CLIMATIC
ENVIRONMENT
SOLUTIONS
AND EQUIPMENT

Green Line

ULTI+ R32

Single-flow heat pump

MADE IN FRANCE

EUROVENT CERTIFIED PERFORMANCE
www.eurovent-certification.com

www.ett-hvac.com

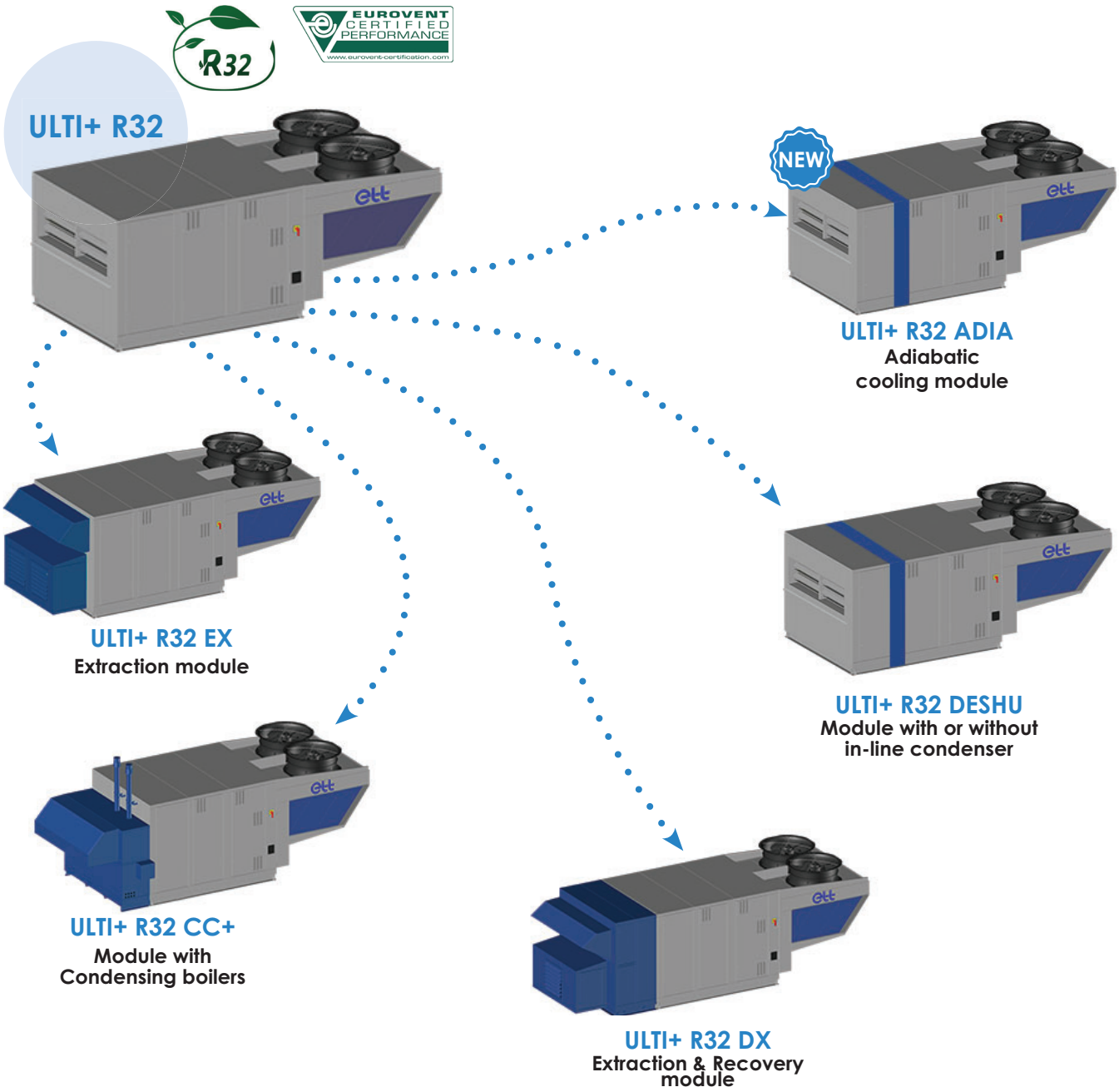
ULTI+ R32: Machine from the ULTIMA Green Line range

The **ULTIMA Green Line** is ETT's latest-generation modular **rooftop range.** It combines **quality materials**, **performance**, **energy savings**, **acoustics**, **regulation** and **new-generation** connected components to ensure that the units operate at optimum efficiency at all times.

An **unrivalled product line-up** (flow rates/power)that **perfectly meets the weight and space constraints** of existing units to be replaced.

The modular design makes it easy to extend the range's capabilities. Users can choose to install the **standard ULTI+ R32 heat pump**, or add modules (condensing boiler(s), extract unit, extract unit with rotary energy recovery, dehu, adiabatic module) to this single-block unit in order to adjust the unit's performance to the environment and the requirements of the application.

ULTIMA Green Line modular principle



ULTI+ R32: ErP Rooftop

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%;
- ✓ increase the share of renewable energy to 20% of the final energy consumption

To achieve these objectives, the ErP directive (Energy related Products) 2009/125/EC Eco-Design has been adopted.

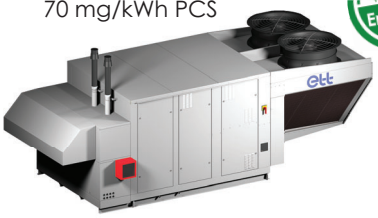
This directive applies to all products using energy or having an impact on energy consumption. It encompasses a **« package of regulations »** setting performance requirements for each type of product. EU regulation **2016/2281 covers air heaters, cooling appliances, high-temperature industrial chillers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

- **1st January 2021**

Information on CC+ and other warm air heaters:

Nitrogen emissions, expressed as nitrogen dioxide, from warm air heaters (including those integrated into rooftops) must not exceed the following values:

- **26 sept. 2021**
  70 mg/kWh PCS



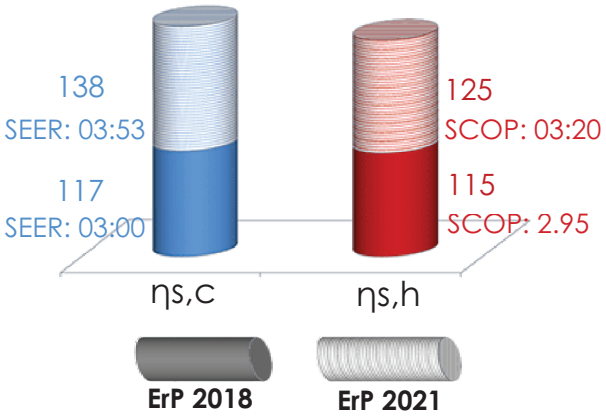
Since 1st January 2018, rooftops that do not comply with ErP Regulation EU 2281/2016 shall no longer be marketed in Europe.

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 minimumEco-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 specifying **rated power & 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: Factor corresponding to regulation.

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.

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

Aluminium frame and casing assembly

Optimised tightness and thermal insulation.

Reduced weight, for new and refurbish projects.

Multiple airflow configurations available.

20-year anti-corrosion guarantee.

Eco-design filtration

Low pressure drop.

Analogue clogging controller.

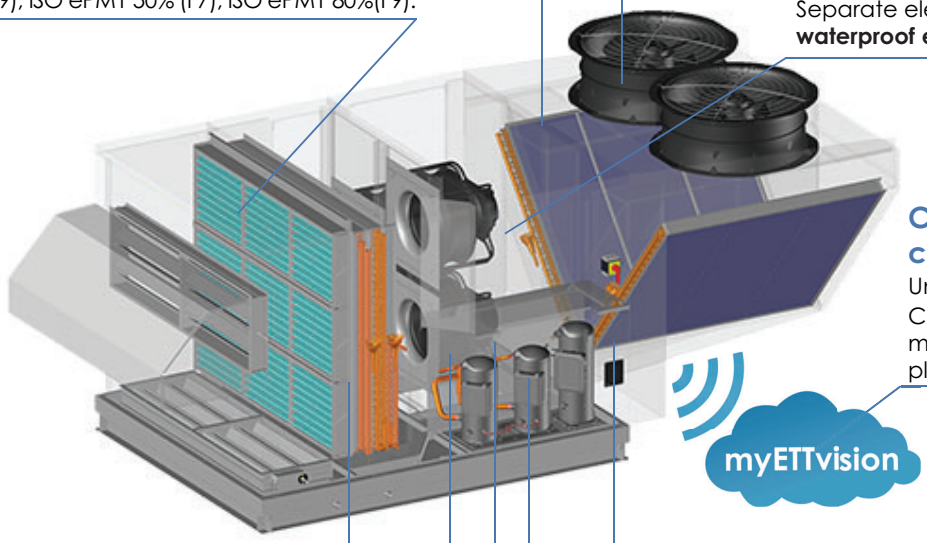
Options: ISO Coarse 65% (G4) refillable, ISO ePM10 50% (M5), ISO Coarse 65% (G4)+ISO ePM1 50% (F7), ISO Coarse 65% (G4)+ISO ePM1 80%(F9), ISO ePM1 50% (F7), ISO ePM1 80%(F9).

Propeller fans

Variable-speed, communicating propeller fans, , bionic blade design, electronically commutated " EC ", optimum efficiency and low noise levels.

Waterproof electrical enclosure

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



Connected components

Unit optimum operation.

Can be connected to myETTvision communication platform

New generation PLC with display

Control enabling optimum operation in all conditions.

Thermal heat exchangers

Optimised heat exchanger for improved energy performance.

Vinyl option available.

Multi-stage circuit with R32 new generation compressors

Optimum performance whatever the part load.

Electronic expansion valves.

Internal fans

Variable speed fans with flow measurement.

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

Low Noise Option available.

AFC option available with flow rate auto-adjustment.

Leak detection reduces the number of periodic inspections.

R32

** ErP (Energy related Product) 2021: the Ultima Green Line range meets the eco-design regulatory requirements applicable to air heaters and cooling appliances (Regulation 2016/2281).*

Unit description

Energy
savings

The ULTIMA Green Line range is an efficient, economical and environmentally friendly solution for heating or cooling buildings.

Thanks to its design, ULTI+ R32 **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 anti-corrosion guarantee
- Non-polluting process
- **Eco Design approach** to combine **economy** and **optimum performance** (SEER, SCOP)
- Simplified replacement of existing units; **identical existing roof curbs**
- Reduced unit size and weight

Access
and flexibility

- **Technical compartment** allowing quick and easy access to the air streams.
- Free and easy access to **the filters by removable panels.**
- **Accessible components** for **maintenance purposes.**
- **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
Low GWP

- New **ULTIMA Green Line** range with R32, a 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.
- Optimised casing with high performance tightness level.
- CO_2 sensor controlling the supply of fresh air.
- **Quick and easy filter replacement**

Acoustic
performance

MAIN FEATURES

- **New-generation variable-speed fans and propeller fans**
- **Regulation system adapting rotation speeds to power stages**

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

Outdoor, on the rooftop or at ground level.

ETT Services

- Guarantee: please consult us !
- A team to guide you from commissioning to operational support
- Manufacturer visits and audits
- Installation optimisation and retrofit
- Service contracts
- Training your teams.
- Access to the ETT Services hotline

myETTvision platform

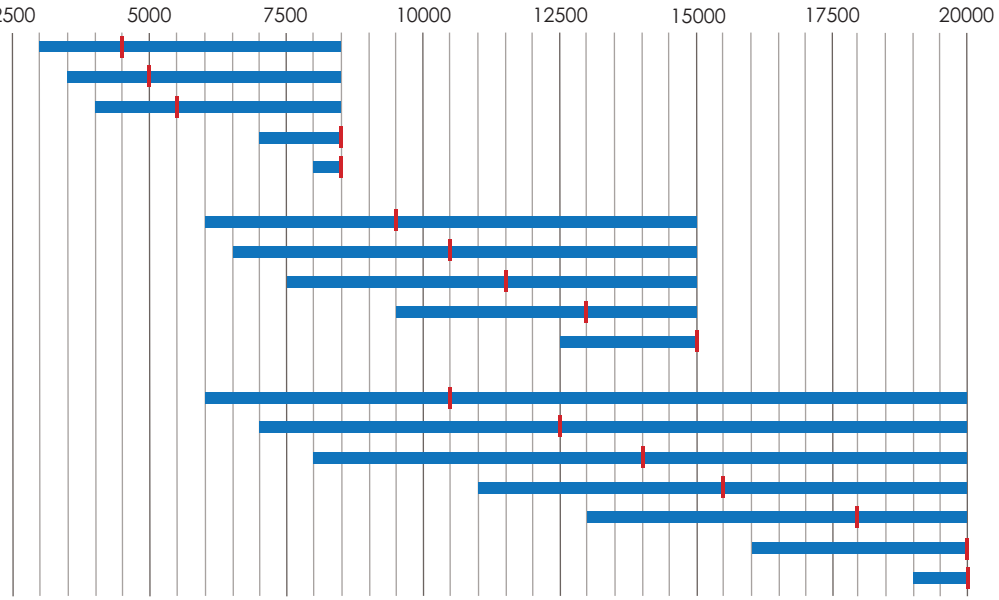
myETTvision allows you to control and optimise your installation remotely and instantly.

Unit description

A WIDE RANGE

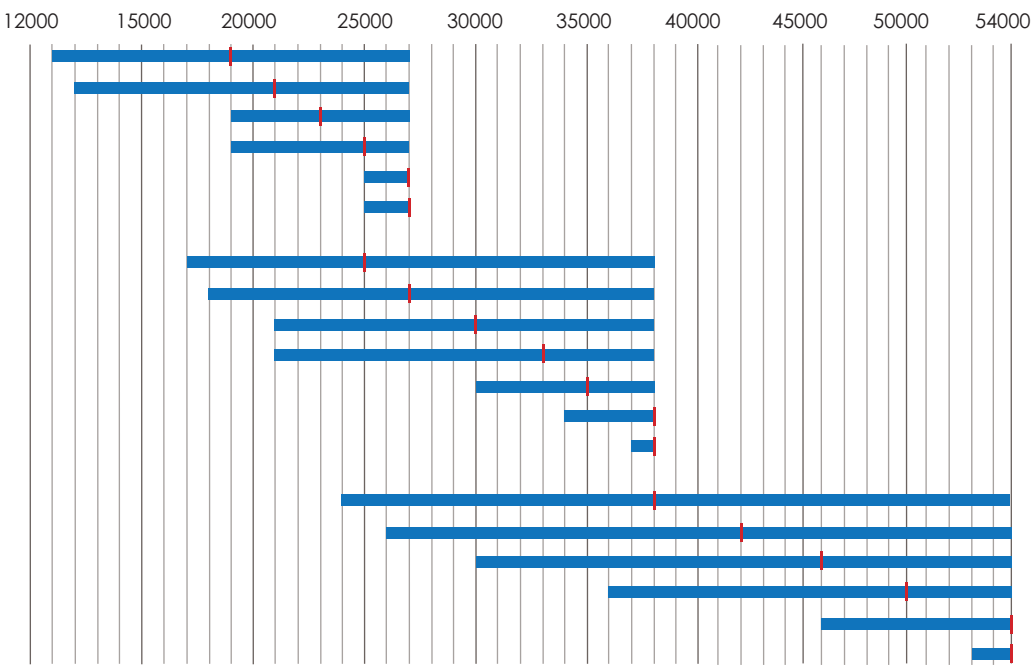
Flow rate range (m^3/h) & rated flow rate (|)

Unit	Capacity
ULTI+ R32 01-020	20
ULTI+ R32 01-025	25
ULTI+ R32 01-030	30
ULTI+ R32 01-045	40
ULTI+ R32 01-050	43
ULTI+ R32 11-045	43
ULTI+ R32 11-050	46
ULTI+ R32 11-055	52
ULTI+ R32 11-065	60
ULTI+ R32 11-075	67
ULTI+ R32 12-050	49
ULTI+ R32 12-055	55
ULTI+ R32 12-065	63
ULTI+ R32 12-075	70
ULTI+ R32 12-080	78
ULTI+ R32 12-090	87
ULTI+ R32 12-100	92



Flow rate range (m^3/h) & rated flow rate (|)

Unit	Capacity
ULTI+ R32 21-090	84
ULTI+ R32 21-095	90
ULTI+ R32 21-110	102
ULTI+ R32 21-115	115
ULTI+ R32 21-130	122
ULTI+ R32 21-140	132
ULTI+ R32 22-115	109
ULTI+ R32 22-130	124
ULTI+ R32 22-140	132
ULTI+ R32 22-150	144
ULTI+ R32 22-160	161
ULTI+ R32 22-180	177
ULTI+ R32 22-200	190
ULTI+ R32 23-180	168
ULTI+ R32 23-200	190
ULTI+ R32 23-220	211
ULTI+ R32 23-245	232
ULTI+ R32 23-270	254
ULTI+ R32 23-285	273



Operating principles

The machine operates as a reversible heat pump:

> Source: outside air
> Treated fluid: inside air

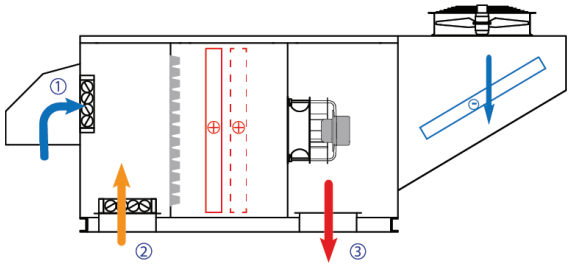
Operating modes can be:

> Heat pump
> Air conditioning
> Free Cooling: cooling using outside air, without thermodynamics

In these modes, , the unit can operate:

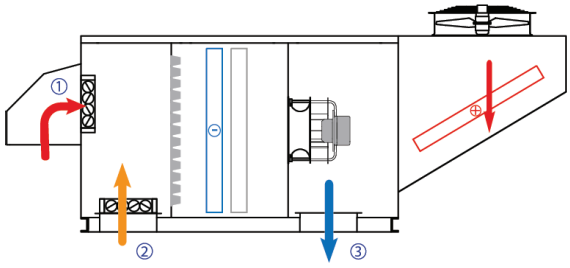
> With all recirculated air
> All fresh air mode
> Mixed air mode

Heating Mode



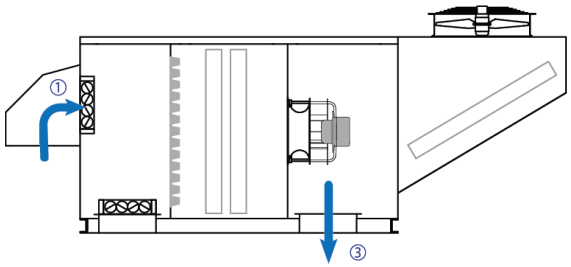
Heating Mode: Comfort temperature maintained in winter by the thermodynamic system and by the auxiliary heaters (optional).

Cooling Mode



Cooling Mode: The thermodynamic system maintains a comfortable temperature in summer.

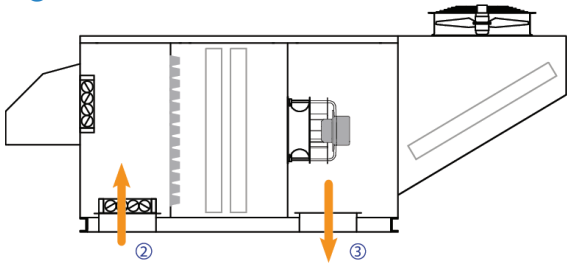
Free Cooling Mode



Free Cooling Mode: Mid-season comfort temperature maintained by using the temperature difference between the outside air and the inside air to cool the building.

Free Cooling **enables significant savings** delaying the start-up of the thermodynamic system.

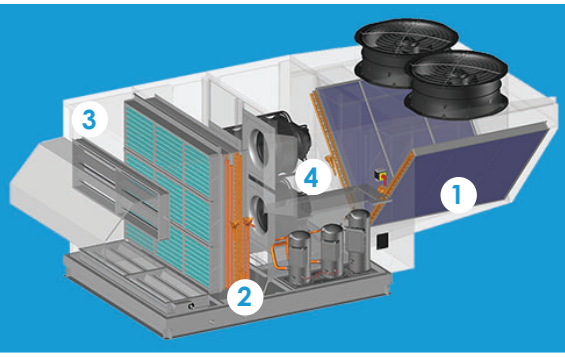
Recycling Mode



Recycling Mode: Destratification of the volume treated by recycling, when the return temperature is much higher than the ambient temperature in winter.

① Fresh air ② Return air ③ Supply air

Detailed components of the unit



The ETT packaged unit comprises 4 different sections:

1. An external compartment to ensure heat exchange with the environment.
2. A separate technical compartment housing the refrigerating and regulating components.
3. An internal compartment ensuring air change and air treatment.
4. A sealed electrical compartment (IP44).

Aluminium frame and casing assembly :

- **The ULTI+ R32 is equipped with a 2-damper motorised mixing box with low-load aluminium dampers, Class 3 Upstream-Downstream sealing and Class B frame sealing (in accordance with EN 1751):**
  - ✓ Optimized fresh air supply dosage, combined with the CO_2 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.**
- **Watertight floor** with drainage outlets around the unit, connected to rubber traps.
- **Aluminium vertical panels and roof, 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. The removable panels are sealed by compression on a flexible lip seal, ensuring a perfect sealing over time.
- **Soundproofing and thermal insulation provided by 80 mm to 100 mm rock wool** (M0 classification) in the frame and **50 mm glass wool** (M0 classification in accordance with **PAB regulations** (Public Access Buildings), article CH36 Directive 2006/42/EC) **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 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.
- **Replacement filter kit available as an option**
- **High energy efficiency propeller fans**

  As a forerunner, ETT has chosen the latest generation of fans:
  - ✓ Fitted with a variable-speed electronically commutated « EC » motor, these newly-designed fans can increase the airflow through the heat exchangers by up to 15%, while maintaining the same power consumption. These "EC" fans ensure a precise temperature for greater comfort and energy savings by adapting their rotation speed to real needs.
  - ✓ **Innovative blade design** - this new blade profile generates lower compressor consumption, given the lower and higher HP and LP respectively in the various operating modes,
  - ✓ Communicating for real time operation adjustment.
  - ✓ Increased diameter for unrivalled efficiency and low noise levels.
- **Last generation internal fans (High Energy Performance):**
  - ✓ **Direct transmission** (savings 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.
  - ✓ With integrated Soft Starter to reduce starting current and enable soft starting (textile sheaths).
- **Low Noise Option** available.
- **AFC option with self-adjusting flow rate**, to compensate for filter fouling.
- **VPF option** (Variable Power Flow) option to reduce energy consumption.

Detailed components of the unit

Energy and thermodynamic assembly:

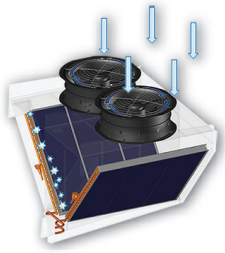
- **For units with several thermodynamic circuits,** only the first circuit is equipped with a tandem. This allows the thermal power provided to be staggered according to the needs of the application, for less consumption and greater comfort.
- **Communicating electronic expansion valves** combining 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. External heat exchangers designed to delay frost build-up and ensure 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 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. When working on the compression unit, these isolation valves make it easier to repair and maintain the refrigerant circuit.
- **Completely independent** refrigeration circuit: each refrigeration circuit has its own independent propeller fan ventilating its heat exchanger.
- **Anti-acid filter drier.**
- Switchover **valve**.
- **Optimised defrosting** with a new external compartment design (**optimised for eco-design**).
- **Leak detection :** ULTI+ R32 is fitted 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 inspections of your equipment**.

Optimised defrosting:

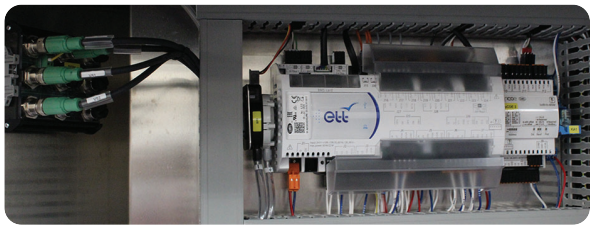
Defrosting principle:

- ✓ The coil frosts by condensing the moisture in the air.
- ✓ Stops the propeller fan of the defrosting circuit (with simultaneous defrosting prohibited).
- ✓ Reversal of the refrigeration system's 4-way valve: the defrosting coil switches to condenser.
- ✓ Coil drying.
- ✓ The other refrigeration circuit continues to operate normally.



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 Control Box remote display or via native BMS Modbus.
  - ✓ **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.
  - ✓ A Ik3 basic **breaking capacity** of 10 kA.
  - ✓ **Components** protection using circuit breakers.
  - ✓ **A phase controller.**
  - ✓ **The nominal LV** distribution voltage is governed by the French Interministerial Order of 24 December 2007. Consult us if the regulations of the country of installation require other characteristics for the nominal distribution voltage. 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.



Detailed components of the unit

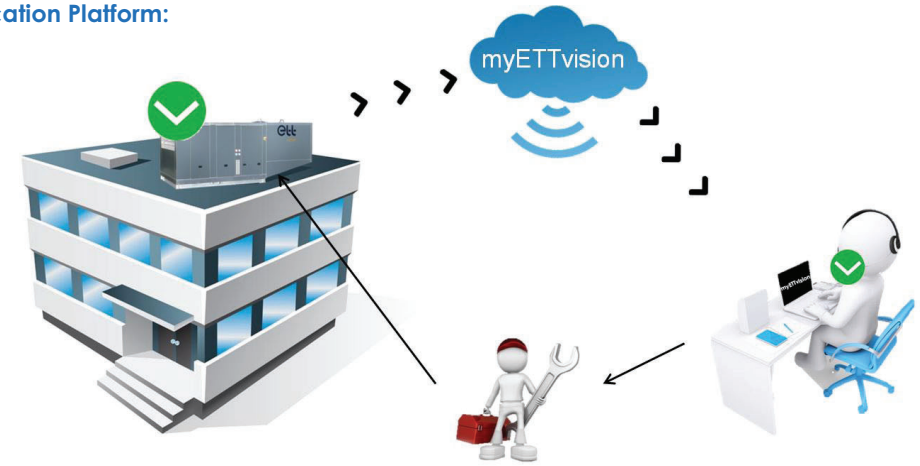
Advanced control assembly:

- **Temperature control with 2 set points for Cooling/Heating mode in compliance with 2002/91/EC Directive: responsive, precise and anticipatory.**

  Economy 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.
- **Real-time regulation of the speed of the propeller fans** according to operating mode, outdoor temperature and thermodynamic power, for optimum acoustic performance and energy savings.
- **Optional VDP (variable airflow / power)**, which adapts the indoor airflow according to the thermodynamic power.
- **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 control by CO_2**, sensor to optimise fresh air dosage 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 water weights.
- **Optional indoor humidity control**, with or without energy recovery.
- **Optional all-weather kit function**, for air-conditioning operation at outdoor temperatures below 15°C.
- **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**.
- **myETTvision remote 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 the ULTI+ R32 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%
- **Installation efficiency**
  - ✓ Operating **costs**
  - ✓ **Users**' comfort
  - ✓ **Durability**
  - ✓ **Availability**
- **Conformity**
  - ✓ **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
  - Initial commissioning inspection, periodic inspections, periodic re-qualifications (monitoring of pressure equipment)
  - 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
- Inspection and maintenance of the environment (distribution 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	▪ Double aluminium skin on inner compartment ▪ Motorised external damper for supply air, except downdraft (CH38 - Directive 2006/42/CE)
Acoustics	▪ EC Low Noise supply fans ▪ Compressor soundproofing covers
Airflow section	▪ Operation with all recirculated air (excluding Public Access Buildings) ▪ All fresh air operation ▪ Actuating smoke detector with battery back-up ▪ Epoxy coating for supply air fans ▪ Analogue air flow controller (AFC) with auto-adjustment of supply fans flow rate ▪ Pressure gauge for supply 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 filters with analogue sensor ▪ ISO ePM1 80% (F9) 98mm supply filters with analogue sensor ▪ Pressure relief vent ▪ Defrosting damper ▪ Cover for pressure relief vent ▪ Fresh air cowl extension
Thermodynamics	▪ Air-conditioning operation only (non-reversible machine) ▪ Compressor MAP monitoring ▪ Vinyl coating on thermodynamic coils ▪ HP and LP pressure gauge
Auxiliaries	▪ Hot water recovery coil with analogue frost protection thermostat ▪ 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-stage sequential electric heaters + load shedding via dry contact ▪ Fresh air preheated by 3-stage electric heaters
Electrics	▪ Totalising electrical energy metering. ▪ Aluminium/copper terminal block (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 cover for external power supply (to be fitted by the installer)
Installation	▪ Adjustable connecting aluminium roof curb ▪ Connecting adaptor aluminium roof curb ▪ Adjustable ventilated aluminium roof curb ▪ Ventilated adaptor aluminium roof curb ▪ 200, 400 or 600mm aluminium feet

Main options

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 ▪ VDP operation (Variable Flow / Power) ▪ HPE+ operation (High Energy Efficiency) ▪ Level 1 dehumidification function (without heat recovery) ▪ Level 2 dehumidification function (with heat recovery & on/off 3-WV valve) ▪ Average room temperature (4 sensors) ▪ Minimum fresh air slaving using turret contacts (3 maximum)
Communication	▪ myETTvision ▪ ETT Control Box remote touch display ▪ CCAD remote display ▪ Native RS485 Modbus ▪ Modbus IP ▪ BacNet IP
Guarantee	▪ Please contact us

Technical features

	DESIGNATION	Unit	020	025	030	045	050
VENTILATION	**FLOW RATES**						
	Rated air flow rate	**m³/h**	4500	5000	6000	8500	8500
	Minimum air flow rate	**m³/h**	3000	3500	4000	7000	8000
	Maximum air flow rate	**m³/h**	8500	8500	8500	8500	8500
	ACOUSTICS (Eurovent certified) (1)						
	Sound power level at supply air	**dB(A)**	68	69	72	79	78
	Outside sound power level	**dB(A)**	69	71	73	76	79
	Resulting external sound pressure at 10m ref. $2*10^{-5}$ in free field, directivity 1	**dB(A)**	41	43	45	45	48
COOLING PERFORMANCE	**RATED PERFORMANCE AT +35°C (Eurovent Certified)** (1)						
	Net cooling capacity	**kW**	20.3	23.5	28.6	40.0	42.2
	Net EER	**kW/kW**	3.60	3.57	3.18	2.95	2.90
	SEASONAL EFFICIENCY (2)						
	Net design cooling capacity	**kW**	20.3	23.5	28.6	40.0	42.2
	SEER	**kW/kW**	6.29	6.23	6.02	4.70	4.48
	ηs,C	**%**	249	246	238	185	176
	Eurovent class	**E ... A**	A+	A+	A+	A	B
HEATING PERFORMANCE	**RATED PERFORMANCE AT +7°C (Eurovent Certified)** (1)						
	Net heating capacity	**kW**	19.9	22.2	27.9	41.9	45.7
	Net COP	**kW/kW**	4.12	4.03	3.77	3.63	3.50
	RATED PERFORMANCE AT -7°C (3)						
	Net heating capacity	**kW**	14.1	15.5	19.3	28.8	31.6
	Net COP	**kW/kW**	3.34	3.27	3.14	2.96	2.90
	SEASONAL EFFICIENCY (2)						
	Net design heat output	**kW**	19.6	21.8	24.6	37.2	37.7
	SCOP	**kW/kW**	4.60	4.56	4.22	3.89	3.80
	ηs,H	**%**	181	179	166	153	149
	Eurovent class	**E ... A**	A+	A+	A+	A+	A+
GENERAL INFORMATION	**ELECTRICAL DATA**						
	Total installed electrical power (4)	**kW**	11.4	12.3	14.7	22.1	23.5
	Total installed electrical current (4)	**A**	18.4	19.9	23.7	35.6	37.9
	Starting current	**A**	30.8	30.8	30.8	123.7	124.8
	Maximum absorbed electrical power (5)	**kW**	7.4	8.4	11.0	15.2	16.3
	REFRIGERATION CIRCUIT(S)						
	Power stages	**-**	Variable	Variable	Variable	2	2
	OPERATING LIMITS IN COOLING MODE						
	Maximum outside temperature (6)	**°C**	+53	+52	+50	+51	+ 50
	Minimum outside temperature (6)	**°C**			+15		
	Minimum inside coil inlet temperature	**°C**			+18		
	OPERATING LIMITS IN HEATING MODE						
	Minimum outside temperature	**°C**			-15		
	Minimum inside coil inlet temperature	**°C**			+18		
	WEIGHT						
	Unit weight without options (7)	**kg**	482	482	482	532	535
	Weight of connecting roof curb	**kg**			73		
	Weight of standard ventilated roof curb	**kg**			102		

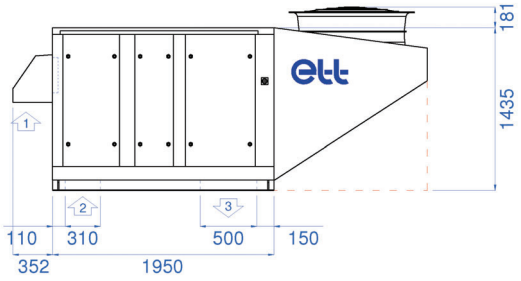
(1) In accordance with EN 14511.
Cooling mode: Indoor conditions: +27°C DB/+19°C WB and outside conditions: +35°C DB / 24°C WB
Heating mode: Indoor conditions: +20°C DB/+12°C WB and outside conditions: +7°C DB / +6°C WB.
(2) According to EcoDesign regulation 2016/2281.
(3) In accordance with EN 14511.
Heating mode: Indoor conditions: +20°C DB and outside conditions: -7°C DB / -8°C WB.
(4) Three-phase power supply 400V - 50 Hz + earth without neutral.
The values given do not include any options and may change during the design stage. They must be confirmed after the purchase order has been placed.

(5) Cooling mode: Indoor conditions: +27°C DB /+19°C WB and outside conditions: +35°C DB / 24°C WB. Nominal flow, 400Pa available pressure on return + supply & ISO Coarse 65% filters clogged.
(6) For indoor conditions: +27°C DB /+19°C WB at nominal air flow.
(7) Weight for an available pressure of 400 Pa.

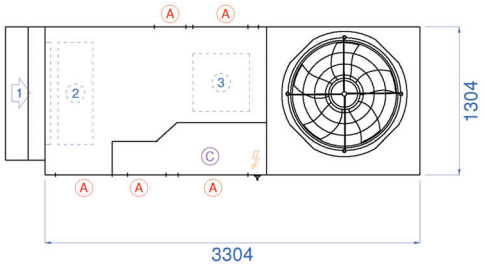
Dimensions and connections

SUPPLY AIR *underneath*

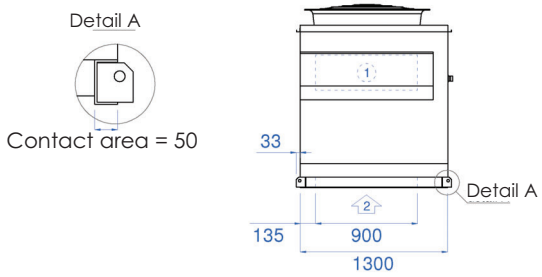
Front view:



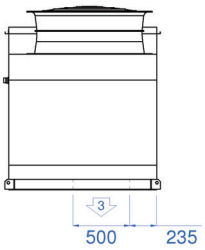
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	3304 mm	1304 mm	1435 mm

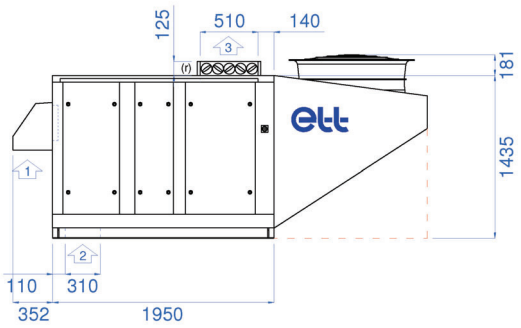
(1) Side return: +125 mm

Note: fresh air cowls shall be installed by the installer.

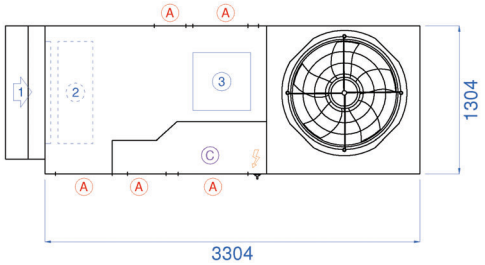
Dimensions and connections

SUPPLY AIR *on top*

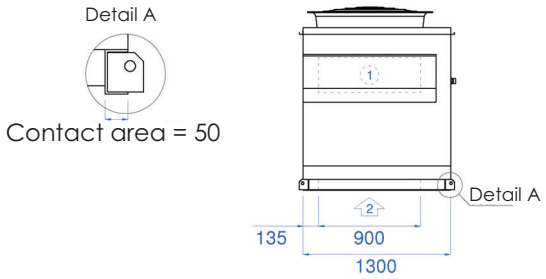
Front view:



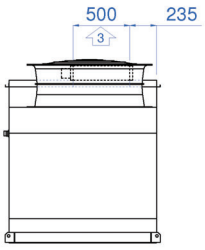
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	3304 mm	1304 mm	1435 mm

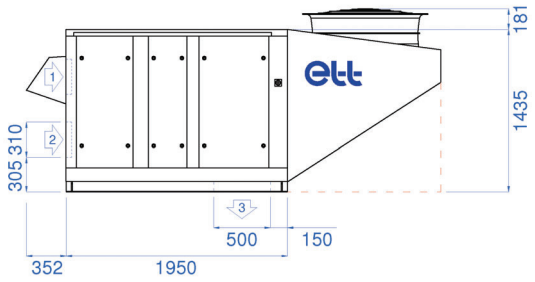
(1) Side return: +125 mm

Note: fresh air cowls shall be installed by the installer.

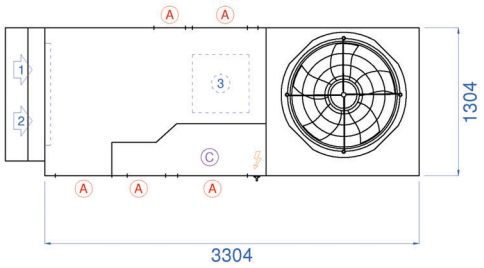
Dimensions and connections

SUPPLY AIR *underneath, end recovery*

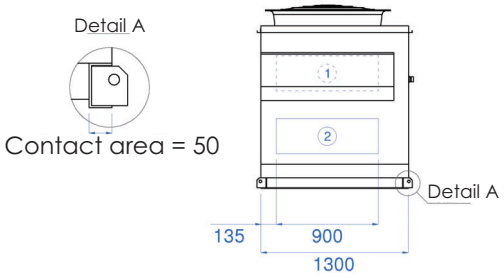
Front view:



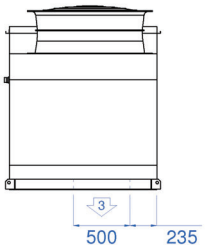
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	3304 mm	1304 mm	1435 mm

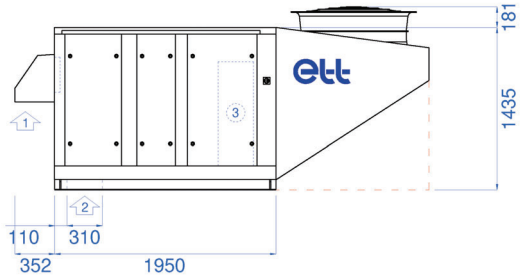
(1) Side return: +125 mm

Note: fresh air cowls shall be installed by the installer.

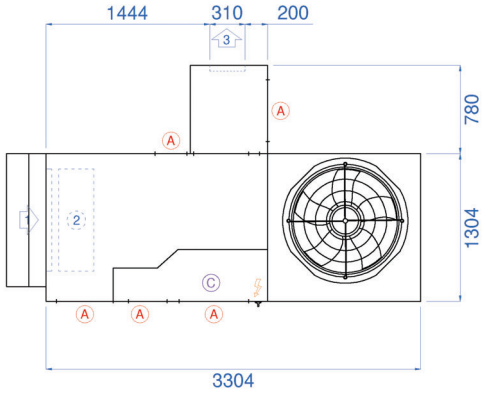
Dimensions and connections

SUPPLY AIR *side*

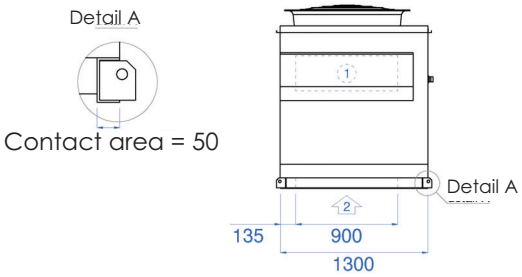
Front view:



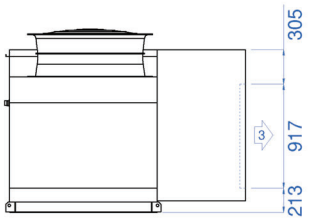
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

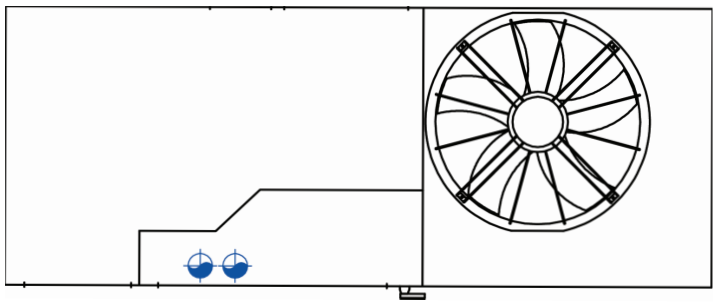
	Length	Width (1)	Height
Casing dimensions	3304 mm	1304 mm	1435 mm

(1) Side return: +125 mm

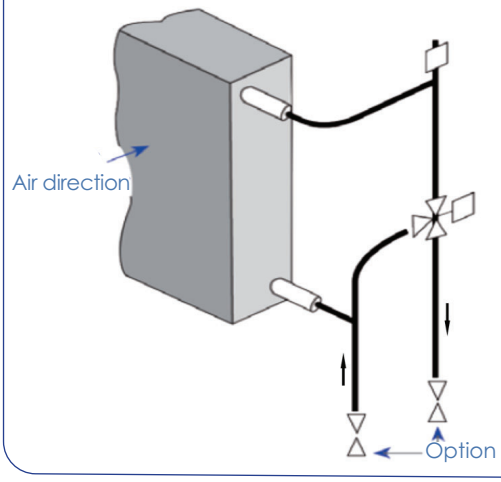
Nota: - fresh air cowls shall be installed by the installer.
- the side box shall be installed by the installer.
- the electrical connection of the supply air damper is the responsibility of the installer.

DIAGRAM AND CONNECTION

Top view



Principle



POWER RATINGS

	Unit		020	025	030	045	050
Water regime 90/70°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	75.3	80.8	91.1	113.2	113.2
	Water flow rate	m³/h	3.3	3.6	4.1	5.0	5.0
	Exchanger pressure drop	mWC	0.9	1.0	1.2	1.8	1.8
	Exchanger pressure drop and 3-WV (1)	mWC	1.3	1.5	1.8	2.8	2.8
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	1.7	2.0	2.5	3.8	3.8
Water regime 80/60°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	63.7	68.4	77.0	95.4	95.4
	Water flow rate	m³/h	2.8	3.0	3.4	4.2	4.2
	Exchanger pressure drop	mWC	0.7	0.7	0.9	1.4	1.4
	Exchanger pressure drop and 3-WV (1)	mWC	1.0	1.1	1.4	2.0	2.0
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	1.3	1.4	1.8	2.7	2.7
Water regime 90/70°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	64.2	68.9	77.6	96.2	96.2
	Water flow rate	m³/h	2.8	3.0	3.4	4.2	4.2
	Exchanger pressure drop	mWC	0.6	0.7	0.9	1.4	1.4
	Exchanger pressure drop and 3-WV (1)	mWC	0.9	1.1	1.4	2.0	2.0
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	1.3	1.4	1.8	2.7	2.7
Water regime 80/60°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	52.6	56.4	63.4	78.4	78.4
	Water flow rate	m³/h	2.3	2.5	2.8	3.5	3.5
	Exchanger pressure drop	mWC	0.5	0.5	0.6	0.9	0.9
	Exchanger pressure drop and 3-WV (1)	mWC	0.7	0.8	0.9	1.4	1.4
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	0.9	1.0	1.2	1.9	1.9

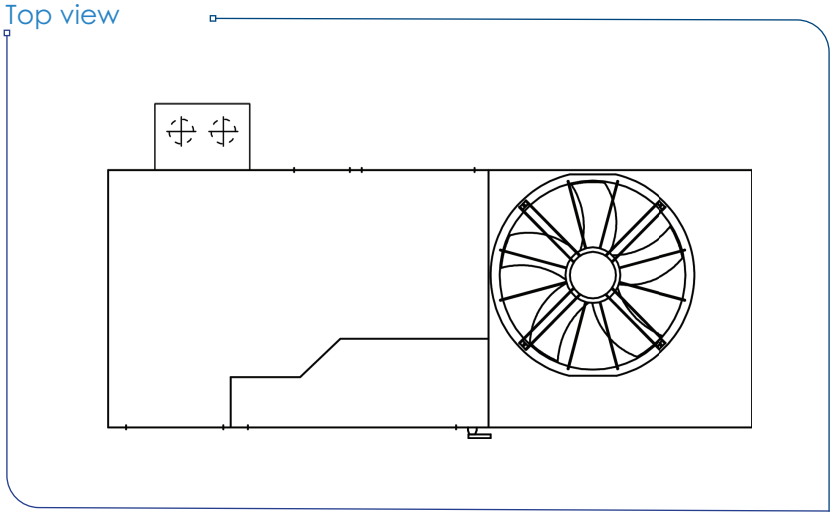
(1) With 3-WV option
(2) With 3-WV, VTA, VA option

3-WV: 3-Way valve
VA: Return flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate.

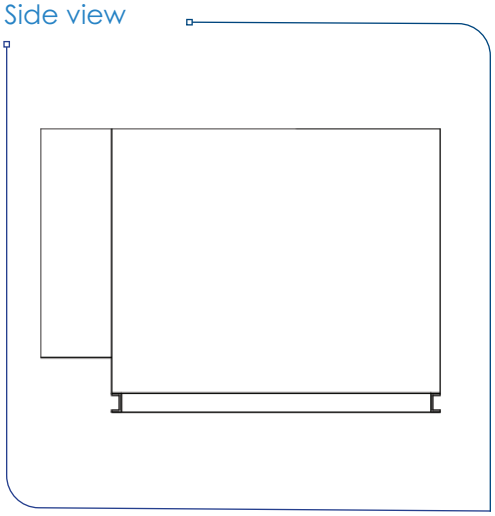
DIAGRAM AND CONNECTION

► Connection opposite the technical compartment.

Top view



Side view



► Connection identical to hot water coil connection.

See diagram and connection.

POWER RATINGS

		Unit	020	025	030	045	050
Water regime 35/30°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	23.6	25.3	28.6	35.5	35.5
	Water flow rate	m³/h	4.1	4.4	5.0	6.2	6.2
	Exchanger pressure drop	mWC	1.4	1.6	2.0	3.0	3.0
	Exchanger pressure drop and 3-WV (1)	mWC	2.1	2.4	3.0	4.5	4.5
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	2.7	3.1	4.0	6.0	6.0
Water regime 35/30°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	12.6	13.4	15.1	18.6	18.6
	Water flow rate	m³/h	2.2	2.3	2.6	3.2	3.2
	Exchanger pressure drop	mWC	0.5	0.5	0.6	0.9	0.9
	Exchanger pressure drop and 3-WV (1)	mWC	0.6	0.7	0.9	1.3	1.3
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	0.8	0.9	1.2	1.7	1.7

(1) With 3-WV option
(2) With 3-WV, VTA, VA option

3-WV: 3-Way valve
VA: Return flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate

Technical features

	DESIGNATION	Unit	045	050	055	065	075
VENTILATION	**FLOW RATES**						
	Rated air flow rate	m³/h	9500	10500	11500	13000	15000
	Minimum air flow rate	m³/h	6000	6500	7500	9500	12500
	Maximum air flow rate	m³/h	15000	15000	15000	15000	15000
	ACOUSTICS (Eurovent certified) (1)						
	Sound power level at supply air	dB(A)	75	78	79	82	87
	Outside sound power level	dB(A)	70	70	74	80	86
	Resulting external sound pressure at 10m ref. $2*10^{-5}$ in free field, directivity 1	dB(A)	39	39	43	49	55
PERFORMANCE COOLING	**RATED PERFORMANCE AT +35°C (Eurovent Certified)** (1)						
	Net cooling capacity	kW	43.2	46.5	52.0	59.5	67.0
	Net EER	kW/kW	3.40	3.31	3.24	3.17	3.13
	SEASONAL EFFICIENCY (2)						
	Net design cooling capacity	kW	43.2	46.5	52.0	59.5	67.0
	SEER	kW/kW	5.38	4.84	4.76	4.64	4.74
	ηs,C	%	212	191	187	182	187
	Eurovent class	E ... A	A+	A	A	B	A
HEATING PERFORMANCE	**RATED PERFORMANCE AT +7°C (Eurovent Certified)** (1)						
	Net heating capacity	kW	43.9	47.5	53.9	61.3	69.3
	Net COP	kW/kW	4.25	4.29	4.17	4.06	3.92
	RATED PERFORMANCE AT -7°C (3)						
	Net heating capacity	kW	30.0	33.0	37.2	42.9	48.2
	Net COP	kW/kW	3.39	3.43	3.37	3.25	3.11
	SEASONAL EFFICIENCY (2)						
	Net design heat output	kW	40.0	42.7	47.5	54.0	60.9
	SCOP	kW/kW	4.33	4.28	4.18	3.99	3.82
	ηs,H	%	170	168	164	157	150
	Eurovent class	E ... A	A+	A+	A+	A+	A+
GENERAL INFORMATION	**ELECTRICAL DATA**						
	Total installed electrical power (4)	kW	24.9	26.3	29.8	33.0	34.9
	Total installed electrical current (4)	A	39.9	42.2	48.0	53.3	55.2
	Starting current	A	128.0	129.1	159.9	173.6	172.5
	Maximum absorbed electrical power (5)	kW	15.3	16.8	19.0	22.0	24.9
	REFRIGERATION CIRCUIT(S)						
	Power stages	-	2	2	2	2	2
	OPERATING LIMITS IN COOLING MODE						
	Maximum outside temperature (6)	°C	+50	+ 49	+ 51	+ 50	+ 48
	Minimum outside temperature (6)	°C			+15		
	Minimum inside coil inlet temperature	°C			+18		
	OPERATING LIMITS IN HEATING MODE						
	Minimum outside temperature	°C			-15		
	Minimum inside coil inlet temperature	°C			+12		
	WEIGHT						
	Unit weight without options (7)	kg	697	699	745	747	835
	Weight of connecting roof curb	kg			80		
	Weight of standard ventilated roof curb	kg			112		

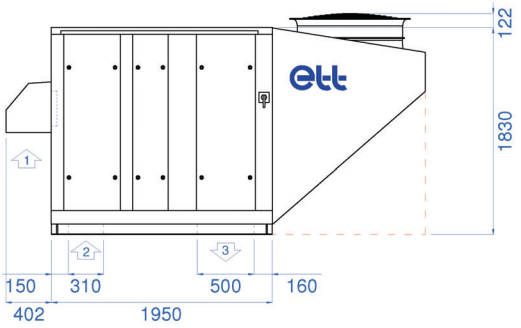
(1) In accordance with EN 14511.
Cooling mode: Indoor conditions: +27°C DB/+19°C WB and outside conditions: +35°C DB / 24°C WB
Heating mode: Indoor conditions: +20°C DB/+12°C WB and outside conditions: +7°C DB / +6°C WB.
(2) According to EcoDesign regulation 2016/2281.
(3) In accordance with EN 14511.
Heating mode: Indoor conditions: +20°C DB and outside conditions: -7°C DB / -8°C WB.
(4) Three-phase power supply 400V - 50 Hz + earth without neutral.
The values given do not include any options and may change during the design stage. They must be confirmed after the purchase order has been placed.

(5) Cooling mode: Indoor conditions: +27°C DB /+19°C WB and outside conditions: +35°C DB / 24°C WB. Nominal flow, 400Pa available pressure on return + supply & ISO Coarse 65% filters clogged.
(6) For indoor conditions: +27°C DB /+19°C WB at nominal air flow.
(7) Weight for an available pressure of 400 Pa.

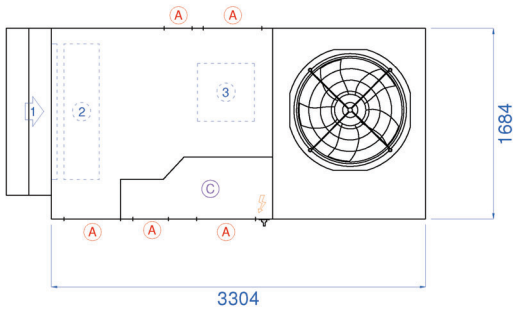
Dimensions and connections

SUPPLY AIR *underneath*

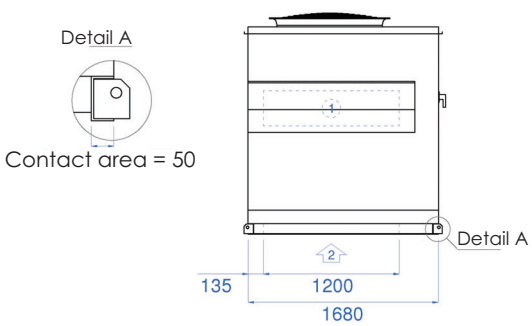
Front view:



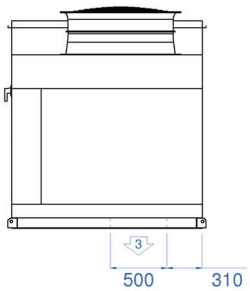
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	3304 mm	1684 mm	1830 mm

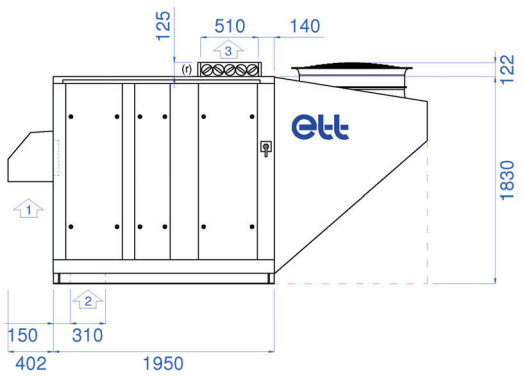
(1) Side return: +125 mm

Note: fresh air cowls shall be installed by the installer.

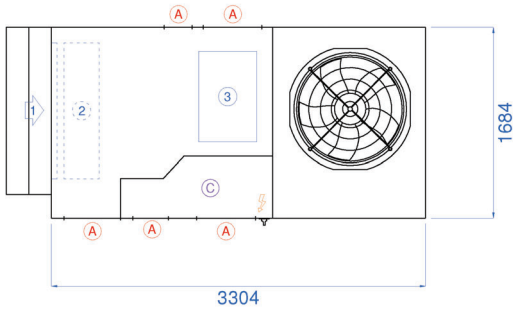
Dimensions and connections

SUPPLY AIR *on top*

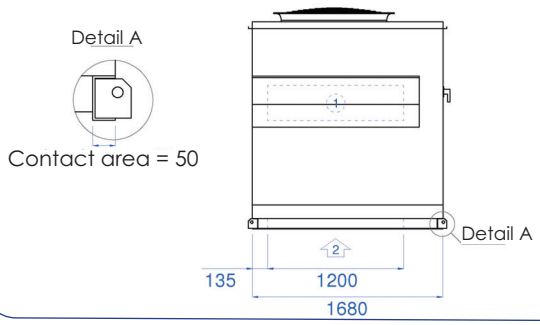
Front view:



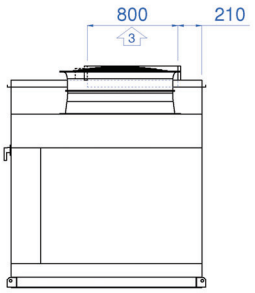
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	3304 mm	1684 mm	1830 mm

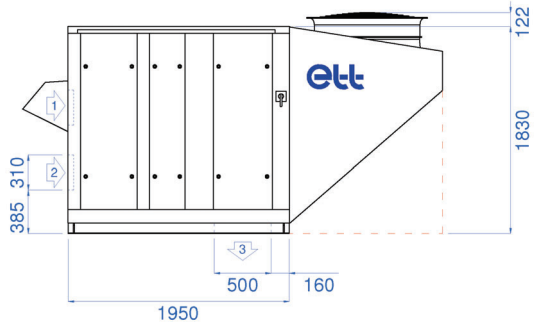
(1) Side return: +125 mm

Note: fresh air cowls shall be installed by the installer.

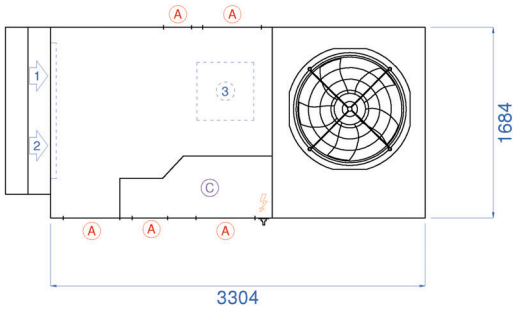
Dimensions and connections

SUPPLY AIR *underneath, end recovery*

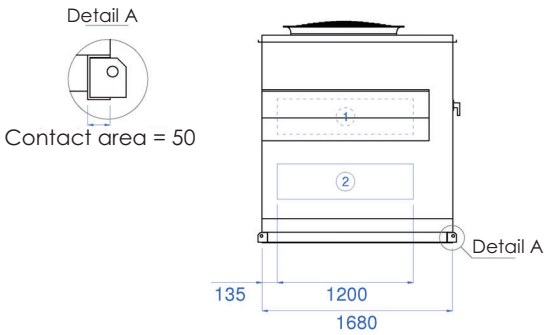
Front view:



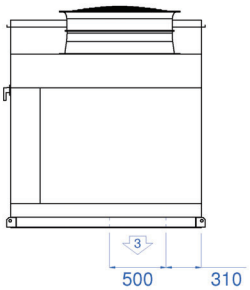
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	3304 mm	1684 mm	1830 mm

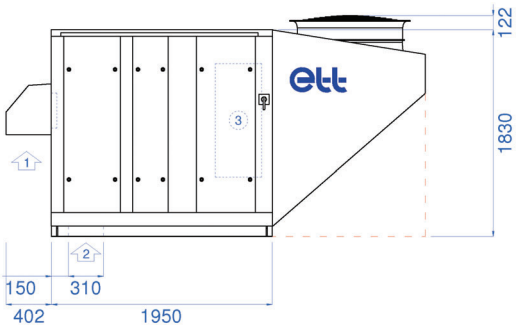
(1) Side return: +125 mm

Note: fresh air cowls shall be installed by the installer.

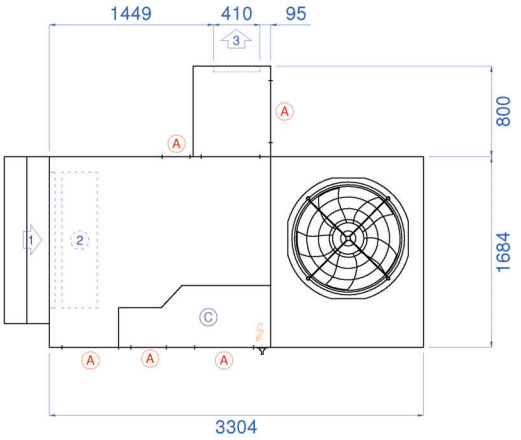
Dimensions and connections

SUPPLY AIR Side

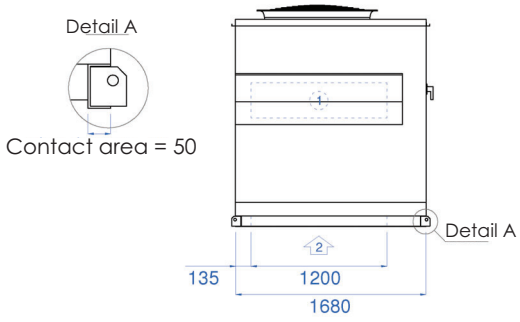
Front view:



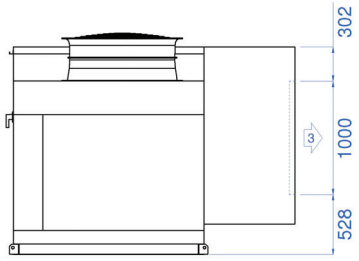
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

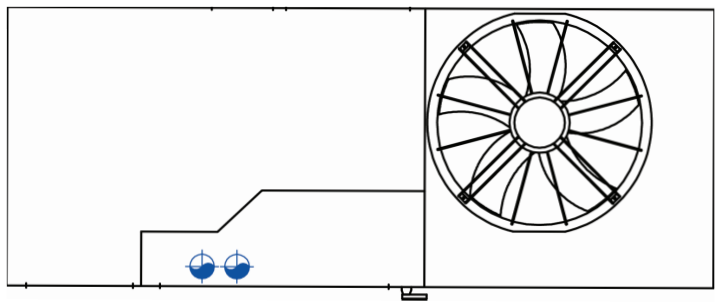
	Length	Width (1)	Height
Casing dimensions	3304 mm	1684 mm	1830 mm

(1) Side return: +125 mm

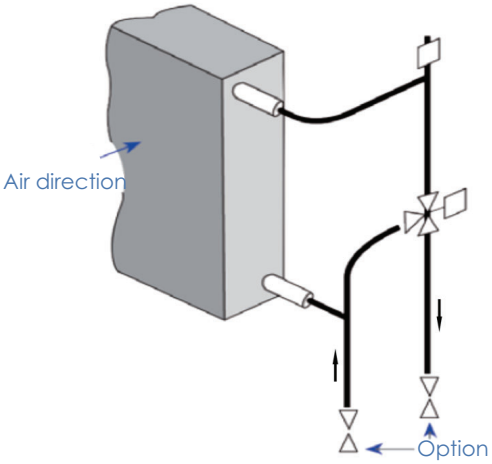
Nota: - fresh air cowls shall be installed by the installer.
- the side box shall be installed by the installer.
- the electrical connection of the supply air damper is the responsibility of the installer.

DIAGRAM AND CONNECTION

Top view



Principle



POWER RATINGS

		Unit	045	050	055	065	075
Water regime 90/70°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	153.2	163.7	173.6	187.7	205.1
	Water flow rate	m³/h	6.8	7.3	7.7	8.3	9.1
	Exchanger pressure drop	mWC	2.4	2.7	3.0	3.5	4.1
	Exchanger pressure drop and 3-WV (1)	mWC	4.1	4.7	5.2	6.1	7.2
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	5.9	6.7	7.5	8.8	10.4
Water regime 80/60°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	130.1	138.8	147.2	159.1	173.6
	Water flow rate	m³/h	5.8	6.1	6.5	7.0	7.7
	Exchanger pressure drop	mWC	1.8	2.0	2.2	2.6	3.0
	Exchanger pressure drop and 3-WV (1)	mWC	3.0	3.4	3.8	4.5	5.3
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	4.3	4.9	5.5	6.4	7.6
Water regime 90/70°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	130.8	139.7	148.0	160.0	174.7
	Water flow rate	m³/h	5.8	6.2	6.6	7.1	7.7
	Exchanger pressure drop	mWC	1.8	2.0	2.2	2.6	3.0
	Exchanger pressure drop and 3-WV (1)	mWC	3.0	3.5	3.9	4.5	5.3
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	4.4	4.9	5.5	6.4	7.6
Water regime 80/60°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	107.7	114.8	121.6	131.3	143.1
	Water flow rate	m³/h	4.8	5.1	5.4	5.8	6.3
	Exchanger pressure drop	mWC	1.3	1.4	1.6	1.8	2.1
	Exchanger pressure drop and 3-WV (1)	mWC	2.1	2.4	2.7	3.1	3.7
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	3.0	3.4	3.8	4.4	5.2

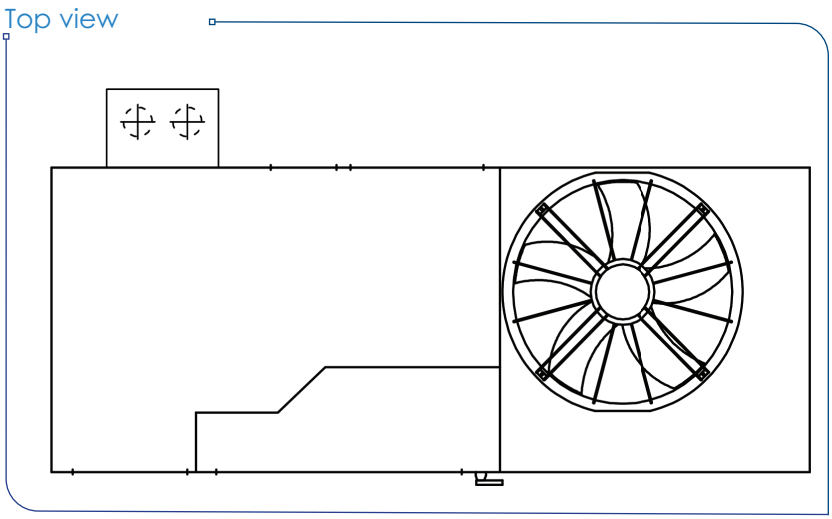
(1) With 3-WV option
(2) With 3-WV, VTA, VA option

3-WV: 3-Way valve
VA: Return flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate.

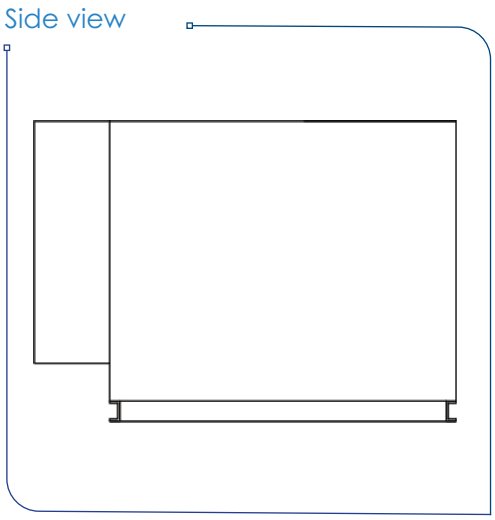
DIAGRAM AND CONNECTION

► Connection opposite the technical compartment.

Top view



Side view



► Connection identical to hot water coil connection.
See diagram and connection.

POWER RATINGS

		Unit	045	050	055	065	075
Water regime 35/30°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	48.2	51.5	54.7	59.1	64.6
	Water flow rate	m³/h	8.4	8.9	9.5	10.2	11.2
	Exchanger pressure drop	mWC	4.0	4.5	5.0	5.8	6.8
	Exchanger pressure drop and 3-WV (1)	mWC	6.7	7.6	8.5	9.8	11.6
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	9.4	10.7	12.0	14.0	16.6
Water regime 35/30°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	25.9	27.6	29.3	31.5	34.3
	Water flow rate	m³/h	4.5	4.8	5.1	5.5	6.0
	Exchanger pressure drop	mWC	1.3	1.4	1.6	1.8	2.1
	Exchanger pressure drop and 3-WV (1)	mWC	2.1	2.3	2.6	3.0	3.5
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	2.9	3.2	3.6	4.2	4.9

(1) With 3-WV option
(2) With 3-WV, VTA, VA option

3-WV: 3-Way valve
VA: Return flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate.

Technical features

	DESIGNATION	Unit	050	055	065	075	080	090	100
VENTILATION	**FLOW RATES**								
	Rated air flow rate	**m³/h**	11000	12500	14000	16000	18000	20000	20000
	Minimum air flow rate	**m³/h**	6000	7000	8000	11000	13000	16000	19000
	Maximum air flow rate	**m³/h**	20000	20000	20000	20000	20000	20000	20000
	ACOUSTICS (Eurovent certified) (1)								
	Sound power level at supply air	**dB(A)**	74	76	77	80	83	86	86
	Outside sound power level	**dB(A)**	71	74	78	80	84	93	94
	Resulting external sound pressure at 10m ref. $2*10^{-5}$ in free field, directivity 1	**dB(A)**	40	43	47	49	53	62	63
COOLING PERFORMANCE	**RATED PERFORMANCE AT +35°C (Eurovent Certified)** (1)								
	Net cooling capacity	**kW**	48.8	54.9	62.8	69.9	77.6	87.0	92.1
	Net EER	**kW/kW**	3.54	3.44	3.35	3.25	3.15	2.95	3.01
	SEASONAL EFFICIENCY (2)								
	Net design cooling capacity	**kW**	48.8	54.9	62.8	69.9	77.6	87.0	92.1
	SEER	**kW/kW**	5.37	5.08	4.95	5.03	4.84	4.98	4.52
	ηs,C	**%**	212	200	195	198	191	196	178
	Eurovent class	**E ... A**	A+	A	A	A	A	A	B
HEATING PERFORMANCE	**RATED PERFORMANCE AT +7°C (Eurovent Certified)** (1)								
	Net heating capacity	**kW**	48.1	54.3	63.2	71.3	79.9	91.3	97.4
	Net COP	**kW/kW**	4.73	4.65	4.49	4.43	4.26	3.90	3.94
	RATED PERFORMANCE AT -7°C (3)								
	Net heating capacity	**kW**	33.0	37.3	43.4	48.6	54.9	63.1	66.8
	Net COP	**kW/kW**	3.72	3.66	3.53	3.42	3.31	3.05	3.08
	SEASONAL EFFICIENCY (2)								
	Net design heat output	**kW**	44.0	48.0	55.5	62.3	69.6	79.0	83.5
	SCOP	**kW/kW**	4.68	4.50	4.34	4.25	4.05	3.90	3.73
	ηs,H	**%**	184	177	171	167	159	153	146
	Eurovent class	**E ... A**	A+	A+	A+	A+	A+	A+	A
GENERAL INFORMATION	**ELECTRICAL DATA**								
	Total installed electrical power (4)	**kW**	25.2	27.5	32.0	33.8	37.8	46.3	45.1
	Total installed electrical current (4)	**A**	40.6	44.5	51.7	53.6	61.6	77.1	72.6
	Starting current	**A**	127.5	156.4	172.0	170.9	183.3	242.4	217.1
	Maximum absorbed electrical power (5)	**kW**	16.7	19.1	22.2	25.2	28.6	33.8	35.0
	REFRIGERATION CIRCUIT(S)								
	Power stages	**-**	2	2	2	2	2	2	2
	OPERATING LIMITS IN COOLING MODE								
	Maximum outside temperature (6)	**°C**	+ 50	+ 48	+50	+ 49	+ 50	+ 49	+ 48
	Minimum outside temperature (6)	**°C**				+15			
	Minimum inside coil inlet temperature	**°C**				+18			
	OPERATING LIMITS IN HEATING MODE								
	Minimum outside temperature	**°C**				- 15			
	Minimum inside coil inlet temperature	**°C**				+ 12			
	WEIGHT								
	Unit weight without options (7)	**kg**	865	886	907	960	988	964	1001
	Weight of connecting roof curb	**kg**				104			
	Weight of standard ventilated roof curb	**kg**				146			

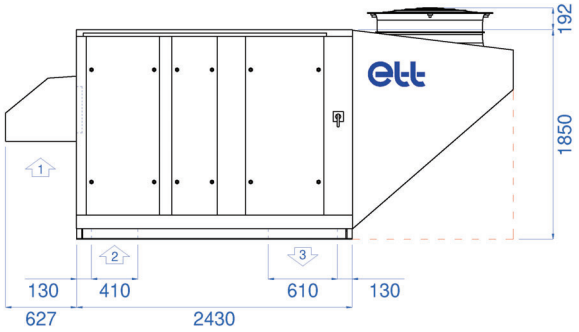
(1) In accordance with EN 14511.
Cooling mode: Indoor conditions: +27°C DB/+19°C WB and outside conditions: +35°C DB / 24°C WB
Heating mode: Indoor conditions: +20°C DB/+12°C WB and outside conditions: +7°C DB / +6°C WB.
(2) According to EcoDesign regulation 2016/2281.
(3) In accordance with EN 14511.
Heating mode: Indoor conditions: +20°C DB and outside conditions: -7°C DB / -8°C WB.
(4) Three-phase power supply 400V - 50 Hz + earth without neutral.
The values given do not include any options and may change during the design stage. They must be confirmed after the purchase order has been placed.

(5) Cooling mode: Indoor conditions: +27°C DB /+19°C WB and outside conditions: +35°C DB / 24°C WB. Nominal flow, 400Pa available pressure on return + supply & ISO Coarse 65% filters clogged.
(6) For indoor conditions: +27°C DB /+19°C WB at nominal air flow.
(7) Weight for an available pressure of 400 Pa.

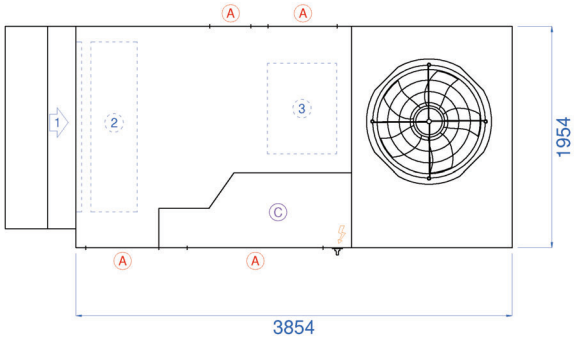
Dimensions and connections

SUPPLY AIR *underneath*

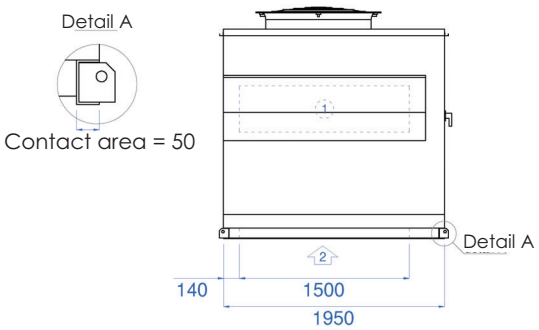
Front view:



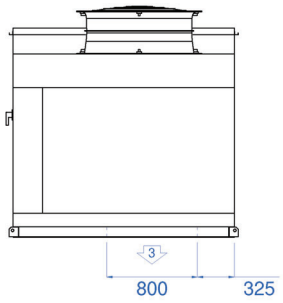
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width [1]	Height
Casing dimensions	3854 mm	1954 mm	1850 mm

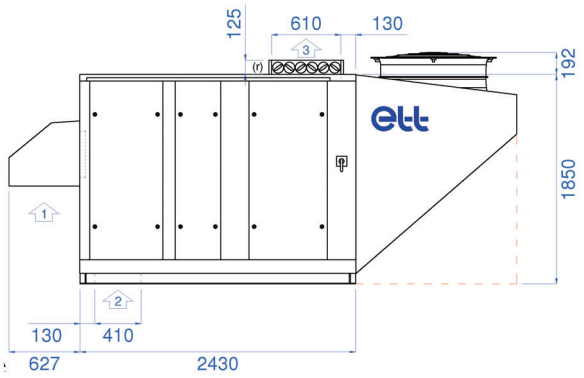
(1) Side return: +125 mm

Note: fresh air cowls shall be installed by the installer.

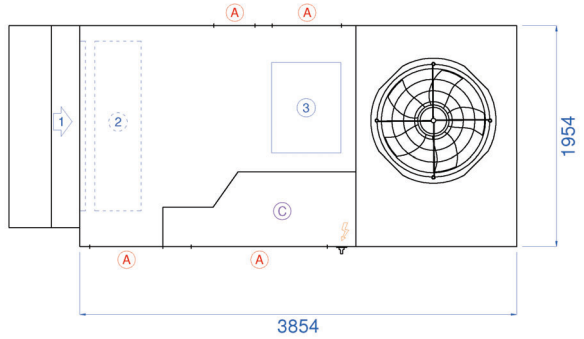
Dimensions and connections

SUPPLY AIR *on top*

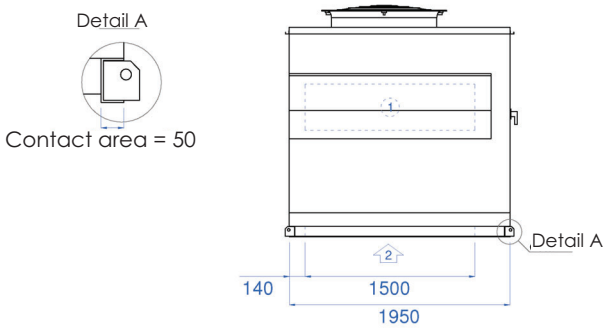
Front view:



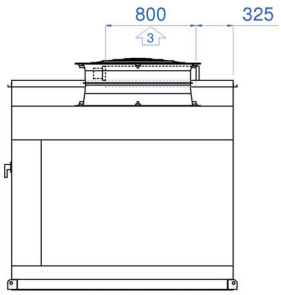
Top view :



Return side view:



Supply air side view :



① Fresh air
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⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width [1]	Height
Casing dimensions	3854 mm	1954 mm	1850 mm

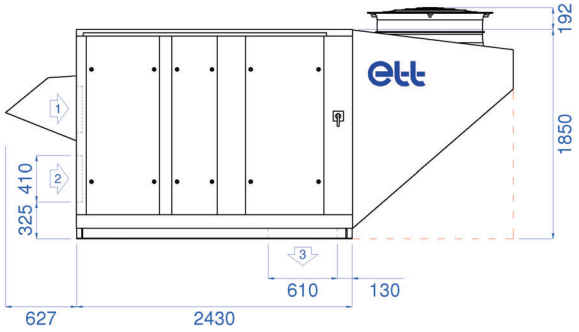
(1) Side return: +125 mm

Note: fresh air cowls shall be installed by the installer.

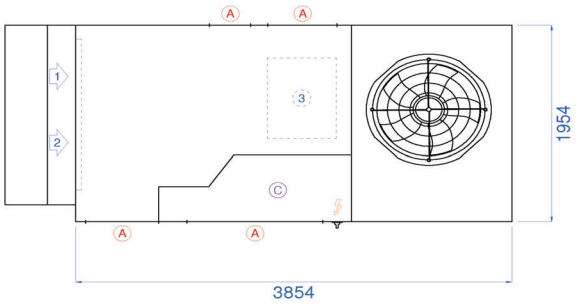
Dimensions and connections

SUPPLY AIR *underneath, end recovery*

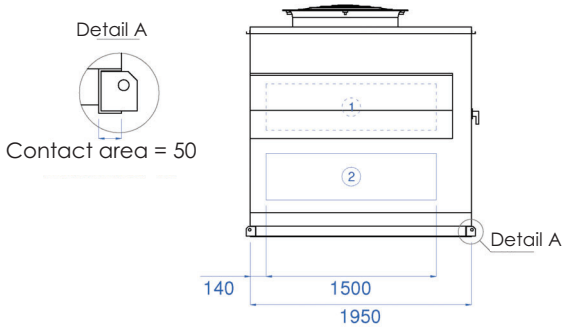
Front view:



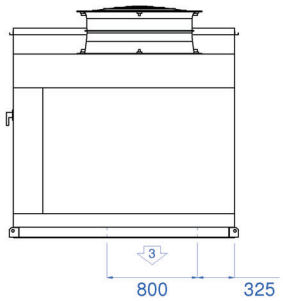
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	3854 mm	1954 mm	1850 mm

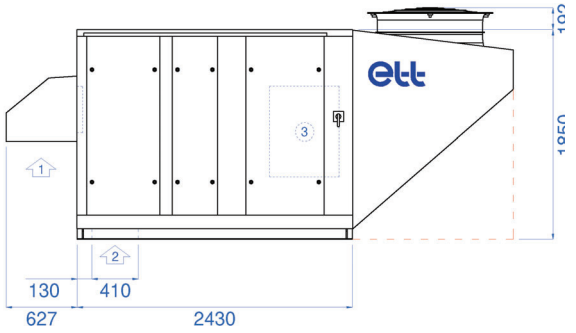
(1) Side return: +125 mm

Note: fresh air cowls shall be installed by the installer.

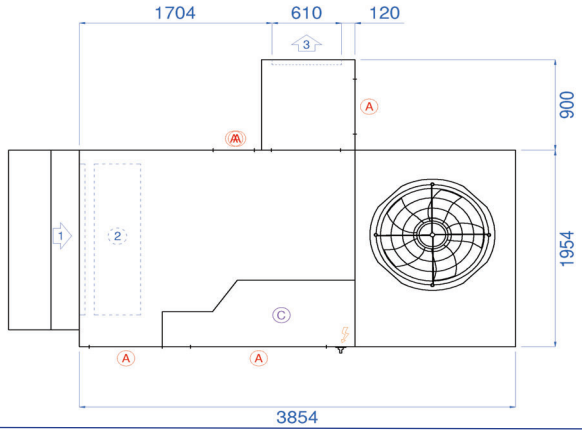
Dimensions and connections

SUPPLY AIR *side*

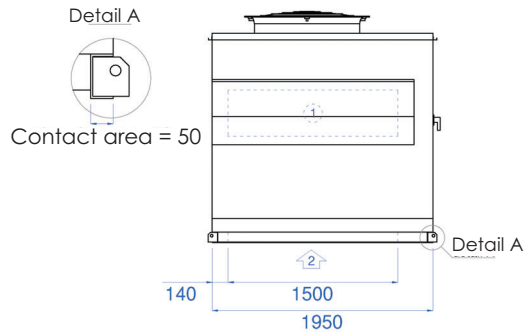
Front view:



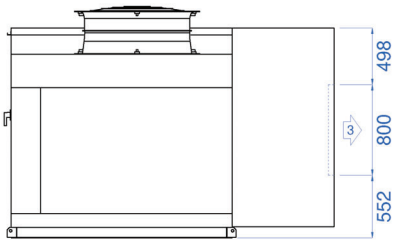
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

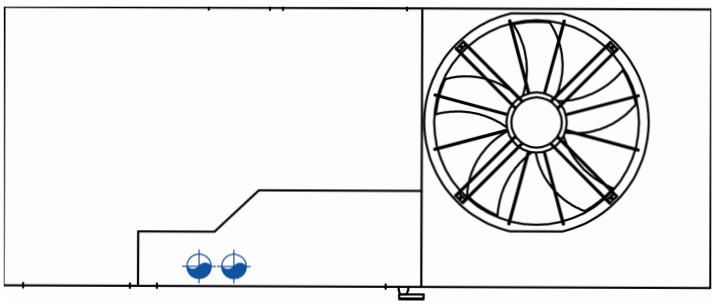
	Length	Width	Height
Casing dimensions	3854 mm	1954 mm	1850 mm

(1) Side return: +125 mm

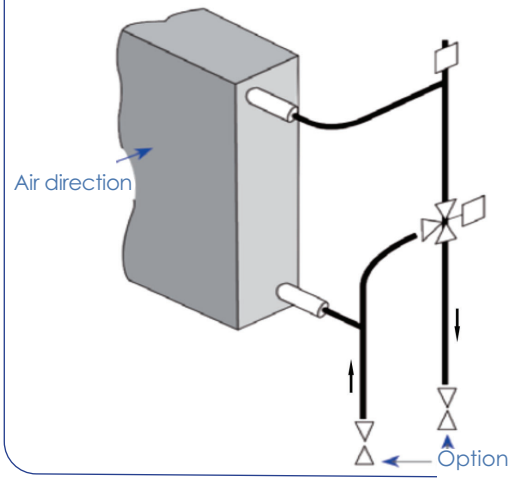
Nota:
- fresh air cowls shall be installed by the installer.
- the side box shall be installed by the installer.
- the electrical connection of the supply air damper is the responsibility of the installer.

DIAGRAM AND CONNECTION

Top view



Principle



POWER RATINGS

		Unit	050	055	065	075	080	090	100
Water regime 90/70°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	179.7	195.7	210.7	229.4	246.8	263.0	263.0
	Water flow rate	m³/h	8.0	8.7	9.4	10.2	11.0	11.7	11.7
	Exchanger pressure drop	mWC	0.9	1.1	1.2	1.4	1.6	1.9	1.9
	Exchanger pressure drop and 3-WV (1)	mWC	1.8	2.1	2.5	2.9	3.3	3.8	3.8
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	2.8	3.3	3.8	4.5	5.2	5.9	5.9
Water regime 80/60°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	151.6	164.9	177.4	193.0	207.4	220.9	220.9
	Water flow rate	m³/h	6.7	7.3	7.8	8.5	9.2	9.8	9.8
	Exchanger pressure drop	mWC	0.7	0.8	0.9	1.0	1.2	1.4	1.4
	Exchanger pressure drop and 3-WV (1)	mWC	1.3	1.5	1.8	2.1	2.4	2.7	2.7
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	2.0	2.4	2.7	3.2	3.7	4.2	4.2
Water regime 90/70°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	152.9	166.3	179.0	194.7	209.3	223.0	223.0
	Water flow rate	m³/h	6.7	7.3	7.9	8.6	9.2	9.8	9.8
	Exchanger pressure drop	mWC	0.7	0.8	0.9	1.1	1.2	1.4	1.4
	Exchanger pressure drop and 3-WV (1)	mWC	1.3	1.5	1.8	2.1	2.4	2.7	2.7
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	2.0	2.4	2.8	3.3	3.8	4.3	4.3
Water regime 80/60°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	124.7	135.5	145.5	158.1	170.0	180.9	180.9
	Water flow rate	m³/h	5.5	6.0	6.4	7.0	7.5	8.0	8.0
	Exchanger pressure drop	mWC	0.5	0.5	0.6	0.7	0.8	0.9	0.9
	Exchanger pressure drop and 3-WV (1)	mWC	0.9	1.0	1.2	1.4	1.6	1.8	1.8
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	1.4	1.6	1.9	2.2	2.5	2.8	2.8

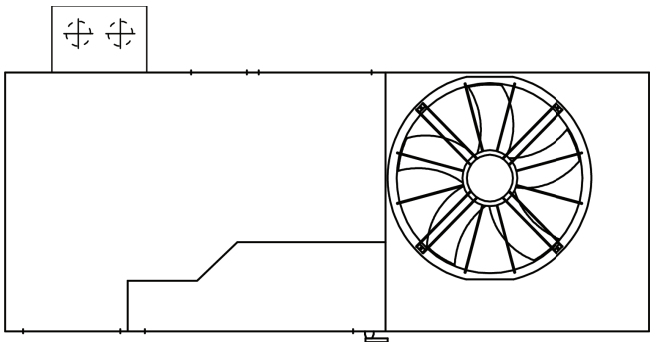
(1) With 3-WV option
(2) With 3-WV, VTA, VA option

3-WV: 3-Way valve
VA: Return flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate.

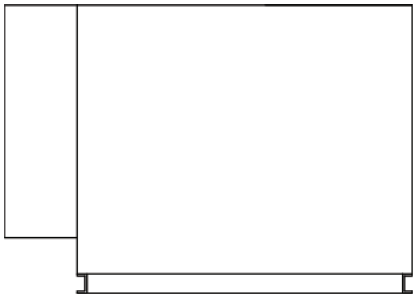
DIAGRAM AND CONNECTION

Connection opposite the technical compartment.

Top view



Side view



► Connection identical to hot water coil connection.
See diagram and connection.

POWER RATINGS

		Unit	050	055	065	075	080	090	100
Water regime 35/30°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	56.1	61.1	65.8	71.7	77.1	82.2	82.2
	Water flow rate	m³/h	9.7	10.6	11.4	12.4	13.4	14.2	14.2
	Exchanger pressure drop	mWC	1.5	1.7	2.0	2.3	2.7	3.0	3.0
	Exchanger pressure drop and 3-WV (1)	mWC	2.8	3.3	3.9	4.5	5.2	5.9	5.9
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	4.4	5.2	6.0	7.0	8.1	9.2	9.2
Water regime 35/30°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	29.5	32.0	34.4	37.3	40.0	42.5	42.5
	Water flow rate	m³/h	5.1	5.5	6.0	6.5	6.9	7.4	7.4
	Exchanger pressure drop	mWC	0.4	0.5	0.6	0.7	0.8	0.9	0.9
	Exchanger pressure drop and 3-WV (1)	mWC	0.8	0.9	1.1	1.3	1.5	1.6	1.6
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	1.2	1.4	1.7	2.0	2.2	2.5	2.5

(1) With 3-WV option
(2) With 3-WV, VTA, VA option

3-WV: 3-Way valve
VA: Return flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate.

Technical features

	DESIGNATION	Unit	090	095	110 (8)	115 (8)	130 (8)	140 (8)
VENTILATION	**FLOW RATES**							
	Rated air flow rate	m³/h	19000	21000	23000	25000	27000	27000
	Minimum air flow rate	m³/h	12000	13000	19000	19000	25000	25000
	Maximum air flow rate	m³/h	27000	27000	27000	27000	27000	27000
	ACOUSTICS (Eurovent certified) (1)							
	Sound power level at supply air	dB(A)	77	79	80	81	83	83
	Outside sound power level	dB(A)	77	77	81	83	86	88
	Resulting external sound pressure at 10m ref. $2*10^{-5}$ in free field, directivity 1	dB(A)	46	46	50	52	55	57
COOLING PERFORMANCE	**RATED PERFORMANCE AT +35°C (Eurovent Certified) (1)**							
	Net cooling capacity	kW	84.2	90.0	101.8	114.6	121.8	131.5
	Net EER	kW/kW	3.51	3.38	3.26	3.17	3.15	3.06
	SEASONAL EFFICIENCY (2)							
	Net design cooling capacity	kW	84.2	90.0	101.8	114.6	121.8	131.5
	SEER	kW/kW	5.40	5.07	4.91	4.77	4.96	4.60
	ηs,C	%	213	200	193	188	188	181
	Eurovent class	E ... A	A+	A	A	A	A	-
HEATING PERFORMANCE	**RATED PERFORMANCE AT +7°C (Eurovent Certified) (1)**							
	Net heating capacity	kW	84.5	90.9	105.9	120.1	127.3	139.5
	Net COP	kW/kW	4.26	4.27	4.04	3.99	3.98	3.84
	RATED PERFORMANCE AT -7°C (3)							
	Net heating capacity	kW	57.4	62.5	72.3	81.9	86.4	95.1
	Net COP	kW/kW	3.39	3.40	3.20	3.16	3.11	3.02
	SEASONAL EFFICIENCY (2)							
	Net design heat output	kW	76.8	80.3	92.5	101.5	111.1	117.3
	SCOP	kW/kW	4.06	3.99	3.79	3.74	3.43	3.43
	ηs,H	%	159	157	149	146	134	134
	Eurovent class	E ... A	A+	A+	A	A	B	-
GENERAL INFORMATION	**ELECTRICAL DATA**							
	Total installed electrical power (4)	kW	45.5	48.6	56.6	61.7	63.5	68.9
	Total installed electrical current (4)	A	74.2	78.8	91.8	100.1	101.9	111.0
	Starting current	A	188.7	209.0	222.0	304.8	306.7	353.4
	Maximum absorbed electrical power (5)	kW	29.5	32.6	37.6	42.8	45.7	50.1
	REFRIGERATION CIRCUIT(S)							
	Power stages	-	4	4	4	4	4	4
	OPERATING LIMITS IN COOLING MODE							
	Maximum outside temperature (6)	°C	+ 50	+ 49	+ 49	+ 49	+ 48	+ 48
	Minimum outside temperature (6)	°C	+ 15					
	Minimum inside coil inlet temperature	°C	+ 18					
	OPERATING LIMITS IN HEATING MODE							
	Minimum outside temperature	°C	- 15					
	Minimum inside coil inlet temperature	°C	+ 12					
	WEIGHT							
	Unit weight without options(7)	kg	1218	1225	1302	1329	1386	1380
	Weight of connecting roof curb	kg	121					
	Weight of standard ventilated roof curb	kg	169					

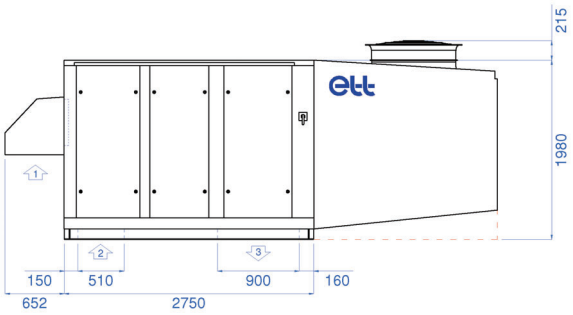
(1) In accordance with EN 14511.
Cooling mode: Indoor conditions: +27°C DB/+19°C WB and outside conditions: +35°C DB / 24°C WB
Heating mode: Indoor conditions: +20°C DB/+12°C WB and outside conditions: +7°C DB / +6°C WB.
(2) According to EcoDesign regulation 2016/2281.
(3) In accordance with EN 14511.
Heating mode: Indoor conditions: +20°C DB and outside conditions: -7°C DB / -8°C WB.
(4) Three-phase power supply 400V - 50 Hz + earth without neutral.
The values given do not include any options and may change during the design stage. They must be confirmed after the purchase order has been placed.

(5) Cooling mode: Indoor conditions: +27°C DB /+19°C WB and outside conditions: +35°C DB / 24°C WB. Nominal flow, 400Pa available pressure on return + supply & ISO Coarse 65% filters clogged.
(6) For indoor conditions: +27°C DB /+19°C WB at nominal air flow.
(7) Weight for an available pressure of 400 Pa.
(8) Machine not Eurovent certified

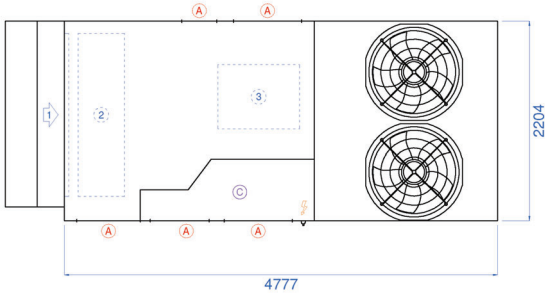
Dimensions and connections

SUPPLY AIR *underneath*

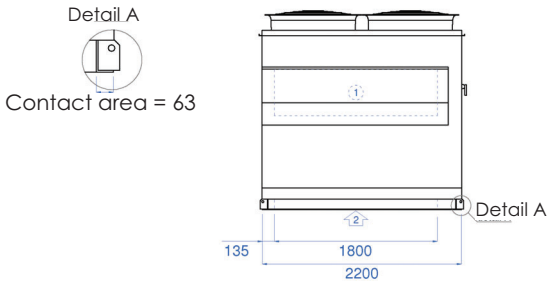
Front view:



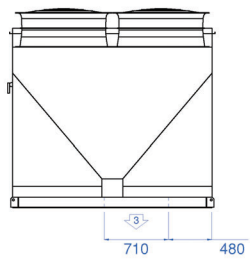
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	4777 mm	2204 mm	1980 mm

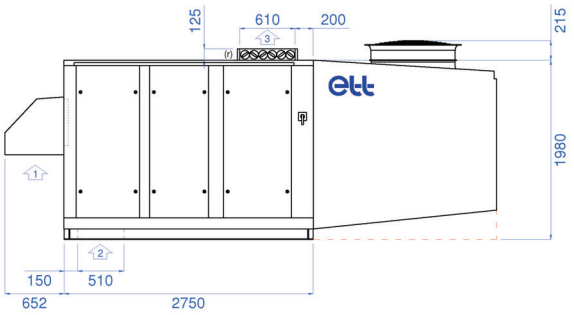
(1) Side return: +125 mm

Note: fresh air cowls shall be installed by the installer.

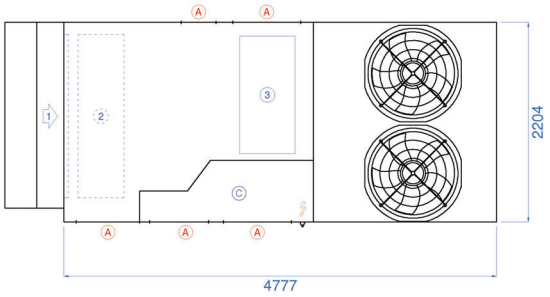
Dimensions and connections

SUPPLY AIR *on top*

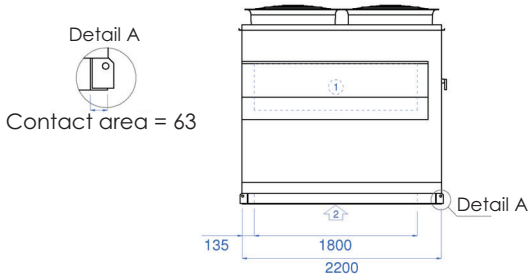
Front view:



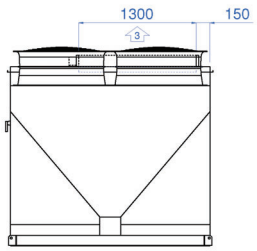
Top view :



Return side view:



Supply air side view :



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Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	4777 mm	2204 mm	1980 mm

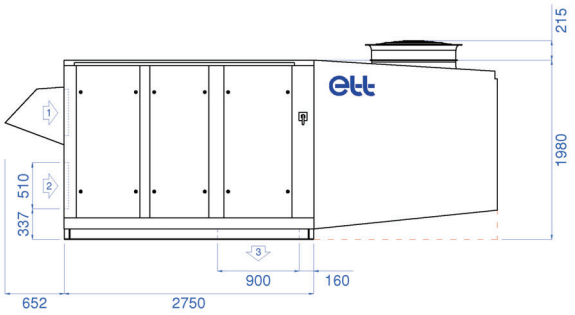
(1) Side return: +125 mm

Note: fresh air cowls shall be installed by the installer.

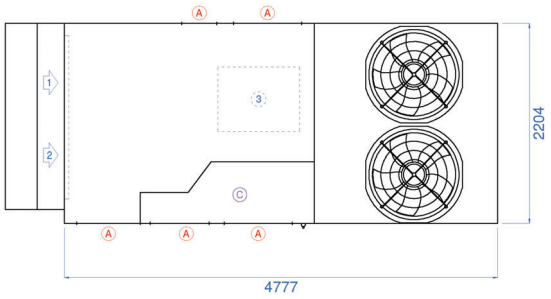
Dimensions and connections

SUPPLY AIR *underneath, end recovery*

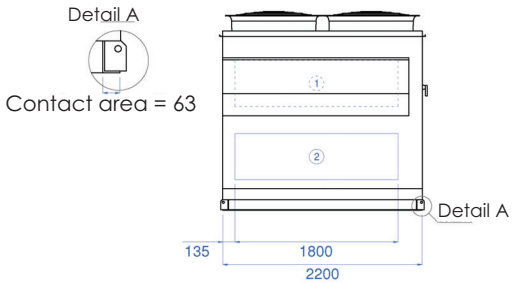
Front view:



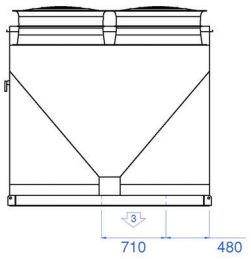
Top view :



Return side view:



Supply air side view :



① Fresh air
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③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width [1]	Height
Casing dimensions	4777 mm	2204 mm	1980 mm

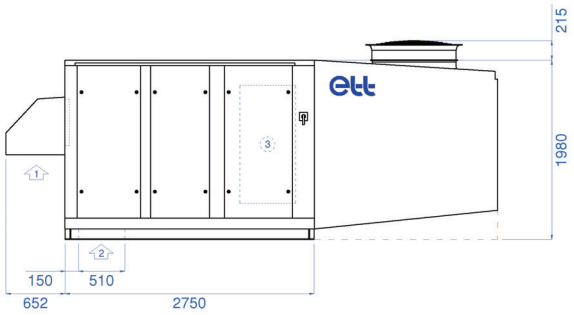
(1) Side return: +125 mm

Note: fresh air cowls shall be installed by the installer.

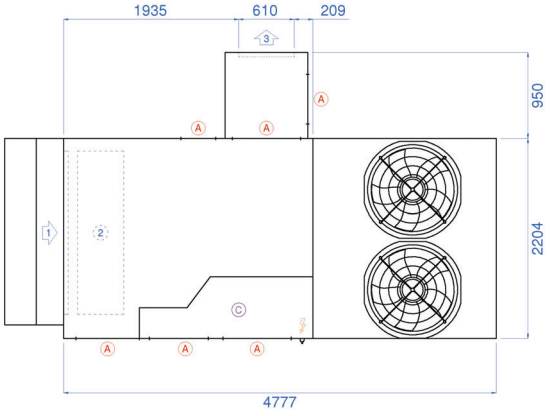
Dimensions and connections

SUPPLY AIR Side

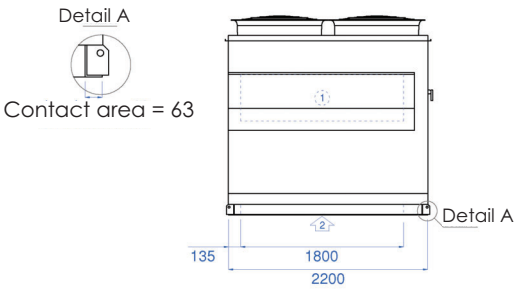
Front view:



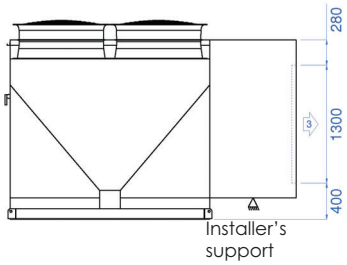
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

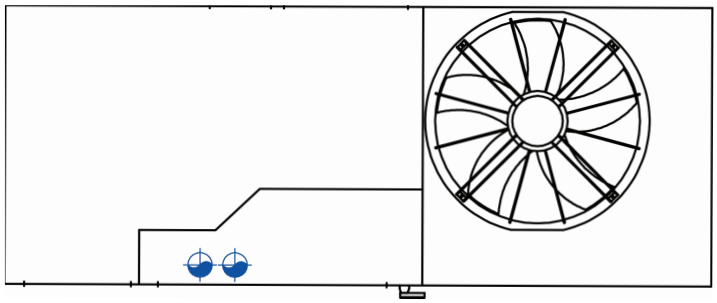
	Length	Width (1)	Height
Casing dimensions	4777 mm	2204 mm	1980 mm

(1) Side return: +125 mm

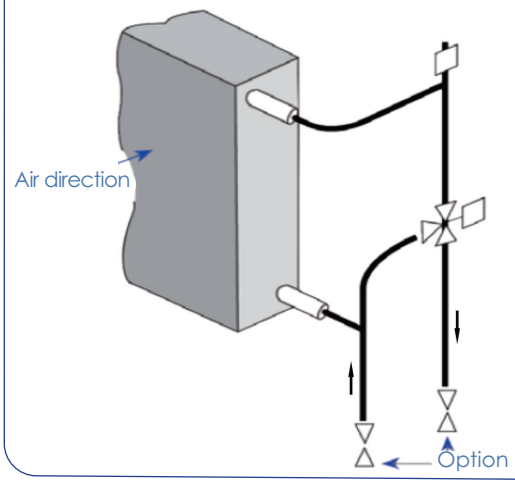
Nota: - fresh air cowls shall be installed by the installer.
- the side box shall be installed by the installer.
- the electrical connection of the supply air damper is the responsibility of the installer.

DIAGRAM AND CONNECTION

Top view



Principle



POWER RATINGS

		Unit	090	095	110	115	130	140
Water regime 90/70°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	287.6	306.6	324.5	341.6	357.9	357.9
	Water flow rate	m³/h	12.8	13.6	14.4	15.2	15.9	15.9
	Exchanger pressure drop	mWC	2.0	2.3	2.6	2.8	3.1	3.1
	Exchanger pressure drop and 3-WV (1)	mWC	4.3	4.9	5.5	6.1	6.7	6.7
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	6.9	7.9	8.8	9.7	10.7	10.7
Water regime 80/60°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	242.7	258.6	273.5	287.8	301.3	301.3
	Water flow rate	m³/h	10.7	11.4	12.1	12.7	13.3	13.3
	Exchanger pressure drop	mWC	1.5	1.7	1.9	2.1	2.3	2.3
	Exchanger pressure drop and 3-WV (1)	mWC	3.1	3.5	4.0	4.4	4.8	4.8
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	5.0	5.6	6.3	6.9	7.6	7.6
Water regime 90/70°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	244.6	260.6	275.7	290.1	303.8	303.8
	Water flow rate	m³/h	10.8	11.5	12.2	12.8	13.4	13.4
	Exchanger pressure drop	mWC	1.5	1.7	1.9	2.1	2.3	2.3
	Exchanger pressure drop and 3-WV (1)	mWC	3.2	3.6	4.0	4.4	4.8	4.8
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	5.0	5.7	6.4	7.0	7.7	7.7
Water regime 80/60°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	199.7	212.6	224.8	236.3	247.3	247.3
	Water flow rate	m³/h	8.8	9.4	9.9	10.5	10.9	10.9
	Exchanger pressure drop	mWC	1.0	1.2	1.3	1.4	1.6	1.6
	Exchanger pressure drop and 3-WV (1)	mWC	2.1	2.4	2.7	3.0	3.2	3.2
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	3.4	3.8	4.3	4.7	5.1	5.1

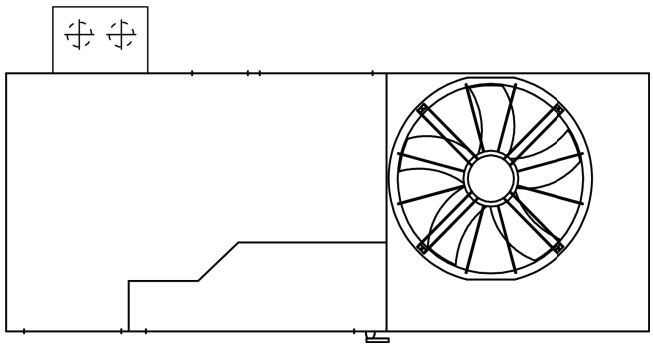
(1) With 3-WV option
(2) With 3-WV, VTA, VA option

3-WV: 3-Way valve
VA: Return flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate.

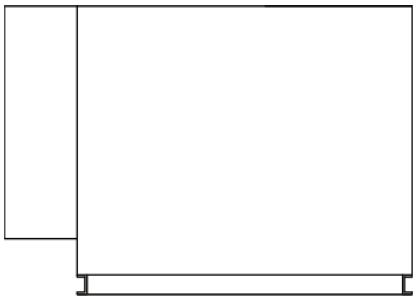
DIAGRAM AND CONNECTION

► Connection opposite the technical compartment.

Top view



Side view



► Connection identical to hot water coil connection.
See diagram and connection.

Power ratings

		Unit	090	095	110	115	130	140
Water regime 35/30°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	90.1	96.0	101.7	107.0	112.1	112.1
	Water flow rate	m³/h	15.6	16.6	17.6	18.5	19.4	19.4
	Exchanger pressure drop	mWC	3.3	3.7	4.2	4.6	5.0	5.0
	Exchanger pressure drop and 3-WV (1)	mWC	6.8	7.7	8.7	9.6	10.5	10.5
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	10.8	12.2	13.7	15.2	16.6	16.6
Water regime 35/30°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	47.4	50.4	53.3	56.0	58.5	58.5
	Water flow rate	m³/h	8.2	8.7	9.2	9.7	10.1	10.1
	Exchanger pressure drop	mWC	1.0	1.1	1.2	1.4	1.5	1.5
	Exchanger pressure drop and 3-WV (1)	mWC	2.0	2.2	2.5	2.7	2.9	2.9
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	3.1	3.5	3.8	4.2	4.6	4.6

(1) With 3-WV option
(2) With 3-WV, VTA, VA option

3-WV: 3-Way valve
VA: Return flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate.

Technical features

	DESIGNATION	Unit	115 (8)	130 (8)	140 (8)	150 (8)	160 (8)	180 (8)	200 (8)
VENTILATION	**FLOW RATES**								
	Rated air flow rate	**m³/h**	25000	27000	30000	33000	35000	38000	38000
	Minimum air flow rate	**m³/h**	17000	18000	21000	21000	30000	34000	37000
	Maximum air flow rate	**m³/h**	38000	38000	38000	38000	38000	38000	38000
	ACOUSTICS (Eurovent certified) (1)								
	Sound power level at supply air	**dB(A)**	77	78	80	82	84	85	85
	Outside sound power level	**dB(A)**	82	84	85	86	89	91	94
	Resulting external sound pressure at 10m ref. $2*10^{-5}$ in free field, directivity 1	**dB(A)**	51	53	54	55	58	60	63
COOLING PERFORMANCE	**RATED PERFORMANCE AT +35°C** (1)								
	Net cooling capacity	**kW**	109.2	123.8	131.7	143.7	161.0	177.4	183.9
	Net EER	**kW/kW**	3.56	3.48	3.44	3.31	3.21	3.07	3.07
	SEASONAL EFFICIENCY (2)								
	Net design cooling capacity	**kW**	109.2	123.8	131.7	143.7	161.0	177.4	183.9
	SEER	**kW/kW**	5.32	5.33	5.26	5.09	4.85	4.61	4.72
	ηs,C	**%**	210	210	208	200	191	181	186
	Eurovent class	**E ... A**	A+	A+	-	-	-	-	-
HEATING PERFORMANCE	**RATED PERFORMANCE AT +7°C** (1)								
	Net heating capacity	**kW**	107.5	123.0	130.9	144.3	163.4	183.4	190.8
	Net COP	**kW/kW**	4.64	4.57	4.57	4.47	4.23	4.05	4.01
	RATED PERFORMANCE AT -7°C (3)								
	Net heating capacity	**kW**	72.8	82.7	89.3	98.8	112.3	127.7	132.3
	Net COP	**kW/kW**	3.51	3.48	3.48	3.38	3.18	3.03	2.97
	SEASONAL EFFICIENCY (2)								
	Net design heat output	**kW**	93.0	106.5	116.7	119.8	139.0	156.9	163.2
	SCOP	**kW/kW**	4.25	4.13	4.18	4.01	3.70	3.37	3.64
	ηs,H	**%**	167	162	164	157	145	132	143
	Eurovent class	**E ... A**	A+	A+	-	-	-	-	-
GENERAL INFORMATION	**ELECTRICAL DATA**								
	Total installed electrical power (4)	**kW**	58.7	63.9	65.7	71.1	82.1	90.6	95.3
	Total installed electrical current (4)	**A**	95.0	103.3	105.1	114.2	132.3	144.1	152.4
	Starting current	**A**	225.2	308.0	309.9	356.6	374.7	397.2	417.4
	Maximum absorbed electrical power (5)	**kW**	36.7	42.1	45.5	51.2	58.3	66.6	66.4
	REFRIGERATION CIRCUIT(S)								
	Power stages	**-**	4	4	4	4	4	4	4
	OPERATING LIMITS IN COOLING MODE								
	Maximum outside temperature (6)	**°C**	+ 50	+ 50	+ 49	+ 48	+ 49	+ 48	+ 48
	Minimum outside temperature (6)	**°C**				+ 15			
	Minimum inside coil inlet temperature	**°C**				+ 18			
	OPERATING LIMITS IN HEATING MODE								
	Minimum outside temperature	**°C**				- 15			
	Minimum inside coil inlet temperature	**°C**				+ 12			
	WEIGHT								
	Unit weight without options (7)	**kg**	1774	1819	1856	1895	1924	2036	2036
	Weight of connecting roof curb	**kg**				163			
	Weight of standard ventilated roof curb	**kg**				228			

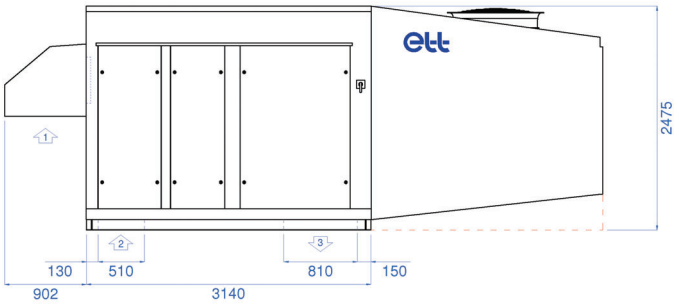
(1) In accordance with EN 14511.
Cooling mode: Indoor conditions: +27°C DB/+19°C WB and outside conditions: +35°C DB / 24°C WB
Heating mode: Indoor conditions: +20°C DB/+12°C WB and outside conditions: +7°C DB / +6°C WB.
(2) According to EcoDesign regulation 2016/2281.
(3) In accordance with EN 14511.
Heating mode: Indoor conditions: +20°C DB and outside conditions: -7°C DB / -8°C WB.
(4) Three-phase power supply 400V - 50 Hz + earth without neutral.
The values given do not include any options and may change during the design stage. They must be confirmed after the purchase order has been placed.

(5) Cooling mode: Indoor conditions: +27°C DB /+19°C WB and outside conditions: +35°C DB / 24°C WB. Nominal flow, 400Pa available pressure on return + supply & ISO Coarse 65% filters clogged.
(6) For indoor conditions: +27°C DB /+19°C WB at nominal air flow.
(7) Weight for an available pressure of 400 Pa.
(8) Machine not Eurovent certified

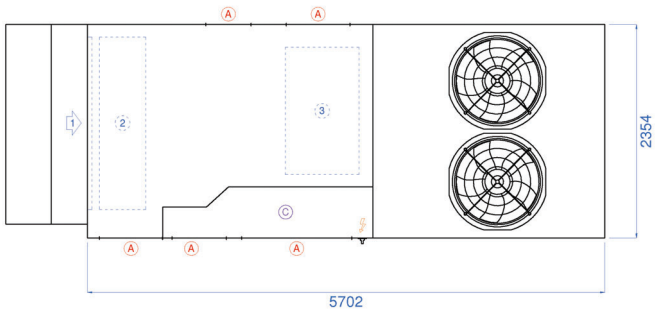
Dimensions and connections

SUPPLY AIR *underneath*

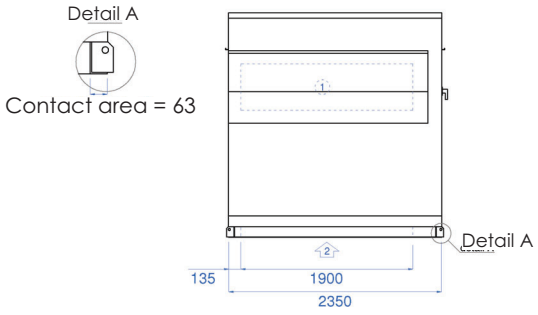
Front view:



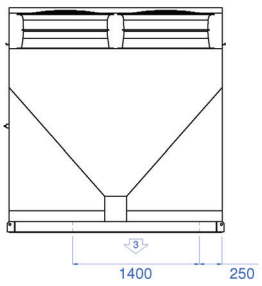
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	6605 mm	2350 mm	2475 mm

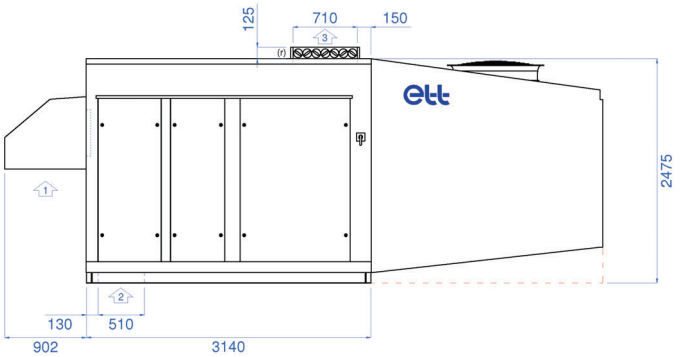
(1) Side return: +125 mm

Note: fresh air cowls shall be installed by the installer.

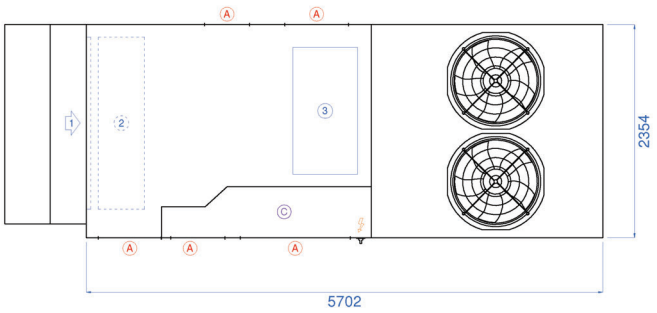
Dimensions and connections

SUPPLY AIR *on top*

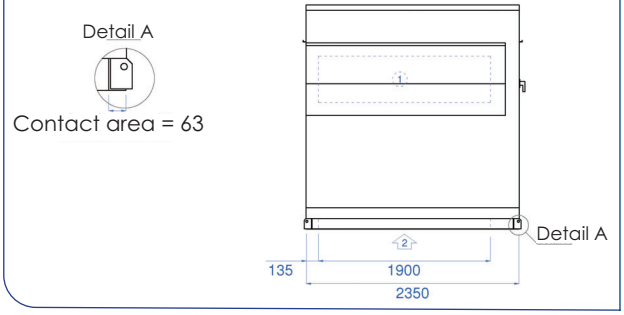
Front view:



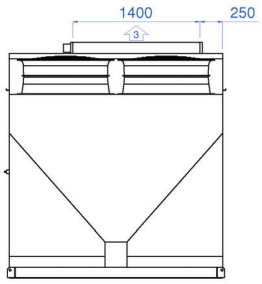
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

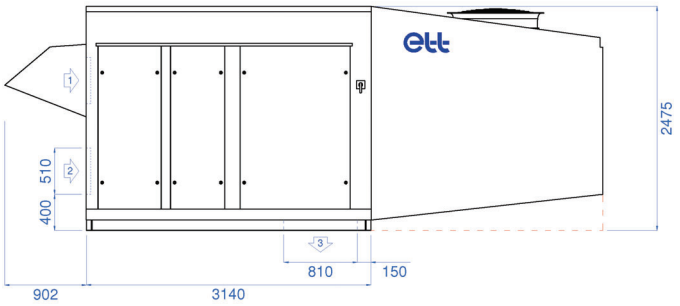
	Length	Width (1)	Height
Casing dimensions	6605 mm	2350 mm	2475 mm

(1) Side return: +125 mm

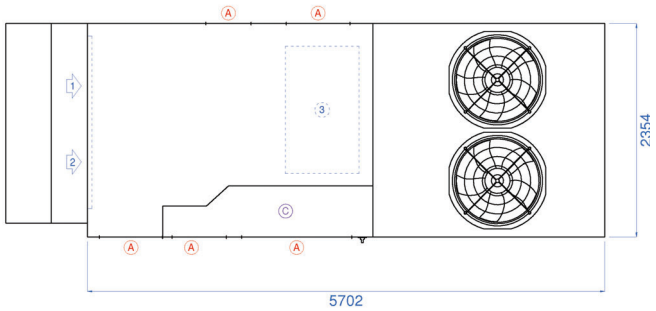
Note: fresh air cowls shall be installed by the installer.

SUPPLY AIR *underneath, end recovery*

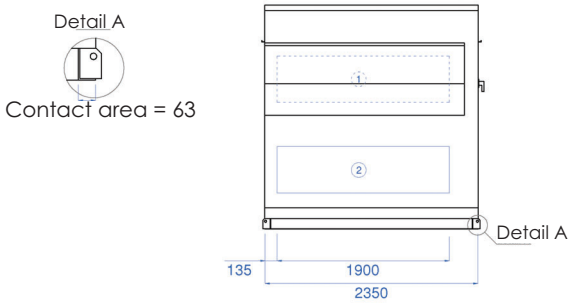
Front view:



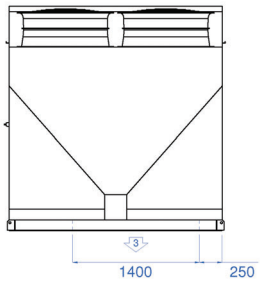
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

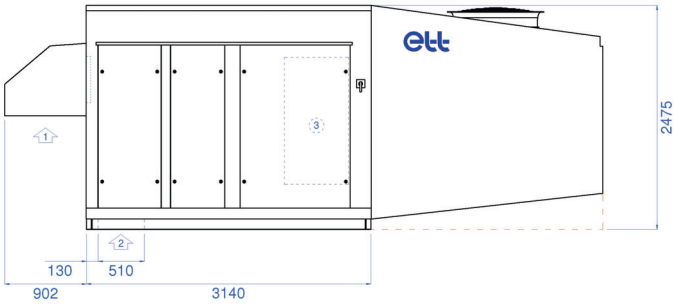
	Length	Width (1)	Height
Casing dimensions	6605 mm	2350 mm	2475 mm

(1) Side return: +125 mm

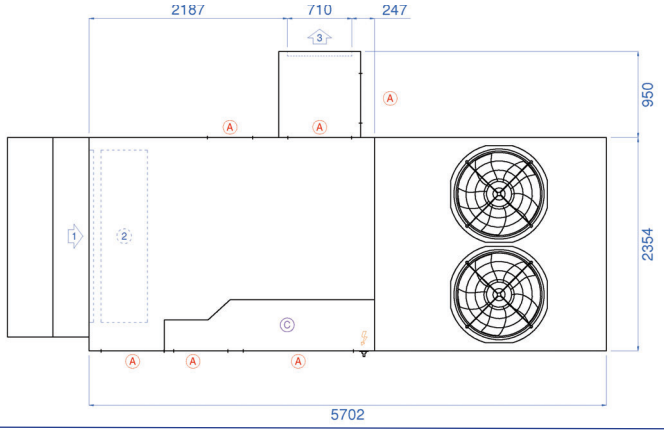
Note: fresh air cowls shall be installed by the installer.

SUPPLY AIR Side

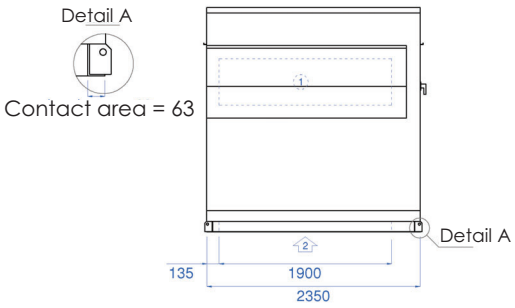
Front view:



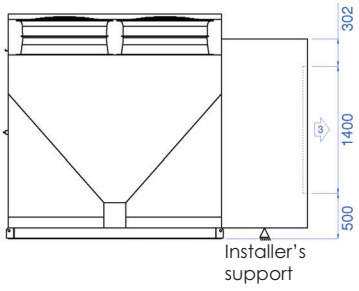
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

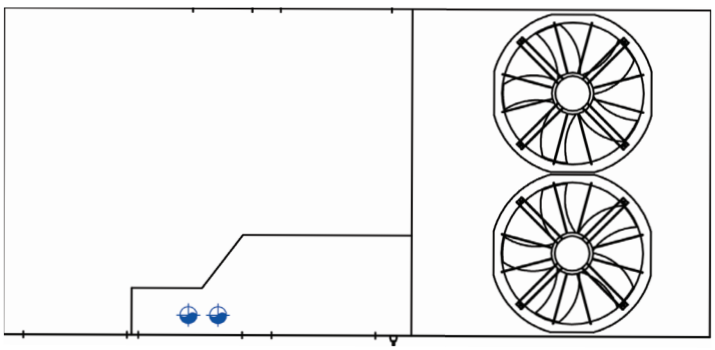
	Length	Width (1)	Height
Casing dimensions	6605 mm	2350 mm	2475 mm

(1) Side return: +125 mm

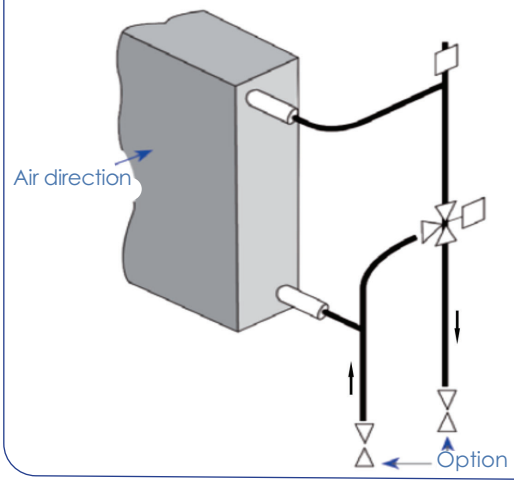
Nota: - fresh air cowls shall be installed by the installer.
- the side box shall be installed by the installer.
- the electrical connection of the supply air damper is the responsibility of the installer.

DIAGRAM AND CONNECTION

Top view



Principle



POWER RATINGS

		Unit	115	130	140	150	160	180	200
Water regime 90/70°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	299.0	314.3	336.2	356.8	370.0	388.9	388.9
	Water flow rate	m³/h	13.3	14.0	14.9	15.9	16.4	17.3	17.3
	Exchanger pressure drop	mWC	2.2	2.4	2.7	3.0	3.3	3.6	3.6
	Exchanger pressure drop and 3-WV (1)	mWC	4.7	5.1	5.9	6.6	7.1	7.8	7.8
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	7.4	8.2	9.4	10.6	11.3	12.5	12.5
Water regime 80/60°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	252.7	265.5	283.7	301.0	311.9	327.7	327.7
	Water flow rate	m³/h	11.2	11.7	12.5	13.3	13.8	14.5	14.5
	Exchanger pressure drop	mWC	1.6	1.8	2.0	2.2	2.4	2.6	2.6
	Exchanger pressure drop and 3-WV (1)	mWC	3.4	3.7	4.2	4.7	5.1	5.6	5.6
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	5.3	5.9	6.7	7.5	8.1	8.9	8.9
Water regime 90/70°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	254.6	267.5	285.9	303.3	314.4	330.3	330.3
	Water flow rate	m³/h	11.2	11.8	12.6	13.4	13.9	14.6	14.6
	Exchanger pressure drop	mWC	1.6	1.8	2.0	2.2	2.4	2.6	2.6
	Exchanger pressure drop and 3-WV (1)	mWC	3.4	3.7	4.3	4.8	5.1	5.7	5.7
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	5.4	6.0	6.8	7.7	8.2	9.1	9.1
Water regime 80/60°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	208.2	218.6	233.5	247.5	256.4	269.2	269.2
	Water flow rate	m³/h	9.2	9.7	10.3	10.9	11.3	11.9	11.9
	Exchanger pressure drop	mWC	1.1	1.2	1.4	1.5	1.6	1.8	1.8
	Exchanger pressure drop and 3-WV (1)	mWC	2.3	2.5	2.9	3.2	3.5	3.8	3.8
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	3.6	4.0	4.6	5.1	5.5	6.1	6.1

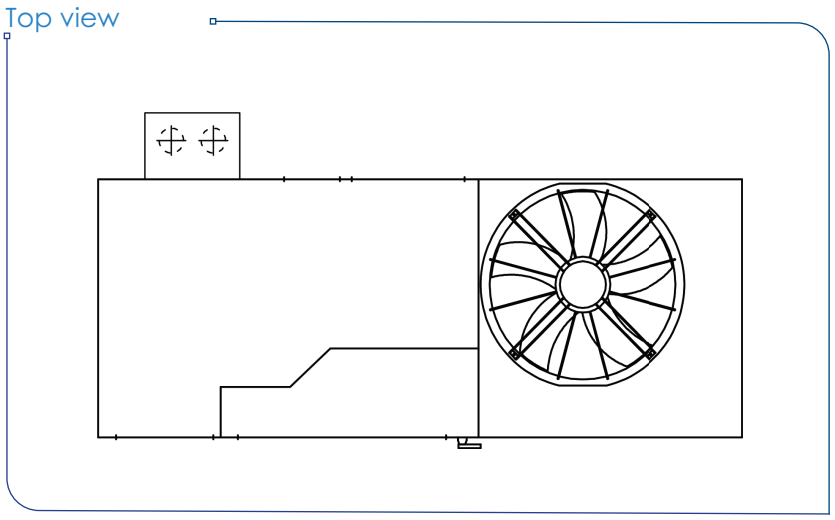
(1) With 3-WV option
(2) With 3-WV, VTA, VA option

3-WV: 3-Way valve
VA: Return flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate.

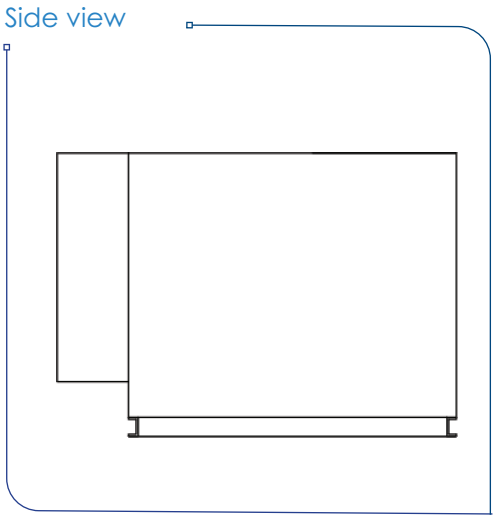
DIAGRAM AND CONNECTION

► Connection opposite the technical compartment.

Top view



Side view



► Connection identical to hot water coil connection.

See diagram and connection.

POWER RATINGS

		Unit	115	130	140	150	160	180	200
Water regime 35/30°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	93.7	98.5	105.4	111.9	116.0	121.9	121.9
	Water flow rate	m³/h	16.2	17.1	18.3	19.4	20.1	21.1	21.1
	Exchanger pressure drop	mWC	3.5	3.9	4.4	4.9	5.3	5.8	5.8
	Exchanger pressure drop and 3-WV (1)	mWC	7.3	8.1	9.2	10.4	11.1	12.3	12.3
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	11.6	12.8	14.6	16.5	17.7	19.5	19.5
Water regime 35/30°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	49.6	52.0	55.5	58.8	60.8	63.8	63.8
	Water flow rate	m³/h	8.6	9.0	9.6	10.2	10.5	11.1	11.1
	Exchanger pressure drop	mWC	1.1	1.2	1.3	1.5	1.6	1.7	1.7
	Exchanger pressure drop and 3-WV (1)	mWC	2.1	2.3	2.6	3.0	3.2	3.5	3.5
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	3.3	3.6	4.1	4.6	5.0	5.5	5.5

(1) With 3-WV option
(2) With 3-WV, VTA, VA option

3-WV: 3-Way valve
VA: Return flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate.

Technical features

	DESIGNATION	Unit	180	200	220	245	270	285
VENTILATION	**FLOW RATES**							
	Rated air flow rate	**m³/h**	38000	42000	46000	50000	54000	54000
	Minimum air flow rate	**m³/h**	24000	26000	30000	36000	46000	52000
	Maximum air flow rate	**m³/h**	54000	54000	54000	54000	54000	54000
	ACOUSTICS (1)							
	Sound power level at supply air	**dB(A)**	80	81	83	85	85	86
	Outside sound power level	**dB(A)**	84	85	87	88	91	94
	Resulting external sound pressure at 10m ref. $2*10^{-5}$ in free field, directivity 1	**dB(A)**	53	54	56	57	60	63
COOLING PERFORMANCE	**RATED PERFORMANCE AT +35°C** (1)							
	Net cooling capacity	**kW**	168.2	190.4	211.1	231.6	254.0	273.5
	Net EER	**kW/kW**	3.55	3.42	3.32	3.24	3.10	2.99
	SEASONAL EFFICIENCY (2)							
	Net design cooling capacity	**kW**	168.2	190.4	211.1	231.6	254.0	273.5
	SEER	**kW/kW**	6.49	5.76	5.68	5.07	5.17	4.91
	ηs,C	**%**	257	227	224	200	204	193
HEATING PERFORMANCE	**RATED PERFORMANCE AT +7°C** (1)							
	Net heating capacity	**kW**	164.8	186.4	210.3	234.2	259.7	285.2
	Net COP	**kW/kW**	4.48	4.27	4.27	4.16	4.00	3.79
	RATED PERFORMANCE AT -7°C (3)							
	Net heating capacity	**kW**	114.5	129.6	145.7	162.8	181.4	200.3
	Net COP	**kW/kW**	3.60	3.48	3.45	3.36	3.25	3.12
	SEASONAL EFFICIENCY (2)							
	Net design heat output	**kW**	152.7	173.9	181.0	202.4	224.9	247.9
	SCOP	**kW/kW**	4.72	4.46	4.46	4.23	4.21	3.89
	ηs,H	**%**	186	175	176	166	165	152
GENERAL INFORMATION	**ELECTRICAL DATA**							
	Total installed electrical power (4)	**kW**	92.1	99.8	108.4	125.4	136.2	147.0
	Total installed electrical current (4)	**A**	151.0	170.0	180.6	204.4	222.4	240.4
	Starting current	**A**	281.2	313.2	385.3	409.1	464.8	482.8
	Maximum absorbed electrical power (5)	**kW**	56.8	65.9	74.7	82.7	94.6	102.9
	REFRIGERATION CIRCUIT(S)							
	Power stages	**-**	4	4	4	4	4	4
	OPERATING LIMITS IN COOLING MODE							
	Maximum outside temperature (6)	**°C**	+ 52	+ 51	+ 50	+ 51	+ 50	+ 49
	Minimum outside temperature (6)	**°C**	- 15					
	Minimum inside coil inlet temperature	**°C**	+ 18					
	OPERATING LIMITS IN HEATING MODE							
	Minimum outside temperature	**°C**	- 15					
	Minimum inside coil inlet temperature	**°C**	+ 12					
	WEIGHT							
	Unit weight without options (7)	**kg**	2595	2588	2682	2751	2755	2755
	Weight of connecting roof curb	**kg**	210					
	Weight of standard ventilated roof curb	**kg**	294					

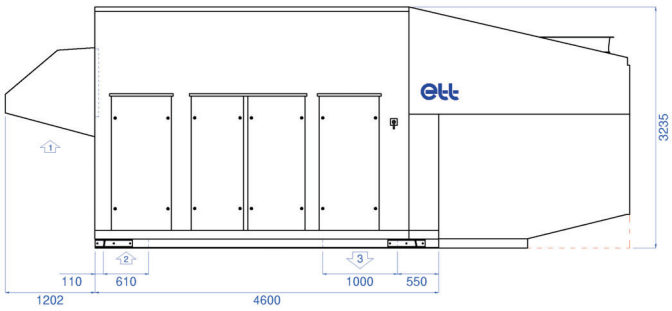
(1) In accordance with EN 14511.
Cooling mode: Indoor conditions: +27°C DB/+19°C WB and outside conditions: +35°C DB / 24°C WB
Heating mode: Indoor conditions: +20°C DB/+12°C WB and outside conditions: +7°C DB / +6°C WB.
(2) According to EcoDesign regulation 2016/2281.
(3) In accordance with EN 14511.
Heating mode: Indoor conditions: +20°C DB and outside conditions: -7°C DB / -8°C WB.
(4) Three-phase power supply 400V - 50 Hz + earth without neutral.
The values given do not include any options and may change during the design stage. They must be confirmed after the purchase order has been placed.

(5) Cooling mode: Indoor conditions: +27°C DB /+19°C WB and outside conditions: +35°C DB / 24°C WB. Nominal flow, 400Pa available pressure on return + supply & ISO Coarse 65% filters clogged.
(6) For indoor conditions: +27°C DB /+19°C WB at nominal air flow.
(7) Weight for an available pressure of 400 Pa.

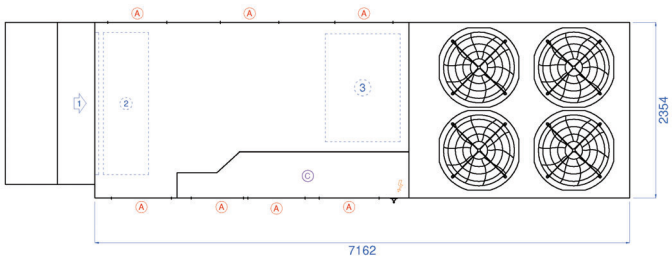
Dimensions and connections

SUPPLY AIR *underneath*

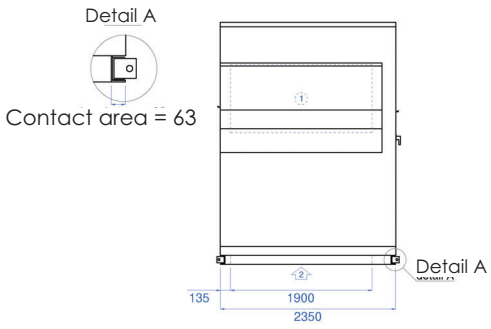
Front view:



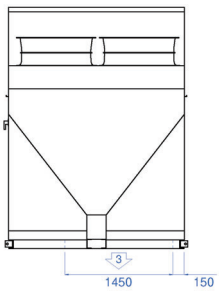
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

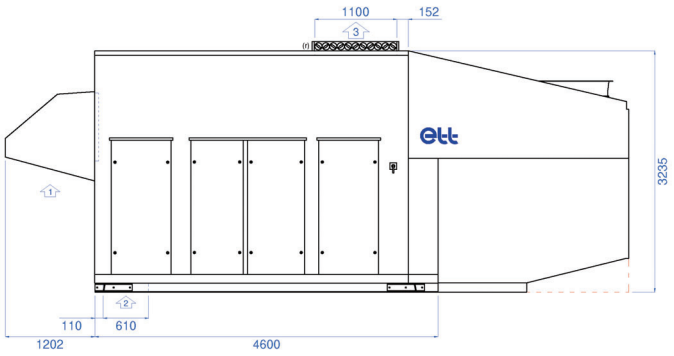
	Length	Width (1)	Height
Casing dimensions	7161 mm	2354 mm	3225 mm

(1) Side return: +125 mm

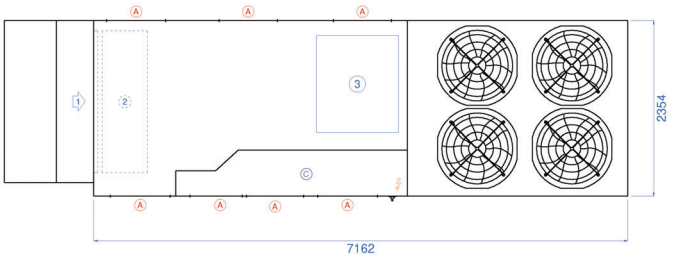
Note: fresh air cowls shall be installed by the installer.

SUPPLY AIR *on top*

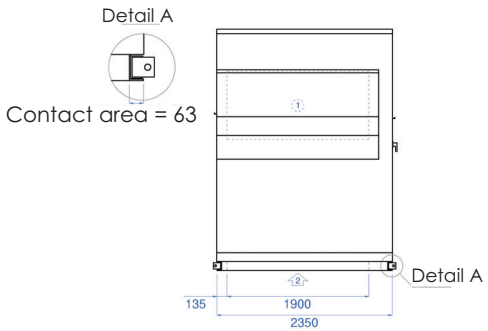
Front view:



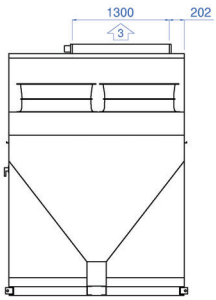
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

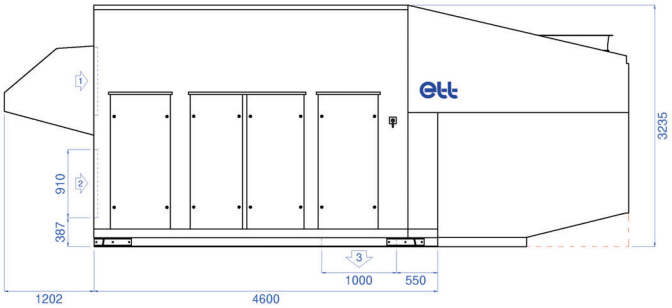
	Length	Width (1)	Height
Casing dimensions	7161 mm	2354 mm	3225 mm

(1) Side return: +125 mm

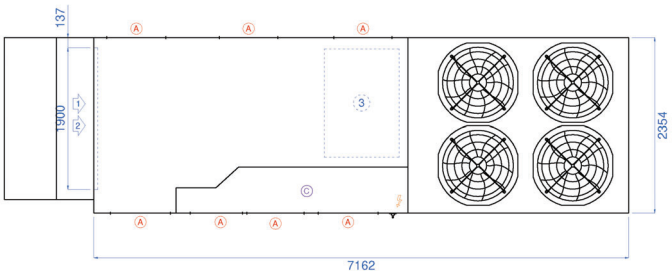
Note: fresh air cowls shall be installed by the installer.

SUPPLY AIR *underneath, end recovery*

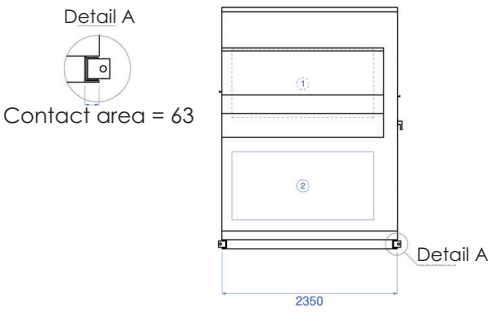
Front view:



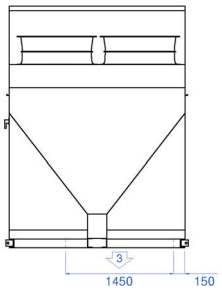
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

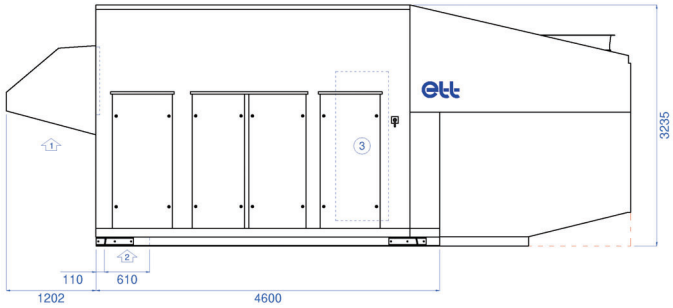
	Length	Width (1)	Height
Casing dimensions	7161 mm	2354 mm	3225 mm

(1) Side return: +125 mm

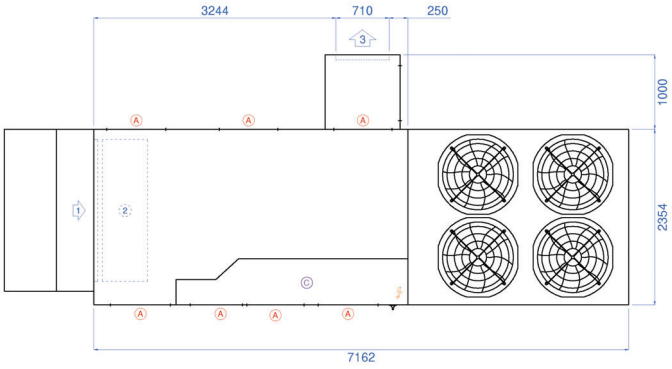
Note: fresh air cowls shall be installed by the installer.

SUPPLY AIR Side

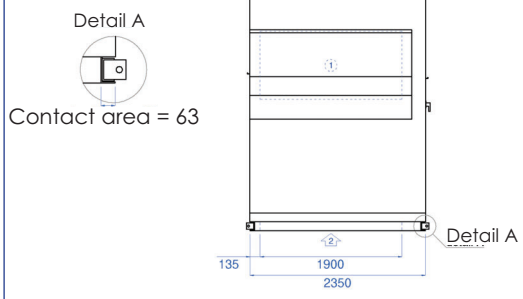
Front view:



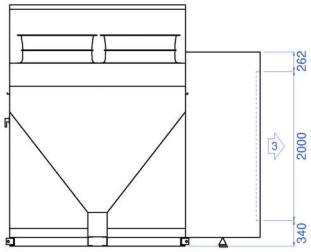
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

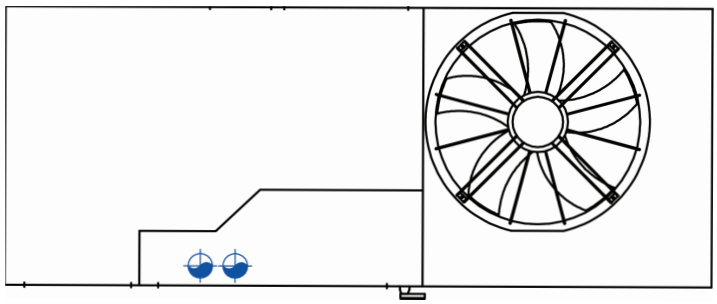
	Length	Width (1)	Height
Casing dimensions	7161 mm	2354 mm	3225 mm

(1) Side return: +125 mm

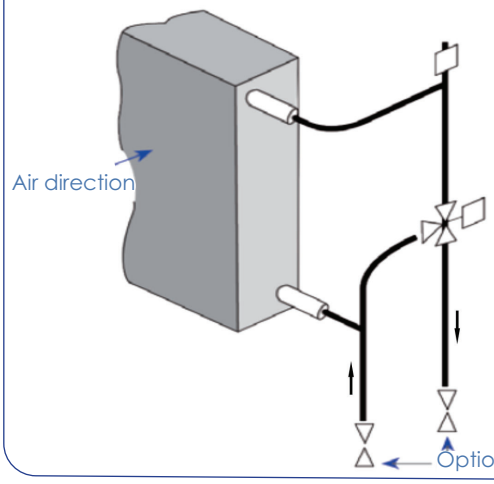
Nota: - fresh air cowls shall be installed by the installer.
- the side box shall be installed by the installer.
- the electrical connection of the supply air damper is the responsibility of the installer.

DIAGRAM AND CONNECTION

Top view



Principle



POWER RATINGS

		Unit	180	200	220	245	270	285
Water regime 90/70°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	313.9	334.7	354.3	372.9	390.7	390.7
	Water flow rate	m³/h	14.0	14.9	15.7	16.6	17.4	17.4
	Exchanger pressure drop	mWC	2.4	2.7	3.0	3.3	3.6	3.6
	Exchanger pressure drop and 3-WV (1)	mWC	5.1	5.8	6.5	7.2	7.9	7.9
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	8.2	9.3	10.4	11.5	12.6	12.6
Water regime 80/60°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	265.2	282.5	298.8	314.4	329.2	329.2
	Water flow rate	m³/h	11.7	12.5	13.2	13.9	14.6	14.6
	Exchanger pressure drop	mWC	1.8	2.0	2.2	2.4	2.6	2.6
	Exchanger pressure drop and 3-WV (1)	mWC	3.7	4.2	4.7	5.1	5.6	5.6
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	5.9	6.7	7.4	8.2	9.0	9.0
Water regime 90/70°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	267.1	284.6	301.1	316.8	331.8	331.8
	Water flow rate	m³/h	11.8	12.6	13.3	14.0	14.7	14.7
	Exchanger pressure drop	mWC	1.8	2.0	2.2	2.4	2.7	2.7
	Exchanger pressure drop and 3-WV (1)	mWC	3.7	4.2	4.7	5.2	5.7	5.7
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	6.0	6.8	7.6	8.3	9.1	9.1
Water regime 80/60°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	218.4	232.4	245.7	258.4	270.4	270.4
	Water flow rate	m³/h	9.7	10.3	10.9	11.4	12.0	12.0
	Exchanger pressure drop	mWC	1.2	1.4	1.5	1.7	1.8	1.8
	Exchanger pressure drop and 3-WV (1)	mWC	2.5	2.9	3.2	3.5	3.8	3.8
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	4.0	4.5	5.1	5.6	6.1	6.1

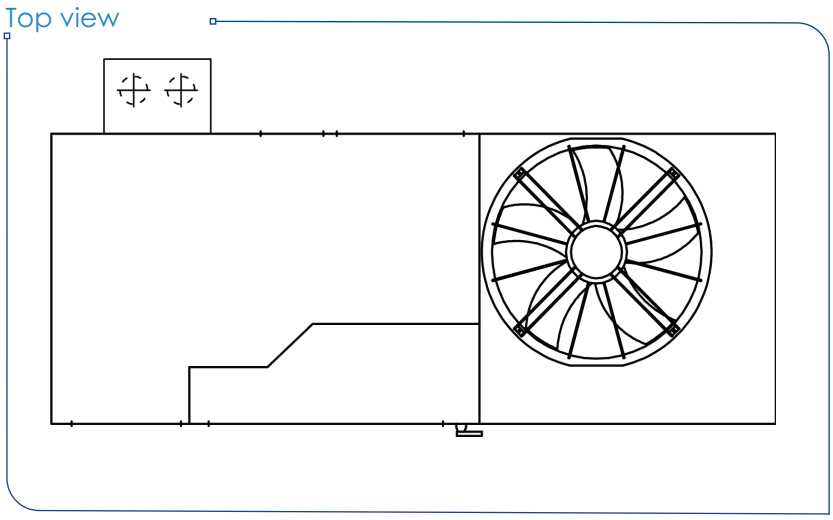
(1) With 3-WV option
(2) With 3-WV, VTA, VA option

3-WV: 3-Way valve
VA: Return flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate.

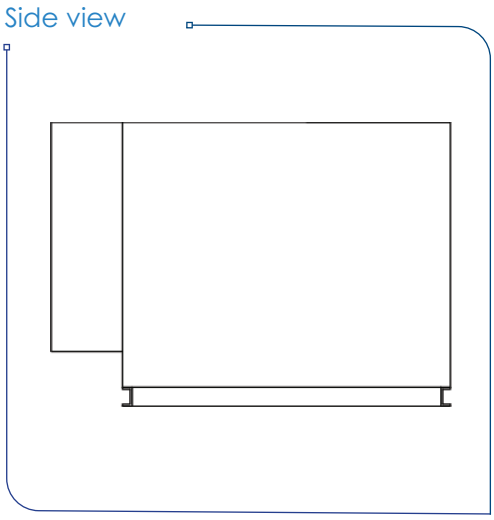
DIAGRAM AND CONNECTION

► Connection opposite the technical compartment.

Top view



Side view



► Connection identical to hot water coil connection.
See diagram and connection.

POWER RATINGS

		Unit	180	200	220	245	270	285
Water regime 35/30°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	98.4	104.9	111.1	116.9	122.5	122.5
	Water flow rate	m³/h	17.1	18.2	19.2	20.3	21.2	21.2
	Exchanger pressure drop	mWC	3.9	4.4	4.9	5.4	5.9	5.9
	Exchanger pressure drop and 3-WV (1)	mWC	8.1	9.1	10.2	11.3	12.4	12.4
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	12.8	14.5	16.2	18.0	19.7	19.7
Water regime 35/30°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	52.0	55.2	58.4	61.3	64.1	64.1
	Water flow rate	m³/h	9.0	9.6	10.1	10.6	11.1	11.1
	Exchanger pressure drop	mWC	1.2	1.3	1.4	1.6	1.7	1.7
	Exchanger pressure drop and 3-WV (1)	mWC	2.3	2.6	2.9	3.2	3.5	3.5
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	3.6	4.1	4.6	5.0	5.5	5.5

(1) With 3-WV option
(2) With 3-WV, VTA, VA option

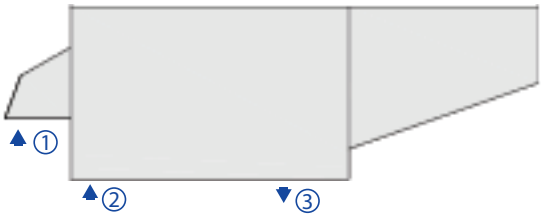
3-WV: 3-Way valve
VA: Return flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate.

Aeraulic arrangements

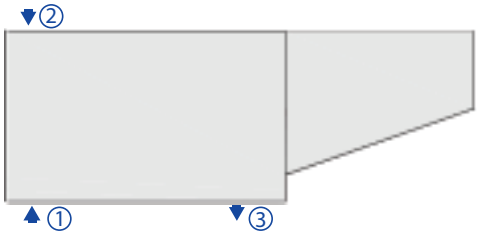
Downward *supply air*

Installed on curb or customer frame, on the roof.

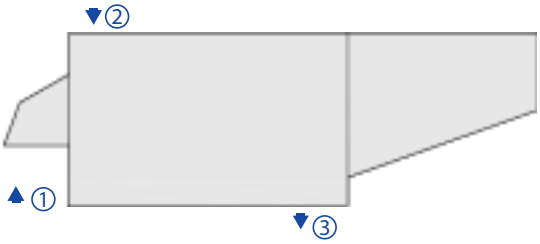
Arrangement 1.1



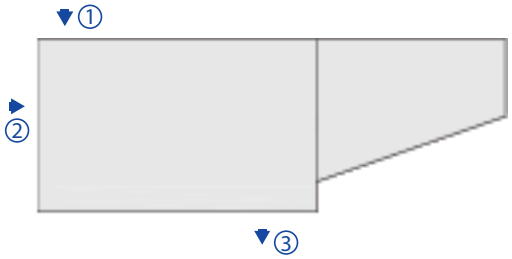
Arrangement 1.2



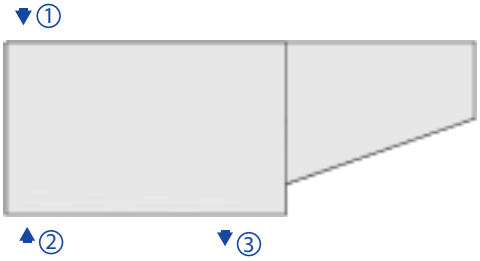
Arrangement 1.3



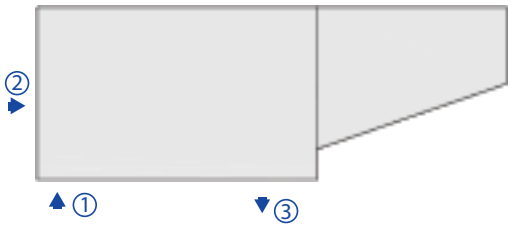
Arrangement 1.4: With optional cover



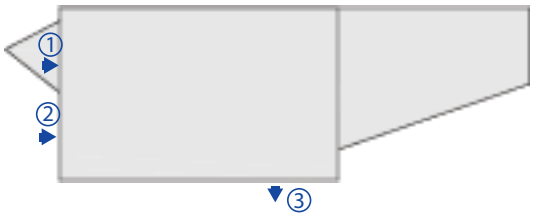
Arrangement 1.5: With optional cover



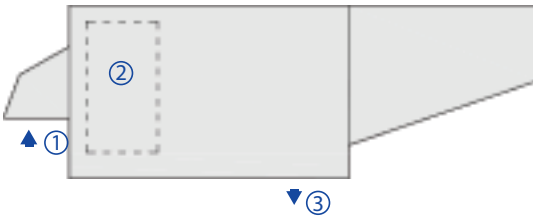
Arrangement 1.6



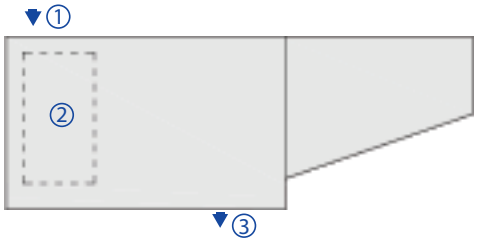
Arrangement 1.7



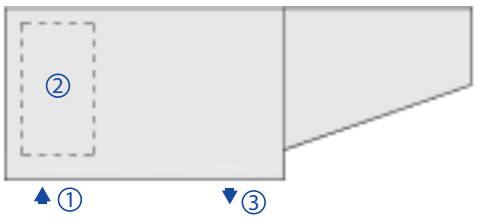
Arrangement 1.8



Arrangement 1.9: With optional cover



Arrangment 1.10



① Fresh air ② Return air ③ Supply air

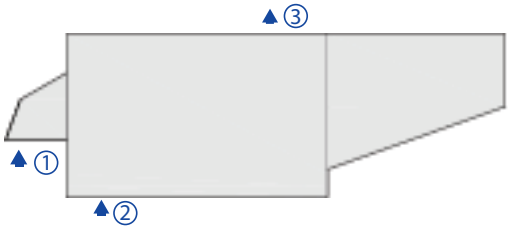
Aeraulic arrangements

Upward *supply air*

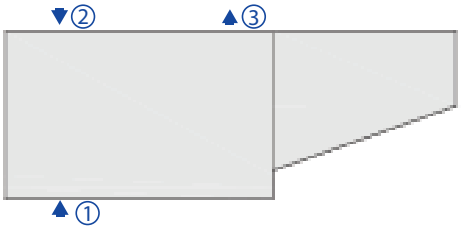
Mounted on feet (minimum 400 mm) or on customer frame.

Feet are optional. For a machine of more than 10,000^3/h in a Public Access Building, a supply air damper must be provided.

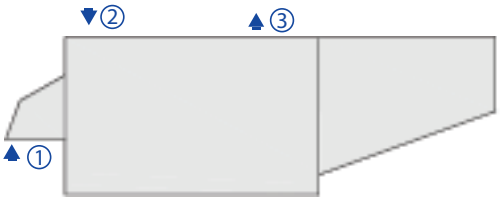
Arrangement 2.1



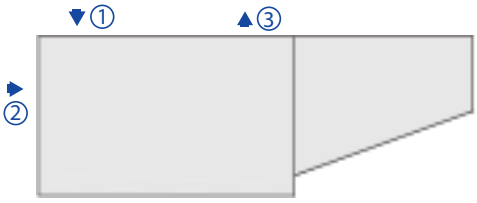
Arrangement 2.2



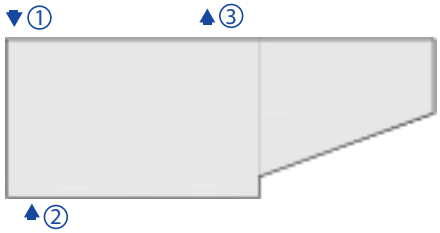
Arrangement 2.3



Arrangement 2.4: With optional cover



Arrangement 2.5: With optional cover



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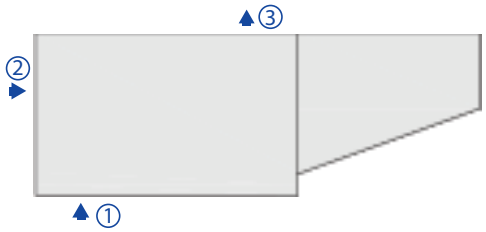

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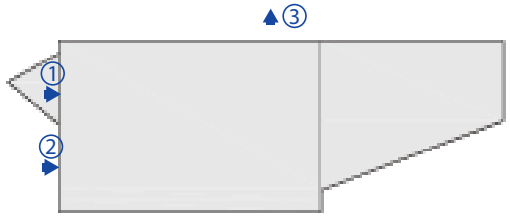

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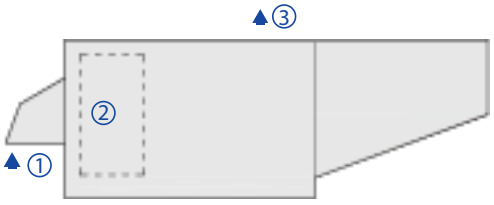

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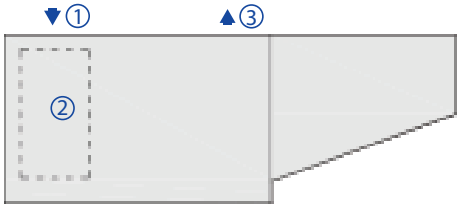

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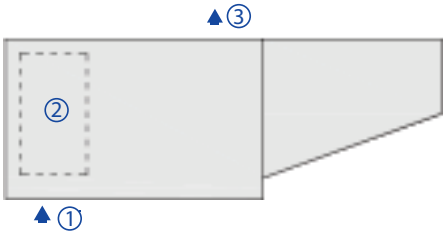
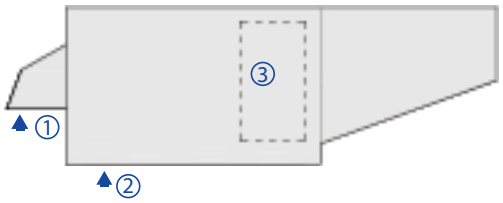


① Fresh air ② Return air ③ Supply air

Aeraulic arrangements

Side *SUPPLY AIR*
Opposite the technical compartment (with feet 400 mm minimum).

Arrangement 3.1



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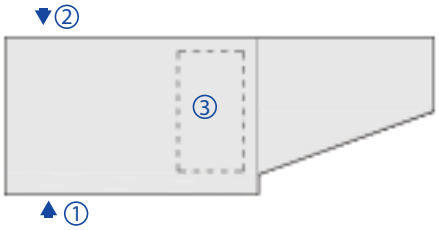

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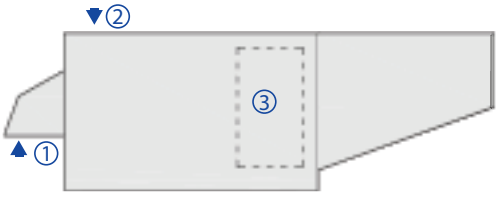

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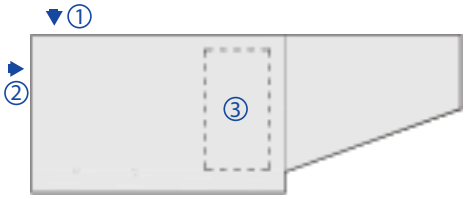
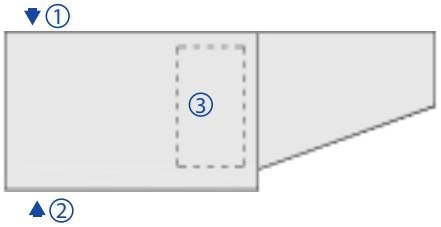


Arrangement 3.5: With optional cover



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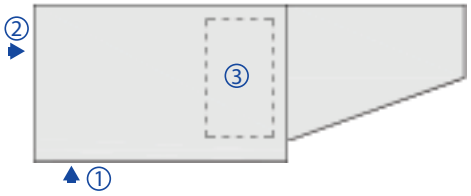

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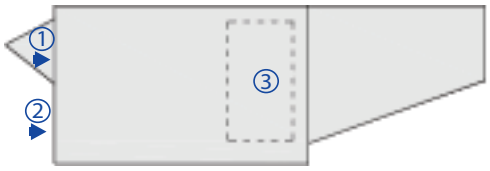

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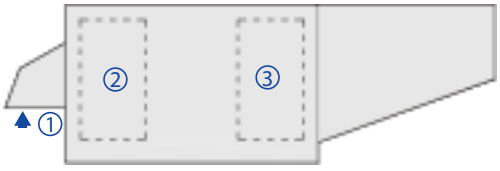
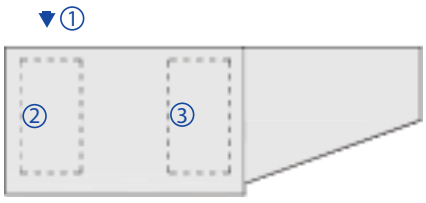
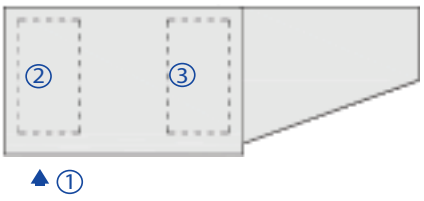


Arrangement 3.9: With optional cover



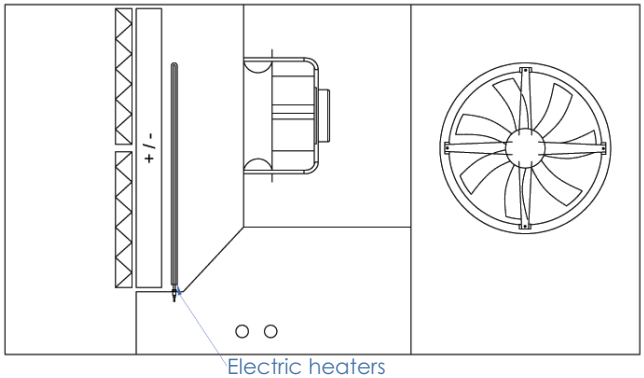
Arrangement 3.10



① Fresh air ② Return air ③ Supply air

Auxiliaries: Sequential electric coils

SCHEMATIC DIAGRAM



POWER AVAILABLE (in kW)

Total power (kW)	Current (A)	1st stage	2nd stage	ULTI+ R32 01	ULTI+ R32 11	ULTI+ R32 12	ULTI+ R32 21	ULTI+ R32 22	ULTI+ R32 23	Weight (kg)
7.5	10.8	3	4.5	•						2.4
9	13.0	3	6	•						2.9
12	17.3	4.5	7.5	•						3.4
12	17.3	3	9		•					3.4
15	21.7	6	9	•	•					4.2
18	26.0	9	9	•						4.7
18	26.0	6	12		•		•			5.0
21	30.3	6	15		•	•		•		5.9
21	30.3	9	12	•			•			5.5
24	34.6	9	15	•	•	•	•	•		6.4
27	39.0	12	15		•	•	•	•		7.2
30	43.3	12	18		•	•	•	•		7.8
33	47.6	9	24		•	•				8.6
33	47.6	12	21					•		6.4
36	52.0	12	24			•	•			9.4
36	52.0	15	21					•		10.6
39	56.3	15	24			•	•			10.3
39	56.3	18	21					•		12.4
42	60.6	12	30			•				11.3
42	60.6	18	24				•	•	•	12.1
45	65.0	15	30			•	•			12.2
45	65.0	21	24					•	•	12.7
48	69.3	18	30				•	•		14.0
54	77.9	18	36				•	•	•	17.6
60	86.6	24	36				•			18.0
60	86.6	18	42					•	•	18.8
66	95.3	24	42					•	•	19.2
72	103.9	30	42					•	•	21.1
81	116.9	39	42					•	•	25.3
90	129.9	33	57						•	26.6
99	142.9	39	60						•	31.2
108	155.9	39	63						•	31.8
117	168.9	54	63						•	35.9

Note: For higher power ratings, please contact us.

Weight of options (in kg)

Options	ULTI+ R32 01	ULTI+ R32 11	ULTI+ R32 12	ULTI+ R32 21	ULTI+ R32 22	ULTI+ R32 23
Frame - Casing						
Unit with vertical (V) or lateral (L) supply air	31	55	73	84	119	169
Removal of the FA and RA dampers	-10	-16	-22	-33	-34	-48
Double skin 50mm	28	40	54	70	97	152
Fresh air cowl	7	9	10	19	20	20
Airflow section						
Pressure relief vents (underneath return)	17	22	26	32	39	39
Thermal heat exchangers						
Auxiliary hot water coil or pre-heating, in water	21	35	47	60	76	76
Auxiliary hot water coil or pre-heating, in water, with 3-WV option	23	37	49	63	79	79
Auxiliary hot water coil or pre-heating, in water) with 3-WV, VTA, VA option	26	39	53	66	83	83
Dehumidification level 2	18	33	43	38	40	82
Installation						
Adjustable connecting aluminium roof curb	73	80	104	121	163	210
Aluminium ventilated roof curb	102	112	146	169	228	294

3-WV: 3-Way valve
VA: Return flow shut-off valve
VTA: TA return control valve, 7/8th opening

Dehumidification option
with heat recovery by in-line condenser

The dehumidification option adds the ability to regulate humidity levels in the treated volume to the operation of the heat pump. This function is particularly well-suited to large and medium-sized stores, where the increasing installation of closed refrigeration units means that the air-conditioning system has to deal with latent supply.

This option is available in several configurations to suit the context of each project.

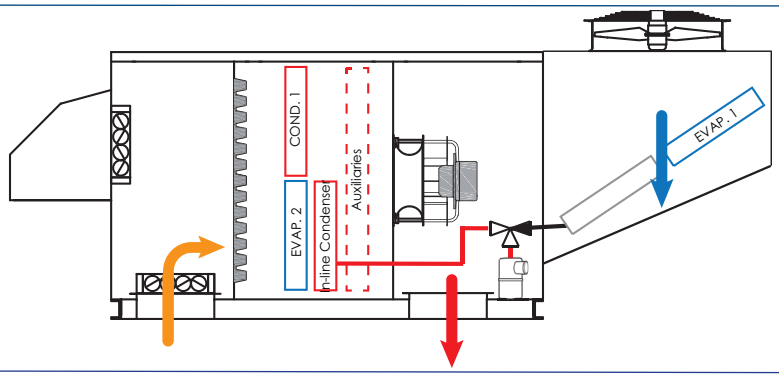
The return air passes over the evaporator(s) where the humidity in the air is condensed.

The heat extracted in this way can be redistributed using the in-line condenser (optional). The heat output of the thermodynamic cycle is thus returned to the treated air.

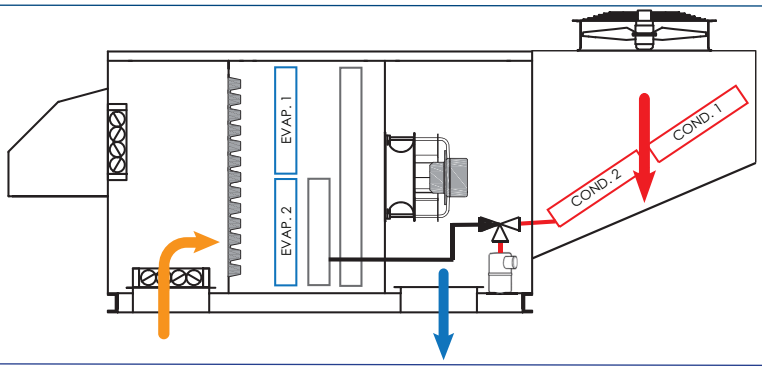
The heat can also be rejected to the outdoor condenser (summer).

Depending on outdoor and indoor conditions, the control system can dehumidify by introducing fresh air, thus delaying the start-up of the thermodynamic system.

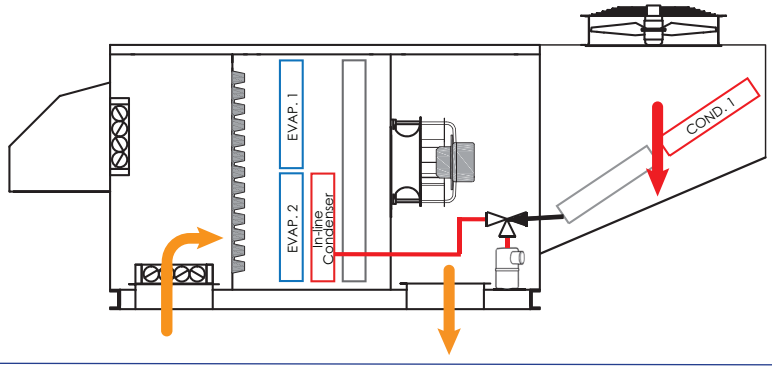
Winter



Summer



mid-season



Dehumidification option
with heat recovery by in-line condenser

LEVELS OF OPTIONS PER CIRCUIT

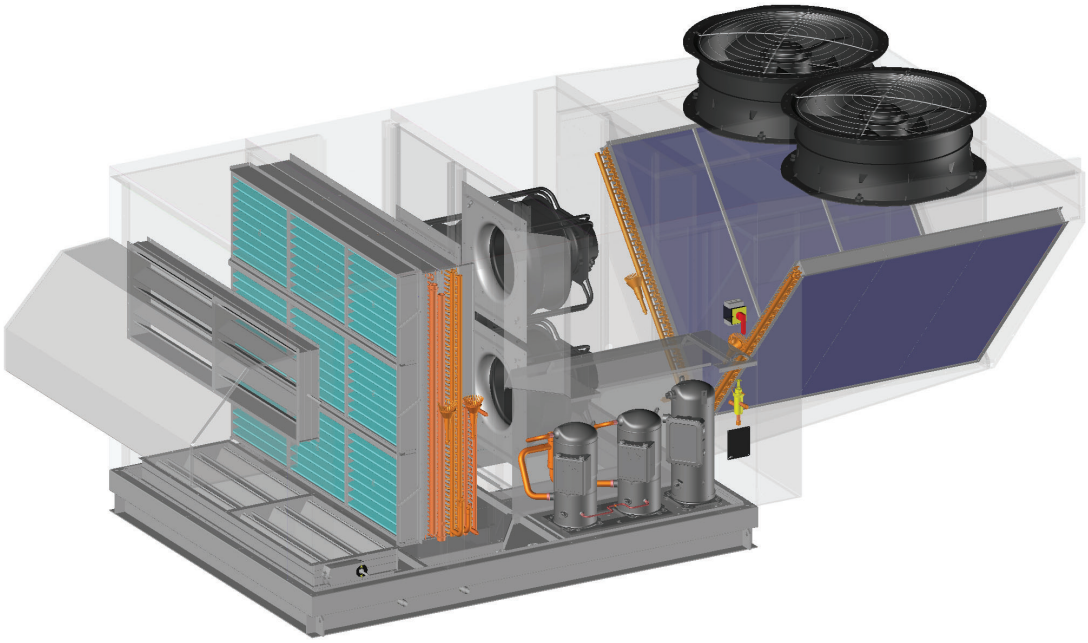
Level 1:

Dehumidification without energy recovery. The refrigeration circuit is fitted with an all-weather kit for dehumidification in winter. The heat is evacuated to the external condenser.

Level 2:

Dehumidification with energy recovery via an in-line condenser, on/off three-way refrigeration valve (for one circuit), and all-season kit (for all circuits). The heat recovered is re-injected into the air stream or the outdoor condenser, depending on the season or the supply air temperature set point.

Whatever the level, an additional auxiliary can be installed depending on the context of the project for operation in winter.



Dehumidification option
with heat recovery by in-line condenser

TECHNICAL FEATURES

	ULTI+ R32 01		020	025	030	045	050
Summer recovery conditions 26°C DB / 50% RH (1)	Dehumidification capacity	kg/h	5.7	6.7	8.5	12.6	14.2
	Power recovery by in-line condenser (optional)	kW	-	-	-	49.5	52.6
Winter recovery conditions 20°C DB / 50% RH (2)	Dehumidification capacity	kg/h	4.9	6.8	7.9	12.2	13.9
	Power recovery by in-line condenser (optional)	kW	-	-	-	44.8	47.1

	ULTI+ R32 11		045	050	055	065	075
Summer recovery conditions 26°C DB / 50% RH (1)	Dehumidification capacity	kg/h	17.3	18.0	21.0	23.4	26.7
	Power recovery by in-line condenser (optional)	kW	54.7	58.9	66.9	75.7	87.0
Winter recovery conditions 20°C DB / 50% RH (2)	Dehumidification capacity	kg/h	13.3	13.8	16.0	17.8	20.6
	Power recovery by in-line condenser (optional)	kW	49.7	53.6	60.7	68.6	79.3

	ULTI+ R32 12		050	055	065	075	080	090	100
Summer recovery conditions 26°C DB / 50% RH (1)	Dehumidification capacity	kg/h	19.4	22.3	25.3	29.6	30.9	33.0	37.8
	Power recovery by in-line condenser (optional)	kW	61.7	70.9	80.5	92.8	101.7	112.3	121.1
Winter recovery conditions 20°C DB / 50% RH (2)	Dehumidification capacity	kg/h	15.0	17.1	19.4	23.0	23.6	25.2	29.2
	Power recovery by in-line condenser (optional)	kW	56.4	64.6	73.2	84.9	92.7	101.7	109.9

	ULTI+ R32 21		090	095	110	115	130	140
Summer recovery conditions 26°C DB / 50% RH (1)	Dehumidification capacity	kg/h	30.7	32.4	37.7	41.2	43.8	50.3
	Power recovery by in-line condenser (optional)	kW	54.3	60.2	61.2	73.6	74.8	85.0
Winter recovery conditions 20°C DB / 50% RH (2)	Dehumidification capacity	kg/h	28.5	30.7	35.0	38.1	41.3	46.6
	Power recovery by in-line condenser (optional)	kW	49.2	54.5	55.5	66.5	67.7	77.1

	ULTI+ R32 22		115	130	140	150	160	180	200
Summer recovery conditions 26°C DB / 50% RH (1)	Dehumidification capacity	kg/h	39.3	44.1	45.8	50.7	56.4	62.9	62.9
	Power recovery by in-line condenser (optional)	kW	63.7	77.9	79.5	95.5	96.0	117.3	117.3
Winter recovery conditions 20°C DB / 50% RH (2)	Dehumidification capacity	kg/h	37.2	41.3	44.0	48.5	53.4	59.1	59.1
	Power recovery by in-line condenser (optional)	kW	58.0	70.8	72.5	86.8	87.9	106.5	106.5

	ULTI+ R32 23		180	200	220	245	270	285
Summer recovery conditions 26°C DB / 50% RH (1)	Dehumidification capacity	kg/h	61.8	67.5	74.5	82.5	94.7	105.1
	Power recovery by in-line condenser (optional)	kW	108.5	120.1	134.4	147.9	164.9	173.5
Winter recovery conditions 20°C DB / 50% RH (2)	Dehumidification capacity	kg/h	57.3	62.3	69.0	75.7	87.5	95.8
	Power recovery by in-line condenser (optional)	kW	98.5	108.9	121.8	133.8	149.2	156.8

(1) At 80% of nominal airflow, for an outside temperature of +35°C, saturation at 95%.
(2) At 80% of nominal airflow, for an outside temperature of +7°C, saturation at 95%.

Option: Pressure relief vents

DESCRIPTION :

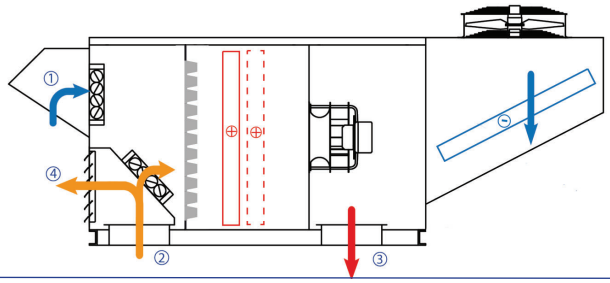
The pressure relief vent option is recommended for buildings with a high level of airtightness.

This prevents the room from becoming over-pressurised by passive extraction when a high rate of fresh air is introduced, particularly in Free Cooling mode.

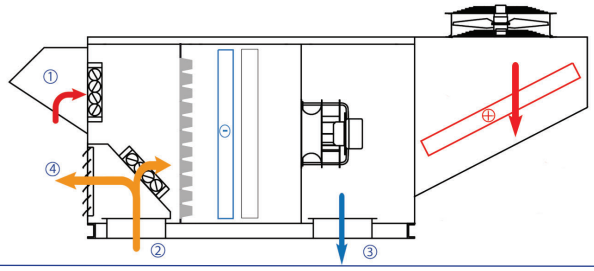
When switched off or in full recirculation mode, the pressure relief vents close by gravity (non-return function).
Pressure relief vents are available on the following arrangements: 1.1 - 1.2 - 1.3 - 1.5 / 2.1 - 2.2 - 2.3 - 2.5 / 3.1 - 3.2 - 3.3 - 3.5.

OPERATING PRINCIPLES:

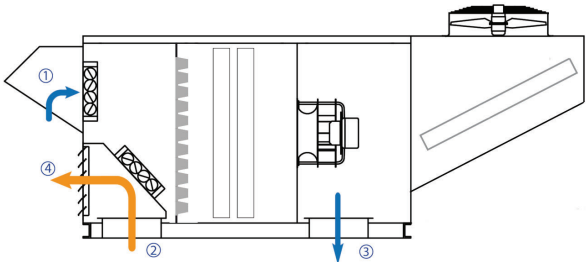
Heating Mode



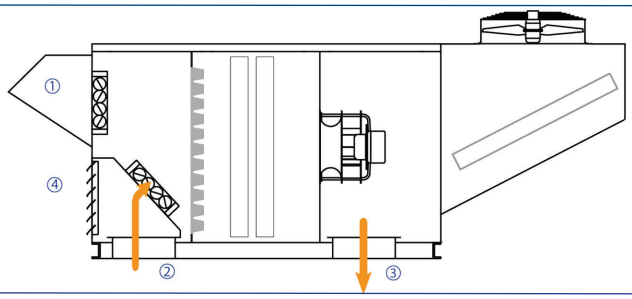
Cooling Mode



Free Cooling Mode

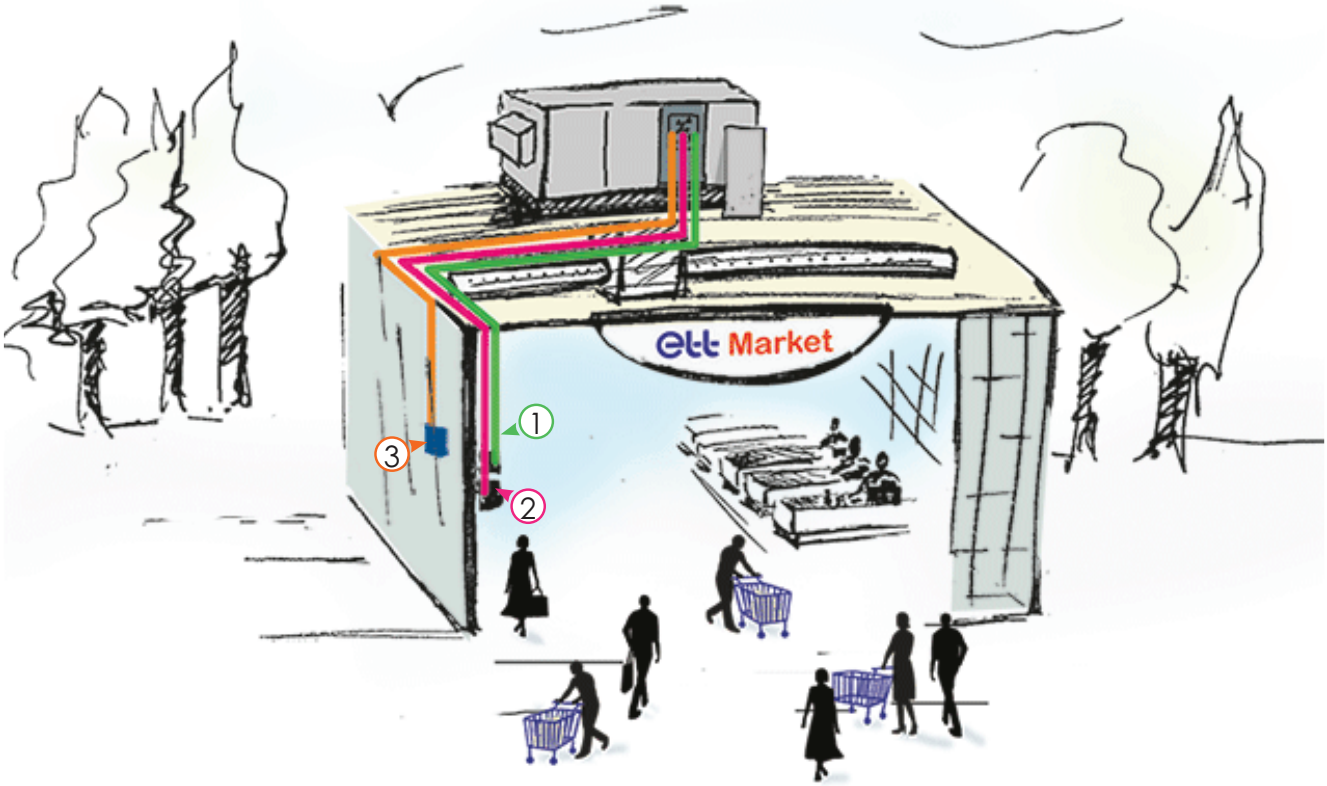


Recycling Mode



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

Sensors connection principle



- ① **Room sensor:** 1 pair shielded cable, 2 x 0,75 mm² (max.length. 100 lm)
- ② **CO_2 sensor:** 2-pair shielded twisted cable, 3 x 0.75 mm² (max. length 100 lm)
- ③ **Humidity sensor:** shielded twisted cable, 5 x 0,75 mm² (max. length 100 lm) *(Optional, replaces the room sensor)*

Nota:

- In order to measure the sensor value that is most representative of the environment, avoid installing them:
  > near a heat source (spotlights, cooking appliances, glass walls, chimney ducts);
  > in draughty areas (near storerooms, entrances, openings, etc.);
  > in dead zones (back of shelving, corners of buildings);
  > close to high-traffic areas (checkouts, fitting rooms).
- To avoid disrupting the measurements:
  > the sensors must not be located in the axis of the duct used for their wiring, otherwise they may be disturbed by a parasitic air flow;
  > the routing of control cables must be separate from the routing of power cables (risk of electromagnetic interference).

Accessories for installation: Roof curbs

DESCRIPTION

The roof curb provides the interface between the roof and the rooftop. Its design makes it easy to mount on roofs and simplifies installation of the machine.

Standard curb on header:

Adjustable connecting curb:

- Complies with French standard NF P 84-206-1 (installation of corrugated steel sheet roofs with a waterproofing coating) and fire regulations for Public Access Buildings (French Order of 14 February 2000).
- A one-piece aluminium curb that is significantly lighter than a galvanised steel curb.
- Adjustable angles to compensate for the slope of the roof. Other slope percentages are available on request (option). In this case, specify the percentage and direction of the slope when carrying out the work.
- Skirtboard for up to 100 mm of insulation according to RT 2005 specifications.
- The roof curbs are designed for a maximum height of 145 mm for the steel panel and 200 mm for the insulation (i.e. maximum height H = 345 mm).
- Lifting lugs for easy positioning when craning.
- Interior side insulation in Stopflam 20 mm, to limit the risk of condensation.

Adjustable ventilated curb

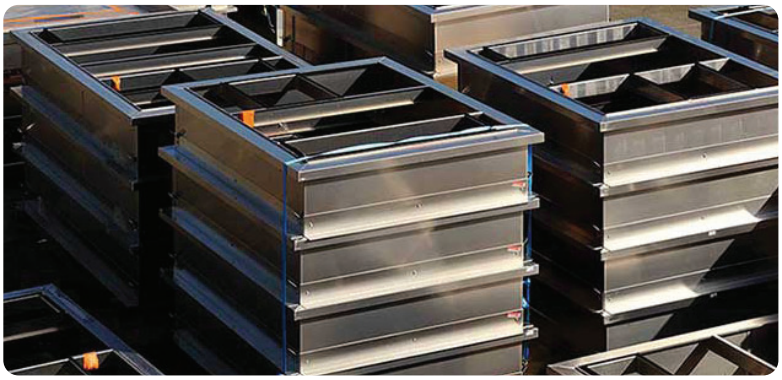
In addition to the 7 points listed for the "adjustable connecting curb":

- 200 mm ventilated air section. The machine is bolted to 4 (or 6) feet and sealed with a foam gasket on the frames of the supply and return ducts.
- The air gap also provides acoustic insulation, significantly reducing the noise radiated from the underside of the machine.
- The outlets of the supply and return ducts and the roof of the ventilated curb are insulated with 25 mm thick glass wool with protective fleece. The insulation is welded to the sheet using aluminium clips, providing a better hold than glued solutions. Insulation limits heat loss and prevents condensation on the underside.
- Sleeves for routing power supply cable and hot water coil pipes through the underside of the machine.

Adaptation curb:

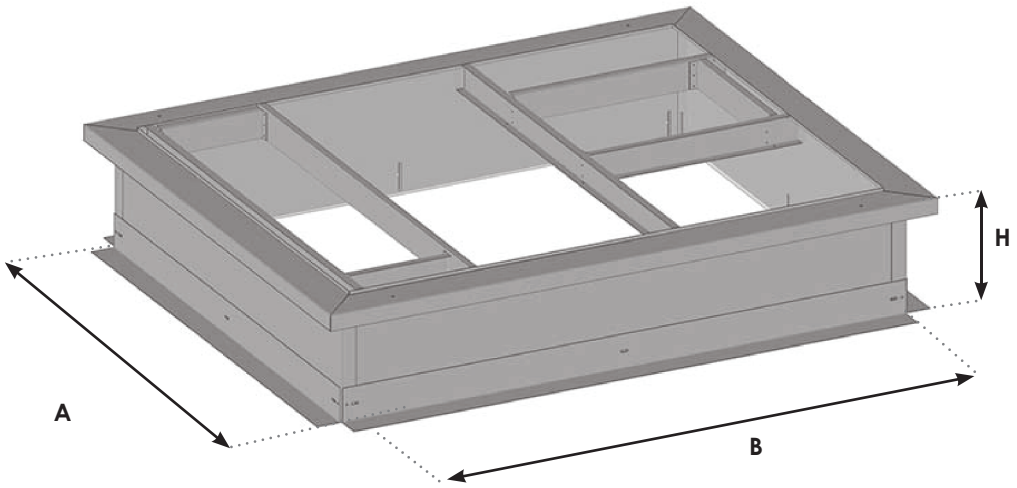
on existing header or curb

- Custom-made roof curb to fit all types of existing curbs or headers according to dimensions supplied by the installer (see our special clauses for this type of material).
- Complies with French standard NF P 84-206-1 (installation of corrugated steel sheet roofs with a waterproofing coating) and fire regulations for Public Access Buildings (French Order of 14 February 2000).
- A one-piece aluminium curb that is significantly lighter than a galvanised steel curb.
- Possible compensation for the slope of the roof. To be checked with the Engineering and Design office.
- Internal insulation.



Accessories for installation: Roof curbs

ADJUSTABLE CONNECTING ROOF CURB



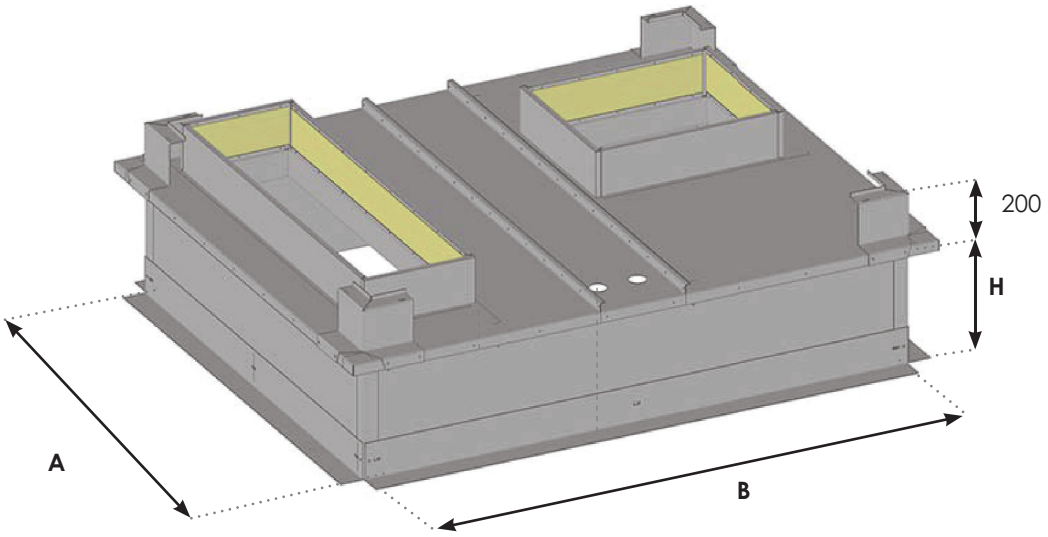
ATTENTION: With this type of roof curb installation, the installer is responsible for the ten-year roofing guarantee.
If the value of the slope is greater than that in the table below, you must send us (see MARK-NOT_55-EN_ Measurement_ Form):
- the value of the slope of your roof in %,
- the direction of the slope
- the orientation of the machine in relation to the slope of the building
- the thickness of the waterproofing complex (insulation + steel deck + membrane)

The roof curbs must be counter-drilled after assembly. **The machine must be bolted to the roof curb**. Putty must be applied to the underside of the machine frame.

Dimensions of the recess (mm)	A	B	H	Overall width	Overall length	Overall height	Max. slope length (%)	Max. slope width (%)	Weight (kg)
ULTI+ R32 01	1,320	1,970	550	1,534	2,178	568	5.0	7.5	76
ULTI+ R32 11	1,700	1,970	550	1,914	2,178	563	5.0	5.8	84
ULTI+ R32 12	1,970	2,450	613	2,184	2,658	618	5.0	6.2	110
ULTI+ R32 21	2,220	2,770	600	2,434	2,978	618	5.0	6.2	128
ULTI+ R32 22	2,370	3,160	600	2,584	3,368	618	5.0	6.7	170
ULTI+ R32 23	2,370	4,220	650	2,586	4,428	668	5.0	8.9	221

Accessories for installation: Roof curbs

VENTILATED ADJUSTABLE ROOF CURB



ATTENTION: With this type of roof curb installation, the installer is responsible for the ten-year roofing guarantee.
If the value of the slope is greater than that in the table below, you must send us (see MARK-NOT_55-EN_ Measurement_ Form):

- the value of the slope of your roof in %,
- the direction of the slope
- the orientation of the machine in relation to the slope of the building
- the thickness of the waterproofing complex (insulation + steel deck + membrane)

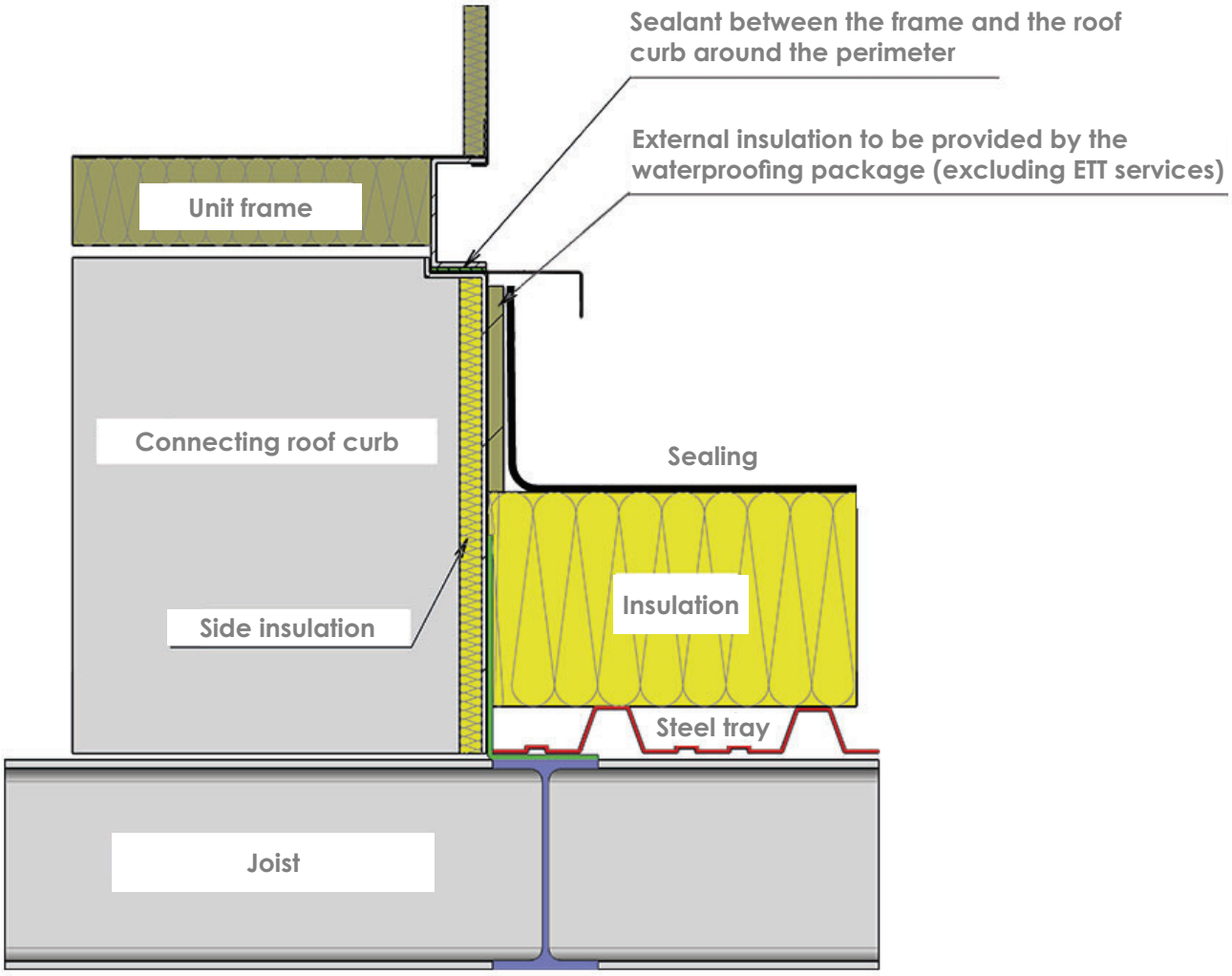
The roof curbs must be counter-drilled after assembly. **The machine must be bolted to the roof curb.**

Dimensions of the recess (mm)	A	B	H	Overall width	Overall length	Overall height	Max. slope length (%)	Max. slope width (%)	Weight (Kg)
ULTI+ R32 01	1,320	1,970	550	1,524	2,168	768	5.0	7.5	102
ULTI+ R32 11	1,700	1,970	550	1,904	2,168	763	5.0	5.8	112
ULTI+ R32 12	1,970	2,450	600	2,174	2,648	818	5.0	6.2	146
ULTI+ R32 21	2,220	2,770	600	2,424	2,968	818	5.0	6.2	169
ULTI+ R32 22	2,370	3,160	600	2,574	3,358	818	5.0	6.7	228
ULTI+ R32 23	2,370	4,020	650	2,576	4,418	868	5.0	8.5	294

Accessories for installation: Roof curbs

HOW TO INSTALL ROOF CURBS

The diagram below is a schematic diagram, conforming to French standard DTU 43.1 (Sealing of flat roofs and pitched roofs with load-bearing masonry elements in lowland climates):

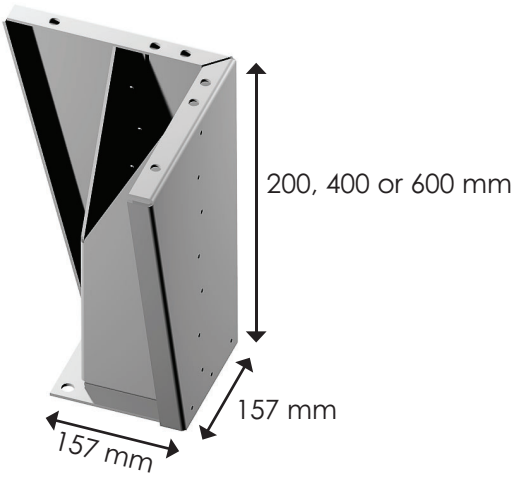


Note: The curbs are designed for a maximum total height of 345 mm of steel tray and insulation.
To maintain a standard curb height (refer to the curb drawing), you need to check that, depending on the slope of the roof on site, the 'insulation and steel tray' height dimension leaves sufficient insulation height in accordance with French standard DTU 43.1.

An optional blanking plate can be supplied to protect the building from the bad weather between the installation of the curb and the unit.

Accessories for installation: Feet

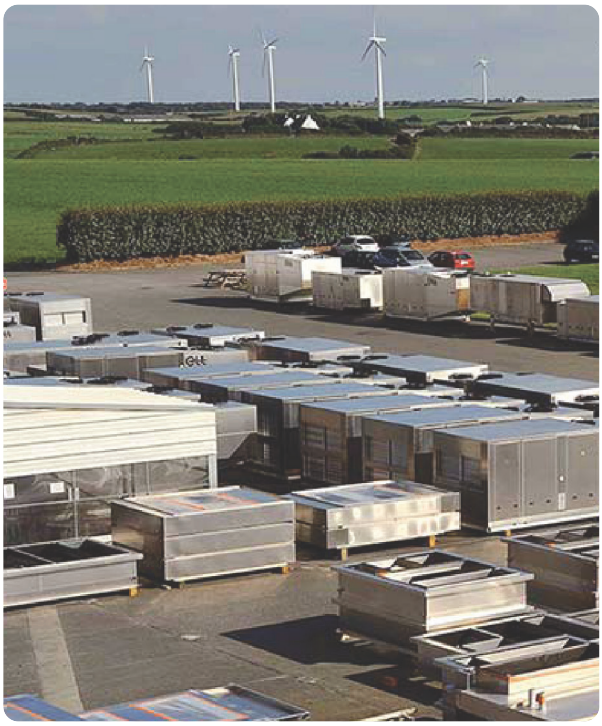
Aluminium fixed foot
Unit weight: 1 kg

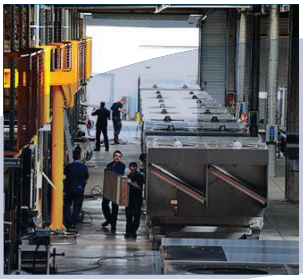


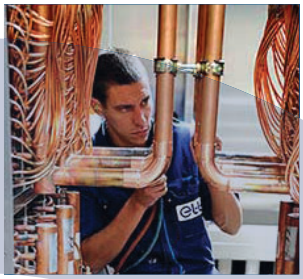
The feet are mounted on the corners of the frame. For ULTI+R32 - 23 frames, two additional feet are required in the centre of the casing.

	ULTI+ R32 01	ULTI+ R32 11	ULTI+ R32 12	ULTI+ R32 21	ULTI+ R3 22	ULTI+ R32 23
No. of feet	4	4	4	4	4	6

(*) The central feet have a 200 x 200 mm base (instead of 157 x 157 mm).







Reference: MARK-BRO_36-EN_I

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