



ENVIRONMENTAL  
CLIMATE CONTROL  
EQUIPMENT  
& SOLUTIONS



**FR CH RE V**



**Vertical double flow rooftop heat pump & air conditioner**



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# General description

The **ETT** packaged unit is delivered ready to operate. Its full aluminium structure (frame & casing) ensures an excellent corrosion protection (20-year anti-corrosion guarantee). The **ETT** unit can be installed either at ground level or on a roof.

**ECODESIGN involves DECONSTRUCTION:** ETT units are 98 % recyclable (re-use and recycling rates based on EFFI+ 220).

Our technical choices have several impacts on the **environment**

- **Legal and regulatory framework:**

- In accordance with Directive 2008/98/EC on waste, clause 26: "The polluter-pays principle is a guiding principle at European and international levels. The waste producer and the waste holder should manage the waste in a way that guarantees a high level of protection of the environment and human health.", ETT is a member of "Eco-systèmes Pro".
- In accordance with articles 5.3, 5.4 and 11 of Regulation (EC) No 303/2008, ETT holds a certificate of capability to handle refrigerants (no. 637).



- **Aluminium: a good choice for the planet!**

- Aluminium is endlessly 100% recyclable.
- Recycling covers over 30% of aluminium needs.

- **Low polluting ETT manufacturing process:**

- Selective sorting, waste recovery, 60% of waste is recycled.
- No paint on casings, no use of solvent.
- ISO 14001 Certification (Environmental Management System).



- **Consumables: efficient waste management:**

- Filtration: ETT units include "ecodesigned" air filters (selective sorting: frame - grille - media)

### We placed ease of operation at the heart of our units design:

- The separate **technical section** facilitates service and control of the unit and allows measurement and adjustment during operation.
- The **BEST controller** is specifically designed for this application. It allows great flexibility, thus optimum performance of the **ETT** unit through a user-friendly interface, be it local or remote (with remote display, PC or BMS).

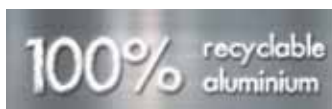


Each unit is checked and tested at the factory, prior to shipment, and a test certificate is issued. ETT Quality organisation is certified **ISO 9001:2008** (AFNOR Certificate 1994/2016f).



Moreover, each unit is delivered with an **EC standard certificate of conformity** and complies with the standards listed below:

- Machinery Directive 2006/42/EC - Operator's safety
- Low Voltage Directive 2006/95/EC - Electricity
- EMC Directive 2004/108/EC - Electromagnetic Compatibility
- 2009/142/EC Directive - Gas Appliances
- EN 1886 - Ventilation for buildings – Air Handling Units – Mechanical performance
- EN 60204-1 - Safety of machinery – Electrical equipment of machines



**20-year guarantee against corrosion frame - casing**



# Operating principles

## The unit operates as a reversible heat pump:

- > Source: outside air + inside air (in recovery mode)
- > Treated fluid: inside air + hygienic air

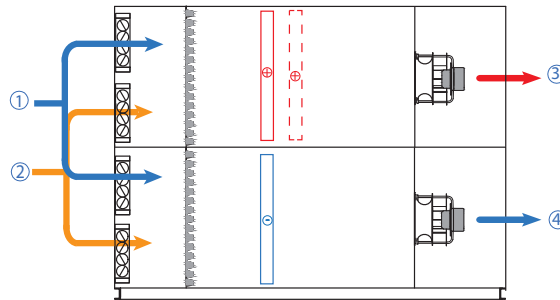
## The following operating modes are available:

- > Heat pump
- > Air conditioner
- > Free Cooling: cooling through outside air, without thermodynamics

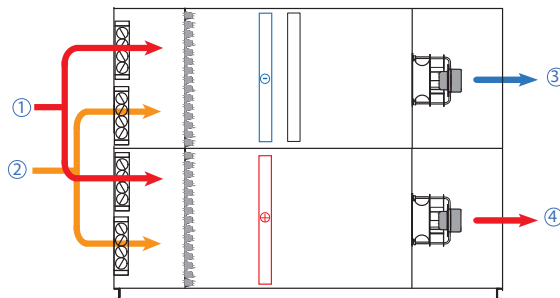
## In these modes, the unit can operate:

- > In all recycling mode
  - > In all fresh air - all exhaust air
  - > In mixing mode
- The unit ensures air extraction and fresh air modulation without indoor pressure change.

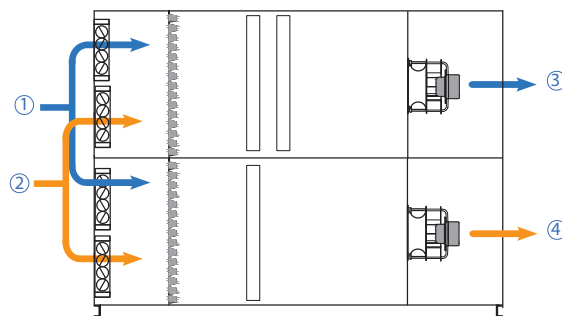
### Heating mode



### Cooling mode

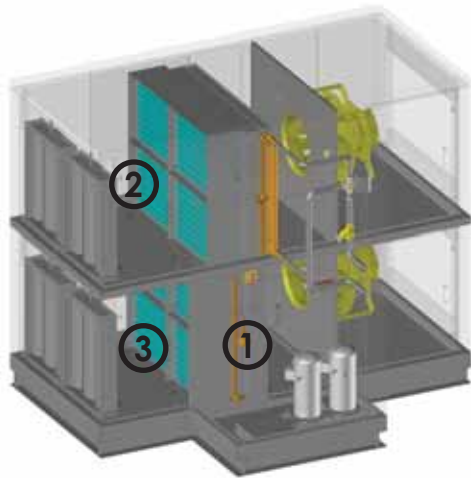


### Free Cooling mode



- ① Fresh air    ② Return air    ③ Supply air    ④ Exhaust air

# Description



## The ETT packaged unit comprises 3 different sections:

- 1 The separate technical section houses the refrigeration components, the electrical board and the control components.
- 2 The internal section ensures air change and air treatment.
- 3 The exhaust air section allows heat recovery and/or heat rejection on exhaust air (depending on the operating mode).

## Aluminium frame and casing:

- **Rigid, compact and lightweight packaged unit**, perfectly weather-resistant, with a 20-year anti corrosion guarantee on casing.
- **Watertight floor** with drainage outlets around the unit, connected to rubber siphons.
- **Aluminium vertical panels and roof (AG3).**
- **Access through large "easy to remove" panels.** Panels are closed with square locks. Doors tightness is ensured by a flexible gasket under compression, providing ideal elasticity day after day.
- **Inner acoustic and thermal insulation on panels** using 50 mm M0/A glass wool, in accordance with French Public Access Buildings regulations (Article CH36), protected by a 13/10 thick aluminium sheet for mechanical protection and easy maintenance.
- **Floor acoustic and thermal insulation** using 100 mm M0/A rock wool with double skin.
- **2-damper mixing box** including a motorised fresh air damper with bird proof grid and a motorised return air damper to ensure the desired proportions and optimise Free Cooling phases. Dampers have extruded aluminium blades with low pressure drop thanks to their plane wing profile and a flexible gasket which ensures excellent air tightness. The damper frame is made of tightness class 3 aluminium. The damper frame is made of aluminium.

# Description

## Energy and thermodynamic assembly:

- **Refrigeration circuits** compliant with European directive on pressure equipment (PED 97/23/EC).
- **R410A refrigerant.**
- **Direct expansion internal and external exchangers**, made with copper pipes and aluminium fins and frame, coupled with a thermostatic expansion valve in heat pump mode.
- **Tandem circuit**, operation in part load considerably reduces the number of defrost cycles and their duration.



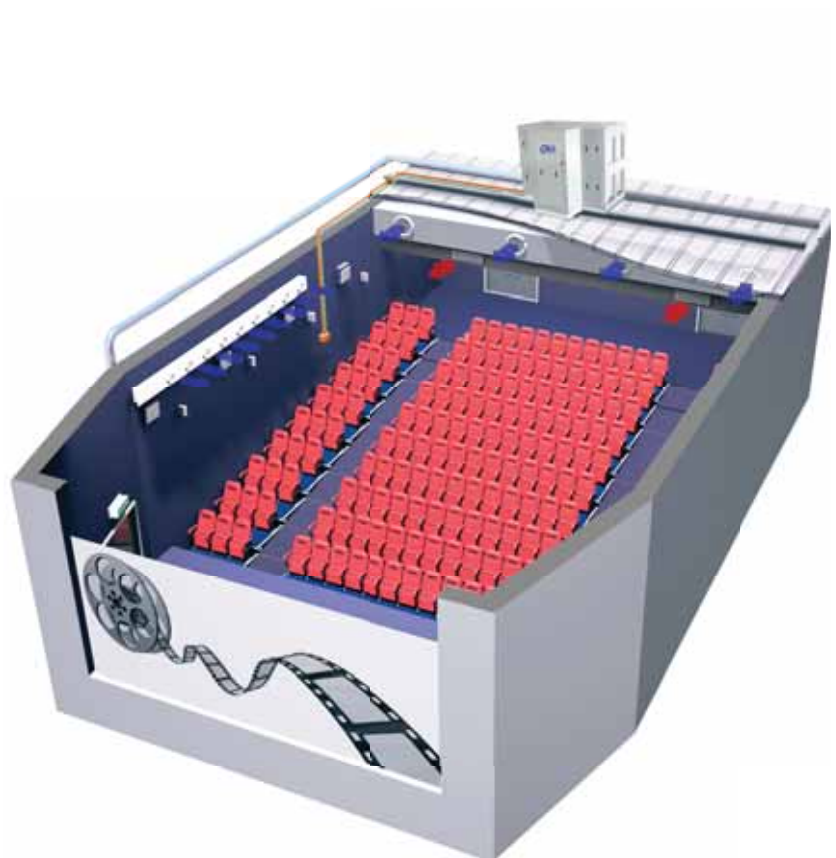
- **2 expansion valves per circuit and per refrigeration cycle** to optimise the efficiency of each evaporator cycle and reduce energy consumption.
- **Anti-acid filter drier.**
- **HP and LP switches.**
- **Cycle reversal valve.**

## Compulsory additional heating assembly:

compulsory auxiliary heating (see pages 17 and 18).

## Air assembly:

- **2 sets of easy-to-remove ecodeign filters (on supply and exhaust air)** - 98 mm pleated media, efficiency 95% ASHRAE gravimetric (G4), pressure switch for fouling control.
- **Plug fans on supply air and exhaust air** with EC motors. This technology avoids losses due to pulley-belt transmissions, thus improving energy efficiency.



# Control description

## Electrical assembly:

- **Electrical board** compliant with European standards EN 15-100 and EN 60204-01, including:
  - ✓ **ETT controller** with display.
  - ✓ **Power switch** with lockable external handle for full load cut-off. Connection using standard universal cable. Optional copper/aluminium connection boxes.
  - ✓ **400-230-24 volts transformer** for regulation and control circuits.
  - ✓ **Faults synthesis** with pending dry contact on terminal.
  - ✓ **Numbered terminal blocks** with disconnecting terminals for remote controls and transfers.
  - ✓ **Terminal block** for compressors load shedding.
  - ✓ **Internal wiring** with numbered ferrules at both extremities.
  - ✓ **Ik3 breaking capacity** of basis 10 kA.
  - ✓ **All components protected** by circuit breakers.

## Control assembly:

- **CTN type temperature probes.** Their accuracy and reliability have been tested and validated both at the factory and on site.
- **One or more BEST controllers** (Building Energy Saving Technology) especially developed by ETT for this range of units. Programs are updated annually in order to add functions requested for some applications and to optimise units electricity consumption.

The microprocessor, memory and controllers size are adapted to the chosen applications and options by integrating a program set-up in the factory out of 160 possible configurations.

The controller is in a plastic box which guarantees a high mechanical protection and reduces electrostatic shock threats.

**Among other functions, the controller includes:**

- ✓ **On/Off with remote contact** or vacancy contact.
- ✓ **On/Off** according to programmed schedule (2 time slots per day).
- ✓ **Fault synthesis** with dry contact for transfer to customer system.
- ✓ **2 setpoints** (cooling and heating) according to the European directive 2002/91/EC.

- ✓ **Security management** (freezestat, smoke detector, HP switch, etc.) and faults management.
- ✓ **Optimisation** and equalisation of compressors operating time.
- ✓ **Economiser management** (Free Cooling) through inside temperature analysis and comparison between return air and outside air temperatures.
- ✓ **Compressors stages management** giving priority to the highest COP and EER in part load.
- ✓ **Frost protection.**
- ✓ **Auxiliaries management** (possibility of banning according to outside temperature).
- ✓ **Night energy consumption management** with compressors' use limitation (Night Cooling).
- ✓ **Written faults history** (no code needed) with time and outside temperature display.
- ✓ **Operating hours counting** (unit, compressors and auxiliaries).
- ✓ **Air quality control** with CO<sub>2</sub> probe to optimise fresh air quantities to introduce, therefore limiting energy consumption.



# Main options

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<b>Frame - Casing</b>	<ul style="list-style-type: none"><li>▪ Motorised external damper for supply air (2006/42/EC Directive)</li><li>▪ Unit painting</li><li>▪ Delivery in three blocks (sheet metal work assembly and electrical connection shall be done by the customer)</li></ul>
<b>Acoustics</b>	<ul style="list-style-type: none"><li>▪ Technical section acoustic insulation using STOPFLAM flexible fire-proof polyurethane foam</li><li>▪ Fresh air cowl sound insulation</li><li>▪ Compressors acoustic jackets</li></ul>
<b>Air handling</b>	<ul style="list-style-type: none"><li>▪ Pressure gauge at each filtration stage</li><li>▪ Analogue air flow controller (AFC), air flow rate measurement and indication</li><li>▪ Filters fouling analogue control (FFAC)</li><li>▪ Backed-up self-contained smoke detector</li><li>▪ Epoxy coating for fans &amp; Vinyl coating for exchangers</li><li>▪ Supply air fan available pressure 600 Pa max.</li><li>▪ Exhaust air fan available pressure 400 Pa max.</li><li>▪ Operation in all recycling or all fresh air mode (not available for public access buildings)</li><li>▪ G4 refillable filters</li><li>▪ 1 set of spare G4 filters, 98 mm thick</li><li>▪ F6 to F9 opacimetric filters, 98 mm thick</li></ul>
<b>Thermodynamics</b>	<ul style="list-style-type: none"><li>▪ HP and LP pressure gauges</li><li>▪ Electronic expansion valves</li></ul>
<b>Thermal exchangers</b>	<ul style="list-style-type: none"><li>▪ 2-stage electric heater</li><li>▪ Triac</li><li>▪ 2-row hot water coil with analogue freezestat</li><li>▪ Vinyl coating on hot water coil</li><li>▪ Exhaust air fan available pressure 400 Pa max.</li><li>▪ Operation in all recycling or all fresh air mode (not available for public access buildings)</li><li>▪ G4 refillable filters</li><li>▪ 1 set of spare G4 filters, 98 mm thick</li><li>▪ F6 to F9 opacimetric filters, 98 mm thick</li></ul>
<b>Laying</b>	<ul style="list-style-type: none"><li>▪ 200 or 400 mm aluminium feet</li></ul>
<b>Electricity</b>	<ul style="list-style-type: none"><li>▪ Unit global energy metering</li></ul>
<b>Control</b>	<ul style="list-style-type: none"><li>▪ Banning of Free Cooling using specific humidity comparison</li><li>▪ Humidity probe (for external humidifier control)</li></ul>

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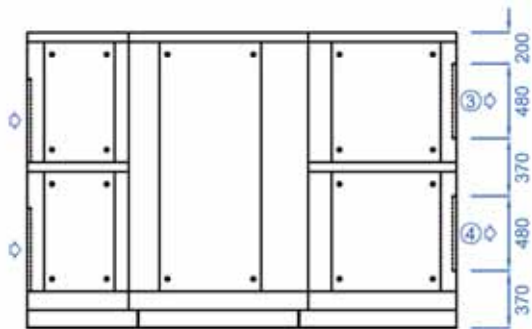


	NAME	Unit	09	19
<b>SPECIFICATIONS</b>	Rated air flow rate	<b>m<sup>3</sup>/h</b>	3000	5000
	Min./Max. air flow rate	<b>m<sup>3</sup>/h</b>	2500/4500	4000/6000
	Rated exhaust air flow rate	<b>m<sup>3</sup>/h</b>	4000	6500
	Rated gross cooling capacity Outside conditions: 35°C/40% RH, return air conditions: 27°C/47% RH, 40% fresh air <sup>(1)</sup>	<b>kW</b>	15.2	22.2
	Rated net cooling capacity Outside conditions: 35°C/40% RH, return air conditions: 27°C/47% RH, 40% fresh air <sup>(1)</sup>	<b>kW</b>	14.2	20.7
	Net EER <sup>(1)</sup>	<b>kW/kW</b>	2.7	2.8
	Rated gross heating capacity Outside conditions: 7°C/87 % RH, return air conditions: 20°C/40 % RH, 40% fresh air <sup>(1)</sup>	<b>kW</b>	15.4	21.9
	Rated net heating capacity Outside conditions: 7°C/87 % RH, return air conditions: 20°C/40 % RH, 40% fresh air <sup>(1)</sup>	<b>kW</b>	16.4	23.5
	Net COP <sup>(1)</sup>	<b>kW/kW</b>	4.1	4.4
	Rated gross heating capacity Outside conditions: -7°C/73 % RH, return air conditions: 20°C/40 % RH, 40% fresh air <sup>(1)</sup>	<b>kW</b>	12.3	17.4
	Rated net heating capacity Outside conditions: -7°C/73 % RH, return air conditions: 20°C/40 % RH, 40% fresh air <sup>(1)</sup>	<b>kW</b>	13.3	19.0
	Net COP <sup>(1)</sup>	<b>kW/kW</b>	3.8	4.0
	Number of independent refrigeration circuits	<b>u</b>	1	1
Power stages		1	2	
<b>ELECTRICAL CONNECTION</b>	Maximum absorbed electrical power <sup>(2)</sup>	<b>kW</b>	9.4	13.0
	Total installed electrical power <sup>(2)</sup>	<b>kW</b>	14.9	17.2
	Rated current <sup>(2)</sup>	<b>A</b>	25	29
	Starting current <sup>(2)</sup>	<b>A</b>	78	100
<b>FAN</b>	<b>SUPPLY AIR</b>			
	Absorbed electrical power <sup>(1)</sup>	<b>kW</b>	1.0	1.6
	SFPv (EN 13779)	<b>kW/(m<sup>3</sup>/s)</b>	1.16	1.12
	<b>EXHAUST AIR</b>			
	Absorbed electrical power <sup>(1)</sup>	<b>kW</b>	0.8	1.5
	SFPv (EN 13779)	<b>kW/(m<sup>3</sup>/s)</b>	1.44	1.71
<b>GENERAL</b>	Resulting outside sound pressure level at 10 m, ref. 10 <sup>-5</sup> in half-sphere configuration <sup>(1)</sup>	<b>dB(A)</b>	39	41
	Filters efficiency		G4	
	Filters dimensions & number	<b>mm</b>	(4x) 595*498*98	
	Max. outside operating temperature in Cooling mode	<b>°C</b>	45	
	Min. outside operating temperature in Cooling mode	<b>°C</b>	15	
	Min. outside operating temperature in Heating mode	<b>°C</b>	-15	
	Min. internal coil inlet temperature in Heating/Cooling mode	<b>°C</b>	12/18	
	Unit weight <sup>(3)</sup>	<b>kg</b>	846	867

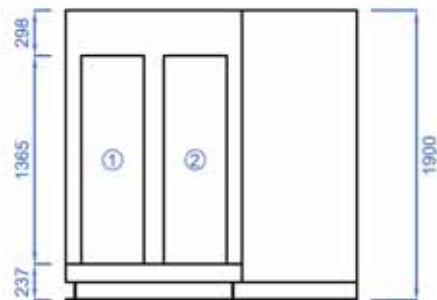
(1) External static pressure: 400 Pa on supply air side, 200 Pa on exhaust air side  
 (2) Out of electrical resistances

(3) Out of options

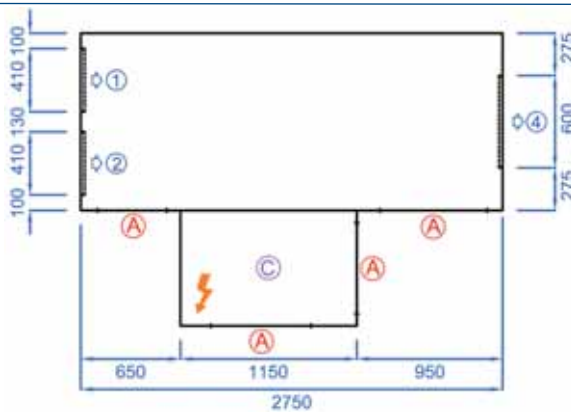
Front view:



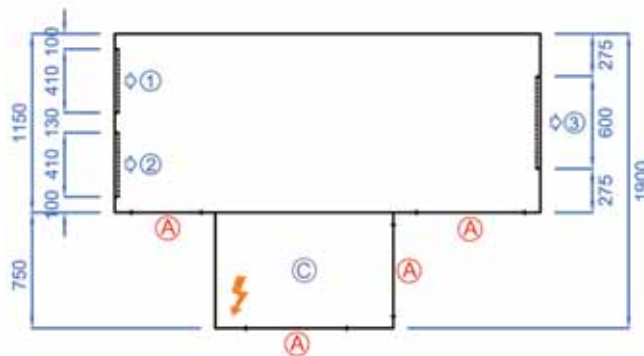
Fresh air/return air side view:



Top view - exhaust air stream:



Top view - supply air stream:



- ① Fresh air
- ② Return air
- ③ Supply air
- ④ Exhaust air
- Ⓐ Access
- ⚡ Power supply
- Ⓒ Technical section

	Length	Width	Height
Casing dimensions	2750 mm	1900 mm	1900 mm
Transport overall dimensions	2850 mm	1950 mm	1950 mm

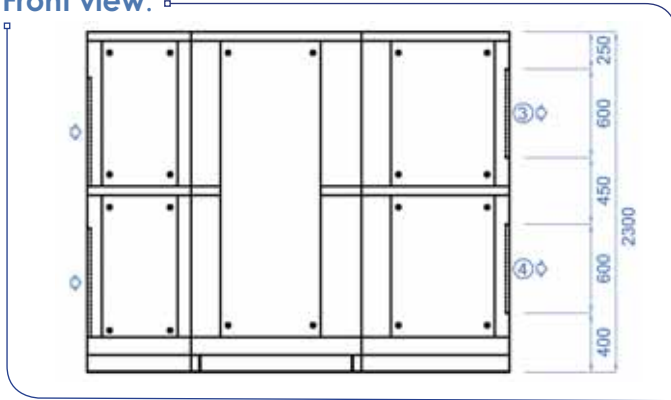
**Nota:** Fresh air cowls shall be installed by the installer. Feet shall be installed by the installer. Ducts (supply air, return air, fresh air and exhaust air) shall be connected with inserts (supplied by ETT) using 40 mm Metu frames.

	NAME	Unit	29	39	49
<b>SPECIFICATIONS</b>	Rated air flow rate	m <sup>3</sup> /h	7000	7500	9000
	Min./Max. air flow rate	m <sup>3</sup> /h	6000/8000	7000/9000	8000/11000
	Rated exhaust air flow rate	m <sup>3</sup> /h	9500	10000	13000
	Rated gross cooling capacity Outside conditions: 35°C/40% RH, return air conditions: 27°C/47% RH, 40% fresh air <sup>(1)</sup>	kW	32.2	40.1	45.6
	Rated net cooling capacity Outside conditions: 35°C/40% RH, return air conditions: 27°C/47% RH, 40% fresh air <sup>(1)</sup>	kW	30.3	38.0	42.9
	Net EER <sup>(1)</sup>	kW/kW	3.0	2.6	2.7
	Rated gross heating capacity Outside conditions: 7°C/87 % RH, return air conditions: 20°C/40 % RH, 40% fresh air <sup>(1)</sup>	kW	31.6	40.6	45.6
	Rated net heating capacity Outside conditions: 7°C/87 % RH, return air conditions: 20°C/40 % RH, 40% fresh air <sup>(1)</sup>	kW	33.5	42.7	48.3
	Net COP <sup>(1)</sup>	kW/kW	4.3	4.2	4.0
	Rated gross heating capacity Outside conditions: -7°C/73 % RH, return air conditions: 20°C/40 % RH, 40% fresh air <sup>(1)</sup>	kW	25.1	32.5	36.2
	Rated net heating capacity Outside conditions: -7°C/73 % RH, return air conditions: 20°C/40 % RH, 40% fresh air <sup>(1)</sup>	kW	27.0	34.6	38.9
	Net COP <sup>(1)</sup>	kW/kW	4.0	4.1	3.7
	Number of independent refrigeration circuits	u	1	1	1
	Power stages			2	
<b>ELECTRICAL CONNECTION</b>	Maximum absorbed electrical power <sup>(2)</sup>	kW	17.4	22.4	25.6
	Total installed electrical power <sup>(2)</sup>	kW	20.5	25.2	28.0
	Rated current <sup>(2)</sup>	A	34	43	47
	Starting current <sup>(2)</sup>	A	142	216	215
<b>FAN</b>	<b>SUPPLY AIR</b>				
	Absorbed electrical power <sup>(1)</sup>	kW	1.9	2.1	2.7
	SFPv (EN 13779)	kW/(m <sup>3</sup> /s)	0.97	0.99	1.06
	<b>EXHAUST AIR</b>				
	Absorbed electrical power <sup>(1)</sup>	kW	2.2	2.5	3.6
	SFPv (EN 13779)	kW/(m <sup>3</sup> /s)	1.67	1.76	2.01
<b>GENERAL</b>	Resulting outside sound pressure level at 10 m, ref. 10 <sup>-5</sup> in half-sphere configuration <sup>(1)</sup>	dB(A)	45	46	47
	Filters efficiency		G4		
	Filters dimensions & number	mm	(8x) 595*498*98		
	Max. outside operating temperature in Cooling mode	°C	45		
	Min. outside operating temperature in Cooling mode	°C	15		
	Min. outside operating temperature in Heating mode	°C	-15		
	Min. internal coil inlet temperature in Heating/Cooling mode	°C	12/18		
	Unit weight <sup>(3)</sup>	kg	1145	1145	1165

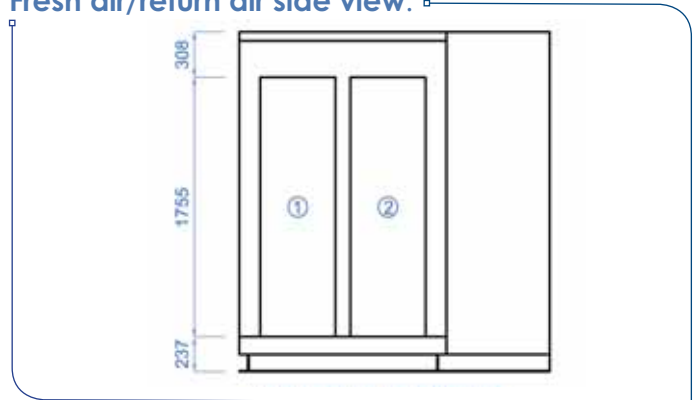
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 (2) Out of electrical resistances

(3) Out of options

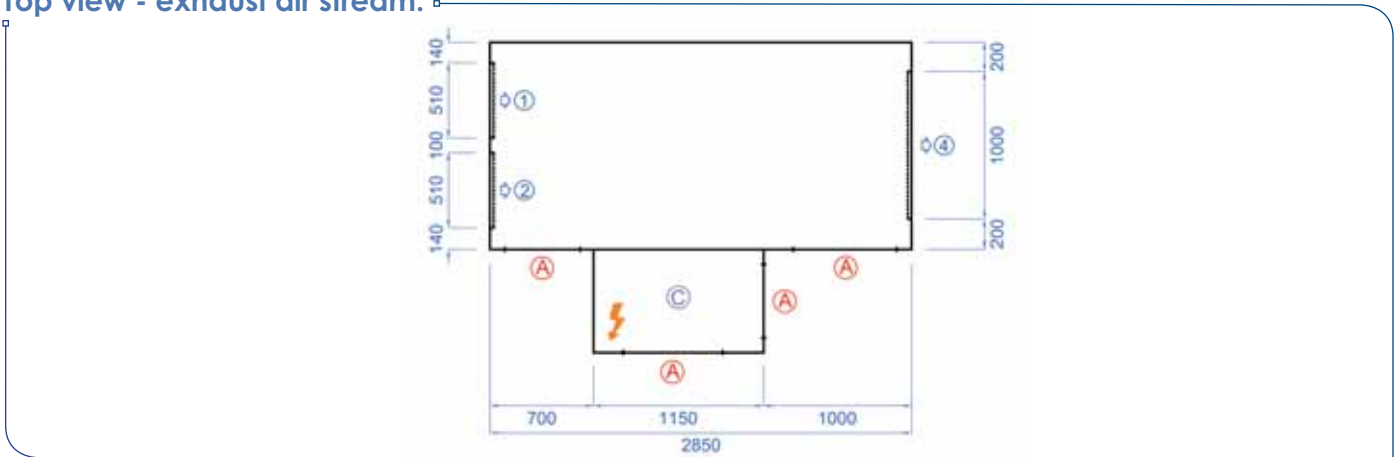
Front view:



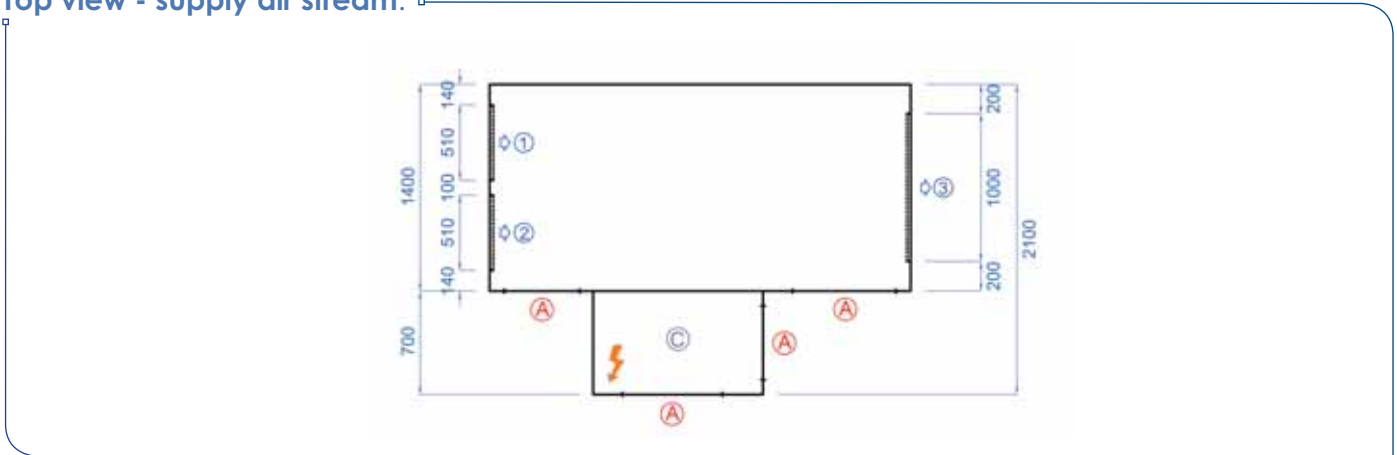
Fresh air/return air side view:



Top view - exhaust air stream:



Top view - supply air stream:



- ① Fresh air
- ② Return air
- ③ Supply air
- ④ Exhaust air
- (A) Access
- ⚡ Power supply
- (C) Technical section

	Length	Width	Height
Casing dimensions	2850 mm	2100 mm	2300 mm
Transport overall dimensions	2950 mm	2150 mm	2350 mm

**Nota:** Fresh air cowls shall be installed by the installer. Feet shall be installed by the installer. Ducts (supply air, return air, fresh air and exhaust air) shall be connected with inserts (supplied by ETT) using 40 mm Metu frames.

	NAME	Unit	59	69	79	99
SPECIFICATIONS	Rated air flow rate	m <sup>3</sup> /h	12000	14000	16000	20000
	Min./Max. air flow rate	m <sup>3</sup> /h	10000/14000	12000/16000	14000/16000	18000/22000
	Rated exhaust air flow rate	m <sup>3</sup> /h	16000	18500	21000	26000
	Rated gross cooling capacity Outside conditions: 35°C/40% RH, return air conditions: 27°C/47% RH, 40% fresh air <sup>(1)</sup>	kW	56.8	64.4	80	94.3
	Rated net cooling capacity Outside conditions: 35°C/40% RH, return air conditions: 27°C/47% RH, 40% fresh air <sup>(1)</sup>	kW	53.5	60.6	75.4	87.7
	Net EER <sup>(1)</sup>	kW/kW	2.9	2.9	2.8	2.6
	Rated gross heating capacity Outside conditions: 7°C/87 % RH, return air conditions: 20°C/40 % RH, 40% fresh air <sup>(1)</sup>	kW	56	63.7	80.6	94.1
	Rated net heating capacity Outside conditions: 7°C/87 % RH, return air conditions: 20°C/40 % RH, 40% fresh air <sup>(1)</sup>	kW	59.3	67.5	85.2	100.7
	Net COP <sup>(1)</sup>	kW/kW	4.4	4.4	4.4	4.0
	Rated gross heating capacity Outside conditions: -7°C/73 % RH, return air conditions: 20°C/40 % RH, 40% fresh air <sup>(1)</sup>	kW	43.5	50.6	64.3	75.2
	Rated net heating capacity Outside conditions: -7°C/73 % RH, return air conditions: 20°C/40 % RH, 40% fresh air <sup>(1)</sup>	kW	46.8	54.4	68.9	81.8
	Net COP <sup>(1)</sup>	kW/kW	4.1	4.1	4.1	3.8
	Number of independent refrigeration circuits	u	2	2	2	2
Power stages		4				
ELECTRICAL CONNECTION	Maximum absorbed electrical power <sup>(2)</sup>	kW	28.2	33.6	42.4	50.0
	Total installed electrical power <sup>(2)</sup>	kW	33.6	39.8	46.9	56.3
	Rated current <sup>(2)</sup>	A	57	67	80	99
	Starting current <sup>(2)</sup>	A	150	175	253	269
FAN	<b>SUPPLY AIR</b>					
	Absorbed electrical power <sup>(1)</sup>	kW	3.3	3.8	4.6	6.6
	SFPv (EN 13779)	kW/(m <sup>3</sup> /s)	1.00	0.99	1.03	1.19
	<b>EXHAUST AIR</b>					
	Absorbed electrical power <sup>(1)</sup>	kW	3.5	4.5	5.0	7.6
	SFPv (EN 13779)	kW/(m <sup>3</sup> /s)	1.56	1.74	1.70	2.12
GENERAL	Resulting outside sound pressure level at 10 m, ref. 10 <sup>-5</sup> in half-sphere configuration <sup>(1)</sup>	dB(A)	47	47	48	51
	Filters efficiency		G4			
	Filters dimensions & number	mm	(12x) 595*498*98 + (6x) 595*287*98			
	Max. outside operating temperature in Cooling mode	°C	45			
	Min. outside operating temperature in Cooling mode	°C	15			
	Min. outside operating temperature in Heating mode	°C	-15			
	Min. internal coil inlet temperature in Heating/Cooling mode	°C	12/18			
	Unit weight <sup>(3)</sup>	kg	1787	1844	1882	1892

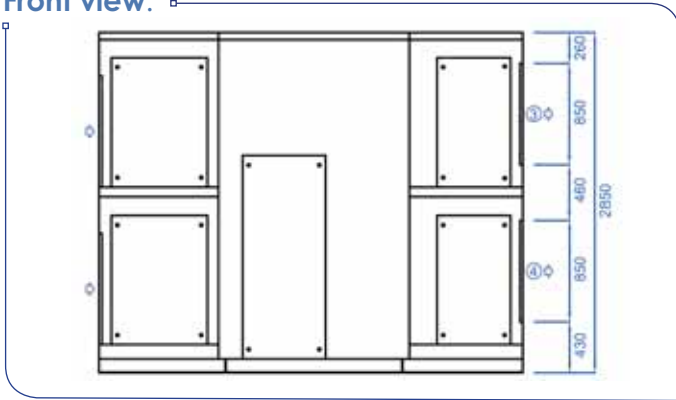
(1) External static pressure: 400 Pa on supply air side, 200 Pa on exhaust air side  
 (2) Out of electrical resistances

(3) Out of options

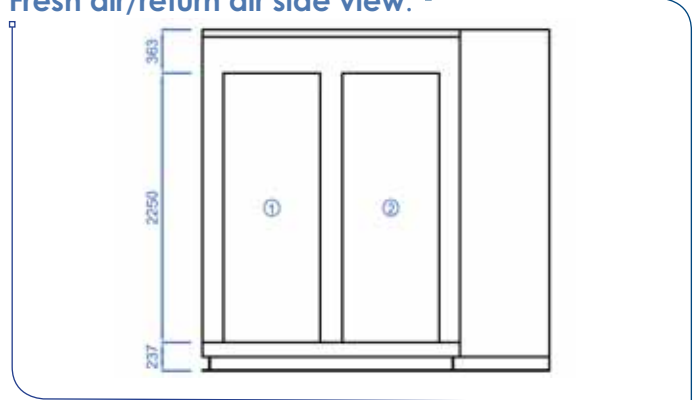
# Dimensions and connections

Type 59 - 69 - 79 -99

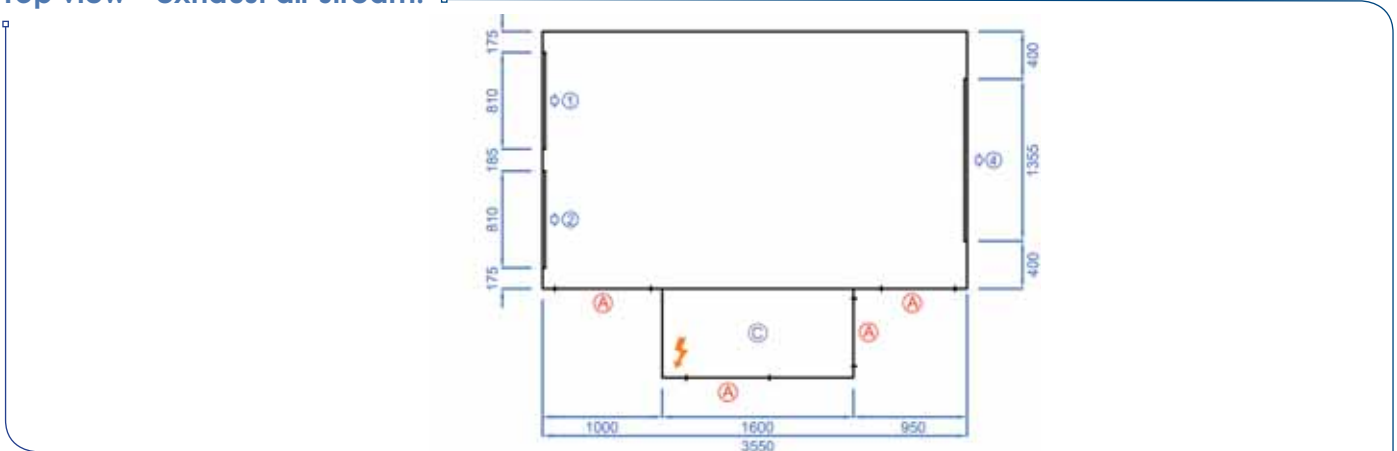
Front view:



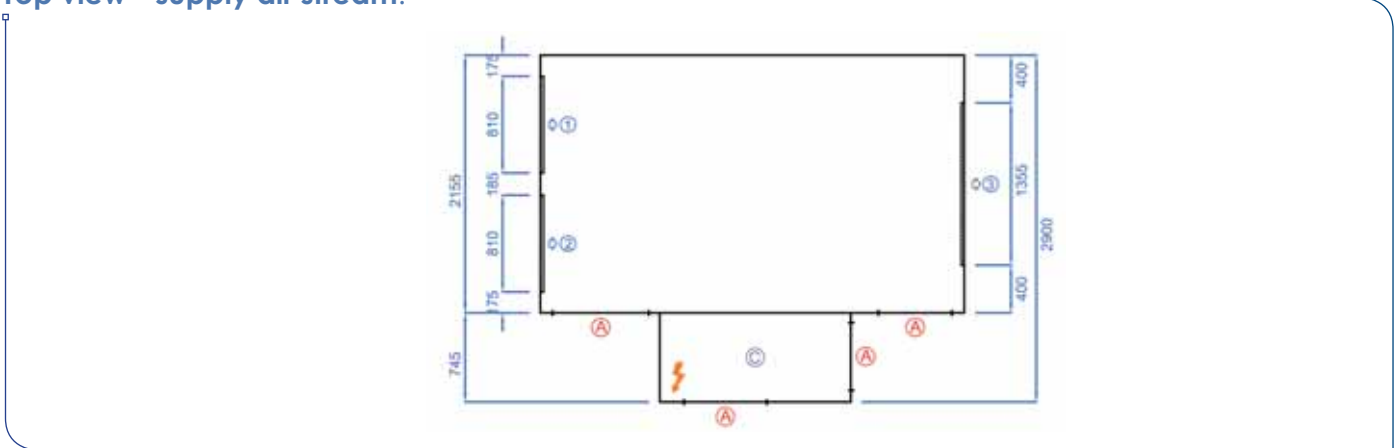
Fresh air/return air side view:



Top view - exhaust air stream:



Top view - supply air stream:



- ① Fresh air
- ② Return air
- ③ Supply air
- ④ Exhaust air
- Ⓐ Access
- ⚡ Power supply
- Ⓒ Technical section

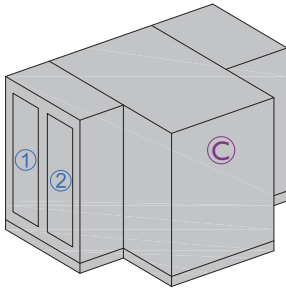
	Length	Width	Height
Casing dimensions	3550 mm	2900 mm	2850 mm
Transport overall dimensions	3650 mm	2950 mm	2900 mm

**Nota:** Fresh air cowls shall be installed by the installer. Feet shall be installed by the installer. Ducts (supply air, return air, fresh air and exhaust air) shall be connected with inserts (supplied by ETT) using 40 mm Metu frames.

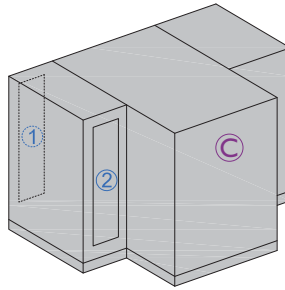
# Arrangements

## FR CH RE V dampers

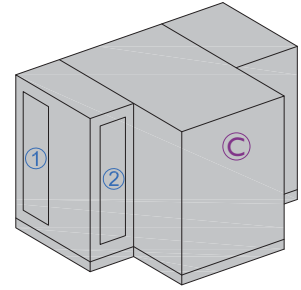
Arrangement A



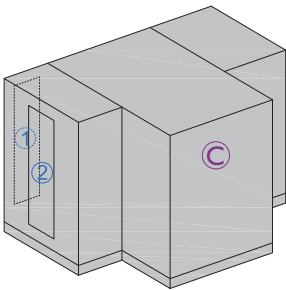
Arrangement B



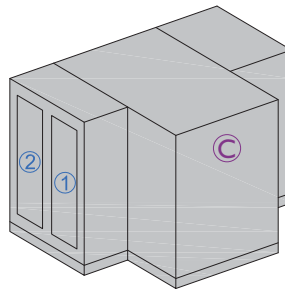
Arrangement C



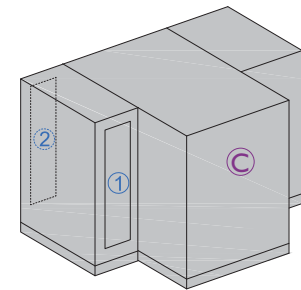
Arrangement D



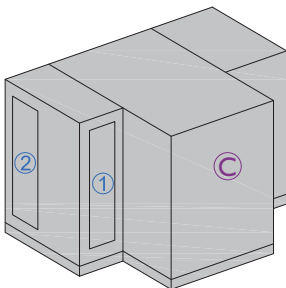
Arrangement E



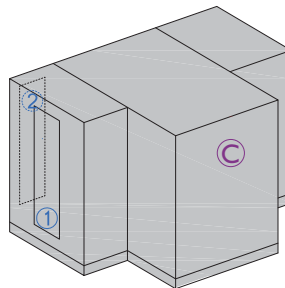
Arrangement F



Arrangement G

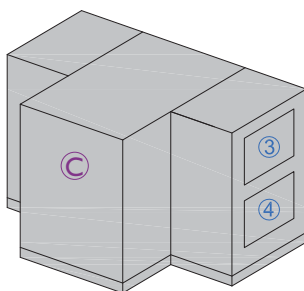


Arrangement H

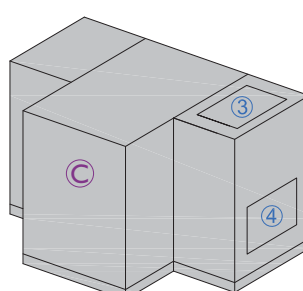


## FR CH RE V fans

Arrangement 1



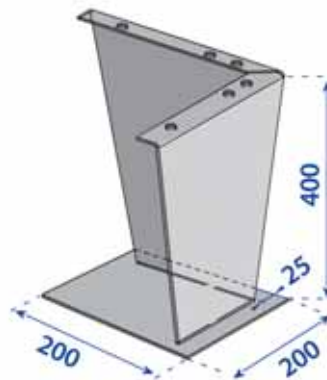
Arrangement 2



- ① Fresh air & make-up air
- ② Return air & exhaust air
- ③ Supply air
- ④ Exhaust air
- ⓐ Technical section

# Installation accessories: Feet

AG3 fixed foot  
Unitary weight: 1 kg  
Item code: TPP 50010



Unit	09	19	29	39	49	59	69	79	99
Nr. of feet	6	6	6	6	6	6	6	6	6

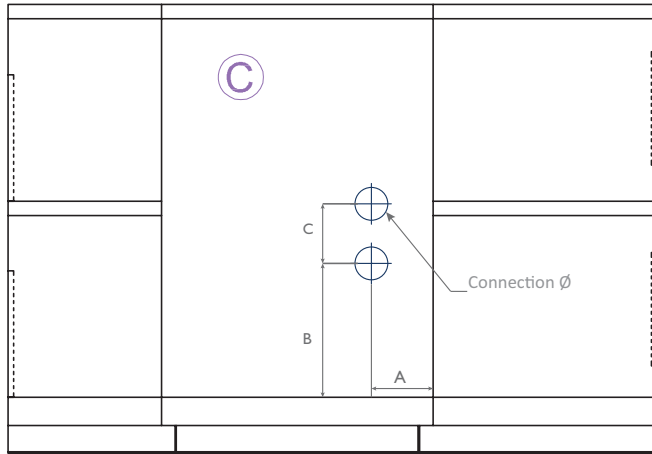




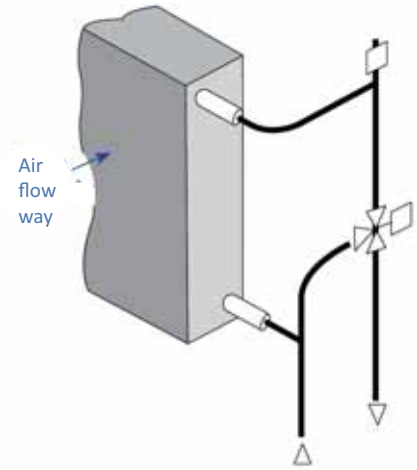
# Auxiliary: Hot water coils

## SCHEMATIC DIAGRAM

Top view



Principle



© Technical section

## DIMENSIONS

	Unit	09	19	29	39	49	59	69	79	99
A	mm	220	220	200	200	200	592	592	592	592
B	mm	960	960	1230	1230	1230	1622	1622	1622	1622
C	mm	85	85	185	185	185	135	135	135	135
Customer connection diameter	mm	33x42	33x42	33x42	33x42	33x42	40x49	40x49	40x49	40x49
Coil + 3WV with water	kg	30	30	50	50	50	74	74	74	74

## CAPACITY

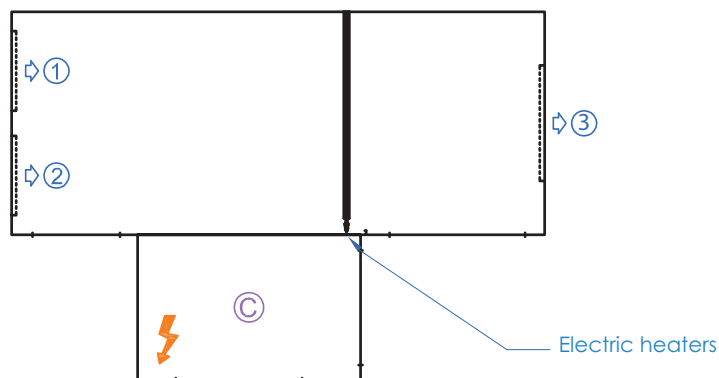
With +10°C air inlet temperature on coils

		Unit	09	19	29	39	49	59	69	79	99
90/70 °C water regime	Maxi power (kW)	kW	45.2	63.6	59.2	64.6	71.9	149	166	180	180
	Max. flow rate	m³/h	2	2.8	2.6	2.8	3.2	6.6	7.3	7.4	4.4
	3WV + coil pressure drop	mWC	1.6	2	3.4	3.8	4.7	4.1	5.1	5.1	2.1
	Stop and TA valves pressure drop (opened by 3 turns)	mWC	0.55	0.98	0.86	1.01	1.23	2.87	3.55	3.6	1.4
Water supply 80/60 °C	Maxi power (kW)	kW	38.1	53.4	49.9	54.4	60.5	127	142	155	180
	Max. flow rate	m³/h	1.7	2.4	2.2	2.4	2.7	5.6	6.2	6.8	7.9
	3WV + coil pressure drop	mWC	1.3	2.2	2.6	2.9	3.6	3.1	3.9	4.4	5.9
	Stop and TA valves pressure drop (opened by 3 turns)	mWC	0.43	0.72	0.64	0.75	0.9	2.1	2.56	3.1	4.1

Optional: stop valve on outlet and TA regulating valve on inlet

# Auxiliary: Electric heaters

## SCHEMATIC DIAGRAM



① Fresh air    ② Return air    ③ Supply air    ⚡ Power supply    © Technical section

## AVAILABLE CAPACITIES (in kW)

Total capacity (kW)	1 <sup>st</sup> stage	2 <sup>nd</sup> stage	09	19	29	39	49	59	69	79	99	Weight (kg)
9	3	6	•	•	•	•	•	•	•	•	•	9.6
12	3	9	•	•	•	•	•	•	•	•	•	13.3
15	6	9	•	•	•	•	•	•	•	•	•	19.9
18	6	12	•	•	•	•	•	•	•	•	•	24.3
21	6	15	•	•	•	•	•	•	•	•	•	29.1
24	9	15			•	•	•	•	•	•	•	32.7
27	9	18			•	•	•	•	•	•	•	37.2
30	12	18						•	•	•	•	41.7
33	12	21						•	•	•	•	44.1
36	15	21						•	•	•	•	48.9
39	15	24						•	•	•	•	53.7
42	18	24						•	•	•	•	58.2
45	18	27						•	•	•	•	62.7

**Nota:** An additional coil can be mounted in the supply air duct or on the fresh air inlet for higher performances. Please consult us.

# Sound level\* of the fan on supply and exhaust air side

## On supply air side

	FREQUENCY BAND Hz ▶		63	125	250	500	1000	2000	4000	8000	Overall level Lw (dB(A))
	Supply air flow rate (m <sup>3</sup> /h) ▼	Exhaust air flow rate (m <sup>3</sup> /h) ▼									
09	3000	4000	59.4	71.4	72.0	74.4	75.3	72.2	68.2	59.6	80.6
19	5000	6500	50.7	71.1	73.4	75.8	76.4	74.8	71.5	62.9	82.1
29	7000	9500	47.1	69.7	74.7	79.0	79.7	77.0	73.7	65.5	84.6
39	7500	10000	47.9	68.6	75.8	80.4	81.1	78.0	74.6	66.6	85.8
49	9000	13000	49.1	65.8	81.1	85.0	85.6	81.7	77.6	69.5	90.1
59	12000	16000	50.5	70.4	79.7	85.7	85.2	83.4	79.0	75.8	90.6
69	14000	18500	50.3	72.4	77.8	82.1	82.8	80.1	76.8	68.6	87.7
79	16000	21000	51.7	70.3	80.7	85.1	85.7	82.3	78.7	70.7	90.3
99	20000	26000	53.2	69.2	84.4	89.5	89.9	87.5	83.1	79.8	94.8

\*Lw: sound power level (dB(A))

Data for 400 Pa available on supply air side and 200 Pa on exhaust air side

## On exhaust air side

	FREQUENCY BAND Hz ▶		63	125	250	500	1000	2000	4000	8000	Overall level Lw (dB(A))
	Supply air flow rate (m <sup>3</sup> /h) ▼	Exhaust air flow rate (m <sup>3</sup> /h) ▼									
09	3000	4000	46.2	63.3	65.9	69.9	70.6	68.7	64.3	55.8	75.8
19	5000	6500	45.2	69.7	73.2	76.9	77.6	75.1	71.7	63.3	82.7
29	7000	9500	49.2	67.9	81.1	85.6	87.0	83.9	78.0	69.6	91.2
39	7500	10000	50.0	67.5	82.2	86.8	88.6	85.5	79.9	70.9	92.6
49	9000	13000	52.2	69.2	82.2	88.1	87.6	86.1	81.9	78.3	93.1
59	12000	16000	49.5	75.7	79.5	83.8	84.6	81.5	76.7	68.7	89.3
69	14000	18500	51.9	70.8	83.5	88.0	89.2	85.9	80.4	72.2	93.5
79	16000	21000	50.3	78.0	80.8	85.5	85.2	83.3	78.2	73.8	90.7
99	20000	26000	55.1	71.9	85.1	91.1	90.6	88.8	85.0	81.3	96.0

\*Lw: sound power level (dB(A))

Data for 400 Pa available on supply air side and 200 Pa on exhaust air side

# Sound level\* of the fan at fresh air - make-up air inlet/ at exhaust air - return air inlet

## At fresh air/make-up air inlet

	FREQUENCY BAND Hz ▶		63	125	250	500	1000	2000	4000	8000	Overall level Lw (dB(A))
	Supply air flow rate (m³/h) ▼	Exhaust air flow rate (m³/h) ▼									
09	3000	4000	57.1	65.6	64.1	63.0	61.3	62.2	56.3	49.1	70.9
19	5000	6500	45.7	65.3	67.7	66.3	65.3	66.7	61.3	54.4	73.7
29	7000	9500	46.6	64.5	71.9	74.5	71.7	73.8	65.9	59.3	79.5
39	7500	10000	47.2	63.9	72.8	75.8	73.0	75.4	67.4	60.6	80.8
49	9000	13000	48.7	63.8	75.8	77.8	74.6	76.8	70.6	67.6	82.9
59	12000	16000	48.5	67.7	74.7	75.4	73.1	74.6	69.1	65.0	81.2
69	14000	18500	49.5	67.2	74.5	77.0	74.1	76.0	68.6	62.0	82.0
79	16000	21000	48.9	69.7	75.2	74.9	73.4	74.9	68.9	63.7	81.3
99	20000	26000	52.3	66.9	80.1	81.2	78.5	80.4	75.0	72.0	86.7

\*Lw: sound power level (dB(A))

Data for 400 Pa available on supply air side and 200 Pa on exhaust air side

## In the exhaust air / return air inlet

	FREQUENCY BAND Hz ▶		63	125	250	500	1000	2000	4000	8000	Overall level Lw (dB(A))
	Supply air flow rate (m³/h) ▼	Exhaust air flow rate (m³/h) ▼									
09	3000	4000	57.1	65.6	64.1	63.0	61.3	62.2	56.3	49.1	70.9
19	5000	6500	45.7	65.3	67.7	66.3	65.3	66.7	61.3	54.4	73.7
29	7000	9500	46.6	64.5	71.9	74.5	71.7	73.8	65.9	59.3	79.5
39	7500	10000	47.2	63.9	72.8	75.8	73.0	75.4	67.4	60.6	80.8
49	9000	13000	48.7	63.8	75.8	77.8	74.6	76.8	70.6	67.6	82.9
59	12000	16000	48.5	67.7	74.7	75.4	73.1	74.6	69.1	65.0	81.2
69	14000	18500	49.5	67.2	74.5	77.0	74.1	76.0	68.6	62.0	82.0
79	16000	21000	48.9	69.7	75.2	74.9	73.4	74.9	68.9	63.7	81.3
99	20000	26000	52.3	66.9	80.1	81.2	78.5	80.4	75.0	72.0	86.7

\*Lw: sound power level (dB(A))

Data for 400 Pa available on supply air side and 200 Pa on exhaust air side

# Probes connection principle



- ① **Room probe:** 1 shielded pair wire, 2 x 0.75 mm<sup>2</sup> LIY-CY (max. length 100 lm)
- ② **CO<sub>2</sub> probe:** 2 shielded pairs wire, 4 x 0.75 mm<sup>2</sup> LIY-CY (max. length 100 lm)
- ③ **Humidity probe:** 2 shielded pairs wire, 4 x 0.75 mm<sup>2</sup> LIY-CY (max. length 100 lm) *(optional)*

- Nota:**
- Please note that the value indicated can vary depending on probe location. For more representative results, do not install them:
    - > Close to heat sources (spotlight, cooking appliances, glass wall, flues)
    - > In draft zones (close to entrance, stockrooms, openings)
    - > In dead zones (behind shelvings, in a corner)
    - > Close to crowded areas (checkouts, fitting rooms)
  - For accurate measurements:
    - > Do not install the probes in the axis of the duct used for their wiring.
    - > Do not install control cables and power cables in the same duct (risk of electromagnetic interference).



Reference: MARK-BRO\_11.00-EN

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