



# Eurovent Certification Programmes

**Air Filters Class M5-F9 \***

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**Cooling Towers**

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**Fan Coils Units\***

**Heat Exchangers \***

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**Remote Refrigerated Display Cabinets**

**Rooftop (RT)\***

**Variable Refrigerant Flow (VRF)\***

\* All models in the production has to be certified

## Air Handling Units

CERTIFY ALL



Swegon has participated in the program for Air Handling Units from the start. The first priority at that time, and still is, was to find a way for fair competition. This is a long term struggle we try to cover all aspects from manufacturing to software performance predictions and its agreement with tests. We discuss and take decisions about mandatory performance in software print-out, rules for the energy labelling, how to test and what to apply in the, on site, auditor check. Customers should go for Eurovent certified products, to get reliable data, and then they can cut the main cost and take care of the environment by minimising the use of energy.



**Committee chair:**  
**Mr Gunnar Berg**  
Development Engineer, Swegon

### Scope of certification

This Certification Programme applies to selected ranges of Air Handling Units.

Participants shall certify all models in the selected product range up to the maximum stated air flow.

A range to be certified shall include at least one size with a rated air volume flow below 7 m<sup>3</sup>/s (25 000 m<sup>3</sup>/h).

### Certification requirements

For the qualification procedure: the selection software will be audited by our internal auditor. A visit on production site will be organized. During that visit, the au-

ditor will select one real unit per range, as well as several model boxes that will cover all mechanical variations.

The selected models will be tested and performances delivered by the selection software will be compared to the performances measured in an independent laboratory.

For the repetition procedures, the auditor will annually check the software conformity against the production data, and tests will be repeated every 3 to 6 years

### Certified characteristics & tolerances

- External Pressure: 4% or 15 Pa
- Absorbed motor power: 3%
- Heat recovery efficiency: 3%-points
- Heat recovery pressure drop (air side): max. of 10% or 15 Pa
- Water coil performances (heating/cooling): 2%
- Water coil pressure drop (water side): max. of 10% or 2 kPa
- Radiated sound power level casing: 3 dB(A)
- Sound power level unit openings:
  - 5 dB @ 125 Hz
  - 3 dB @ 250 – 8 000 Hz

### ECC Reference documents

- Certification manual
- Operational Manual OM-5
- Rating Standard RS 6/C/005

### Testing standards

- EN 1886: "Ventilation for buildings – Air handling units – Mechanical performance"
- EN 13053: "Ventilation for buildings – Air handling units - Rating & performance for units components and sections"

### Air to Air Plate Heat Exchangers

CERTIFY  
ALL



#### Scope of certification

This Certification programme applies to selected ranges of Air to Air Plate and Tube Heat Exchangers. Participants shall certify all models in the selected range, including:

- cross flow, counter-flow and parallel flow units
- all sizes
- all materials
- all airflow rates
- all edge lengths

Heat Exchangers with accessories such as bypass and dampers shall not be included.

The programme does not cover other types of Air to Air Heat Exchangers like Rotary Heat Exchangers or Heat Pipes. Combination of units (twin exchangers) shall not be included.

#### Certification requirements

For each range to be certified, 3 units will be selected by Eurovent Certification and tested in an independent Laboratory.

On a yearly basis, Eurovent Certification checks whether the certified products still fulfil the requirements. One unit selected from regular production will be tested in an independent laboratory. If the previous test campaign has been successfully completed and the unit of the current test campaign is ready for a new test, the certification is granted for another year.

#### Certified characteristics & tolerances

- Dimensions:  $\pm 2$  mm
- Plate spacing:  $\pm 1\%$  or  $\pm 1$  plate
- Dry efficiency:  $-3$  percentage points
- Wet efficiency:  $-5$  percentage points
- Pressure drop:  $+10\%$ , minimum 15 Pa

#### ECC Reference documents

- Certification manual
- Operational Manual OM-8
- Rating Standard RS 8/C/001

#### Testing standards

- EN 308

### Air to Air Rotary Heat Exchangers

CERTIFY  
ALL



#### Scope of certification

Eurovent Air to Air Rotary Heat Exchangers Certification Programme applies to all Rotary Heat Exchangers including casing. Participants shall certify all models, if available, including:

- all classes: condensation rotor / non hygroscopic rotor / enthalpy rotor / hygroscopic rotor / sorption rotor
- all rotor geometry (wave height, foil thickness)
- all sizes (rotor diameters and rotor depths)
- all materials
- all airflow rates
- all different types of sealing (if available)

#### Certification requirements

For the qualification & repetition procedures: one unit will be selected and tested by an independent laboratory.

#### Certified characteristics & tolerances

- Sensible Efficiency:  $-3\%$  points
- Latent Efficiency:  $-5\%$  points (min. tolerance 0.2 g/kg in absolute humidity of leaving supply air).
- Pressure Drop:  $-110\%$  (min 10 Pa)

#### ECC Reference documents

- Certification manual
- Operational Manual OM-10
- Rating Standard RS 8/C/002

#### Testing standards

- EN 308
- ARI 1060

## Chilled Beams

CERTIFY  
ALL



### Scope of certification

This Certification Programme applies to all Active and Passive Chilled Beams.

Chilled Beams are presented by ranges but all ranges must be certified. This applies to all product ranges which have either catalogue leaflets with product details including technical data or similar product information in electronic format.

### Certification requirements

For the qualification & repetition procedures (yearly): 3 units are selected from regular production and tested in the independent Laboratory selected by Eurovent Certification.

Obtained performances shall be compared with the values presented in the catalogues or electronic selection from manufacturer's website.

### Certified characteristics & tolerances

Cooling capacity: 3 conditions are required.

- Active: 80 – 100 – 120% of the nominal air flow rate.
- Passive: 8 – 10 – 12°C temperature difference.

### ECC Reference documents

- Certification manual
- Operational Manual OM-12
- Rating Standard RS 2/C/007

### Testing standards

- EN 14518: "Testing and rating of Passive Chilled Beams"
- EN 15116: "Testing and rating of Active Chilled Beams"

## Close Control Air Conditioners

CERTIFY  
ALL



### Scope of certification

This Certification Programme applies to factory-made units intended for Close Control Air Conditioning. This programme includes units with cooling capacities up to 100 kW under the specified test conditions.

Participating companies must certify all production models within the scope of the programme.

### Certification requirements

For the qualification & repetition procedures: 10% of the units declared will be selected and tested by an independent laboratory.

### Certified characteristics & tolerances

Air-Cooled and Water-Cooled Close Control Air Conditioners

- Total cooling capacity (-8%)
- Sensible cooling capacity (-8%)

- EER (-8%)
- A-weighted sound power level (+0 dB)

Chilled-Water Close Controls Air Conditioners

- Total cooling capacity (-8%)
- Sensible cooling capacity (-8%)
- Effective power input (+8%)
- A weighted sound power level (+0 dB)
- Water pressure drop (+10%)

### ECC Reference documents

- Certification manual
- Operational Manual OM-1
- Rating Standard RS 6/C/001
- Rating Standard RS 6/C/004
- Rating Standard RS 6/C/006

### Testing standards

- EN 14511
- EN 12102 - EUROVENT 8/1

### Comfort Air Conditioners

CERTIFY ALL



#### Scope of certification

This certification programme includes:

- AC1: comfort units with cooling capacity up to 12 kW
- AC2: comfort units with cooling capacity from 12 to 45 kW
- AC3: comfort units with cooling capacity from 45 to 100 kW

This programme applies to factory-made units intended to produce cooled air for comfort air conditioning (AC1, AC2, AC3). It also applies to units intended for both cooling and heating by reversing the cycle. For the AC1 programme class G units are excluded.

Participating Companies must certify all production models within the scope of the programme they enter. However concerning multi-split air conditioners, only systems with maximum two indoor units are included.

#### Certification requirements

For the qualification & repetition procedures: 10% of the units declared will be selected and tested by an independent laboratory.

#### Certified characteristics & tolerances

- Capacity (cooling and heating) -5%
- Efficiency (EER and COP) -8%
- A-weighted sound power level +0 dB

#### ECC Reference documents

- Certification manual
- Operational Manual OM-1
- Rating Standard RS 6/C/001
- Rating Standard RS 6/C/004
- Rating Standard RS 6/C/006

#### Testing standards

- EN 14511
- EN 12102

### Fan Coils Units

CERTIFY ALL



#### Scope of certification

- This Certification Programme applies to Fan Coil Units using hot or chilled water. It concerns both non ducted and ducted fan coils:
- Non ducted units: Fan Coil Units with air flow less than 0.7 m<sup>3</sup>/s and a published external static duct pressure at 40 Pa maximum.
- Ducted units: Fan Coil Units up to 1 m<sup>3</sup>/s airflow and 300 Pa available pressure.
- Participating companies must certify all production models within the scope of the programme.

#### Certification requirements

- Repetition procedure: the number of units to be tested each year will be proportional to the number of his basic models listed in the Directory, in an amount equal to 20% for Fan Coil Units with a minimum of one test.

#### Certified characteristics & tolerances

- Capacity (cooling, sensible, heating): -5%
- Water pressure drop: +10%
- Fan power input: +10%
- A-weighted sound power: +1 / +2 dB(A)
- Air flow rate: -10%
- Available static pressure 0 Pa for medium speed and -5 Pa for other speeds
- FCEER & FCCOP
- Eurovent energy efficiency class

#### ECC Reference documents

- Certification manual
- Operational Manual OM-1A
- Rating Standard RS 6/C/002
- Rating Standard RS 6/C/002A

#### Testing standards

- Performance testing: Eurovent 6/3, 6/11, 6/10
- Acoustic testing: Eurovent 8/2

## Cooling Towers



The importance of air conditioning and industrial cooling is constantly increasing in modern architecture and industrial process cooling. The human perception of comfort and the new challenges to reduce the electrical power consumption and CO<sub>2</sub> footprint have designers striving for optimal system performances with the highest possible efficiencies. Reliable thermal performances are crucial to ensure these best efficiencies which are typical for cooling circuits driven by evaporative cooling equipment. On a yearly basis, one random picked cooling tower of each Eurovent-CTI certified product line will be full scale thermal tested by applying the CTI standard 201.

Eurovent Certification Company guarantees the consistency of thermal testing and manufacturing of European and non-European companies that subscribe to the program.



**Committee chair:**  
**Mr Rob Vandenboer**  
Product Manager, Quality Manager  
Evapco Europe, BVBA

### The first ECC / CTI collaborative certification program for Cooling Towers

The Eurovent Certification Company (ECC, Brussels, Belgium) is pleased to announce the Certification programme for cooling tower thermal performance developed in cooperation with the Cooling Technology Institute Est.1950 (CTI, Houston, Texas, USA). The scope of the program includes standardized model lines for open circuit cooling towers, typically factory assembled. Standardized model lines are composed of individual models that are required to have published thermal rating capacities at corresponding input fan power levels.

Thermal performance certification via this program offers a tower buyer assurance that the capacity published for the product has been confirmed by the initial and on-going performance testing per the requirements of the program using CTI STD-201. It also offers for regulators of energy consumption related to cooling towers, that the capacity of the towers has been validated. Minimum energy efficiency standards such as ASHRAE 90.1, which requires cooling tower energy efficiency validation by the CTI certification process, are used by governments and by green building certification programs such as LEED™.

### Scope of certification

The Eurovent Certification Programme for Cooling Towers applies to product ranges (or product lines) of Open-Circuit series Cooling Towers. The programme applies to product ranges that:

- Are manufactured by a company whose headquarter or main facility are located in Europe, Middle-East, Africa or India. After getting the Eurovent Certification, the CTI certificate could be requested.
- Have already achieved and hold current certification by the Cooling Technology Institute (CTI) according to CTI STD-201.

### Certification requirements

For the qualification & repetition procedures (yearly): our internal auditor will visit the production place and review the conformity of Data of Records. One unit per range will be selected and tested by an independent test agency.

### Certified characteristics & tolerances

- Certified characteristic shall be per CTI STD-201
- Entering wet bulb temperature:  
-12.8°C to 32.2°C (55°F to 90°F)
- Cooling range > 2.2°C (4°F)
- Cooling approach > 2.8°C (5°F)
- Process fluid temperature < 51.7°C (125°F)
- Barometric pressure:  
-91.4 to 105.0 kPa (27" to 31" Hg)

### ECC Reference documents

- Certification manual
- Operational Manual OM-4
- Rating Standard RS 9/C/001

### Testing standards

- CTI STD-201
- ECC OM-4

### Cooling & Heating Coils



Heating Cooling Coils (HCCs) which enable the conditioning of different zones and flexibility in application in buildings are generally employed in compact and central station AHU. To meet the required extra capacity in various processes, they are also used as heating or cooling devices.

With the application of these coils to high energy efficient heat recovery systems, the entire system becomes more compact as well as it avoids occupation of large spaces. Besides, they can be applied to Variable Air Volume (VAV) systems used for conditioning of hospitals, shopping centers and convention facilities.

The Certification programme for the HCCs has increased integrity and accuracy of the industrial performance ratings which provides clear benefits for end users who can be confident that the product will operate in accordance with design specifications. Also, by means of this certification programme users can collect reference data on the fundamental characteristics of the HCCs, such as capacity, pressure drop, mass flow complying with the standard of EN 1216.



**Committee chair:**  
**Engin Söylemez**  
R&D Test Engineer, Friterm A.Ş

#### Scope of certification

The rating standard applies to ranges of forced circulation air cooling and air heating coils as defined in ENV1216.

#### Certification requirements

- Qualification and repetition procedures: units declared will be selected and tested by an independent laboratory.
- The number of units will depend on the variety of coil material configurations and their applications for the applied range.
- The selection software will be verified in comparison with the test results.

#### Certified characteristics & tolerances

- Capacity: -15%
- Air side pressure drop: +20%
- Liquid side pressure drop: +20%

#### ECC Reference documents

- OM-9
- RS 7/C/005

#### Testing standards

- ENV 1216

### Drift Eliminators



#### Scope of certification

The Eurovent Certification Programme for Drift Eliminators applies to Drift Eliminators used for evaporative water-cooling equipment.

#### Certified characteristics & tolerances

The following characteristics of Drift Eliminators shall be certified by tests:

- For counter-flow and cross-flow film fill, the average drift losses of the two tests at 3.5 m/s are less than 0.007% of circulating water flow rate.
- For cross-flow splash fill, the average drift losses of the two tests at 3 m/s are less than 0.007% of circulating water flow rate.

No tolerance will be applied on the average drift losses.

#### ECC Reference documents

- Certification manual
- Operational Manual OM-14
- Rating Standard RS 9/C/003

#### Testing standards

- Eurovent Rating Standard 9/C/003
- CTI ATC-140

## Air Filters Class M5-F9



Today, people spend most of the time inside of buildings. Hence, indoor air quality is a key factor to human health. Air filters removing fine dust from the air stream are the key component in building heating, ventilation and air conditioning systems to supply air of the required cleanliness and to ensure a high level of indoor air quality. With the air filter certification program, reliable and transparent filter data are ensured to customers. On a yearly base, four different filters are selected out of the product range of each participant for testing at independent laboratories according to EN 779:2012, verifying the initial pressure drop, the filter class and the initial and minimum efficiency, as well as the energy efficiency class to Eurovent document 4/11. Additionally, with the new energy efficiency label, Eurovent provides valuable data to enable users to select the most energy efficient air filters.



**Committee chair:**  
**Dr. Thomas Caesar**  
Head of Filter Engineering Industrial Filtration Europe  
Freudenberg Filtration Technologies SE & Co. KG

### Scope of certification

- This Certification Programme applies to air filters elements rated and sold as “Medium or Fine Air Filters F5-F9” as defined in EN 779:2012 and with a front frame size of 592 x 592 mm according to standard EN 15805.
- When a company joins the programme, all relevant air filter elements shall be certified.

### Certification requirements

- For the qualification & repetition procedures: 4 units will be selected and tested by an independent Laboratory selected by Eurovent Certification.

### Certified characteristics & tolerances

- Filter class: no tolerance.
- Initial pressure drop: +10% + 5 Pa (minimum 15 Pa)
- Initial efficiency for F7 to F9: 10% – point
- Discharge efficiency for F7 to F9: 10% – point
- Eurovent energy class: no tolerance
- Annual energy consumption

### ECC Reference documents

- Certification manual
- Operational Manual OM-11
- Rating Standard RS 4/C/001

### Testing standards

- EN 779:2012
- Eurovent 4/11

## Hydronic Heat Pumps



### Scope of certification

- This programme applies to standard chillers and hydronic heat pumps used for heating, air conditioning and refrigeration.
- They may operate with any type of compressor (hermetic, semi-hermetic and open) but only electrically driven chillers are included.
- Only refrigerants authorised in EU are considered. Chillers may be air cooled, liquid cooled or evaporative cooled.

### Certification requirements

Qualification and repetition: a certain number of units will be selected by Eurovent Certification and tested every year, based on the number of ranges and products declared.

### Certified characteristics & tolerances

- Cooling & heating capacity and EER & COP at full load: < -5%
- A-weighted sound power level: > +3 dB(A)
- Water pressure drop: +15%
- Available pressure: -15%

### ECC Reference documents

- Certification manual
- Operational Manual OM-3
- Rating Standard RS 6/C003
- Rating Standard RS 6/C/003A

### Testing standards

- Performance testing: EN 14511
- Sound testing: EN 12102

## Heat Exchangers



Air coolers for refrigeration



Dry coolers



Air cooled condensers

The purpose of the Eurovent "Certify-All" certification programme for heat exchangers is to encourage honest competition and to assure customers that equipment is correctly rated.

The programme covers 3 product groups:

- Unit Air Coolers
- Air Cooled Condensers
- Dry Coolers

The "Certify-All" principle ensures that, for heat exchangers, all models in the three product categories are submitted for certification, not just some models chosen by the manufacturer.

A product energy class scheme has been incorporated into the certification programme, based on 7 classes from "A++" to "E" in order to provide a guide to the best choice of product: this enables the user to minimize life-cycle costs, including running costs which account for a much superior sum than the initial investment cost.



Committee chair:  
**Stefano Filippini**  
Technical manager - LUVE

- Product ranges of Dx Air Coolers where maximum standard SC2 is below 1.5 kW.
- Product ranges of Air Cooled Condensers where maximum standard capacity under DT1 15K is below 2.0 kW

### Certification requirements

- Qualification: units selected by Eurovent Certification shall be tested in an Independent Laboratory selected by Eurovent Certification.
- Repetition procedure: units selected from regular production shall be tested on a yearly basis.

### Certified characteristics & tolerances

- Standard capacity -8%
- Fan power input +10%
- Air volume flow  $\pm 10\%$
- External surface area  $\pm 4\%$

### For Air Cooled Condensers and Dry Coolers:

- A-weighted sound pressure level: +2 dB(A)
- A-weighted sound power level: +2 dB(A)
- Surface area:  $\pm 4\%$

### ECC Reference documents

- Certification manual
- Operational Manual OM-2
- Rating Standard RS 7/C/003
- Rating Standard RS 7/C/001

### Testing standards

- Performance ENV 328
- Performance EN 327
- Acoustics EN 13487

### Scope of certification

The Eurovent Certification Programme for Heat Exchangers applies to products using axial flow fans. The following products are excluded from the Eurovent Certification Programme for Heat Exchangers:

- Products units using centrifugal type fans.
- Units working at 60 Hz

In particular, the following products are also excluded from the Eurovent Certification programme for Dx Air Coolers and Air Cooled Condensers:

- Products using R717 refrigerant (ammonia), CO<sub>2</sub>, and refrigerants with high glide like R407C or without correction factors.

## Liquid Chilling Packages



### Scope of certification

- This programme applies to standard chillers and hydronic heat pumps used for heating, air conditioning and refrigeration.
- They may operate with any type of compressor (hermetic, semi-hermetic and open) but only electrically driven chillers are included.
- Only refrigerants authorised in EU are considered. Chillers may be air cooled, liquid cooled or evaporative cooled.

### Certification requirements

Qualification and repetition: a certain number of units will be selected by Eurovent Certification and tested every year, based on the number of ranges and products declared.

### Certified characteristics & tolerances

- Cooling & heating capacity and EER & COP at full load: < -5%
- A-weighted sound power level: > +3 dB(A)
- Water pressure drop: +15%
- Available pressure: -15%

### ECC Reference documents

- Certification manual
- Operational Manual OM-3
- Rating Standard RS 6/C003
- Rating Standard RS 6/C/003A

### Testing standards

- Performance testing: EN 14511
- Sound testing: EN 12102

## Remote Refrigerated Display Cabinets



### Why do we need transparent information on refrigeration equipment?

Refrigeration in the supermarkets represents between 30 to 60% of the electrical consumption of the store. For design offices, consultants and end-users, the difference in energy efficiency of the products shall be accurate and visible, so that it is possible to make the right choice.

Furthermore the Europe targets an energy saving by 2020 and put in place an Energy Related Product Directive. The less efficient products will be banned from the market.

Only a Certification program via its independent controls guarantees the required transparency and it allows a fair market.



Committee chair:  
**Stéphane Mousset**  
Product Manager – Marketing  
EPTA Group

### Scope of certification

- 100 basic model groups divided in 5 categories: semi-verticals and verticals (with doors); multi-deckers; islands; service counters; combi freezers.

- At least two references per basic model group representing 80% of sales shall be declared.
- One Bill of Material for each declared reference.

### Certification requirements

- Qualification: sampling and test of one unit & Audit of one factory.
- Repetition test of one unit per brand every 6 months & Annual audit of each factory.

### Certified characteristics & tolerances

- Warmest and coldest product temp.  $\pm 0.5^{\circ}\text{C}$
- Refrigeration duty (kW) 10%
- Evaporating temperature  $-1^{\circ}\text{C}$
- Direct elec. Energy Consumption +5%
- Refrigeration elec. Energy Cons.
- Total Display Area (TDA) -3%

### ECC Reference documents

- Certification manual
- Operational Manual OM-7
- Rating Standard RS 14/C/001

### Testing standards

- EN ISO 29953 and amendments
- CEN TC44/WG1 amendments
- “Alternative for filling test packages”

### Rooftop (RT)

CERTIFY  
ALL



The Eurovent rooftop certification (RT) program covers air-cooled and watercooled packaged rooftop units below 100 kW in cooling mode, with an option to certify units from 100 kW to 200 kW. The Rooftop program participants represent the five main European rooftop manufacturers.

Eurovent certifies indoor and outdoor sound levels, cooling and heating capacity and efficiency. Certified performances provide transparency and fair comparison between manufacturers. It is also the basis for the reliable study of HVAC system energy performance.

Currently the program evolves towards part load efficiency (SEER, SCOP) and certification of performance simulation tool data. Current work done on EN 14825 aims to address rooftops in the calculation hypothesis. The software certification is a key item to comply with existing and coming certification of building energy calculations in the EU countries.



**Committee chair:**

**Mr Philippe Tisserand**

Product Manager for rooftop & commercial unitary for Trane EMEA – Chairman of Eurovent Rooftop program compliance committee

#### Scope of certification

- This Certification Program applies to air-cooled and water cooled rooftops rated below 100 kW.
- Models with cooling or heating capacity ranging from 100 kW to 200 kW can be certified as an option.
- Models of rooftops using gas burners for heating shall be only certified for cooling.

#### Certification requirements

- For the qualification and repetition procedures (yearly) between 1 & 3 units are selected and tested by Eurovent Certification, depending on the number of products declared.

#### Certified characteristics & tolerances

- Capacity (Cooling or Heating): -5%
- EER or COP: -8%
- Condenser water pressure drop: +15%
- A-weighted Sound Power Level: +3 dBA.
- Eurovent Energy Efficiency class (cooling and heating)

#### ECC Reference documents

- Certification manual
- Operational Manual OM -13
- Rating Standard RS 6/C/007

#### Testing standards

- EN 14511 for Performance Testing
- EN 12102 for Acoustical Testing

### Variable Refrigerant Flow (VRF)

CERTIFY  
ALL



#### Scope of certification

The certification programme for Variable Refrigerant Flow (VRF) applies to:

- Outdoor units used in Variable Refrigerant Flow systems with the following characteristics:
- Air or water source,
- Reversible, heating-only and cooling-only.

VRF systems with data declared and published as combinations are excluded from the scope.

Heat recovery units are included in the scope but the heat recovery function is not certified.

High ambient systems are included in the scope but tested under standard conditions as specified in RS 6/C/008.

#### Certification requirements

- Qualification: units selected by Eurovent Certification shall be tested in an independent laboratory selected by Eurovent Certification.

- Repetition procedure: units selected from regular production shall be tested on a yearly basis.

#### Certified characteristics & tolerances

- Outdoor Capacity (cooling and heating): -8%
- Outdoor Efficiency (EER, COP): -10%
- A-weighted sound power level: 0 dB

#### ECC Reference documents

- Certification manual
- Operation manual OM-15
- Rating Standard RS 6/C/008
- Rating Standard RS 6/C/009

#### Testing standards

- EN 14511
- EN 12102