CLIMATIC
ENVIRONMENT
SOLUTIONS
AND EQUIPMENT

Green Line

ULTI+ R32 RE

Solution ErP 2021

R32

Double flow rooftop heat pump & air conditioning unit

MADE IN FRANCE

www.ett-hvac.com

ULTI+ R32 RE: ErP 4-damper heat pump

When they adopted the KYOTO protocol, the Member States of the European Union (EU) voted a set of measures known as the "energy-climate package", aiming at:

- ✓ reducing greenhouse gas emissions by 20%;
- ✓ reducing energy consumption by 20%;
- ✓ increasing the proportion of renewable energies to 20% of the final energy consumption.

Directive 2009/125/EC on the ecodesign of ErP (Energy related Products) has been adopted to achieve these objectives.

This directive applies to all products using energy or having an impact on energy consumption. It encompasses a **« package of regulations »** setting performance requirements for each type of product. EU Regulation **2016/2281 covers air heaters, cooling appliances, high-temperature industrial chillers and fan coil units**.

- **1st January 2021**

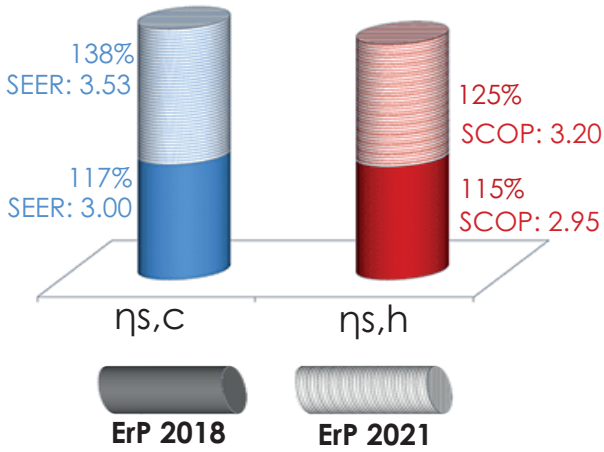
4-Damper heat pumps failing to comply with Regulation (EU) 2281/2016 shall no longer be marketed in Europe

Regulatory impacts since 1 January 2018

The European Parliament compels rooftop manufacturers to comply with Regulation (EU) 2281/2016 on ErPs, in order to give the users the possibility to evaluate their energy consumption.

A new method for assessing the energy efficiency of rooftops has been defined under this regulation, which specifies the minimum eco-design requirements: **seasonal efficiency**.
This new measure gives a **more realistic indication of the energy efficiency** of a heating or air-conditioning system and its impact on the environment.

Seasonal yields to be achieved according to ErP 2018 or ErP 2021.



A summary sheet stating **rated capacity & seasonal efficiency** is available on request.

SCOP

Seasonal Coefficient of Performance

The SCOP is the ratio between annual heating demand to the reference climate and the annual electricity consumption for heating.

$$\eta s,h = \frac{SCOP}{2.5} - 3\%$$

SEER

Seasonal energy efficiency

The SEER is the ratio between annual cooling demand to the reference climate and the annual electricity consumption for cooling.

$$\eta s,c = \frac{SEER}{2.5} - 3\%$$

2.5: Primary energy conversion coefficient
3 %: Control-related factor

CONTENTS

General description

The **ETT** packaged unit is delivered ready to operate. Its full aluminium structure (frame and casing) ensures an excellent corrosion protection (20-year anti- corrosion guarantee).

Aluminium promotes the REFURBISHING of machines for a second life: Aluminium allows our machines to be refurbished for a second life, unlike a steel structure.

Environmental impact :

The Ultima Green Line is environmentally responsible and uses the R32, a refrigerant with low environmental impact:

- ✓ Zero ozone depletion (ODP)
- ✓ Global Warming Potential (GWP) of 675

Our technical choices have a major impact on the environment

- **DECARBONATION:**

ETT is committed to an ambitious approach to reducing Greenhouse Gas Emissions:

- Reducing the energy consumption of our machines
- Fluid refrigerants with low GWP
- Energy monitoring & AI
- Adiabatic cooling
- Development of machine retrofits

- **ALUMINIUM: PERFORMANCE AND DURABILITY!**
  - Lightweight: 3 times lighter than steel
  - Corrosion resistant and long lifespan
  - Thermal performance
  - 100% recyclable indefinitely
  - Facilitates the refurbishing of our machines

- **ECO-DESIGN:**

Our technologies are designed with sustainability in mind, reducing their environmental impact throughout their life cycle.

- **LOW-POLLUTION MANUFACTURING PROCESS:**
  - Selective sorting: 80% recovery rate
  - No paint or solvents

- **END OF MACHINE LIFE:**

In compliance with regulations, ETT is a member of the Ecologic eco-organisation for the end-of-life processing of machines, which are 98% recyclable.

EcoLogic

- **ETT CERTIFICATIONS**

- **CSR assessment: ECOVADIS Gold Medal** for our CSR approach

- **Iso 14001 & Iso 9001 certification** for our Quality and Environmental Management system

- **Certificate of competence for handling refrigerants**

- **Membership of the UN Global Compact**

- **Qualiopi certification** for our training centre

As a positive-impact company, ETT contributes to a more sustainable world through our decarbonising products and services.

CE In addition, each unit is delivered with an certificate of conformity to EU standards and complies with the following standards:

- Machinery Directive 2006/42/EC - Operator's safety
- Low Voltage Directive (LVD) 2014/35/EU - Electricity
- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Regulation (EU) 2016/426 – Gas appliances
- Standard NF EN 60204 -1- Electrical appliances
- Standard EN 378-2 : 2017 – Safety and environmental requirements
- PED Directive 2014/68/EU (in accordance with Articles 2.10, 2.11, 3.4, 5a and 5d of Annex 1) - Pressure equipment
- EcoDesign regulations ErP UE 2281/2016

20-year guarantee against corrosion frame - casing

ENERGY SAVING

ENVIRONMENTAL ATTITUDE

SERVICE LINK

Unit description

20-year guarantee against corrosion frame - casing

Eco-design filtration

Low pressure drop.

Analogue clogging controller.

Options ISO Coarse 65% (G4) refillable, ISO ePM10 50% (M5), ISO Coarse 65% (G4)+ISO ePM1 50% (F7), ISO Coarse 65% (G4)+ISO ePM1 80%(F9), ISO ePM1 50% (F7), ISO ePM1 80%(F9).

Aluminium frame-casing assembly

Optimised tightness and thermal insulation.

Reduced weight, for new and refurbish projects.

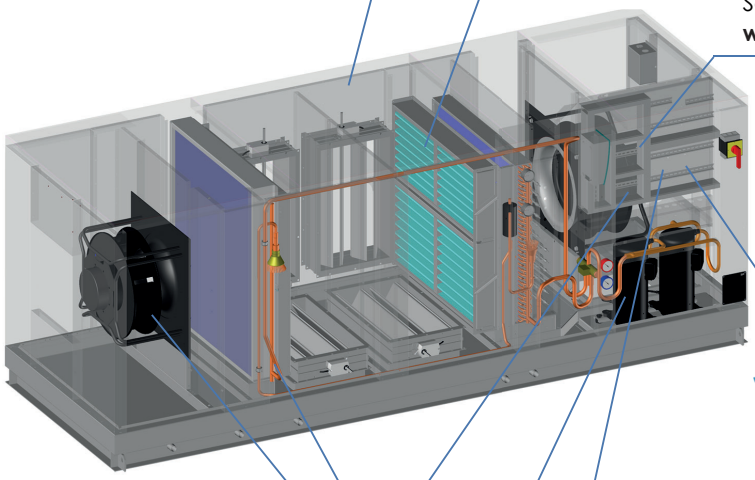
Multiple airflow configurations available.

20-year anti-corrosion guarantee.

Waterproof electrical enclosure

Separate electrical board in a **IP44 waterproof enclosure** for greater safety.

Solution ErP 2021



Connected components

Optimum unit operation.

Connection to myETTvision communication platform available

myETTvision

Internal fans

Variable-speed fans with air flow rate measurement.

Analogue air flow controller (AFC), communicating, direct transmission, « EC » electronically commutated motor optimum performance and low acoustic level.

Low Noise configuration as an option

AFC option available with flow rate auto-adjustment.

New generation PLC with display

Control enabling optimum operation in all conditions.

Multi-stage circuit with R32 new generation compressors

Optimum performance whatever the partial load.

Electronic expansion valves.

R32

Leak detection

Reduces the number of periodic visits.

Thermal heat exchangers

Optimized heat exchanger for improved energy performance.

Vinyl coating as an option

** Energy related Product (ERP) 2021: THE ULTI+ R32 RE Green Line meets the eco-design regulatory requirements applicable to air heaters and cooling appliances (Regulation 2016/2281).*

Unit description

Energy
savings

The ULTI+R32 RE is an efficient,economical and eco-friendly solution for heating or cooling buildings.

Thanks to its design, the ULTI+ R32 RE provides precise regulation for optimum energy performance throughout its years of operation.

PREMIUM PROCESS
Quality of components

- **Sustainable and recyclable equipment**: **aluminium frame and casing**, 100% recyclable, 20 year corrosion proof warranty
- Non-polluting process
- **Eco Design approach** to combine **economy** and **optimum performance** (SEER, SCOP)
- Reduced unit size and weight

Accessibility
and flexibility

- **Technical compartment** allowing simple and rapid access to the air ducts.
- Free and simplified access to **the filters through removable panels.**
- **Accessible components** for **maintenance.**
- **Wide range of power ratings** to suit the needs of each project
- **Numerous airflow configurations**, meeting integration constraints.

Connected components
New Generation PLC

- allows communication between units
- transfers the technical data from the units to an external server for optimum remote control with myETTvision.

R32 fluid
with Low GWP

- New **ULTI+ R32 RE Green Line** using R32, low GWP fluid (675).
- **plays an active role in meeting the CO_2** equivalent tonnage quota, a legal obligation imposed on gas producers/importers.
- minimizes the impact on the greenhouse effect.

Indoor
Air quality

- Eco - Design filtration.
- VOC or CO_2 sensor controlling the supply of fresh air.
- Free access to filters via removable panels allowing **quick and easy replacement of filters**.

Acoustic
performance

MAIN FEATURES

- **Low Noise fans selection optimized for low-noise operation, optional**
- **Acoustic treatment of the technical compartment and compressors, optional**

Because respect for the sound environment is essential, we offer **standard** stand-alone units that **meet your acoustic constraints.**

ETT goes the extra mile...

Installation

- Indoors in a technical room.
- Outdoor, on the rooftop or at ground level.

ETT Services

- A team to guide you from commissioning to operational support
- Manufacturer visits and audits
- Optimising and upgrading your units
- Service contracts (comfort peace of mind - serenity - pay-per-view)
- Staff training
- Access to the ETT Services hotline

myETTvision platform

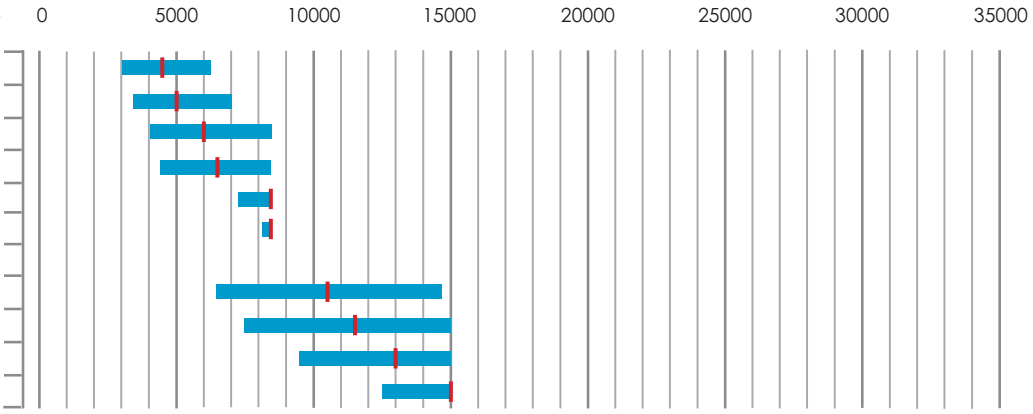
myETTvision allows you to control and optimize your installation remotely.

Unit description

A WIDE RANGE

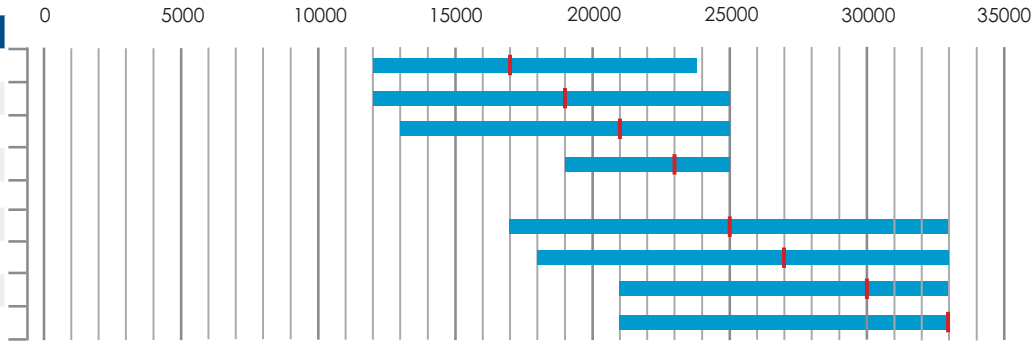
Flow rate range (m³/h) & rated flow rate (|)

Unit	Capacity
ULTI+ R32 RE 01-020	18.1
ULTI+ R32 RE 01-025	20.4
ULTI+ R32 RE 01-030	24.9
ULTI+ R32 RE 01-035	30.4
ULTI+ R32 RE 01-045	40.1
ULTI+ R32 RE 01-050	41.8
ULTI+ R32 RE 11-050	47.1
ULTI+ R32 RE 11-055	53.0
ULTI+ R32 RE 11-065	59.9
ULTI+ R32 RE 11-075	66.9



Flow rate range (m³/h) & rated flow rate (|)

Unit	Capacity
ULTI+ R32 RE 21-080	77.4
ULTI+ R32 RE 21-090	82.6
ULTI+ R32 RE 21-095	89.4
ULTI+ R32 RE 21-110	108.7
ULTI+ R32 RE 22-115	107.6
ULTI+ R32 RE 22-130	122.0
ULTI+ R32 RE 22-140	130.2
ULTI+ R32 RE 22-150	147.2



Operating principles

The unit operates as a reversible heat pump :

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

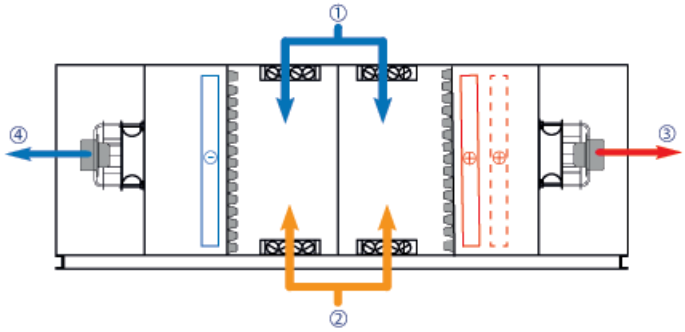
The following operating modes are available:

- Heat pump
- Cooling
- Free Cooling: cooling with outside air, without thermodynamics

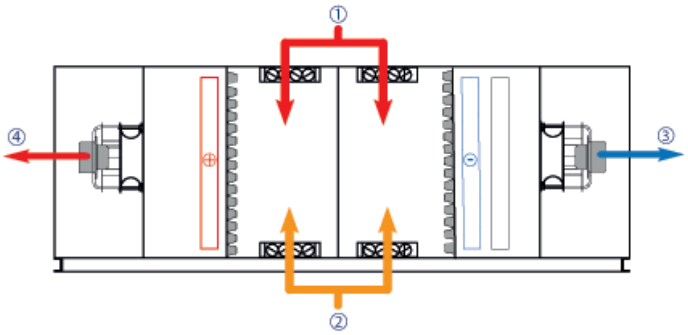
In these modes, the unit can operate:

> With all recirculated air
> With all fresh air/all exhaust air
> With mixed-air
> The unit ensures air extraction and fresh air modulation without indoor pressure change.

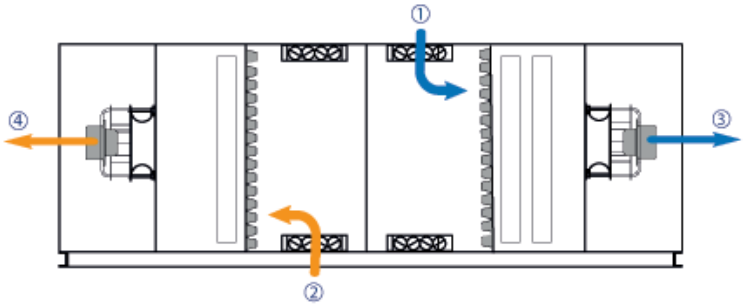
Heating Mode



Cooling Mode

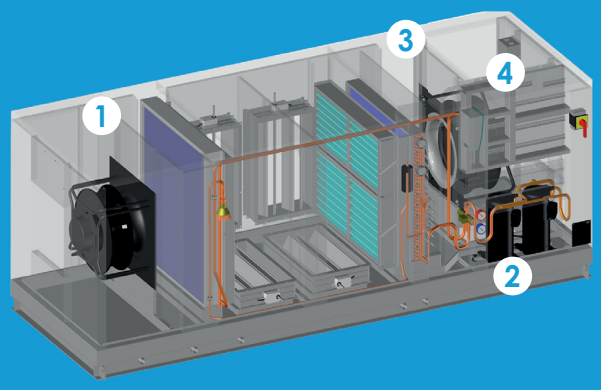


Free Cooling Mode



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

Detailed components of the unit



The ETT packaged unit comprises 4 different sections:

1. An extraction compartment for recovering and/or rejecting heat from the extracted air (depending on the operating mode).
2. A separate technical compartment housing the refrigeration components and control units.
3. The internal compartment ensures air change and air treatment.
4. A sealed electrical compartment (IP44).

Aluminium frame and casing assembly :

- **Fitted with a motorised, aluminium, low-load 4-damper mixing box with Class 3 Upstream-Downstream sealing and Class B frame sealing (in accordance with EN1751) the Ulti+ R32 RE allows:**
  - ✓ Optimized fresh air supply dosage, combined with the CO_2 or VOC sensor.
  - ✓ Free Cooling mode switch to delay thermodynamic circuit operation and allow significant energy savings.
  - ✓ **Perfect weather resistance, 20-year anti corrosion guarantee on casing.**
- Double-walled **watertight floor** with drainage outlets around the unit, connected to rubber traps.
- **Aluminium vertical panels and roof, with double insulation, mounted on aluminium frame.**
- A separate **technical section** facilitates unit control and maintenance and allows measurement and adjustment during operation.
- **Access through large removable panels**. Doors tightness is ensured by a flexible gasket under compression, providing ideal sealing over time.
- **Sound and thermal insulation provided by 80 mm to 100 mm rock wool** (M0 classification) in the frame and by **50 mm glass wool** (M0 classification in accordance with **ERP** (Public Access Buildings) regulations, article CH36 **in the walls and roof.**
- **Optional rain proof cowl on fresh air** (to be fitted by the installer).

Aeraulics assembly :

- **Eco-design filtration,** easy to dismantle - ISO Coarse efficiency 65% (G4) in **98 mm** pleated media on the supply side to increase filter life and reduce pressure drops, fouling controlled by analogue pressure switch.
- **Several levels of filtration available** to suit your project needs: ISO Coarse 65% refillable (G4) 98mm, ISO ePM10 50% (M5) 98mm, ISO Coarse 65% (G4) + ISO ePM1 50% (F7) 48+48mm, ISO ePM1 50% (F7) 98mm, ISO Coarse 65% (G4) + ISO ePM1 80% (F9) 48+48mm, ISO ePM1 80% (F9) 98mm, ISO Coarse 65% (G4)48mm on exhaust side etc.
- **Replacement filter kit available as an option.**
- **Last generation inside fans (High Energy Performance):**
  - ✓ **Direct transmission** (gains in maintenance, reliability and consumption),
  - ✓ Fitted **with a variable speed "EC" electronically commutated motor** combined with an Analogue Flow Controller - AFC (easier to commission),
  - ✓ With an aluminium wheel design,
  - ✓ Communicating for real time operation adjustment.
  - ✓ Integrated Soft Starter device for reduced starting current and soft start (textile ducting).
- **Low Noise Option** available.
- **AFC option with automatic flow adjustment**, to compensate for filter fouling.

Detailed components of the unit

Energy and thermodynamic assembly:

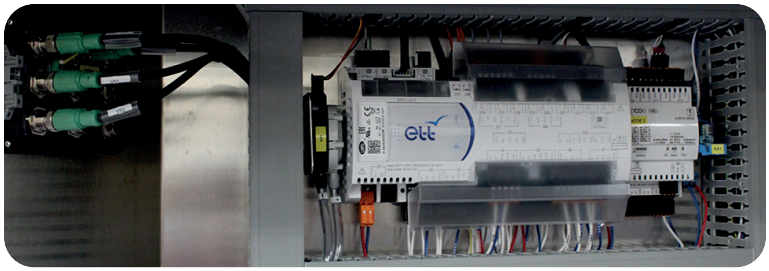
- **New generation multi-stage compressors or variable speed compressors depending on the model:** these adapt the power of the compressors to the needs of the application, for lower consumption and greater comfort.
- **Communicating electronic expansion valves** combining increased optimisation of the exchangers and fast stabilisation of the thermodynamic system.
- Reinforced **heat exchangers** with aluminium fins and copper tubes with double helical grooves for improved heat exchange. Design of the external exchangers ensuring delayed frost build-up and fast and efficient defrosting.

  Vinyl coating available on request.
- **Refrigeration circuits** compliant with the European directive on pressure equipment (PED 2014/68/EU).
- **Refrigerant** R32.
- **Tandem or variable speed circuits,** for staggered power delivery and energy savings during part-load operation. Operation in part load considerably reduces the number of defrost cycles and their duration.
- **The refrigerant circuit is equipped with isolation valves at** the compression unit terminals depending on the model. When working on the compression unit, these isolation valves make it easier to repair and maintain the refrigerant circuit.
- **Anti-acid filter drier.**
- Switchover **valve**.
- **Leak detection : ULTI+ R32 RE** is equipped with leak detection as standard. This detection allows the user to be warned in case of R32 fluid leakage. Leak detection also reduces the need for periodic visits to your equipment.

Electrical assembly in a sealed compartment (IP44):

- **Electrical board** in accordance with NF EN C15-100 and NF EN 60204-01 including:
  - ✓ **An ETT PLC** with optional Touch screen remote display or by native Modbus BMS.
  - ✓ **A power switch** with lockable external handle for full load cut-off. Connection using standard universal cable. Optional copper/aluminium connection boxes.
  - ✓ **A** 400-230-24 volt **transformer** for control and regulation circuits.
  - ✓ **A fault summary** with a dry contact on stanby at terminal.
  - ✓ **Numbered terminal blocks** with disconnectable terminals for all transfers or remote controls.
  - ✓ **A terminal block** for compressor load shedding.
  - ✓ **Internal wiring** fully numbered at both ends with numbered rings.
  - ✓ An Ik3 **breaking capacity** of 10 kA basic.
  - ✓ **A dry contact**: emergency stop included as standard, for customer connection for Fire Safety System testing.
  - ✓ Components **protection** using circuit breakers.
  - ✓ **A phase controller.**
  - ✓ **The nominal LV** distribution voltage is governed by the French Interministerial Order of 24 December 2007. This sets the nominal voltage level at 230/400 V. It defines minimum and maximum values that are acceptable at a user's point of delivery (average value over 10 ml), corresponding to a range of -10 % / +10 % around the nominal values. It also defines the maximum allowable value of the voltage drop gradient: 2%. This is the additional voltage drop generated at a network point if 1 Kw single-phase is added at that same point.

  Consult us if the regulations of the country of installation require other characteristics for the nominal distribution voltage.



Detailed components of the unit

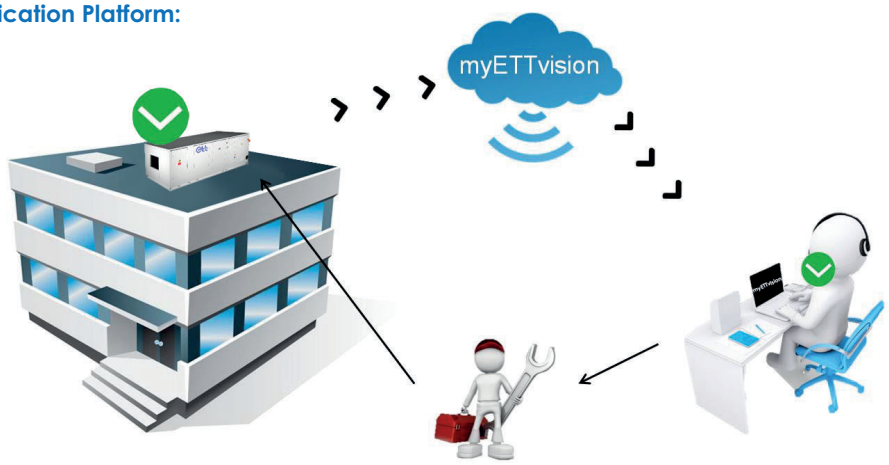
Advanced control assembly:

- **Temperature control with 2 set points for Cooling/Heating mode according to 2002/91/EC Directive: responsiveness, accuracy and anticipation.**

  Economy mode or Comfort mode controls available.
- **Filters Fouling Analogue control (FFAC), measures and indicates filter fouling to the PLC**, enabling preventive filter replacement for optimum air quality and reduced consumption.
- **Analogue Air Flow Controller (AFC)** for measuring and indicating the air flow rate of supply fans on the PLC, with optional auto-adjustment of the air flow rate, to compensate for filter fouling.
- **Air quality regulation by CO_2 or VOC sensor**, to optimize new air dosing and reduce energy consumption.
- **Free Cooling** function: cooling with outside air, delaying thermodynamic operation for significant energy savings.
- **Optional function to prohibit Free Cooling by comparing specific humidity** , in order to limit latent inputs during Free Cooling phase by comparing indoor and outdoor specific humidity.
- **Metering of electrical energy**, with breakdown of electrical consumption by operating modes.
- **Monitoring, diagnostic and safety and faults management** (anti-freeze thermostat, smoke detector, fire thermostat, HP switch, compressor MAP monitoring…), with written fault history.
- **Diagnostic help for detecting refrigerant leaks**.
- **myETTvisionremote communication platform providing access to parameter setting, operation and energy monitoring, access to faults in your fleet of units**.
- De-stratification (comparison between ambient and outdoor temperature)

myETTvision:

ETT Remote Communication Platform:



Operating tips for ULTI+ R32 RE unit

OPERATION: COSTS, PERFORMANCE AND GUARANTEES

The **quality of the operation** combined with the installation has a major impact on the **overall cost of the units.**

It influences 3 parameters:

- **Total cost**
  - ✓ Purchase and implementation (15%)
  - ✓ Operating costs (85%)
- **Efficiency**
  - ✓ Operating **costs**
  - ✓ **Users**' comfort
  - ✓ **Durability**
  - ✓ **Availability**
- **Conformity4**
  - ✓ **Regulations**
  - ✓ Manufacturer's **warranty conditions**

As soon as it is commissioned, the plant must be operated and maintained in such a way as to guarantee regulatory compliance. Operating instructions aim at optimising unit performance and settings. Also, the validity of the guarantee is conditional upon strict compliance with these instructions.

Periodic checks must include, at least:

- **Checking/adjusting technical functions** (safety, ventilation, refrigeration circuits, etc.)
- **Control** adjustment (setpoints, time slots, advanced parameters, etc.)
- **Technical and regulatory** checks:
  - Leakage checking, once or twice a year
  - Commissioning, periodic checks and periodic requalification (pressure equipment monitoring)
  - Filters replacement, 2 to 4 times a year depending on the type of filters and installation environment
  - Checking and replacing sensitive parts of humidity sensors CO_2 sensors or smoke detectors
- Related equipment control and maintenance (diffusion networks, sensors condition, etc.)

ETT's **service solutions** make it possible to achieve **operational performance** and **compliance** objectives while providing **peace of mind** for the user.

Main options

Frame - Casing	▪ Motorised external damper for supply air, except downdraft (CH38 - Directive 2006/42/CE)
Acoustics	▪ EC Low Noise supply and exhaust fans
Airflow section	▪ Operation with all recirculated air (excluding Public Buildings) ▪ Operation with all fresh air ▪ Actuating smoke detector with battery back-up ▪ Epoxy coating for supply air and exhaust air fans ▪ Analogue air flow controller (AFC) with supply and exhaust air fans flow rate auto-adjustment ▪ Pressure gauge for supply air and exhaust air filters ▪ ISO Coarse 65% (G4) refillable 98mm supply filters with analogue sensor ▪ ISO ePM10 50% (M5) 98mm supply filters with analogue sensor ▪ Double filters ISO Coarse 65% (G4) + ISO ePM1 50% (F7) or ISO ePM1 80% (F9) (48 + 48mm) at supply with analogue sensor ▪ ISO ePM1 50% (F7) 98mm supply air filters with analogue sensor ▪ ISO ePM1 80% (F9) 98mm supply air filters with analogue sensor ▪ ISO Coarse 65% (G4) refillable 48mm supply air filters with analogue sensor
Thermodynamics	▪ Compressor MAP monitoring ▪ Vinyl coating on thermodynamic coils ▪ Refrigerant leak detection diagnostic assistance ▪ HP and LP pressure gauge
Auxiliaries	▪ Auxiliary hot water coil with analogue frost protection thermostat ▪ Progressive 3-way valve for hot water coil ▪ Stop valve on outlet + TA regulating valve on inlet for hot water coil ▪ 2-sequential stage auxiliary electric heaters + load shedding using dry contact ▪ Fresh air preheating through 3-stage auxiliary electric heaters
Electrics	▪ Total electrical energy metering ▪ Aluminium/ Copper connection terminal blocks (Mandatory for aluminium supply cables) ▪ 230V / 16A single-phase PC socket in the technical room (separate power supply to be provided by the installer) ▪ IT earthing system compatibility ▪ Cable protective cowl for outside power supply (to be mounted by the installer)
Installation	▪ Adjustable aluminium connection roof curb ▪ Aluminium connection adaptor roof curb ▪ Adjustable aluminium ventilated roof curb ▪ Aluminium ventilated adaptor roof curb ▪ 200, 400 or 600mm aluminium feet
Control	▪ Year-round operation (compressor enabled for air conditioning with external temperature < +15°C) ▪ Control function in comfort mode (setpoint temperatures control by PID) ▪ Free Cooling banning based on specific humidity comparison ▪ Average room temperature (4 sensors) ▪ Minimum fresh air control using turret contacts (3 maximum)
Communication	▪ myETTvision ▪ ETT ControlBox remote touch display ▪ CCAD remote display ▪ Native RS485 Modbus ▪ Modbus IP ▪ BacNet IP
Warranty	▪ Please contact us

Technical features

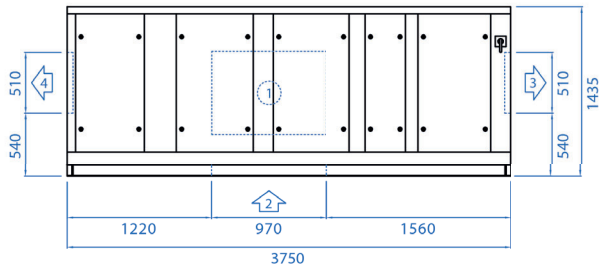
	DESIGNATION	Unit	020	025	030	035	045	050
VENTILATION	**FLOW RATES**							
	Rated air flow rate	**m³/h**	4500	5000	6000	6500	8500	8500
	Minimum air flow rate	**m³/h**	3000	3500	4000	4500	7000	8000
	Maximum air flow rate	**m³/h**	6300	7000	8400		8500	
	Rated exhaust air flow rate	**m³/h**	6300	7000	8400	9100	11900	11900
	SUPPLY AIR VENTILATION (1)							
	Absorbed electrical power	**kW**	0.9	1	1.3	1.4	2.3	2.3
	ACOUSTICS (1)							
	Sound power level on supply air	**dB(A)**	74	74	76	78	83	83
	Outside sound power level	**dB(A)**	66	67	69	71	75	75
	Resulting external sound pressure at 10m ref. 10^{-5} in free field	**dB(A)**	35	36	38	40	44	44
AIR CONDITIONING PERFORMANCES	**NOMINAL PERFORMANCE AT +35°C** (1)							
	Net cooling capacity	**kW**	20.3	22.4	27.7	33.5	43.6	46.1
	Net EER	**kW/kW**	4.23	3.91	3.53	3.38	2.76	2.67
	SEASONAL EFFICIENCY (2)							
	Design net cooling capacity	**kW**	18.1	20.4	24.9	30.4	40.1	41.8
	SEER	**kW/kW**	6.16	6.06	5.62	5.39	4.32	4.29
	ηs,C	**%**	244	239	222	213	170	168
PERFORMANCES HEATING	**NOMINAL PERFORMANCE AT +7°C** (1)							
	Net heating capacity	**kW**	19.1	20.9	26.7	32.0	45.7	48.9
	Net COP	**kW/kW**	5.29	4.93	4.56	4.54	3.92	3.96
	NOMINAL PERFORMANCE AT -7°C (2)							
	Net heating capacity	**kW**	12.1	13.8	17.8	20.7	29.8	31.8
	Net COP	**kW/kW**	3.53	3.47	3.37	3.18	3.04	3.05
	SEASONAL EFFICIENCY (2)							
	Net design heat output	**kW**	17.4	19.9	23.3	26.5	36.0	37.5
	SCOP	**kW/kW**	4.51	4.44	4.19	3.85	3.47	3.53
	ηs,H	**%**	177	175	165	151	136	138
GENERAL	**ELECTRICAL DATA**							
	Total installed electrical power (3)	**kW**	21.4	21.4	21.4	21.4	27.7	29.1
	Total installed electrical intensity (3)	**A**	33	33	33	33	49	51
	Starting current (3)	**A**	40	40	40	40	119	127
	Maximum absorbed electrical power (4)	**kW**	27.3	30.7	34.6	35.1	50.5	54.9
	Recommended electric auxiliary	**kW**	15	18	21	21	27	30
	REFRIGERATION CIRCUIT(S)							
	Power stages	-	Variable				2	2
	OPERATING LIMITS IN COOLING MODE							
	Maximum outside temperature (5)	**°C**	45					
	Minimum outside temperature (5)	**°C**	15					
	Minimum internal coil inlet temperature	**°C**	18					
	OPERATING LIMITS IN HEATING MODE							
	Minimum outside temperature	**°C**	-15					
	Minimum internal coil inlet temperature	**°C**	12					
	WEIGHT (6)							
	Unit weight without any option	**kg**	755					

(1) External static pressure: 250 Pa on supply air, 150 Pa on exhaust air
Cooling mode: Indoor conditions: +27°C DB / +19°C WB & External conditions + 35°C DB/24°C WB Fresh air percentage: 60%
Heating mode: Indoor conditions: +20°C DB */+12°C WB and outside conditions: +7°C DB / +6°C WB Fresh air percentage: 60%
(2) According to EcoDesign regulations 2016/2281
(3) Power to be used for power cables selection (excluding auxiliary)
400V/ 50HZ 3-phase power supply + earth without neutral

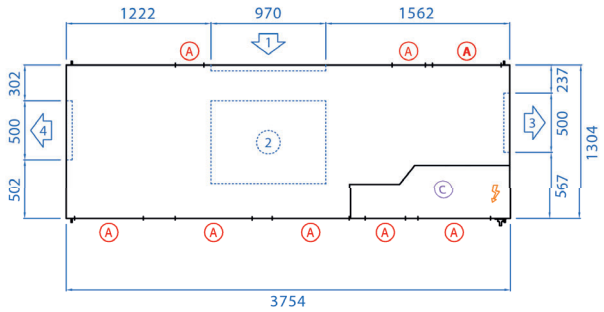
(4) Heating mode: Defrost with auxiliaries recommended
(5) For inside conditions: +27°C DB / +19°C WB at nominal air flow
(6) Weight for a total available pressure of 600 Pa on supply air and 400 Pa on exhaust air

Dimensions and connections

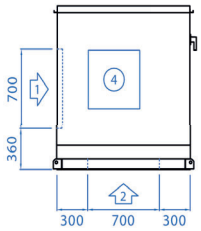
Front view :



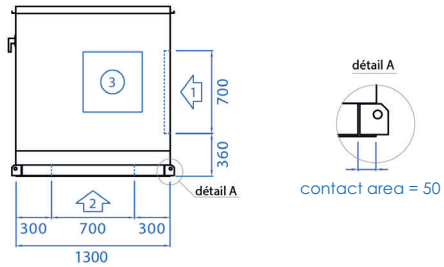
Top view :



Exhaust air side view:



Supply air side view :



- ① Fresh air
- ② Return air
- ③ Supply air
- ④ Exhaust air
- Ⓐ Access
- ⚡ Power supply
- Ⓒ Technical compartment
- ▪ Provide a service area of 1200 mm on the TC side and 850 on the opposite side

	Length	Width	Height
Casing dimensions	3754 mm	1304 mm	1435 mm
Transport overall dimensions	3754 mm	1399 mm	1435 mm

Note: Fresh air cowls shall be installed by the installer. Feet shall be installed by the installer. Duct connections (supply, return, fresh air and exhaust) are made using an insert (supplied by ETT) for fixing ducts to a 40 mm Metu frame.

Technical features

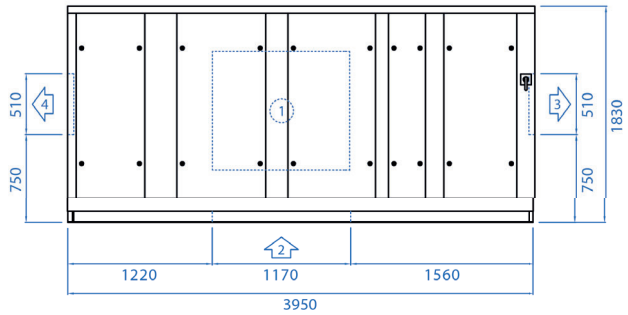
	DESIGNATION	Unit	050	055	065	075
VENTILATION	**FLOW RATES**					
	Rated air flow rate	m³/h	10500	11500	13000	15000
	Minimum air flow rate	m³/h	6500	7500	9500	12500
	Maximum air flow rate	m³/h	14700		15000	
	Rated exhaust air flow rate	m³/h	14700	16100	18200	21000
	SUPPLY AIR VENTILATION (1)					
	Absorbed electrical power	kW	2.3	2.7	3.2	4.1
	ACOUSTICS (1)					
	Sound power level on supply air	dB(A)	79	80	82	84
	Outside sound power level	dB(A)	70	70	72	76
	Resulting external sound pressure at 10m ref. 10^{-5} in free field	dB(A)	39	39	41	45
AIR CONDITIONING PERFORMANCES	**NOMINAL PERFORMANCE AT +35°C** (1)					
	Net cooling capacity	kW	52.2	58.4	65.7	73.6
	Net EER	kW/kW	3.55	3.50	3.22	2.94
	SEASONAL EFFICIENCY (2)					
	Design net cooling capacity	kW	47.1	53.0	59.9	66.9
	SEER	kW/kW	5.51	5.47	5.10	4.32
	ηs,C	%	218	216	201	170
PERFORMANCES HEATING	**NOMINAL PERFORMANCE AT +7°C** (1)					
	Net heating capacity	kW	51.7	57.8	67.0	75.7
	Net COP	kW/kW	4.80	4.69	4.49	4.22
	NOMINAL PERFORMANCE AT -7°C (2)					
	Net heating capacity	kW	33.4	37.7	43.2	49.0
	Net COP	kW/kW	3.59	3.38	3.31	3.26
	SEASONAL EFFICIENCY (2)					
	Net design heat output	kW	43.3	48.0	53.9	60.1
	SCOP	kW/kW	4.27	4.16	3.98	3.73
	ηs,H	%	168	163	156	146
GENERAL	**ELECTRICAL DATA**					
	Total installed electrical power (3)	kW	39.5	41.7	45.1	46.8
	Total installed electrical intensity (3)	A	68	72	79	81
	Starting current (3)	A	144	182	196	195
	Maximum electrical power input (4)	kW	56.8	60.2	65.4	70.1
	Recommended electric auxiliary	kW	33	33	33	33
	REFRIGERATION CIRCUIT(S)					
	Power stages	-	2	2	2	2
	OPERATING LIMITS IN COOLING MODE					
	Maximum outside temperature (5)	°C		45		
	Minimum outside temperature (5)	°C		15		
	Minimum internal coil inlet temperature	°C		18		
	OPERATING LIMITS IN HEATING MODE					
	Minimum outside temperature	°C		-15		
	Minimum internal coil inlet temperature	°C		12		
	WEIGHT					
	Unit weight without options(6)	kg		1188		

(1) External static pressure: 250 Pa on supply air, 150 Pa on exhaust air
Cooling mode: Indoor conditions: +27°C DB / +19°C WB & External conditions + 35°C DB/24°C WB Fresh air percentage: 60%
Heating mode: Indoor conditions: +20°C DB */+12°C WB and outside conditions: +7°C DB / +6°C WB Fresh air percentage: 60%
(2) According to EcoDesign regulations 2016/2281
(3) Power to be used for power cables selection (excluding auxiliary)
400V/ 50HZ 3-phase power supply + earth without neutral

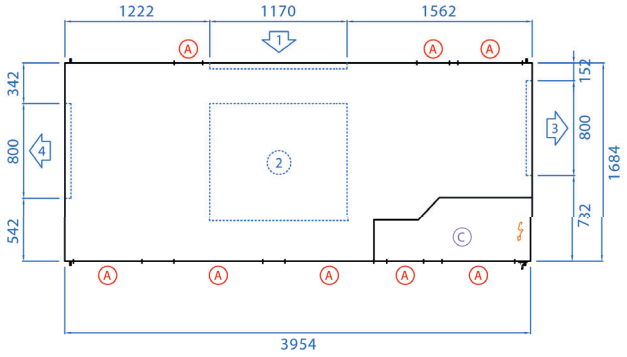
(4) Heating mode: Defrost with auxiliaries recommended
(5) For inside conditions: +27°C DB / +19°C WB at nominal air flow
(6) Weight for a total available pressure of 600 Pa on supply air and 400 Pa on exhaust air

Dimensions and connections

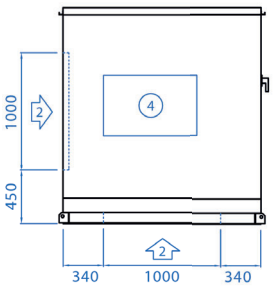
Front view :



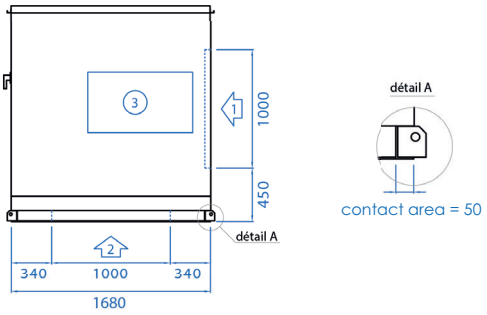
Top view :



Exhaust air side view :



Supply air side view :



① Fresh air
② Return air
③ Supply air
④ Exhaust air
Ⓐ Access
⚡ Power supply
Ⓒ Technical section
▪ Provide a service area of 1550 mm on the technical compartment side and 850 mm on the opposite side.

	Length	Width	Height
Casing dimensions	3954 mm	1684 mm	1830 mm
Transport overall dimensions	3954 mm	1779 mm	1830 mm

Note: Fresh air cowls shall be installed by the installer. Feet shall be installed by the installer. Duct connections (supply, return, fresh air and exhaust) are made using an insert (supplied by ETT) for fixing ducts to a 40 mm Metu frame.

Technical features

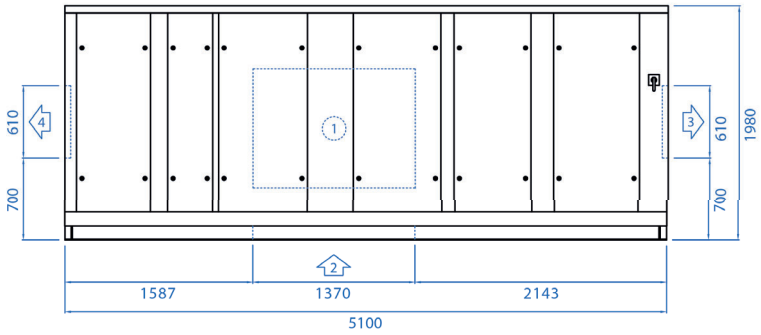
	DESIGNATION	Unit	080	090	095	110
VENTILATION	**FLOW RATES**					
	Rated air flow rate	**m³/h**	17000	19000	21000	23000
	Minimum air flow rate	**m³/h**	12000	12000	13000	19000
	Maximum air flow rate	**m³/h**	23800		25000	
	Rated exhaust air flow rate	**m³/h**	23800	26600	29400	32200
	SUPPLY AIR VENTILATION (1)					
	Absorbed electrical power	**kW**	3.7	4.3	5	5.7
	ACOUSTICS (1)					
	Sound power level on supply air	**dB(A)**	85	86	87	88
	Outside sound power level	**dB(A)**	72	74	75	77
	Resulting external sound pressure at 10m ref. 10^{-5} in free field	**dB(A)**	41	43	44	46
AIR CONDITIONING PERFORMANCES	**NOMINAL PERFORMANCES AT +35°C** (1)					
	Net cooling capacity	**kW**	86.1	91.6	99.0	119.9
	Net EER	**kW/kW**	3.52	3.49	3.30	3.39
	SEASONAL EFFICIENCY (2)					
	Design net cooling capacity	**kW**	77.4	82.6	89.4	108.7
	SEER	**kW/kW**	3.83	3.74	3.53	3.53
	ηs,C	**%**	150	147	138	138
PERFORMANCES HEATING	**NOMINAL PERFORMANCES AT +7°C** (1)					
	Net heating capacity	**kW**	85.7	91.9	100.2	113.0
	Net COP	**kW/kW**	4.67	4.89	5.05	4.78
	NOMINAL PERFORMANCES AT -7°C (2)					
	Net heating capacity	**kW**	55.4	59.0	64.9	73.4
	Net COP	**kW/kW**	3.30	3.36	3.38	3.40
	SEASONAL EFFICIENCY (2)					
	Net design heat output	**kW**	70.1	75.0	81.5	86.0
	SCOP	**kW/kW**	3.22	3.21	3.39	3.20
	ηs,H	**%**	126	125	133	125
GENERAL	**ELECTRICAL DATA**					
	Total installed electrical power (3)	**kW**	58.9	60.6	63.7	69.3
	Total installed electrical intensity (3)	**A**	101	107	108	119
	Starting current (3)	**A**	223	217	236	247
	Maximum absorbed electrical power (4)	**kW**	72.8	76.5	85.0	96.2
	Recommended electric auxiliary	**kW**	33	33	36	39
	REFRIGERATION CIRCUIT(S)					
	Power stages	**-**	4	4	4	4
	OPERATING LIMITS IN COOLING MODE					
	Maximum outside temperature (5)	**°C**	45			
	Minimum outside temperature (5)	**°C**	15			
	Minimum internal coil inlet temperature	**°C**	18			
	OPERATING LIMITS IN HEATING MODE					
	Minimum outside temperature	**°C**	-15			
	Minimum internal coil inlet temperature	**°C**	12			
	WEIGHT					
	Unit weight without options(6)	**kg**	1726			

(1) External static pressure: 250 Pa on supply air, 150 Pa on exhaust air
Cooling mode : Indoor conditions: +27°C DB / +19°C WB & External conditions + 35°C DB/24°C WB Fresh air percentage: 60%
Heating mode: Indoor conditions: +20°C DB */+12°C WB and outside conditions: +7°C DB / +6°C WB Fresh air percentage: 60%
(2) According to EcoDesign regulations 2016/2281
(3) Power to be used for power cables selection (excluding auxiliary)
400V/ 50HZ 3-phase power supply + earth without neutral

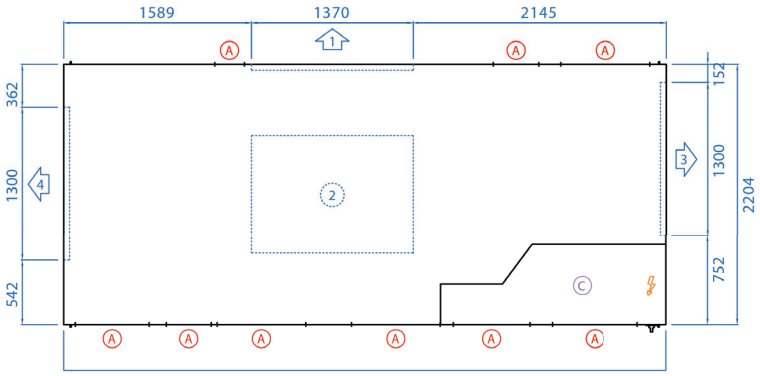
(4) Heating mode: Defrost with auxiliaries recommended
(5) For inside conditions: +27°C DB / +19°C WB at nominal air flow
(6) Weight for a total available pressure of 600 Pa on supply air and 400 Pa on exhaust air

Dimensions and connections

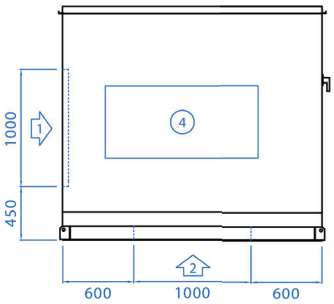
Front view :



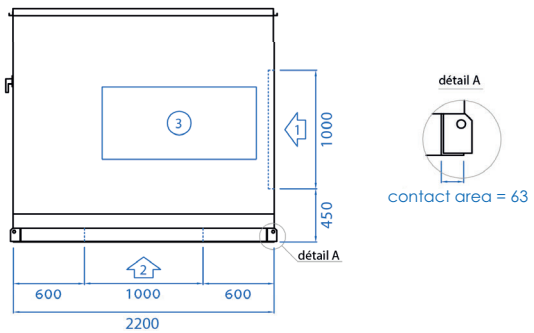
Top view :



Exhaust air side view :



Supply air side view :



① Fresh air
② Return air
③ Supply air
④ Exhaust air
Ⓐ Access
⚡ Power supply
Ⓒ Technical section
▪ Provide a maintenance area of 2100 mm on the technical section side and 850 mm on the opposite side.

	Length	Width	Height
Casing dimensions	5104 mm	2204 mm	1980 mm
Transport overall dimensions	5104 mm	2298 mm	1980 mm

Note: Fresh air cowls shall be installed by the installer. Feet shall be installed by the installer. Duct connections (supply, return, fresh air and exhaust) are made using an insert (supplied by ETT) for fixing ducts to a 40 mm Metu frame.

Technical features

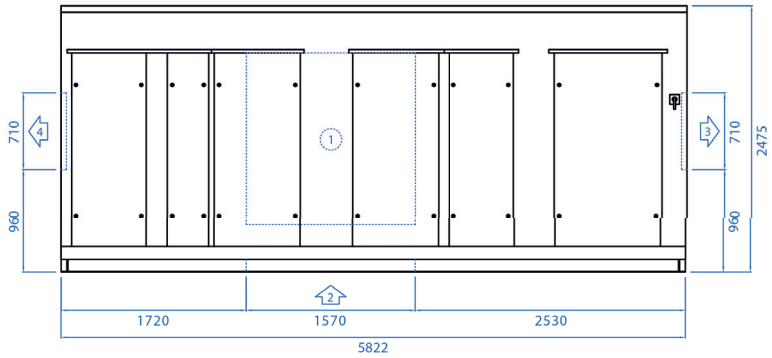
	DESIGNATION	Unit	115	130	140	150
VENTILATION	**FLOW RATES**					
	Rated air flow rate	m³/h	25000	27000	30000	33000
	Minimum air flow rate	m³/h	17000	18000	21000	21000
	Maximum air flow rate	m³/h		33000		
	Rated exhaust air flow rate	m³/h	35000	37800	42000	46200
	SUPPLY AIR VENTILATION (1)					
	Absorbed electrical power	kW	5.1	5.6	6.7	7.7
	ACOUSTICS (1)					
	Sound power level on supply air	dB(A)	83	84	85	86
	Outside sound power level	dB(A)	73	76	77	79
	Resulting external sound pressure at 10m ref. 10^{-5} in free field	dB(A)	42	45	46	48
AIR CONDITIONING PERFORMANCES	**NOMINAL PERFORMANCE AT +35°C** (1)					
	Net cooling capacity	kW	119.1	135.0	144.0	163.6
	Net EER	kW/kW	3.72	3.57	3.39	3.36
	SEASONAL EFFICIENCY (2)					
	Design net cooling capacity	kW	107.6	122.0	130.2	147.2
	SEER	kW/kW	4.04	4.06	3.64	3.63
	ηs,C	%	159	159	142	142
PERFORMANCES HEATING	**NOMINAL PERFORMANCE AT +7°C** (1)					
	Net heating capacity	kW	115.9	132.8	142.3	158.3
	Net COP	kW/kW	5.12	4.89	4.72	4.64
	NOMINAL PERFORMANCE AT -7°C (2)					
	Net heating capacity	kW	75.7	85.9	92.2	102.0
	Net COP	kW/kW	3.48	3.48	3.45	3.39
	SEASONAL EFFICIENCY (2)					
	Net design heat output	kW	94.8	108.4	113.6	126.8
	SCOP	kW/kW	3.59	3.55	3.32	3.23
	ηs,H	%	140	139	130	126
GENERAL	**ELECTRICAL DATA**					
	Total installed electrical power (3)	kW	81.1	86.2	87.9	93.3
	Total installed electrical intensity (3)	A	137	145	147	158
	Starting current (3)	A	265	347	349	396
	Maximum absorbed electrical power (4)	kW	96.4	106.2	114.4	129.5
	Recommended electric auxiliary	kW	42	45	48	54
	REFRIGERATION CIRCUIT(S)					
	Power stages	-	4	4	4	4
	OPERATING LIMITS IN COOLING MODE					
	Maximum outside temperature (5)	°C		45		
	Minimum outside temperature (5)	°C		15		
	Minimum internal coil inlet temperature	°C		18		
	OPERATING LIMITS IN HEATING MODE					
	Minimum outside temperature	°C		-15		
	Minimum internal coil inlet temperature	°C		12		
	WEIGHT					
	Unit weight without options(6)	kg		2337		

(1) External static pressure: 250 Pa on supply air, 150 Pa on exhaust air
Cooling mode: Indoor conditions: +27°C DB / +19°C WB & External conditions + 35°C DB/24°C WB Fresh air percentage: 60%
Heating mode: Indoor conditions: +20°C DB */+12°C WB and outside conditions: +7°C DB / +6°C WB Fresh air percentage: 60%
(2) According to EcoDesign regulations 2016/2281
(3) Power to be used for power cables selection (excluding auxiliary)
400V/ 50HZ 3-phase power supply + earth without neutral

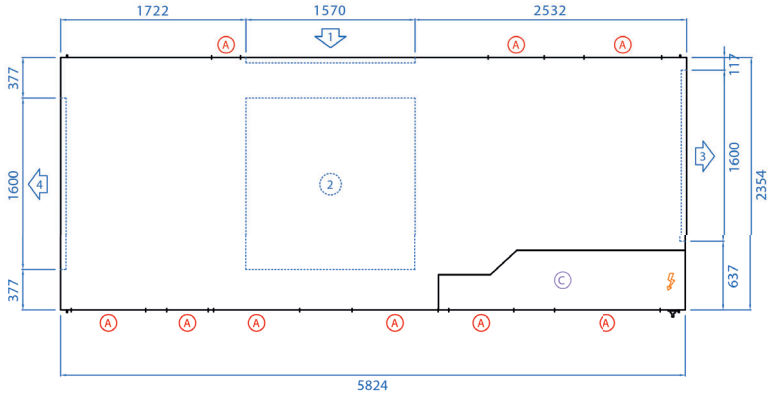
(4) Heating mode: Defrost with auxiliaries recommended
(5) For inside conditions: +27°C DB / +19°C WB at nominal air flow
(6) Weight for a total available pressure of 600 Pa on supply air and 400 Pa on exhaust air

Dimensions and connections

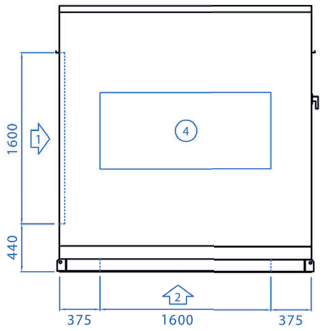
Front view :



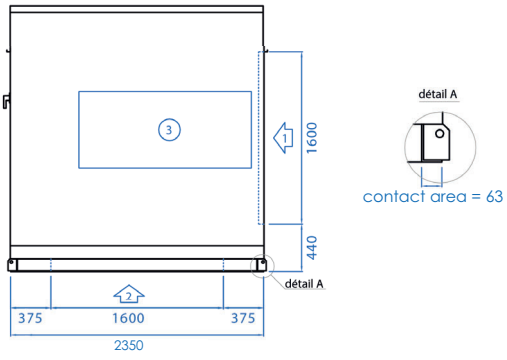
Top view :



Exhaust air side view :



Supply air side view :



① Fresh air
② Return air
③ Supply air
④ Exhaust air
Ⓐ Access
⚡ Power supply
Ⓒ Technical section
▪ Provide a maintenance area of 2200 mm on the technical section side and 850 mm on the opposite side.

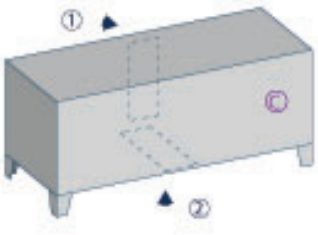
	Length	Width	Height
Casing dimensions	5824 mm	2354 mm	2475 mm
Transport overall dimensions	5824 mm	2448 mm	2475 mm

Note: Fresh air cowls shall be installed by the installer. Feet shall be installed by the installer. Duct connections (supply, return, fresh air and exhaust) are made using an insert (supplied by ETT) for fixing ducts to a 40 mm Metu frame.

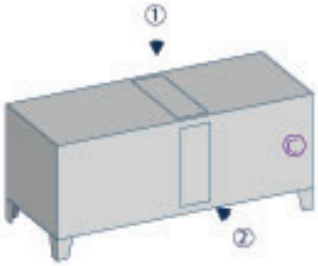
Aeraulic arrangements

Return air and fresh air

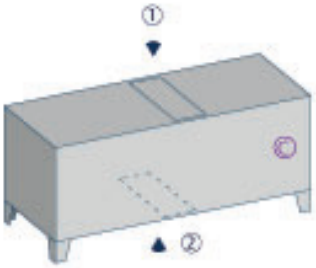
Arrangement 1



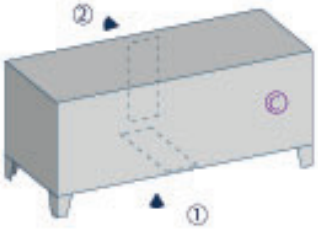
Arrangement 2



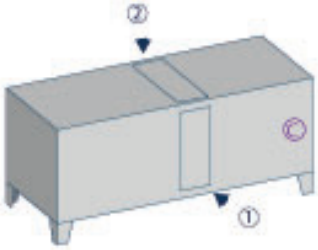
Arrangement 3



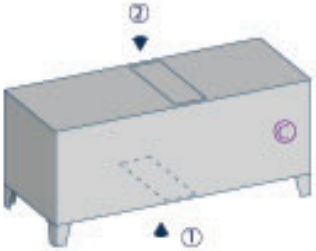
Arrangement 4



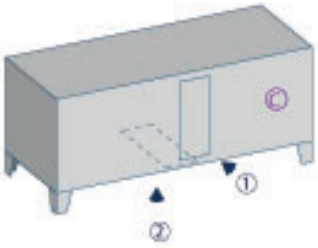
Arrangement 5



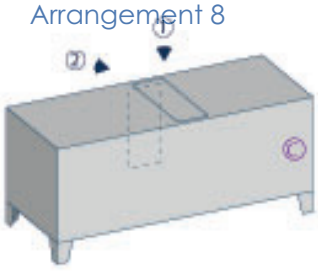
Arrangement 6



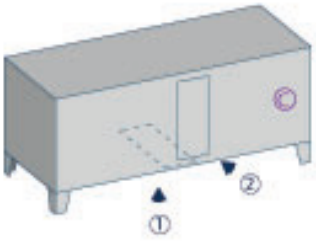
Arrangement 7



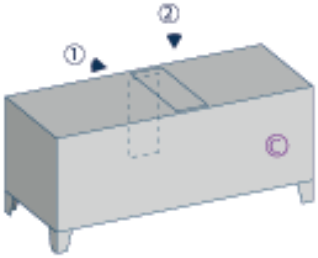
Arrangement 8



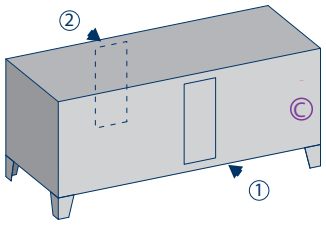
Arrangement 9



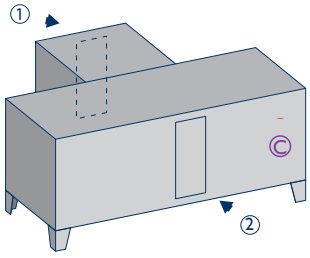
Arrangement 10



Arrangement 11 *



Arrangement 12C *



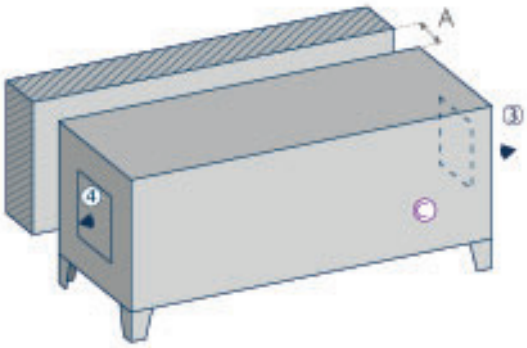
① Fresh air & additional fresh air
② Return air & exhaust air
© Technical compartment
* Access box offered as an option for arrangements 11 and 12 (see arrangement 12) in the case of ducted fresh air.

Note: Arrangements 2, 5 and 7 are not recommended for units installed against a wall, since it would block access to the filters. In such case, the box on arrangement 11 is mandatory (optional).
For other configurations: please contact us.
Feet can be supplied as an option. Feet installation shall be made by the user.

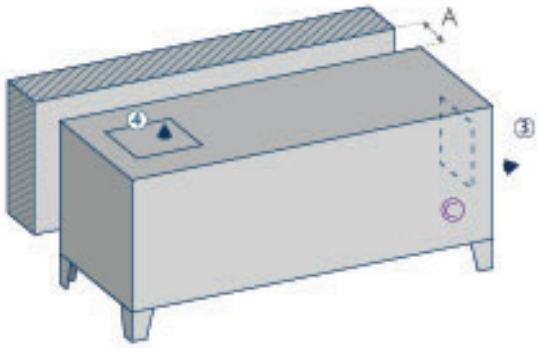
Aeraulic arrangements

Supply and exhaust air

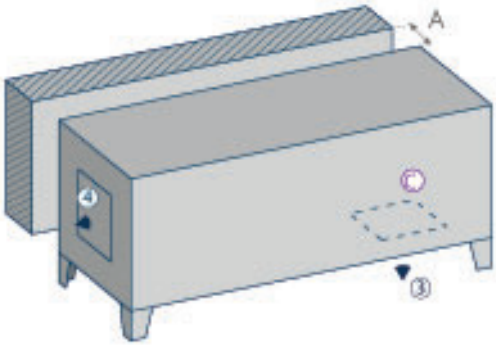
Arrangement A



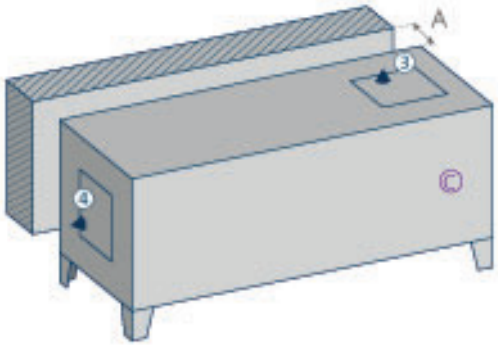
Arrangement B



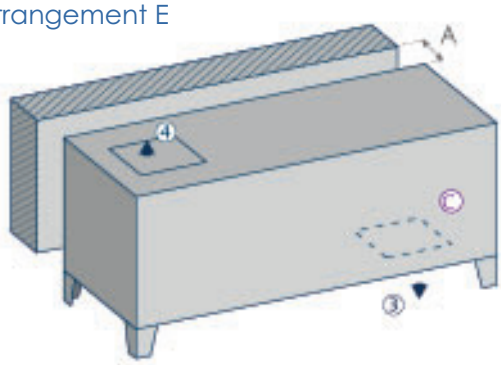
Arrangement C



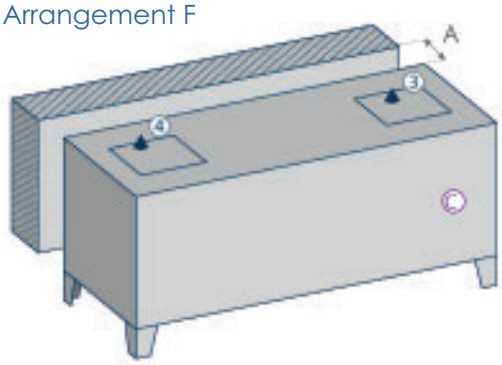
Arrangement D



Arrangement E



Arrangement F

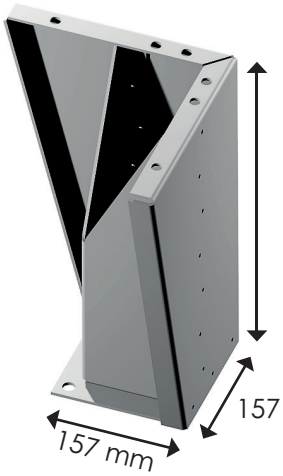


③ Supply air
④ Exhaust air
Ⓒ Technical compartment
A Minimum maintenance area between the wall and the unit: 850 mm

Note: Feet can be supplied as an option. Feet installation shall be made by the user.

Installation accessories: Feet

Aluminium fixed foot
Unit weight: 1 kg



Serial number	01	11	21	22
No. of feet	4	4	6	6

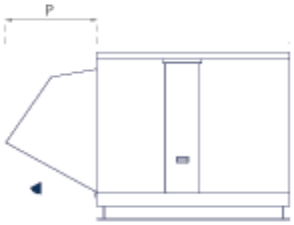
Installation accessories: Fresh and exhaust air cowls (*)

Fresh air cowl

Inlet on top (optional)

	Serial number	01						11				21				22			
	Unit	020	025	030	035	045	050	050	055	065	075	080	090	095	110	115	130	140	150
H	mm	550						750				800				900			

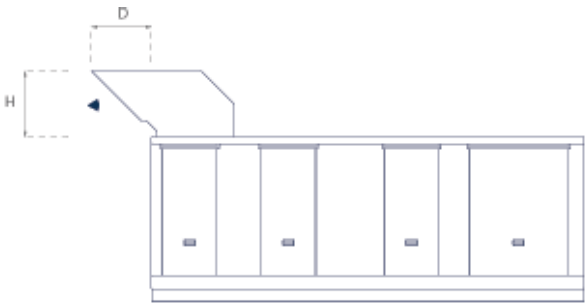
Inlet on side



	Serial number	01						11				21				22			
	Unit	020	025	030	035	045	050	050	055	065	075	080	090	095	110	115	130	140	150
H	mm	550						750				800				900			

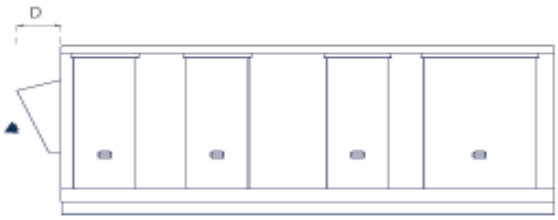
Exhaust air cowl

On top (optional)



	Serial number	01						11				21				22			
	Unit	020	025	030	035	045	050	050	055	065	075	080	090	095	110	115	130	140	150
H	mm	450						600				600				600			
D	mm	365						510				480				450			

At the end

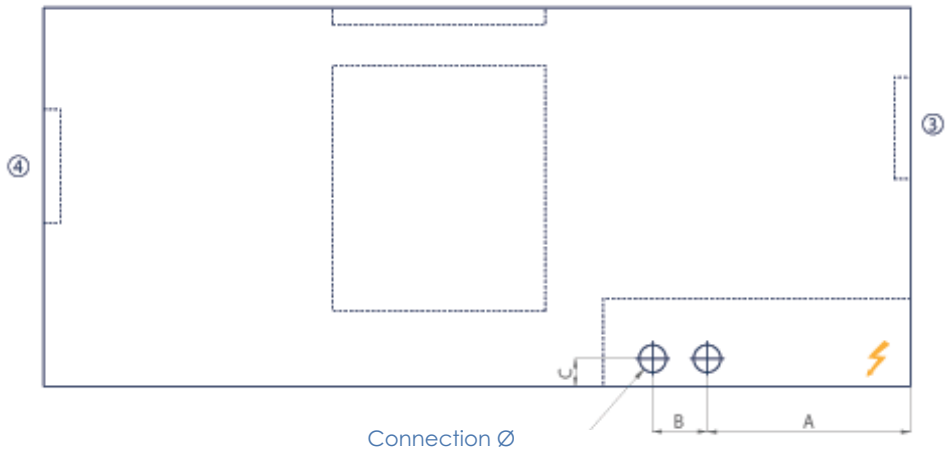


	Serial number	01						11				21				22			
	Unit	020	025	030	035	045	050	050	055	065	075	080	090	095	110	115	130	140	150
D	mm	365						365				410				450			

Auxiliaries: Hot water coils

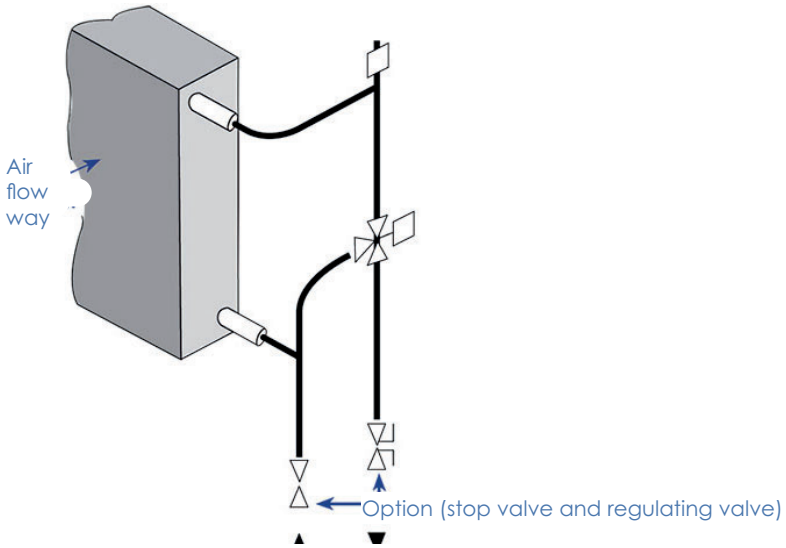
Schematic diagram

Top view



③ Supply air ④ Exhaust © Technical compartment ⚡ Power supply

Installation principle



Auxiliaries: Hot water coils

Dimensions

	Serial number	01						11				21				22			
	Unit	020	025	030	035	045	050	050	055	065	075	080	090	095	110	115	130	140	150
A	mm	873						972				1300				1672			
B	mm	163						183				200				186			
C	mm	98						98				134				167			
Customer connection diameter	mm	40*49						40*49				50*60				50*60			
Weight of coil + 3WV with water	kg	23						37				63				79			

Capacity

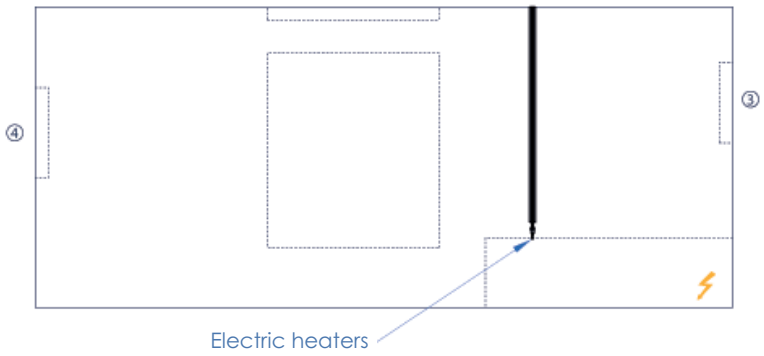
For coils air inlet temperature of +10°C

		Serial number	01						11				21				22			
		Unit	020	025	030	035	045	050	050	055	065	075	080	090	095	110	115	130	140	150
90/70 °C water regime	Max. power	kW	77	83	93	98	116	116	167	177	192	209	274	294	313	332	306	322	344	365
	Max. flow rate	m³/h	3.4	3.7	4.1	4.3	5.1	5.1	7.4	7.8	8.5	9.2	12.1	13.0	13.8	14.6	13.5	14.2	15.2	16.1
	3WV + coil pressure drop	mWC	1.3	1.5	1.8	2.0	2.6	2.6	4.0	4.5	5.2	6.1	3.2	3.4	3.6	4.1	3.6	3.9	4.5	5.2
	Stop and TA valves pressure drop (3-turn opening)	mWC	0.8	0.9	1.1	1.2	1.7	1.7	3.5	3.8	4.5	5.3	3.2	3.7	4.1	4.6	3.9	4.3	5	5.6
Water regime 80/60°C	Max. power	kW	65	70	79	83	97	97	142	150	163	177	231	248	264	279	259	272	290	308
	Max. flow rate	m³/h	2.9	3.1	3.5	3.6	4.3	4.3	6.2	6.6	7.1	7.8	10.2	10.9	11.6	12.3	11.4	11.9	12.7	13.5
	3WV + coil pressure drop	mWC	1.0	1.2	1.4	1.5	2.0	2.0	3.0	3.4	3.9	4.6	2.5	2.7	2.9	3.2	2.6	2.7	3.3	3.6
	Stop and TA valves pressure drop (3-turn opening)	mWC	0.6	0.7	0.9	0.9	1.2	1.2	2.5	2.8	3.2	3.8	2.3	2.6	2.9	3.3	2.8	3.1	3.5	3.9

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

Auxiliaries: Electric heaters

Schematic diagram



③ Supply air ④ Exhaust air ⚡ Electrical power

Available capacities (in kW)

				01						11				21				22			
Total capacity (kW)	Current (A)	1st stage	2nd stage	020	025	030	035	045	050	050	055	065	075	080	090	095	110	115	130	140	150
6	8.7	3	3																		
9	13.0	3	6	•	•	•	•	•	•												
12	17.3	4.5	7.5	•	•	•	•	•	•												
12	17.3	3	9							•	•	•	•	•	•	•	•				
15	21.7	6	9	•	•	•	•	•	•	•	•	•	•	•	•	•	•				
18	26.0	9	9	•	•	•	•	•	•												
18	26.0	6	12							•	•	•	•	•	•	•	•				
21	30.3	6	15							•	•	•	•	•	•	•	•	•	•	•	•
21	30.3	9	12	•	•	•	•	•	•												
24	34.6	9	15	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
27	39.0	9	18	•	•	•	•	•	•												
27	39.0	12	15							•	•	•	•	•	•	•	•	•	•	•	•
30	43.3	12	18	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
33	47.6	9	24							•	•	•	•	•	•	•	•				
33	47.6	15	18																		
33	47.6	12	21															•	•	•	•
36	52.0	12	24																		
36	52.0	15	21															•	•	•	•
39	56.3	15	24																		
39	56.3	18	21															•	•	•	•
42	60.6	18	24															•	•	•	•
45	65.0	15	30																		
45	65.0	21	24															•	•	•	•
48	69.3	18	30															•	•	•	•
54	77.9	18	36															•	•	•	•
60	86.6	24	36																		
60	86.6	18	42															•	•	•	•
66	95.3	24	42															•	•	•	•
72	103.9	30	42																		

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

Fan sound* level at supply air and exhaust air

On supply air side

Available pressure: 250 Pa at supply air and 150 Pa at exhaust

		FREQUENCY BAND Hz ►		63	125	250	500	1000	2000	4000	8000	Lw general level (dB(A))
		Supply air flow rate (m³/h) ▼	Exhaust air flow rate (m³/h) ▼									
01	020	4500	6300	47	65	63	66	67	67	63	60	74
	025	5000	7000	44	62	63	68	68	68	64	61	74
	030	6000	8400	43	61	65	70	71	70	67	62	76
	035	6500	9100	43	62	66	72	72	71	68	63	78
	045	8500	11900	45	67	72	78	78	76	73	69	83
	050	8500	11900	45	67	72	77	78	76	73	69	83
11	050	10500	14700	48	66	68	72	73	73	69	65	79
	055	11500	16100	47	66	68	73	74	74	70	66	80
	065	13000	18200	47	67	70	75	76	75	72	68	82
	075	15000	21000	48	68	73	78	79	78	74	70	84
21	080	17000	23800	51	66	70	78	81	79	73	67	85
	090	19000	26600	49	67	71	79	82	80	76	69	86
	095	21000	29400	47	67	72	79	83	82	77	71	87
	110	23000	32200	47	67	72	81	84	83	79	72	88
22	115	25000	35000	56	59	66	77	78	77	73	66	83
	130	27000	37800	55	61	67	77	79	77	74	67	84
	140	30000	42000	52	63	68	78	81	79	76	69	85
	150	33000	46200	51	64	69	79	83	80	78	70	86

On exhaust air side

Available pressure: 250 Pa at supply air and 150 Pa at exhaust

		FREQUENCY BAND Hz ►		63	125	250	500	1000	2000	4000	8000	Lw general level (dB(A))
		Supply air flow rate (m³/h) ▼	Exhaust air flow rate (m³/h) ▼									
01	020	4500	6300	40	61	66	70	70	69	66	60	76
	025	5000	7000	42	63	68	73	73	71	68	63	78
	030	6000	8400	44	67	72	78	78	76	72	68	83
	035	6500	9100	46	69	74	80	80	79	74	70	85
	045	8500	11900	52	67	84	88	88	87	83	79	94
	050	8500	11900	52	67	84	88	88	87	83	79	94
11	050	10500	14700	45	68	73	78	77	75	72	67	83
	055	11500	16100	47	70	75	80	80	78	74	70	85
	065	13000	18200	49	72	78	83	83	82	77	74	89
	075	15000	21000	52	73	82	87	87	86	81	78	93
21	080	17000	23800	46	65	70	79	82	81	79	71	87
	090	19000	26600	48	66	73	82	84	84	81	75	89
	095	21000	29400	49	68	75	84	87	86	82	79	92
	110	23000	32200	51	67	79	86	91	89	84	83	95
22	115	25000	35000	51	63	69	78	80	79	81	68	86
	130	27000	37800	50	66	71	80	83	80	84	70	88
	140	30000	42000	50	68	73	83	85	82	87	73	91
	150	33000	46200	52	69	75	85	87	84	89	76	93

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

Fan sound* level at fresh air intake and return

At unit fresh air intake

Available pressure: 250 Pa at supply air and 150 Pa at exhaust

		FREQUENCY BAND Hz ►		63	125	250	500	1000	2000	4000	8000	Lw general level (dB(A))
		Supply air flow rate (m³/h) ▼	Exhaust air flow rate (m³/h) ▼									
01	020	4500	6300	47	61	64	63	64	64	61	54	71
	025	5000	7000	45	62	66	66	66	66	63	56	73
	030	6000	8400	45	64	70	70	70	70	66	61	77
	035	6500	9100	46	65	72	73	72	72	68	63	79
	045	8500	11900	49	65	79	81	79	80	75	72	87
	050	8500	11900	49	65	79	81	79	80	75	72	87
11	050	10500	14700	48	66	71	70	70	70	67	61	77
	055	11500	16100	48	67	72	72	72	72	69	63	79
	065	13000	18200	49	68	75	76	75	75	71	67	82
	075	15000	21000	51	69	78	80	79	79	75	71	86
21	080	17000	23800	50	62	70	72	76	77	75	65	82
	090	19000	26600	48	63	72	73	78	79	77	69	84
	095	21000	29400	48	64	74	75	80	82	78	74	86
	110	23000	32200	50	65	77	77	81	84	79	78	88
22	115	25000	35000	52	60	69	69	76	75	77	63	81
	130	27000	37800	51	62	71	70	77	76	79	64	83
	140	30000	42000	50	65	73	72	79	78	83	67	86
	150	33000	46200	49	66	75	75	80	79	85	70	88

On return air side

Available pressure: 250 Pa at supply air and 150 Pa at exhaust

		FREQUENCY BAND Hz ►		63	125	250	500	1000	2000	4000	8000	Lw general level (dB(A))
		Supply air flow rate (m³/h) ▼	Exhaust air flow rate (m³/h) ▼									
01	020	4500	6300	47	61	64	63	64	64	61	54	71
	025	5000	7000	45	62	66	66	66	66	63	56	73
	030	6000	8400	45	64	70	70	70	70	66	61	77
	035	6500	9100	46	65	72	73	72	72	68	63	79
	045	8500	11900	49	65	79	81	79	80	75	72	87
	050	8500	11900	49	65	79	81	79	80	75	72	87
11	050	10500	14700	48	66	71	70	70	70	67	61	77
	055	11500	16100	48	67	72	72	72	72	69	63	79
	065	13000	18200	49	68	75	76	75	75	71	67	82
	075	15000	21000	51	69	78	80	79	79	75	71	86
21	080	17000	23800	50	62	70	72	76	77	75	65	82
	090	19000	26600	48	63	72	73	78	79	77	69	84
	095	21000	29400	48	64	74	75	80	82	78	74	86
	110	23000	32200	50	65	77	77	81	84	79	78	88
22	115	25000	35000	52	60	69	69	76	75	77	63	81
	130	27000	37800	51	62	71	70	77	76	79	64	83
	140	30000	42000	50	65	73	72	79	78	83	67	86
	150	33000	46200	49	66	75	75	80	79	85	70	88

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

Sensors connection principle

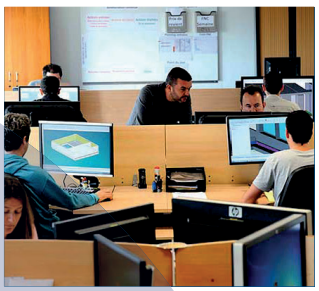
- ① **Room sensor:** 1 pair shielded cable, 2 x 0,75 mm² (max.length 100 lm)
- ② **CO_2/VOC sensor:** 2-pair shielded cable, 3 x 0,75 mm² (max. length 100 lm)
  Humidity sensor : 2-pair shielded cable, 5 x 0,75 mm²
- ③ (max. length 100 lm)
  (optional)

Note: To measure a sensor value that is as representative as possible of the environment, avoid installing them:

> Close to heat sources (spotlight, cooking appliances, glass wall, flues)
> In draft zones (close to entrance, stockrooms, openings)
> In dead zones (behind shelves, building corner)
> Close to crowded areas (checkout, fitting rooms)

For accurate measurements:

> Do not install the sensors in the axis of the duct used for their wiring to avoid stray airflow.
> Do not install control cables and power cables in the same duct (risk of electromagnetic interference).



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