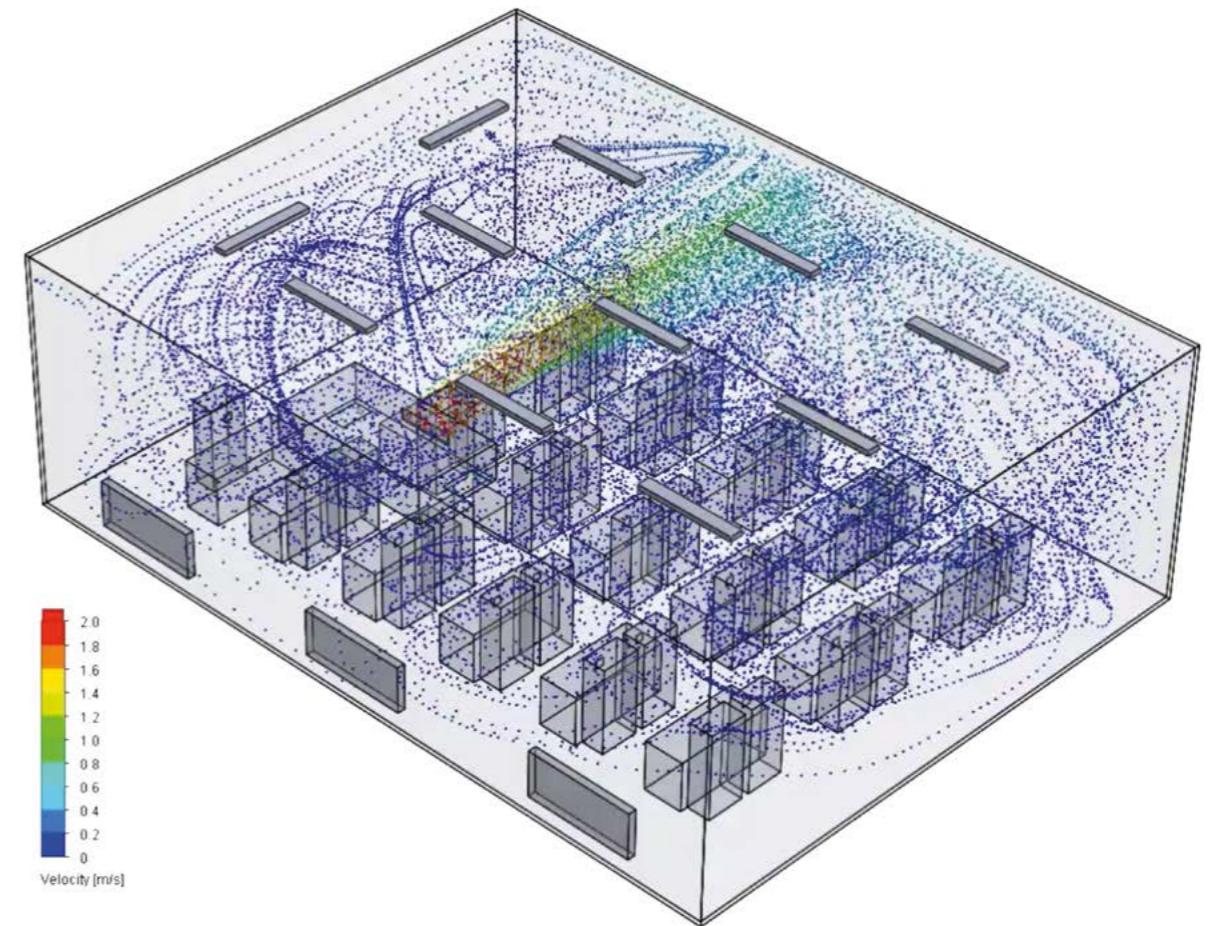
Susurro units can be selected from its own Airflow selection software according to specific design requirements. The selection software is a highly useful tool providing marketing support and technical

information. The project designer can shift between the 5 tabs: Calculation specifications, Calculation results, Fan diagram, Sound levels and Dimensioned drawing.



A standard classroom was used in a CFD (Computational Fluid Dynamics) simulation to see the velocity and temperature distribution.

The classroom dimensions are: (length x width x height) 10m x 7.5m x 3.3m, 75 m² area and 247.5m³ volume. A number of 30 students and 1 teacher was taken into account for calculating the simulation parameters.



The CFD simulation results showed the optimal solution of having the unit installed in the middle of the longer wall of the classroom under the ceiling. The air flow hits the opposite wall, where is deflected equally to all directions, turns direction to the floor and creates slow reversed

flow. The air flow reaches all corners of the room and the entire room volume is ventilated by well mixed fresh air. Therefore, the air flow slows down by the time it reaches the occupied level to prevent having a draught effect.

Susurro

Computational Fluid Dynamics simulations

APPLICATION 1 – CFD SIMULATION IN A LIBRARY

The goal of the CFD (Computational Fluid Dynamics) simulations is to define how to efficiently ventilate classrooms in a particular building using Susurro units.

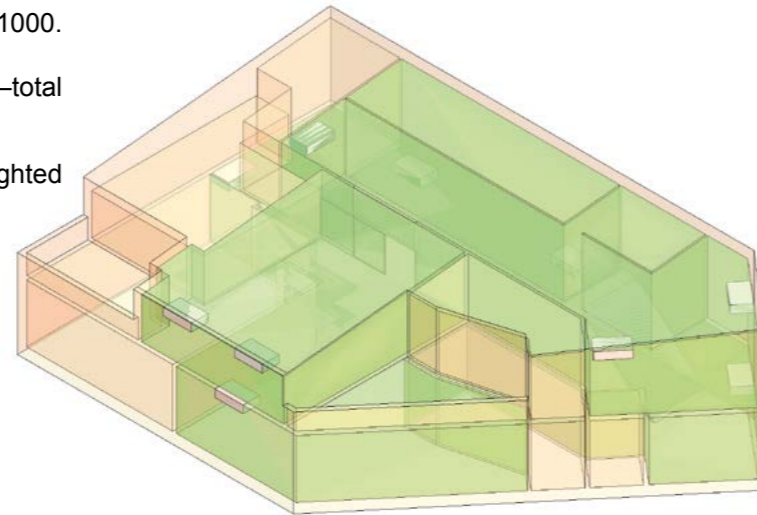
Ventilation requirements	
Ground floor level – Flow rate $1.3\text{m}^3/\text{s} = 4680\text{ m}^3/\text{h}$ (130pp@ 10l/s/pp)	First floor level – Flow rate $1.3\text{m}^3/\text{s} = 4680\text{ m}^3/\text{h}$ (130pp@ 10l/s/pp)
5 x Susurro 1000 Unit nominal airflow $1018\text{ m}^3/\text{h}$ Unit working (required) air flow $936\text{ m}^3/\text{h}$	5 x Susurro 1000 Unit nominal airflow $1018\text{ m}^3/\text{h}$ Unit working (required) air flow $936\text{ m}^3/\text{h}$

SIMULATION SETTINGS – WHOLE LIBRARY BUILDING

Isothermal air flow conditions –10x Susurro 1000.

Each unit Susurro1000@airflow $936\text{ m}^3/\text{h}@20^\circ\text{C}$ –total airflow $9360\text{ m}^3/\text{h}$.

Space in the building ventilated by Susurro units highlighted in green.



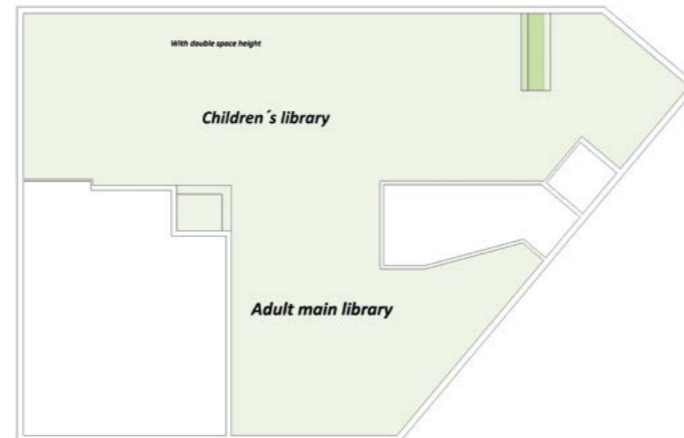
SIMULATIONS SETTINGS – GROUND FLOOR

Isothermal air flow conditions – 5x Susurro 1000.

Each unit Susurro1000@airflow $936\text{ m}^3/\text{h}@20^\circ\text{C}$ –total airflow $4680\text{ m}^3/\text{h}$.

Floor area of the ventilated space in the simulation 478 m^2 - ceiling height 4.4m .

Space in the building ventilated by Susurro units highlighted in green

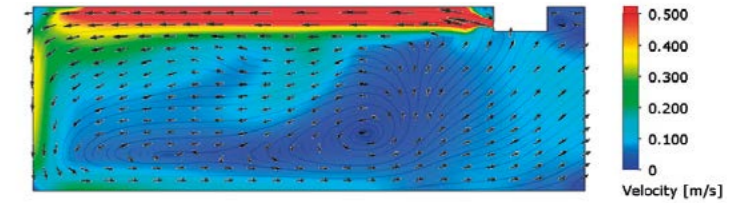


Susurro

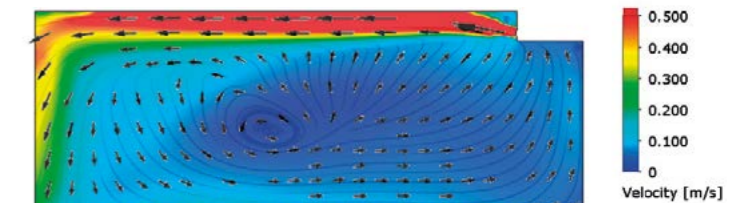
Computational Fluid Dynamics simulations

SIMULATIONS SETTINGS – GROUND FLOOR – UNITS LOCATIONS

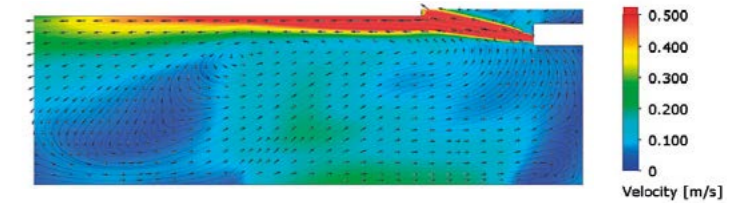
Cut plot – through center of unit 1 – air velocity (displayed interval $0,5\text{ m/s}$; $0 - 98,4\text{ ft / min}$).



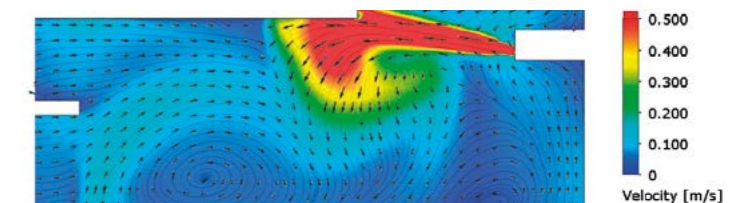
Cut plot – through center of unit 2 – air velocity (displayed interval $0-0,5\text{ m/s}$; $0 - 98,4\text{ ft / min}$).



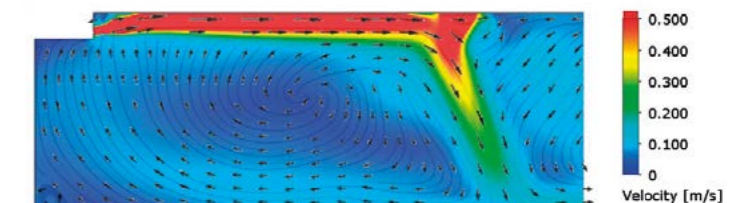
Cut plot – through center of unit 3 – air velocity (displayed interval $0-0,5\text{ m/s}$; $0 - 98,4\text{ ft / min}$).



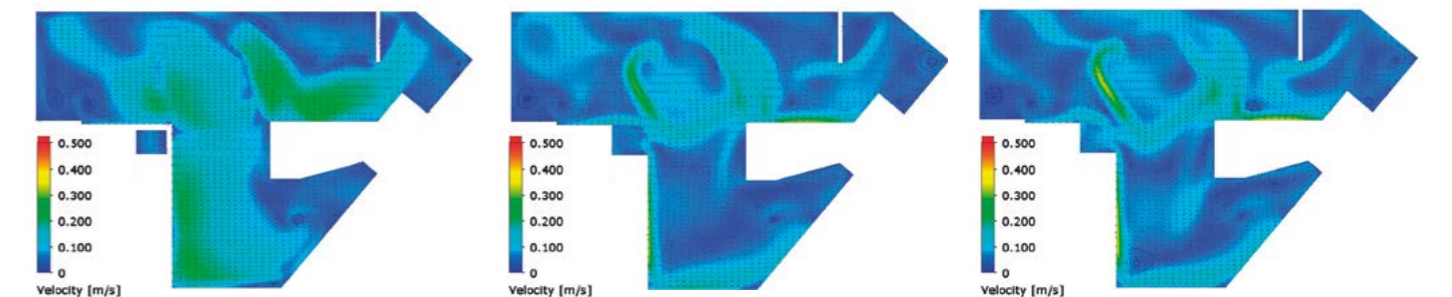
Cut plot – through center of unit 4 – air velocity (displayed interval $0-0,5\text{ m/s}$; $0 - 98,4\text{ ft / min}$).



Cut plot – through center of unit 5 – air velocity (displayed interval $0-0,5\text{ m/s}$; $0 - 98,4\text{ ft / min}$).



Cut plots – $0,1\text{ m} \approx 0,33\text{ ft}$, $1,1\text{ m} \approx 3,6\text{ ft}$ and $1,7\text{ m} \approx 5,6\text{ ft}$ above the floor – air velocity (displayed interval $0 - 0,5\text{ m/s}$; $0 - 98,4\text{ ft / min}$).



Susurro

Computational Fluid Dynamics simulations

SIMULATIONS SETTINGS – FIRST FLOOR

Isothermal air flow conditions – 5x Susurro 1000.

Each unit Susurro 1000@airflow 936 m³/h@20°C–total airflow 4680 m³/h.

Floor area of the ventilated space in the simulation 325 m²- ceiling height 4.3 m.Space in the building ventilated by Susurro units highlighted in blue.

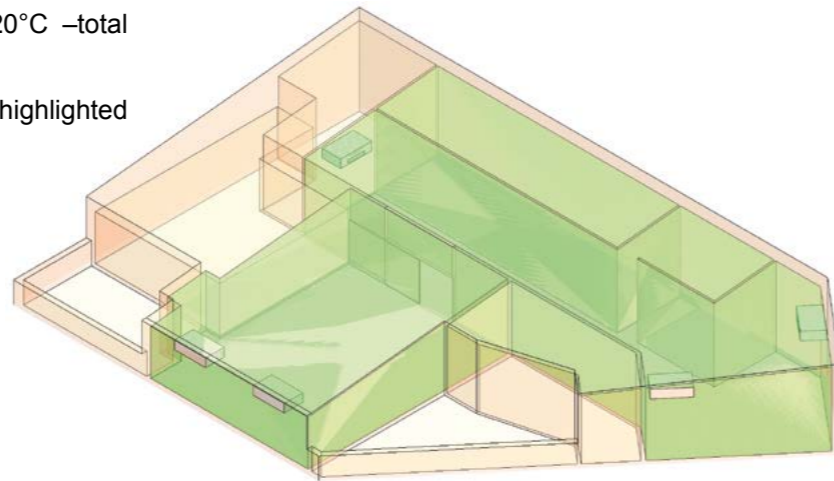


SIMULATION SETTINGS – WHOLE LIBRARY BUILDING

Isothermal air flow conditions –10x Susurro 1000.

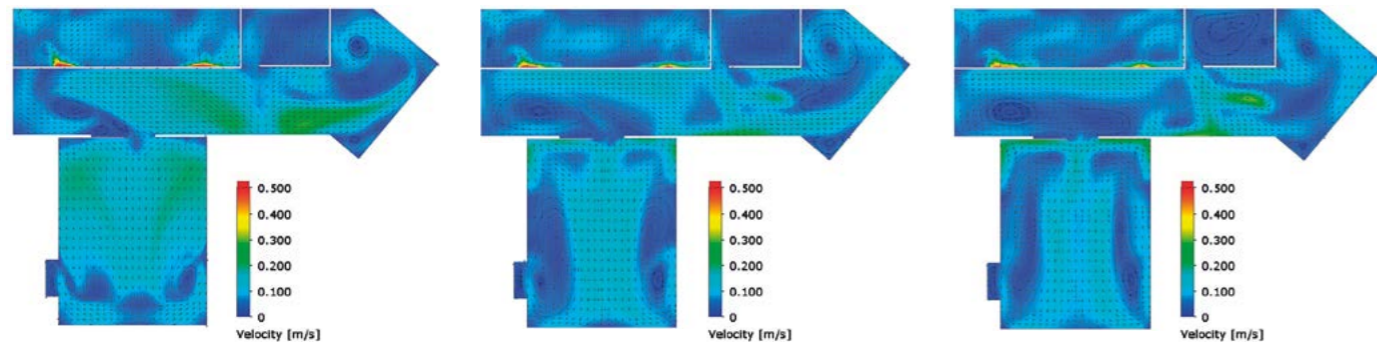
Each unit Susurro1000@airflow 936 m³/h@20°C –total airflow 9360 m³/h.

Space in the building ventilated by Susurro units highlighted in green.



SIMULATIONS SETTINGS – FIRST FLOOR – CUT PLOTS

Cut plots –0,1 m ≈0,33 ft, 1,1 m≈3,6 ft and 1,7 m ≈ 5,6 ft above the floor – air velocity (displayed interval 0 - 0,5 m/s ; 0 - 98,4 ft / min).

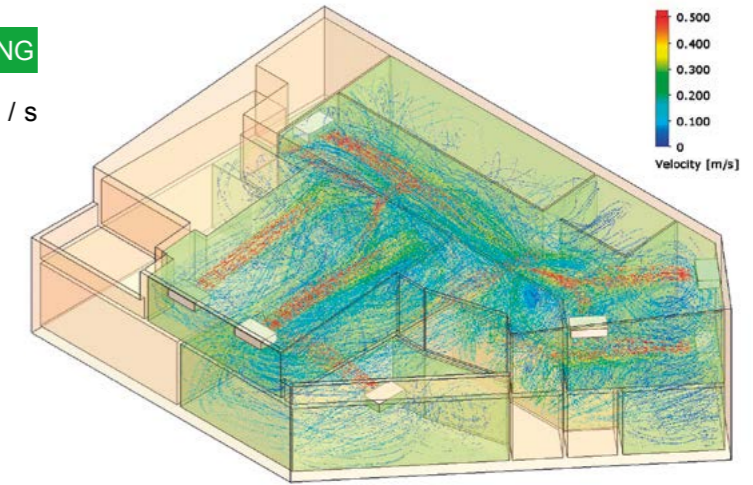


Susurro

Computational Fluid Dynamics simulations

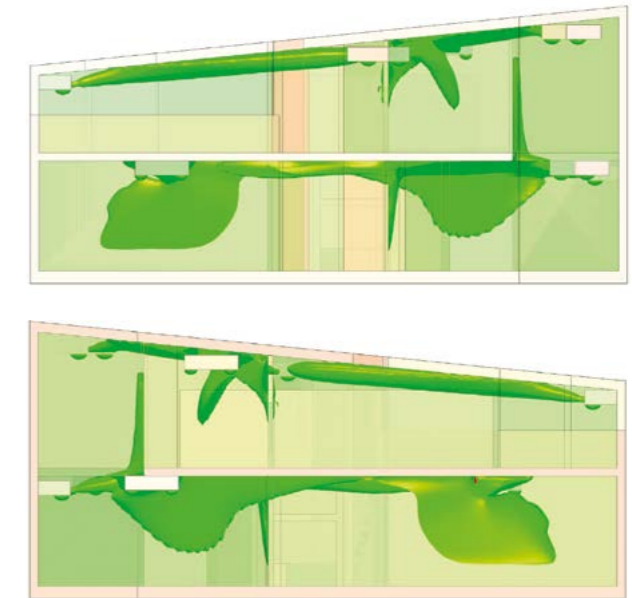
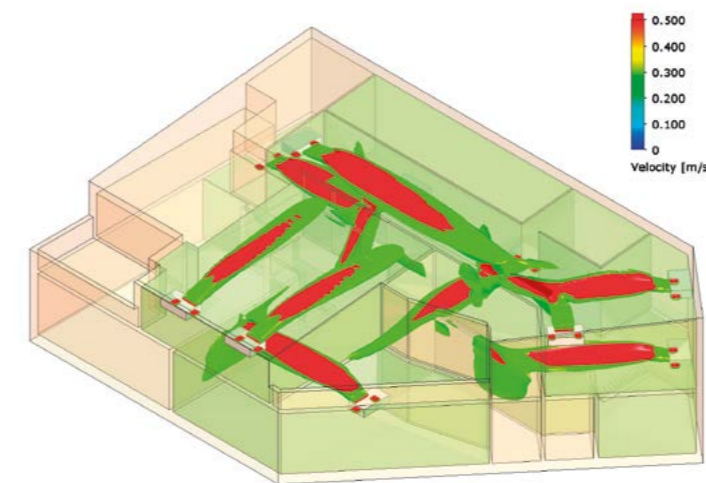
SIMULATION SETTINGS – WHOLE LIBRARY BUILDING

Flow trajectories – velocity (displayed interval 0-0,5 m / s ; 0 - 98,4 ft / min).



SIMULATION SETTINGS – WHOLE LIBRARY BUILDING

Isosurfaces – velocity – 0,5 m/s-98,4 ft / min and 0,3 m / s - 59 ft / min.



CONCLUSIONS

The simulations show how the units work and how can the required space be efficiently ventilated.

There is no significant penetration of air whose velocity exceeds 0.3 m / s in the residential zone (after exceeding this air flow velocity, people may feel discomfort - draft - under certain conditions).

In places where the air velocity exceeds 0.3 m / s, the air flow velocity does not exceed 0.5 m / s (in the residential zone 2 m from the floor).

The CFD simulation was made with Susurro Dezajno model (design cover directs exhaust air from the unit at an angle of 10° to the ceiling -this option allows better adhesion of airflow to the ceiling).

The simulation does not take into account possible interactions with air conditioning or ventilation of adjacent areas in the building, as well interaction with the internal equipment and with heat sources (including people) inside the library.

Susurro

Computational Fluid Dynamics simulations

APPLICATION 2 – CFD SIMULATION IN A LIBRARY

For running this CFD simulations, one typical classroom and one atypical shaped classroom ventilated using Susurro units were selected.

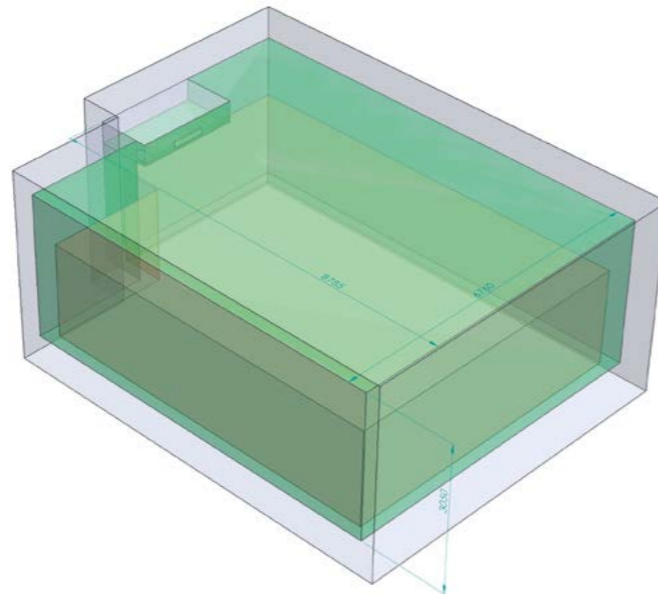
Ventilation requirements	
Typical Classroom - 1x Susurro 700 Unit working (required) air flow 747 m ³ /h - (33ppl@ 6,3l/s/pp) Boost - 917 m ³ /h - (33ppl@ 7,7l/s/pp)	Atypical Classroom - 1x Susurro 400 Unit working (required) air flow 415 m ³ /h - (18ppl@ 6,4l/s/pp) Boost - 625 m ³ /h - (18ppl@ 9,6 l/s/pp)

SIMULATION SETTINGS – TYPICAL CLASSROOM

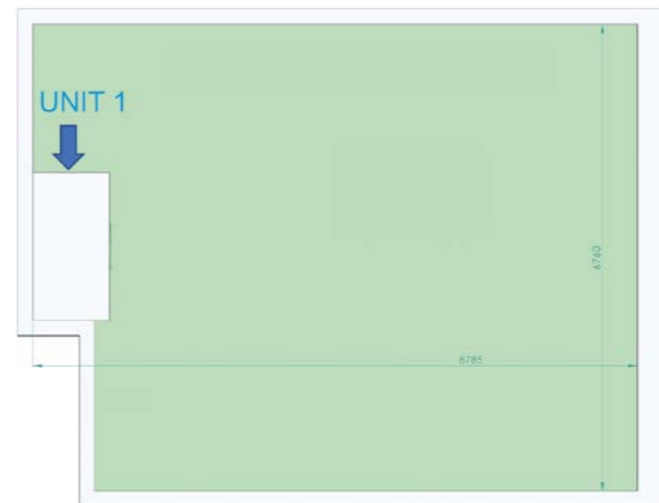
Isothermal air flow conditions – 1x Susurro 700.

Susurro700 @airflow 747 m³/h@20°C.

Space in the building ventilated by Susurro units highlighted in green.



SIMULATIONS SETTINGS – TYPICAL CLASSROOM – UNIT LOCATION

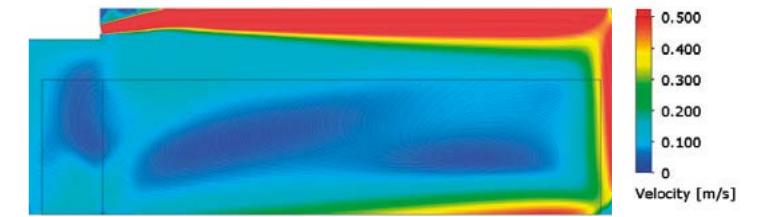


Susurro

Computational Fluid Dynamics simulations

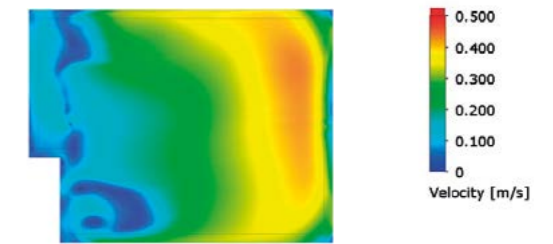
SIMULATION SETTINGS – TYPICAL CLASSROOM – CUT PLOTS

Cut plot – through center of unit 1 – air velocity (displayed interval - 0,5 m/s ; 0-98,4 ft / min).

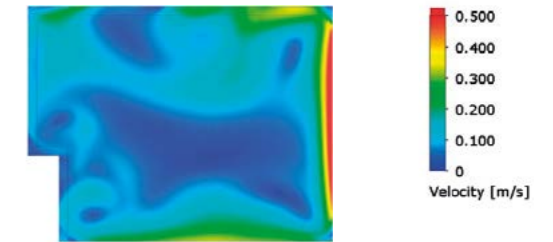


Cut plots – 0,1 m ≈ 0,33 ft , 1,1 m ≈ 3,6 ft and 1,7 m ≈ 5,6 ft above the floor – air velocity (displayed interval 0 - 0,5 m/s ; 0-98,4 ft / min).

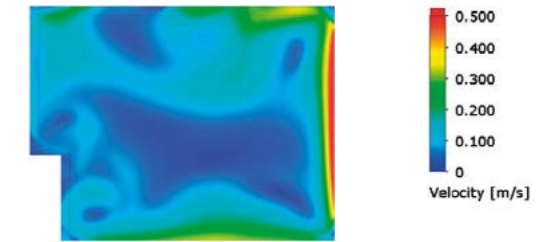
Cut plot 0,1 m ≈ 0,33 ft



Cut plot 1,1 m ≈ 3,6 ft

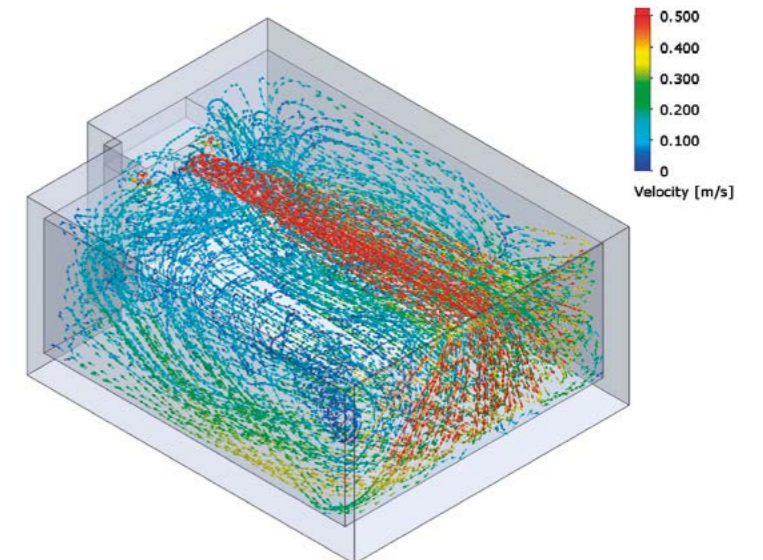


Cut plot 1,7 m ≈ 5,6 ft



SIMULATION SETTINGS – TYPICAL CLASSROOM – FLOW TRAJECTORIES

Flow trajectories – velocity - (displayed interval 0 - 0,5 m / s ; 0 - 98,4 ft / min)



Susurro

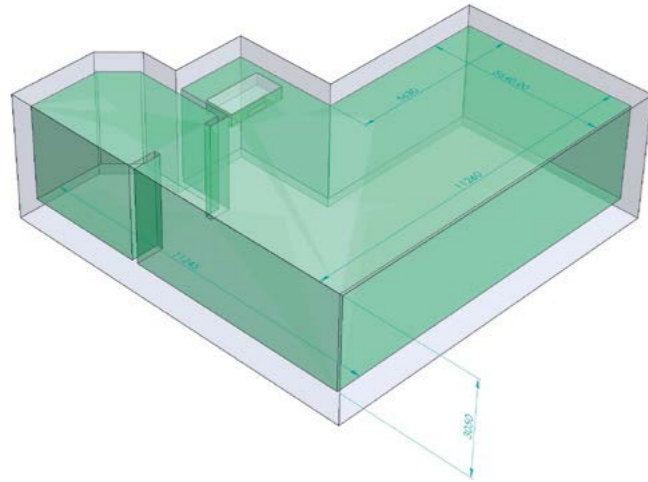
Computational Fluid Dynamics simulations

SIMULATION SETTINGS – ATYPICAL CLASSROOM

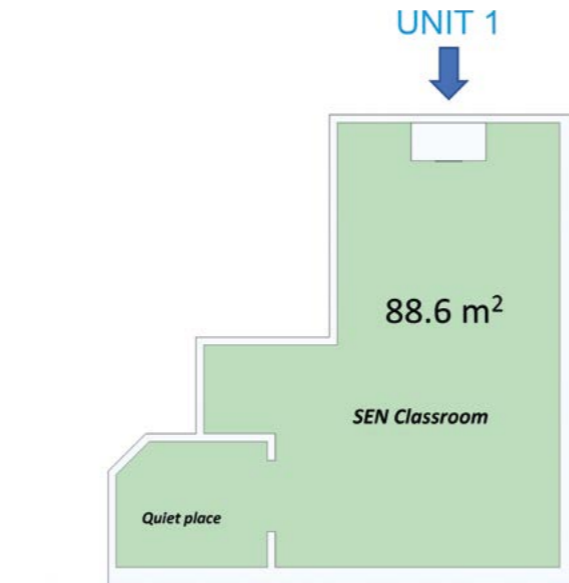
Isothermal air flow conditions – 1x Susurro 400

Susurro 400 @airflow 415 m³/h@20°C

Space in the building ventilated by Susurro units highlighted in green.

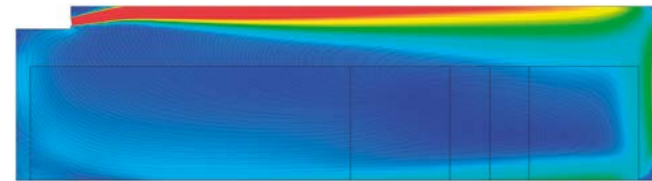


SIMULATION SETTINGS – ATYPICAL CLASSROOM – UNIT LOCATION

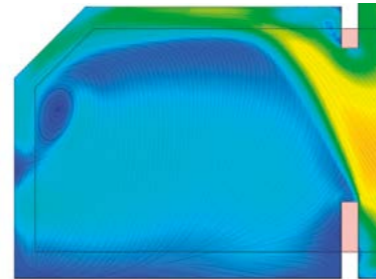


SIMULATIONS SETTINGS – ATYPICAL CLASSROOM – CUT PLOTS

Cut plot – through center of unit 1 – air velocity (displayed interval 0 - 0,5 m/s; 0-98,4 ft / min).

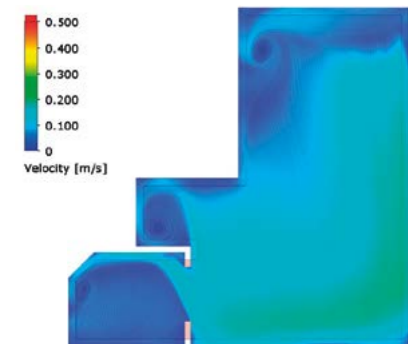


Cut plot 0,1 m ≈ 0,33 ft above the floor – air velocity (displayed interval 0 - 0,2 m / s; 0-39,4 ft / min).

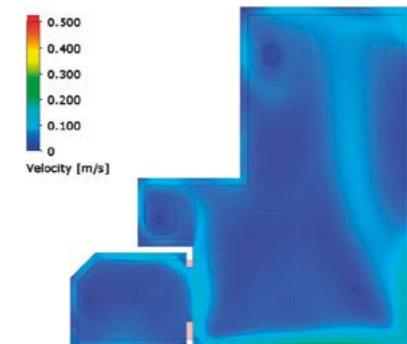


Cut plots – 0,1 m ≈ 0,33 ft , 1,1 m ≈ 3,6 ft and 1,7 m ≈ 5,6 ft above the floor – air velocity (displayed interval 0 - 0,5 m / s ; 0-98,4 ft / min).

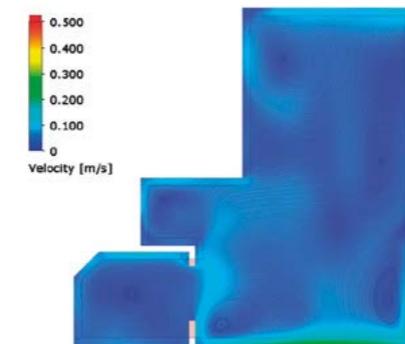
Cut plot 0,1 m ≈ 0,33 ft



Cut plot 1,1 m ≈ 3,6 ft



Cut plot 1,7 m ≈ 5,6 ft

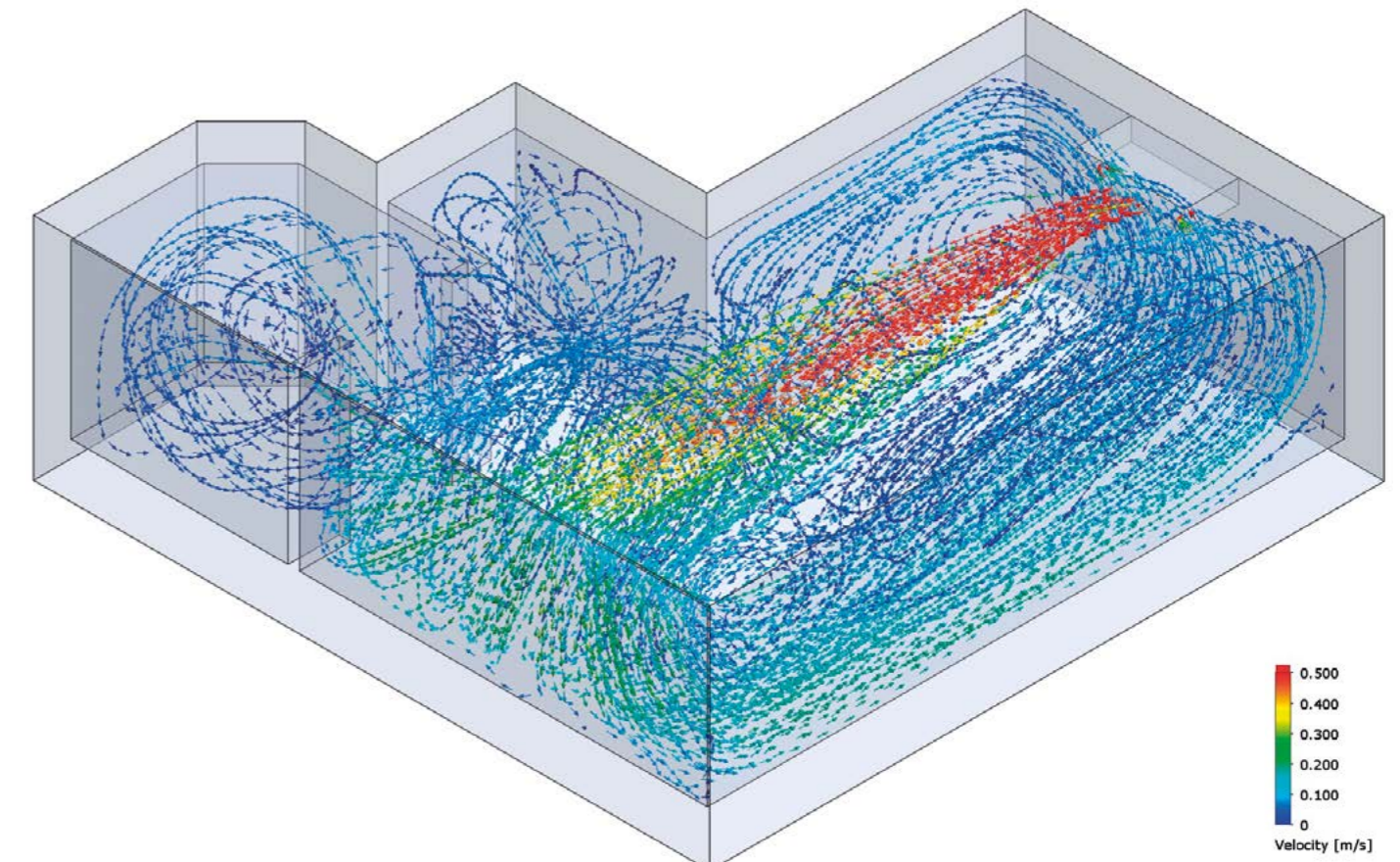


Susurro

Computational Fluid Dynamics simulations

SIMULATION SETTINGS – ATYPICAL CLASSROOM – FLOW TRAJECTORIES

Flow trajectories – velocity - (displayed interval 0 - 0,5 m / s ; 0 - 98,4 ft / min)



CONCLUSIONS

The simulations show how the units work and how can the required space be efficiently ventilated.

There is no significant penetration of air whose velocity exceeds 0.2 m / s (39,4 ft / min) into a residential zone - it occurs only in the ankle area 0.1 m above the floor (after exceeding this air flow velocity, people may feel discomfort - draft - under certain conditions).

The air flow velocity does not exceed 0.5 m/s (in the residential zone 2 m from the floor).

The CFD simulation was made with Susurro Dezajno units (design cover directs exhaust air from the unit at an angle of 10° to the ceiling - this option allows better adhesion of airflow to the ceiling).


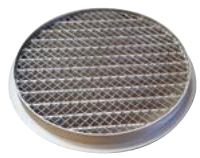
The simulation does not take into account possible interactions with air conditioning or ventilation of adjacent areas in the building, as well as interaction with the internal equipment and with heat sources (including people) inside the building.

ACCESSORIES

Filter replacement

Spare filter classes - ISO 16890 compliant

Description		Susurro 400	Susurro 700	Susurro 1000	Supply air filter
Standard	Coarse 60% (G4)	90000902	90000903	90000904	 Extract air filter  Note: 2 extract air filters required per unit.
	ePM1 60% (F7)	90000905	90000906	90000907	
Optional	ePM10 60% (M5)	90000908	90000909	90000910	
	ePM1 70% (F8)	90000911	90000912	90000913	

Product	Description	Part number	
Condensate siphon	Siphon with a ball for installation on the wall or flush mounting	90000964	
Condensate siphon	Ball siphon for direct connection to the unit	90000965	
Condensate removal pump Silent+ Mini Orange	The quietest condensation pump in its class. Featuring an acoustic damper, anti-vibration tubing & bracket, the Silent+ Mini Orange is whisper quiet.	90000951	
External grilles	Circular external weather louvre complete with bird mesh for outdoor air intake and extract air discharge	D=250mm (for Susurro 400): 90000962 D=315mm (for Susurro 700/1000): 90000963	

Call: 01494 525252

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