TECHNICAL CERTIFICATION RULES OF THE EUROVENT CERTIFIED PERFORMANCE MARK

ROOFTOP

Identification: ECP-13-Rooftop

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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. In addition to the provisions laid down in the Certification Manual, all the requirements in this document apply

Modifications as against last version:

No.	Modifications	Section	Page
1	*The desert certification option details has been added in multiple section*	*multiple*	*multiple*
2	*Clarification on the number of tests (standard scheme versus desert certification scheme)*	*III.1.3.1*	*13*
3	*Clarification of the ISO 9001 requirements for the standard scheme and the desert certification scheme (removal of the validity date replaced by :* ***valid at the selection date***	*III.1.3.1*	*13*

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I. GENERAL INFORMATION

I.1. Scope

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.

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.1.1. General

The Programme scope is divided in three type of products :

- Air-sourced RT systems (Mandatory)
- Water-sourced RT systems (Optionnal)
- Desert certification RT systems (Optionnal – the certify-all does not apply to this option. The participant can declare only desert certification products)

Are included in the RT scope:

- Air-to-air rooftops units covered by ErP regulation No 2016/2281 and defined as a Rooftop air conditioner or Rooftop heat pump:
  - with a cooling capacity rated up to or equal to 100 kW. (Mandatory for the certify all - Will be tested in an independent laboratory)
  - with a cooling capacity rated above 100 kW.(Optional - Will be tested in the participant's laboratory)

- Water-to-air rooftop units: covered by ErP regulation No 2016/2281 driven by an electric compressor, of which the evaporator, compressor and condenser are integrated into a single package.
  - with a cooling capacity rated up to or equal to 100 kW. (Optional - Will be tested in an independent laboratory)
  - with a cooling capacity rated above 100 kW.(Optional - Will be tested in the participant's laboratory)

- 3 or 4 dampers units : (Optional)

- Products not reaching the minimum ErP regulation No 2016/2281 requirements can be certified with a clear indication of the intended market as "Non-EU"
- Desert certification systems are included in the scope as an option. The scheme is for the Middle East market that includes Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates.

Are excluded in the RT scope:

- Desert certification systems following SASO 2874:2016 not compliant with the MEPS (minimum energy performance standard) in the standard.

Features included in the RT scope:

- 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.
- 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.

Features excluded from the RT scope:

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

Examples of rooftops

Figure 1 : 2 dampers rooftops

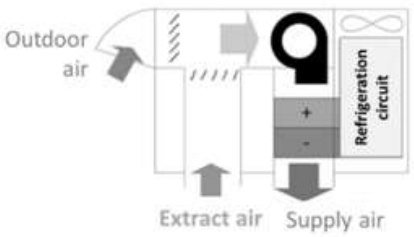


Figure 2: 3 dampers rooftops

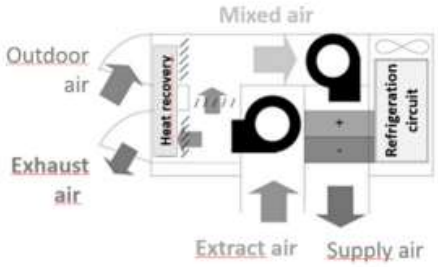
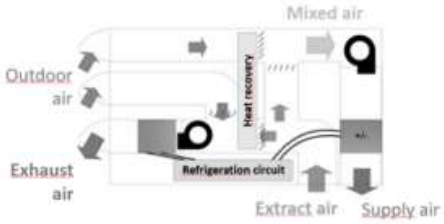


Figure 3: 4 dampers rooftops



I.1.2. Certify-all principle

Whenever a company participates in the RT programme, all production models that are promoted by the applicant/participant/applicant to end-users, specifiers, trading companies, contractors by all means 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 as defined in the Certification Manual is applicable. Only air-to-air rooftops units with a cooling capacity rated up to or equal to 100 kW are submitted to the certify-all. For the other products, including the desert certification option, it is entirely up to the participant to choose which units to declare.

I.2. Certified and published performances

The performances that are certified and published are the following:

Table 1: Number of required tests

	Unit	RT Programme	
		Cert. Perf	Web
EN 14511:2022			
Standard Cooling/Cooling PL Cond A			
Pc *(Total Cooling Capacity at standard conditions / Part Load condition A @ 35°C)*	kW	YES	YES
Pec *(Electric Power Input at standard conditions / Part Load condition A @ 35°C)*	kW	YES	YES
EER *(Energy Efficiency Ratio at standard conditions / Part Load condition A @ 35°C)*		YES	YES
Qv *(Nominal airflow rate)*	m^3/h	YES	YES
ESP *(External static pressure)*	Pa	YES	YES
Dpc *(Condenser water pressure drop)*	kPa	YES	YES
Standard Heating			
Ph *(Total heating capacity at standard conditions @ +7°C)*	kW	YES	YES
Peh *(Electric Power Input at standard conditions @ +7°C)*	kW	YES	YES
COP *(Coefficient of Performance at standard conditions @ +7°C)*		YES	YES
EN 14825:2022			
Seasonal Efficiency In Cooling			
Pdesignc *(Design Load in cooling mode at Tdesign @ +35°C)*	kW	YES	YES
SEER *(Seasonal Energy Effeciency Ratio)*		YES	YES
SEER Class *(Seasonal Energy Efficiency Ratio Class)*		YES	YES
ηsc *(Seasonnal space efficiency in cooling mode)*	%	YES	YES
Cooling PL Cond B			
Pc PL CondB *(Total Cooling Capacity Part Load condition B @ 30°C)*	kW	YES	YES
EER PL CondB *(Energy Efficiency Ratio Part Load conditions B @ 30°C)*		YES	YES
Cooling PL Cond C			
Pc PL CondC *(Total Cooling Capacity Part Load condition C @ 25°C)*	kW	YES	YES
EER PL CondC *(Energy Efficiency Ratio Part Load conditions C @ 25°C)*		YES	YES
Cooling PL Cond D			
Pc PL CondD *(Total Cooling Capacity Part Load condition D @ 20°C)*	kW	YES	YES
EER PL CondD *(Energy Efficiency Ratio Part Load conditions D @ 20°C)*		YES	YES
AVERAGE CLIMATE			
Seasonnal Coefficient of Performance			
Pdesignh *(Design Load in heating mode at Tdesign @ -10°C)*	kW	YES	YES
SCOP *(Seasonnal Coefficient of Performance)*		YES	YES
SCOP Class *(Seasonal Coefficient of Performance Class)*		YES	YES
ηsh *(Seasonnal space efficiency in heating mode)*	%	YES	YES
Heating PL Cond A			
Ph PL CondA *(Total heating capacity Part Load condition A @ -7°C)*	kW	YES	YES
COP PL CondA *(Coefficient of Performances Part Load condition A @ -7°C)*		YES	YES
Heating PL Cond B			
Ph PL CondB *(Total heating capacity Part Load condition B @ +2°C)*	kW	YES	YES
COP PL CondB *(Coefficient of Performances Part Load condition B @ +2°C)*		YES	YES
Heating PL Cond C			
Ph PL CondC *(Total heating capacity Part Load condition C @ +7°C)*	kW	YES	YES
COP PL CondC *(Coefficient of Performances Part Load condition C @ +7°C)*		YES	YES
Heating PL Cond D			
Ph PL CondD *(Total heating capacity Part Load condition D @ +12°C)*	kW	YES	YES
COP PL CondD *(Coefficient of Performances Part Load condition D @ +12°C)*		YES	YES
Heating PL Cond E - TOL			
TOL *(Operating LimitTemperature)*	°C	YES	YES
Ph PL CondE *(Total heating capacity Part Load condition E @ TOL -10°C or above)*	kW	YES	YES
COP PL CondE *(Coefficient of Performances Part Load condition E @ TOL -10°C or above)*		YES	YES
Heating PL Cond F - Bivalent Point			
Tbiv *(Bivalent Temperature)*	°C	YES	YES
Ph PL CondF Tbiv *(Total heating capacity Part Load condition F @ TBiv)*	kW	YES	YES
COP PL CondF Tbiv *(Coefficient of Performances Part Load condition F @ Tbiv)*		YES	YES
Auxiliairies in Cooling			
Psbc *(Power consumption in standby mode in cooling mode)*	W	YES	YES
Poffc *(Power consumption in off mode in cooling mode)*	W	YES	YES
Ptoc *(Power consumption in thermostat off mode in cooling mode)*	W	YES	YES
Pckc *(Power consumption of the crankcase heater in cooling mode)*	W	YES	YES
Auxiliairies in Heating			
Psbh *(Power consumption in standby mode in heating mode)*	W	YES	YES
Poffh *(Power consumption in off mode in heating mode)*	W	YES	YES
Ptoh *(Power consumption in thermostat off mode in heating mode)*	W	YES	YES
Pckh *(Power consumption of the crankcase heater in heating mode)*	W	YES	YES

	Unit	RT Programme	
		Cert. Perf	Web
EN 12102-1:2022			
Acoustic in cooling			
LwO env *(A-weighted sound power level outdoor unit non-ducted)*	dB(A)	YES	YES
ISO 15042:2017, SASO 2874:2016, GSO 03 Draft, ISO16358-1:2013/Amd.1:2019 - DESERT CERTIFICATION OPTION			
T1			
Pc T1 *(Total Cooling Capacity at @ 35°C)*	kW	YES	YES
Pec T1 *(Electric Power Input at @ 35°C)*	kW	YES	YES
EER T1 *(Energy Efficiency Ratio at @ 35°C)*		YES	YES
T3 / Cooling PL Cond A			
Pc T3 *(Total heating capacity at @ 46°C)*	kW	YES	YES
Peh T3*(Electric Power Input at @ 46°C)*	kW	YES	YES
EER T3 *(Energy Efficiency Ratio at @ 46°C)*		YES	YES
T4			
Pc T4 *(Total heating capacity at standard conditions @ 48°C)*	kW	YES - Kuwait only	YES
Peh T4 *(Electric Power Input at standard conditions @ 48°C)*	kW	YES - Kuwait only	YES
EER T4 *(Energy Efficiency Ratio at @ 48°C)*		YES - Kuwait only	YES
Operability at 52°C			
Operability_test *(Operability at 52°C for 2 hours)*		YES	YES
Cooling PL CondB DS			
Pc PL CondB_DS *(Total Cooling Capacity Part Load condition B @ 40°C)*	kW	YES	YES
EER PL CondB_DS *(Energy Efficiency Ratio at @ 40°C)*		YES	YES
Cooling PL CondC DS			
Pc PL CondC_DS *(Total Cooling Capacity Part Load condition C @ 33°C)*	kW	YES	YES
EER PL CondC_DS *(Energy Efficiency Ratio at @ 33°C)*		YES	YES
Cooling PL CondD DS			
Pc PL CondD_DS *(Total Cooling Capacity Part Load condition D @ 26°C)*	kW	YES	YES
EER PL CondD_DS *(Energy Efficiency Ratio at @ 26°C)*		YES	YES
DSEERon - Part Loads			
DSEERon		YES	YES
OTHER			
LRCONTMIN in Cooling			
LRcontminc *(Minimum continuous operation load ratio in cooling mode)*		YES - Optionnal	YES
CcpLRcontminc		YES - Optionnal	YES
LRCONTMIN in Heating			
LRcontminh *(Minimum continuous operation load ratio in heating mode)*		YES - Optionnal	YES
CcpLRcontminh		YES - Optionnal	YES
Caracteristiques			
Refrigerant		YES	YES
Main Power Supply*(Voltage (V) - Phase - Frequency (Hz))*		YES	YES
PartLab Max Capacity		YES	YES
PartLab Max Airflow		YES	YES
Geographical Market		YES	YES
Edibatec		YES	YES

I.3. Definitions

In addition to the definitions specified in the Certification Manual and the definitions given in EN14511:2022 and EN14825:2022, Commission Regulation (EU) 2016/2281, and standard SASO ISO 13253, SASO 2874:2016 and GSO 03 Draft, the following definitions apply:

I.3.1. Basic Mode Group (BMG)

Each Participant/applicant declaration list will be grouped in Basic Model Groups (BMG). A basic model shall be defined in terms of :

- Height (mm)
- Width (mm)
- Length (mm)
- Part of a common commercial range
- Same product type (ex:-RT/A/P/C)

- With similar components (fans, coils, compressors and motors)

I.3.2. LRcontmin

LRcontmin is defined as the load rate under which a unit with a variable speed compressor behaves as an ON/OFF. Ratio of the capacity in heating (or cooling) divided by the heating (or cooling) capacity measured in the standard rating test conditions.

CcpLRcontmin is defined as the Ratio of the COP in heating (or EER in cooling) divided by the COP in heating (or EER in cooling) measured in the standard rating test conditions.

I.3.3. Desert certification Option - DSEERon

As an additional option, DSEERon (active mode seasonal energy efficiency ratio of Desert Certification scheme) can be declared and certified within the desert certification option.

DSEERon is defined as: Average energy efficiency ratio of the unit in active mode for the space cooling function for Desert Certification scheme, determined from part load and bin-specific energy efficiency ratios, EERbin(Tj), and weighted by the operating bin hours where the bin condition occurs, which are defined by ISO 16358-1:2013/Amd.1:2019

The part load conditions, load ratios and calculation bin are given in Appendix

I.4. Contributors

The lists of contributors are given for information and may be modified by ECC whenever necessary.

I.4.1. Independant laboratory / test body

The tests are performed at the request of ECC by the following independent laboratory:

DMT GmbH & Co. KG	✉ : AM Technilogiepark 1 45307 Essen, Germany	☎ : +49 201 172-1408
CEIS : Centro de Ensayos Innovación y Servicios	✉ : Cr. de Villaviciosa de Odón a Móstoles, Km. 1,5, 28935 Móstoles (Madrid) Spain	☎ : +34 916 169 710
CETIAT	✉ : 25 Avenue des Arts Adresse de livraison :, 54 Bd Niels Bohr, 69100 Villeurbanne	☎ : +34 04 72 44 49 00

II. REQUIREMENTS OF THE REFERENCE DOCUMENT

II.1. Reference documents

II.1.1. Product and test standards

The test procedure is detailed in Appendix and in the product and test standards.The applicable standards are as follows (non-exhaustive list):

II.1.1.1. Performance testing

EN 14511:2022 “Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling” used for:

- Standard rating points
- LRcontmin and $Ccp_{LRcontmin}$
- Minimum and maximum internal static pressure requirements are defined in standard EN14511-3:2022

EN 14825:2022 "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:

- Psb, Pto, Poff, Pck
- Part-Load Conditions in cooling mode
- Part-Load Conditions in heating mode

These 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 14511:2022 and EN 14825:2022.

Desert certification option:

- SASO 2874:2016 "Air conditioners – Minimum energy performance requirements and testing requirements".
- GSO 03 Draft "Air conditioners – Minimum energy performance requirements and testing requirements"
- SASO ISO 13253: "Ducted air-conditioners and air to air heat pumps – Testing and rating for performance".

II.1.1.2. Acoustics testing

EN 12102-1:2022 "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.2. Marking

It is highly recommended that the participating company indicates participation in the Eurovent Certified Performance (ECP) program 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.2.1. Display of ECP logo on production units

The provisions of the Certification Manual apply.

II.2.2. Display of ECP logo on technical documentation

The provisions of the Certification Manual apply.

III. CERTIFICATION PROCESS

III.1. Admission procedure

For the admission procedure, the campaign schedule on the appendix C is not applicable. In addition to the provisions laid down in the Certification Manual, the following requirements apply:

III.1.1. Declaration of data

The applicant, after signing the Certification Agreement, shall send to ECC all the information required for the qualification: the Declaration files and relevant literature.

The forms shall be sent by e-mail to ECC within the time limits specified in Certification manual (see Certification Manual Art. 126).Copies of the forms are part of this Technical Certification Rules

The participant shall use suitable means to identify the products by a unique identification code (the minimum traceable information: production plant, N° of lot, components), and the retention of documented information (records) necessary to enable traceability.

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

III.1.1.1. 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.1.1.2. Declaration of factory file RT

The form *Declaration factories RT* will be used for manufacturing companies (Original Equipment Manufacturer – OEM) to declare the list of manufacturing plants to ECC, and in which plant(s) its ranges are produced. The city and the country of the manufacturing plants will be visible on their certificate.(as per decision from the committee)

For units concerned by several plants, ECC may 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.1.1.3. Declaration file RT

The form *Declaration file RT* will be used for manufacturing companies (Original Equipment Manufacturer – OEM) to declare models. It must be completed for each different declared performance of each models that the manufacturer specify. The *Declaration file RT* is send to Brand Name (BN) companies to identify the corresponding model’s number of the original equipment manufacturer

Product types

The product type is defined by the following letters:

A: Air cooled , W : Water-cooled

C: Colling only, R: Reversible

For Example: **RT/A/P/R**

III.1.2. Admissibility of the application

ECC proceeds to the selection of units to be tested based on the declaration file. The independent laboratory staff can than proceeds to the products performances testing according to the procedure described in the sections below

III.1.3. Implementation of checking operations

ECC shall select units to be tested based on its evaluation of the *Declaration file RT* communicated by the applicant. At least one (1) unit shall be selected to be tested per campaign.

The samples necessary for carrying out the tests may be taken:

- either from the Participant/applicant production line
- or a stocking point

III.1.3.1. Number of units to be tested

The number of units tested each year per participant/applicant shall be as follows:

- 10% (rounded up, at least 1) of the number of the listed BMG for air-sourced and water-sources units combined
- 10% (rounded up, at least 1) of the number of the listed BMG for the Desert certification units

Table 2: Number of required tests

	Number of tests	
Number of Basic Model Groups	ISO 9001 Manufacturers	Others
1 to 10	1	2
11 to 20	2	4
>20	3	6

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

- The manufacturing places of the declared products 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 for the standard scheme or by the international Accreditation forum for middle east)
  - valid when the selection is done
  - 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.1.3.2. Selection performances to be tested

a. Thermal measurements for RT air-cooled and water-cooled units

For each unit selected by ECC for test, the following measurements and conditions shall be tested.

- Capacity (Pc) and efficiency (EER) at standard rating conditions / Part Load condition in cooling mode at +35°C)
- One capacity (Pc) and efficiency (EER) at Part Load in cooling to be chosen by ECC between Part Load condition B @ 30°C, C @ 25°C, D @ 20°C
- Capacity (Ph) and coefficient of performance (COP) at standard rating condition in heating mode at +7°C
- One capacity (Ph) and coefficient of performance (COP) at PL condition F (Tbivalent) for the average climate
- One capacity (Ph) and coefficient of performance (COP) at Part Load in heating in average climate to be chosen by ECC between Part Load condition A @ -7°C, B @ +2°C, C @ +7°C, D @ +12°C

  *If PL conditions temperature = Tbiv, it cannot be chosen

- LRcontmin & CCPLRcontmin in cooling or heating. If both modes are declared, ECC will test one of them. The mode chosen for LRcontmin and CCPLRcontmin will be the same (Optional – tested if declared)
- One test among Psb, Pto, Poff and Pck in cooling mode
- One test among Psb, Pto, Poff and Pck in heating mode

For the one condition chosen by ECC in Part loads ,when 2 stages are declared, for a given condition, 1 stage (Lower or Upper) is chosen by ECC for the test.

b. Acoustic measurements for RT

A-weighted sound power level test the unit shall be carried out for all units selected in cooling mode

c. Desert certification

The products in the desert certification are in cooling only or reversible. If the Participant/Appliquants declares the product RT/A/P/DS, the following points shall all be declared and will be tested:

- Capacity and EER at T1 (35°C)
- Capacity and EER at T3 (46°C)
- Capacity and EER at T4 (48°C) – Only for Kuwait
- Operability at 52°C for 2h
- For DSEERon : Capacity (Pc) and efficiency (EER) at Part Load in cooling to be chosen by ECC between Part Load condition B @ 40°C, C @ 33°C, D @ 26°C

The EER for desert certification is defined as follow:

$$\mathrm{EER(T1\ or\ T3\ or\ T4)} = \frac{\mathrm{Pc_{out}}}{\mathrm{Pec_{out}}}$$

d. Summarize table for RT

Table 3 : Measurements of RT tests

Conditions		Cooling only	Reversible
Cooling	A (standard +35°C full load)	X	X
	One point at PL condition between : B, C, D	X	X
Heating	Nominal (+7°C standard rating condition)	N/A	X
	One point at at T_{biv} for the average climate	N/A	X
	One point at PL condition between : A (if ≠F), B (if ≠F), C, D or E (if ≠F) for the average climate	N/A	X
Auxiliairies	One point between Poff, Psb, Pto, Pck in heating	N/A	X
	One point between Poff, Psb, Pto, Pck in cooling	X	X
Lrcontmin	In cooling or heating mode (must be the same mode as CCPLRcontmin)	(X)	(X)
CCPLRcontmin	In cooling or heating mode (must be the same mode as LRcontmin)	(X)	(X)
Acoustics	A-weighted sound power level in cooling	X	X
Desert Certification	Capacity and EER at T1 (35°C)	(X)	(X)
	Capacity and EER at T3 (46°C)	(X)	(X)
	Capacity and EER at T4 (48°C) – Optional, only for Kuwait	(X)	(X)
	Operability at 52°C for 2h	(X)	(X)
	DSEERon: One point at PL condition between : A, B, C, D	(X)	(X)

(X) To be tested if declared only

III.1.3.3. Tests at the independent laboratory

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

a. Laboratories

All units with cooling capacity at ECC Standard Rating Conditions rated up to or equal to 100 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)
- one of the units appears to be damaged

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

Table 4 : Independent laboratory specifications

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

b. 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.

c. 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 recrating 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.

For up to 25kg weight goods, palletized delivery is preferred. For above 25kg, goods must be palletized upon delivery. When received in conditions other than previously requested or with visible damages, goods will not be unloaded from the transport vehicle by laboratory staff and will be refused. The sender will be immediately informed.

Laboratory will not be held responsible for any damages not visible during the unload process from the transport vehicle or damages detected after goods unpacking. The sender will be informed of any externally visible damage on the goods within 7 working days from delivery date.

d. Time limitation of acquisition of a unit

If a laboratory is unable to obtain the unit and the relevant documentation within the time limitations defined by ECC . 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.1.3.4. Procedure to test 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.1.3.5. Procedure to test their 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.1.3.6. Procedure to test their own products in a competitor 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.1.3.7. Selection software checking

ECC shall check at least the certified performances of each unit tested during the qualification campaign. During the repetition procedure ECC shall check at least the certified performances of each unit tested during the previous test campaign, in particular the rerated performances which should be updated in the selection tool.

a. Scope

The following provisions of the Certification Manual Appendix E.I. apply:

- Art 228. The selection tool shall be related to the scope of the ECP programme as defined in the relevant Technical Certification Rules.
- Art 229. There shall be only one selection tool name and version on the European market for the products covered by the ECP certificate. Extension to other regions can be defined by the Programme Committee.
- Art 231. Structure of rights and rights of access to selection tool associated to a password must be made available to checkers. When rights associated to password can be differentiated, the level of rights given to the auditors should be at least equivalent and cover all level of rights given to any kind and all kinds of customers.
- All the units of a same range shall be included in the same selection tool.

b. Material and functioning

The following provisions of the Certification Manual Appendix E.II. apply:

- Art 232. The selection software name and version shall be clearly identifiable for no possible confusion between different releases. An example of suitable code is given below:

MySoft vXY.Z
- characters indicating a version serial number, not affecting the selection results
- characters to indicate the technical version serial number

Any modification of the software which has an impact on the certified products / performances must be communicated to ECC. ECC will then perform a new check of the software.If the modifications do not

have an impact on the certified products / performances and based on the software record sheet, then ECC will update the version with no extra checking.

- Art 233. The model designation, the software name and its version number shall be written on each page of the printouts.
- The issue date shall be in the printout.
- Art 234. The selection software shall be available as an executable file or on a website with remote access. Other access facilities are only possible in consultation with ECC. The selection software when installable must be usable under a common operating system.
- Art 235. The software must be able to store and restore the selection details without alterations of the calculations. Printout outputs shall be not editable (i.e. not modifiable). It is highly recommended that the output is delivered at least in pdf format.
- Art 236. The selection software shall be operative as an entity with all components integrated in one software. Components in a model that are selected with different software or any other means of selection cannot be certified.
- Art 237. Use of the ECP mark shall be in accordance with the Certification Manual (CM). The relevant Programme Committee may decide to make the ECP mark mandatory on the printouts. In any case the ECP mark cannot be used in a selection tool available to customers before the selection tool is certified. (As an option)
- Art 238. It shall be possible to run the software as well as the “How to use” (if it exists) instructions in English. Output shall be delivered at least in English. Conditions, characteristics and performance shall be expressed at least in S.I.
- Art 239. The software shall be able to select a model according to at least one of these three possibilities:
- operating conditions and expected characteristic items and/or performance items
- model range and/or expected characteristic values and/or performance values
- model designation (reference) and operating conditions
- Art 240. The selection software shall be able to select a model between an upper and lower running conditions and show warning messages if conditions and/or results are out of limits.
- Art 241. The software shall be able to give for a model selection the certified characteristics and performance under the testing conditions of the relevant Technical Certification Rules in the same output (see specific requirements per programme).
- Art 242. Performance values under other operating conditions are authorized, as soon as operating conditions are fully specified jointly. The relevant Programme Committee may decide to reduce the envelope of certified conditions and may define and forbid unrealistic conditions.
- Art 245. For a programme where “Certify-all” policy applies, all the products brands present on the commercial documentation must be listed on the software. If units or components are out of the scope of the programme, a clear statement shall be visible on the corresponding printouts.
- Overall dimensions shall be available on printouts
- Sketch of the duct configuration can be provided (As an option)
- Only one selection tool is allowed by range

Input data and output data

See Certification Manual Art. 248

III.1.3.8. Test conditions

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

III.1.3.9. Reporting of the test result file

For models tested, the Reporting of test result file is sent by ECC, showing the deviations between declared and measured data as well as the rerate propositions

III.1.3.10. Failure treatment

a. 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.

b. Failure of general performances

For each test, a performance item fails when the difference between the declared value and the measurement differs by more than the acceptable acceptance criteria (see Appendix A). A test fails when one or more performance items fail. For each failed test, the Applicant/Participant/applicant has 4 weeks after notification of failure to choose between one of the following alternatives:

- Re-rate the products in accordance with the re-rating rules (see dedicated chapter below);
- Ask for a second test on the same unit;
- Ask for a second test on another unit of the same model selected by ECC.

c. Failure on ESP and QV

If the ESP measured is not in accordance with *EN 14511:2022* (i.e. lower than ESP_{min} or higher than $2xESP_{min}$), 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.

d. Tested part-loads for seasonal efficicency

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 Tbiv. 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.

e. Failure of the Operability at 52°C for 2h test

If the unit cannot operate at 52°C for 2h, the test is failed. The procedure for a second test applies. If the second test fails, the unit is then not certified.

f. Second test

Second test on the same unit: If the second test is performed on the same unit without any modification on the unit, and not leaving the laboratory :

- If the failed value is a thermal measurement, the second test can repeat <u>all the thermal and pressure measurements of the failed mode only</u>
- If the failed value is a sound measurement, the second test can repeat all the sound measurement only
- If the failure of the 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 failed value is seasonal efficiencies, the participant has the right to choose a complete seasonal test (all points, including all auxiliaries).

Second test on a new unit : 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

Re-rate : 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.1.3.11. Re-rating rules

For each failed test, the model shall be rerated according to the following rules.

a. Proposal of rerate file

For models tested with failures, the *Proposal of rerate file* is sent by ECC, showing the list of products affected by the failed test and their proposal of rerate. (See annexe B)

b. Rerating of design load (P designh)

Whenever the test at bivalent condition shows a deviation on capacity larger than the allowed acceptance criteria, the Participant will be informed and can choose to stop the test (in this case, a new declaration shall be provided to ECC and a new test shall be scheduled). Otherwise, the design load is rerated according to the measured deviation for all models in the same basic model group.

- Tested model: $Pdesignh_{\_rerated} = Pdesignh_{\_declared}$ + Deviation of the capacity at Pbivalent
- Models with same BMG: $Pdesignh_{\_rerated} = Pdesignh_{\_declared}$ + Deviation

c. Rerating on Capacity at Tbivalent

The tested model shall be rerated to the measured value

- Tested model: $Perf_{\_rerated} = Perf_{\_measured}$

d. Rerating of auxiliary power consumption

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

- Tested model: $Perf_{\_rerated} = Perf_{\_measured}$
- Models with same BMG: $Perf_{\_rerated} = Perf_{\_declared}$ + Deviation

e. Rerating of capacity and/or efficiency at standard rating conditions (including T1, T3 and T4 for desert certification)

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

- Tested model: $Perf_{\_rerated} = Perf_{\_measured}$
- Models with same BMG: $Perf_{\_rerated} = Perf_{\_declared}$ + Deviation
- Power input: recalculated with the rerated performances

f. Rerating of EER and COP at Part load conditions (including the PL conditions for Desert certification)

Whenever a measurement at a part-load condition selected by ECC shows a deviation on EER or COP larger than the allowed acceptance criteria, the deviation shall be applied to all the other part load EER (respectively COP) of the unit.

- Part Load tested: $Perf_{\_rerated} = Perf_{\_measured}$
- Other Part loads of the same unit : $Perf_{\_rerated} = Perf_{\_declared}$ + Dev. $COP/EER_{measured}$ – acceptance criteria

In cooling, the concerned Part Loads are B, C and D

In heating, the concerned part Loads are A, B, C, D, G

Special case: for staged units

- 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). Whitin the same Part load (ErP value).
- 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). Whitin the same Part load (ErP value).

g. Rerating of SEER and SCOP

When all points for SCOP/SEER are tested, ECC will recalculate the seasonal efficiency using:

- The declared value of part load, if the result is passed
- The measured value, if the result is failed (out of acceptance criteria)

Whenever a measurement at a part-load condition selected by ECC or the test on auxiliary power consumption shows a deviation on EER or COP at part loads larger than the allowed acceptance criteria, the deviation shall be applied to all the other part load EER (respectively COP) and then, SEER and SCOP will be recalculated by ECC, to be rerated.

When EER (or COP) and/or the auxiliary (Psb/Pto/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.

SEER and COP recalculation

- Tested m odel: $Perf_{\_rerated} = Perf_{\_recalculated}$

$\eta_{s,c}$ and $\eta_{s,h}$ recalculation

Tested model recalculation:

- ηsc = $\frac{100}{CC}$ x SEER – 3% where CC (conversion coefficient, equal to 2.5)
- ηsh = $\frac{100}{CC}$ x SCOP – 3% where CC (conversion coefficient, equal to 2.5)

Rerating of the DSEERon

Whenever a measurement at a part-load condition selected by ECC shows a deviation on EER at part loads larger than the allowed acceptance criteria, the deviation shall be applied to all the other part load EER and then, DSEERon will be recalculated by ECC, to be rerated.

Table 5: Synthesis of situation withSEER/SCOP recalculations

FAILED ITEM	RECALCULATION	
	SEER	SCOP
Cooling Part Loads		
EER PL CondB *(Energy Efficiency Ratio Part Load conditions B @ 30°C)*	X	
EER PL CondC *(Energy Efficiency Ratio Part Load conditions C @ 25°C)*	X	
EER PL CondD *(Energy Efficiency Ratio Part Load conditions D @ 20°C)*	X	
Heating Part Loads - All Climates		
COP PL CondA *(Coefficient of Performances Part Load condition A @ -7°C)*		X
COP PL CondB *(Coefficient of Performances Part Load condition B @ +2°C)*		X
COP PL CondC *(ECoefficient of Performances Part Load condition C @ +7°C)*		X
COP PL CondD *(Coefficient of Performances Part Load condition D @ +12°C)*		X
COP PL CondG *(Coefficient of Performances Part Load condition D @ -15°C)*		X
COP PL CondE *(Coefficient of Performances Part Load condition E @ TOL)*		X
COP PL CondF Tbiv *(Coefficient of Performances Part Load condition F @ Tbiv A)*		X
Auxiliairies in Cooling		
Psbc *(Power consumption in standby mode in cooling mode)*	X	
Poffc *(Power consumption in off mode in cooling mode)*	X	
Ptoc *(Power consumption in thermostat off mode in cooling mode)*	X	
Pckc *(Power consumption of the crankcase heater in cooling mode)*	X	
Auxiliairies in Heating		
Psbh *(Power consumption in standby mode in heating mode)*		X
Poffh *(Power consumption in off mode in heating mode)*		X
Ptoh *(Power consumption in thermostat off mode in heating mode)*		X
Pckh *(Power consumption of the crankcase heater in heating mode)*		X
Desert Certification	**DSEERon**	
EER PL CondB *(Energy Efficiency Ratio Part Load conditions B @ 40°C)*	X	
EER PL CondC *(Energy Efficiency Ratio Part Load conditions C @ 33°C)*	X	
EER PL CondD *(Energy Efficiency Ratio Part Load conditions D @ 26°C)*	X	

h. Rerating on acoustic performances

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

- Tested model : $Perf_{\_rerated} = Perf_{\_measured}$
- Models with same BMG : $Perf_{\_rerated} = Perf_{\_measured}$ + Deviation

i. Rerating on LRcontmin and CCPLRcontmin

LRcontmin

If the unit does not allow to keep stable conditions during the test as defined in EN 14511:2022 or if the deviation of LRcontmin exceed the acceptance criteria, then LRcontmin is failed. The tested model shall be rerated to the measured value and all the models with the same BMG shall be rerated according to the deviation measured

- Tested model: $Perf_{\_rerated} = Perf_{\_measured}$
- Models with same BMG: $Perf_{\_rerated} = Perf_{\_declared}$ + Deviation

If the Lrcontmin $Perf_{\_rerated} > 0.4$ for the tested unit or for a unit of the same BMG, then the LRcontmin is rerated to 0.4 for that unit

CCPLRcontmin

If the unit does not allows to keep stable conditions during the test as defined in EN 14511:2022 or if the deviation of CCPLrcontmin exceed the acceptance criteria, then CCPLRcontmin is failed. CCPLRcontmin the tested model shall be rerated in accordance with the test result. The deviation shall be applied to all models in the same basic model group (BMG).:

- Tested model: $Perf_{\_rerated} = Perf_{\_measured}$
- Models with same BMG: $Perf_{\_rerated} = Perf_{\_declared} + Deviation$

If the CCPLrcontmin $Perf_{\_rerated} < 1$ for the tested unit or for a unit of the same BMG, then the CCPLRcontmin is rerated to 1.

j. Rerating rules synthesis

Table 6: Synthesis of rerated

Failed point	Rerated values	
	Tested model	Models with the same BMG
Pc or Ph (including T1, T3 and T4)	$Pc_{\_rerated} = Pc_{\_measured}$	$Pc_{\_rerated} = Pc_{\_declared} + Deviation$
	$P_{E\_rerated} = Pc_{\_rerated} / EER_{\_declared}$	$P_{E\_rerated} = Pc_{\_rerated} / EER_{\_declared}$
EER or COP (including T1, T3 and T4)	$EER_{\_rerated} = EER_{\_measured}$	$EER_{\_rerated} = EER_{\_declared} + Deviation$
	$P_{E\_rerated} = Pc_{\_declared} / EER_{\_rerated}$	$P_{E\_rerated} = Pc_{\_declared} / EER_{\_rerated}$
Pc + EER or Ph + COP (including T1, T3 and T4)	$Pc_{\_rerated} = Pc_{\_measured}$	$Pc_{\_rerated} = Pc_{\_declared} + Deviation$
	$EER_{\_rerated} = EER_{\_measured}$	$EER_{\_rerated} = EER_{\_declared} + Deviation$
	$P_{E\_rerated} = Pc_{\_rerated} / EER_{\_rerated}$	$P_{E\_rerated} = Pc_{\_rerated} / EER_{\_rerated}$
Acoustics	$LwO_{\_rerated} = LwO_{\_measured}$	$LwO_{\_rerated} = LwO + Deviation$
LRcontmin	$LRcontmin_{\_rerated} = LRcontmin_{\_measured}$	$LRcontmin_{\_rerated} = LRcontmin_{\_declared}$ + deviation
		If the Lrcontmin $Perf_{\_rerated} > 0.4$, then $Perf_{\_rerated} = 0.4$
CcpLRcontmin	$CcpLRcontmin_{\_rerated} = CcpLRcontmin_{\_measured}$	$CcpLRcontmin_{\_rerated} = CcpLrcontmin_{\_declared}$ + deviation
		If the Lrcontmin $Perf_{\_rerated} < 1$ then $Perf_{\_rerated} = 1$
Psb or Pto or Poff or Pck	$Psb_{\_rerated} = Psb_{\_measured}$	$Psb_{\_rerated} = Psb_{\_declared} + Deviation$
SEER or SCOP	Recalculated	N/A
ηsc or ηsc	Recalculated	N/A
Pdesign h	$Pdesignh_{\_rerated} = Pdesignh_{\_declared} + (Dev_{\_Ph\ at\ Tbiv})$	$Pdesignh_{\_rerated} = Pdesignh_{\_declared} + (Dev_{\_Ph\ at\ Tbiv})$
Ph a Tbiv	$Ph_{\_rerated} = Ph_{\_measured}$	N/A
Dp (Water Press. Drop)	$Dp_{\_rerated} = Dp_{\_measured}$	N/A

Table 7: Synthesis of rerated for Part loads

Failed point	Rerated values		
	Tested Part-Load	Other Part-Loads of the test	SEER or SCOP (or DSEERon)
EER or COP (including Desert certification)	$EER_{rerated} = EER_{measured}$	$EER_{rerated} = EER_{declared} + (Dev_{of\ the\ tested\ PL}$ - Accept criteria)	$EER_{rerated}$
EER or COP when all PL tested	$EER_{rerated} = EER_{measured}$	No re-rate. All PL are measured	$EER_{measured}$

III.1.3.12. 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) including desert certification option
- Deviation by more than 15 % on efficiency (standard conditions) including desert certification option
- 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.1.3.13. Time limitation for the recovery of units

The participant shall indicate in the TDS, in the appropriate section, if they want the unit returned after the testing is over or if they want to scrap it. It shall also include a contact person the laboratory can reach to coordinate. The following procedure will apply for all units:

- Within **8** weeks after receiving the test report, ECC shall notify the laboratory whether a unit is intended to be used for a second test.
- The Unit remains at the independent laboratory, when:
  - 2nd test will be required on the same unit
  - The same unit declared as ITF will be used for the pending test.
- If no 2nd test is required on the same unit, or in case of a second ITF on the same unit, or without any notification from ECC to the Laboratory within **8** weeks after receiving the test report, the option chosen into the TDS applies (scrapping/recovery).
- For the recovery option, the manufacturer has maximum of **4 weeks to recover** the unit since the official notification of the recovery allowance from the laboratory. In case he doesn't, the unit will be disposed and ECC will duly manage the scrapping invoice.

III.1.3.14. 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.1.4. Evaluation and decision

The certification is granted on condition that:

- The test campaign (N) has been successfully completed
- The product delivery together with the technical datasheet, the starting procedure have been completed
- The payments have been settled
- Penalty tests following an admission procedure need to be validated before the certification is granted.

III.2. Surveillance Procedure

The provisions of the Certification Manual apply.

III.2.1. Implementation of surveillance procedures

III.2.1.1. Update of the declaration list

ECC will requests an update of *the Declaration file RT* every year, at the beginning of a new campaign (see annexe C). The Participant shall update their declaration list form following the same requirements as the admission campaign.

Beside current models, the Participants shall provide ECC with the list of obsolete and deleted models.

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.

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.

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.2.1.2. Update of the factory declaration list

ECC will requests an update of *the Declaration factories file RT* every year, at the beginning of a new campaign (see annexe F) the Participant shall update their declaration list form following the same requirements as the admission campaign.

III.2.1.3. Selection of units to be tested

For the surveillance procedure, the selection follows the same rules than the admission procedure.

III.2.1.4. Surveillance tests

For the surveillance procedure, the surveillance tests follows the same rules than the admission tests.

III.2.1.5. Technical and commercial documentation check

The provisions of the Certification Manual apply.

III.2.1.6. Penalty tests

An additional unit will be selected for the next test campaign each time there is a deviation by more than the high acceptance criteria on:

- efficiency and/or capacity;
- sound power level.

An additional unit will be selected for the next test campaign each time there is a second test on a new unit.
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.2.2. Evaluation and decision

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.

For the surveillance procedure the certification is renewed at the date specified in the Certification Schedules on condition that:

- The previous test campaign (N-1) has been successfully completed
- The product delivery together with the technical datasheet, the starting procedure have been completed
- The payments have been settled

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.3. Declaration of modifications

The provisions of the Certification Manual apply.

III.3.1. Changes concerning the participant/applicant

The provisions of the Certification Manual apply.

III.3.2. Changes concerning production entities

The provisions of the Certification Manual apply.

III.3.3. 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 product (e.g. units above 100 kW); the units will be considered as “Not Certified” until the validation of the tests results.

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

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.3.4. Temporary or permanent cessation of production of a certified product

The provisions of the Certification Manual apply.

III.4. Suspension/cessation conditions

The provisions of the Certification Manual apply.

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

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

The tests shall be carried out at 230 V for one phase units and 400 V for three phase units, with the rated frequency of 50 Hz.

For one phase units: the MPS shall be declared as 230-1-50.

For three phase units: the MPS shall be declared as 400-3-50.

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
- The operating conditions shall be used following the Table
- Allowable deviations from set values are given in EN 14511:2022
- Testing shall be carried without mixing damper (except in the case of 3 / 4 dampers units)

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

1) Lrcontmin test method

Two tests have to be performed:

- A heating (respectively cooling) capacity test at this load ratio to verify the continuous operation of the unit (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 then calculated and validated, as follows:

In cooling:

$$\text{LRcontminc} = \frac{\text{Pc at LRcontmin}}{\text{Pc at standard rating conditions}}$$

In heating:

$$\text{LRcontminh} = \frac{\text{Ph at LRcontmin}}{\text{Ph at standard rating conditions}}$$

CcpLRcontmin is then calculated and validated, as follows:

In cooling:

$$\text{CcpLRcontminc} = \frac{\text{EER at LRcontmin}}{\text{EER at standard rating conditions}}$$

In heating:

$$\text{CcpLRcontminh} = \frac{\text{COP at LRcontmin}}{\text{COP at standard rating conditions}}$$

The default value for Lrcontmin is 0.4 and for CCPLRcontmin is 1

2) <u>Lrcontmin test method for heating mode only (Alternative method)</u>

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.

A.3. Standard rating conditions

Table 8: Operating conditions for standard rating (EN 14511:2022)

	OUTDOOR SIDE				INDOOR SIDE	
	Air °C		Water °C		Air °C	
	Dry bulb	Wet bulb	Inlet	Outlet	Dry bulb	Wet bulb
Cooling	35	24	30	35	27	19
Heating	7	6	20*	17	20	15 max
Sound**	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.4. Part_Load rating conditions for cooling and heating mode (EN14825:2022)

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.5. Reference temperatures and hours

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

Table 9: Reference design temperatures

	Design Temperature [°C]		Bivalent temperature [°C]	Operating limit Temperature [°C]
	Outdoor	Indoor		
Cooling	35 (24)	27 (19)	n.a	n.a
Heating / Average	-10(-11)	20 (15 max)	+2 or lower	-7 or lower
Heating / Warmer	+2(1)	20 (15 max)	+7 or lower	+2 or lower
Heating / Colder	-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 10: 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_{CE} or H_{HE}	H_{TO}	H_{SB}	H_{OFF}	H_{CK}
Cooling (to calculate SEER & $\eta_{s,c}$)		600	659	1377	0	2036
Heating (to calculate SCOP & $\eta_{s,h}$)	**Average**	1400	179	0	0	179
	Colder	2100	131	0	0	131
	Warmer	1400	755	0	0	755

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

A.6. Desert Certification Option

1) Standard conditions (T1, T3 and T4)

Tests according to ISO15042 standard shall be carried out at the following testing conditions:

Table 09: Operating conditions for standard conditions – Desert certification

	INDOOR UNIT		OUTDOOR UNIT	
	Air entering °C		Air entering °C	
	Dry bulb	Wet bulb	Dry bulb	Wet bulb
T1	27	19	35	24
T3	29	19	46	24
T4	26.6	19.4	48	24
Operability test	32	23	52	31

2) DSEERon calculation

EN 14825:2022 standard shall be used for the test methods of the DSEERon with all required corrections as per EN 14511-3:2022.The following formula shall be used to determine the DSEERon.

$$DSEER_{on} = \frac{\sum_{j=1}^{n} h_j \times P_c(T_j)}{\sum_{j=1}^{n} h_j \left(\frac{P_c(T_j)}{EER_{bin}(T_j)} \right)}$$

where

T_j *is the bin temperature;*

j *is the bin number;*

n *is the total number of bins;*

$P_c(T_j)$ *is the cooling load for the corresponding bin temperature Tj, in kW;*

h_j *is the number of bin hours occurring at the corresponding bin temperature Tj;*

$EER_{bin}(T_j)$ *is the EER value of the unit for the corresponding bin temperature Tj.*

The same calculation procedures and rules for determination given in EN 14825:2022 standard shall be applied (interpolation and extrapolations, degradation coefficient, calculation procedure for fixed or staged/variable capacity units, etc.).

The part load ratios and conditions are given in the table below,

Table 10: Operating conditions for Part load conditons – Desert certification

	% Part load	INDOOR UNIT		OUTDOOR UNIT	
		Air entering °C		Air entering °C	
		Dry bulb	Wet bulb	Dry bulb	Wet bulb
Pc PL CondA_DS	100%	29	19	46	24
Pc PL CondB_DS	77%	27	19	40	24
Pc PL CondC_DS	50%	27	19	33	24
Pc PL CondD_DS	23%	27	19	26	24

The operating bin hours, originally defined by ISO 16358-1:2013/Amd.1:2019, are given in Table below:

Table 25: Applicable climate bins and hours for DSEERon

Bin number, j #	***Outdoor air temperature, T_j*** °C	***Outdoor air temperature, h_j*** h
1	*21*	*307*
2	*22*	*311*
3	*23*	*317*
4	*24*	*325*
5	*25*	*334*
6	*26*	*342*
7	*27*	*349*
8	*28*	*354*
9	*29*	*356*
10	*30*	*355*
11	*31*	*351*
12	*32*	*344*
13	*33*	*332*
14	*34*	*317*
15	*35*	*299*
16	*36*	*277*
17	*37*	*252*
18	*38*	*225*
19	*39*	*195*
20	*40*	*165*
21	*41*	*133*
22	*42*	*103*
23	*43*	*73*
24	*44*	*47*
25	*45*	*24*
26	*46*	*6*
	Total	***6493***

A.7. 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:

Table11: Table of acceptance criteria, intermediate and high deviations

Item Measured	Deviation calculation	Acceptance criteria	Mean value	High deviation
Capacity in cooling (Pc) or heating (Ph) at standard rating conditions	(Measured - Declared)/Declared	< -5%	< -8%	< -12%
Capacity at T1, T3, T4 for Desert Certification				
Capacity at Tbiv	(Measured - Declared)/Declared	< -8%	< -15%	<-25%
EER or COP at standard rating conditions	(Measured - Declared)/Declared	< -8 %	< -12 %	N/A
EER at T1, T3, T4 for Desert Certification				
SEER or SCOP if all points are tested	(Measured - Declared)/Declared	< -8%	N/A	N/A
SEER or SCOP recalculated	(Measured - Declared)/Declared	< -0,5%	N/A	N/A
A-weighted sound power level	Measured - Declared	≥ +2 dB(A)	≥+5 dB(A)	≥ +7 dB(A)
Poff , Psb, Pto, Pck	If the declared value is =< 10W Measured - Declared	1W	1W	N/A
	If the declared value is > 10W (Measured - Declared)/Declared	> +10%	> +10%	N/A
Lrcontmin	(Measured - Declared)/Declared	> +5%	> +5%	N/A
CCPLrcontmin	(Measured - Declared)/Declared	< -5%	< -5%	N/A
Water pressure drop	Measured - Declared	+/- 3 kPa (ΔP ≤20kPa)	N/A	N/A
		+/- 15% (ΔP >20kPa)		
AVERAGE CLIMATE				
EER on part load point		< -(4+6/%Part Load)	N/A	N/A
Part Load B	(Measured - Declared)/Declared	<-12%		
Part Load C	(Measured - Declared)/Declared	<-17%		
Part Load D	(Measured - Declared)/Declared	<-33%		
COP on part load point		< -(4+6/%Part Load)		
Part Load A	(Measured - Declared)/Declared	<-11%		
Part Load B	(Measured - Declared)/Declared	<-15%		
Part Load C	(Measured - Declared)/Declared	<-21%		
Part Load D	(Measured - Declared)/Declared	<-43%		
Part Load E	(Measured - Declared)/Declared	<-10%		
Part Load F	(Measured - Declared)/Declared	<-10%		
DESERT CERTIFICATION				
EER on part load point		< -(4+6/%Part Load)	N/A	N/A
Part Load B	(Measured - Declared)/Declared	<-12%		
Part Load C	(Measured - Declared)/Declared	<-16%		
Part Load D	(Measured - Declared)/Declared	<-30%		

APPENDIX B. Forms

B.1. Form: Declaration file RT

All characteristics and performances shall be expressed in SI units. Maximum of 3 significant digits shall be used for capacity, EER, COP, SEER, SCOP, power consumption and water pressure drop and 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. Submittal of data shall be made by filling in the forms provided by ECC as .xls or .xlsx files

B.2. Form : Declaration file RT

The form Declaration file RT to be filled in shall be sent by ECC to:

- Applicants who have signed the license agreement
- Participant/applicants, on an annual basis before the deadline specified in the Certification schedule

A template is available for information and upon request.

B.3. Form : Declaration factories RT

The form Declaration factories RT to be filled in shall be sent by ECC to:

- Applicants who have signed the license agreement
- Participant/applicants, on an annual basis before the deadline specified in the Certification schedule

A template is available for information and upon request.

B.4. Form : Technical Data Sheet (TDS)

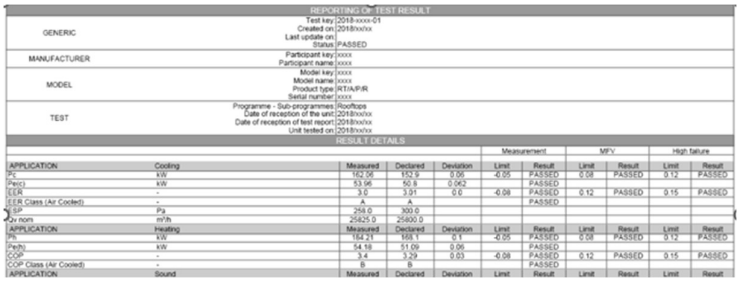
The form Technical Data Sheet (TDS) to be filled in shall be sent by ECC to applicants/participant after the tests selections are completedIt is mandatory to provide the Technical Data Sheet form before the deadline in the calendar (see Appendix C)

A template is available for information and upon request.

B.5. Form : Starting Procedure (SP)

The form Starting procedure is sent directly by the participant/applicant to ECC before the laboratory can test the unit. It is mandatory to provide the starting procedure form before the deadline in the calendar (see Appendix C)

B.6. Form : Reporting of test results file



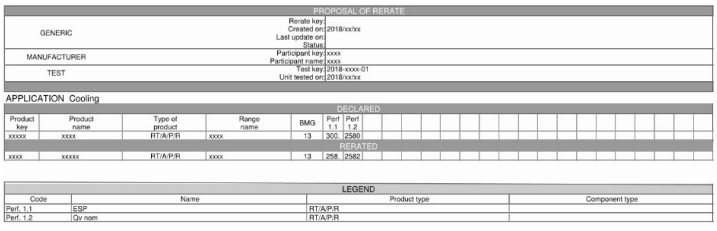
REPORTING OF TEST RESULT

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		MFY		High failure	
APPLICATION	Cooling	Measured	Declared	Deviation	Limit	Result	Limit	Result	Limit	Result
Pc	kW	162.06	162.9	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	254.0	300.0							
Qv nom	m³/h	25425.9	25600.0							
APPLICATION	Heating	Measured	Declared	Deviation	Limit	Result	Limit	Result	Limit	Result
Ph	kW	184.21	185.1	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	Sound	Measured	Declared	Deviation	Limit	Result	Limit	Result	Limit	Result

B.7. Form :Proposal of rerate file



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	

B.8. Form: Information sheet for SASO 2874:2016

The information sheet for SASO 2874:2016 to be filled in shall be sent by ECC to:

- Applicants who have signed the license agreement
- Participant/applicants, on an annual basis before the deadline specified in the Certification schedule

Once the information sheet is filled it will be published on ECC website. If the performances of the sheet are rerated, the sheet will be updated by ECC and republished on the website.

A template is available for information and upon request.

APPENDIX C. Campaign schedule

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

ECC asks for up-date of product list	01/12/n-1
Participant/appliquant confirms up-date of products list	01/01/n
ECC sends preselection unit to test	31/01/n
Participant/appliquant confirms preselection unit to test	15/02/n
ECC sends official selection of unit to test	28/02/n
Test at laboratory : Delivery + Payment + TDS + starting procedures are completed	30/06/n
PartLab: Payment + Date of test are defined before	15/05/n
PartLab: TDS	01/09/n
Diploma for test campaign n are valid until	15/09/n+1
The Laboratory carries out all 1st tests (including tests in PartLab)	30/11/n
The Participant can ask for a second test up to	one month after reception of the test results
Delivery + TDS + Starting procedure + order /payment from Participant are completed for second test	one month after request of 2nd test
Laboratory carries out all second tests	15/03/n+1

APPENDIX D. Testing in participant's laboratory

D.1. Detailed procedure

Participants can take the Participant Laboratory option for the unit testing. It is not the intent of this programme to preclude certification if a Participant does not have a qualified test facility. Test facilities of Participants approved by ECC will therefore be available to a Participant not having a test facility.

Tests in Participant Laboratories shall be performed under supervision and control of an independent laboratory (test agency) approved and under contract with ECC. 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 14511:2022* (see Table).

Independent laboratories, who have dedicated personnel for this purpose, are as follows.

- CETIAT, Lyon (France)
- DMT, Essen (Germany)

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 (Approval of Compliance)

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 maximum permissible deviations of measured values from set values *as defined in relevant standards given in this document.*

The independent laboratory selected by ECC shall approve the capability of Participant Laboratory based on the characteristics of the test installation. Upon this approval, Participant Laboratory is qualified with the 'Approval of Compliance' document by ECC and valid for a certain period defined. For each Participant, this approval is annual .

If the Participant wants to increase the limit in the document, a test shall be performed with a unit which can reach the desired limit.

The limit of Participant Laboratory: The limit is determined for each Participant by rounding up their maximum capacity tested at standard rating conditions separately for air- and water-to-water units to the nearest upper hundreds, e.g., if tested as 312 kW, then the laboratory limit is rounded up to 400 kW.

End of validity of the Approval of Compliance: The same validity date with the certificate of the products.

Annual renewal of 'Approval of Compliance'

There shall be at least one test conducted in Participant Laboratory within last two campaigns to extend the validity date of the Approval of Compliance document for one year. The highest capacity is determined by all the capacities tested ever at the concerned Participant Laboratory.

Approval of Compliance document, as it is not a certification, cannot be mentioned as a certification *or accreditation*, however, the document can be presented in front of the participant laboratory or on a website etc. The ECP mark shall not be applied and used for an approved laboratory.

The test installation shall be designed in such a way that requirement from test agencies concerning installation of measuring probes and instruments could be satisfied. That concerns in particular the installation of a water flow meter for which the diameter and length of the connecting pipe are specified. In order to obtain a homogeneous water temperature, a mixing device shall be used on the leaving water.

The Participant shall provide to the independent test agency the calibration certificates of all sensors included in the airflow measurement system (temperature, humidity, and differential pressure).

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 14511:2022*
- 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).

In case the test agency determines that the Participant Laboratory does not fulfil the required specifications, the test shall not be carried out. *ECC shall then re-organize the test.*

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) 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

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 Seasonnal Efficiency Classes for Rooftops

ECC Seasonal Efficiency Class	Cooling mode	Heating mode
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.

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

APPENDIX G. DESERT CERTIFICATION - MEPS

Units to be certified according to the SASO 2874:2016 shall be compliant with the MEPS (minimum energy performance standard) in the standard:

5.2 MEPS for Electrically operated Unitary air conditioners[1,2]

Table 4 – MEPS for electrically operating air conditioners (Unitary Air Conditioning Equipment)

Air Conditioner Appliance Type	Rated cooling capacity (Btu/h) [kW]	Testing method	EER (Btu/W.h)
Air conditioners, air cooled	≤ 65,000 [19.05 kW] (excluding window, split ducted, and split non-ducted)	ANSI/AHRI 210/240 or ISO 5151 or ISO 13253	11.2
	> 65,000 [19.05 kW] and ≤ 135,000 [39.56 kW]	ANSI/AHRI 340/360 Or ISO 5151 Or ISO 13253	11.2
	> 135,000 [39.56 kW] and ≤ 240,000 [70.32 kW]		11.0
	> 240,000 [70.32 kW] and ≤ 760,000 [222.68 kW]		10.0
	> 760,000 [222.68 kW]		9.7
Air conditioners, water cooled	≤ 65,000 [19.05 kW]	ANSI/AHRI 210/240 Or ISO 13256-1	12.1
	> 65,000 [19.05 kW] and ≤ 135,000 [39.56 kW]	ANSI/AHRI 340/360 Or ISO 13256-1	12.1
	> 135,000 [39.56 kW] and ≤ 240,000 [70.32 kW]		12.5
	> 240,000 [70.32 kW] and ≤ 760,000 [222.68 kW]		12.4
	> 760,000 [222.68 kW]		12.2
Air conditioners, evaporatively cooled	≤ 65,000 [19.05 kW]	ANSI/AHRI 210/240	12.1
	> 65,000 [19.05 kW] and ≤ 135,000 [39.56 kW]	ANSI/AHRI 340/360	12.1
	> 135,000 [39.56 kW] and ≤ 240,000 [70.32 kW]	ANSI/AHRI 340/360	12.0
	> 240,000 [70.32 kW] and ≤ 760,000 [222.68 kW]	ANSI/AHRI 340/360	11.9
	> 760,000 [222.68 kW]	ANSI/AHRI 340/360	11.7

[1] Values apply when the unit has no heating section or when the heating section is of electrical resistance type. For all other types, deduct 0.2 from the EER values

[2] For systems with heat recovery, deduct 0.2 from the EER values

APPENDIX H. 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 1 : Illustration of the ROOFTOP Energy Efficiency Labels: Cooling and heating modes

APPENDIX I. Calculation Method and Implementation of Mean Value of Failure (MVF)

I.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.

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

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 (including desert certification option)
- EER and COP at standard rating conditions. (including desert certification option)
- 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.

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%.

I.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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