CLIMATIC
ENVIRONMENT
SOLUTIONS
AND EQUIPMENT

Green Line

ULTI+ R32 OR

R32

Single-flow heat pump with water loop

MADE IN FRANCE

www.ett-hvac.com

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

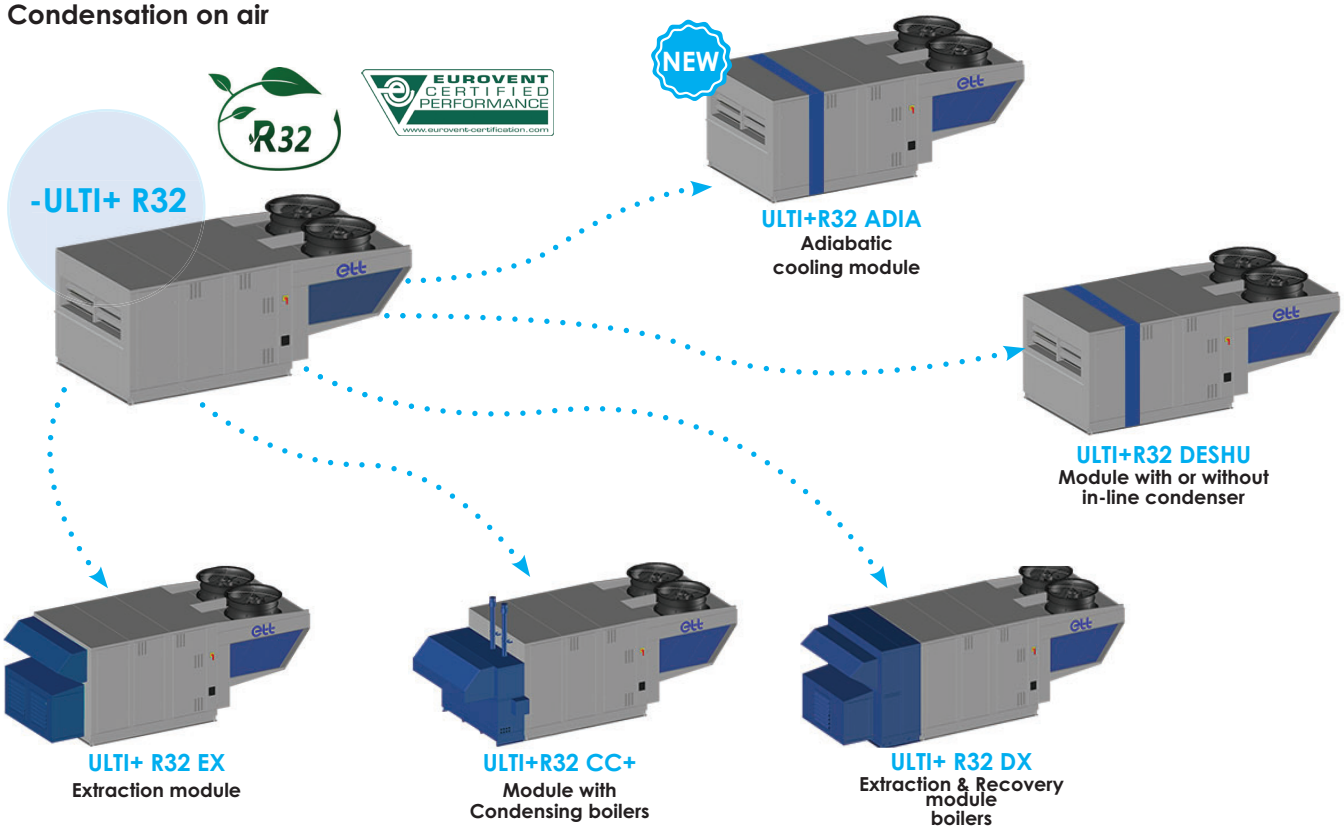
The ULTIMA Green Line is **ETT's latest-generation** modular rooftop range. It combines **quality materials, performance, energy savings, acoustics, regulation and new-generation connected components** to ensure that the units operate at optimum efficiency at all times.

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

The modular design allows for easy expansion of this range's capacities. 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, dehumidifier, adiabatic module, OR module) to this packaged unit in order to adjust the unit's performance to the environment and the requirements of the application.

ULTIMA Green Line modular principle

Condensation on air



Condensation on water

ENERGIE TRANSFERT THERMIQUE

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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

GOLD | Top 5% ecovadis Sustainability Rating JAN 2025

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

ISO 14001 ISO 9001

- **Certificate of competence for handling refrigerants**
- **Membership of the UN Global Compact**
- **Qualiopi certification** for our training centre

Qualiopi processus certifié RÉPUBLIQUE FRANÇAISE
La certification qualité a été délivrée au titre de la catégorie d'action suivante : Actions de formation

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

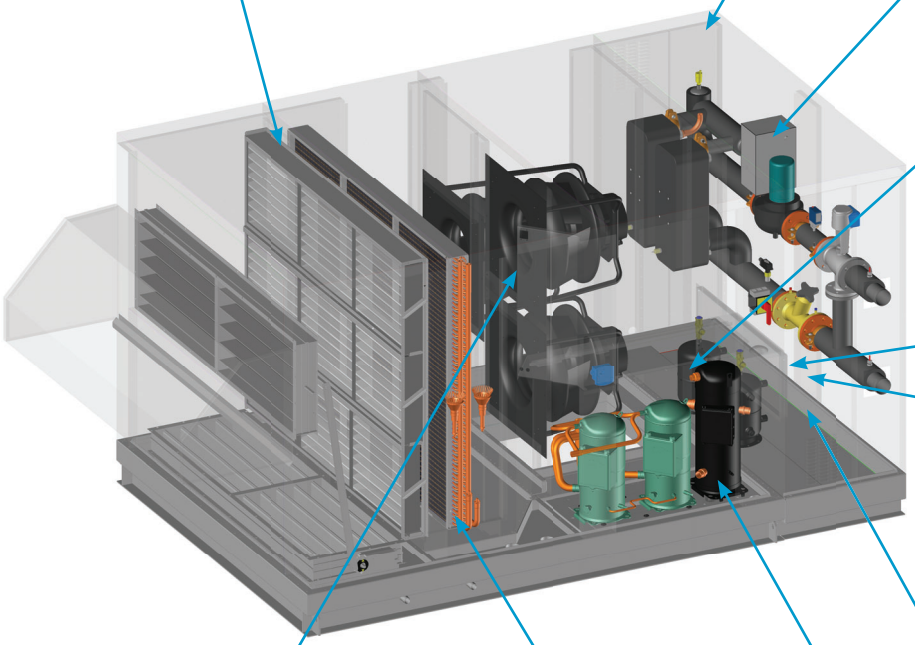
SERVICE LINK

Unit description

Eco-design filtration
- Low pressure drop.
- Analogue clogging controller.
- Options ISO Coarse 65% (G4) refillable , ISO ePM10 50% (M5), ISO Coarse 65% (G4) + ISO ePM1 50% (F7), ISO Coarse 65% (G4) + ISO ePM1 80% (F9), ISO ePM1 50% (F7), ISO ePM1 80% (F9).

AG3 Aluminium frame and casing assembly
- Optimised tightness and thermal insulation.
- Low weight, for new build and refurbishment projects.
- Multiple airflow configurations available.
- 20-year anti-corrosion warranty.

Hydraulic assembly
consisting of one or two brazed plate heat exchangers, a control valve and a water flow controller as standard.
Optional pump and/or 3-way valve



Leak detection
Reduces the number of periodic inspections.

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

New generation PLC with display
Control enabling optimum operation in all conditions.

Internal fans
- Variable-speed fans with air 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.

Thermal heat exchangers
- Optimized heat exchanger for improved energy performance.
- Vinyl option available.

Multi-stage circuit with R32 new generation compressors
- Optimum performance whatever the partial load.
- Electronic expansion valves.

R32

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

Unit description

Energy
savings

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

Thanks to its design, ULTI+ R32 OR 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 warranty
- 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 layouts**, to meet integration requirements

Connected components
New Generation PLC

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

R32 fluid
Low GWP

- New **ULTIMA Green Line** range with R32, a low GWP fluid (675).
- **Plays an active role in meeting the CO_2** equivalent tonnage quota, a legal obligation imposed on gas producers/importers.
- Minimizes the impact on the greenhouse effect.

Indoor
air quality

- Eco-Design filtration.
- Optimised casing with high performance tightness level.
- CO_2 sensor controlling the supply of fresh air.
- **Quick and easy filter replacement**

Water loop
operation

- Compatible with a wide range of water loop temperatures.
- Return temperature of 10 to 25 °C in winter and 20 to 50 °C in summer.
- Control valve for controlling and optimising water flow.
- 2 maintenance doors for easy access.

ETT goes the extra mile...

Installation

- Outside on a roof or on the ground, or in a technical room.

ETT Services

- 5-year basic warranty.
- A team to guide you from commissioning to operational support
- Manufacturer visits and audits
- Installation optimisation and retrofit
- Service contracts (comfort - tranquillity - serenity - à la carte).
- Training your teams.
- Access to the ETT Services hotline

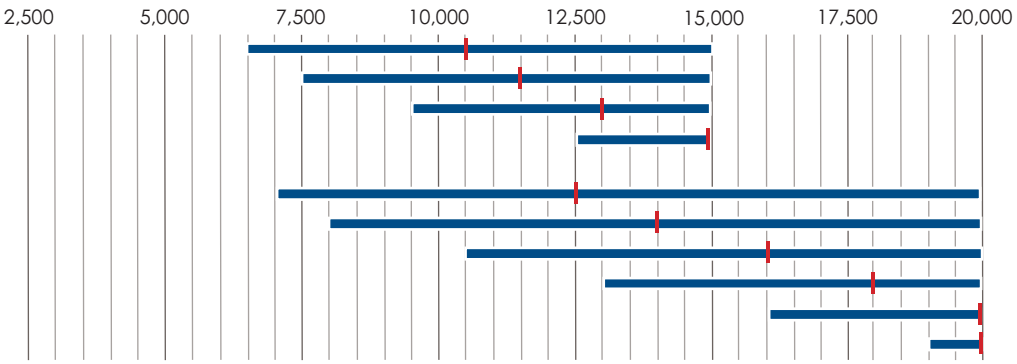
myETTvision platform

myETTvision allows you to control and optimize your installation remotely.

A WIDE RANGE

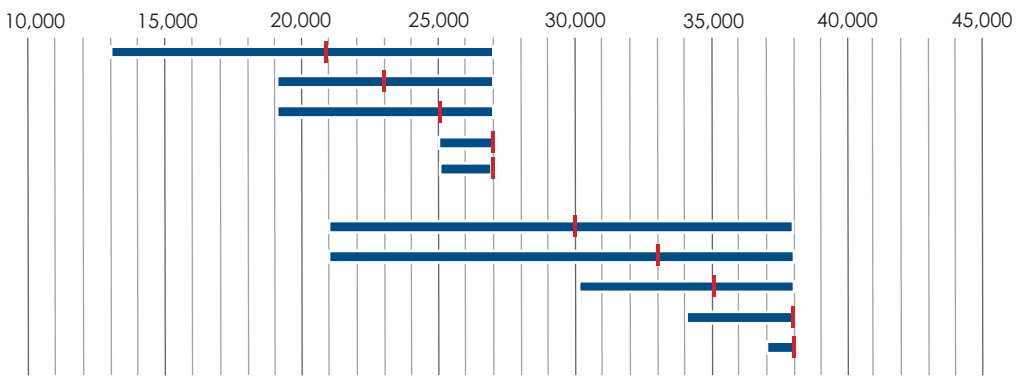
Flow rate range (m^3/h) & rated flow rate (|)

Unit	Power*
ULTI+R32 OR 11-050	48
ULTI+R32 OR 11-055	52
ULTI+R32 OR 11-065	58
ULTI+R32 OR 11-075	67
ULTI+R32 OR 12-055	55
ULTI+R32 OR 12-065	62
ULTI+R32 OR 12-075	71
ULTI+R32 OR 12-080	78
ULTI+R32 OR 12-090	87
ULTI+R32 OR 12-100	95



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

Unit	Power*
ULTI+R32 OR 21-095	93
ULTI+R32 OR 21-110	100
ULTI+R32 OR 21-115	112
ULTI+R32 OR 21-130	127
ULTI+R32 OR 21-140	134
ULTI+R32 OR 22-140	122
ULTI+R32 OR 22-150	139
ULTI+R32 OR 22-160	147
ULTI+R32 OR 22-180	161
ULTI+R32 OR 22-200	177



* Thermodynamic cooling capacity

Operating principles

The machine operates as a reversible heat pump:

> Source: water loop

> Fluid handled: inside and/or outside air

Operating modes can be:

> Heating by heat pump and / or heat recovery coil

> Cooling

> Free Cooling: cooling using outside air, without thermodynamics

> Recycling

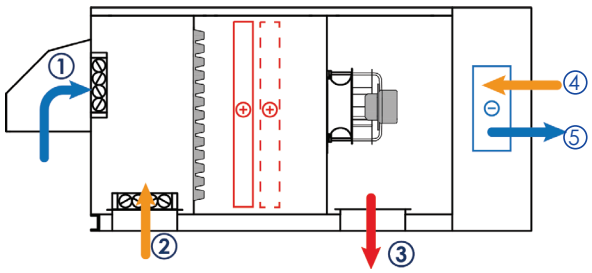
In these modes, the unit can operate:

> With all recirculated air

> In all fresh air mode

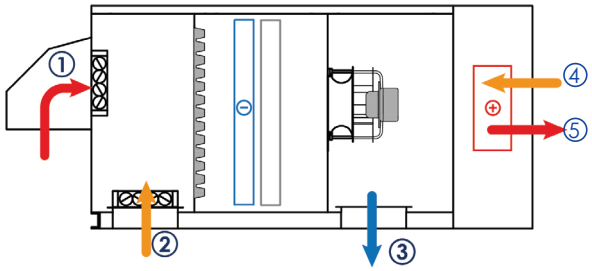
> In mixed air mode

Heating Mode



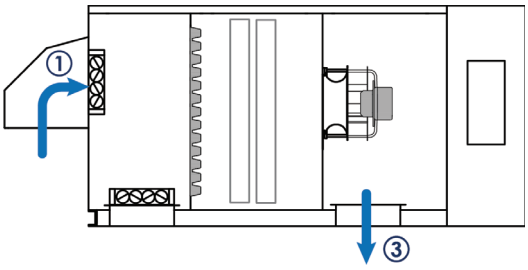
Heating Mode: Comfort temperature maintained in winter by the thermodynamic system and by the auxiliary heaters (optional).

Cooling Mode



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

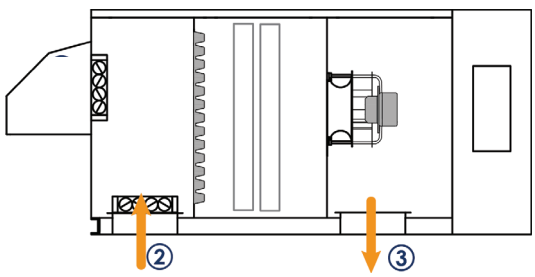
Free Cooling Mode



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** delaying the start-up of the thermodynamic system.

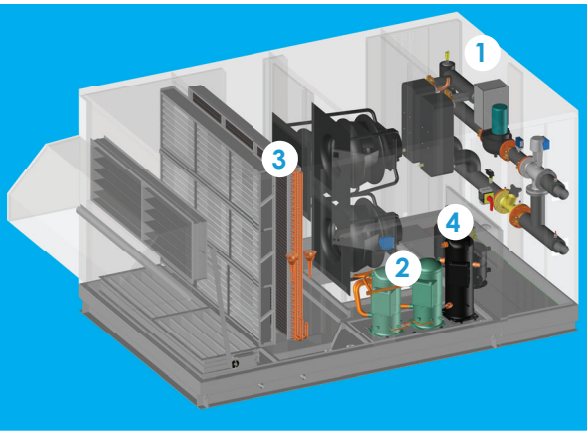
Recycling Mode



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

① Fresh air ② Return air ③ Supply air ④ Water return ⑤ Water supply

Detailed components of the unit



The ETT packaged unit includes 4 different compartments:

1. A hydraulic compartment, to ensure heat exchange with the water loop.
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 (IP44).

Aluminium frame and casing assembly :

- **Equipped with a low-load 2-damper mixing box with motorised aluminium dampers, featuring Class 3 Upstream-Downstream airtightness and Class B airtightness (according to EN1751) the ULTI+ R32 OR allows:**
  - ✓ Optimised fresh air supply dosage, combined with the CO_2 sensor.
  - ✓ Switching to Free Cooling mode, delaying the operation of the thermodynamic unit, for significant energy savings.
  - ✓ **Perfect weather resistance, 20-year anti corrosion guarantee on casing.**
- **Watertight floor** with drainage outlets around the unit, connected to rubber traps.
- **Aluminium vertical panels and roof, mounted on aluminium frame.**
- A separate **technical section** facilitates unit control and maintenance and allows measurement and adjustment during operation.
- **Access through large** removable panels. The removable panels are sealed by compression on a flexible lip seal, ensuring a perfect sealing over time.
- **Soundproofing and thermal insulation provided by 80 mm to 100 mm rock wool** (M0 classification) in the frame and **50 mm glass wool** (M0 classification in accordance with **BOP regulations** (Buildings Open to the Public), (article CH36 ERP fire regulations (decree of 14 February 2000)) **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**
- **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 (savings on commissioning),
  - ✓ With an aluminium wheel design,
  - ✓ Communicating for real time operation adjustment.
  - ✓ With integrated Soft Starter to reduce starting current and enable soft starting (textile ducts).
- **Low Noise Option** available.
- **AFC option with flow rate auto-adjustment,** to compensate for filter fouling.
- **VPF option** (Variable Power Flow) to reduce energy consumption.

Detailed components of the unit

Energy and thermodynamic assembly:

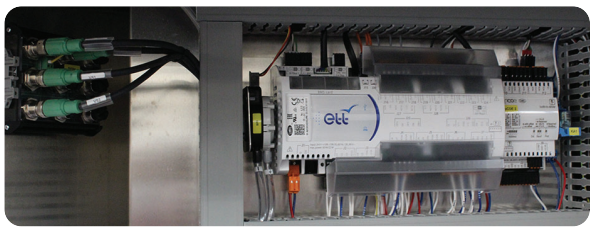
- **For units with several thermodynamic circuits,** only the first circuit is equipped with a tandem. This allows the thermal power provided to be staggered according to the needs of the application, for less consumption and greater comfort.
- **Communicating electronic expansion valves** combining increased optimisation of the exchangers and fast stabilisation of the thermodynamic system.
- Reinforced **internal heat exchangers** with aluminium fins and copper tubes with double helical grooves for improved heat exchange.
- **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.
- **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.
- **Anti-acid filter drier.**
- Switchover **valve**.
- **Leak detection :** The ULTI+ R32 OR 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**, in accordance with the French Order of 29/02/2016 on certain refrigerants and fluorinated greenhouse gases.

Hydraulic assembly :

- **Brazed plate** heat exchangers.
- **Water flow controller**
- **Balancing** valve
- Pre-arrangement for Victaulic equipment
- Return and flow **temperature sensors**
- Anti-freeze thermostat
- Optional **3-way relief valve** to protect plate heat exchangers in the event of out-of-range operation.
- **Optional pump (EC) and 3-way valve assembly** providing a constant flow recycling function to protect plate heat exchangers in the event of operation outside the temperature range.

Electrical assembly in a sealed compartment (IP44):

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



Detailed components of the unit

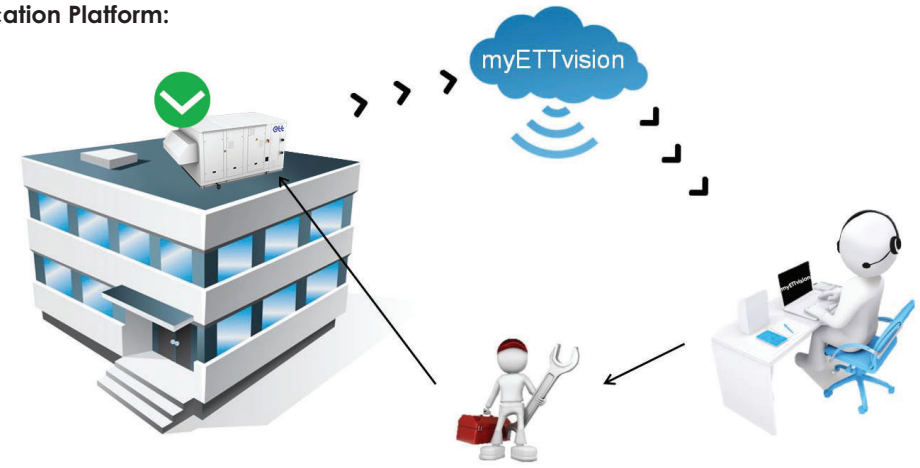
Advanced control assembly:

- **Temperature control with 2 cooling/heating set points in compliance with French RT 2012, responsive, precision and anticipatory.**

  Savings 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.
- **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 humidity ratio**, in order to limit latent inputs during the Free Cooling phase by comparing indoor and outdoor humidity ratio.
- Optional **indoor humidity control**, with or without energy recovery.
- **Metering of electrical energy**, with breakdown of electrical consumption by operating modes.
- **Monitoring, diagnostic, 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 communications platformproviding access to parameter setting, operation and energy monitoring, and access to faults in your fleet of machines**.
- De-stratification (comparison between ambient and outdoor temperature)

myETTvision:

ETT Remote Communication Platform:



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 affects 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. Compliance with the manufacturer's recommendations is a prerequisite for guaranteeing and optimising operation and settings.

ETT recommends that periodic checks 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 the supply air, except downwards (article CH38 ERP fire regulations (decree of 14 February 2000) - 2006/42/EC Directive)
Acoustics	▪ EC Low Noise supply fans ▪ Compressor jackets
Aeraulics	▪ Operation with all recirculated air (excluding Buildings Open to the Public) ▪ All fresh air operation ▪ Actuating smoke detector with battery back-up ▪ Epoxy coating on supply air fans ▪ Analogue air flow controller (AFC) with auto-adjustment of supply fans flow rate ▪ Pressure gauge for supply air filters ▪ ISO Coarse 65% (G4) refillable 98mm supply filters with analogue sensor ▪ ISO ePM10 50% (M5) 98mm supply filters with analogue sensor ▪ Double filters ISO Coarse 65% (G4) + ISO ePM1 50% (F7) or ISO ePM1 80% (F9) (48 + 48mm) at supply with analogue sensor ▪ ISO ePM1 50% (F7) 98mm supply filters with analogue sensor ▪ ISO ePM1 80% (F9) 98mm supply filters with analogue sensor ▪ Pressure relief vent ▪ Cowl for pressure relief vent ▪ Fresh air cowl extension
Thermodynamics	▪ Air-conditioning operation only (non-reversible machine) ▪ Compressor MAP monitoring ▪ Vinyl protection for the fins of the refrigerant/air exchanger.
Auxiliaries	▪ Hot water recovery coil with analogue frost protection thermostat ▪ Modulating 3-way valve for hot water coil ▪ Shut-off valve on the supply + 'TA' regulating valve on the return for hot water coil ▪ Preheating of fresh air by 3-stage electric auxiliary heaters
Electrics	▪ Totalising electrical energy metering in compliance with French RT 2012 ▪ Aluminium/copper terminal block (mandatory for aluminium supply cables) ▪ 230V / 16 A single-phase PC socket in the technical compartment (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 curb ▪ Connecting adapter aluminium curb ▪ Adjustable ventilated aluminium curb ▪ Adapting ventilated aluminium curb ▪ 200, 400 or 600mm aluminium feet

Main options

Hydraulics	▪ Connecting flange ▪ Stop valve (Victaulic) ▪ Strainer (0.86 mm mesh, Victaulic) ▪ 3-Way valve + circulation pump assembly ▪ 3-W valve assembly only
Control	▪ Comfort mode control function (setpoint temperatures control by PID) ▪ Free Cooling banning based on specific humidity comparison ▪ Flow Rate / Power Variation operation ▪ HPE+ operation (High Energy Efficiency) ▪ Level 1 dehumidification function (without heat recovery) ▪ 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
Warranty	▪ Available extended warranty. Consult us!

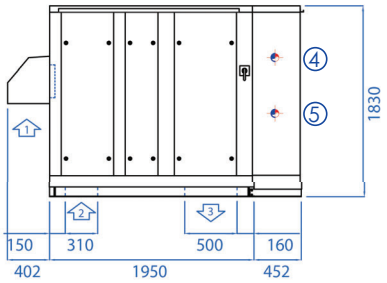
	DESIGNATION	Unit	050	055	065	075
VENTILATION	**FLOW RATES**					
	Rated air flow rate	m³/h	10,500	11,500	13,000	15,000
	Minimum air flow rate	m³/h	6,500	7,500	9,500	12,500
	Maximum air flow rate	m³/h	15,000	15,000	15,000	15,000
	ACOUSTICS (1)					
	Sound power level at supply air	dB(A)	73	75	79	82
	Outside sound power level	dB(A)	66	66	66	67
	Resulting external sound pressure at 10m ref. 10^{-5} in free field	dB(A)	35	35	35	36
THERMODYNAMIC EFFICIENCY AIR-CONDITIONING MODE	**NOMINAL EFFICIENCY** (1)					
	Net cooling capacity	kW	48.1	51.7	58.3	65.4
	Net EER	kW/kW	5.00	4.91	4.83	4.40
	SEASONAL EFFICIENCY (2)					
	Net design cooling capacity	kW	48.1	51.7	58.3	65.4
	SEER	kW/kW	6.90	6.62	6.21	5.42
	ηs,C	%	273	262	246	214
THERMODYNAMIC EFFICIENCY HEATING MODE	**NOMINAL EFFICIENCY** (1)					
	Net heating capacity	kW	64.6	70.3	80.8	94.1
	Net COP	kW/kW	5.46	5.45	5.47	5.16
	SEASONAL EFFICIENCY (2)					
	Net design heat output	kW	64.6	70.3	80.8	94.1
	SCOP	kW/kW	6.55	6.48	6.32	5.76
	ηs,H	%	259	256	250	227
HYDRAULICS	**AIR CONDITIONING FEATURES**					
	Nominal water flow rate	m³/h	9.9	10.7	12.1	13.8
	Pressure drop at nominal flow rate	kPa	9	11	13	17
	Minimum water flow rate	m³/h	5.0	5.3	6.0	6.9
	Minimum water return temperature	°C	20	20	20	20
	Maximum water return temperature	°C	50	50	50	50
	HEATING FEATURES					
	Nominal water flow rate	m³/h	15.4	16.7	19.2	22.1
	Pressure drop at nominal flow rate	kPa	21	25	32	41
	Minimum water flow rate	m3/h	7.7	8.4	9.6	11.1
	Minimum water return temperature	°C	10	10	10	10
	Maximum water return temperature	°C	25	25	25	25
	CONNECTION FEATURES					
	Maximum water pressure	bar		16		
	Victaulic connection (excluding option)	DN		65		
GENERAL INFORMATION	**ELECTRICAL DATA**					
	Total installed electrical power excluding auxiliaries (3)	kW	20.2	21.6	23.8	27.2
	Total installed electrical current excluding auxiliaries (3)	A	37	39	43	50
	Starting current excluding auxiliaries (3)	A	107	115	153	167
	Maximum absorbed electrical power excluding auxiliaries (4)	kW	14.2	15.5	18.0	22.4
	REFRIGERATION CIRCUIT(S)					
	Power stages	-	2	2	2	2
	OPERATING LIMITS IN COOLING MODE					
	Maximum outside temperature (5)	°C	49	49	49	49
	Minimum outside temperature (5)	°C	15	15	15	15
	Minimum inside coil inlet temperature	°C	18	18	18	18
	OPERATING LIMITS IN HEATING MODE					
	Minimum outside temperature	°C	-15	-15	-15	-15
	Minimum inside coil inlet temperature	°C	12	12	12	12
	WEIGHT					
	Unit weight without options(6)	kg	701	747	749	837

(1) According to Standard 14511, water loop application
Cooling mode:
Indoor conditions: +27°C DB/+19°C WB, water return temperature 30°C
Heating mode:
Indoor conditions: +20°C DB */+15°C WB, water return temperature: 20°C
(2) According to EcoDesign regulation 2016/2281.

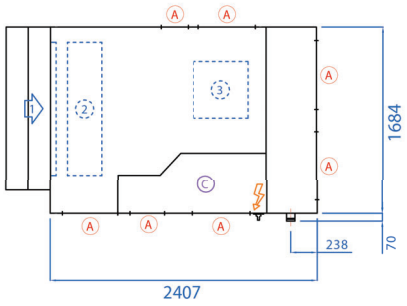
(3) Power to be considered for the supply cables (excluding auxiliaries) Three-phase power supply 400V - 50HZ + earth without neutral
(4) Heating mode
(5) For inside conditions: +27°C DB / +19°C WB at nominal air flow
(6) Weight for an available pressure at 400 Pa

SUPPLY AIR *from below*

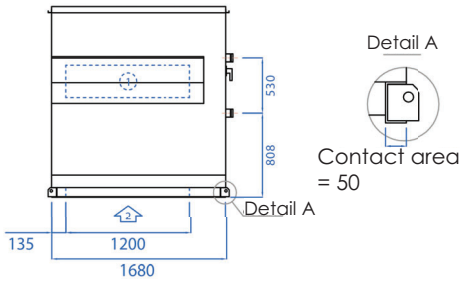
Front view:



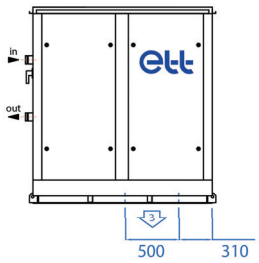
Top view:



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
④ Water return
⑤ Water flow
⚡ Power supply
Ⓐ Access
Ⓒ Technical compartment
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	2,407 mm	1,684 mm	1,830 mm

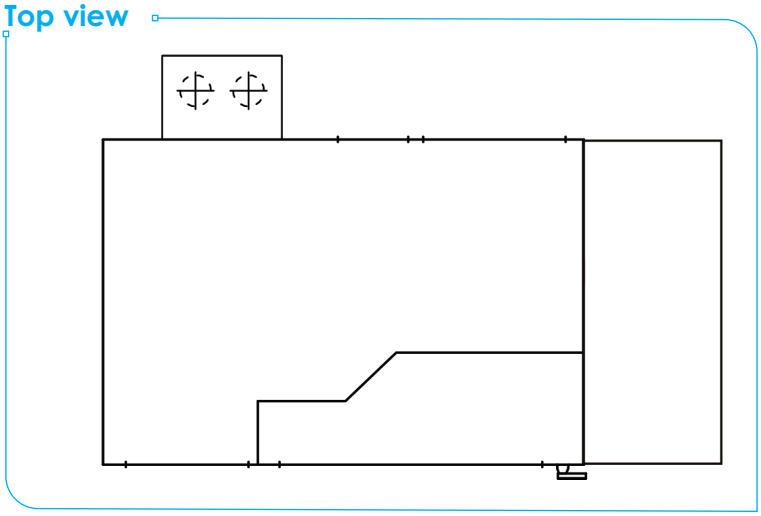
(1) Side return: +125 mm

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

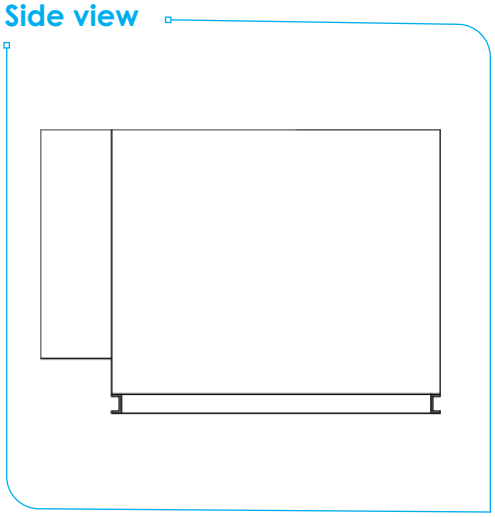
SCHEMATIC DIAGRAM AND CONNECTION

► Connection opposite the technical compartment.

Top view



Side view



► Connection identical to hot water coil connection.

See schematic and connection diagram.

POWER RATINGS

		Unit	050	055	065	075
Water regime 35/30°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	51.5	54.7	59.1	64.6
	Water flow rate	m³/h	8.9	9.5	10.2	11.2
	Exchanger pressure drop	mWC	4.5	5.0	5.8	6.8
	Exchanger pressure drop and 3-WV (1)	mWC	7.6	8.5	9.8	11.6
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	10.7	12.0	14.0	16.6
Water regime 35/30°C and Exchanger inlet air temperature 20°C	Heating capacity	kW	27.6	29.3	31.5	34.3
	Water flow rate	m³/h	4.8	5.1	5.5	6.0
	Exchanger pressure drop	mWC	1.4	1.6	1.8	2.1
	Exchanger pressure drop and 3-WV (1)	mWC	2.3	2.6	3.0	3.5
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	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: Flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate

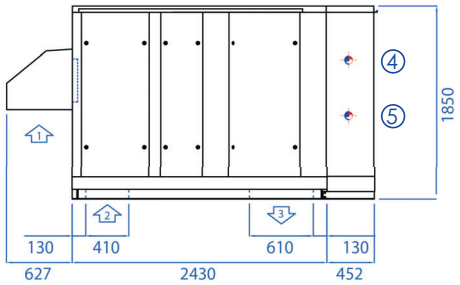
	DESIGNATION	Unit	055	065	075	080	090	100
VENTILATION	**FLOW RATES**							
	Rated air flow rate	m³/h	12,500	14,000	16,000	18,000	20,000	20,000
	Minimum air flow rate	m³/h	7,000	8,000	11,000	13,000	16,000	19,000
	Maximum air flow rate	m³/h	20,000	20,000	20,000	20,000	20,000	20,000
	ACOUSTICS (1)							
	Sound power level at supply air	dB(A)	76	78	82	85	88	88
	Outside sound power level	dB(A)	66	65	66	71	73	72
	Resulting external sound pressure at 10m ref. 10^{-5} in free field	dB(A)	35	34	35	40	42	41
THERMODYNAMIC EFFICIENCY AIR-CONDITIONING MODE	**NOMINAL EFFICIENCY** (1)							
	Net cooling capacity	kW	54.9	62.1	70.5	78.5	86.5	95.2
	Net EER	kW/kW	5.53	5.58	5.27	4.78	4.64	4.60
	SEASONAL EFFICIENCY (2)							
	Net design cooling capacity	kW	54.9	62.1	70.5	78.5	86.5	95.2
	SEER	kW/kW	8.15	8.04	7.40	5.48	5.37	6.34
	ηs,C	%	323	319	293	216	212	250
THERMODYNAMIC EFFICIENCY HEATING MODE	**NOMINAL EFFICIENCY** (1)							
	Net heating capacity	kW	70.9	81.1	93.9	108.1	120.9	134.7
	Net COP	kW/kW	6.37	6.48	6.19	5.75	5.69	5.62
	SEASONAL EFFICIENCY (2)							
	Net design heat output	kW	70.9	81.1	93.9	108.1	120.9	134.7
	SCOP	kW/kW	7.71	7.75	7.29	6.16	6.10	6.80
	ηs,H	%	305	307	289	243	241	269
HYDRAULICS	**AIR CONDITIONING FEATURES**							
	Nominal water flow rate	m³/h	11.1	12.6	14.4	16.3	18.0	19.8
	Pressure drop at nominal flow rate	kPa	11	14	18	23	27	33
	Minimum water flow rate	m³/h	5.6	6.3	7.2	8.1	9.0	9.9
	Minimum water return temperature	°C	20	20	20	20	20	20
	Maximum water return temperature	°C	50	50	50	50	50	50
	HEATING FEATURES							
	Nominal water flow rate	m³/h	17.4	20.0	22.9	26.0	29.0	32.2
	Pressure drop at nominal flow rate	kPa	26	34	44	55	67	82
	Minimum water flow rate	m³/h	8.7	10.0	11.5	13.0	14.5	16.1
	Minimum water return temperature	°C	10	10	10	10	10	10
	Maximum water return temperature	°C	25	25	25	25	25	25
	CONNECTION FEATURES							
	Maximum water pressure	bar	16					
	Victaulic connection (excluding option)	DN	65					
GENERAL INFORMATION	**ELECTRICAL DATA**							
	Total installed electrical power excluding auxiliaries (3)	kW	24.6	26.8	30.2	33.2	36.4	42.6
	Total installed electrical current excluding auxiliaries (3)	A	44	48	54	57	61	75
	Starting current excluding auxiliaries (3)	A	119	157	172	171	294	366
	Maximum absorbed electrical power excluding auxiliaries (4)	kW	13.3	15.0	18.0	22.1	25.1	27.9
	REFRIGERATION CIRCUIT(S)							
	Power stages	-	2	2	2	2	2	2
	OPERATING LIMITS IN COOLING MODE							
	Maximum outside temperature (5)	°C	49	49	49	49	49	49
	Minimum outside temperature (5)	°C	15	15	15	15	15	15
	Minimum inside coil inlet temperature	°C	18	18	18	18	18	18
	OPERATING LIMITS IN HEATING MODE							
	Minimum outside temperature	°C	-15	-15	-15	-15	-15	-15
	Minimum inside coil inlet temperature	°C	12	12	12	12	12	12
	WEIGHT							
	Unit weight without options(6)	kg	877	898	951	979	955	992

(1) According to Standard 14511, water loop application
Cooling mode:
Indoor conditions: +27°C DB/+19°C WB, water return temperature 30°C
Heating mode:
Indoor conditions: +20°C DB */+15°C WB, water return temperature: 20°C
(2) According to EcoDesign regulation 2016/2281.

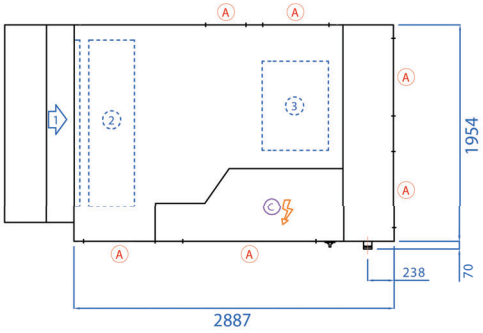
(3) Power to be considered for the supply cables (excluding auxiliaries) Three-phase power supply 400V - 50HZ + earth without neutral
(4) Heating mode
(5) For inside conditions: +27°C DB / +19°C WB at nominal air flow
(6) Weight for an available pressure at 400 Pa

SUPPLY AIR *from below*

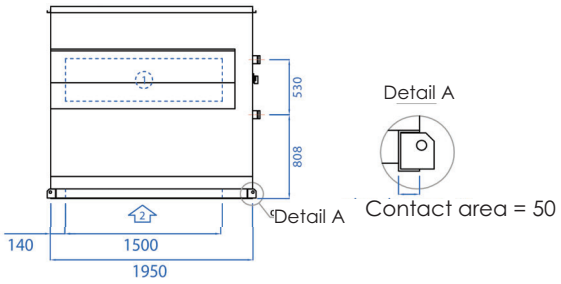
Front view:



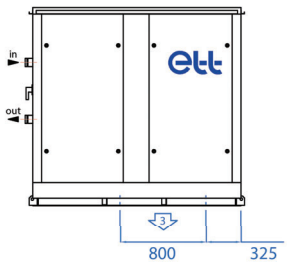
Top view:



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
④ Water return
⑤ Water flow
⚡ Power supply
Ⓐ Access
Ⓒ Technical compartment
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	2,887 mm	1,954 mm	1,850 mm

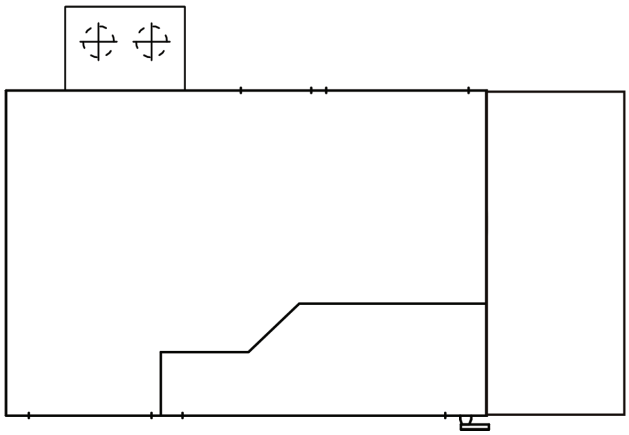
(1) Side return: +125 mm

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

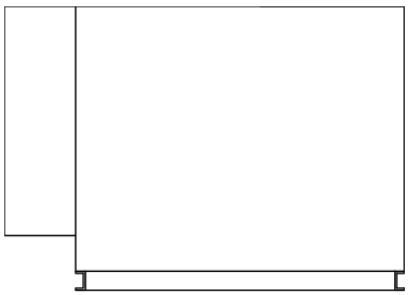
DIAGRAM AND CONNECTION

► Connection opposite the technical compartment.

Top view



Side view



► Connection identical to hot water coil connection.

See schematic and connection diagram.

POWER RATINGS

		Unit	055	065	075	080	090	100
Water regime 35/30°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	61.1	65.8	71.7	77.1	82.2	82.2
	Water flow rate	m³/h	10.6	11.4	12.4	13.4	14.2	14.2
	Exchanger pressure drop	mWC	1.7	2.0	2.3	2.7	3.0	3.0
	Exchanger pressure drop and 3-WV (1)	mWC	3.3	3.9	4.5	5.2	5.9	5.9
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	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	32.0	34.4	37.3	40.0	42.5	42.5
	Water flow rate	m³/h	5.5	6.0	6.5	6.9	7.4	7.4
	Exchanger pressure drop	mWC	0.5	0.6	0.7	0.8	0.9	0.9
	Exchanger pressure drop and 3-WV (1)	mWC	0.9	1.1	1.3	1.5	1.6	1.6
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	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: Flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate

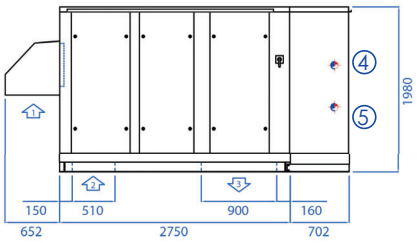
	DESIGNATION	Unit	095	110	115	130	140
VENTILATION	**FLOW RATES**						
	Rated air flow rate	m³/h	21,000	23,000	25,000	27,000	27,000
	Minimum air flow rate	m³/h	13,000	19,000	19,000	25,000	25,000
	Maximum air flow rate	m³/h	27,000	27,000	27,000	27,000	27,000
	ACOUSTICS (1)						
	Sound power level at supply air	dB(A)	78	80	81	83	83
	Outside sound power level	dB(A)	69	70	70	73	75
	Resulting external sound pressure at 10m ref. 10^{-5} in free field	dB(A)	38	39	39	42	44
THERMODYNAMIC EFFICIENCY AIR-CONDITIONING MODE	**NOMINAL EFFICIENCY** (1)						
	Net cooling capacity	kW	93.3	99.5	112.5	127.3	133.5
	Net EER	kW/kW	5.29	5.14	4.96	4.76	4.61
	SEASONAL EFFICIENCY (2)						
	Net design cooling capacity	kW	93.3	99.5	112.5	127.3	133.5
	SEER	kW/kW	6.54	6.40	5.88	5.87	4.99
	ηs,C	%	258	253	232	232	197
THERMODYNAMIC EFFICIENCY HEATING MODE	**NOMINAL EFFICIENCY** (1)						
	Net heating capacity	kW	123.8	133.6	154.5	178.6	190.4
	Net COP	kW/kW	5.72	5.68	5.43	5.24	5.00
	SEASONAL EFFICIENCY (2)						
	Net design heat output	kW	123.8	133.6	154.5	178.6	190.4
	SCOP	kW/kW	6.27	6.32	6.03	5.89	5.42
	ηs,H	%	248	250	238	233	214
HYDRAULICS	**AIR CONDITIONING FEATURES**						
	Nominal water flow rate	m³/h	19.0	20.4	23.2	26.4	27.9
	Pressure drop at nominal flow rate	kPa	9	10	12	16	17
	Minimum water flow rate	m³/h	9.5	10.2	11.6	13.2	13.9
	Minimum water return temperature	°C	20	20	20	20	20
	Maximum water return temperature	°C	50	50	50	50	50
	HEATING FEATURES						
	Nominal water flow rate	m³/h	29.7	32.0	36.8	42.0	44.4
	Pressure drop at nominal flow rate	kPa	20	23	30	37	42
	Minimum water flow rate	m3/h	14.8	16.0	18.4	21.0	22.2
	Minimum water return temperature	°C	10	10	10	10	10
	Maximum water return temperature	°C	25	25	25	25	25
	CONNECTION FEATURES						
	Maximum water pressure	bar			16		
	Victaulic connection (excluding option)	DN			80		
GENERAL INFORMATION	**ELECTRICAL DATA**						
	Total installed electrical power excluding auxiliaries (3)	kW	44.2	47.3	52.9	58.3	61.3
	Total installed electrical current excluding auxiliaries (3)	A	81	83	94	99	101
	Starting current excluding auxiliaries (3)	A	191	211	222	304	306
	Maximum absorbed electrical power excluding auxiliaries (4)	kW	25.2	27.4	32.8	39.2	43.2
	REFRIGERATION CIRCUIT(S)						
	Power stages	-	4	4	4	4	4
	OPERATING LIMITS IN COOLING MODE						
	Maximum outside temperature (5)	°C	49	49	49	49	49
	Minimum outside temperature (5)	°C	15	15	15	15	15
	Minimum inside coil inlet temperature	°C	18	18	18	18	18
	OPERATING LIMITS IN HEATING MODE						
	Minimum outside temperature	°C	-15	-15	-15	-15	-15
	Minimum inside coil inlet temperature	°C	12	12	12	12	12
	WEIGHT						
	Unit weight without options(6)	kg	1,170	1,247	1,274	1,331	1,325

(1) According to Standard 14511, water loop application
Cooling mode:
Indoor conditions: +27°C DB/+19°C WB, water return temperature 30°C
Heating mode:
Indoor conditions: +20°C DB */+15°C WB, water return temperature: 20°C
(2) According to EcoDesign regulation 2016/2281.

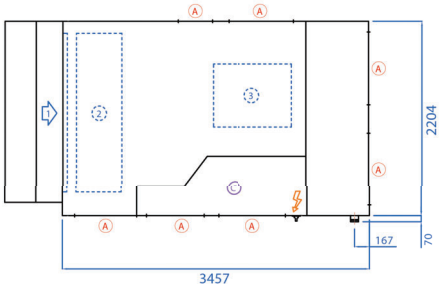
(3) Power to be considered for the supply cables (excluding auxiliaries) Three-phase power supply 400V - 50HZ + earth without neutral
(4) Heating mode
(5) For inside conditions: +27°C DB / +19°C WB at nominal air flow
(6) Weight for an available pressure at 400 Pa

SUPPLY AIR *from below*

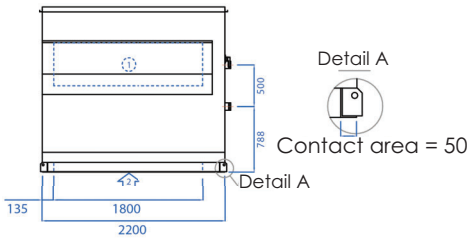
Front view:



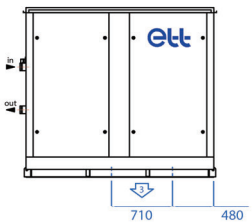
Top view:



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
④ Water return
⑤ Water flow
⚡ Power supply
Ⓐ Access
Ⓒ Technical compartment
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	3,457 mm	2,204 mm	1,980 mm

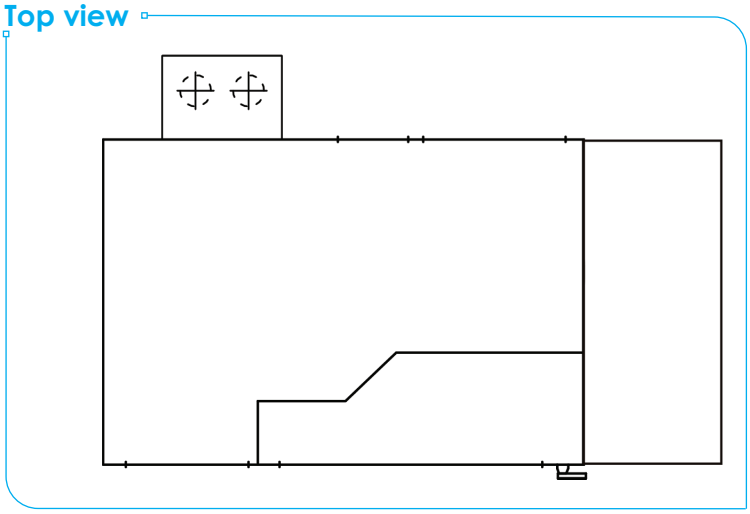
(1) Side return: +125 mm

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

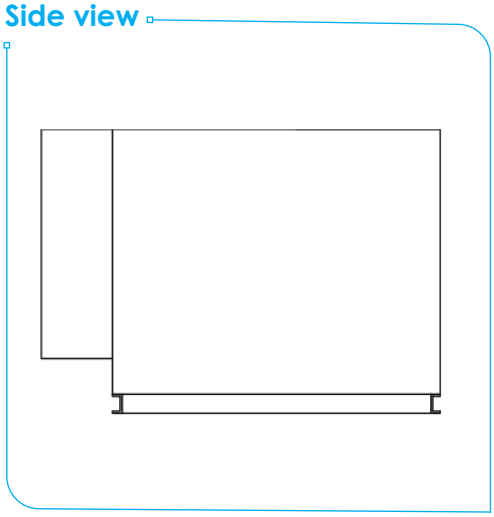
SCHEMATIC DIAGRAM AND CONNECTION

► Connection opposite the technical compartment.

Top view



Side view



► Connection identical to hot water coil connection.

See schematic and connection diagram.

POWER RATINGS

		Unit	095	110	115	130	140
Water regime 35/30°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	96.0	101.7	107.0	112.1	112.1
	Water flow rate	m³/h	16.6	17.6	18.5	19.4	19.4
	Exchanger pressure drop	mWC	3.7	4.2	4.6	5.0	5.0
	Exchanger pressure drop and 3-WV (1)	mWC	7.7	8.7	9.6	10.5	10.5
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	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	50.4	53.3	56.0	58.5	58.5
	Water flow rate	m³/h	8.7	9.2	9.7	10.1	10.1
	Exchanger pressure drop	mWC	1.1	1.2	1.4	1.5	1.5
	Exchanger pressure drop and 3-WV (1)	mWC	2.2	2.5	2.7	2.9	2.9
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	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: Flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate

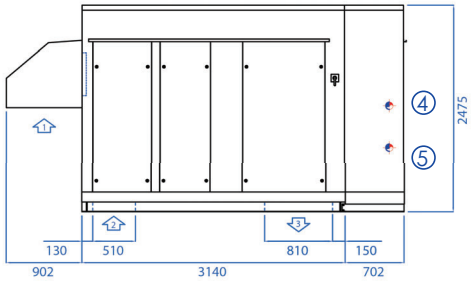
	DESIGNATION	Unit	140	150	160	180	200
VENTILATION	**FLOW RATES**						
	Rated air flow rate	m³/h	30,000	33,000	35,000	38,000	38,000
	Minimum air flow rate	m³/h	21,000	21,000	30,000	34,000	37,000
	Maximum air flow rate	m³/h	38,000	38,000	38,000	38,000	38,000
	ACOUSTICS (1)						
	Sound power level at supply air	dB(A)	81	84	85	87	87
	Outside sound power level	dB(A)	70	74	75	75	76
	Resulting external sound pressure at 10m ref. 10^{-5} in free field	dB(A)	39	43	44	44	45
THERMODYNAMIC EFFICIENCY AIR-CONDITIONING MODE	**NOMINAL EFFICIENCY** (1)						
	Net cooling capacity	kW	122.0	139.0	147.4	161.3	177.4
	Net EER	kW/kW	5.52	5.25	5.01	4.85	4.70
	SEASONAL EFFICIENCY (2)						
	Net design cooling capacity	kW	122.0	139.0	147.4	161.3	177.4
	SEER	kW/kW	6.72	6.67	5.35	5.26	5.11
	ηs,C	%	266	264	211	207	201
THERMODYNAMIC EFFICIENCY HEATING MODE	**NOMINAL EFFICIENCY** (1)						
	Net heating capacity	kW	158.7	184.3	198.5	221.0	248.3
	Net COP	kW/kW	6.59	6.32	6.09	6.08	5.76
	SEASONAL EFFICIENCY (2)						
	Net design heat output	kW	158.7	184.3	198.5	221.0	248.3
	SCOP	kW/kW	7.22	7.02	6.27	6.23	6.07
	ηs,H	%	286	278	248	246	240
HYDRAULICS	**AIR CONDITIONING FEATURES**						
	Nominal water flow rate	m³/h	24.7	28.4	30.3	33.3	36.9
	Pressure drop at nominal flow rate	kPa	14	18	20	24	29
	Minimum water flow rate	m³/h	12.4	14.2	15.1	16.7	18.4
	Minimum water return temperature	°C	20	20	20	20	20
	Maximum water return temperature	°C	50	50	50	50	50
	HEATING FEATURES						
	Nominal water flow rate	m³/h	39.2	45.0	48.2	53.5	59.5
	Pressure drop at nominal flow rate	kPa	34	43	49	58	72
	Minimum water flow rate	m3/h	19.6	22.5	24.1	26.8	29.8
	Minimum water return temperature	°C	10	10	10	10	10
	Maximum water return temperature	°C	25	25	25	25	25
	CONNECTION FEATURES						
	Maximum water pressure	bar			16		
	Victaulic connection (excluding option)	DN			100		
GENERAL INFORMATION	**ELECTRICAL DATA**						
	Total installed electrical power excluding auxiliaries (3)	kW	54.1	59.5	62.5	68.1	75.3
	Total installed electrical current excluding auxiliaries (3)	A	96	101	103	113	123
	Starting current excluding auxiliaries (3)	A	224	306	308	355	365
	Maximum absorbed electrical power excluding auxiliaries (4)	kW	28.8	34.4	38.3	43.3	50.1
	REFRIGERATION CIRCUIT(S)						
	Power stages	-	4	4	4	4	4
	OPERATING LIMITS IN COOLING MODE						
	Maximum outside temperature (5)	°C	49	49	49	49	49
	Minimum outside temperature (5)	°C	15	15	15	15	15
	Minimum inside coil inlet temperature	°C	18	18	18	18	18
	OPERATING LIMITS IN HEATING MODE						
	Minimum outside temperature	°C	-15	-15	-15	-15	-15
	Minimum inside coil inlet temperature	°C	12	12	12	12	12
	WEIGHT						
	Unit weight without options(6)	kg	1,770	1,809	1,838	1,950	1,950

(1) According to Standard 14511, water loop application
Cooling mode:
Indoor conditions: +27°C DB/+19°C WB, water return temperature 30°C
Heating mode:
Indoor conditions: +20°C DB */+15°C WB, water return temperature: 20°C
(2) According to EcoDesign regulation 2016/2281.

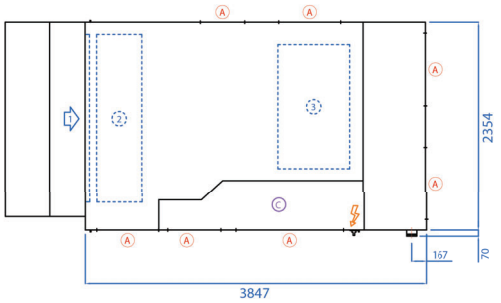
(3) Power to be considered for the supply cables (excluding auxiliaries) Three-phase power supply 400V - 50HZ + earth without neutral
(4) Heating mode
(5) For inside conditions: +27°C DB / +19°C WB at nominal air flow
(6) Weight for an available pressure at 400 Pa

SUPPLY AIR *from below*

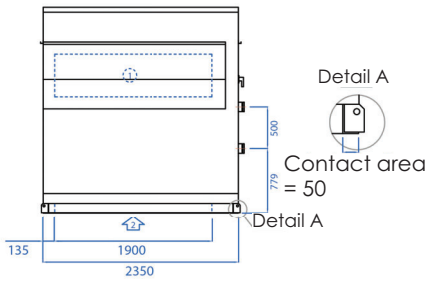
Front view:



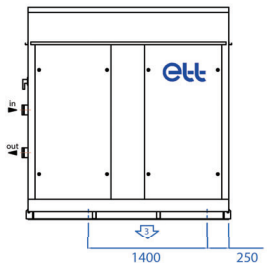
Top view:



Return side view:



Supply air side view :



① Fresh air
② Return air
③ Supply air
④ Water return
⑤ Water flow
⚡ Power supply
Ⓐ Access
Ⓒ Technical compartment
--- Allow at least 400 mm of air space under the machine.

	Length	Width (1)	Height
Casing dimensions	3,847 mm	2,354 mm	2,475 mm

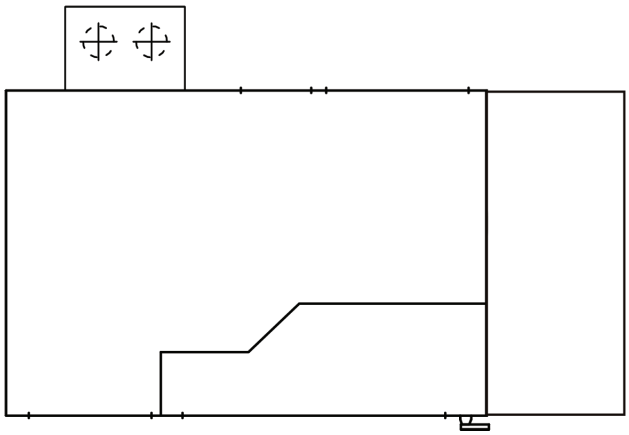
(1) Side return: +125 mm

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

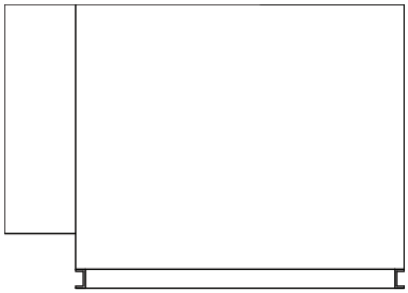
SCHEMATIC DIAGRAM AND CONNECTION

► Connection opposite the technical compartment.

Top view



Side view



► Connection identical to hot water coil connection.

See schematic and connection diagram.

POWER RATINGS

		Unit	140	150	160	180	200
Water regime 35/30°C and Exchanger inlet air temperature 10°C	Heating capacity	kW	105.4	111.9	116.0	121.9	121.9
	Water flow rate	m³/h	18.3	19.4	20.1	21.1	21.1
	Exchanger pressure drop	mWC	4.4	4.9	5.3	5.8	5.8
	Exchanger pressure drop and 3-WV (1)	mWC	9.2	10.4	11.1	12.3	12.3
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	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	55.5	58.8	60.8	63.8	63.8
	Water flow rate	m³/h	9.6	10.2	10.5	11.1	11.1
	Exchanger pressure drop	mWC	1.3	1.5	1.6	1.7	1.7
	Exchanger pressure drop and 3-WV (1)	mWC	2.6	3.0	3.2	3.5	3.5
	Exchanger pressure drop, 3-WV, VA and VTA (2)	mWC	4.1	4.6	5.0	5.5	5.5

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

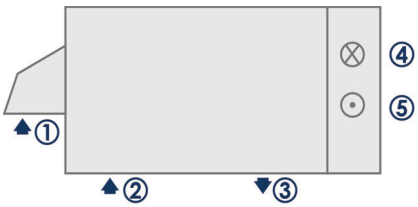
3-WV: 3-Way valve
VA: Flow shut-off valve
VTA: TA return control valve, 7/8th opening
Technical data for non-glycol water at nominal air flow rate

Airflow layouts

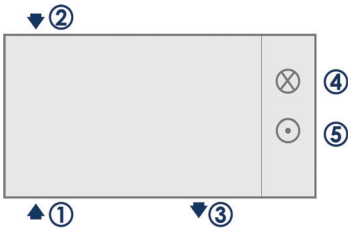
Downward **supply air**

Installed on curb or customer frame, on the roof.

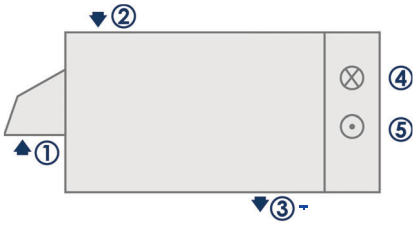
Layout 1.1



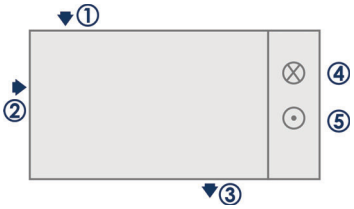
Layout 1.2



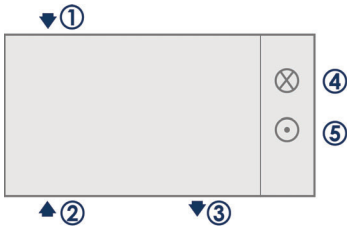
Layout 1.3



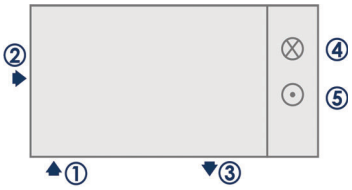
Layout 1.4: with optional grilled air vent



Layout 1.5: with optional grilled air vent

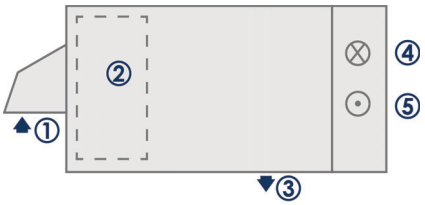


Layout 1.6

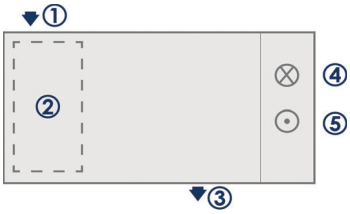


Layout 1.7

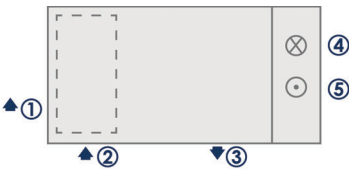
Layout 1.8



Layout 1.9: with optional grilled air vent



Layout 1.10



① Fresh air ② Return air ③ Supply air ④ Water return ⑤ Water supply

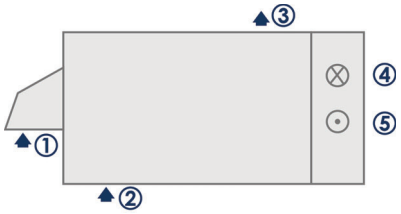
Airflow layouts

Upward **supply air**

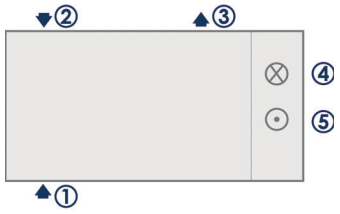
Mounted on feet (minimum 400 mm) or on customer frame.

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

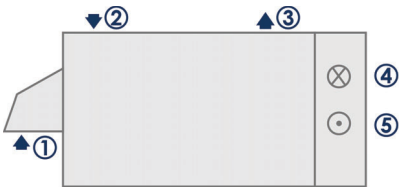
Layout 2.1



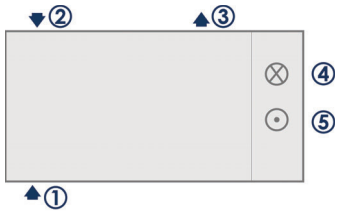
Layout 2.2



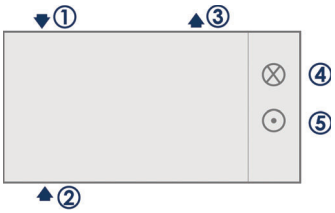
Layout 2.3



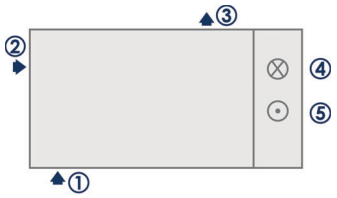
Layout 2.4: with optional grilled air vent



Layout 2.5: with optional grilled air vent

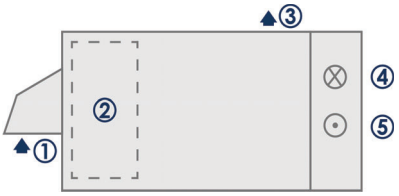


Layout 2.6

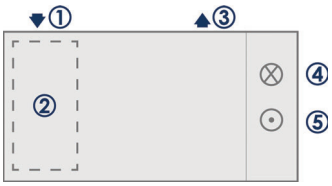


Layout 2.7

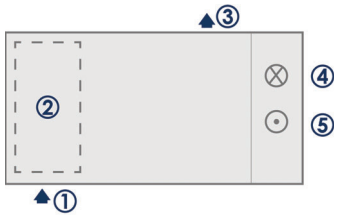
Layout 2.8



Layout 2.9: with optional grilled air vent



Layout 2.10



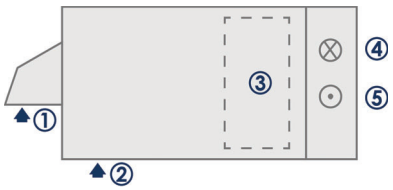
① Fresh air ② Return air ③ Supply air ④ Water return ⑤ Water supply

Airflow layouts

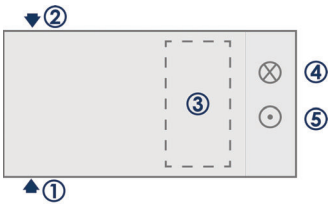
Side SUPPLY AIR

Opposite the technical compartment (with feet of 400 mm minimum).

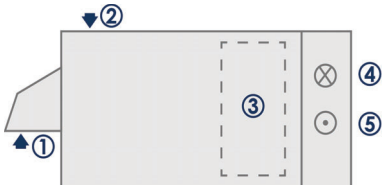
Layout 3.1



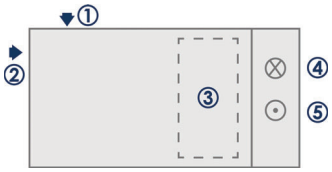
Layout 3.2



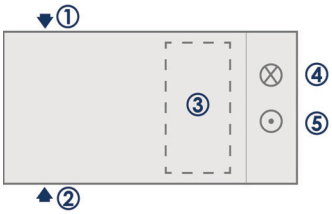
Layout 3.3



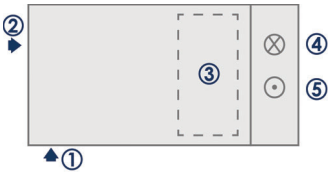
Layout 3.4: with optional grilled air vent



Layout 3.5: with optional grilled air vent

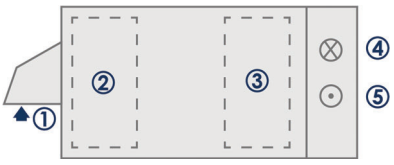


Layout 3.6

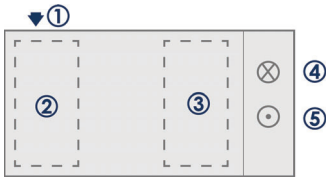


Layout 3.7

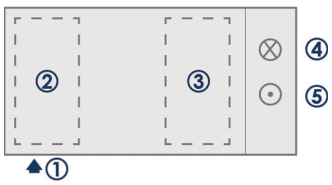
Layout 3.8



Layout 3.9: with optional grilled air vent



Layout 3.10



① Fresh air ② Return air ③Supply air ④Water return ⑤ Water supply

Weight of options (in kg)

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

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

Option: Pressure relief vents

DESCRIPTION

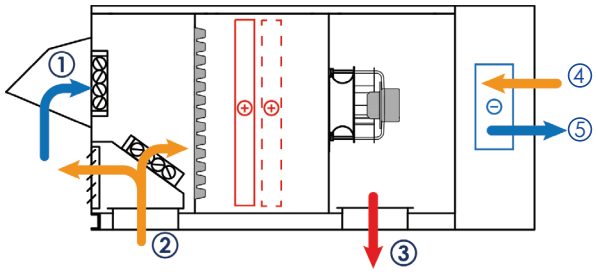
The pressure relief vent option is recommended for buildings with a high level of airtightness.

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

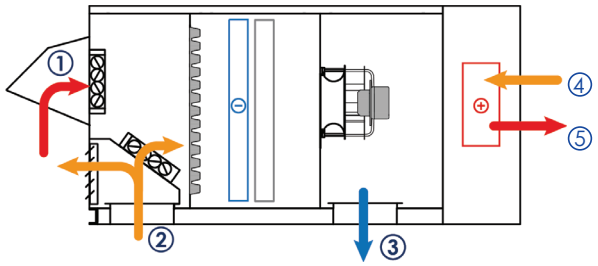
When switched off or in full recirculation mode, the pressure relief vents close by gravity (non-return function). Pressure relief vents are available on the following layouts: 1.1 - 1.2 - 1.3 - 1.5 / 2.1 - 2.2 - 2.3 - 2.5 / 3.1 - 3.2 - 3.3 - 3.5.

OPERATING PRINCIPLES:

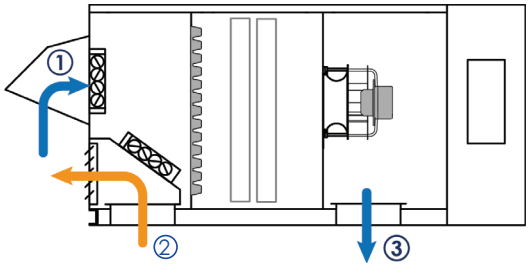
Heating Mode



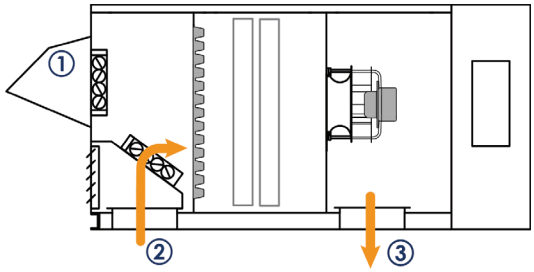
Cooling Mode



Free Cooling Mode

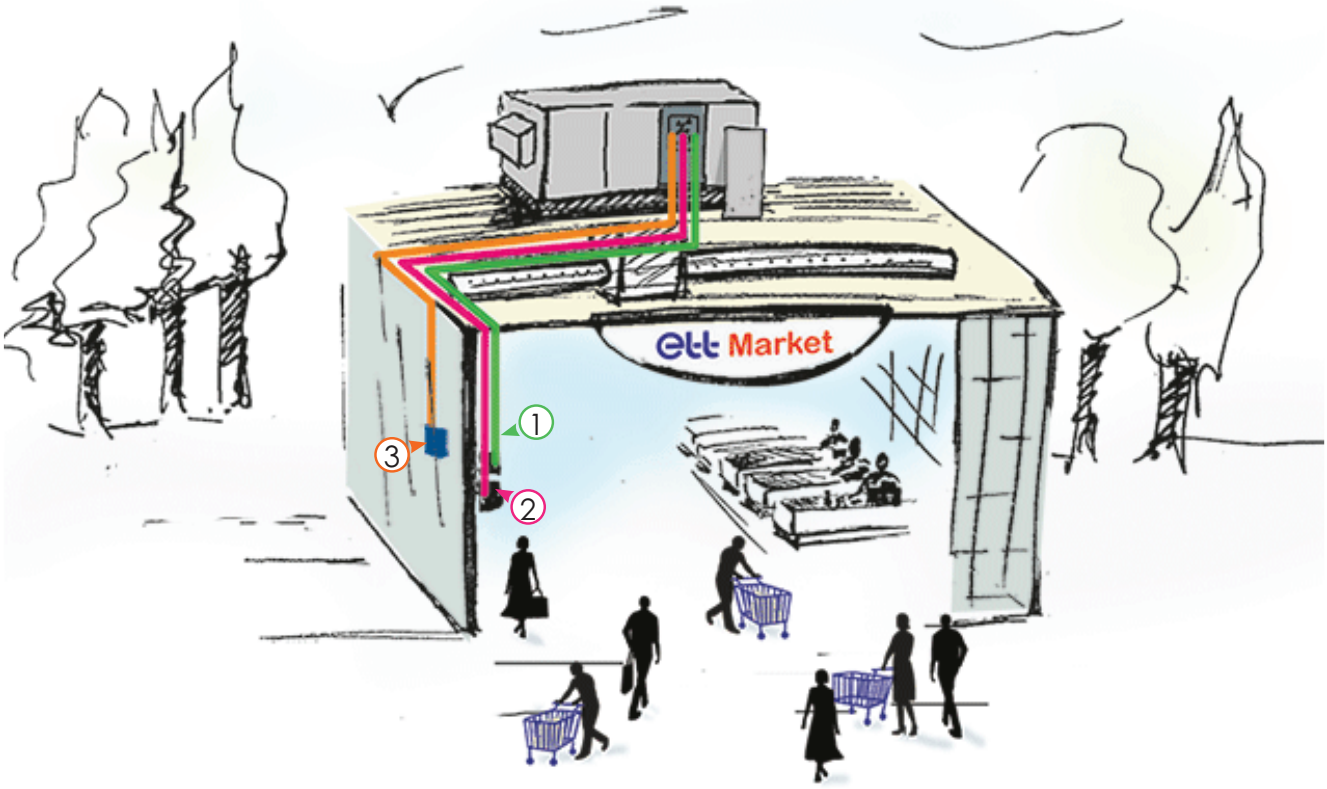


Recycling Mode



① Fresh air ② Return air ③ Supply air ④ Water return ⑤ Water supply

Sensor connection principle



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

Note:

- 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 crowded 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).

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

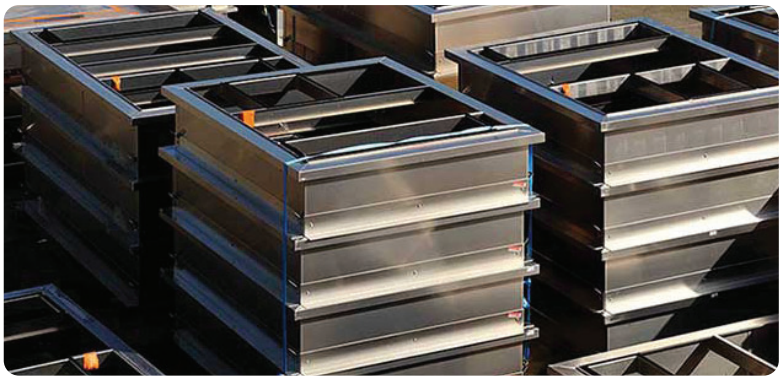
In addition to the 7 points listed for the "adjustable connecting curb":

- 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.

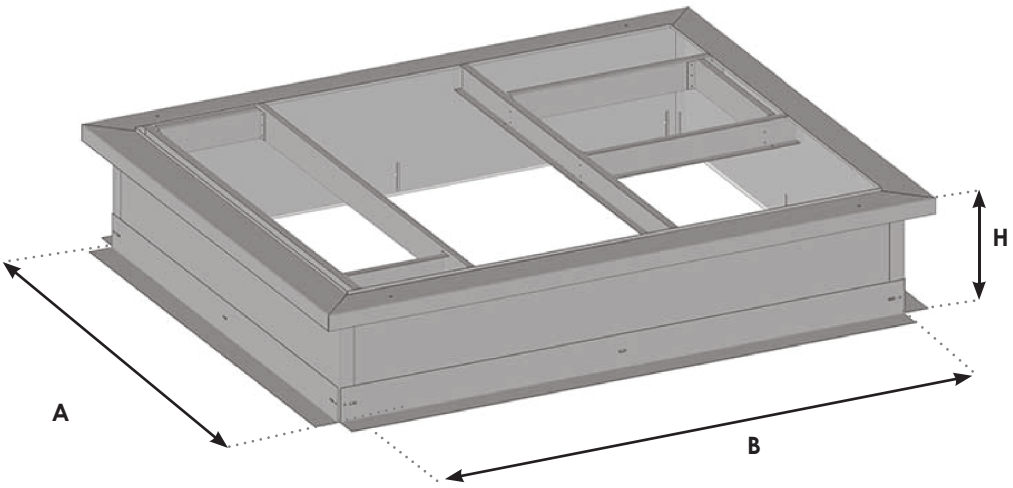
Adaptation curb:

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.



ADJUSTABLE CONNECTING ROOF CURB

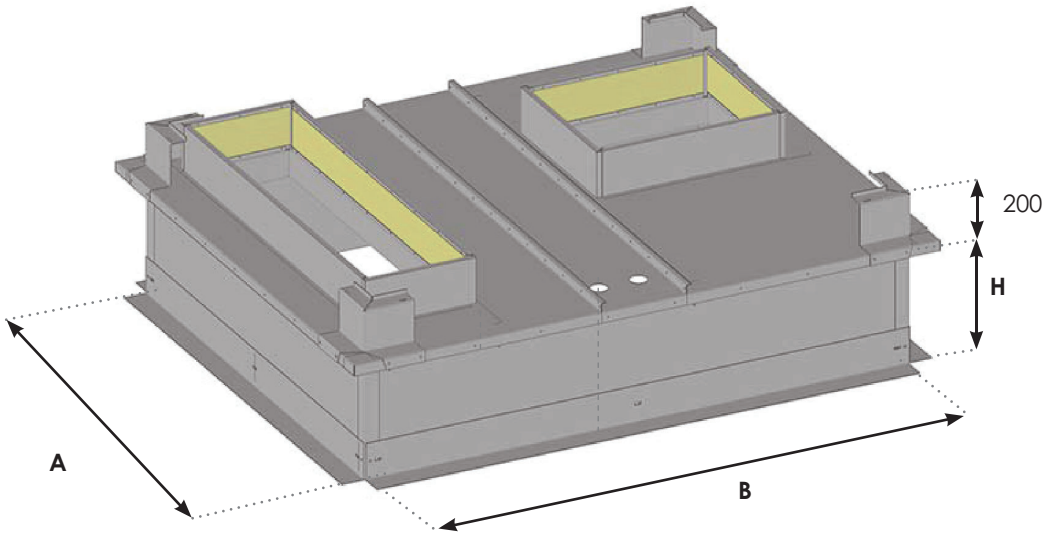


ATTENTION: With this type of roof curb installation, the installer is responsible for the ten-year roofing guarantee.
If the value of the slope is greater than that in the table below, you must send us (see MARK-NOT_55-EN_ Measurement_ Form):
- the value of the slope of your roof in %,
- the direction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

Reservation dimensions (mm)	A	B	H	Overall width	Overall length	Overall height	Max. slope length (%)	Max. slope width (%)	Weight (kg)
ULTI+R32 OR 11	1 700	1,970	550	1,914	2,178	563	5.0	5.8	80
ULTI+R32 OR 12	1 970	2,450	600	2,184	2,658	618	5.0	6.2	104
ULTI+R32 OR 21	2 220	2,770	600	2,434	2,978	618	5.0	6.2	121
ULTI+R32 OR 22	2 370	3,160	600	2,584	3,368	618	5.0	6.7	163

VENTILATED ADJUSTABLE ROOF CURB



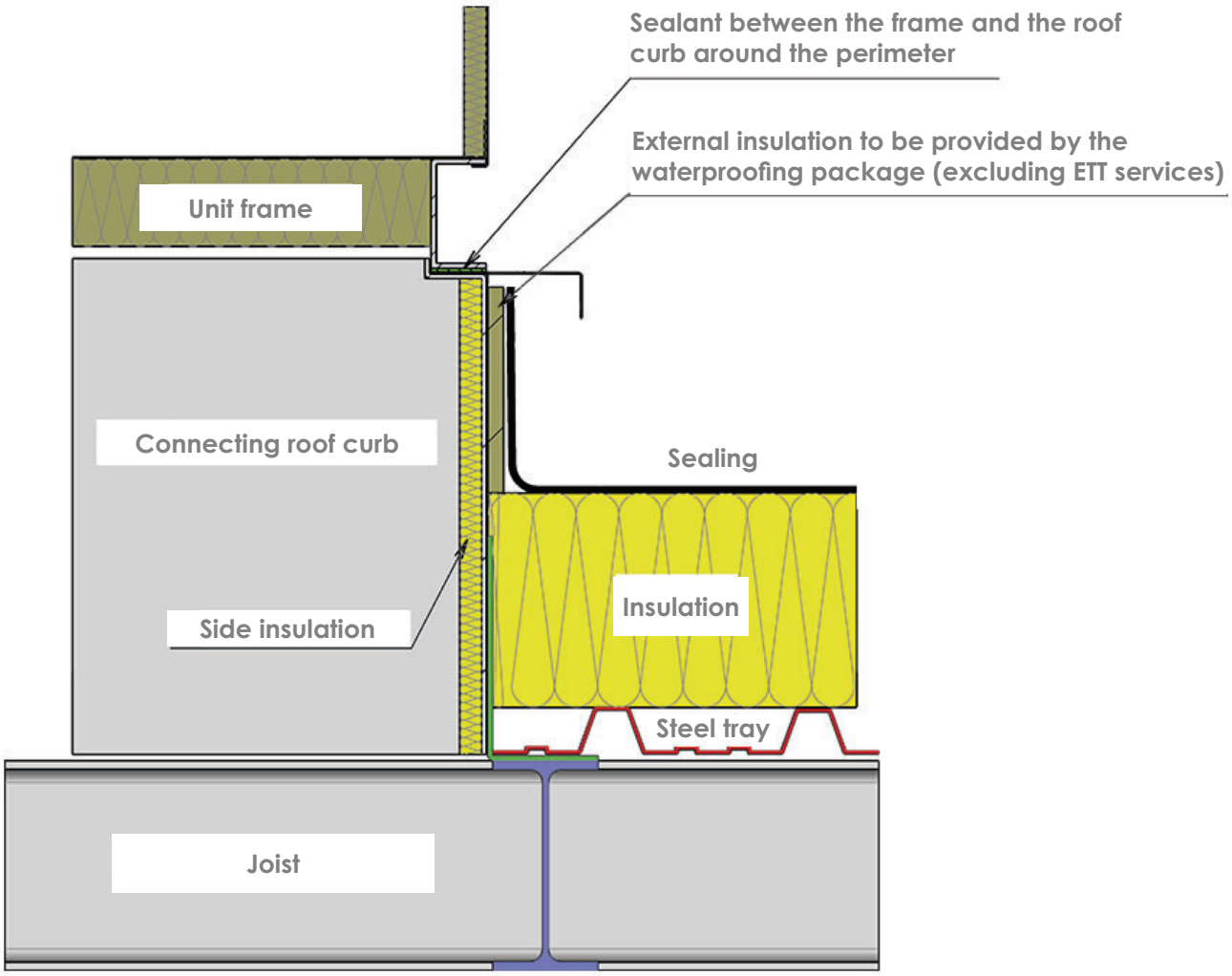
ATTENTION: With this type of roof curb installation, the installer is responsible for the ten-year roofing guarantee.
If the value of the slope is greater than that in the table below, you must send us (see MARK-NOT_55-EN_ Measurement_ Form):
- the value of the slope of your roof in %,
- the direction 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 OR 11	1 700	1,970	550	1,904	2,168	763	5.0	5.8	148.0
ULTI+R32 OR 12	1 970	2,450	600	2,174	2,648	818	5.0	6.2	192.4
ULTI+R32 OR 21	2 220	2,770	600	2,424	2,968	818	5.0	6.2	223.9
ULTI+R32 OR 22	2 370	3,160	600	2,574	3,358	818	5.0	6.7	301.6

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):

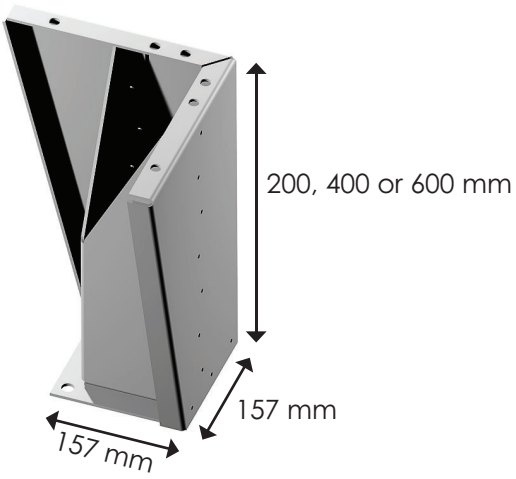


Note: The curbs are designed for a maximum total height of 345 mm of steel tray and insulation.
To maintain a standard curb height (refer to the curb drawing), you need to check that, depending on the slope of the roof on site, the 'insulation and steel tray' height dimension leaves sufficient insulation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

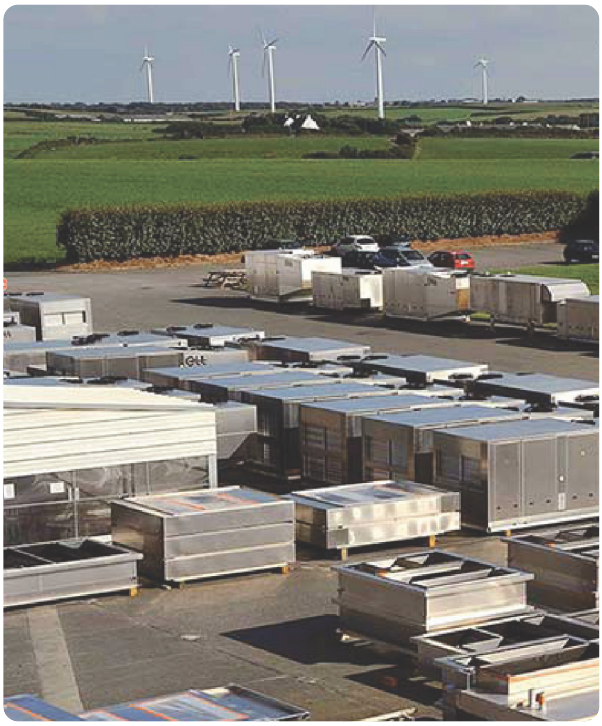
Fixed aluminium foot
Unit weight: 1 kg

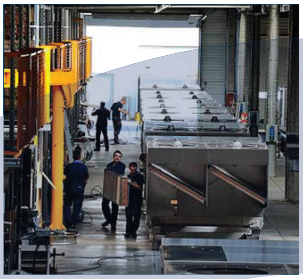


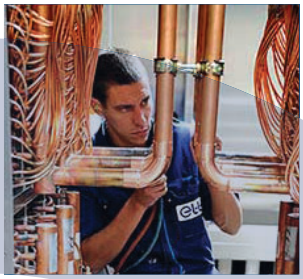
The feet are mounted on the corners of the frame.

	ULTI+R32 OR 11	ULTI+R32 OR 12	ULTI+R32 OR 21	ULTI+R32 OR 22
Number of feet	4	4	4	4

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







Reference: MARK-BRO_63-EN_D

ETT - Route de Brest - BP26
29830 Ploudalmézeau - France
Tel: +33 2 98 48 14 22
Export Contact: +33 2 98 48 00 70
ETT Services: +33 2 98 48 02 22

www.ett-hvac.com

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