



# TECHNICAL CERTIFICATION RULES OF THE EUROVENT CERTIFIED PERFORMANCE MARK



## ROOFTOP

Identification: ECP-13-Rooftop

Revision 1 – June 2021  
(This version cancels and replaces any previous versions)

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The purpose of this Technical Certification Rules is to prescribe procedures for the operation of the Eurovent Certified Performance (ECP) certification programme for Rooftop (RT), in accordance with the Certification Manual.

Modifications as against last version:

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# I. GENERAL INFORMATION

The purpose of this manual is to prescribe procedures for the operation of the Eurovent Certified Performance (ECP) certification programme for ROOFTOP (RT), in accordance with the Certification Manual.

This manual also establishes definitions and specifications for testing and rating of RT units.

Participation in this programme is open to:

- Original Equipment Manufacturers (OEM)
- Brand Name Manufacturers (BN) selling products already certified by OEM
- Distributors purchasing and selling products non-certified by OEM

## I.1. Scope

### I.1.a. General

The programme scope covers air-to-air rooftops and water-to-air rooftops as defined in § I.3.a, rated up to 200 kW in cooling capacity at standard condition as defined in EN 14511:2018.

The following features are excluded from certification scope:

- gas burners,
- pre-heaters,
- heaters,
- additional internal coil,
- heat recovery (plate, wheels, thermodynamic systems),
- exhaust fans,
- split rooftop,
- roomtop.

Minimum and maximum external static pressure requirements are defined in standard EN 14511- 3:2018.

The programme is divided into four sub-programmes:

- One mandatory sub-programme: Air-to-air units up to 100 kW
- Three optional sub-programmes:

#### I.1.a.1 Air-to-air rooftops from 100 kW to 200 kW

Units above 100 kW capacities can be certified as an option using tests done in Participant Laboratory (see Appendix D).

Maximum capacities are defined for each participant according to the capacity of the participant's laboratory and with a maximum at 200 kW in cooling mode.

Nevertheless, some units above 100 kW can be certified and tested in independent laboratory following some conditions and configurations (see § III.1.e.4.i).

### I.1.a.2 Water-to-air rooftops up to 200 kW

Water-to-air rooftop up to 100 kW can be certified as an option and will be tested in independent laboratory.

Units above 100 kW capacities can be certified as an option in Participant Laboratory (see Appendix D).

Maximum capacities are defined for each participant according to the capacity of the participant's laboratory and with a maximum at 200 kW in cooling mode.

### I.1.a.3 3 or 4 dampers units

3 or 4 dampers units, as described in the § I.3.a, can be certified as an option.

### **I.1.b. Certify-all principle**

Whenever a company participates in the programme for RT, all products that are promoted by the applicant/participant to end-users, specifiers, trading companies, contractors by means of paper or electronic catalogue, price list or software within the scope of the programme, shall be certified, in accordance with this Technical Certification Rules. This includes all models in modular ranges. For the RT programme, the certify-all requirement is applicable for the European market as defined in the Certification Manual (Art. 30).

### **I.2. Certified performances**

The following performance characteristics shall be certified and verified by tests:

- Cooling Capacity ( $P_c$ )
- Heating Capacity ( $P_h$ )
- Total Power Inputs ( $P_{e_c}$  &  $P_{e_h}$ )
- EER
- COP
- Seasonal Efficiency in Cooling (SEER &  $\eta_{s,c}$ )
- Seasonal Efficiency in Heating (SCOP &  $\eta_{s,h}$ )
- Eurovent Seasonal Efficiency class (cooling and heating)
- External static pressure (ESP)
- Nominal airflow rate ( $Q_v$ )
- Condenser water pressure drop (only for water cooled rooftops)
- A-weighted Sound Power Level outside
- A-weighted Sound Power Level in supply duct

### **I.3. Definitions**

In addition to the definitions specified in the Certification Manual, the following definitions apply:

### I.3.a. Rooftop

A rooftop unit is defined by the following features:

- Air-to-air rooftop: Units covered by ErP regulation No 2016/2281 and defined as a Rooftop air conditioner or Rooftop heat pump.
- Water-to-air rooftop: Water-to-air heat pump/air conditioner (defined and covered by the EU regulation No 2016/2281), driven by an electric compressor, of which the evaporator, compressor and condenser are integrated into a single package.

Features according to definitions from ErP regulation:

- Single packaged unit assembled in factory
- Common single frame
- Direct expansion system
- For Air-to-air unit, the outdoor side heat exchanger (condenser / evaporator) allows heat transfer with 100% outdoor (ambient) air.

Additional features:

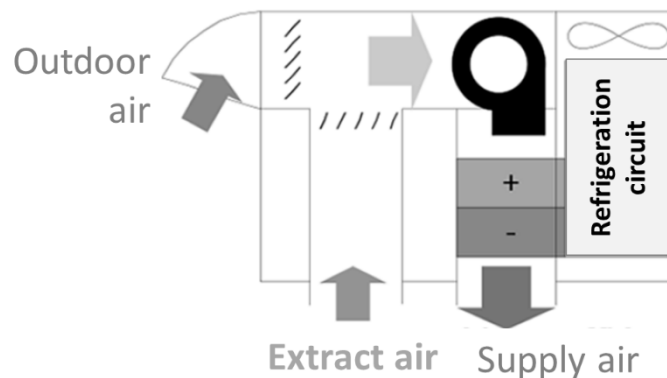
- Designed to operate permanently outdoor
- The rooftop is designed to permanently handle 100% recycled air with the possibility of mixing partly the fresh air.
- The outdoor fan from an air-to-air rooftop could be ducted but for the certification tests, the unit must be not ducted.
- Rooftops could be equipped with 2 / 3 or 4 dampers depending on heat recovery system included or not.
- $SEER_{freecooling}$

These types of rooftops shall be tested:

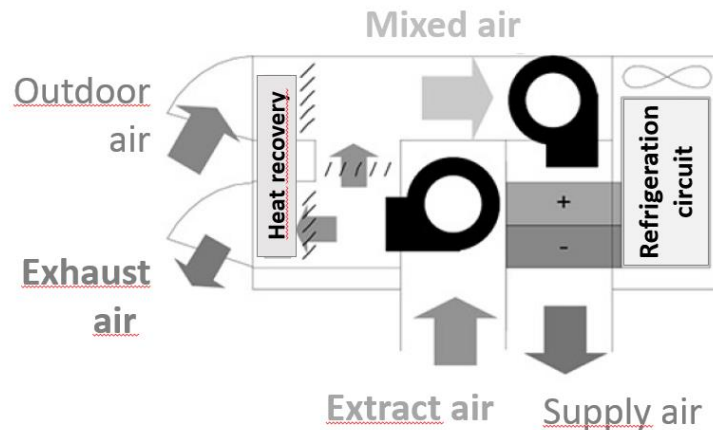
- For the indoor heat exchanger with mixed air equal to 100% extract air and,
- For the 'outdoor' heat exchanger with 100% outdoor air.
- Other parameters in accordance with the standards EN 14511:2018 and EN 14825:2018.

Some examples of rooftops:

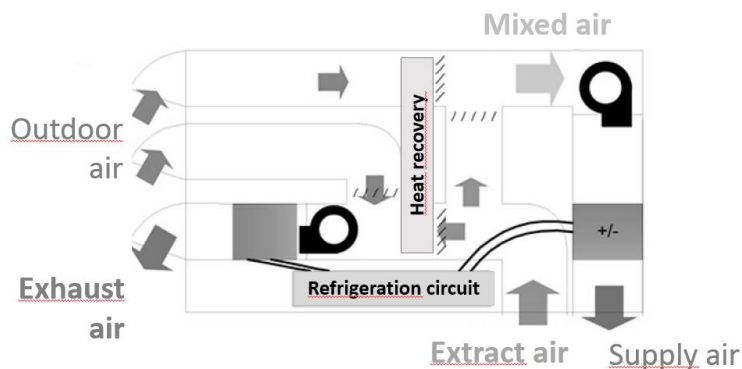
**Figure 1 : 2 dampers rooftops**



**Figure 2: 3 dampers rooftops**



**Figure 3: 4 dampers rooftops**



### **I.3.b. Basic model groups (BMG)**

A Basic Model Groups (BMG) is a list of Rooftops models, part of a common commercial range sharing the same overall dimensions:

- Height (mm)
- Width (mm)
- Length (mm)
- with the same function and application (For instance, reversible rooftops and cooling only rooftops are in two separate Basic Model Groups)
- with similar components (fans, coils, compressors and motors)

### **I.3.c. Measured and rated data**

#### **I.3.c.1 Definitions in accordance with EN 14511**

The definitions of the following items are given in EN 14511:2018.

- Cooling Capacity ( $P_c$ )
- Heating Capacity ( $P_h$ )
- Total Power Input ( $P_{e_c}$  or  $P_{e_h}$ )
- EER, COP



### I.3.c.2 Definitions in accordance with EN 14825

The definitions of the following items are given in EN 14825:2018.

- Part-Load ratio
- Part-Load conditions
- SEER
- SCOP

#### I.3.d. Other definitions

**LRcontmin:** Load rate under which a unit with a variable speed compressor behaves as an ON/OFF unit. For staged capacity units it is the load rate of the smallest capacity step in full mode. For ON/OFF units LRcontmin equals 1.

**Ccp<sub>LRcontmin</sub>:** Ratio of the COP (or EER) at full load and the COP (or EER) at LRcontmin.

**The seasonal space cooling efficiency  $\eta_{s,c}$  [%]** is defined as:

$$\eta_{s,c} = \frac{SEER}{CC} \times 100 - \Sigma F(i) \quad (1)$$

where:

CC is the conversion coefficient, equal to 2,5

SEER is the Seasonal Energy Efficiency Ratio

$\Sigma F(i)$  is the correction calculated equal to 3% for air-to-air rooftops.

**The seasonal space heating efficiency  $\eta_{s,h}$  [%]** is defined as:

$$\eta_{s,h} = \frac{SCOP}{CC} \times 100 - \Sigma F(i) \quad (2)$$

where:

CC is the conversion coefficient, equal to 2,5

SCOP is the Seasonal Coefficient of Performance

$\Sigma F(i)$  is the correction calculated equal to 3% for air-to-air rooftops.

### I.4. Contributors

The lists of contributors are given for information and may be modified by Eurovent Certita Certification (ECC) whenever necessary.

#### I.4.a. Independent laboratory / test body

When the checks carried out involve product tests, these are performed at the request of ECC by the following laboratories, known as Independent laboratory:

##### **CEIS**

Cr. de Villaviciosa de Odón a Móstoles,  
Km. 1,5  
28935 Móstoles (Madrid)  
SPAIN

##### **DMT GmbH & Co. KG**

Am Technologiepark 1  
45307 Essen  
Germany

## II. REQUIREMENTS OF THE REFERENCE DOCUMENT

### II.1. Reference documents

#### II.1.a. Product and test standards

The test procedure is detailed in Appendix A.2 and in the product and test standards.

The applicable standards are as follows (non-exhaustive list):

##### II.1.a.1 Performance testing

**EN 14511:2018** "Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling" used for:

- Standard rating points
- LRcontmin and CcpLRcontmin

**EN 14825:2018** "Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling. Testing and rating at part-load conditions and calculation of seasonal performance" used for:

- P<sub>sb</sub>, P<sub>to</sub>, P<sub>off</sub>, P<sub>ck</sub>
- Part-Load Conditions in cooling mode
- Part-Load Conditions in heating mode

##### II.1.a.2 Acoustical testing

**EN 12102-1:2017** "Air conditioners, liquid chilling packages, heat pumps and dehumidifiers with electrically driven compressors for space heating and cooling - Measurement of airborne noise - Determination of the sound power level".

*When implementing the sound power measurements using the ISO 9614-1 method, "engineering grade" is not always achievable. "Surveillance grade" results are accepted as far as the overall measurement uncertainty is equivalent to "engineering grade" test results. Duct end correction of the noise figures described in section 6.2.2. are not applicable for the purpose of the certified values.*

#### II.1.b. Specific technical requirements: LRcontmin test method

##### II.1.b.1 Standard approach

- A heating (respectively cooling) capacity test at selected load ratio to verify the continuous operation of the Rooftop (no cycling) and record the heating capacity and the COP (respectively EER) at LRcontmin.
- A heating (respectively cooling) capacity test at the standard rating conditions and record the capacity and the COP (respectively EER) in these standard rating conditions.

LRcontmin is the ratio of the capacity measured at minimum continuous operation divided by the heating capacity measured in the standard rating conditions.

CcpLRcontmin is then calculated and validated, as follows:

In cooling:

$$C_{cpLRcontmin,c} = \frac{EER \text{ at } LRcontmin}{EER \text{ at standard rating conditions}} \quad (3)$$

In heating:

$$C_{pLRcontminh} = \frac{COP \text{ at } LRcontmin}{COP \text{ at standard rating conditions}} \quad (4)$$

#### II.1.b.2 Alternative method for heating mode

The only case in which “Part-Load C” values (Ph and COP) could be used in the calculation of LRcontmin is when the 3 following requirements are met:

- Unit must be declared with minimum compressor frequency for Part-Load C.
- Capacity declared at such Part-Load C (which corresponds to minimum compressor frequency) complies with standard tolerance (10%).
- For staged units ECC will systematically select the lower stage at Condition C.

The manufacturer shall inform ECC which method is used regarding this declaration once the unit is selected for testing.

### **II.2. Marking**

It is highly recommended that the participating company indicates participation in the Eurovent Certified Performance (ECP) programme for Rooftop by the following means.

The provisions laid down in the Certification Manual apply.

The Eurovent Certified Performance Mark consists of:

- Mark in conformity to the design as presented in the License Agreement. The accepted color combinations consist of green pantone n° 341 on white, or black on white. Any size of mark may be used.
- Reference of the certified Rooftops.
- Identification number provided by ECC when the certification is granted.

#### **II.2.a. Display of ECP logo on production units**

The provisions of the Certification Manual apply.

#### **II.2.b. Display of ECP logo on technical documentation**

The provisions of the Certification Manual apply.

## **III. CERTIFICATION PROCESS**

### **III.1. Admission procedure**

#### **III.1.a. Declaration of data**

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

The Applicant, after signing the Certification Agreement, shall send to ECC all information required for the qualification: declaration file and relevant literature.

All technical documentation shall be provided 12 weeks after having signed the License Agreement (see Certification Manual Art 126).

Submittal of certification of models shall be made in writing and sent to ECC by e-mail by filling in the appropriate form.

The participant shall send the appropriate technical documentation (means “commercially available” as defined in Certification Manual) and/or public hyperlink and ECC will check the consistency between the file of combination and this technical documentation.

#### III.1.a.1 Responsibility and confidentiality of certification data

All ratings submitted for certification by participating manufacturers on their own models, and test data on competitive models, shall, in each case, be submitted over the signature of the person properly authorized by the company to undertake this responsibility.

All data submitted to ECC shall be held confidential except for information authorized to be published in the Directory.

#### III.1.a.2 Rated performance data

All characteristics shall be expressed in SI Units. Maximum of three (3) significant figures shall be used for capacity, effective power input EER, COP, SEER, SCOP and water pressure drop; and two (2) significant figures for sound power. *The seasonal space heating energy efficiency ( $\eta_{s,h}$ ) and seasonal space cooling energy efficiency ( $\eta_{s,c}$ ) shall be expressed in % without any decimal.*

#### III.1.a.3 Certification forms

Submittal of models shall be made by filling in the Excel forms provided by ECC. Modifications of performances on previously tested or re-rated units can be done only under the conditions given in the Certification Manual.

#### III.1.a.4 Reporting of models

In reporting models for certification and for publication in the Directory, certified ratings shall be given for all models that meet the requirements of the present TCR.

Beside current models, the Participants shall provide ECC with the list of obsolete and deleted models, according to the Certification Manual Appendix D.

**Deleted Models** are listed on the website under the heading "Deleted" for one year. Production of Deleted Models has ceased but stock is still available for sale. These models have to be reported as such on Form RT-1 (see Appendix B.1).

**Obsolete Models** are not listed on the Eurovent Certified Performance website. Production of Obsolete Models has ceased and there is no remaining stock for sale. These models have to be reported as such on Form RT-1 (see Appendix B.1).

Models affected by failed tests in year n cannot be declared as Obsolete. They can only be listed as Deleted Models in year n+1 for one year.

#### III.1.a.5 Traceability

The manufacturer must declare the list of manufacturing plants to ECC, and in which plant(s) its ranges are produced.

For units concerned by several plants, ECC will also select the manufacturing plant in the selection of unit.

The manufacturing sites shall be identifiable on the product nameplate: A code / a city / ... etc. which will be checked by the laboratory on the unit before testing.

### **III.1.b. Challenge procedure**

Under special conditions a challenge procedure may be carried out. It deals with complaints to ECC concerning certified products as described in the Certification Manual.

### **III.1.c. Programme cost allocations**

The allocation of the cost to Participants is based on:

- Annual administration fee
- Listing fee per Models listed in the Directory
- Testing fee per unit tested

### **III.1.d. Admissibility of the application**

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

ECC proceeds to selection based on the declaration file and requests the performances declaration together with selected units' delivery to the laboratory. The independent laboratory staff proceeds to products performance testing on the selected units according to the procedure detailed in § III.1.e

The certification is granted on condition that:

- If the aforementioned checks prove all the ranges compliance with the requirements specified in the relevant Testing Standards,
- All the other requirements from the present TCR are fulfilled,
- All fees have been settled.

If not, the failure treatment procedure shall be applied.

### **III.1.e. Implementation of checking operations**

The provisions of the Certification Manual apply.

#### **III.1.e.1 Selection of units to be tested**

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

ECC shall select units to be tested based on its evaluation of the declaration file RT-1 communicated by the applicant.

#### **III.1.e.2 Number of units for scheduled tests**

For the qualifying and surveillance procedure, a defined number of units shall be tested by a test Laboratory every year. The following method shall be used in order to calculate the number of tests. All models presented by the participant shall be listed together; however, only basic models shall be included, various options shall not be counted. The number of required tests shall follow Table 1.

***Table 1: Number of required tests according to the number of BMG\****

Number of BMG	Number of tests	
	ISO 9001 manufacturers	others
1 to 10	1	2
11 to 20	2	4
> 20	3	6

*\*number of BMG including units related to the main programme and optional sub-programmes.*

Manufacturers fulfilling the following requirements are considered as ISO 9001 certified:

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- All manufacturing places for the products within the scope of the certification programme are declared to ECC
- All declared ranges are associated to at least one of the manufacturing places declared
- All manufacturing places are covered by an ISO 9001 certificate:
  - issued by a certification body accredited by an accreditation body member of the European co-operation for Accreditation (EA, see list in [www.european-accreditation.org](http://www.european-accreditation.org))
  - valid:
    - on the day of the first selection by ECC for admission test campaign
    - on the 30<sup>th</sup> of June year *n* for surveillance test campaigns (see Appendix C)
    - whose scope covers at least “design production” of all products within the scope of the certification programme.
  - If several factories produce the same reference, all of them have to be certified.

A Manufacturing place is the address of the factory where the finished product is assembled.

### III.1.e.3 Number of tested points

For each selected unit, the number of tested points shall follow the Table 2:

**Table 2: Tested points**

Mode	Condition*	Cooling only unit	Reversible unit
Cooling	Standard rating condition	X	X
	One condition chosen by ECC among B, C or D	X	X
Heating	Standard rating condition	Not Applicable	X
	Bivalent Point		X
	One condition chosen by ECC among A, B, C or D		X
Auxiliaries	One mode chosen by ECC among P <sub>sb</sub> , P <sub>off</sub> , P <sub>to</sub> , P <sub>ck</sub> in cooling mode	X	X
	One mode chosen by ECC among P <sub>sb</sub> , P <sub>off</sub> , P <sub>to</sub> , P <sub>ck</sub> in heating mode	Not Applicable	X

\*Temperature conditions are given in Appendix A.2

### For RT 2012 declaration (Optional)

One measurement of LR<sub>contmin</sub> (in heating mode or in cooling mode)

### III.1.e.4 Tests at the laboratory

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

#### III.1.e.4.i Laboratories

All units with cooling capacity at ECC Standard Rating Conditions below 80 kW in cooling mode shall be tested in an independent laboratory approved and under contract with ECC. The choice of the independent laboratory is made by ECC.

Units with higher capacity shall be tested either in an independent laboratory or in a Participant laboratory (approved by ECC) by an independent agency (selected by ECC) following the procedures specified in Appendix D.

Before testing, the laboratory shall check the product against the information declared in the technical datasheet to ensure that the unit corresponds to the selection.

The laboratory shall not perform the test and contact ECC in case:

- one of the information is not compliant with the technical datasheet (see Appendix B.2),
- one of the units appears to be damaged

ECC will contact the applicant to give instructions regarding further actions.

**Table 3 : Specifications for the testing facility of independent laboratory**

	DMT	CEIS
<b>Water Side</b>		
<b>Flow rate on cooling water side up to</b>	500 m <sup>3</sup> /h	45 m <sup>3</sup> /h
<b>Flow rate on cold water side up to</b>	500 m <sup>3</sup> /h	45 m <sup>3</sup> /h
<b>Temperatures</b>	1,8 to 60°C (even lower temperatures with ethylene glycol)	2 to 70°C
<b>Air Side</b>		
<b>1st air side: pre-conditioned air flow rates of up to</b>	30 000 m <sup>3</sup> /h	44 000 m <sup>3</sup> /h
<b>2nd air side: pre-conditioned air flow rates of up to</b>	30 000 m <sup>3</sup> /h	Not available
<b>Outdoor Temperatures</b>	from -7 to 60°C	from -22 to 54°C
<b>Relative humidity</b>	up to 95% at 32°C	up to 95% at 0°C
<b>Data of test hall</b>		
<b>Inner dimension of the climate-controlled test chamber (L x H x W)</b>	10 m x 3,6 m x 5 m	10,5 m x 5,2 m x 8 m
<b>Maximum height of crane hook and carrying capacity</b>	7,9 m and 8 000 kg	3,2 m and 3 000 kg
<b>Maximum size of the unit (L x W x H)</b>	4 000 x 2 150 x 1 700 mm with both duct connections on the same long side, or one on the long side and one on the front side	5 000 x 2 800 x 2 800 mm (*) Maximum duct connections: 1 900 x 1 900 mm (*)

(\*) Each unit configuration must be EVALUATED BY LAB before final selection and delivery.

A specific demand to the laboratory can be done.

Laboratory shall notify the participant of the estimated date of test at least three weeks prior to the test.

Units shall be installed in the test facility in accordance with the Participant's published installation start-up and service instructions. A contact person shall be designated by the Participant to provide whatever support is required during the test.

Special instructions shall be sent with the unit. The laboratory cannot be held responsible for a wrong installation if the Participant did not provide these specific instructions.

#### III.1.e.4.ii Notification to provide equipment for testing

ECC shall notify the Participant of the intent to test specific models in accordance with the requirements of this programme. This notification shall request delivery of the units, the duly completed Technical Datasheet, the order and all relevant installation and operation manuals.

#### III.1.e.4.iii Selection, shipment, handling of test unit and return

ECC shall arrange for a particular unit to be obtained from the Participant's production lines, or any stocking point, and delivered to the laboratory.

The independent laboratory shall have the responsibility of uncrating, handling, testing and re-crating the unit for shipment.

A contact person shall be designated by the Participant to organize the shipment to the laboratory, the laboratory shall inform him when the test is completed.

#### III.1.e.4.iv Time limitation of acquisition of unit

If a laboratory is unable to obtain the unit and the relevant documentation within the time limitations defined by ECC (see Appendix C) the section regarding non-application of procedure of the Certification Manual shall be applied.

ECC may choose to not discontinue the listing when a Participant provides him with a definite and acceptable date of his next production.

#### III.1.e.5 Testing in an independent laboratory

A Participant's representative can prepare the start-up of the unit. In that case, the Participant shall inform ECC that he wants to attend the start-up, and the laboratory shall inform the Participant about the date the unit will be installed. This information needs to be completed by the Participant in the TDS under "Attendance: Yes". By default, in the TDS the Attendance will be set to "No". The laboratory will not communicate directly to the Participant any test results.

Only the laboratory personnel shall be permitted to install and check out tested units. The procedures used shall be in accordance with the Participant's installation start-up and service instructions. No Participant's personnel shall be permitted in the laboratory test facility before or during the test except the personnel needed to operate.

In case of damage the laboratory personnel shall be allowed to supply necessary tools for repair of the test sample before the test. If the unit cannot be repaired, it shall be replaced by the Participant within one month for units below 100 kW and three months for units above 100 kW in cooling capacity.

#### III.1.e.6 Testing own products in a Participant laboratory

Tests in Participant Laboratories shall be performed under supervision and control of an independent agency approved and under contract with ECC. It is not the intent of this programme to preclude certification if a Participant does not have a qualified test facility. Several Participants' test facilities will be approved by ECC and made available to a Participant not having a test facility.

Tests shall be performed by an independent agency, selected by and under contract with ECC. The same procedure as for testing in an independent laboratory shall be applied except that the Participant's personnel shall not be permitted in the laboratory test room facility.

The test agency is requested to install its own instruments (apart from the airflow measuring device) and to carry out complete test under its own responsibility. The Participant's personnel is requested to help during the preparation and to operate the test installation during the measurement. The Participant may perform its own measurement in parallel, but only results obtained by the independent test agency are considered by ECC.



The following procedure shall be applied:

- Approval of independent test agencies by ECC (based on technical capabilities and cost)
- Approval of Participant's laboratory by the independent agency selected by ECC (based on characteristics of test installation)
- Selection of unit to be tested by ECC
- Selection of test agency by ECC (based on availability, cost or other considerations)
- The Participant provides the selected test agency with all the required information concerning test installation. In particular, the participant will notify to ECC and the independent test agency if the refrigerant pressure shall be tested (not mandatory, this will lead to additional cost).
- The test agency notifies the Participant of its requirements to prepare adjustments for installation of measuring probes and instruments
- On the agreed date of test, the test agency installs its own instruments and performs the test; the Participant's personnel assure the correct operation of the installation
- Test report prepared by the test agency is sent to ECC

The detailed procedure for testing in Participant laboratory is given in Appendix D.

#### III.1.e.7 Testing competitor products at a Participant laboratory

Tests shall be performed by an independent agency, selected by and under contract with ECC. The application forms shall be checked by an independent agent and shall not be disclosed to the competitor laboratory. Problems of confidentiality shall be solved by a mutual agreement between Participants.

#### III.1.f. Time limitation of acquisition and recovery of units

The provisions of the Certification Manual apply.

#### III.1.g. Test conditions

The tests shall be conducted at the conditions stated in Appendix A.2.

#### III.1.h. Failure treatment

If a failure occurs during testing, a second test, on another unit of the same model, may be asked. Re-rating will be applied to the tested model in accordance with the test results.

##### III.1.h.1 General

If the value found by testing in the independent laboratory differs more than the acceptable acceptance criteria, Participants will have four weeks from the notification of the failure to select one of the following alternatives:

- Ask for a second test on the same unit
- Ask for a second test on a new unit. The new unit shall be delivered within four weeks after reply
- Re-rate the tested model according to the measured performances

##### III.1.h.2 Second test

- If the second test is performed on the same unit (without any modification on the unit, and not leaving the laboratory), the Participant can choose to repeat only:
  - All thermal and pressure measurements
  - or
  - All sound measurements
- If the second test is performed on a repaired or a new unit, or if the participant has shipped back the unit, the complete test shall be carried out.

If case of failure of seasonal efficiencies, the participant has the right to choose a complete seasonal test (all points, including all auxiliaries).

If the failure of thermal tests comes from the auxiliaries only, the same unit can be tested only for the auxiliary (combined with the associated part-load).

If the second test is unsuccessful, the Participant shall re-rate according to the results from the second test. Up-rate of claimed values is possible only under the conditions given in the Certification Manual.

The surveillance procedure does not allow for a third test.

### III.1.h.3 Re-rating rules

When the test results fail to comply with the requirements of the present TCR (see Appendix A.4) the following failure treatment is applied.

#### III.1.h.3.i Standard conditions (Capacities, EER/COP, Lwo/Lwi)

The tested model shall be re-rated to the measured value and all models with the same BMG shall be re-rated according to the deviation measured:

- *Tested model:  $Perf_{re-rated} = Perf_{measured}$*
- *Models with same BMG:  $Perf_{re-rated} = Perf_{declared} + Deviation$*

In case of failure on efficiency and/or capacity the power input of the re-rated models shall be recalculated according to the re-rated performances.

The different cases of re-rating are described in § III.1.h.4 (Table 4).

#### III.1.h.3.ii Auxiliaries (Psb/Pto/Poff/Pck), LRcontmin or CcpLRcontmin

*The tested model shall be re-rated to the measured value and all models with the same BMG shall be re-rated according to the deviation measured:*

- *Tested model:  $Perf_{re-rated} = Perf_{measured}$*
- *Models with same BMG:  $Perf_{re-rated} = Perf_{declared} + Deviation$*

*The different cases of re-rating are described in § III.1.h.4 (Table 4).*

#### III.1.h.3.iii ESP and Qv

*If the ESP measured is not in accordance with EN 14511:2018 (i.e. lower than  $ESP_{min}$  or higher than  $2 \times ESP_{min}$ ), then the laboratory can adjust the airflow rate, if this adjustment can be done in a reasonable time.*

*If readjusted airflow rate value is out of +/-5% compared to the declared value, then the test is declared initial test failure.*

#### III.1.h.3.iv Seasonal conditions (Part-Load Efficiencies, SEER/SCOP, $\eta_{s,c}/\eta_{s,h}$ )

*The EER (or COP) tested shall be re-rated to the measured value and all the other EER (or COP) at the conditions defined in EN 14825 shall be re-rated according to the deviation minus acceptance criteria used for the test.*

*Specific cases:*

- When 1 stage (lower or upper) is tested:

*The deviation measured at the tested stage is applied to the rerate of the associated EER (or COP).*

- When 2 stages (lower and upper) are tested:

*The deviation measured after interpolation of the tested stages is applied to the rerate of the associated EER (or COP).*

- When all the part-loads are tested:

*The measured EER (or COP) are used for the SEER (or SCOP) calculation. The acceptance criteria will be applied for SEER (or SCOP) to determine if test is failed.*

*When EER (or COP) and/or the auxiliary (Psb/Pfo/Poff/Pck) tested are out of acceptance criteria, SEER (or SCOP) is recalculated by ECC, to be rerated.*

*The  $\eta_{s,c}$  (or  $\eta_{s,h}$ ) is automatically recalculated in case of SEER (or SCOP) rerating for the tested model.*

*ErP declaration needs to be corrected and sent to ECC.*

*The different cases of re-rating are described in § III.1.h.4 (Table 5).*

III.1.h.4 Re-rating rules Synthesis

**Table 4 : Synthesis for standard performances**

Failed point	Re-rated values	
	Tested model	Models with the same BMG
Pc (respectively Ph)	$P_{C\_re-rated} = P_{C\_measured}$ $P_{e(c)\_re-rated} = P_{C\_re-rated} / EER\_declared$	$P_{C\_re-rated} = P_{C\_declared} + Deviation$ $P_{e(c)\_re-rated} = P_{C\_re-rated} / EER\_declared$
EER (respectively COP)	$EER\_re-rated = EER\_measured$ $P_{e(c)\_re-rated} = P_{C\_re-rated} / EER\_declared$	$EER\_re-rated = EER\_declared + Deviation$ $P_{e(c)\_re-rated} = P_{C\_re-rated} / EER\_declared$
Pc and EER (respectively Ph and COP)	$P_{C\_re-rated} = P_{C\_measured}$ $EER\_re-rated = EER\_measured$ $P_{e(c)\_re-rated} = P_{C\_re-rated} / EER\_re-rated$	$P_{C\_re-rated} = P_{C\_declared} + Deviation$ $EER\_re-rated = EER\_declared + Deviation$ $P_{e(c)\_re-rated} = P_{C\_re-rated} / EER\_re-rated$
LwoEnv	$LwoEnv\_re-rated = LwoEnv\_measured$	$LwoEnv\_re-rated = LwoEnv\_declared + deviation$
LwiDuct	$LwiDuct\_re-rated = LwiDuct\_measured$	$LwiDuct\_re-rated = LwiDuct\_declared + deviation$
LRcontmin	$LRcontmin\_re-rated = LRcontmin\_measured$	$LRcontmin\_re-rated = LRcontmin\_declared + deviation$
CcpLRcontmin	$CcpLRcontmin\_re-rated = CcpLRcontmin\_measured$	$CcpLRcontmin\_re-rated = CcpLRcontmin\_declared + deviation$
Dp (Water Press. Drop)	$Dp\_re-rated = Dp\_measured$	Not applicable

**Table 5 : Synthesis for seasonal performances**

Failed point	Re-rated values			
	Tested Part-Load	Other Part-Loads	SEER (respectively SCOP)	$\eta_{s,c}$ (respectively $\eta_{s,h}$ )
EER (respectively COP)	$EER\_re-rated = EER\_measured$	$EER\_re-rated = EER\_declared + (Dev- Accept Crit)$	Calculated with $EER\_re-rated$	Automatically recalculated
EER (respectively COP) When all PL tested	$EER\_re-rated = EER\_measured$	No re-rate. All PL are measured	Calculated with $EER\_measured$	
Psb (respectively Pto, Poff and Pck)	$Psb\_re-rated = Psb\_measured$	$Psb\_re-rated = Psb\_declared + deviation$	Calculated with $Psb\_re-rated$	

### **III.1.i. Initial test failure**

If any functional component is inoperative, or the unit is damaged and cannot be repaired and tested at the Laboratory, then it is considered as a "initial test failure". The complete test shall then be carried out on the repaired unit or a new unit from the same range. The new unit shall be delivered within four weeks from the notification of the failure.

### **III.1.j. High failure treatment**

An additional unit will be selected for the next test campaign in case of a:

- Deviation by more than 12 % on capacity (standard conditions)
- Deviation by more than 15 % on efficiency (standard conditions)
- Deviation by more than 7 dB(A) on sound power level.
- Deviation by more than 25 % on capacity at Bivalent point

*In case of High failures on several performances in the same test, only one penalty test will be requested.*

Penalty tests following a qualifying procedure need to be validated before the certification is granted.

### **III.1.k. Evaluation and decision**

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

#### **III.1.k.1 Report of test results**

Upon completion of the tests on each unit, the Laboratory will send a complete report, as a PDF file to ECC who will then forward a copy together with the reporting and rerating test result to participating company.

Participant has to recover his products one month after receiving the test report. If the units are not recovered after this delay, the laboratory will destroy the units and invoice the manufacturer.

#### **III.1.k.2 Repeated failures along the test campaigns**

This section refers to the corresponding Appendix of the Certification Manual.

The rules regarding Mean Value of Failure (MVF) are described in Appendix H of this document.

## **III.2. Surveillance procedure**

The provisions of the Certification Manual apply.

### **III.2.a. Implementation of surveillance operations**

#### **III.2.a.1 Selection of units to be tested**

In addition to the provisions laid down in the Certification Manual, the requirements described in § III.1.e applies.

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Every year, ECC checks whether the performance of the products still meet the requirements.

- Surveillance tests in independent laboratory shall be conducted annually in compliance with the Certification Schedule (see Appendix C)
- Units selected from regular production shall be tested in the independent laboratory selected by ECC.

For the surveillance procedure the certification is renewed at the date specified in the Certification Schedules (see Appendix C) on condition that:

- The previous test campaign (N-1) has been successfully completed
- The product delivery together with the technical datasheet and the payment have been completed

The company receives a renewed certificate, and the display of data is maintained on the Eurovent Certified Performance (ECP) website. If not, failure treatment shall be applied.

#### III.2.a.2 Surveillance tests

In addition to the provisions laid down in the Certification Manual, the requirements of § III.1.e.4 applies.

#### III.2.a.3 Technical and commercial documentation check

In addition to the provisions laid down in the Certification Manual, the requirements of § III.1.a applies.

### **III.2.b. Evaluation and decision**

The provisions of the Certification Manual apply.

### **III.3. Declaration of modifications**

The provisions of the Certification Manual apply.

#### **III.3.a. Changes concerning the participant**

The provisions of the Certification Manual apply.

#### **III.3.b. Changes concerning production entities**

The provisions of the Certification Manual apply.

#### **III.3.c. Additional admission for a new model and/or new range**

The provisions of the Certification Manual apply.

*When applying for the first time to an optional sub programme (e.g. units above 100 kW); the units will be considered as “Not Certified” until the validation of the tests results.*

#### **III.3.d. Changes concerning the certified product**

In addition to the provisions laid down in the Certification Manual, the following requirements apply:

The applicant/participant shall inform ECC of any modification of the product portfolio by updating the declaration file (RT-1) and sending the updated technical documentation and/or public hyperlink. Non-compliance of the applicant/participant is considered as non-application of procedures (see § III.4).

ECC decides whether the modification is significant for the certified performance data or not. In the case of significant modifications ECC is entitled to request adequate tests to check the influence on performance data. This test shall not be considered as a repetition one.

#### **III.3.e. Temporary or permanent cessation of production of a certified product**

In addition to the provisions laid down in the Certification Manual apply.

#### **III.4. Suspension/cessation conditions**

Non-application of procedures and relevant penalties are described in the Certification Manual § III.4.

To come back to the certification programme, the suspended participant has to complete the test campaign of the year he has been suspended for (n) and give all the necessary elements for the following test campaign (n+1).

## Appendix A. Technical Appendixes

### A.1 Testing requirements

Standard ratings shall be established at the standard rating conditions specified in Appendix A.2.a. All standard ratings shall be verified by tests conducted in accordance with the following standards:

### A.2 Rating requirements

Performance ratings claimed by manufacturers shall be verified by tests performed in one of ECC Independent Laboratories or in Participant Laboratory (see Appendix D). The following specifications will be used during the tests:

- Test unit shall be installed with vertical or horizontal airflow in accordance with the manufacturer's specifications
- No fresh air shall be used for rating, neither in cooling, nor in heating (except in the case of SEER<sub>freecooling</sub>)
- The operating conditions shall be used following the Table 6
- Allowable deviations from set values are given in EN 14511:2018
- Testing shall be carried without mixing damper (except in the case of 3 / 4 dampers units or SEER<sub>freecooling</sub>)

The nominal airflow rate and the external static pressure (ESP) given by the manufacturer shall be measured.

#### A.2.a Standard rating conditions

**Table 6: Operating conditions for standard rating (EN 14511:2018)**

	OUTDOOR SIDE				INDOOR SIDE	
	Air °C		Water °C		Air °C	
	Dry bulb	Wet bulb	Inlet	Outlet	Dry bulb	Wet bulb
<b>Cooling</b>	35	24	30	35	27	19
<b>Heating</b>	7	6	20*	17	20	15 max
<b>Sound**</b>	20-35	-	30	35	27	19 (+/-2)

\* For units designated for cooling mode, the water flow rate obtained during the test at standard rating conditions in cooling is used.

\*\* Same airflow and same available pressure as for the thermal test shall be used.

Indoor airflow shall be in relation with the cooling capacity and used also for the heating mode.

#### A.2.b Part-load rating conditions for Cooling & Heating mode (EN 14825:2018)

For each part-load condition, it is possible to vary the air flow of the machine.

Only the damper setting cannot be changed.

Participant will provide a specific procedure to set each part-load (RPM or standard airflow...). Without specific procedure, if only the standard flow is declared by Participant for example, the lab will carry out a specific airflow test to determine it.



### **A.2.c Tested part-loads for Seasonal Efficiency**

One condition is chosen by ECC. When 2 stages are declared, for a given condition, 1 stage (Lower or Upper) is chosen by ECC.

In case of failure, the participant can choose to:

- Accept the rerate with the measured values
- Ask for a 2<sup>nd</sup> test

When a 2<sup>nd</sup> test is requested, the participant can choose to:

- Test the same condition again.
- Do a complete seasonal test (all conditions)

For the testing of the Part-load(s) in Heating mode, the laboratory shall perform the test in the following order:

- Standard heating point
- Bivalent condition point
- Selected Part-load(s)

In case the targeted capacity at Bivalent Point is not reached by +/-10%, the test is considered as failed for this point. However, the test continues for the other points.

The Part-load capacities in heating are recalculated based on the measured capacity at T<sub>biv</sub>. This calculation is done by the laboratory in the TDS.

The laboratory will immediately inform ECC of the recalculated values. ECC will then inform the participant.

Acceptance criteria for the capacity at Bivalent point is given in the Appendix A.4.

### **A.2.d Reference temperatures and hours**

Reference design temperatures and operational hours used in the calculation of SEER and SCOP must be in accordance with *Table 7 and Table 8*.

***Table 7: Reference design temperatures***

	Design Temperature [°C]		Bivalent temperature [°C]	Operating limit Temperature [°C]
	Outdoor	Indoor		
<b>Cooling</b>	35 (24)	27 (19)	n.a	n.a
<b>Heating / Average</b>	-10(-11)	20 (15 max)	+2 or lower	-7 or lower
<b>Heating / Warmer</b>	+2(1)	20 (15 max)	+7 or lower	+2 or lower
<b>Heating / Colder</b>	-22	20 (15 max)	-7 or lower	-15 or lower

*For outdoor air-dry bulb temperatures higher or equal to -10 °C the wet bulb temperature equals the dry bulb temperature minus 1 K. For dry bulb temperatures below -10 °C, the wet bulb temperature is not defined.*

**Table 8: Operational hours per type of appliance per functional mode**

Season		Operational hours				
		On-mode	Thermostat Off mode	Standby mode	Off mode	Crankcase heater mode
		H <sub>CE</sub> or H <sub>HE</sub>	H <sub>TO</sub>	H <sub>SB</sub>	H <sub>OFF</sub>	H <sub>CK</sub>
<b>Cooling</b> (to calculate SEER & $\eta_{s,c}$ )		600	659	1377	0	2036
<b>Heating</b> (to calculate SCOP & $\eta_{s,h}$ )	<b>Average</b>	1400	179	0	0	179
	<b>Colder</b>	2100	131	0	0	131
	<b>Warmer</b>	1400	755	0	0	755

These tables come from Commission Regulation (EU) No. 2016/2281.

### **A.3 Certified Performance Items**

The certified data of the certified products are published on the website: [www.eurovent-certification.com](http://www.eurovent-certification.com). ECC will supply, on request, any interested party, with the current status of any participant or of any model.

The limits of certified capacity shall be clearly indicated on the Eurovent Certified Performance website.

The following information pertaining to each model certified shall be published on the web page for Rooftops:

- Name of Company
- Trade or brand name of model
- Model number(s) or designation(s)
- Cooling Capacity (P<sub>c</sub>)
- Heating Capacity (P<sub>h</sub>)
- Effective power inputs in cooling and heating (P<sub>ec</sub>, P<sub>eh</sub>)
- EER
- COP
- Cooling Part Load capacity at condition A, B, C and D
- Cooling Part Load EER at condition A, B, C and D
- Seasonal Efficiency in Cooling (SEER &  $\eta_{s,c}$ )
- Heating Part Load capacity at condition A, B, C, D, E (TOL) and F (T<sub>biv</sub>)
- Heating Part Load COP at condition A, B, C, D, E (TOL) and F (T<sub>biv</sub>)
- Seasonal Efficiency in Heating (SCOP &  $\eta_{s,h}$ )
- Eurovent Seasonal Efficiency class (cooling and heating)
- Nominal Airflow Rate (Q<sub>v</sub>)
- External Static Pressure (ESP)
- Condenser water pressure drop - only for water cooled rooftops (D<sub>pc</sub>, D<sub>ph</sub>)
- A-weighted Sound Power Level outside (L<sub>wO env</sub>)
- A-weighted Sound Power Level in supply duct (L<sub>wI duct</sub>)
- Main Power Supply (MPS)
- Refrigerant
- Intended Geographical Market

*Each participant of the present programme is entitled, upon request, to become a participant of the Eurovent Heat Pumps (Eurovent-HP) programme for all products certified under the present programme and falling under the scope of the Eurovent-HP Technical Certification*

Rules (TCR-17\_2020 in force). European Heat Pumps certification may however be limited by the participant to specific ranges or models, using the relevant Declaration list; it may also be refused by the participant for all his products, using a waiver to be signed and sent out to ECC.

#### **A.4 Acceptance criteria**

When tested in Laboratory, the characteristics obtained shall not differ from the values claimed by the participants by more than the acceptance criteria given below. High deviations lead to penalty tests (see § III.1.j). Mean Value are used for the calculation of the Mean Value of Failure (MVF, see Appendix H).

**Table 9: Table of acceptance criteria, intermediate and high deviations**

	Acceptance criteria	Mean Value	High Value
<b>Standard Rating conditions</b>			
<b>Cooling or heating capacity</b>	≤ -5%	≤ -8%	≤ -12%
<b>EER or COP</b>	≤ -8%	≤ -12%	≤ -15%
<b>Seasonal Efficiency in cooling</b>			
<b>EER Condition B</b>	≤ -12.1%		
<b>EER Condition C</b>	≤ -16.8%		
<b>EER Condition D</b>	≤ -32.6%		
<b>SEER/η<sub>s,c</sub> (when all PL are tested)</b>	≤ -8%		
<b>Seasonal Efficiency in heating</b>			
<b>Capacity at Bivalent point</b>	≤ -8%	≤ -15%	≤ -25%
<b>COP Condition A</b>	≤ -11%		
<b>COP Condition B</b>	≤ -15%		
<b>COP Condition C</b>	≤ -21%		
<b>COP Condition D</b>	≤ -44%		
<b>COP Condition F</b>	≤ -10%		
<b>SCOP/η<sub>s,h</sub> (when all PL are tested)</b>	≤ -8%		
<b>Sound</b>			
<b>A-weighted sound power levels</b>	≥ +3 dB(A)	≥ +5 dB(A)	≥ +7 dB(A)
<b>Others</b>			
<b>Water pressure drop</b>	≥ + 15%	-	-
<b>P<sub>sb</sub> / P<sub>to</sub> / P<sub>off</sub> / P<sub>ck</sub></b>	≥ +10%	-	-
<b>LR<sub>contmin</sub></b>	+/- 5% (point)	-	-
<b>Ccp<sub>LRContmin</sub></b>	≤ - 5% (point)	-	-

## Appendix B. Forms

### B.1 Form RT-1: Submittal for certification

ECC will provide an .xls fill for the declaration of products.

RT - 2018 GENERIC							Cooling (STD_C)							Sound (Sound)		
Status	Participant Name	Product Name	Trade Name	Type of product	Range Name	BMG	Pc	Pe(c)	EER	EER Class (Air Cooled)	ESP	Qv nom	Lwo Env	Lwi Duct	LRcont	
							kW	kW			Pa	m³/h	dB(A)	dB(A)		
							Decimal	Decimal	Decimal	EnergClass	Decimal	Decimal	Integer	Integer	Decim	
Product Status : New Certified Deleted Obsolete	MyName	Reference Product	MyTradeName	Type of product: RT/A/P/R RT/A/S/C RT/W/P/C	MyRange	Reserved for ECC	Total cooling capacity [kW] according to EN14511:2018	Calculated by ECC	Energy Efficiency Ratio (Cooling mode) according to EN14511:2018	Calculated by ECC	External Static pressure [Pa]	Nominal Air volume flow [m³/h]	A-weighted sound power level of the envelope [dBA]	A-weighted sound power level in supply duct [dBA]	Mini Rate unit cont (Cool)	
<b>Type of Product legend :</b> A : Air-to-Air unit W : Water-to-Air unit P : Packaged S : Split C : Cooling Only R : Reversible (Cooling and Heating)																

### B.2 Form RT-2: Technical datasheet (TDS)

All requested data for testing is highlighted in yellow ( ) in the TDS.

GENERAL	3	prEN14511 : 2018	UNIT POWER INPUT	kVv	0	
	6		EER	kW	0	
	5		Heating mode	CAPACITY	kW	0
	8	prEN14511 : 2018	UNIT POWER INPUT	kW	0	
	9		COP	kW	0	
	6		A-WEIGHTED SOUND POWER LEVEL	Outdoor side - Envelope	dB(A)	0
	7			Indoor side - In duct	dB(A)	0
	8		Dimensions	Height	mm	0
	9			Length	mm	0
	10			Width	mm	0
	11			Weight	kg	0
	12		MSP	Main Power Supply Voltage (V) - Phase - Frequency (Hz)	-	0
	13		Refrigerant	Type	-	0
	14			Charge total system including refrigerant line	kg	-
INDOOR COIL	15		Number of rows	-	-	
	16		Tube pitch (a) x row pitch (b)	mm	-	
	17		Fin spacing	mm	-	
	18		Fin type (code)	-	-	
	19		Tube outside diameter	mm	-	
	20		Tube type	-	-	
	21		Coil dimensions	Length	mm	-
	22			Width	mm	-
	23			Height	mm	-
	24		Number of circuits	-	-	
	25		Fan type (code)	-	-	

### **B.3 Form RT-3: Capacity stage for Part-Load Conditions – TDS - SEER/SCOP**

According to EN 14825:2018 standard:

Determine the declared capacity and EERd/COPd at the closest step or increment of the capacity control of the unit to reach the required cooling/heating load. If this step allows to reach the required cooling/heating load within  $\pm 10\%$  (e.g. between 9,9 kW and 8,1 kW for a required cooling load of 9 kW), the target capacity is considered as achieved and the measured EER/COP shall be used as  $EER_{bin}/COP_{bin}$ . If this step does not allow to reach the required cooling/heating part load within  $\pm 10\%$ , determine the capacity and the effective power input at the defined part load temperatures for the step on the other side of the required cooling/heating load.

The part load power input at the required cooling part load is then determined by linear interpolation between the results obtained from these two steps. The  $EER_{bin}/COP_{bin}$  is then determined by the required cooling/heating part load divided by the interpolated part load power input.

PERFORMANCE DATA						PERFORMANCE DATA							
	Part Load Ratio	Declared ErP		Stage 1	Stage 2	Interpolated values		Part Load Ratio	Declared ErP		Stage 1	Stage 2	Interpolated values
Condition A (35°C)	100%	Pc	0,00				Condition A (-7°C)	88%	Ph	0,00			
		EER	0,00						COP	0,00			
		Pec	#DIV/0!						Peh	#DIV/0!			
Condition B (30°C)	74%	Pc	0,00				Condition B (2°C)	54%	Ph	0,00			
		EER	0,00						COP	0,00			
		Pec	#DIV/0!						Peh	#DIV/0!			
Condition C (25°C)	47%	Pc	0,00				Condition C (7°C)	35%	Ph	0,00			
		EER	0,00						COP	0,00			
		Pec	#DIV/0!						Peh	#DIV/0!			
Condition D (20°C)	21%	Pc	0,00				Condition D (12°C)	15%	Ph	0,00			
		EER	0,00						COP	0,00			
		Pec	#DIV/0!						Peh	#DIV/0!			
Condition E (TOL)	100%	Pc	0,00				Condition F (Tbiv)	88%	Ph	0,00			
		EER	0,00						COP	0,00			
		Pec	#DIV/0!						Peh	#DIV/0!			

ECC will choose only one stage to test among Lower and Upper stage.

### **B.4 Form RT-4: Additional Information Form**

#### **1- Fan speed and compressor frequency**

The following data will help the laboratory to check that the unit is running in TEST MODE. It's highly recommended to fill the table below for inverter models.

Test condition	Fan speed (rpm)	Compressor frequency (Hz)
	Cooling/Heating mode	Cooling/Heating mode
Condition A -7°C		
Condition B 2°C		
Condition C 7°C		
Condition D 12°C		
Condition F X °C		



## B.5 Form RT-5: Test rerate form

REPORTING OF TEST RESULT										
GENERIC	Test key: 2018-xxxx-01 Created on: 2018/xx/xx Last update on: Status: PASSED									
MANUFACTURER	Participant key: xxxx Participant name: xxxx									
MODEL	Model key: xxxx Model name: xxxx Product type: RT/A/P/R Serial number: xxxx									
TEST	Programme - Sub-programmes: Rooftops Date of reception of the unit: 2018/xx/xx Date of reception of test report: 2018/xx/xx Unit tested on: 2018/xx/xx									
RESULT DETAILS										
					Measurement		MFV		High failure	
APPLICATION		Measured	Declared	Deviation	Limit	Result	Limit	Result	Limit	Result
Pc	Cooling kW	162.06	152.9	0.06	-0.05	PASSED	0.08	PASSED	0.12	PASSED
Pe(c)	kW	53.96	50.8	0.062		PASSED				
EER	-	3.0	3.01	0.0	-0.08	PASSED	0.12	PASSED	0.15	PASSED
EER Class (Air Cooled)	-	A	A			PASSED				
ESP	Pa	258.0	300.0							
Qv nom	m³/h	25825.0	25800.0							
APPLICATION		Measured	Declared	Deviation	Limit	Result	Limit	Result	Limit	Result
Ph	Heating kW	184.21	168.1	0.1	-0.05	PASSED	0.08	PASSED	0.12	PASSED
Pe(h)	kW	54.18	51.09	0.06		PASSED				
COP	-	3.4	3.29	0.03	-0.08	PASSED	0.12	PASSED	0.15	PASSED
COP Class (Air Cooled)	-	B	B			PASSED				
APPLICATION		Measured	Declared	Deviation	Limit	Result	Limit	Result	Limit	Result
Lwo Env	Sound dB(A)	91	94	-3	3	PASSED	5	PASSED	7	PASSED
Lwi Duct	dB(A)	89	88	1	3	PASSED	5	PASSED	7	PASSED
APPLICATION		Measured	Declared	Deviation	Limit	Result	Limit	Result	Limit	Result
Pc @ +30°	Cooling PL Cond B kW	135.4	125.95			PASSED				
EER @ +30°	-	3.36	3.33	0.009		PASSED				
APPLICATION		Measured	Declared	Deviation	Limit	Result	Limit	Result	Limit	Result
Ph @ 12°C	Heating PL Cond D kW	73.65	52.29			PASSED				
COP @ 12°C	-	4.32	3.75			PASSED				
APPLICATION		Measured	Declared	Deviation	Limit	Result	Limit	Result	Limit	Result
Tbiv	T bivalent °C	-4.0	-4.0			PASSED				
Ph @ Tbiv	kW	403.42	100.0			PASSED				
COP @ Tbiv	-	2.15	2.09			PASSED				
APPLICATION		Measured	Declared	Deviation	Limit	Result	Limit	Result	Limit	Result
Psbh	Psbh W	352.0	350.0			PASSED				
APPLICATION		Measured	Declared	Deviation	Limit	Result	Limit	Result	Limit	Result
Ptoc	Ptoc W	8510.0	3090.0	1.754		PASSED				

**B.6 Form RT-6: Rerate form**

PROPOSAL OF RERATE	
GENERIC	Rerate key: Created on: 2018/xx/xx Last update on: Status:
MANUFACTURER	Participant key: xxxx Participant name: xxxx
TEST	Test key: 2018-xxxx-01 Unit tested on: 2018/xx/xx

APPLICATION Cooling

DECLARED														
Product key	Product name	Type of product	Range name	BMG	Perf 1.1	Perf 1.2								
xxxxx	xxxx	RT/A/P/R	xxxx	13	300.	2580								
RERATED														
xxxx	xxxxx	RT/A/P/R	xxxx	13	258.	2582								

LEGEND			
Code	Name	Product type	Component type
Perf. 1.1	ESP	RT/A/P/R	
Perf. 1.2	Qv nom	RT/A/P/R	



## Appendix C. Campaign Schedule

For each surveillance test campaign (year n), the following schedule shall be applied:

<i>ECC asks for up-date of product list</i>	<i>15/04/n</i>
<i>PA confirms up-date of products list</i>	<i>31/05/n</i>
<i>ECC sends selection list for test</i>	<i>15/06/n</i>
<i>PA confirms selection list</i>	<i>30/06/n</i>
<i>Delivery + submittal form + order from PA</i>	<i>31/10/n</i>
<i>Date of test in PartLab are defined before</i>	<i>30/11/n</i>
<i>Laboratory carries out all 1<sup>st</sup> tests (including tests in PartLab)</i>	<i>31/05/n+1</i>
<i>PA can ask for a second test up to</i>	<i>one month after reception of the test results</i>
<i>Delivery + submittal form + order from PA (2<sup>nd</sup> test)</i>	<i>one month after request of 2<sup>nd</sup> test</i>
<i>Laboratory carries out all 2<sup>nd</sup> tests</i>	<i>31/08/n+1</i>
<i>Certificate for test campaign n are valid until</i>	<i>31/01/n+2</i>

## Appendix D. Testing in Participant's Laboratory

### D.1 Detailed procedure

The Independent Test Agency shall have qualified personnel and adequate instruments in order to meet the requirements concerning maximum acceptable uncertainty of measurement as specified in EN 14511:2018 (see Table 6).

The cooling and heating capacity at standard rating conditions shall be determined within a maximum acceptance criteria of 5% independent of the individual uncertainties of measurement, including the uncertainties on the properties of fluids.

The test agency shall have at least the following equipment:

For test on water-to-air units:

- Water flow rate (uncertainty + 1%): flow meter class 0.3

For all tests:

- Temperatures (uncertainty: Liquid + 0.1 K, Air + 0.2 K): 12 PT 100 probes with display giving 0.01°C resolution
- Pressure drop (uncertainty + 5%): 2 differential transducers up to 500 Pa with display (class 0.5)
- Electrical measurements (uncertainty + 1%): Wattmeter (class 0.5) or Network analyzer
- Mass measurement device (uncertainty + 1%)
- Data acquisition system

### D.2 Approval of Participant Laboratory

The Participant shall send to ECC a calibration certificate of the airflow measuring devices used in the participant(s) test facilities with the following requirements:

- the certificate has to be issued by a laboratory accredited by one of the full members of the European co-operation for Accreditation (for example COFRAC in France, see list on [www.european-accreditation.org](http://www.european-accreditation.org)) for calibration of airflow or air velocity measurement systems according to *ISO/IEC 17025:2017*
- all the necessary identification information of the calibrated airflow measuring device shall be provided in the certificate (e.g. serial number, dimensions, type). The testing agency will check that the installed airflow measuring device correspond to the information provided in the certificate
- the uncertainty of the calibration method shall be provided
- the range of airflows for which the calibration is valid shall cover the airflow rate of the tested unit
- the issuing date of the certificate shall not differ by more than 10 years from the date of the test

If a calibration certificate of the complete measurement chain of the manufacturer is provided to ECC:

- this certificate shall include the following elements in order to be accepted:
  - for each checking point: manufacturer airflow measurement, test agency airflow measurement, relative deviation, temperature, relative humidity, pressure drop across **the nozzles** measured by the manufacturer
  - for all checking points the relative deviation between the airflow rate measured by the manufacturer and the airflow rate measured by the test agency shall not exceed 5% **after correction by calibration coefficients** which is the maximum uncertainty of measurements defined in EN 14511:2018
- The manufacturer shall provide to the independent test agency the calibration certificates of all sensors included in the airflow measurement system (temperature, humidity and differential pressure).

The Participant shall send an application form to ECC. Essential characteristics of test installation shall be indicated. The test installation shall be able to satisfy the requirement of the EN 14511:2018 Standard concerning the maximum permissible deviations of measured values from set values (see Appendix A.4).

The test installation shall be designed in such a way that requirement from test agencies concerning installation of measuring probes and instruments be satisfied.

In case the test agency determines that the Participant laboratory does not fulfil the required specifications, the test shall not be carried out. The Participant shall then send his unit to the Independent Laboratory for testing if applicable.

### **D.3 Organization of test**

When the unit to be tested and the test agency have been selected by ECC, the direct contact between test agency and Participant shall be established. The test agency shall provide detailed request for preparation to be executed by Participants:

- Connection of water flow meter
- Adaptor for temperature probes
- Adaptor for pressure transducer

This preparation shall be carried out before the day of the test.

The test agency and Participant shall agree on the date of test.

The test agency personnel shall inspect the test installation and connect measuring devices. In particular the independent test agency will check that the casing and the ductwork of the installation is such as to minimize any air leakage.

The test is then performed under full responsibility of the test agency.

ECC shall receive the test report prepared by the test agency.

## Appendix E. ECC Seasonal Efficiency Classes for Rooftops

**Table 10: ECC Seasonal Efficiency Classification of Air-to-air Rooftops**

<b>ECC Seasonal Efficiency Class</b>	<b>Cooling mode</b>	<b>Heating mode</b>
A+	$\eta_{s,c} \geq 203$	$\eta_{s,h} \geq 149$
A	$185 \leq \eta_{s,c} < 203$	$142 \leq \eta_{s,h} < 149$
B	$138 \leq \eta_{s,c} < 185$	$125 \leq \eta_{s,h} < 142$
C	$117 \leq \eta_{s,c} < 138$	$115 \leq \eta_{s,h} < 125$
D	$90 \leq \eta_{s,c} < 117$	$95 \leq \eta_{s,h} < 115$
E	$\eta_{s,c} < 90$	$\eta_{s,h} < 95$

## Appendix F. Eco-Design for Rooftops

Commission Regulation (EU) 2016/2281 of 30 November 2016 implementing Directive 2009/125/EC of the European Parliament and of the Council establishing a framework for the setting of eco-design requirements for energy-related products, with regard to eco-design requirements for air heating products, cooling products, high temperature process chillers and fan coil units.

**Table 11 : Requirements for minimum energy efficiency**

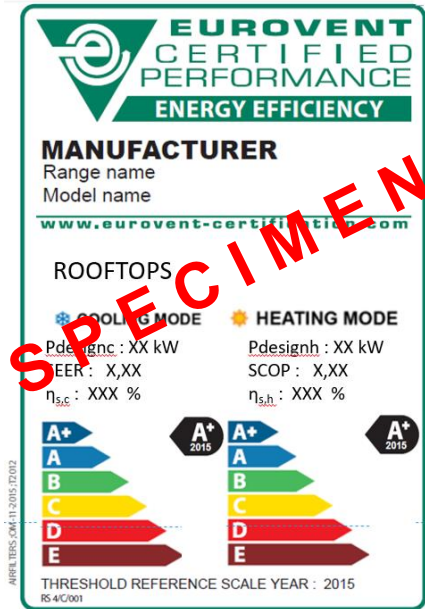
<b>Tier2</b>	<b>from 1 January 2021</b>
Heating ( $\eta_{s,h}$ )	125%
Cooling ( $\eta_{s,c}$ )	138%

## Appendix G. Eurovent Certified Performance Energy Efficiency Label

Rules for the use of Eurovent Certified Performance energy label are given in the Certification Manual (see CM Appendix H).

It is not mandatory to use Eurovent Certified Performance energy labels however it is highly recommended to do so. If an energy label is used by the participant, it is mandatory to use the layout described on our website.

High resolution files of these labels, as well as specifications for the layout are available on the website in the manufacturer's restricted area.



**Figure 4 : Illustration of the ROOFTOP Energy Efficiency Labels: Cooling and heating modes**

## Appendix H. Calculation Method and Implementation of Mean Value of Failure (MVF)

### H.1 General

Mean Value of Failure (MVF) is equal, for each manufacturer, to the ratio between the total number of measurements which failed and the total number of performed measurements in the considered years.

$$MVF_n = \frac{\sum_{\text{Considered years}} \text{Number of measurements failed}}{\sum_{\text{Considered years}} \text{Number of measurements performed}} \quad (5)$$

One global MVF is calculated for each participant. The following performances are considered for the calculation of the MVF:

- Cooling and heating capacity *at standard rating conditions*
- EER and COP at standard rating conditions
- Sound power levels
- *Capacity at Bivalent point*

*ECC takes into consideration data of the last three test campaigns of each participants.*

There is a failure regarding MVF if the deviation measured is greater than the mean value given in Appendix A.4.

When there is a second test, then the first test is not taken into account.

A manufacturer is suspended from the Certification Programme for one test campaign if the MVF is strictly higher than 25%.

### H.2 Newcomers and qualifying procedure

Data of new participants will be first taken into consideration after two test campaigns (including qualifying tests).

A manufacturer that leaves the programme and re-joins some years later is considered to be a newcomer if he re-joins after three years. If he re-joins before, all the latest existing test campaigns are considered, with minimum two and maximum three. The same rule applies if the manufacturer has been excluded for one year.



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