CLIMATIC
ENVIRONMENT
SOLUTIONS
AND EQUIPMENT

Green Line

ULTI+ R32 EX

Double-flow heat pump with extraction module

MADE IN FRANCE

www.ett-hvac.com

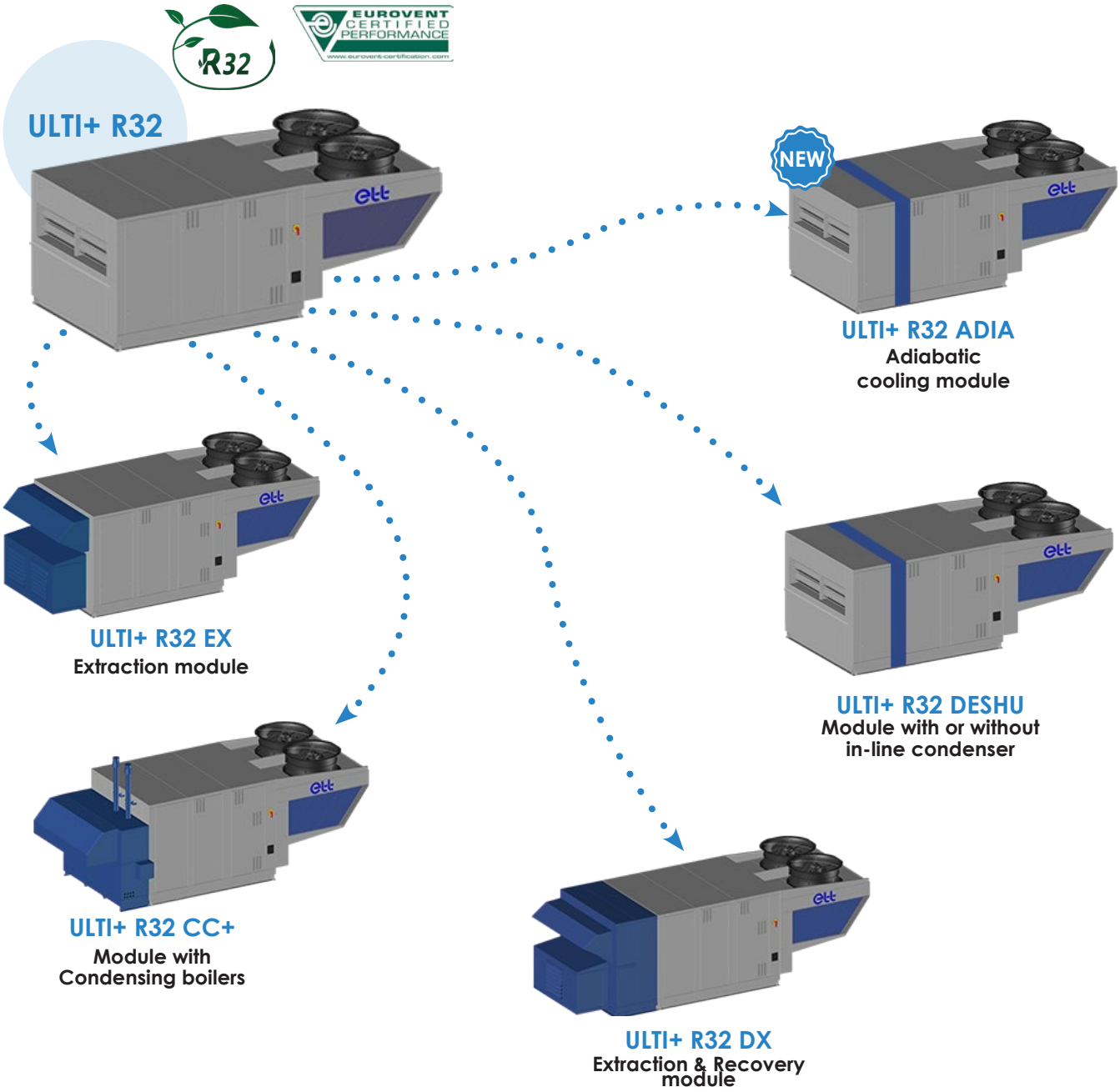
ULTI+ R32 EX: Machine from the ULTIMA Green Line range

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 EX: 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 EX units 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

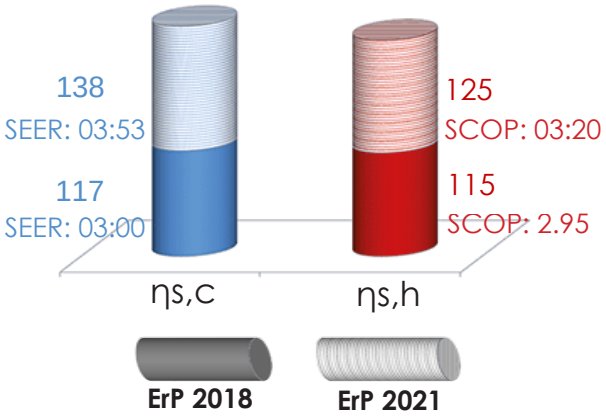
Since 1st January 2018, rooftops that do not comply with ErP Regulation EU 2281/2016 shall no longer be marketed in Europe.

Regulatory impacts since 1ST 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.

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

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

20-year guarantee against corrosion frame - casing

ENERGY SAVING

ENVIRONMENTAL ATTITUDE

SERVICE LINK

Unit description

20-year guarantee against corrosion frame - casing

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) reffilable, 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).

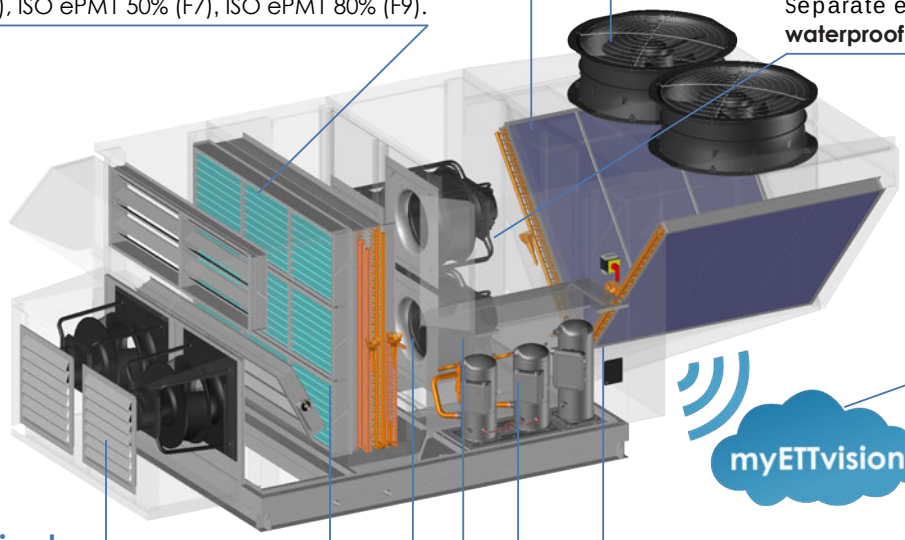
Solution ErP 2021

Propeller fans

Variable-speed, communicating propeller fans, bionic blade design, electronically commutated « EC », motor, 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

myETTvision

Extraction box

Thermal heat exchangers

Optimised heat exchanger for improved energy performance.

Vinyl option available.

New generation PLC with display

Control enabling optimum operation in all conditions.

Multi-stage circuit with R32 new generation compressors

Optimum performance whatever the part load.
Electronic expansion valves.

Internal supply and extract 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 EX provides **precise regulation for optimum energy performance throughout** its years of operation.

QUALITY
Premium process and 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 arrangements**, 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.

Ex Module
Extraction unit

TO AVOID PRESSURISING YOUR BUILDINGS

The EX unit is used **to precisely control the air supplied to and extracted from your building**.

Without this extraction module, the building must be equipped with a means of extracting air from the air conditioning unit.

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 supervision

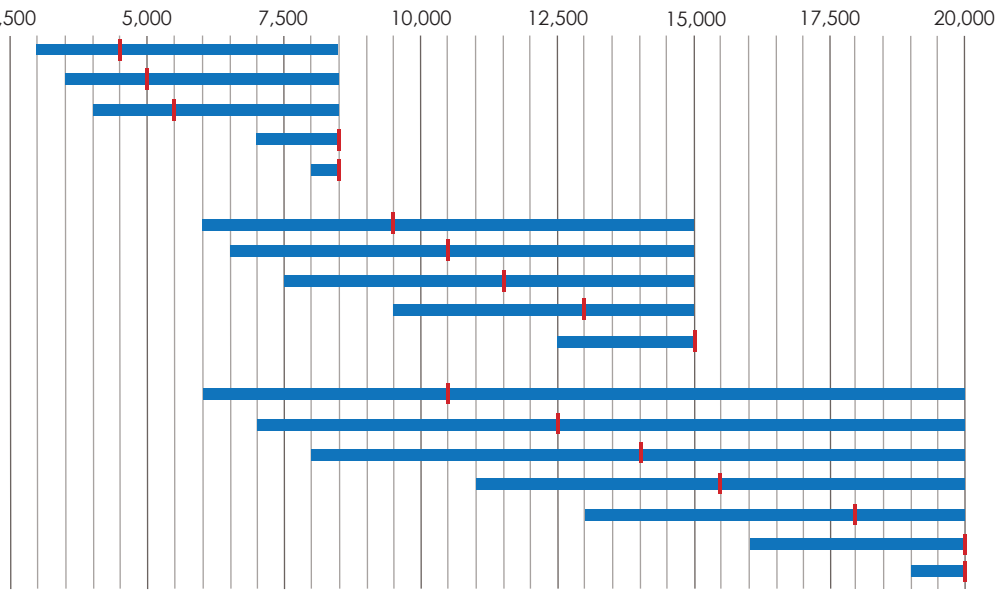
myETTvision allows you to control and optimise your installation remotely and instantly.

Unit description

A WIDE RANGE

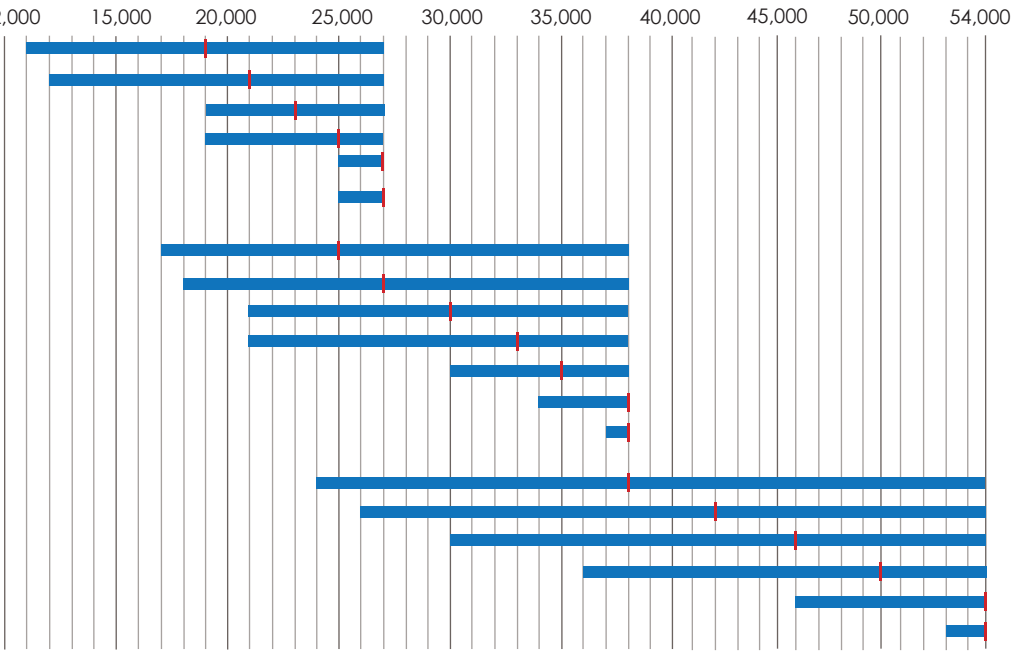
Flow rate range (m³/h) & rated flow rate (|)

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



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

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

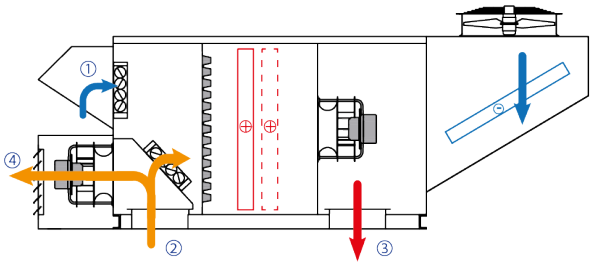
In these modes, the unit can operate:

> With all recirculated air

> In all fresh air mode

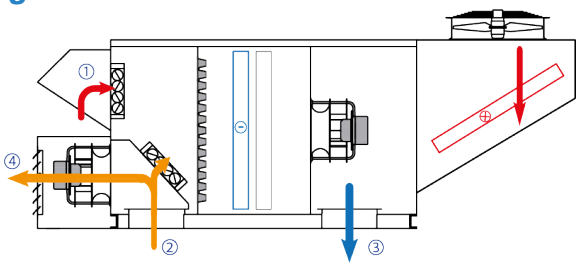
> In mixed air mode

Heating Mode



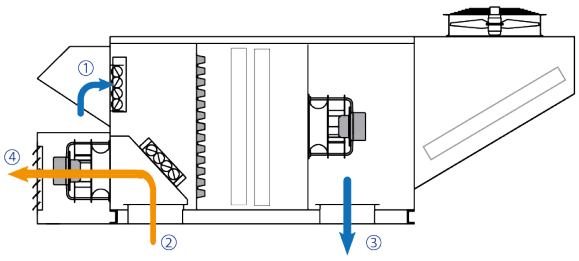
Heating Mode: Comfort temperature maintained in winter by the thermodynamic system and by the auxiliary heaters (optional).

Cooling Mode



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

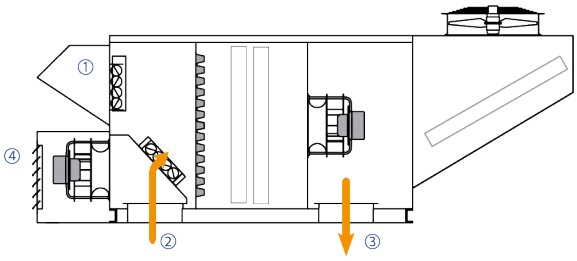
Free Cooling Mode



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** to be made by delaying the thermodynamic system.

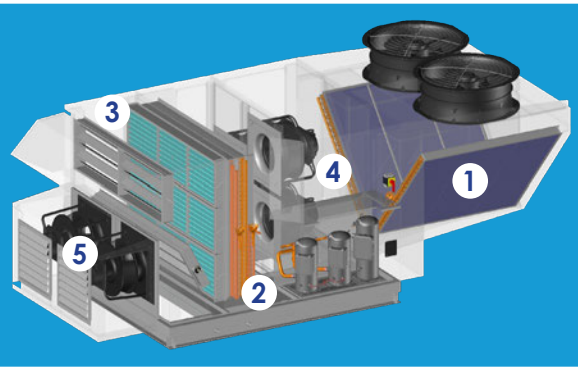
Recycling Mode



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 ④ Exhaust air

Detailed components of the unit



The ETT packaged unit comprises 5 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 ensures air change and air treatment.
4. A sealed electrical compartment étanche (IP44)
5. An extraction compartment/ box.

Aluminium frame and casing assembly :

- **The Ulti+ R32 EX 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 EN1751):**
  - ✓ Combined with the CO_2sensor, optimised fresh air dosage.
  - ✓ 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.
- **Sound and thermal insulation provided by 80 mm to 100 mm rock wool** (M0 classification) in the frame and by **50 mm glass wool** (M0 classification in accordance with **PAB** (Public Access Buildings) regulations, article CH36 **in the walls and roof.**
- **Optional rain proof cowl on fresh air** (to be fitted by the installer)

Aeraulics assembly:

- **Eco-design filtration,** easy to dismantle - ISO Coarse efficiency 65% (G4) in **98 mm** pleated media 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,
  - ✓ **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:

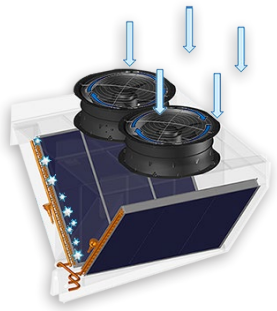
- **For units with several thermodynamic circuits,** only the first circuit is equipped with a tandem. This allows the thermal power provided to be staggered according to the needs of the application, for less consumption and greater comfort.
- **Communicating electronic expansion valves**, combining increased optimisation of the heat 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. Part-load operation significantly reduces defrost times 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.**
- Switch over **valve**.
- **Optimised defrosting** with a new external compartment design (**optimised for eco-design**).
- **Leak detection :** The ULTI+ R32 EX is equipped with leak detection as standard. This detection allows the user to be warned in case of R32 fluid leakage. **Leak detection also reduces the need for periodic 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.



Extraction assembly - EX module:

- **Pressure relief valve** to close the exhaust compartment if the exhaust fan stops.
- **Last generation exhaust 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).

Detailed components of the unit

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 remote Control Box display.
  - ✓ **A power switch** with lockable external handle for full load cut-off. Connection using standard universal cable. Optional copper/aluminium connection boxes.
  - ✓ **A 400-230-24** volt transformer for control and regulation circuits.
  - ✓ **A fault summary** with a dry contact on stanby at terminal.
  - ✓ **Numbered terminal blocks** with disconnectable terminals for all transfers or remote controls.
  - ✓ **A terminal block** for compressor load shedding.
  - ✓ **Internal wiring** fully numbered at both ends with numbered rings.
  - ✓ An Ik3 **breaking capacity** of 10 kA basic.
  - ✓ **A phase controller.**
  - ✓ Components **protection** using circuit breakers.

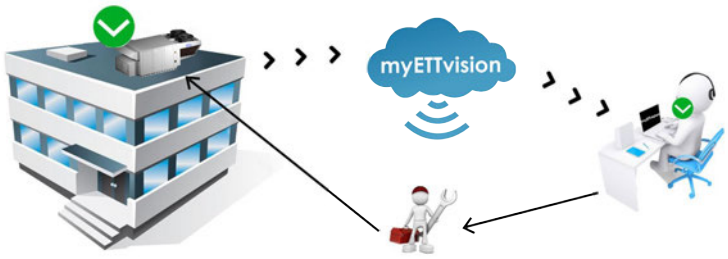
  - ✓ **The nominal LV** distribution voltage is governed by the French Interministerial Order of 24 December 2007. Consult us if the regulations of the country of installation require other characteristics for the nominal distribution voltage. This sets the nominal voltage level at 230/400 V. It defines 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.

Advanced control assembly:

- **Temperature control with 2 set points for cooling/heating mode: responsive, precision and anticipation.**
  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 water weights** , 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**.

myETTvision:

ETT Remote Communication Platform:



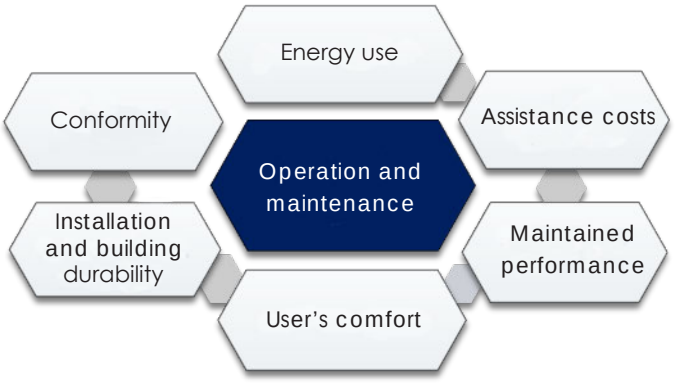
Operating tips for the ULTI+ R32 EX unit

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 and extraction fans ▪ Compressor soundproofing covers
Airflow section	▪ All fresh air operation ▪ Actuating smoke detector with battery back-up ▪ Epoxy coating for supply air and extraction air fans ▪ Analogue air flow controller (AFC) with supply and exhaust air fans flow rate auto-adjustment ▪ 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 ▪ Fresh air cowl extension ▪ Defrosting damper ▪ Cover for pressure relief vent
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
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 in Comfort mode (setpoint temperatures control by PID) ▪ Free Cooling banning based on specific humidity comparison ▪ HPE+ operation (High Energy Efficiency) ▪ VDP operation (Variable Flow / Power) ▪ 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	4,500	5,000	6,000	8,500	8,500
	Minimum air flow rate	m³/h	3,000	3,500	4,000	7,000	8,000
	Maximum air flow rate	m³/h	8,500	8,500	8,500	8,500	8,500
	ON EXTRACTION						
	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	NOMINAL PERFORMANCES AT +35°C (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
PERFORMANCE HEATING	RATED PERFORMANCE AT +7°C (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
GENERAL INFORMATION	ELECTRICAL DATA						
	Total installed electrical power (4)	kW	13.7	14.6	17.0	25.5	26.9
	Total installed electric current (4)	A	21.9	23.4	27.2	40.9	43.2
	Starting current	A	34.3	34.3	34.3	129.0	130.1
	Maximum absorbed electrical power (5)	kW	9.8	10.8	13.5	17.7	18.7
	REFRIGERATION CIRCUIT(S)						
	Power stages	-	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	+12				
	WEIGHT						
	Unit weight without options (7)	kg	531	531	531	582	585
	Weight of connecting roof curb	kg	73				
	Weight of standard ventilated roof curb	kg	102				

(1) In accordance with EN 14511.
Air-conditioning mode: inside conditions: +27°C DB/+19°C WB and outside conditions: +35°C DB / 24°C WB
Heating mode: Inside conditions: +20°C DB/+12°C WB and outside conditions: +7°C DB / +6°C WB.

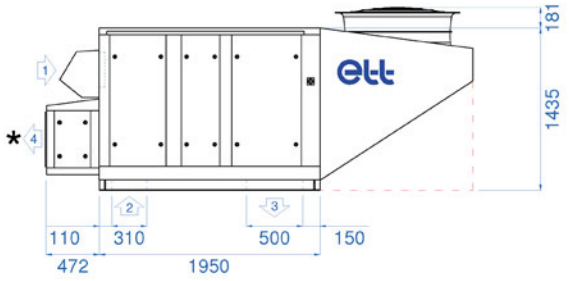
(2) According to EcoDesign regulations 2016/2281.
(3) In accordance with EN 14511.
Heating mode: Inside conditions: +20°C DB and outside conditions: -7°C DB / -8°C WB.
(4) Three-phase power supply 400V - 50 Hz + earth without neutral.
The values given do not include any options and may change during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

(5) Cooling Mode: inside 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. 100 Pa pressure available at return + rejection.
(6) For inside conditions: +27°C DB /+19°C WB at nominal air flow.
(7) Weight for an available pressure of 400 Pa for return + supply, 100 Pa for return + rejection.
(8) For an extract airflow = 100% of the nominal supply airflow, 100 Pa static pressure available at extraction.

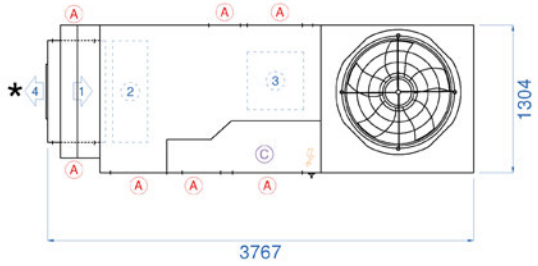
Dimensions and connections

SUPPLY AIR *underneath*

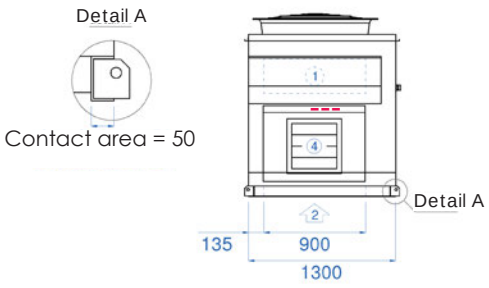
Front view:



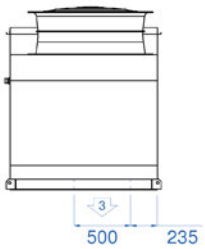
Top view :



Return side view:



Supply air side view :



* Minimum distance of 8 m between discharge and fesh air to avoid recirculation of stale air.

① Fresh air
② Return air
③ Supply air
④ Exhaust air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	3767 mm	1304 mm	1435 mm

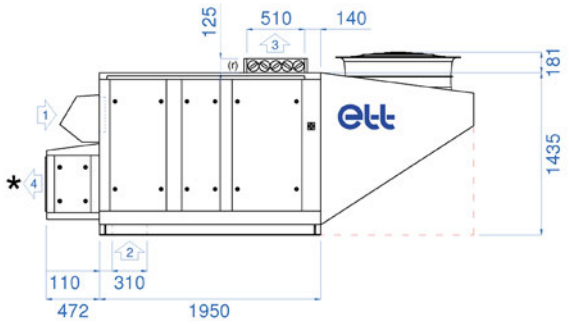
(1) Side return: +125 mm

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

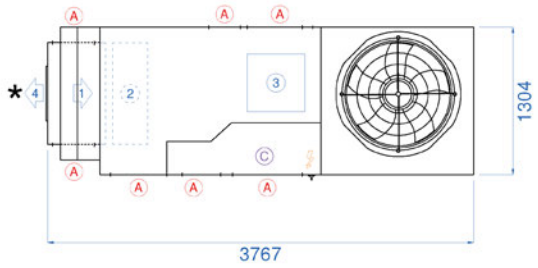
Dimensions and connections

SUPPLY AIR *on top*

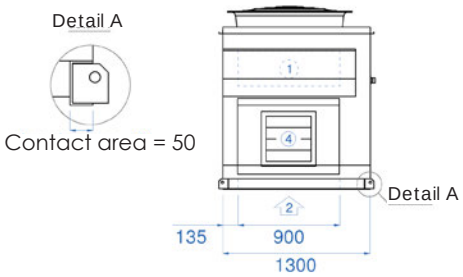
Front view:



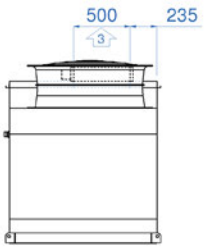
Top view :



Return side view:



Supply air side view :



* Minimum distance of 8 m between discharge and fesh air to avoid recirculation of stale air.

① Fresh air
② Return air
③ Supply air
④ Exhaust air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	3767 mm	1304 mm	1435 mm

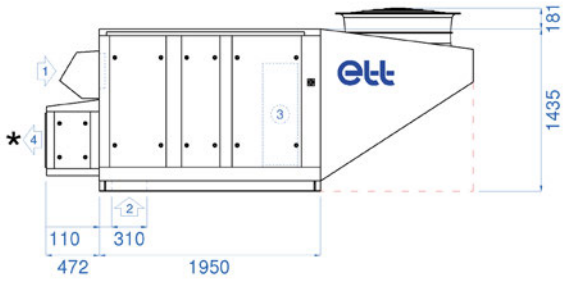
(1) Side return: +125 mm

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

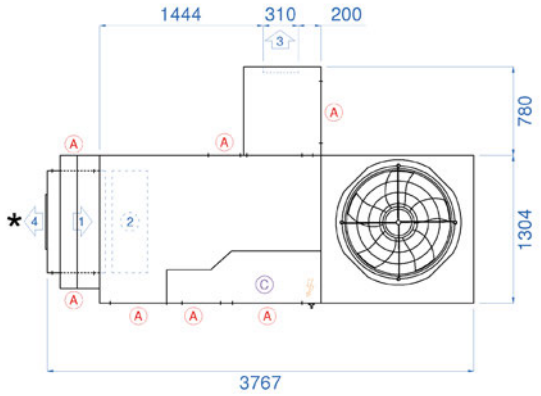
Dimensions and connections

Side *SUPPLYAIR*

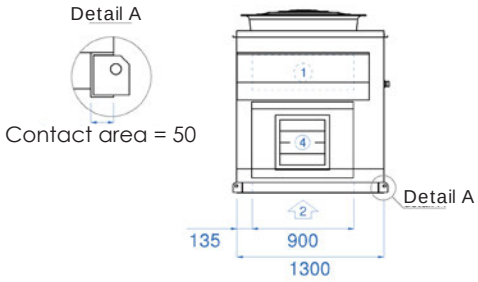
Front view:



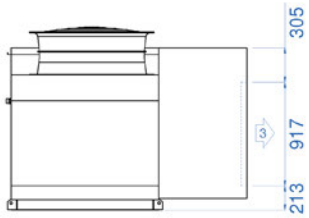
Top view :



Return side view:



Supply air side view :



* Minimum distance of 8 m between discharge and fesh air to avoid recirculation of stale air.

① Fresh air
② Return air
③ Supply air
④ Exhaust air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

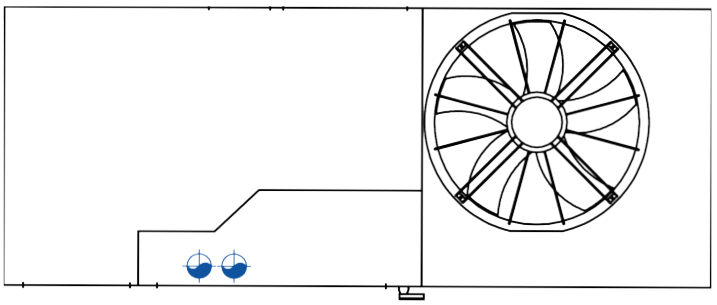
	Length	Width (1)	Height
Casing dimensions	3767 mm	1304 mm	1435 mm

(1) Side return: +125 mm

Note: - 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.

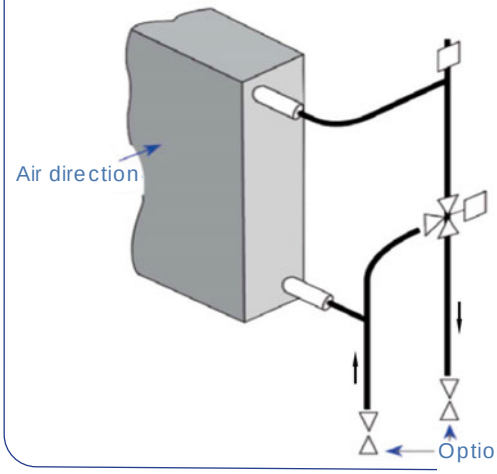
DIAGRAM AND CONNECTION

Top view



Connection diameter: 40/49 (1 "1/2)

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

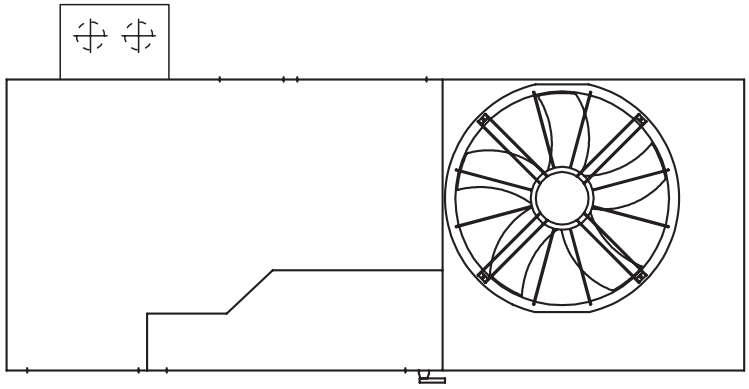
(1) With 3-WV option
(2) With 3-WV, VTA, VA option

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

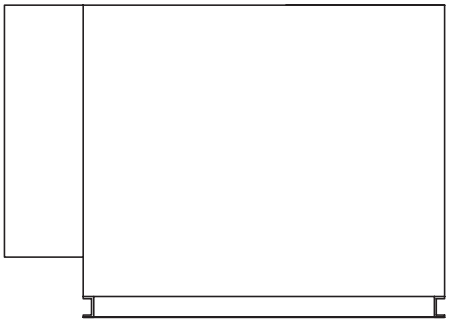
► Connection opposite the technical compartment.

Top view



Connection diameter: 40/49 (1 "1/2)

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	9,500	10,500	11,500	13,000	15,000
	Minimum air flow rate	m³/h	6,000	6,500	7,500	9,500	12,500
	Maximum air flow rate	m³/h	15,000	15,000	15,000	15,000	15,000
	ACOUSTICS (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
COOLING PERFORMANCE	NOMINAL PERFORMANCES AT +35°C (1)						
	Net cooling capacity	kW	43.2	46.5	52.0	59.8	67.0
	Net EER	kW/kW	3.38	3.31	3.21	3.16	3.06
	SEASONAL EFFICIENCY (2)						
	Net design cooling capacity	kW	43.2	46.5	52.0	59.8	67.0
	SEER	kW/kW	5.28	4.78	4.68	4.55	4.65
	ηs,C	%	208	188	184	179	183
HEATING PERFORMANCE	RATED PERFORMANCE AT +7°C (1)						
	Net heating capacity	kW	43.9	47.5	54.1	61.6	69.9
	Net COP	kW/kW	4.18	4.23	4.08	3.99	3.92
	RATED PERFORMANCE AT -7°C (3)						
	Net heating capacity	kW	30.0	33.1	37.1	43.0	48.3
	Net COP	kW/kW	3.33	3.35	3.27	3.15	2.96
	SEASONAL EFFICIENCY (2)						
	Net design heat output	kW	39.3	40.7	45.3	51.8	58.5
	SCOP	kW/kW	4.22	4.12	4.01	3.80	3.67
	ηs,H	%	166	162	158	149	144
GENERAL INFORMATION	ELECTRICAL DATA						
	Total installed electrical power (4)	kW	24.9	26.3	31.8	38.5	39.6
	Total installed electric current (4)	A	39.9	42.2	51.0	61.7	62.5
	Starting current	A	128.0	129.1	162.9	182.0	179.8
	Maximum absorbed electrical power (5)	kW	16.7	18.6	21.3	24.3	28.2
	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	851	853	899	913	1,015
	Weight of connecting roof curb	kg			80		
	Weight of standard ventilated roof curb	kg			112		

(1) In accordance with EN 14511.
Air-conditioning mode: inside conditions: +27°C DB/+19°C WB and outside conditions: +35°C DB / 24°C WB

Heating mode: Inside conditions: +20°C DB/+12°C WB and outside conditions: +7°C DB / +6°C WB.

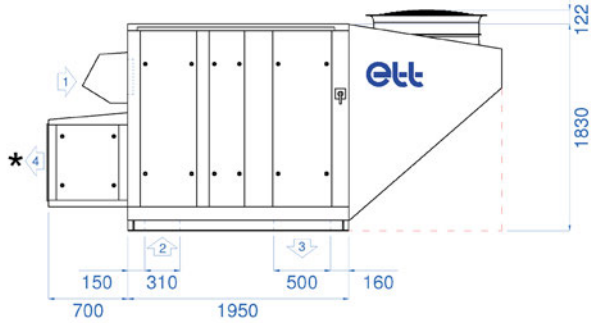
(2) According to EcoDesign regulations 2016/2281.
(3) In accordance with EN 14511.
Heating mode: Inside conditions: +20°C DB and outside conditions: -7°C DB / -8°C WB.
(4) Three-phase power supply 400V - 50 Hz + earth without neutral.
The values given do not include any options and may change during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

(5) Cooling Mode: inside 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. 100 Pa pressure available at return + rejection.
(6) For indoor conditions: +27°C DB /+19°C WB at nominal air flow.
(7) Weight for an available pressure of 400 Pa for return + supply, 100 Pa for return + rejection.
(8) For an extract airflow = 100% of the nominal supply airflow, 100 Pa static pressure available at extraction.

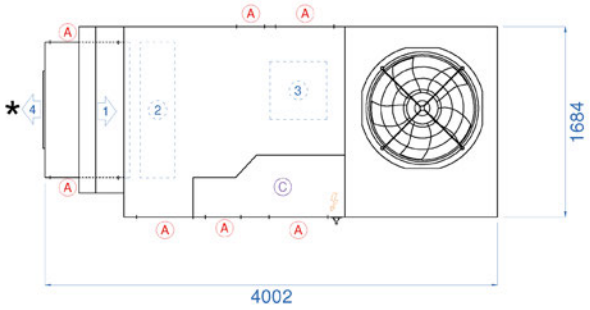
Dimensions and connections

SUPPLY AIR *underneath*

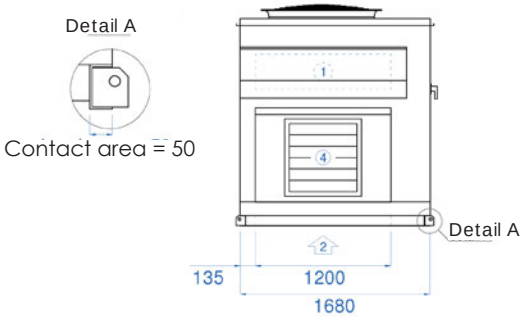
Front view:



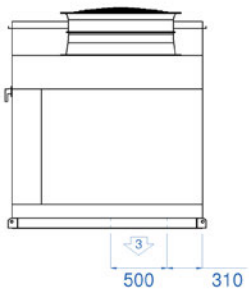
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
④ Exhaust air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

* Minimum distance of 8 m between discharge and fesh air to avoid recirculation of stale air.

	Length	Width (1)	Height
Casing dimensions	4002 mm	1684 mm	1830 mm

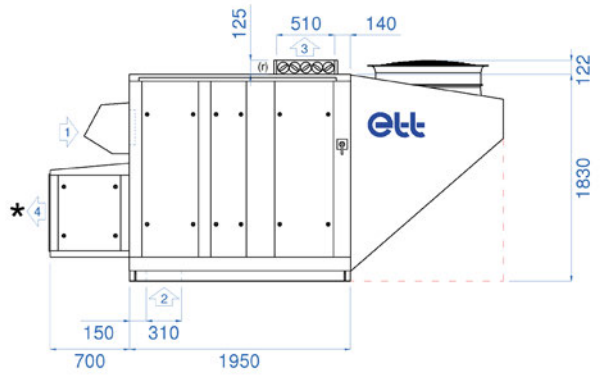
(1) Side return: +125 mm

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

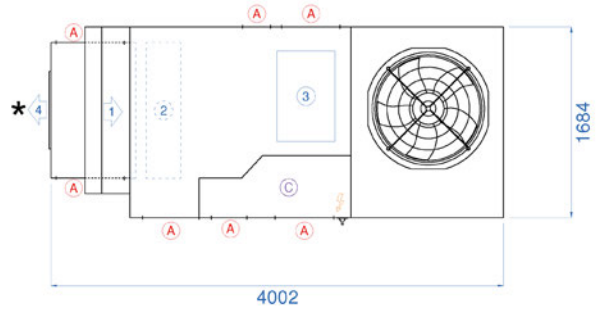
Dimensions and connections

SUPPLY AIR *on top*

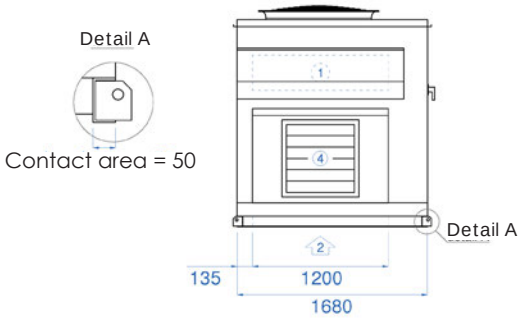
Front view:



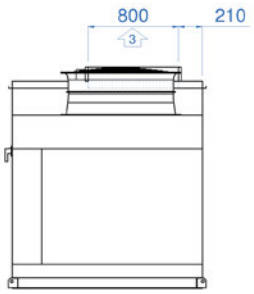
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
④ Exhaust air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

* Minimum distance of 8 m between discharge and fesh air to avoid recirculation of stale air.

	Length	Width (1)	Height
Casing dimensions	4002 mm	1684 mm	1830 mm

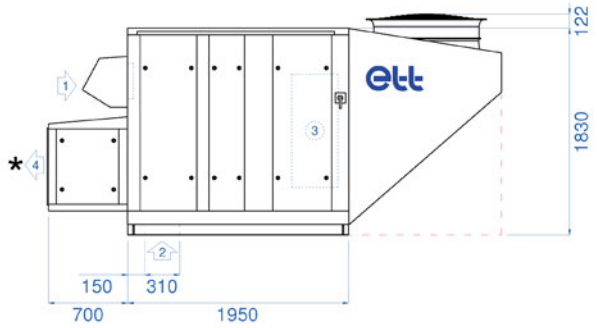
(1) Side return: +125 mm

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

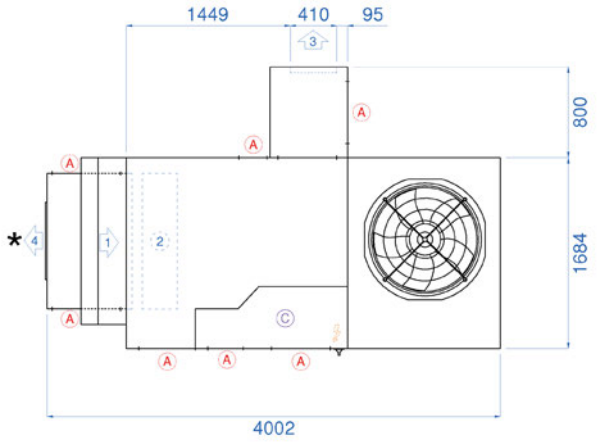
Dimensions and connections

Side *SUPPLY AIR*

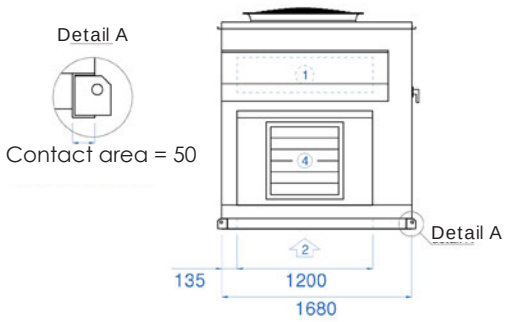
Front view:



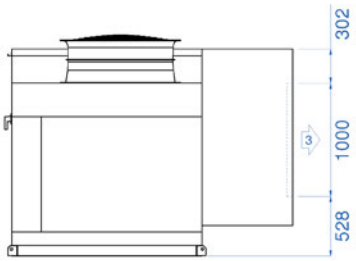
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
④ Exhaust air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

* Minimum distance of 8 m between discharge and fesh air to avoid recirculation of stale air.

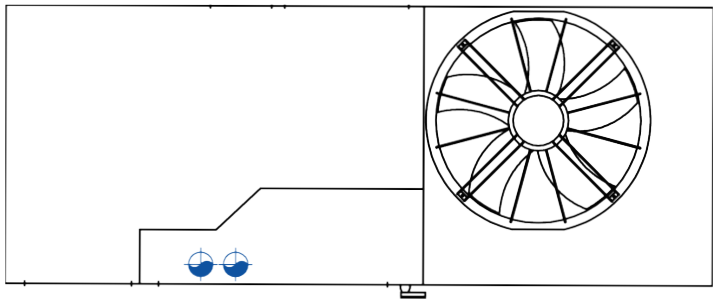
	Length	Width [1]	Height
Casing dimensions	4002 mm	1684 mm	1830 mm

(1) Side return: +125 mm

Note: - 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.

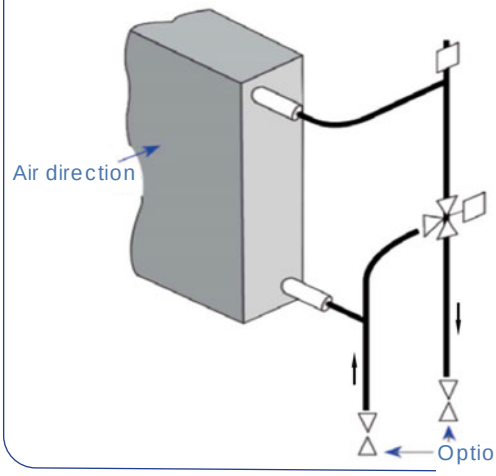
DIAGRAM AND CONNECTION

Top view



Connection diameter: 40/49 (1 "1/2)

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

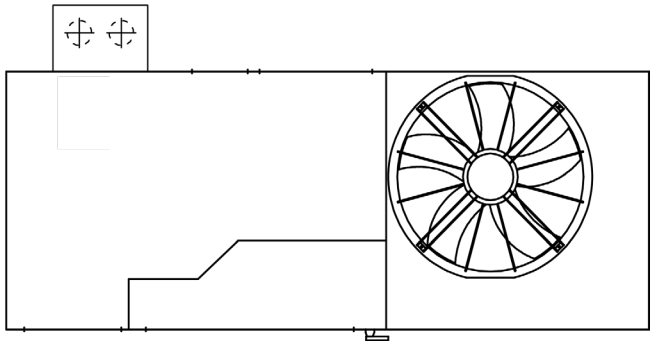
(1) With 3-WV option
(2) With 3-WV, VTA, VA option

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.

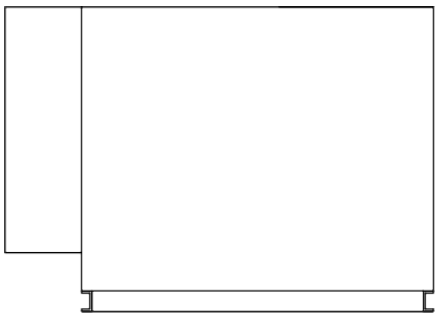
DIAGRAM AND CONNECTION

► Connection opposite the technical compartment.

Top view



Side view



Connection diameter: 40/49 (1 "1/2)

► 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	11,000	12,500	14,000	16,000	18,000	20,000	20,000
	Minimum air flow rate	m³/h	6,000	7,000	8,000	11,000	13,000	16,000	19,000
	Maximum air flow rate	m³/h	20,000	20,000	20,000	20,000	20,000	20,000	20,000
	ACOUSTICS (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	NOMINAL PERFORMANCES AT +35°C (1)								
	Net cooling capacity	kW	49.0	55.1	62.8	69.9	77.6	87.0	92.1
	Net EER	kW/kW	3.54	3.43	3.31	3.23	3.15	2.87	2.98
	SEASONAL EFFICIENCY (2)								
	Net design cooling capacity	kW	49.0	55.1	62.8	69.9	77.6	87.0	92.1
	SEER	kW/kW	5.08	5.05	4.85	4.90	4.73	4.80	4.38
	ηs,C	%	200	199	191	193	186	189	172
HEATING PERFORMANCE	RATED PERFORMANCE AT +7°C (1)								
	Net heating capacity	kW	48.1	54.2	63.5	71.5	80.1	91.5	97.7
	Net COP	kW/kW	4.67	4.59	4.40	4.25	4.09	3.72	3.74
	RATED PERFORMANCE AT -7°C (3)								
	Net heating capacity	kW	33.0	37.1	43.4	48.7	55.0	63.3	66.9
	Net COP	kW/kW	3.67	3.59	3.43	3.26	3.15	2.88	2.88
	SEASONAL EFFICIENCY (2)								
	Net design heat output	kW	43.8	48.0	55.8	62.6	70.0	79.7	84.6
	SCOP	kW/kW	4.60	4.45	4.20	4.18	3.93	3.70	3.63
	ηs,H	%	181	175	165	164	154	145	142
GENERAL INFORMATION	ELECTRICAL DATA								
	Total installed electrical power (4)	kW	28.8	31.0	39.0	40.9	45.8	53.3	52.2
	Total installed electrical current (4)	A	46.0	49.9	62.5	64.4	72.4	87.9	83.4
	Starting current	A	132.9	161.8	182.8	181.7	194.1	253.2	227.9
	Maximum absorbed electrical power (5)	kW	18.6	21.6	25.8	28.5	31.2	37.0	38.3
	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	1,046	1,068	1,096	1,157	1,188	1,164	1,201
	Weight of connecting roof curb	kg				104			
	Weight of standard ventilated roof curb	kg				146			

(1) In accordance with EN 14511.
Air-conditioning mode: inside conditions: +27°C DB/+19°C WB and outside conditions: +35°C DB / 24°C WB

Heating mode: Inside conditions: +20°C DB/+12°C WB and outside conditions: +7°C DB / +6°C WB.

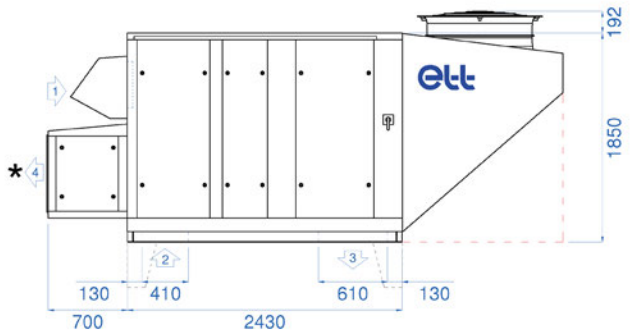
(2) According to EcoDesign regulations 2016/2281.
(3) In accordance with EN 14511.
Heating mode: Inside conditions: +20°C DB and outside conditions: -7°C DB / -8°C WB.
(4) Three-phase power supply 400V - 50 Hz + earth without neutral.
The values given do not include any options and may change during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

(5) Cooling Mode: inside 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. 100 Pa pressure available at return + rejection.
(6) For indoor conditions: +27°C DB /+19°C WB at nominal air flow.
(7) Weight for an available pressure of 400 Pa for return + supply, 100 Pa for return + rejection.
(8) For an extract airflow = 100% of the nominal supply airflow, 100 Pa static pressure available at extraction.

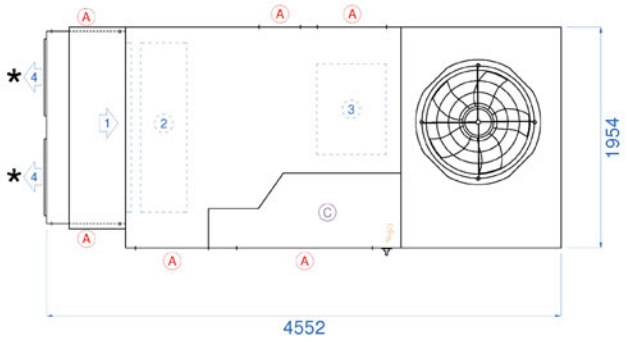
Dimensions and connections

SUPPLY AIR *underneath*

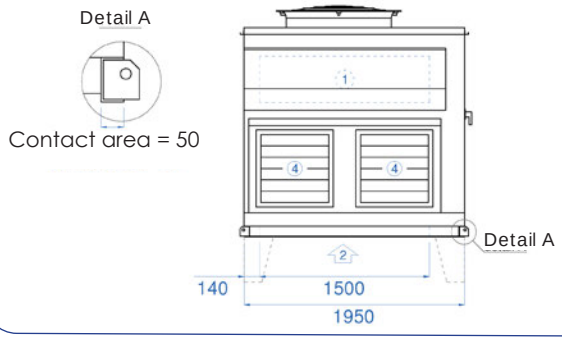
Front view:



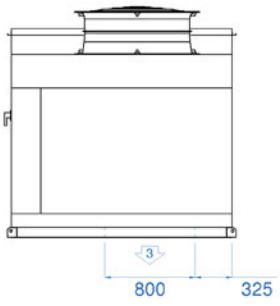
Top view :



Return side view:



Supply air side view :



* Minimum distance of 8 m between discharge and fesh air to avoid recirculation of stale air.

① Fresh air
② Return air
③ Supply air
④ Exhaust air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	4552 mm	1954 mm	1850 mm

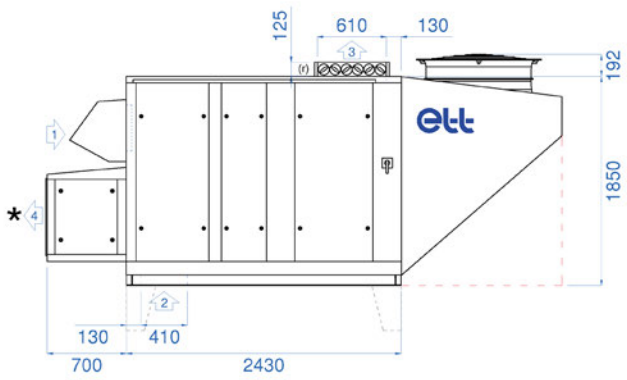
(1) Side return: +125 mm

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

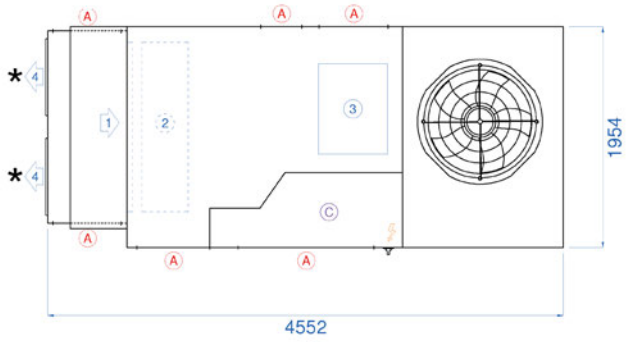
Dimensions and connections

SUPPLY AIR *on top*

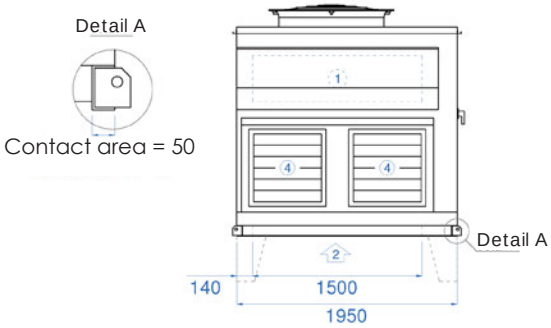
Front view:



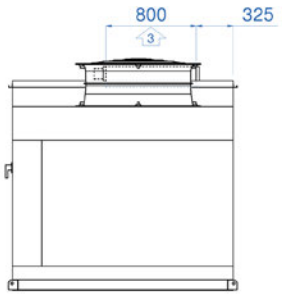
Top view :



Return side view:



Supply air side view :



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② Return air
③ Supply air
④ Exhaust air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

	Length	Width [1]	Height
Casing dimensions	4552 mm	1954 mm	1850 mm

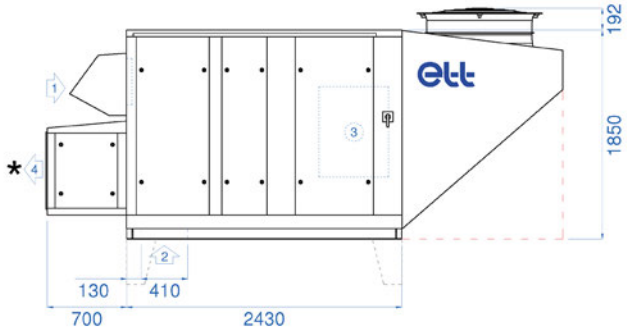
(1) Side return: +125 mm

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

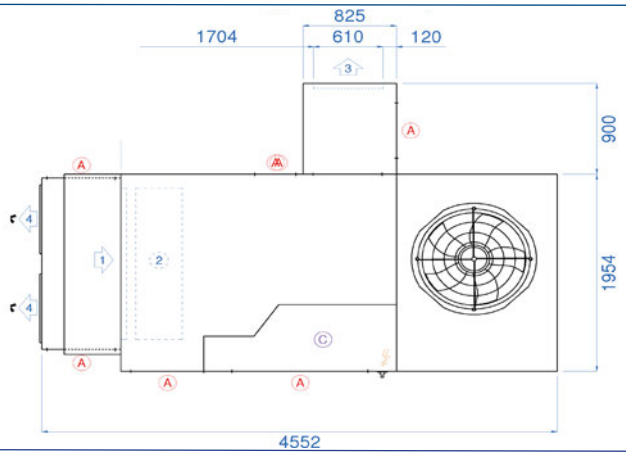
Dimensions and connections

Side *SUPPLY AIR*

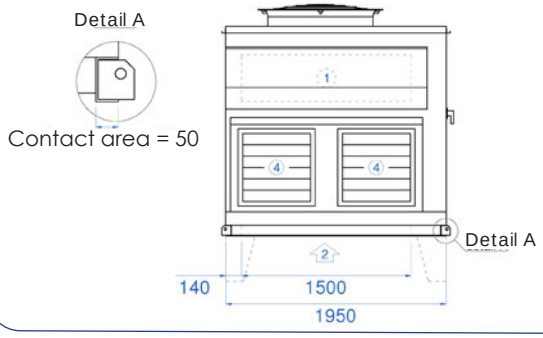
Front view:



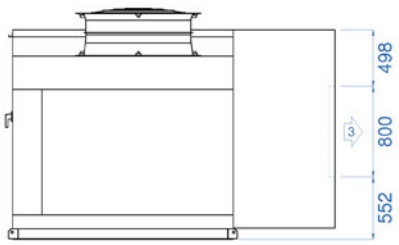
Top view :



Return side view:



Supply air side view :



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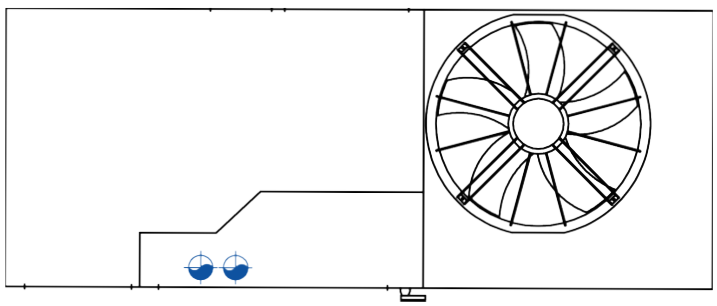
	Length	Width	Height
Casing dimensions	4552 mm	1954 mm	1850 mm

(1) Side return: +125 mm

Note:
- 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.

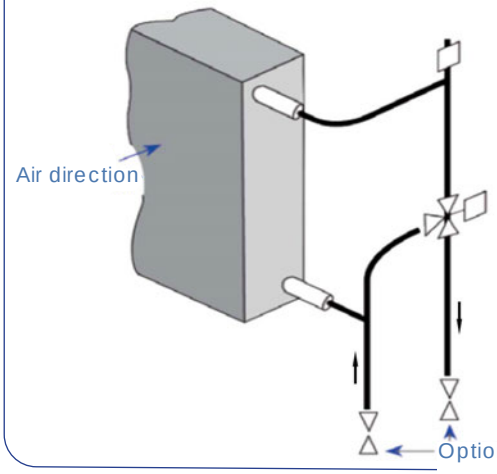
DIAGRAM AND CONNECTION

Top view



Connection diameter: 50/60 (2")

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

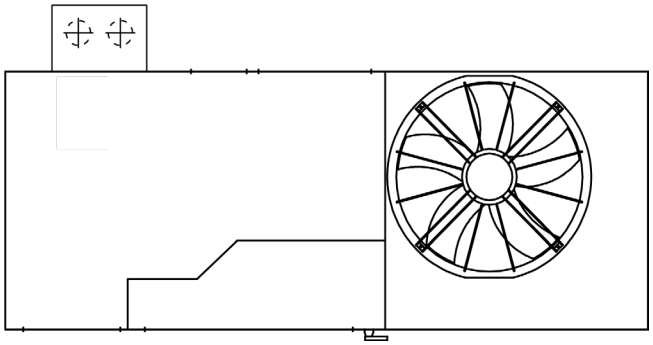
(1) With 3-WV option
(2) With 3-WV, VTA, VA option

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

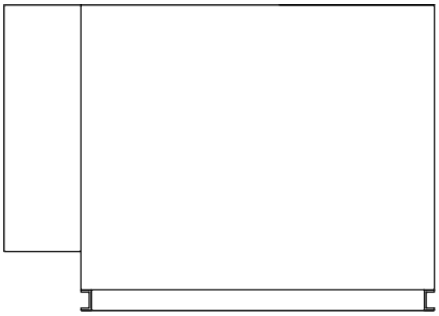
► Connection opposite the technical compartment.

Top view



Connection diameter: 50/60 (2")

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	115	130	140
VENTILATION	FLOW RATES							
	Rated air flow rate	m³/h	19,000	21,000	23,000	25,000	27,000	27,000
	Minimum air flow rate	m³/h	12,000	13,000	19,000	19,000	25,000	25,000
	Maximum air flow rate	m³/h	27,000	27,000	27,000	27,000	27,000	27,000
	ACOUSTICS (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	NOMINAL PERFORMANCES AT +35°C (1)							
	Net cooling capacity	kW	84.2	90.0	102.1	115.1	122.2	131.8
	Net EER	kW/kW	3.50	3.37	3.24	3.16	3.13	3.04
	SEASONAL EFFICIENCY (2)							
	Net design cooling capacity	kW	84.2	90.0	102.1	115.1	122.2	131.8
	SEER	kW/kW	5.35	5.03	4.85	4.75	4.73	4.58
	ηs,C	%	211	198	191	187	188	180
HEATING PERFORMANCE	RATED PERFORMANCE AT +7°C (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	3.98	3.78	3.74	3.68	3.43
	ηs,H	%	159	156	148	146	144	134
GENERAL INFORMATION	ELECTRICAL DATA							
	Total installed electrical power (4)	kW	52.5	55.6	63.6	68.7	74.5	79.9
	Total installed electric current (4)	A	85.0	89.6	102.6	110.9	118.7	127.8
	Starting current	A	199.5	219.8	232.8	315.6	323.5	370.2
	Maximum absorbed electrical power (5)	kW	32.4	36.2	42.2	47.0	53.2	57.6
	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	1,503	1,510	1,564	1,616	1,685	1,679
	Weight of connecting roof curb	kg	121					
	Weight of standard ventilated roof curb	kg	169					

(1) In accordance with EN 14511.
Air-conditioning mode: inside conditions: +27°C DB/+19°C WB and outside conditions: +35°C DB / 24°C WB
Heating mode: Inside conditions: +20°C DB/+12°C WB and outside conditions: +7°C DB / +6°C WB.

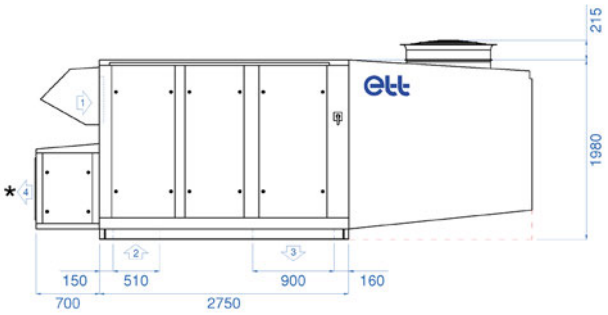
(2) According to EcoDesign regulations 2016/2281.
(3) In accordance with EN 14511.
Heating mode: Inside conditions: +20°C DB and outside conditions: -7°C DB / -8°C WB.
(4) Three-phase power supply 400V - 50 Hz + earth without neutral.
The values given do not include any options and may change during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

(5) Cooling Mode: inside 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. 100 Pa pressure available at return + rejection.
(6) For inside conditions: +27°C DB /+19°C WB at nominal air flow.
(7) Weight for an available pressure of 400 Pa for return + supply, 100 Pa for return + rejection.
(8) For an extract airflow = 100% of the nominal supply airflow, 100 Pa static pressure available at extraction.

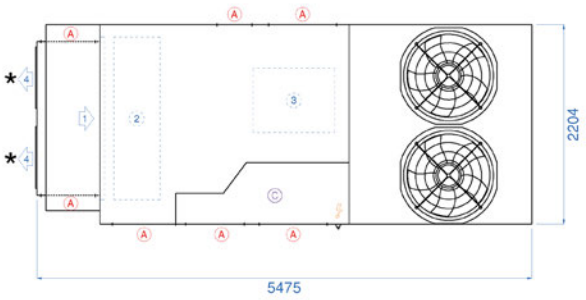
Dimensions and connections

SUPPLY AIR *underneath*

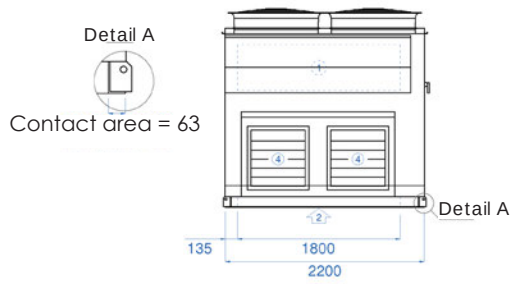
Front view:



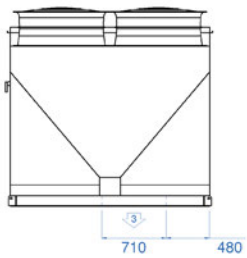
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
④ Exhaust air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

* Minimum distance of 8 m between discharge and fesh air to avoid recirculation of stale air.

	Length	Width (1)	Height
Casing dimensions	5475 mm	2204 mm	1980 mm

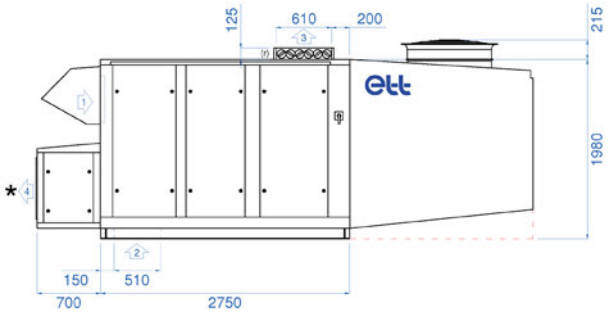
(1) Side return: +125 mm

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

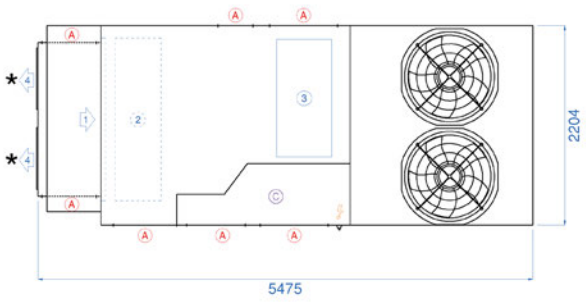
Dimensions and connections

SUPPLY AIR *on top*

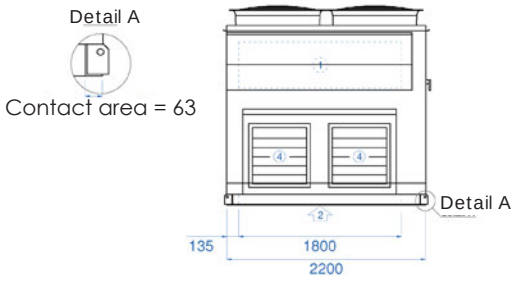
Front view:



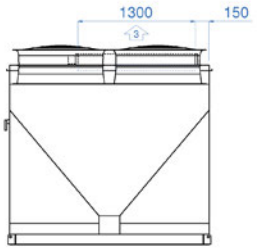
Top view :



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
④ Exhaust air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

* Minimum distance of 8 m between discharge and fesh air to avoid recirculation of stale air.

	Length	Width (1)	Height
Casing dimensions	5475 mm	2204 mm	1980 mm

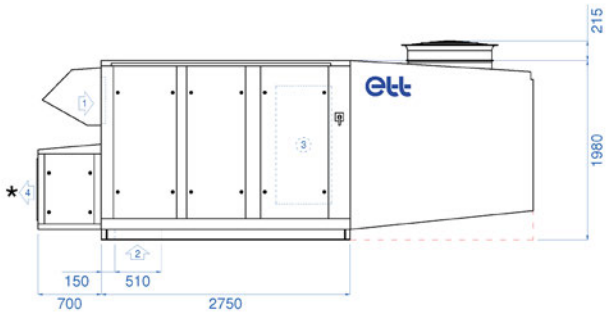
(1) Side return: +125 mm

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

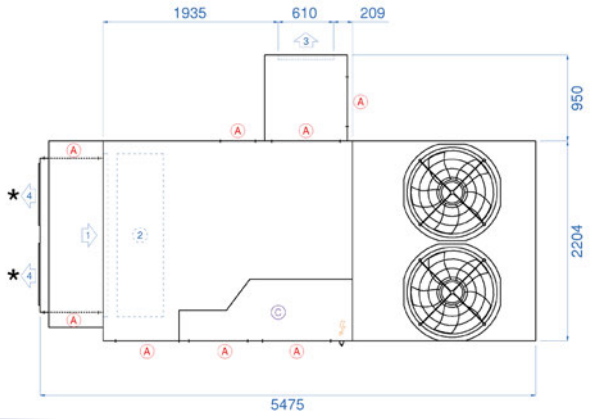
Dimensions and connections

Side *SUPPLY AIR*

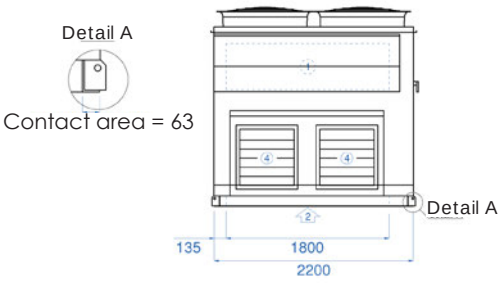
Front view:



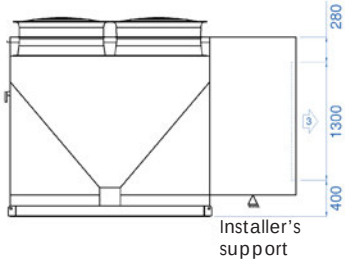
Top view :



Return side view:



Supply air side view :



* Minimum distance of 8 m between discharge and fesh air to avoid recirculation of stale air.

① Fresh air
② Return air
③ Supply air
④ Exhaust air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

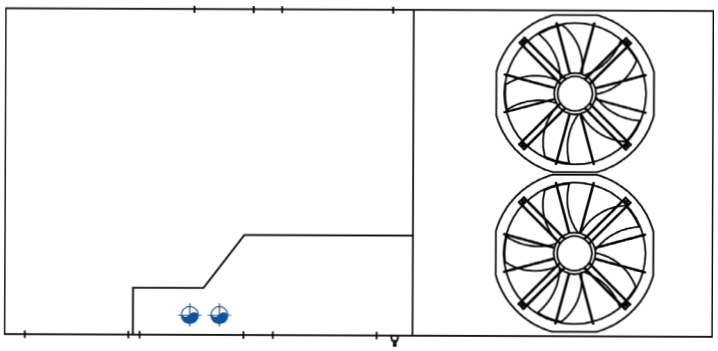
	Length	Width (1)	Height
Casing dimensions	5475 mm	2204 mm	1980 mm

(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.

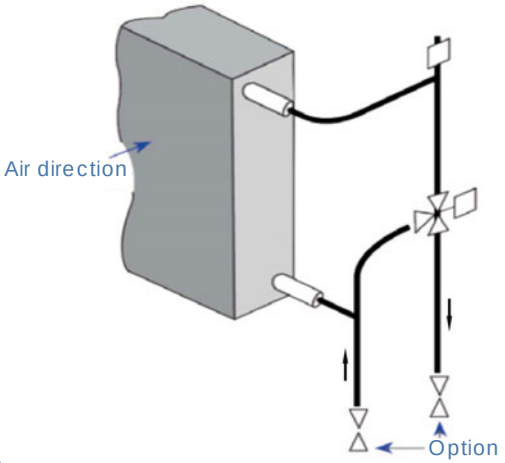
DIAGRAM AND CONNECTION

Top view



Connection diameter: 50/60 (2")

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

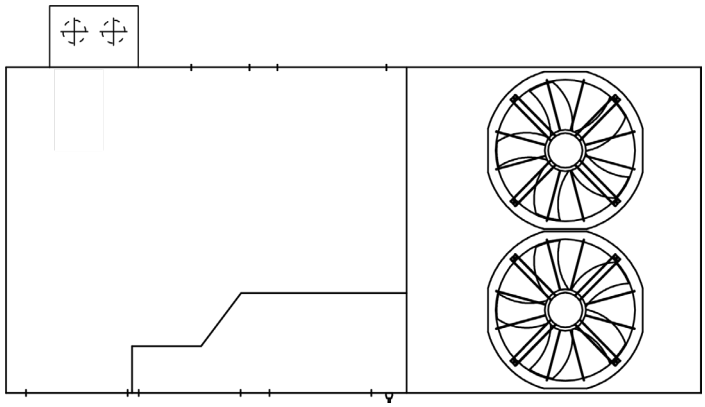
(1) With 3-WV option
(2) With 3-WV, VTA, VA option

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

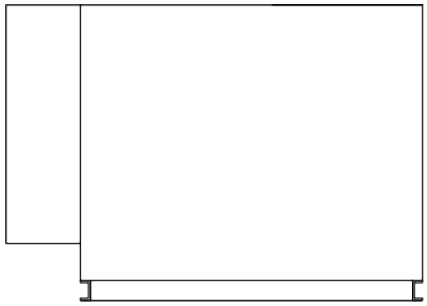
► Connection opposite the technical compartment.

Top view



Connection diameter: 50/60 (2")

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	130	140	150	160	180	200
VENTILATION	FLOW RATES								
	Rated air flow rate	m³/h	25,000	27,000	30,000	33,000	35,000	38,000	38,000
	Minimum air flow rate	m³/h	17,000	18,000	21,000	21,000	30,000	34,000	37,000
	Maximum air flow rate	m³/h	38,000	38,000	38,000	38,000	38,000	38,000	38,000
	ACOUSTICS (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	NOMINAL PERFORMANCES AT +35°C (1)								
	Net cooling capacity	kW	109.3	123.9	132.0	144.4	161.2	177.4	183.9
	Net EER	kW/kW	3.56	3.46	3.41	3.29	3.18	3.04	3.07
	SEASONAL EFFICIENCY (2)								
	Net design cooling capacity	kW	109.3	123.9	132.0	144.4	161.2	177.4	183.9
	SEER	kW/kW	5.30	5.10	5.20	5.05	4.80	4.58	4.72
	ηs,C	%	209	201	205	199	189	180	186
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	4.23	4.10	4.18	4.03	3.70	3.40	3.64
	ηs,H	%	166	161	164	158	145	133	143
GENERAL INFORMATION	ELECTRICAL DATA								
	Total installed electrical power (4)	kW	65.7	70.9	76.2	81.6	92.6	101.1	105.8
	Total installed electrical current (4)	kW	105.8	114.1	121.3	130.4	148.5	160.3	168.6
	Starting current	A	236.0	318.8	326.1	372.8	390.9	413.4	433.6
	Maximum absorbed electrical power (5)	kW	41.8	48.8	51.2	58.5	65.2	72.7	72.5
	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	2,111	2,193	2,246	2,257	2,280	2,428	2,409
	Weight of connecting roof curb	kg				163			
	Weight of standard ventilated roof curb	kg				228			

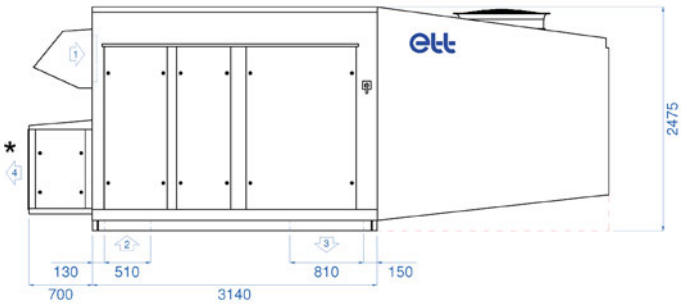
(1) In accordance with EN 14511.
Air-conditioning mode: inside conditions: +27°C DB/+19°C WB and outside conditions: +35°C DB / 24°C WB
Heating mode: Inside conditions: +20°C DB/+12°C WB and outside conditions: +7°C DB / +6°C WB.
(2) According to EcoDesign regulations 2016/2281.
(3) In accordance with EN 14511.
Heating mode: Inside conditions: +20°C DB and outside conditions: -7°C DB / -8°C WB.
(4) Three-phase power supply 400V - 50 Hz + ground 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: inside 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. 100 Pa pressure available at return + rejection.
(6) For indoor conditions: +27°C DB /+19°C WB at nominal air flow.
(7) Weight for an available pressure of 400 Pa for return + supply, 100 Pa for return + rejection.
(8) For an extract airflow = 100% of the nominal supply airflow, 100 Pa static pressure available at extraction.

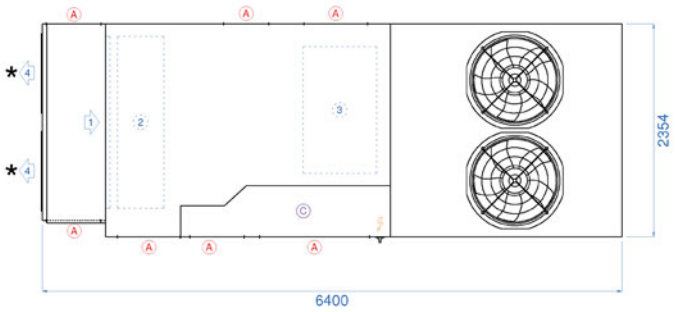
Dimensions and connections

SUPPLY AIR *underneath*

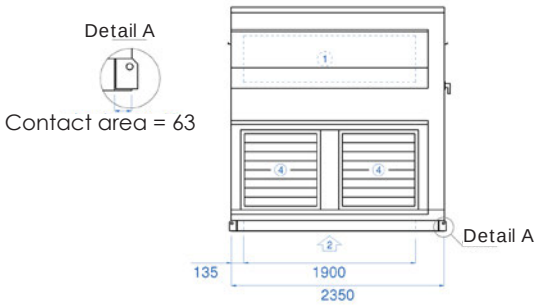
Front view:



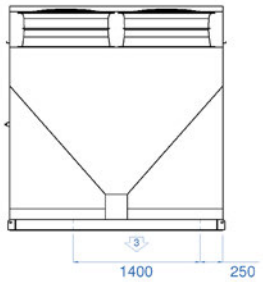
Top view :



Return side view:



Supply air side view :



* Minimum distance of 8 m between discharge and fesh air to avoid recirculation of stale air.

① Fresh air
② Return air
③ Supply air
④ Exhaust 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

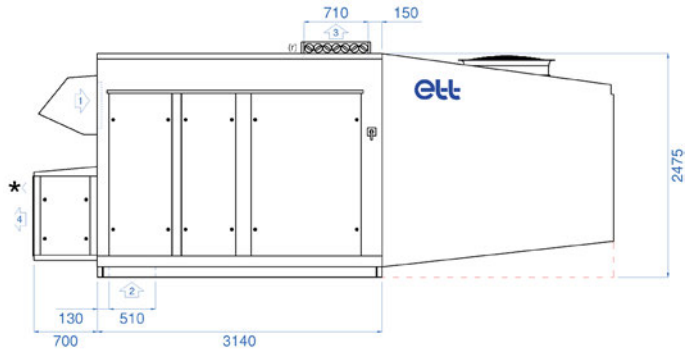
(1) Side return: +125 mm

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

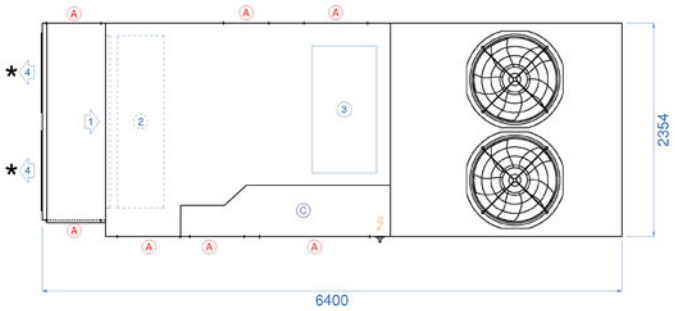
Dimensions and connections

SUPPLY AIR *on top*

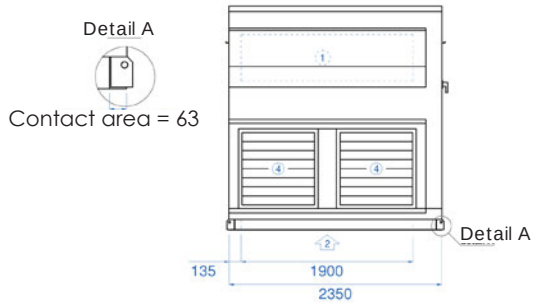
Front view:



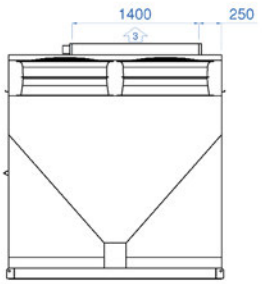
Top view :



Return side view:



Supply air side view :



* Minimum distance of 8 m between discharge and fesh air to avoid recirculation of stale air.

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② Return air
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④ Exhaust air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

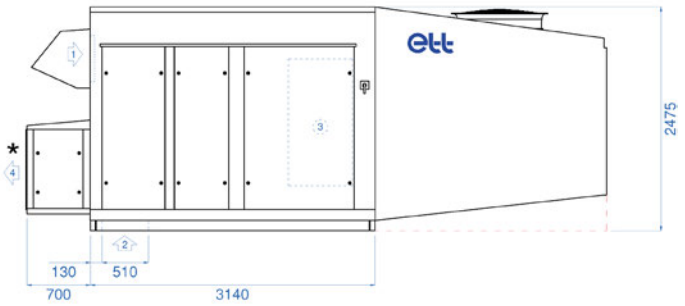
	Length	Width (1)	Height
Casing dimensions	6605 mm	2350 mm	2475 mm

(1) Side return: +125 mm

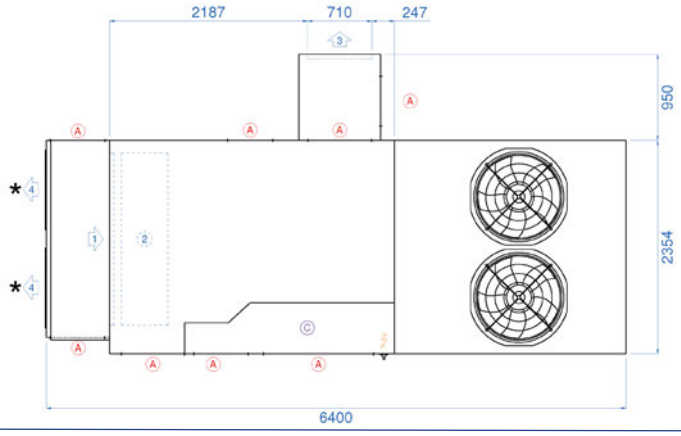
Note: fresh air cowls shall be installed by the installer.

Side *SUPPLY AIR*

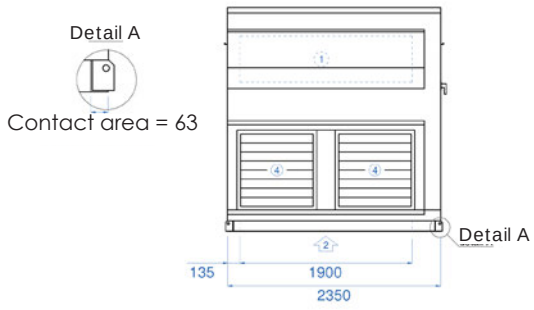
Front view:



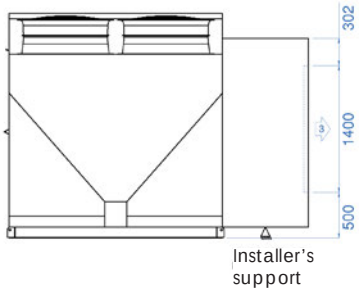
Top view :



Return side view:



Supply air side view :



* Minimum distance of 8 m between discharge and fesh air to avoid recirculation of stale air.

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② Return air
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Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

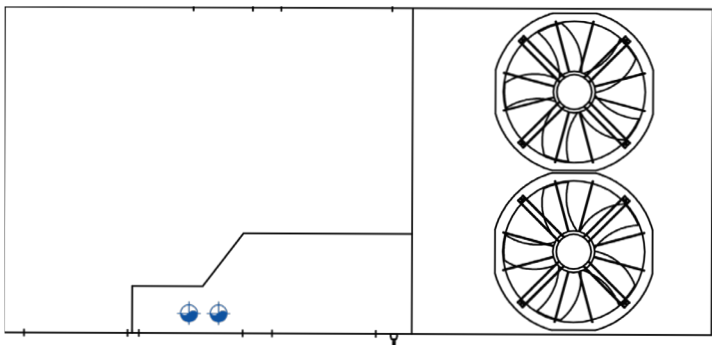
	Length	Width (1)	Height
Casing dimensions	6605 mm	2350 mm	2475 mm

(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.

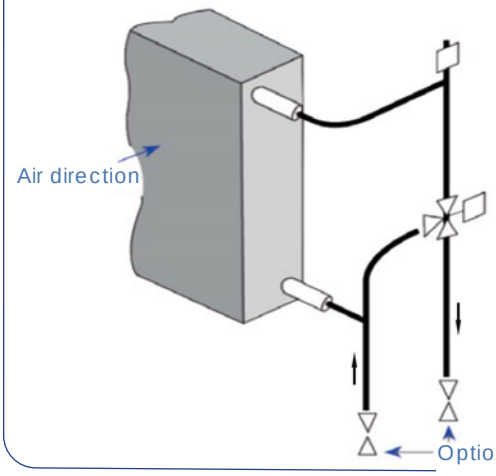
DIAGRAM AND CONNECTION

Top view



Connection diameter: 50/60 (2")

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

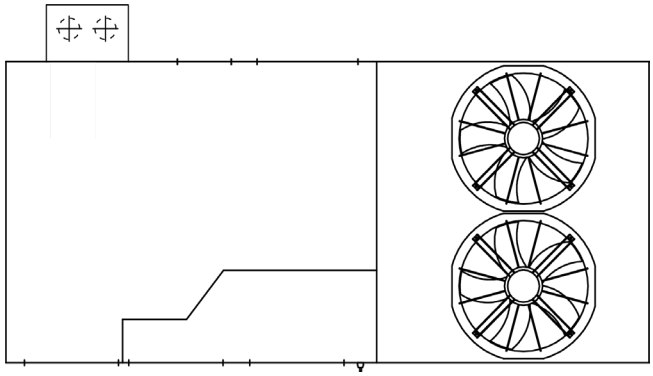
(1) With 3-WV option
(2) With 3-WV, VTA, VA option

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

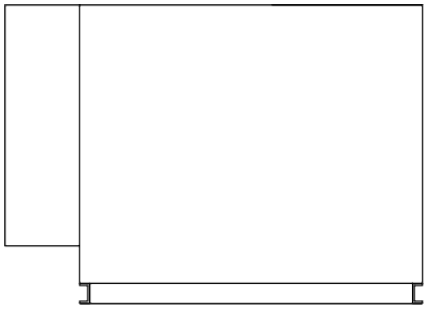
► Connection opposite the technical compartment.

Top view



Connection diameter: 50/60 (2")

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	38,000	42,000	46,000	50,000	54,000	54,000
	Minimum air flow rate	m³/h	24,000	26,000	30,000	36,000	46,000	52,000
	Maximum air flow rate	m³/h	54,000	54,000	54,000	54,000	54,000	54,000
	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	NOMINAL PERFORMANCES AT +35°C (1)							
	Net cooling capacity	kW	168.3	190.5	211.2	231.5	254.8	274.5
	Net EER	kW/kW	3.52	3.40	3.30	3.21	3.08	2.97
	SEASONAL EFFICIENCY (2)							
	Net design cooling capacity	kW	168.3	190.5	211.2	231.5	254.8	274.5
	SEER	kW/kW	6.35	5.68	5.63	5.13	5.15	4.88
	ηs,C	%	251%	224%	222%	202%	203%	192%
HEATING PERFORMANCE	RATED PERFORMANCE AT +7°C (1)							
	Net heating capacity	kW	164.8	186.6	210.3	233.9	260.5	286.2
	Net COP	kW/kW	4.43	4.22	4.27	4.07	3.92	3.70
	RATED PERFORMANCE AT -7°C (3)							
	Net heating capacity	kW	114.3	129.7	145.8	162.9	181.5	200.3
	Net COP	kW/kW	3.54	3.42	3.38	3.28	3.17	3.01
	SEASONAL EFFICIENCY (2)							
	Net design heat output	kW	152.9	174.5	181.2	202.6	225.6	248.0
	SCOP	kW/kW	4.65	4.38	4.38	4.15	4.10	3.83
	ηs,H	%	183%	172%	172%	163%	161%	150%
GENERAL INFORMATION	ELECTRICAL DATA							
	Total installed electrical power (4)	kW	101.1	111.8	120.4	137.4	157.8	168.6
	Total installed electrical current (4)	kW	164.8	188.4	199.0	222.8	256.8	274.8
	Starting current	A	295.0	331.6	403.7	427.5	499.2	517.2
	Maximum absorbed electrical power (5)	kW	62.9	74.6	85.6	95.8	106.4	114.7
	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	3,030	3,045	3,139	3,206	3,230	3,230
	Weight of connecting roof curb	kg	210					
	Weight of standard ventilated roof curb	kg	294					

(1) In accordance with EN 14511.
Air-conditioning mode: inside conditions: +27°C DB/+19°C WB and outside conditions: +35°C DB / 24°C WB
Heating mode: Inside conditions: +20°C DB/+12°C WB and outside conditions: +7°C DB / +6°C WB.

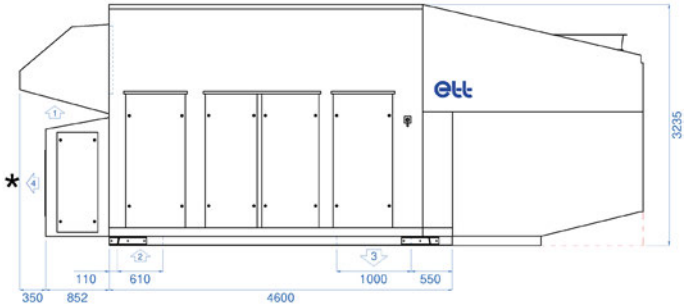
(2) According to EcoDesign regulations 2016/2281.
(3) In accordance with EN 14511.
Heating mode: Inside conditions: +20°C DB and outside conditions: -7°C DB / -8°C WB.
(4) Three-phase power supply 400V - 50 Hz + ground without neutral.
The values given do not include any options and may change during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

(5) Cooling Mode: inside 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. 100 Pa pressure available at return + rejection.
(6) For indoor conditions: +27°C DB /+19°C WB at nominal air flow.
(7) Weight for an available pressure of 400 Pa for return + supply, 100 Pa for return + rejection.
(8) For an extract airflow = 100% of the nominal supply airflow, 100 Pa static pressure available at extraction.

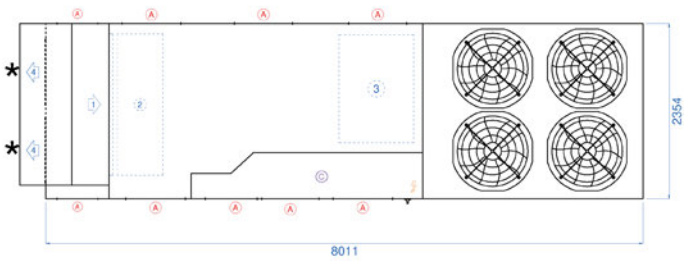
Dimensions and connections

SUPPLY AIR *underneath*

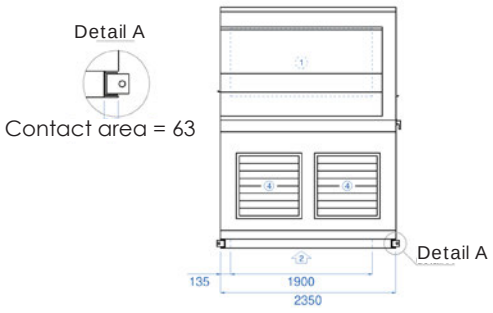
Front view:



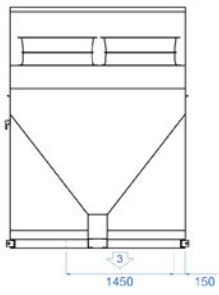
Top view :



Return side view:



Supply air side view :



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① Fresh air
② Return air
③ Supply air
④ Exhaust air
⚡ Power supply
Ⓐ Access
Ⓒ Technical section
--- Allow at least 400 mm of air space under the machine.

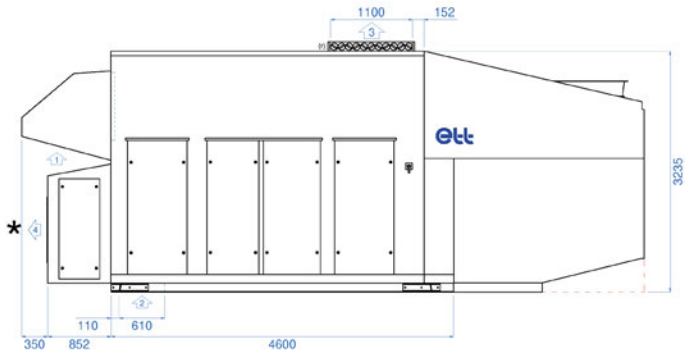
	Length	Width (1)	Height
Casing dimensions	7965 mm	2350 mm	3225 mm

(1) Side return: +125 mm

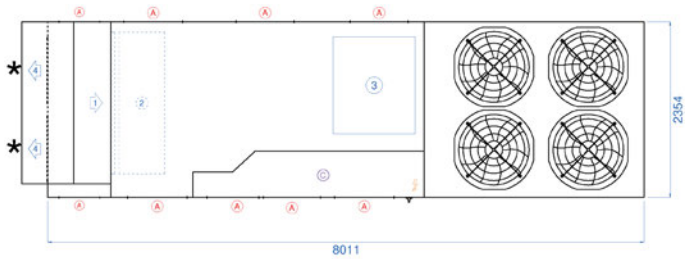
Note: fresh air cowls shall be installed by the installer.

SUPPLY AIR *on top*

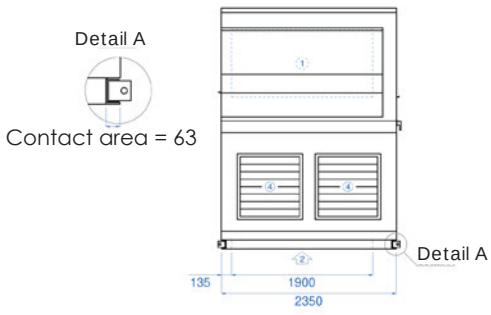
Front view:



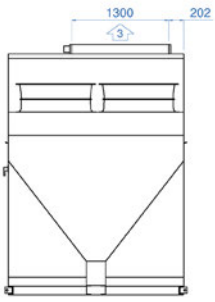
Top view :



Return side view:



Supply air side view :



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Casing dimensions	7965 mm	2350 mm	3225 mm

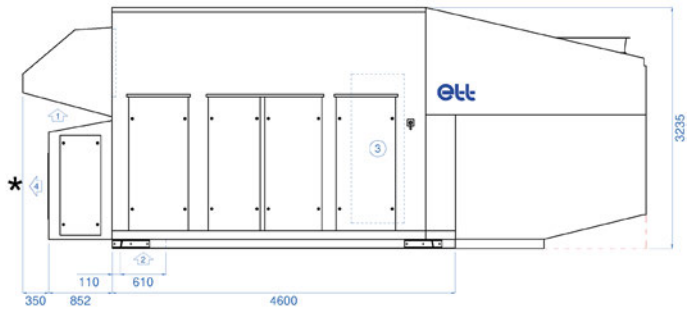
(1) Side return: +125 mm

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

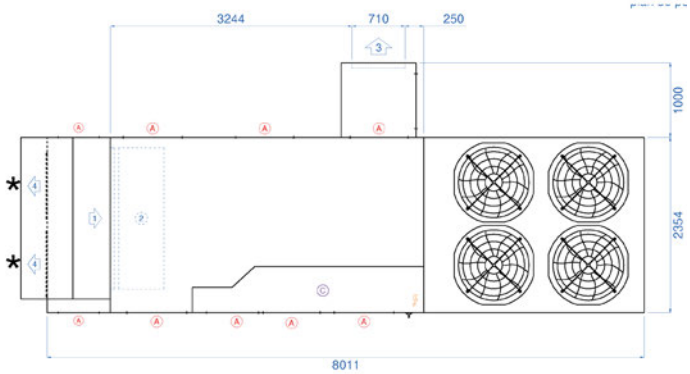
Dimensions and connections

Side*SUPPLY AIR*

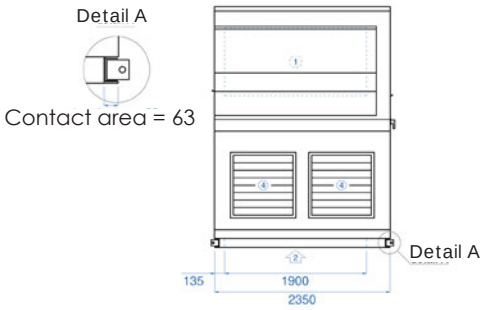
Front view:



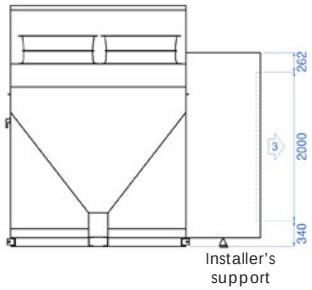
Top view :



Return side view:



Supply air side view :



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

* Minimum distance of 8 m between discharge and fesh air to avoid recirculation of stale air.

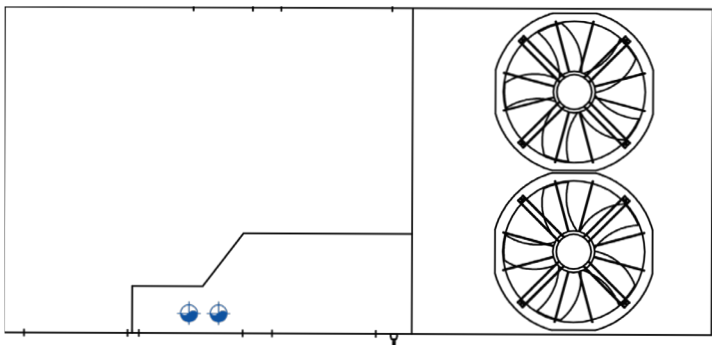
	Length	Width (1)	Height
Casing dimensions	7965 mm	2350 mm	3225 mm

(1) Side return: +125 mm

Note: - 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.

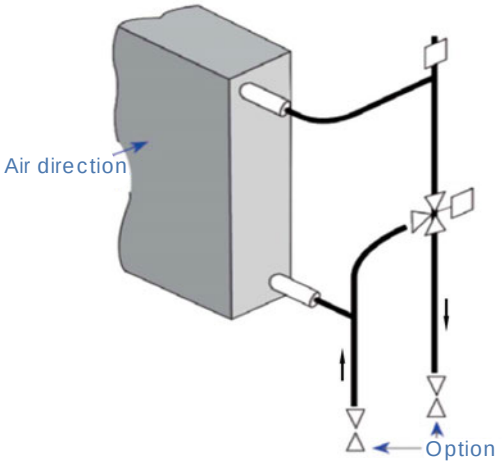
DIAGRAM AND CONNECTION

Top view



Connection diameter: 50/60 (2")

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

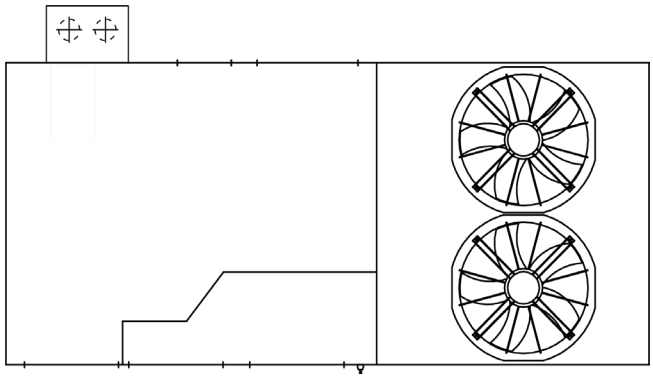
(1) With 3-WV option
(2) With 3-WV, VTA, VA option

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

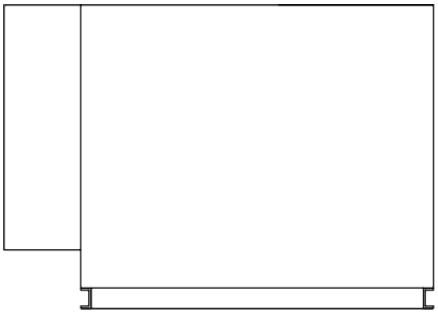
► Connection opposite the technical compartment.

Top view



Connection diameter: 50/60 (2")

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

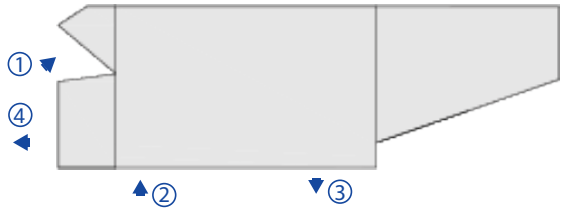
(1) With 3-WV option
(2) With 3-WV, VTA, VA option

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.

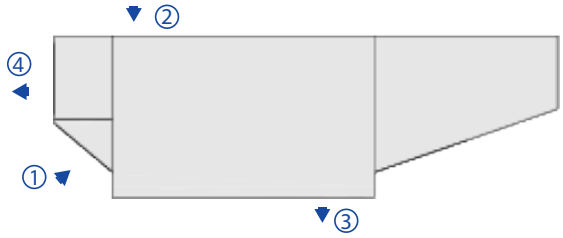
Aeraulic arrangements

Downward *supply air*

Arrangement 1.1

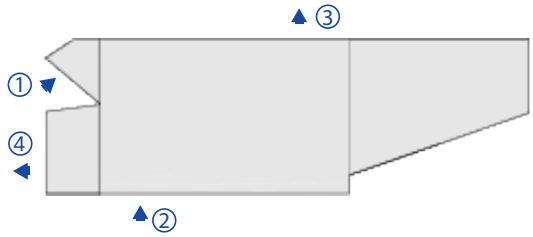


Arrangement 1.3

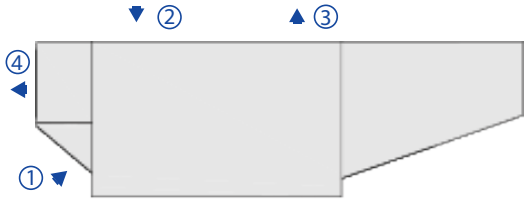


Upward *supply air*

Arrangement 2.1

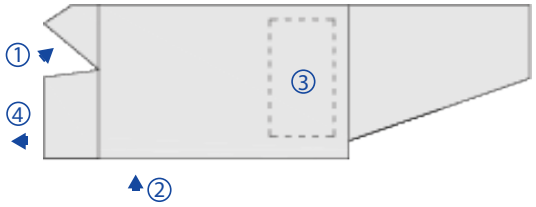


Arrangement 2.3

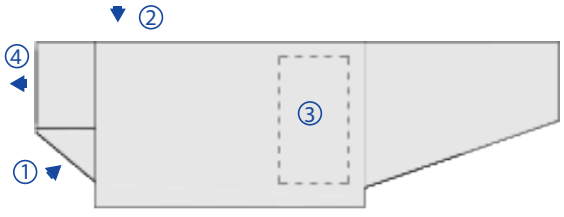


Side *supply air*

Arrangement 3.1



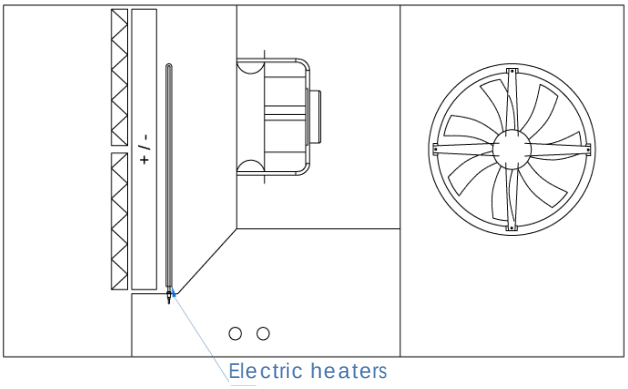
Arrangement 3.3



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

Auxiliaries: Sequential electric coils

SCHEMATIC DIAGRAM



POWER AVAILABLE (in kW)

Total power (kW)	Current (A)	1st stage	2nd stage	ULTI+ R32 01 EX	ULTI+ R32 11 EX	ULTI+ R32 12 EX	ULTI+ R32 21 EX	ULTI+ R32 22 EX	ULTI+ R32 23 EX	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

Nota: For higher power ratings, please contact us.

Weight of options (in kg)

Options	Ulti+ R32 01 EX	Ulti+ R32 11 EX	Ulti+ R32 12 EX	Ulti+ R32 21 EX	Ulti+ R32 22 EX	Ulti+ R32 23 EX
Frame - Casing						
Unit with vertical (V) or lateral (L) supply air	31	55	73	84	119	169
Double skin 50mm	28	40	54	70	97	152
Fresh air cowl	7	9	10	19	20	20
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.

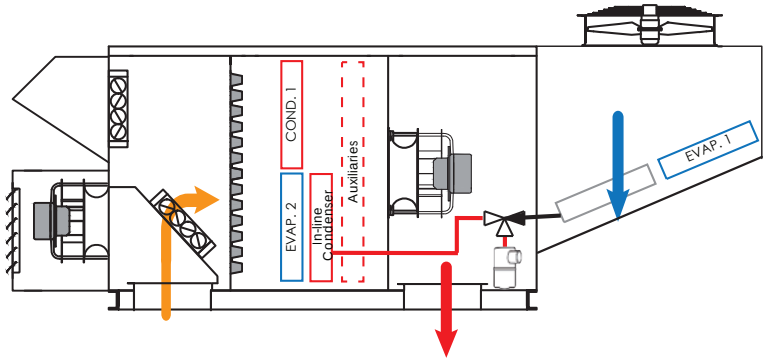
The return air passes over the evaporator(s) where the humidity in the air is condensed.

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.

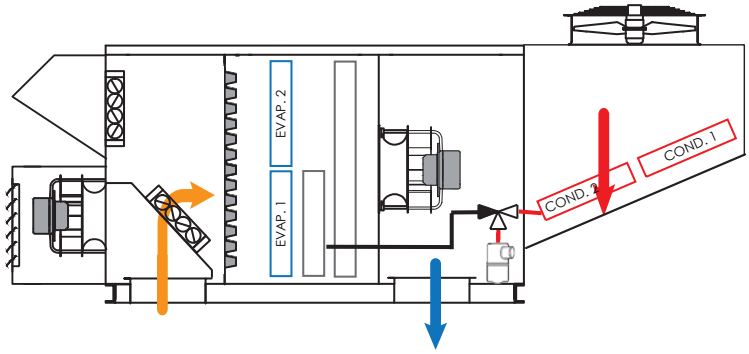
The heat can also be rejected to the outdoor condenser (summer).

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

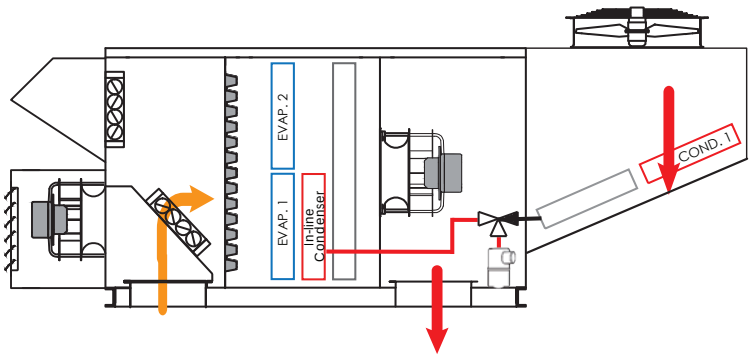
Winter



Summer



Mid-season



Dehumidification option
with heat recovery by in-line condenser

LEVELS OF OPTIONS PER CIRCUIT

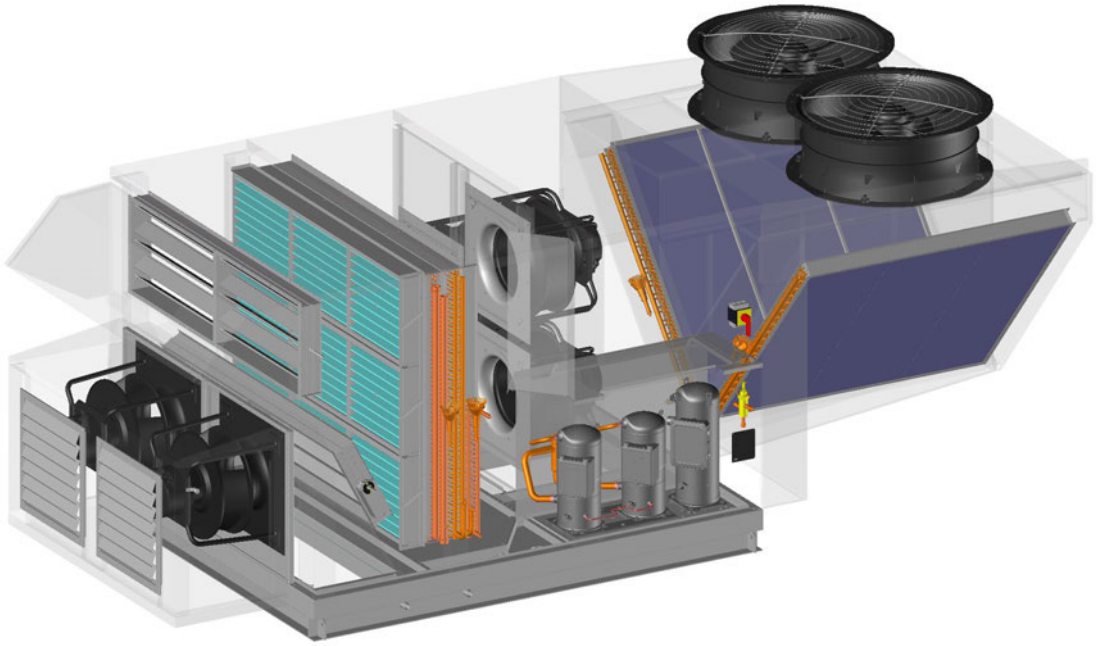
Level 1:

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 EX		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 EX		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 EX		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 EX		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 EX		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 EX		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%.

Sensors connection principle

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

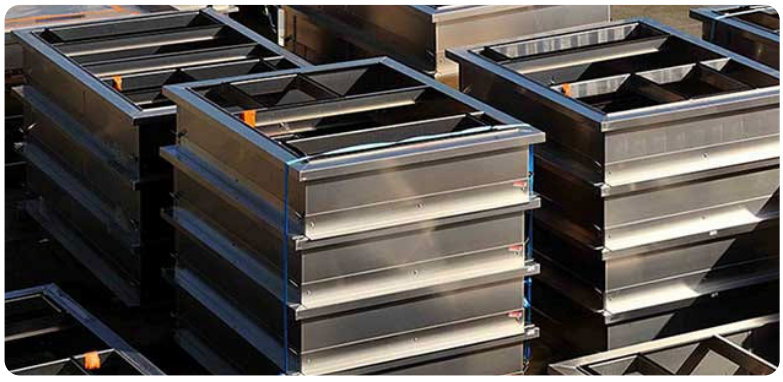
In addition to the 7 points listed for the "adjustable connecting curb":

- 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:

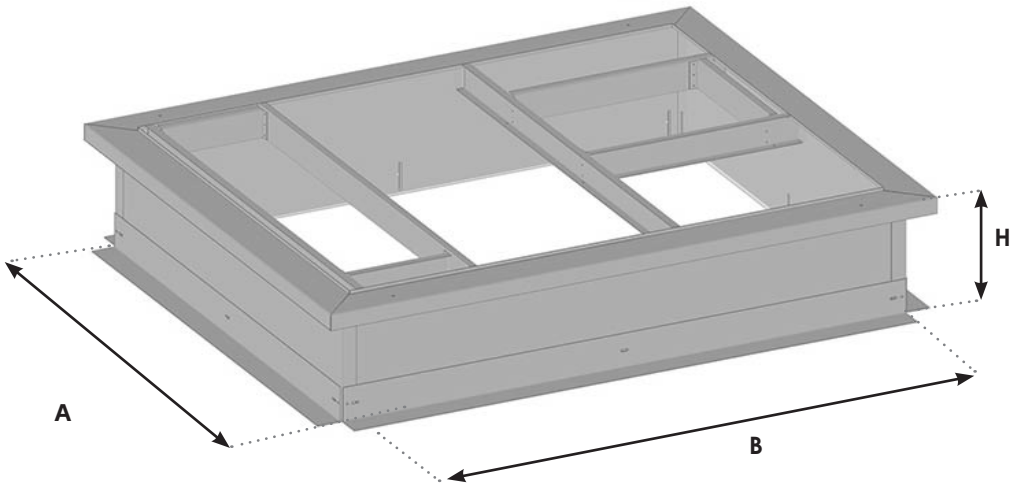
on existing header or curb

- 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):

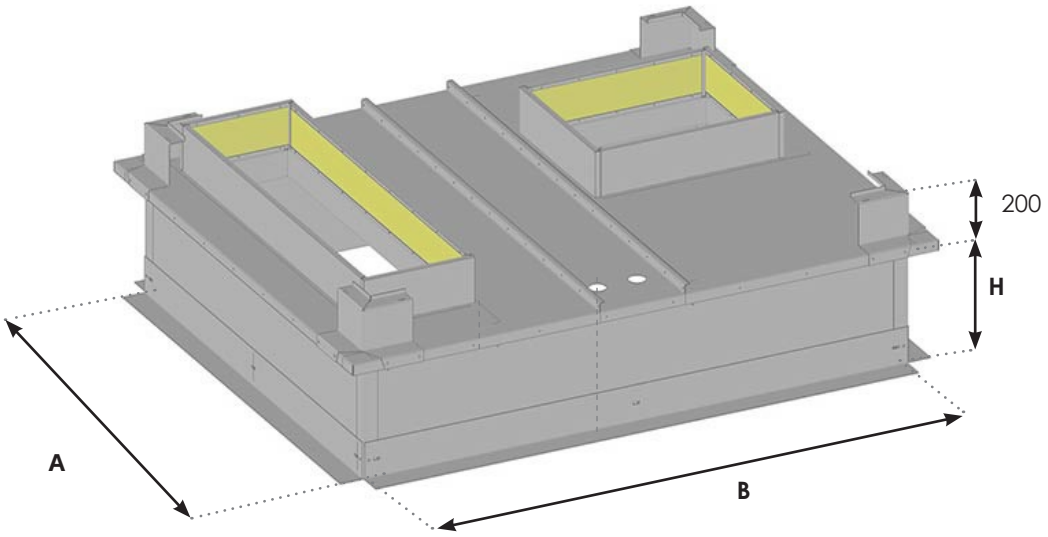
- the value of the slope of your roof in %,
- the direction of the slope
- the orientation of the machine in relation to the slope of the building
- the thickness of the waterproofing complex (insulation + steel deck + membrane)

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 EX	1,320	1,970	550	1,524	2,168	768	5.0	7.5	102
ULTI+ R32 11 EX	1,700	1,970	550	1,904	2,168	763	5.0	5.8	112
ULTI+ R32 12 EX	1,970	2,450	600	2,174	2,648	818	5.0	6.2	146
ULTI+ R32 21 EX	2,220	2,770	600	2,424	2,968	818	5.0	6.2	169
ULTI+ R32 22 EX	2,370	3,160	600	2,574	3,358	818	5.0	6.7	228
ULTI+ R32 23 EX	2,370	4,020	650	2,576	4,418	868	5.0	8.5	294

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)

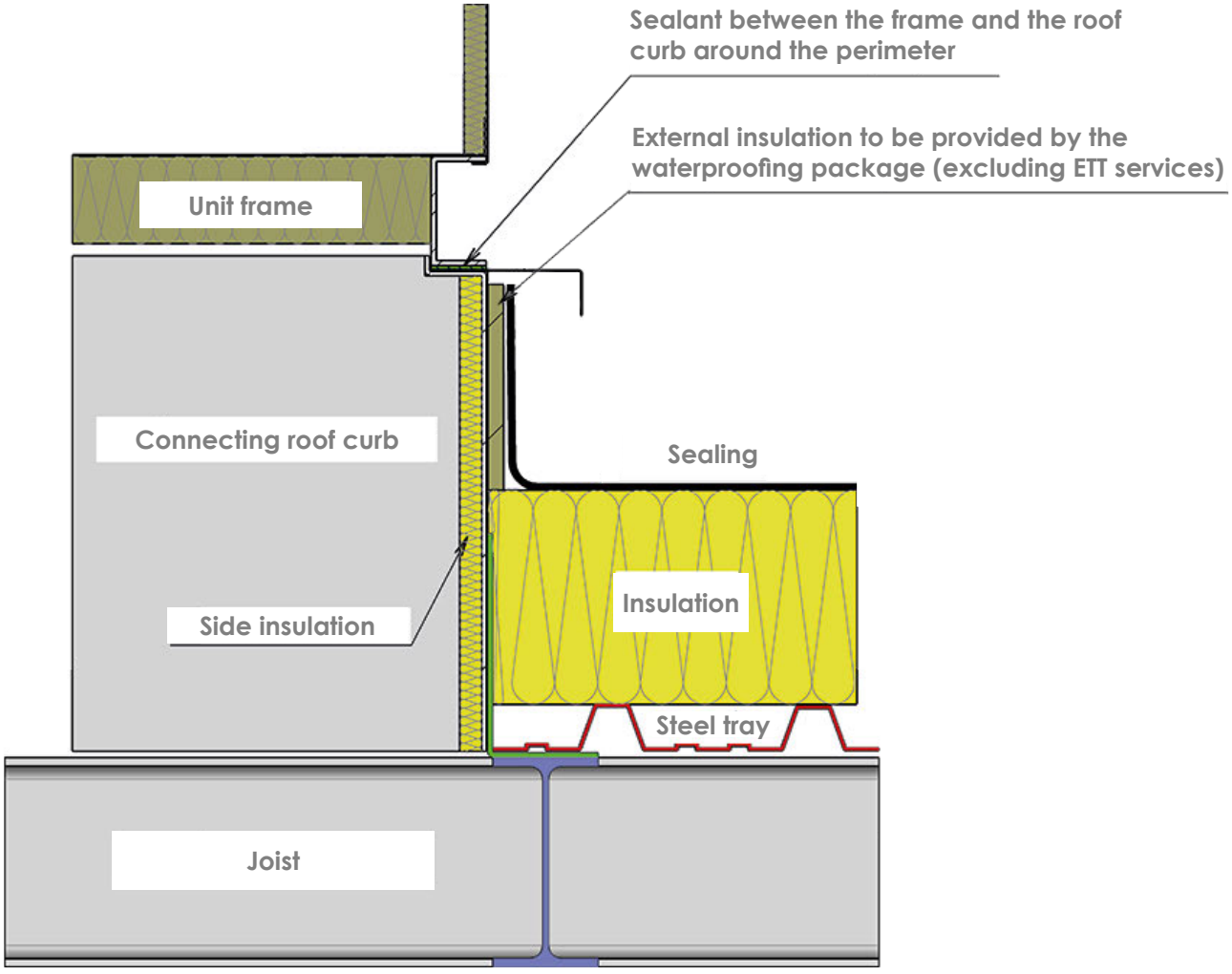
The roof curbs must be counter-drilled after assembly. **The machine must be bolted to the roof curb.**

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 EX	1,320	1,970	550	1,524	2,168	768	5.0	7.5	102
ULTI+ R32 11 EX	1,700	1,970	550	1,904	2,168	763	5.0	5.8	112
ULTI+ R32 12 EX	1,970	2,450	600	2,174	2,648	818	5.0	6.2	146
ULTI+ R32 21 EX	2,220	2,770	600	2,424	2,968	818	5.0	6.2	169
ULTI+ R32 22 EX	2,370	3,160	600	2,574	3,358	818	5.0	6.7	228
ULTI+ R32 23 EX	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):

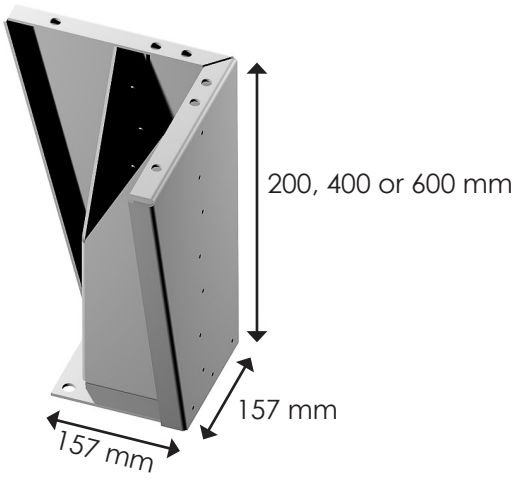


Note: The curbs are designed for a maximum total height of 345 mm of steel tray and insulation.
To maintain a standard curb height (refer to the curb drawing), you need to check that, depending on the slope of the roof on site, the 'insulation and steel tray' height dimension leaves sufficient insulation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

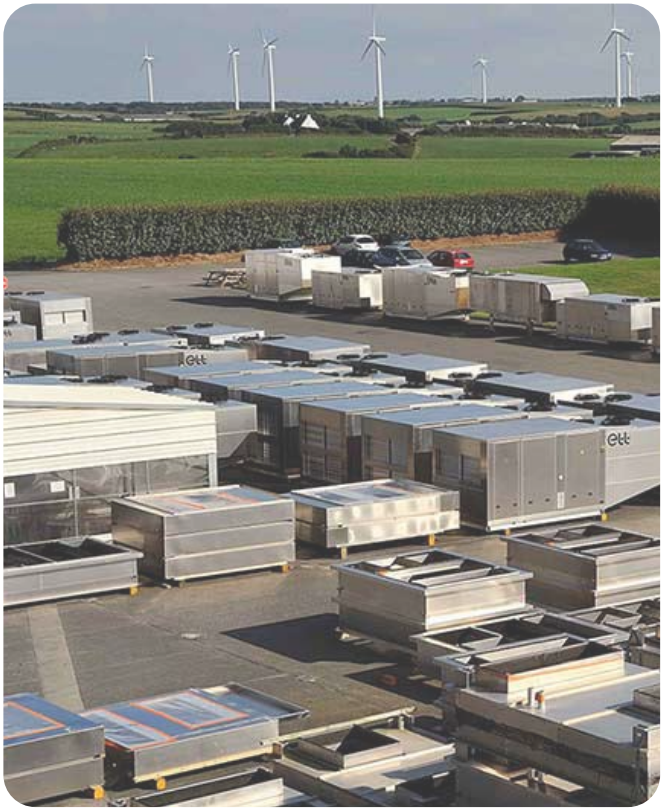
Aluminium fixed foot
Unit weight: 1 kg

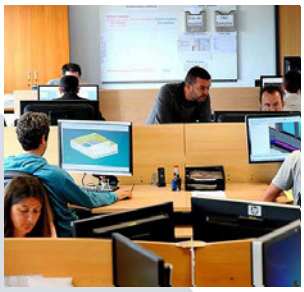


The feet are mounted on the corners of the frame. For ULTI+R32 EX, two additional feet are required in the centre of the casing.

	ULTI+ R32 01 EX	ULTI+ R32 11 EX	ULTI+ R32 12 EX	ULTI+ R32 21 EX	ULTI+ R3 22 EX	ULTI+ R32 23 EX
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_38-EN_H

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