

TECHNICAL CERTIFICATION RULES OF THE EUROVENT CERTIFIED PERFORMANCE MARK



LIQUID CHILLING PACKAGES AND HYDRONIC HEAT PUMPS

Identification: ECP - 3 LCPHP

Revision 4 – 12/2023

(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 Liquid Chilling Packages and Hydronic Heat Pumps (LCPHP), in accordance with the Certification Manual.

Modifications as against the last version:

No.	Modifications	Section	Page
1	Split of optional scope: product type options, application related options	I.1.2.1 and I.1.2.2	7
2	Declaration of the reversible and heating-only heat pumps up to 20 kW has become optional	I.1.2.1.a	7
3	Units for IT cooling	I.1.2.4	8
4	Alignment of the polyvalent unit definition with Recommendation: Eurovent Association 18/1 - 2023	I.3 - A.I.2.2.c	13 - 35
5	Renewal of the ECC address	I.4.1	13
6	Simplification of the text about declaration procedures (no content change)	III.1.1	16
7	Removal of the obligation for the Participant to keep a record of the machine configuration parameters	III.1.3	17
8	Addition of the exceptional cases where ECC can apply remote audit during initial admission audit	III.1.3.1	17
9	Addition of the conditions for selecting only one mode (cooling or heating) for the second test	III.1.3.3.c3	28
10	Participant can choose to skip Step-3 for acoustic test at free field	A.I.3.3.a	37
11	Addition of detailed information about the forms	APPENDIX B	47
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I. GENERAL INFORMATION

I.1. Scope

I.1.1. General

The scope of the programme covers standard chillers and hydronic heat pumps (technically named as 2-pipe units) used for heating, air conditioning and refrigeration. They may operate with any type of compressors (hermetic, semi-hermetic and open), but only electrically driven units are within the scope. Only the refrigerants authorised in the EU, including the toxic and flammable ones, are considered. Units may be air-cooled (air-to-water) or water-cooled (water-to-water). Reversible chillers shall be certified in cooling and heating mode. Heating-only hydronic heat pumps and polyvalent units (4 pipe systems) can be certified as an option.

The following units are specifically excluded from the scope of the LCP-HP programme:

- chillers and heat pumps powered by other than electrically driven drives
- units with free cooling mode
- partial & total heat recovery modes for chillers/heat pumps (please see the Note-1 below)
- 6-pipe units
- evaporative cooled units
- the units specifically designed for domestic hot water (DHW) or sanitary hot water (SHW)
- the units specifically designed for process/district heating applications with water outlet temperatures above the standard rating conditions in EN 14511-2

Note-1: The 2-pipe units with heat recovery mode (partial or total heat recovery) are included in the scope, but only the performances when the heat recovery mode is OFF, are certified.

I.1.2. Certify-all principle

Whenever a company participates in the LCP-HP programme, all liquid chilling packages and hydronic heat pumps (packaged or split), which are promoted by the Applicant/Participant to the end-users, specifiers, trading companies, and the contractors in the European market (as defined in the Certification Manual in force) by means of paper or electronic catalogue, price list or in a selection tool within the scope of the programme (see Table 1), shall be certified, in accordance with this Technical Certification Rules. This includes all the models in modular ranges. For the LCP-HP programme, the certify-all rule applies as defined in the Certification Manual in force and in Table 2.

Table 1: Capacity limits of the certified units

Unit type	Capacity		Mode
	Non-ducted	Ducted	
Water-cooled units	1500 kW	-	Cooling
Air-cooled units	600 kW	200 kW	Cooling
Air-to-water heating-only heat pumps (full load declared only at 7 °C¹ air temperature)*	600 kW at +7 °C ¹	200 kW at +7 °C ¹	Heating
Air-to-water heating-only heat pumps (full load declared at 2 °C and/or -7 °C together with 7 °C¹ air temperature)*	200 kW at +7 °C ¹ 160 kW at +2 °C ¹ 100 kW at -7 °C ¹	200 kW at +7 °C ¹ 160 kW at +2 °C ¹ 60 kW at -7 °C ¹	Heating
Water-to-water heating-only hydronic heat pumps*	1500 kW	-	Heating

* option

All other unit types and units with capacities higher than the limits given above can be certified as an option through the procedures given in the following sections.

¹ All the test conditions according to EN 14511-2:2022.

Table 2: The scope of the Certify-all Principle of LCP-HP Programme

Legend:	Mandatory (Certify-all)	Optional ¹		Out of scope		
Product Type	Cooling-only and reversible standard chillers and hydronic heat pumps (2-pipe units) up to the capacities given below including the units with heat recovery mode (only the performances, when heat recovery mode is OFF, are certified), <i>except reversible and heating-only heat pumps with capacity up to 20 kW</i>					
	Cooling-only and reversible standard chillers and hydronic heat pumps (2-pipe units) with capacities higher than the limits given below (Participant Laboratory option) ²					
	Reversible and heating-only heat pumps with capacity up to 20 kW					
	Heating-only hydronic heat pumps (2-pipe units)					
	Polyvalent (4 pipe systems) units					
	HT, MT, and LT process chillers					
	Units with free cooling mode					
	All chillers and heat pumps powered by other than electric motor drives					
	6-pipe units					
	Evaporative cooled units					
	The units specifically designed for domestic hot water (DHW) or sanitary hot water (SHW)					
	The units specifically designed for process/district heating applications (see I.1.1.)					
	Intended Market	European market (as defined in the Certification Manual in force)				
Countries other than those defined in the Certification Manual in force, and India and Middle East						
Capacity Limits of the Independent Laboratories	Heat source	Application	Cooling Capacity [kW] of both Cooling-only and Reversible units		Heating Capacity [kW] of Heating-only units	
			Non-ducted	Ducted	Non-ducted	Ducted
	Air-to-water	Comfort	600	200	600 ³	200 ³
		HT process	600	200	-	-
		MT process	200	100	-	-
		LT process	60	35	-	-
	Water-to-water	Comfort	1500	-	1500	-
		HT process	1500	-	-	-
		MT process	200	-	-	-
		LT process	100	-	-	-

¹ If any option is chosen by a Participant, then all units under this option and up to the related capacity limits given above shall be declared.

² If a Participant chooses to certify their units above these capacity limits, through Participant Laboratory option.

³ These capacity limits are valid when the performance of units operating at full load is declared only at +7 °C, for the performances declared at +7, +2 and/or -7 °C please check the Table 1.

I.1.2.1. Product type options

Participants can choose to certify any of the following product types as an option. When any of them are chosen, all units of the chosen product type will be declared according to the Certify-all principle regarding the capacity limits.

If high-capacity units option chosen, Participant Laboratory limit shall be considered for the product type options chosen when applicable.

a. Reversible and heating-only heat pumps up to 20 kW

Reversible and heating-only heat pumps with capacity up to 20 kW can be certified as an option.

b. Option for high-capacity units

One or both of the following two heat source types can be certified as an option, if a Participant has their own laboratory, called Participant Laboratory (see APPENDIX F).

- Air-to-water units above 600 kW
- Water-to-water units above 1500 kW

Defined capacity limit for each heat source shall cover all the product types for certification. If not applicable, the capacity limit shall be defined separately for different product types (e.g., medium and/or low temperature process chillers, applications requiring tests below 0 °C such as SCOP, 60-Hertz units, etc.).

c. Option for heating-only hydronic heat pumps

Heating-only hydronic heat pumps can be certified as an option.

d. Option for *stand-alone* process chillers

Stand-alone process chillers can be certified as an option. Any of the process chiller types (high, medium, and low temperature process chiller) can be chosen separately and certified.

When certified, they shall be clearly identified as process chillers in the documentation, selection tool and printouts.

Table 3: Capacity limits of Independent Laboratories for medium and low temperature process chillers

Unit type		Capacity	
		Non-ducted	Ducted
Medium Temp. Process Chillers	Air-cooled units	200 kW	100 kW
	Water-cooled units	200 kW	-
Low Temp. Process Chillers	Air-cooled units	60 kW	35 kW
	Water-cooled units	100 kW	-

e. Option for polyvalent (4 pipe systems) units

4-pipe and 2+2-pipe polyvalent units can be certified as an option. See Appendix A.I.2 for the details.

I.1.2.2. Application options

Participants can choose to certify any of the application options (those other than the mandatory applications for certification, such as SEPR of chillers primarily used for comfort applications, SCOP W35 when SCOP W55 declared, acoustics for water-to-water units, etc.) given in the following sections.

When any of these options is chosen, the Participant shall declare the relevant performances of the entire range(s).

I.1.2.3. Market options (India and/or Middle East)

Participants can choose to certify any of their already-certified range(s), or any range(s) produced exclusively for India and/or Middle East markets separately.

I.1.2.4. Units for IT cooling

Participants can choose to publish their certified process chiller units/ranges if they are able to operate and selectable in the selection tool at the standard conditions of IT cooling program for CRAH units (Computer Room Air Handler) which operates with chilled water.

I.2. Certified performances

All nominal performances within the operating map of the certified units are certified on the selection tool in accordance with the rules set out in this document, even if they are not declared (except the mandatory applications).

When any seasonal performance declared, corresponding nominal performance shall always be declared.

I.2.1. Eurovent applications

The following applications are covered by the programme:

Table 4: The certified applications

Mode	Application	Leaving water (brine) temperature of the indoor heat exchanger (T_{outlet})
Cooling	Comfort	Cooling floor
		$T_{\text{outlet}} = 18\text{ °C}$
		Air conditioning
	Process	$2\text{ °C} \leq T_{\text{outlet}} \leq 15\text{ °C}$
		HT process
		$2\text{ °C} \leq T_{\text{outlet}} \leq 12\text{ °C}$
Heating	Process	MT process
		$-25\text{ °C} < T_{\text{outlet}} \leq -8\text{ °C}$
		LT process
		$T_{\text{outlet}} \leq -25\text{ °C}$
	Low temperature	$T_{\text{outlet}} = 35\text{ °C}$
		Intermediate temperature
		$T_{\text{outlet}} = 45\text{ °C}$
		Medium temperature
	High temperature	$T_{\text{outlet}} = 55\text{ °C}$
		$T_{\text{outlet}} = 65\text{ °C}$

A unit can be declared as:

- comfort chiller and high temperature process chiller, or
- high temperature and medium temperature process chiller, etc.

at the same time. Participants are responsible to make the required CE declarations of the unit separately for each intended application if the unit is marketed in EU. For all the other intended markets, units can be declared for multiple uses depending on the regulations of these markets, if any.

I.2.2. Applications for seasonal efficiency in heating mode

Regarding the following regulations concerning the seasonal efficiency for heating applications:

- Commission Regulation (EU) No 813/2013
- Commission Delegated Regulation (EU) No 811/2013

all units capable of operating in heating mode shall be declared according to the Table 5.

The declaration of the Average Climate (according to EN 14825:2022) is mandatory. The declaration of the performances for Warmer and Colder Climates can be certified as an option.

Table 5: Applications in heating mode

P _{designh}	Low Temperature		Intermediate T.		Medium Temperature		High Temperature		
	Heating W35		Heating W45		Heating W55		Heating W65		
	Nominal Efficiency	Seasonal Efficiency	Nominal Efficiency	Seasonal Efficiency	Nominal Efficiency	Seasonal Efficiency	Nominal Efficiency	Seasonal Efficiency	
≤ 70 kW	Optional if Medium T. already declared		Optional**	Optional	Mandatory if declared according to ErP		Optional**	Optional	
	Mandatory if declared according to ErP								
> 70 kW and ≤ 400 kW	Air-to-water	Optional**	Optional*	Mandatory	Optional*	Optional**	Optional*	Optional**	Optional*
	Water-to-water	Optional if Medium T. already declared			Optional	Mandatory if declared according to ErP		Optional**	Optional
		Mandatory if declared according to ErP							
> 400 kW	Optional**	Optional*	Mandatory	Optional*	Optional**	Optional*	Optional**	Optional*	

* To be tested in Participant Laboratory (air-cooled units with $P_{\text{designh}} > 70\text{ kW}$, water-cooled units with a capacity $> 1500\text{ kW}$)

** Mandatory if the corresponding seasonal efficiency declared.

The water regulation types are given below. At least one of these water regulations shall be declared. All declared performances of the unit shall correspond to its declared water regulation type.

	<u>Codification</u>
- Fixed water flow rate, fixed outlet temperature	FW/FO
- Fixed water flow rate, variable outlet temperature	FW/VO
- Variable water flow rate, fixed outlet temperature	VW/FO
- Variable water flow rate, variable outlet temperature	VW/VO

If more than one water regulation declared, each shall be declared in a new line, but within the same Basic Model Group (BMG). If a reversible unit selected for testing has different water regulation type for its cooling and heating modes, each can be indicated in the TDS files.

In the synthesis Table 5, Nominal Efficiency refers to the full load performance of a unit and Seasonal Efficiency refers to the seasonal performance of a unit at given heating applications.

1.2.3. Applications for seasonal efficiency in cooling mode

Regarding the Commission Regulation (EU) No 2016/2281 concerning the seasonal efficiency for cooling applications:

- Comfort applications (Air conditioning, Cooling floor)
- High temperature process chiller (*can be declared for an already-certified comfort chiller range, or as a primary performance of a stand-alone high temperature process chiller*)

all units shall be declared according to the Table 6.

The seasonal efficiencies of the comfort chillers are SEER and $\eta_{s,c}$ (seasonal space cooling energy efficiency) which shall be declared according to the Table 6. The units operating only at Cooling floor application and up to the capacity limits given in Section I.1.2 shall be declared with their nominal and seasonal performances.

The water regulation types are given below. At least one of these water regulations shall be declared. All performances of the unit shall correspond to its declared water regulation type.

	<u>Codification</u>
- Fixed water flow rate, fixed outlet temperature	FW/FO
- Fixed water flow rate, variable outlet temperature	FW/VO
- Variable water flow rate, fixed outlet temperature	VW/FO
- Variable water flow rate, variable outlet temperature	VW/VO

For all process chillers applications, the seasonal efficiency is SEPR, and it is determined with fixed outlet water (brine) temperature. The water regulation of SEPR can only be FW/FO or VW/FO.

If more than one water regulation is declared, each shall be declared in a new line, but within the same Basic Model Group (BMG). If a reversible unit selected for testing has different water regulation type for its cooling and heating modes, each can be indicated in TDS files.

1.2.3.1. Applications for process chillers (option)

In addition to the High temperature process chillers given in the previous section, regarding the Commission Regulation (EU) No 2015/1095 concerning the seasonal efficiency for cooling Process Chiller applications:

- Medium temperature process chiller
- Low temperature process chiller

all units shall be declared according to the Table 6.

The seasonal efficiency for these process chiller applications is SEPR and it shall be declared with the corresponding nominal efficiency when one of these optional applications is chosen.

In the synthesis Table 6 for the Section I.2.1 and I.2.3, Nominal Efficiency refers to the full load performance of the unit and Seasonal Efficiency refers to the seasonal performance of the unit at given heating applications.

Table 6: Applications in cooling mode

	Nominal Efficiency				Seasonal Efficiency		
	EER				SEER		SEPR
	Cooling floor	Air conditioning (HT process)	MT process	LT process	Cooling floor	Air conditioning	
	Cooling W18	Cooling W7	Cooling W8	Cooling W-25	Cooling W18	Cooling W7	
Comfort Chillers in the scope of the regulation*	Optional**	Mandatory			At least one intended application is mandatory		Optional
Comfort Chillers out of scope of the regulation*					Optional	Mandatory	
Process Chillers (Optional)		Mandatory if SEPR HT declared	Mandatory if SEPR MT declared	Mandatory if SEPR LT declared			At least one SEPR shall be chosen

* Commission Regulation (EU) 2016-2281

** Mandatory when SEER of Cooling Floor application is declared.

I.2.4. Acoustic performances

For all air-cooled cooling-only units, including polyvalent units, sound power level is verified at Air Conditioning application in cooling mode, or at Cooling floor application for units operating only at this application.

For air-to-water reversible chillers and heat pumps with a $P_{designh}$ below 70 kW, Participants shall declare the acoustic performance(s) of the declared seasonal application(s) in heating mode as given below.

- Sound power level at +35 °C (see details in APPENDIX A)
- Sound power level at +55 °C (see details in APPENDIX A)

Reversible chillers can be also tested in cooling mode. If a reversible unit is tested only for SCOP, the acoustic test will be done only in heating mode, at the selected heating application.

The requirements above are also applicable for the air-to-water reversible chillers or heat pumps with a $P_{designh}$ above 70 kW, when any of their seasonal efficiencies in heating mode is declared by the Participant.

For the **water-to-water** units, when their thermal performances including the seasonal efficiencies in **heating mode** are declared, the Participant can declare, as an option, their sound power level at Low and/or Medium Temperature applications. The sound power level of water-to-water units in **cooling mode** can be declared as an option.

I.2.5. Applications for polyvalent units (option)

All mandatory and optional applications are described in Table 7 and Table 7bis depending on the product type.

The Total Efficiency Ratio (TER), with the given formula below and *with the water flow rates during cooling-only and heating-only operation for the intended application, like TER45 (*7°C-*/45°C)*, is applied at following conditions. (See A.I.4.7).

$$TER = \frac{\text{Cooling capacity} + \text{Heating capacity}}{\text{Total power input}}$$

Table 7: Applications for 4-pipe units

	Simultaneous production of heating (Loop 1 and 2)	Loop 1	Loop 1	Loop 2	Cooling with Heat Recovery
		Cooling 12/7 °C	Heating 30/35 °C	Heating 40/45 °C	*1/7 °C and *1/45 °C
		P _c EER	Ph COP	Ph COP	TER45
4-pipe – A	NO	Mandatory	N/A	Mandatory	Mandatory
2+2 pipe – B1	NO	Mandatory	Mandatory	Mandatory	Mandatory
2+2 pipe – B2	YES	Mandatory	Mandatory	Mandatory	Mandatory

Table 7bis: Optional applications for 4-pipe units

	Simultaneous production of heating (Loop 1 and 2)	Loop 2	Cooling with Heat Rec.	Loop 2	Cooling with Heat Rec.	Loop 2	Cooling with Heat Rec.
		Heating 30/35 °C	*1/7 °C and *1/35 °C	Heating 47/55 °C	*1/7 °C and *1/55 °C	Heating 55/65 °C	*1/7 °C and *1/65 °C
		P _h COP	TER35	P _h COP	TER55	P _h COP	TER65
4-pipe – A	NO	Optional	Optional	Optional	Optional	Optional	Optional
2+2 pipe – B1	NO	Optional	Optional	Optional	Optional	Optional	Optional
2+2 pipe – B2	YES	Optional	Optional	Optional	Optional	Optional	Optional

1.2.6. Middle East option

Units shall be declared according to the following conditions. *Fouling factor corrections shall be applied during the tests as per SASO 2874:2016.*

Table 8: Conditions for the Middle East option

		Declared performances ² (Outdoor - Indoor Cond.)
Air-to-water	50 or 60 Hz	T1: 35 °C - 12/7 °C
		T3: 46 °C - 12/7 °C
		Operability at 52 °C
Water-to-water	50 or 60 Hz	30/35 °C - 12/7 °C

1.2.7. India option

Units shall be declared according to the following conditions. *Fouling factor corrections shall be applied during the tests as per IS 16590:2017.*

Table 9: Conditions for the India option

Part load	Air-to-water (Outdoor - Indoor Cond.)	Water-to-water (Outdoor - Indoor Cond.)
100%	39 °C - 12/7 °C	30/35 °C - 12/7 °C
75%	32 °C - a/7 °C	26/b °C - a/7 °C
50%	26 °C - a/7 °C	23/b °C - a/7 °C
25%	20 °C - a/7 °C	20/b °C - a/7 °C

a : with the indoor side water flow rate equal to a 5 K ΔT at 100% rating point

b : with the outdoor side water flow rate equal to a 5 K ΔT at 100% rating point

! for air-to-water units, air flow equal to the full load rating

ISEER (Indian Seasonal Efficiency in Cooling mode) shall be calculated according to IS 16590 Standard.

² According to SASO 2874

I.3. Definitions

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

- **Eurovent Certita Certification Certified Published Ratings:** A statement of the assigned values of those performance characteristics (rating and part load in cooling and heating mode) under stated rating conditions, by which a unit may be chosen to fit its application. These values apply to all units of nominal size and type produced by the same Participant. The term "published rating" includes those shown on the unit, published in specifications, advertising computer selection programmes and other literature controlled by the Company. If the Participant publishes non-certified ratings, they shall be clearly indicated.
- **Liquid Chilling Package:** A factory-made packaged or split unit designed to cool liquid, using an evaporator, a refrigerant compressor, an integral condenser (packaged unit) or remote condenser (split unit) and appropriate controls. It may have means for heating which can be reversing the refrigerating cycle, such as a heat pump.
- **Hydronic Heat Pump:** A factory assembled unit of the packaged or split type designed to heat liquid using a compressor, an evaporator and an integral condenser and appropriate controls.
- **Polyvalent Unit:** *Polyvalent unit is defined as a unit with 4 pipes and capable of providing heating, cooling or simultaneous cooling and heating on two separate and independent water or brine loops using the vapour compression cycle. Details for 4-pipe and 2+2-pipe units are given in A.I.2.2.c.*
- **Basic Model Group (BMG):** When applicable, declared model of the same brand and the same commercial range by the Participant will be grouped in Basic Model Groups (BMG). The basic models shall be defined by units which are essentially the same in terms of thermal performance (capacities with not more than 10% difference) and function and application. The same or comparable in terms of basic components, specifically fans, coils, compressors, and motors. Single-phase and three-phase versions of one model belong to the same BMG.
- **ISBMG Indian Basic Model Group:** ISBMG is defined as a family of chillers using the same compressor model family or combination of same compressors from the same compressor model family.
- Definitions given in,
 - EN 14511-1:2022 and EN 14511-3:2022
 - EN 14825:2022
 - Commission Regulation (EU) 2016/2281
 - Commission Regulation (EU) No 813/2013
 - Commission Delegated Regulation (EU) No 811/2013
 - IS 16590:2017 *for India Certification*
 - SASO 2874:2016 *for Middle East Certification*

I.4. Contributors

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

I.4.1. Audit body

The audit functions are performed by the following body(ies), called audit body.

<u>EUROVENT CERTITA CERTIFICATION SAS</u>	✉ 34 rue Laffitte 75009 PARIS	☎ +33 1 75 44 71 71
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I.4.2. Independent laboratory/test body

When the checks carried out involve product tests, these are performed at the request of ECC by the following laboratories, accredited in accordance with ISO 17025 standard and known as independent laboratory.

<u>CEIS</u> Centro de Ensayos Innovación y Servicios	✉ Cr. de Villaviciosa de Odón a Móstoles, Km. 1,5 28935 Móstoles (Madrid) SPAIN	☎ +34 916 169 710
<u>CETIAT</u> Centre Technique des Industries Aérauliques et Thermiques	✉ Domaine Scientifique de la Doua, 25 avenue des Arts - BP 52042 69603 Villeurbanne Cedex FRANCE	☎ +33 4 72 44 49 00
<u>DMT</u> Deutsche Montan Technologie GmbH	✉ Am TÜV 1 45307 Essen GERMANY	☎ +49 2011 721471
<u>IMQ S.p.A.</u> Istituto Italiano del Marchio di Qualità	✉ HVACR Testing Laboratory, Via Jacopo Linussio 1 33020 Amaro (Udine) ITALY	☎ +39 0433 468607
<u>WPZ</u> Wärmepumpen-Testzentrum	✉ University of applied science NTB Werdenbergstrasse 4 9471 Buchs SG SWITZERLAND	☎ +41 81 755 34 02

II. REQUIREMENTS OF THE REFERENCE DOCUMENT

II.1. Reference documents

II.1.1. Product and test standards

The test procedure and the applicable standards are given and detailed in the APPENDIX A.

II.1.2. Quality Management Systems standards

This option does not apply for this program.

II.1.3. Specific technical requirements

This option does not apply for this program.

II.2. Specific requirements and quality management

Production identification and traceability

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

Use of ECP mark

The participant shall respect the marking requirements of the Certification Manual in force and of the Technical Certification Rules, if the ECP mark is used on their products and/or services and all the relative documentations.

Management of customer claims

Customer claims and their treatment related to certified products shall be done, recorded, and maintained available.

Availability of the certification related documents

Participants shall maintain the latest Certification Manual and the Technical Certification Rules document in their quality documentation database. Having them in the responsible person's computer will also be accepted, instead of having them in the quality documentation database.

II.3. Marking

It is highly recommended that Participants indicate participation in the Eurovent Certified Performance (ECP) programme of LCP-HP with the provisions of the Certification Manual *in force*.

II.3.1. Display of Eurovent Certified Performance (ECP) Mark on production units

The provisions of the Certification Manual apply.

II.3.2. Display of Eurovent Certified Performance (ECP) Mark on technical documentation

The provisions of the Certification Manual apply.

III. CERTIFICATION PROCESS

III.1. Admission procedure

III.1.1. 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 all the information required for the qualification to ECC: selection tool name and version, the tool itself, the declaration file, production site and/or sales office declaration form, and relevant literature.

Rated performance data

Seasonal efficiency values, SCOP, SEER and SEPR shall be expressed with two decimal places. The seasonal space heating energy efficiency ($\eta_{s,h}$) and seasonal space cooling energy efficiency ($\eta_{s,c}$) shall be expressed in % with one decimal place. All sound power levels shall be declared with one decimal place. Main power supply can be either 400-3-50, 400-3-60, 230-1-50 or 230-1-60, expressed respectively in V-Phase-Hz.

Certification forms

Submittal of data shall be made by filling the Declaration File (LCP-1). The forms shall be provided submitted within the deadline specified in Certification Schedule if applicable (see APPENDIX C). *Down-rate of the performances is always allowed whereas up-rate is allowed only under conditions defined in the Certification Manual in force.*

The declaration forms are (see APPENDIX B):

- *Form LCP-1: Declaration File*
- *Form LCP-2: Technical Data Sheet*
- *Form LCP-6: Production Site/Sales Office Declaration Form*

Reporting of models

The certification programme requires that every unit submitted for acceptance shall be accompanied by *complete characteristics and performance data for the mandatory and chosen applications in Form LCP-1, as defined in supplementary declaration guideline prepared and shared by ECC, which shall meet the requirements of the APPENDIX A.*

Participants must declare at least one configuration of their units if component and accessory options are available. However, as selection tool certification is mandatory, including the permitted unit options defined in E.IV.1, they may also declare other configurations of the same units (with different component and accessory options) by adding suffixes to the same model names specifying the configuration. If any option requires a new BMG number for a unit, such as compressor options, they shall be declared.

The Participants shall provide ECC the status of the models (*New, Obsolete, Deleted or DVP*) as defined in the Certification Manual in force.

Acquisition of Participant's product line by another Participant

The provisions of the Certification Manual apply.

III.1.2. Admissibility of the application

In addition to the provisions laid down in the Certification Manual, the following requirements apply. ECC proceeds to unit selection for testing based on the LCP-1, Declaration File and requests the declaration of the detailed performances and characteristics in the LCP-2 Technical Data Sheet (TDS) (See APPENDIX B) together with the delivery of the selected units to the laboratory. The Independent Laboratory assigned by ECC performs the performance testing on the selected units.

The certification is granted on condition that:

- The **unit test(s)** proves all the ranges comply with the requirements specified in the APPENDIX A,
- All the other requirements of this document (readiness of the **selection tool for certification**, etc.) are fulfilled,
- For those who applied to the programme in 2023 campaign or later, the **initial admission audit** has been performed by the auditor and is successful or the Corrective Actions Plan is considered satisfactory.
- All **fees** have been settled.

If not, the procedure for failure treatment shall be applied.

III.1.3. Implementation of checking operations

The provisions of the Certification Manual apply.

III.1.3.1. Initial admission audit

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

There is a **two-year transition period** (by 2025) to complete the initial admission audits where all the non-conformities noticed during the audit shall be considered as non-critical and the Participant will not be penalised due to these non-conformities, except the already recognised penalty situations (i.e., misuse of ECP mark). After this period, on-site audits will be applied annually with the critical non-conformities that might cause penalties.

For the Applicants who apply to the programme in the 2023 campaign or later, the audit shall be carried out as the required part of qualifying procedure in order ECC to grant their certification. For those who applies before, initial audits shall be obligatory to be completed by 2025 but shall not be a required element for ECC to grant their certification.

Remote audits are not possible for initial admission audits as per the Certification Manual in force, *except the following cases. ECC will investigate and decide the applicability.*

- *When a Brand Name participant has no production at all, and their Brand Name units are audited at the OEM's production site, the extra time consumed in OEM's factory to audit Brand Name units will be removed from the default audit duration of the Brand Name participant. The remaining duration can be applied remotely to Brand Name participant for the documentation, website, catalogue and selection tool checks.*
- *Within an audit tour consisting several audits, when a Participant has several production sites in different audit zones, if the site to be audited only receives the production orders and has no authorization or knowledge of managing the website, catalogue(s) and selection tool(s). In this case ECC can apply a remote audit, preferably after the production site audit, to apply the documentation, website, catalogue and selection tool checks.*

a. Purpose

The purpose of the audit is primarily to verify that the certified performances and characteristics of a Participant's unit(s) are consistent with those of the certified unit(s) selected for testing by ECC and/or manufactured and/or sold by the Participant, and to verify that the Participant fulfils the selection tool requirements and other audit checkpoints defined in these Technical Certification Rules.

b. General

All the Participant and Applicants are subject to on-site audits as of the 2023 campaign. The OEM Participants and Applicants shall declare to ECC which production site(s) are involved in the manufacturing of LCP-HP units, and the BN Participants and Applicants shall submit their sales office(s) where audits of certified products and selection tools shall be carried out.

In addition to these declarations, OEM Participants or Applicants shall also provide this information in their declaration lists (Traceability/Plants columns) for each unit. In case of several production sites, the

distinction from one to the other site shall be clearly made with short naming. If required, ECC shall be informed to avoid any misleading information.

ECC will determine the site and date for the audit and the auditor for the LCP-HP programme. For the auditor's safety, prior to on-site audit, the Participant shall provide the safety provisions to the auditor (i.e., Safety Risk Assessment, Safety Needs including Equipment, etc.) If these are not provided or confirmed, then the audit will not take place until they have been provided.

The production site or sales office shall have resources required to conduct the audit in English.

In case the Participant has several production sites or sales offices, only one production site will be audited in the transition period and after.

The duration of the on-site audit is one day (including audit preparation, the audit itself, the report writing and the management of the corrective actions, if relevant). This duration can be adjusted in the case of carrying out a joint audit with other certifications.

If audits are not conducted within the time limitations specified in the notification received from ECC, it is considered as non-application of procedures.

ECC can conduct the audits to the OEM Participant's production site for both the OEM and their BN Participants at the same time. In such cases, it is always up to the OEM Participant to accept the BN's presence during the audit due to confidentiality matters. It shall not be mandatory for the BN Participant to be present during such an audit.

An observer, bounded to the respect of confidentiality (this observer is chosen by ECC by standards and agreements which he has signed), can take part to the audit. The holder is systematically informed by ECC of the presence of this observer prior to the audit.

Each audited Participant shall receive their own audit report regardless they are audited at the same time or not. Each of them is responsible for their own certified unit and the selection tool in which their unit is available, so any non-compliance found during the audit will be reported in the report of the owner of the certified unit and its selection tool.

In case BN Participant's sales office is not OEM Participant's production site (OEM receives only the production order), ECC will organize an audit to BN Participant's sales office(s) to check the selection tool and sales reports for the consistency between what is declared and what is sold.

c. Controls/Verifications during the on-site audit

All certified products and selection tools are subject to the audits. Any certified unit selected for testing and/or the units found on the production line, in stock or in recent sales records can be audited. It is not obligatory, but priority, to conduct the audits to the selected units for the tests of ongoing campaign. Therefore, the priority of the units to be audited in Campaign N shall be as follows, depending on its applicability.

1. Selected units for Campaign N
2. Selected units for Campaign N-1
3. Similar units in the same BMG
4. Similar units in the same commercial range
5. Any certified unit

In two consecutive years, if no certified unit is available in the sales records, production, or stocks to perform the audits, it will be considered as a non-conformity as it might be against the Certify-all rule and the case will be investigated by ECC.

When a selected unit in Campaign N-1 or any unit chosen from the sales reports to be audited, all the relevant printout provided to the customer and also any official document, through which the sold unit can be imaginarily created and which provides the component, performance and characteristics information of the unit (the production reports, assembly follow-up files, BOMs, quality control documents, etc.) shall be submitted to ECC during the audit.

The audits and what to be audited should be handled depending on the following conditions given in Table 10.

Table 10 Controls/Verifications depending on the audit

If only OEM Participant's production site is audited for only their certified products	If OEM Participant's production site is audited for both OEM and their BN participant(s)	If only BN Participant's sales office/head quarter is audited
<ul style="list-style-type: none"> Selected unit(s) for the tests of Campaign N or N-1, and/or Any certified unit(s) (according to the priority list above) in; <ul style="list-style-type: none"> the production line the stock the sales reports of last 6 months <p align="center">+</p> <p align="center">OEM Participant's selection tool</p>	<ul style="list-style-type: none"> OEM Participant's selected unit(s) for the tests of Campaign N or N-1, and/or Any of OEM and BN Participant's certified unit(s) (according to the priority list above) in; <ul style="list-style-type: none"> the production line the stock the sales reports of last 6 months <p align="center">+</p> <p align="center">OEM and BN Participant's selection tool</p>	<p>Any of BN Participant's certified unit(s) in the sales reports of last 6 months*</p> <p align="center">+</p> <p align="center">BN Participant's selection tool</p>

* BN participant shall get prepared for the audit by gathering the underlined documents below from their OEM manufacturer before the audit date.

d. Main checkpoints for on-site audits

During the on-site audits, the auditor shall primarily focus on the Following checkpoints related to the performances and characteristics of the units, units themselves and the selection tools.

Use of ECP mark

- On the certified unit itself, labels, technical documentation, selection tool printouts, etc.

Selection tool

- The consistency between the certified selection tool version and the latest version being used by the Participant
- The consistency between all versions submitted to ECC with 'Selection Tool (Software) Record Sheet' during last 12 months, and all the versions that the Participant has had in the same period
- The consistency between the declared commercial ranges/models to ECC and the ones in the selection tool (mainly for new/deleted/obsoleted declarations)
- If the selection tool(s) fulfil all the requirements of this Technical Certification rules, the Participant shall generate the printouts for the audited units during the on-site audit
- The procedure of the participant to manage the communication of all the version updates within the company, and the proof of a well communication of the new versions to all the distributors, sales offices, and/or the related parties

Declaration and Produced/Sold Certified Product Consistency

For this purpose, ECC will use the declaration files, relevant selection tool printouts and TDS files (in case the units, which have been selected for the tests in Campaign N and/or N-1, will be audited), to gather the certified performance and characteristics for each unit.

The Participant shall provide any formal document asked by ECC (i.e., BOM, assembly follow-up file, production report, quality control document, etc.).

e. Audit report and failure treatment

Based on the check results, ECC shall communicate audit conclusions and report to the participant. The Participant shall provide a Corrective Actions Plan to ECC in case the audit result is not satisfactory due the non-conformities noticed during the audit within the deadline specified by the auditor. Within the transition period, the non-conformities are as follows.

- **Critical non-conformities** may result from non-application of the requirements linked to the certification generic rules defined in the Certification Manual in force (misuse of the ECP mark, presentation of the incorrect data, and non-respect of Certify-all rule, unauthorized communication about application). Such a case may result in ECC sending a formal notice with

loss of penalty points as the rules in the Certification Manual shall apply. For such cases, ECC shall specify a proper deadline for the Participant and expect a full resolution within this time.

- All the other non-conformities will be considered as **Non-Critical non-conformity** which will require a Corrective Actions Plan with a deadline specified by ECC or with an agreement between ECC and the Participant. The resolutions will be checked in the next audit or ECC might ask the Participant to provide a justification of the resolution before the next audit.

III.1.3.2. Selection of the 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 (LCP-1) communicated by the Applicant/Participant.

Within the programme, tests may be conducted under the following procedures:

- Scheduled tests in qualifying procedure
- Scheduled tests in surveillance procedure
- Penalty test in surveillance procedure
- Complaint test

ECC is responsible for the selection of a unit for testing and may select any unit as defined below.

Selection from the existing available stock is preferable, even if only a single unit is available. If no stock is available, a selection will be made from the Participant production schedule within a 6-month period.

For high-capacity units, if a declared standard unit is not available, ECC can ask the list of units ordered or recently sold by the Participant, accompanied with the associate data from their selection tool. ECC will select a model among these units.

For the penalty tests, ECC shall select the additional units from the failed range, if applicable.

a. Number of units for scheduled tests

The Participants are free to group models in commercial ranges in accordance with their own rules. The required number of units for scheduled tests is defined as the highest number of tests in Table 11 corresponding to the number of basic models or the number of commercial ranges.

Table 11: Number of required tests

Number of tests	Number of Basic Model Groups	Number of commercial ranges
1	1 to 15	1 to 5
2	16 to 45	6 to 10
3	46 to 105	11 to 15
4	106 to 225	16 to 20
5	226 to 465	21 to 25
6	466 to 945	26 to 30
7	946 to 1905	31 to 35
8	1906 to 3825	36 to 40
9	3826 to 7665	41 to 45
10	7666 to 15345	46 to 50
11	15346 to 30705	51 to 55
12	30706 to 61425	56 to 60
13	61425 to 122865	61 to 65
n	$u_{n-1} \text{ to } u_n - 1 \text{ where}$ $u_0 = 1; u_1 = 16$ $u_n = 3u_{n-1} - 2u_{n-2}$	$5n-4 \text{ to } 5n$

Example: If a Participant presents 21 ranges with 120 BMGs, then the Participant will be required to submit 5 models for testing although according to the number of BMG, only 4 tests should be needed.

Table 11bis: Seasonal efficiency for heating mode

Number of units to be tested	Minimum number of units with seasonal tests*	Number of air-to-water units to be tested only with seasonal tests**
1	1	0
2	1	0
3	2	1
4	2	1
5	3	1
6	3	1
7	4	1
8	4	1
9	5	1
10	5	1
11 and more	6	2

* if the type of the units allows.

** if the minimum number of units to be tested with seasonal tests are met.

When a Participant chooses to certify models in option (except for water-cooled units above 1500 kW), the total number of BMG and ranges include as a single group, units in the regular scope and the units in options.

- For the option “air-to-water units above 600 kW”, at least one unit over 600 kW shall be selected for testing.
- For the option “water-cooled units above 1500 kW”, one supplementary unit above 1500 kW shall be selected for testing *for qualification campaign*.

Note: The supplementary tests for the water-cooled units above 1500 kW is maintained for the qualification campaign of this option. It will be removed after the qualification campaign and will be managed as the other options.

- For all options, *except water-cooled high-capacity units*, ECC will choose a number of selected units which are representative of the share of the optional units in the global number of units.

If an option cannot be tested during the test campaign, ECC can ask a witness test per option covering the missing options (when possible) among the witness tests to submit (if the witness test option was taken).

When the witness test cannot cover a missing option (or if the Participant does not take the witness test option), one unit per option can be tested every 2 years for the missing options (when possible).

If the Middle East option is chosen by the Participant:

- 2 additional conditions to be tested for air-to-water units at 50 Hz;
- One additional test, if 60 Hz option is taken for air-to-water or water-to-water units.

Table 12 (Middle East option)

Number of tests	Number of units with <u>additional conditions</u> to be tested if Middle East option taken	Number of <u>additional units</u> if Middle East option taken
	Case 1 [T3 + Operability] for air-to-water units	Case 2 [60 Hz] for air- and water-to-water units
1 to 9	1	1
10 to 13	2	

For the India Market option, ECC will determine the number of **ISBMG** among the concerned models.



These ISBMGs are different from Basic Model Groups of LCP-HP Programme (see the I.3 Definitions). For the India option, the number of selected units shall be equal to 30% of the **ISBMG**. Example: 5 IS_BMG → 1.5 unit → 2 selected units.

b. Witness test option

The principle of witness tests:

- The tests shall be done in the Participant's laboratory with a valid Approval of Compliance document with the attendance of the client or designated representative.
- The tests shall be done with an ECC certified unit (with or without options) for a standard conditions or non-standard conditions available in the selection tool (under certification/certified).

The conditions to take the option:

- The Participant shall submit all the witness test reports by 15/01/N+1 for Campaign N. The Participant can submit a Witness Test report for a test performed within one year after the beginning of Campaign N (between 15/01/N and 15/01/N+1).
- If a submitted Witness Test report is not valid, Participant can submit another Witness Test report of a test that has been performed within the same period.
- Different units shall be tested in the witness test option.
- The reference of the unit (certified range and model name) shall be mentioned clearly in the witness test reports. The Participant shall either indicate the model number of the tested unit in the report or provide it to ECC while submitting it.
If the unit is a one which has never been declared to ECC but certified through the selection, then the configuration of this unit (selected component options, water regulation types, etc.) shall be clearly available in the Witness Test report.
- All the type of units allowed for Participant Laboratory testing will be accepted for Witness Test.
- The Participant Laboratory used for the Witness Test shall be clearly indicate in the report.
- The report shall be signed (the name and signature) by the client or designated representative who attended the test.
- The tests shall be done in accordance with the Technical Certification Rules in force and the mentioned standards.
- Each unit's test shall include one full load test (at standard, or non-standard conditions which can be verified through the selection tool), each full load test shall include capacity, efficiency, and pressure difference values.
- Full load, part load or acoustic test is counted as a test point. Capacities, efficiencies, or pressure differences alone are not counted as a test point. For the part load tests, only the tested EER/COP of the part load will be assessed as done in regular tests.
- The performances indicated in the witness tests will be verified through the selection tool, and if there is a failure, the rerate procedure defined in the APPENDIX E will apply.
- If the agreed test reports were not submitted according to the above deadlines, the removed tests will be added to the next campaign.

Depending on the total number of the tests to be performed for the current campaign, between 1 and 4 tests can be removed. In return, the Participant shall provide witness test reports with the corresponding numbers of points (in total) according to the Table 13.

Table 13 (Selection Tool certification and Witness Test option)

Number of tests	Witness Test Option & Selection Tool			Table 11: Number of required tests
	Test removed*	Witness test reports to be submitted	Total number of points to be tested	
1 to 2	0	NA	NA	
3 to 5	-1	3	6	
6 to 8	-2	6	12	
9 to 11	-3	9	18	
12 to 14	-4	12	24	

* max. number of *unit* tests that can be removed from the corresponding total number of *unit* tests required per campaign

c. Number of test points for each selected unit

The number of test points shall be determined in accordance with the number of applications *defined in APPENDIX A certified for the Participant*.

In any cases:

- Maximum two nominal applications (full load) shall be tested for each of the heating and cooling modes, *when applicable*.
- Maximum three SCOP (and $\eta_{s,h}$) and one SEER (and $\eta_{s,c}$) and *one SEPR* shall be tested among different climates and declared application and declared water regulation type (FW/FO, VW/FO, FW/VO, or VW/VO) *as defined in the next sections*.

In addition, all the selected models shall be tested at:

- One application rating condition (selected by ECC) except for the air source heating-only heat pumps for which two points at +7 °C and +2 °C can be required.
- *Test(s) at non-standard conditions as defined in APPENDIX E.*

d. Seasonal efficiencies and part load conditions in cooling mode

The chillers will be characterized by two seasonal efficiencies for cooling mode:

- SEER (and $\eta_{s,c}$) is applicable for comfort chillers, reversible or not.
- SEPR is applicable for low, medium, and high temperature process chillers.

In addition to the nominal performance test linked to seasonal performance, ECC will choose randomly:

- one part load condition for each seasonal application (SEER, and SEPR if declared)
- one auxiliary mode among the four modes (P_{off} , P_{sb} , P_{to} , P_{ck}) in cooling mode
- one Cd for SEER and/or one Cc for SEPR, if declared differently than the default value in the TDS file. If possible, the Cd or Cc that corresponds to the selected part load will be tested.

e. RT 2012 parameters

These performances shall be tested if declared by the Participant.

f. Seasonal efficiencies and part load conditions in heating

These conditions concern reversible chillers and heat pumps. *When a SCOP (and $\eta_{s,h}$) is to be tested*, the following tests shall be carried out. The Participant has also the possibility to ask for all the part loads during the selection.

Table 14: Thermal measurements (Average Climate)

P _h & COP at standard rating condition defined in EN 14511:2022				
P _h & COP for 1 part load condition among:	B	C	D	
One Cd at selected part load, if declared differently than the default value in the TDS file				
P _h & COP at bivalent temperature (only air-cooled units)				
1 auxiliary power consumption test among:	P _{off}	P _{sb}	P _{to}	P _{ck}
All the conditions are detailed in EN 14825:2022				

When more than one SCOP shall be tested due to the conditions given in the III.1.3.2.q,

- *only one auxiliary power consumption of the SCOP application required by the Regulation,*
- *one Cd at the selected part load of each SCOP to be tested, if declared differently than the default value in the TDS file.*

shall be tested.

g. Part load testing in heating regarding the applications and climates

In order to cover all the applications and all the climates declared with a relevant number of tests, the following rules shall be applied. 'Regulation' in this section refers to the Commission Regulation (EU) No 813/2013 and Commission Delegated Regulation (EU) No 811/2013.

Example 1: Average Climate, and the application required by the Regulation. 1 SCOP is tested, the one defined according with the regulation.

Application Name		Low Temperature*	Intermediate Temperature	Medium Temperature*	High Temperature
Temperature, °C		W30/35	W40/45	W47/55	W55/65
Climate	Warmer		See the end of this section		See the end of this section
	Average	Required by the Regulation			
	Colder				

*applications defined in the Regulation

Example 2: Several climates, and the application required by the Regulation. 2 SCOPs are tested: the one defined in the regulation and the other chosen randomly by ECC.

Application Name		Low Temperature*	Intermediate Temperature	Medium Temperature*	High Temperature
Temperature, °C		W30/35	W40/45	W47/55	W55/65
Climate	Warmer		See the end of this section		See the end of this section
	Average	Required by the Regulation			
	Colder	Chosen randomly by ECC			

*applications defined in the Regulation

Example 3: Average Climate, and 2 applications requested by the Regulation. 1 SCOP is tested: for the Low Temperature application or the Medium Temperature application.

Application Name		Low Temperature*	Intermediate Temperature	Medium Temperature*	High Temperature
Temperature, °C		W30/35	W40/45	W47/55	W55/65
Climate	Warmer		See the end of this section		See the end of this section
	Average	Optional by the Regulation		Required by the Regulation	
	Colder				

*applications defined in the Regulation

Example 4: Several climates and several applications among 2 applications defined in the Regulation. 3 SCOPs are checked: the one defined by the regulation, 2 other chosen randomly by ECC among the other declared climates and applications

Application Name		Low Temperature*	Intermediate Temperature	Medium Temperature*	High Temperature
Temperature, °C		W30/35	W40/45	W47/55	W55/65
Climate	Warmer		See the end of this section	Chosen randomly by ECC	See the end of this section
	Average	Chosen randomly by ECC		Required by the Regulation	
	Colder				

*applications defined in the Regulation

Declaration of SCOP at Intermediate and High Temperature applications

In case SCOP declared at the Intermediate Temperature application (W40/45) for one or more climates, *ECC may replace the SCOP that should be tested at the Low or Medium Temperature*

application according to the TCR with the SCOP with any climate at Intermediate Temperature application.

In case SCOP declared at the High Temperature application (W55/65) for one or more climates, it is tested, preferably for Average climate, regardless of whether the SCOP(s) at Low or Medium Temperature application is selected for testing or not.

h. Part load conditions for India option

At least, one condition from ISEER will be tested per unit. If required, the Participant can ask additional ISEER part load point(s) for testing.

i. Sound testing

Only one acoustic performance shall be tested on the selected unit.

j. Compressors

Each information in the table below, declared by the Participant, shall be checked before the test by the Independent Laboratory.

Table 15: Compressors checking

Compressor information	Present on the Declaration List	Publication on the ECC Website
Unit capacity control ¹ (Fixed, staged or variable)	YES	YES
Motor type ² (AC, VSD, DC, BLDC)	YES	YES
Type (Screw, scroll, centrifugal, rotary or reciprocating)	YES	YES
Inverter (TRUE/FALSE)	YES	YES
Number	YES	YES
Reference of the model	YES	NO

¹Unit capacity control shall be declared in accordance with the definitions given in the EN 14825:2022

²AC: Unit compressor is driven by alternating current. VSD: AC motor compressor is equipped with a variable speed drive. DC: Unit compressor is driven by direct current. BLDC: Unit compressor has a brushless DC motor. They are also combined as AC + VSD, AC + DC, AC + BLDC, VSD + DC, etc. when each refrigerant circuit of the unit has different compressor motor type.

k. Tested applications with the selection tool

Table 16: Checking of selection tool

Selection tool check for OEM and BN					
Standard units (declaration list)					
without options			with options		
std points	non-std points	seasonal points	std points	non-std points	seasonal points
YES	YES	YES	YES	YES	out of scope

Non-standard units
(for definition, see
APPENDIX.E.VI)

l. Validation of the Participant's laboratory option

ECC can validate the Participant's laboratory based on the tests done during the Participant Laboratory tests. The rules regarding the official validation of the Participant Laboratory are given in APPENDIX F.

III.1.3.3. Tests at the independent laboratory

In addition to the provisions laid down in the Certification Manual, the following requirements apply: Before testing, the laboratory shall check the product information declared in the TDS file to ensure that the unit corresponds to the selection.

The laboratory shall not perform the test and contact ECC if:

- any information is not compliant with the TDS file (see APPENDIX A),
- one of the units appears damaged.

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

Laboratory

For all the units with cooling or heating capacity at standard rating conditions of ECC below, the following values shall be tested in an independent laboratory approved and under contract with ECC. The assignment of the independent laboratory is made by ECC for units:

- Up to 100 kW for Air Conditioning and Cooling Floor applications
- Up to $P_{designh} = 70$ kW for any declared seasonal heating applications

The units with a higher capacity shall be tested either in an independent laboratory or in a Participant Laboratory approved by ECC by an independent laboratory assigned by ECC following the procedures specified in the APPENDIX A.

The units shall be installed in the test facility in accordance with the provided installation instructions by the Participant. 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 independent laboratory cannot be held responsible for a wrong installation if the Participant does not provide these specific instructions.

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 TDS file, the order and all relevant installation and operation manuals.

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 un-crating, handling, testing, and re-crating the unit for shipment.

A contact person shall be designated by the Participant to organise the shipment to the laboratory, ECC shall inform the Participant and the assigned independent laboratory when the test is completed. The Participant shall ship the unit back within 2 months after the report is sent and when the following conditions are met.

- The result of the test is passed.
- The rerating is accepted by the Participant, or
- The result is failed but the second test is ordered on another unit.

2 months is the maximum period that the tested unit can be kept in the laboratory.

Time limitation of acquisition of units

If the laboratory is unable to obtain the unit and the relevant documentation within the time limitations defined by ECC (see APPENDIX C) the Participant shall be notified that the list of its products will be withdrawn from the ECC Website for one year.

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

Participant's representatives

• **Testing at an independent laboratory**

A Participant's representative can make 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.

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 is not repairable, it shall be replaced by the Participant.

- **Testing own products at a Participant laboratory**

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

- **Testing competitor products at a Participant laboratory**

Tests shall be performed by an independent laboratory, 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.

- a. Time limitation of acquisition and recovery of units**

The provisions of the Certification Manual apply.

- b. Test conditions**

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

- c. Failure treatment**

- c1. Initial test failure**

For each initial test failure, the laboratory shall stop the test, immediately inform ECC and share the failure report with ECC, then ECC inform the Participant.

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".

If the interval between the defrost cycles of unit at +7 °C outdoor temperature is too short to perform acoustic performance tests, or if the defrost is unusual/unexpected behaviour of the unit, then the test is considered as an initial test failure.

If the measured capacity at T_{biv} cannot reach to at least -10% of the declared capacity, then it will be considered as initial test failure. The laboratories should start to start the tests with P_{biv} point, if applicable. The Participant shall modify (downrate) its declaration.

For SEER and SCOP related part load tests, if the measured capacity cannot reach the +/- 10% of corresponding declared capacity at that part load condition, then the laboratory will inform the participant and ECC, so that the Participant can ask, as an option, a supplementary test at the same part load condition for the step or increment of the capacity control on the opposite side of the required cooling load before removing the unit from the test rig. In in this case, the efficiency at the tested part load will be determined as defined in EN 14825:2022 and compared with the declared one.

For SEPR related part load tests, if the measured capacity cannot reach the +/- 3 % of corresponding declared capacity at that part load condition, then the laboratory will inform the participant and ECC, so that the Participant can ask, as an option, a supplementary test at the same part load condition for the step or increment of the capacity control on the opposite side of the required cooling load before removing the unit from the test rig. In in this case, the efficiency at the tested part load will be determined as defined in EN 14825:2022 and compared with the declared one.

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 one month for units below 100 kW and three months for units above 100 kW, from the notification of the failure. If the new unit is not delivered on time, it is considered as a non-application of procedures (see the Certification Manual in force).

c2. General

If the value found by testing in the independent laboratory differs more than the acceptance criteria (see APPENDIX A), 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 one month for units below 100 kW and three months for units above 100 kW, after reply.
- Re-rate the same commercial range in accordance with the re-rating rules (see below).

If there is no decision from the Participant after this deadline, the re-rate is applied.

c3. Second test

The section II.2 – Failure treatment of the Certification Manual in force is applicable if the second test is chosen by the Participant.

- 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 one of the following. *For the tests in the Participant Laboratory, when one of them is completely passed, the other option can be repeated.*
 1. All thermal and pressure measurements
If only one of the cooling and heating modes fails, the Participant can choose to repeat only the failed mode (cooling or heating).
If the Partial Load test and/or the Paux test fails, the second test may be carried out only for the failed Partial Load test(s) with or without the corresponding auxiliary test(s), provided that both the capacity and efficiency tests for each standard application have passed.
 2. All sound power measurements
- If the second test is performed on a repaired or a new unit, or if the Participant has shipped back the unit, the test shall be completely repeated.

If the second test is unsuccessful, the Participant shall re-rate according to the results from the second test and the re-rating rules. The surveillance procedure does not allow for a third test.

The Participant has the possibility to ask a second test composed by all the part loads (including T_{biv} point for air-to-water units) and auxiliary power consumptions when any seasonal efficiency ($\eta_{s,c}$, $\eta_{s,h}$ and SEPR) is failed.

c4. Re-rating rules

The performance characteristics of the tested model shall be rerated to the values obtained by testing. If for an application, a test is performed at an additional non-standard condition, the performances (capacity, EER, COP, pressure drop, available pressure) shall be rerated according to the mean deviation between the measurement at standard conditions and the corresponding measurement at the non-standard condition.

Performances at non-standard conditions shall be justified by a printout from the selection tool of the Applicant/Participant.

It is not acceptable to up-rate claimed values, but a voluntary rerating can be possible.

The following specific rules shall be applied.

For nominal applications:

1. Capacity fails and EER or COP pass

- The capacity of the tested model shall be rerated to the values obtained by testing.
- EER (or COP) is not rerated.
- The power input shall be re-calculated from the measured capacity and the declared EER or COP.

2. Capacity passes and EER or COP fails

- ECC shall re-rate EER or COP according to measured values.

- Capacity is not rerated.
- ECC shall calculate the power input of the tested model according to the declared capacity and the EER or COP, resulting from measurements.

3. Capacity fails and EER or COP fails

- ECC shall re-rate EER or COP and capacity according to measured values.
- ECC shall calculate the power input according to measured capacity and EER or COP, resulting from measurements.

4. Capacity or EER or COP fails

When capacity and/or EER and/or COP fails, the performance characteristics of all other models in the same commercial range as declared by Participant shall be rerated by the deviation found with the tested model minus 3%.

Example: If the deviation of cooling capacity is – 7 %, the tested model shall be rerated by – 7 %, and other models in the range by - 4%.

5. Pressure drop or available pressure fails

- The performance characteristic of the tested model only shall be rerated to the value obtained by testing.
- Other models in the same commercial range are not affected.

6. Sound power level fails

- The performance characteristic of the tested model shall be rerated to the value obtained by testing.
- The performance characteristic of all other models in the same commercial range shall be rerated by the deviation found with the tested model minus 2 dB(A) for deviation up to intermediate deviation (intermediate deviation included - see APPENDIX A).
- The performance characteristic of all other models in the same commercial range shall be rerated by the deviation found with the tested model minus 1 dB(A) for deviation from intermediate deviation (intermediate deviation excluded) to high deviation (high deviation included - see APPENDIX A).
- The performance characteristic of all other models in the same commercial range as declared by Participant shall be rerated by the deviation found with the tested model for high deviation (high deviation excluded - see APPENDIX A).

For seasonal applications:

7. Rerating of design load in heating ($P_{\text{design,h}}$)

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.

8. Part load point fails for SCOP or SEER or SEPR (or ISEER)

When the Participant has tested one part load point including COP at T_{biv} , and the COP (respectively EER) is outside the acceptance criteria (see Table 22: Table of acceptance criteria, intermediate and high deviations in Appendix A), the COP measured (respectively EER) will be applied for SCOP calculation.

Other COP (respectively EER) for part load points will be rerated according with the deviation minus the acceptance criteria used for the test.

When the first Part load (COP) (respectively EER) is outside the acceptance criteria but below or equal to the high deviation, the Participant has the right to ask for a second part load point.

The average deviation will be applied to rerate the other 2 part load performances.

If one capacity (lower or upper) stage fails, the Participant can choose to change to the other stage without changing for another part load point.

When the first Part load (COP) (respectively EER) is outside the acceptance criteria but above the high deviation, the Participant has the right to test the 3 other part load points.

9. Rerating of SCOP or SEER or SEPR (or ISEER)

Whenever a measurement at a part load condition selected by ECC shows a deviation on COP (respectively EER) larger than the allowed acceptance criteria, the point 7 or 8 above shall be applied on all the other part load COP (respectively EER) and then, SCOP (respectively SEER or SEPR) will be recalculated by ECC, to be rerated.

Whenever the test on auxiliary power consumption and/or on Cd (Degradation Coefficient) shows a deviation higher than the allowed acceptance criteria the value of SCOP (respectively SEER or SEPR) should be recalculated.

In case of recalculation of SCOP (respectively SEER or SEPR) for the tested model:

- the deviation on SCOP (respectively SEER or SEPR) shall be applied to all models in the same BMG,
- the deviation of the tested auxiliary power consumptions shall be applied to all models in the BMG.

Table 17: Example of rerating

BMG	Model	Items	Declared	Calculated	Deviation	Rerated / Calculated Value	
1	A	SCOP	3,8	3,18	-16%	3,18	
	B	SCOP	3,9	-	-	SCOP _{declared} X (1 - 0,16)	3,26
	C	SCOP	3,7	-	-	SCOP _{declared} X (1 - 0,16)	3,10

All rerating of SEER or SCOP will lead automatically to the rerating of associated seasonal space efficiency, $\eta_{s,c}$ or $\eta_{s,h}$, using the formula mentioned below:

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

Where:

- CC is the conversion coefficient, equal to 2.5.
- $\sum F(i)$ is the correction calculated according to the following formula:

$$\sum F(i) = F(1) + F(2)$$

The correction F(1) accounts for a negative contribution due to adjusted contributions of temperature controls, expressed in %. $F(1) = 3\%$. It shall always be used for the calculations of $\eta_{s,c}$ or $\eta_{s,h}$.

The correction F(2) accounts for a negative contribution by electricity consumption of water pumps, expressed in %. $F(2) = 5\%$. This correction factor is therefore only for water-to-water units, and it shall always be used for the calculations of $\eta_{s,h}$. But, for the calculations of $\eta_{s,c}$, this factor shall only be applied to the units with ground coupled applications, not with the cooling tower or water loop applications.

10. LRcontmin or Ccp_{LRcontmin} fails

EER/COP_{LRcontmin} is measured and compared to the efficiency at LRcontmin derived from the declared Ccp_{LRcontmin}.

If the unit allows to keep stable conditions during the test as defined in EN 14511:2022, then LRcontmin is validated.

The values measured are the rerate values.

If the deviation of $C_{pLRcontmin}$ is within the acceptance criteria, declared $C_{pLRcontmin}$ is validated.

Otherwise, $C_{pLRcontmin}$ is rerated according to the measured deviation of C_{pLR} .

The performance characteristics of all other models in the same commercial range as declared by Participant shall be rerated by the deviation found with the tested model or the default values when applicable.

11. Auxiliaries fails: P_{sb} , P_{to} , P_{off} , P_{ck}

The tested model shall be rerated to the values obtained by testing.

The performance characteristics of all other models in the same BMG shall be rerated by the deviation found with the tested model.

12. TER fails

ECC shall re-rate TER according to measured value.

The performance characteristics of all other models in the same commercial range as declared by Participant shall be rerated by the deviation found with the tested model minus 3%.

The intermediate capacities and efficiencies (EER & COP) will be rerated according to § 1, § 2, § 3 and § 4.

13. Cd (Degradation Coefficient) fails

Cd is calculated with the equation below in accordance with EN 14825:2022.

$$Cd = 1 - \frac{P_{C,off}}{P_{C,on}}$$

$P_{C,off}$: Compressor-off state power input at the selected part load condition
 $P_{C,on}$: Effective power input measured during the selected part load test

In case of a failure during Cd testing, only the function (SEER, SCOP, or SEPR) failed shall be treated. Two different cases below shall be considered as a failure.

CASE 1 – Only P_{Coff} fails

1. Cd of tested part load condition is recalculated with the measured P_{Coff} .
2. The other Cd values are rerated with the same deviation.
3. Respectively to the tested application, SEER, SCOP or SEPR is recalculated with the rerated Cd values.
4. Then the deviation, which is found after the recalculation of the seasonal efficiency, rerate shall be applied to the corresponding seasonal efficiency of all the models in the same BMG.

CASE 2 – Both P_{Coff} and EER/COP fail

1. Cd of tested part load condition is recalculated with the measured P_{Coff} and P_{Con} .
- 2, 3, and 4th steps are the same with the CASE 1.

14. ESP fails

The performance characteristic of all the models in the same range shall be rerated by using the same percentage deviation.

c5. High deviation and penalty tests

For each failure above high deviation in cooling and/or heating capacity, EER, COP, TER, sound power level, EER at part load condition, COP at part load condition or SCOP, an additional test shall be scheduled for the next test campaign. There will be a maximum of 3 penalty tests per campaign. High failures on several performances in the same test shall lead to one penalty test.

III.1.3.4. Selection tool checking procedure

APPENDIX E will apply.

III.1.3.5. Desk study

This option does not apply for this program.

III.1.4. Evaluation and decision

The provisions of the Certification Manual apply.

III.2. Surveillance procedure

The provisions of the Certification Manual apply.

Every year, ECC checks whether the certified performances of the certified products still fulfil the requirements.

- Surveillance tests in independent laboratory (or Participant Laboratory, when applicable) shall be conducted annually in compliance with the Certification Schedule (see APPENDIX C)
- Units selected from regular production shall be tested in the test facilities approved by ECC.

For the surveillance procedure, the certification is renewed at the date specified in the APPENDIX C, on condition that:

- the previous test campaign (N-1) has been successfully completed,
- the product delivery together with the TDS file(s) and the payment have been completed.

The company receives then a renewed certificate and the display of data is maintained on the ECC Website. If not, failure treatment shall be applied.

III.2.1. Implementation of surveillance operations

III.2.1.1. Surveillance audit

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

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

III.2.1.2. Selection of units to be tested

III.1.3 will apply.

III.2.1.3. Surveillance tests

III.1.3 will apply.

III.2.1.4. Selection tool (Software) checking procedure

APPENDIX E will apply.

III.2.1.5. Desk study

This option does not apply for this program.

III.2.1.6. Technical and commercial documentation check

The provisions of the Certification Manual apply.

III.2.1.7. Verifications at commercial outlets

The provisions of the Certification Manual apply.

III.2.2. Evaluation and decision

The provisions of the Certification Manual apply.

III.3. Declaration of modifications

The provisions of the Certification Manual apply.

III.3.1. Changes concerning the Participant

The provisions of the Certification Manual apply.

III.3.2. Changes concerning production entities

The provisions of the Certification Manual apply.

III.3.3. Changes concerning the quality organisation of the manufacturing and/or marketing process

The provisions of the Certification Manual apply.

III.3.4. Additional admission for a new model and/or new range

The provisions of the Certification Manual apply.

A qualification campaign is required for the options or sub programmes. The status of concerned units shall be maintained as “Not Certified” until the reception of their test reports, the validation of the participant laboratory, and until when the qualification campaign is finalized.

III.3.5. Changes concerning the certified product

The provisions of the Certification Manual apply.

The Applicant/Participant shall inform ECC of any modification of the product portfolio by updating the Declaration File (LCP-1) and sending the updated selection tool together with related update record sheet. Non-compliance of the Applicant/Participant is considered as non-application of procedures (see III.2).

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.3.6. 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.

APPENDIX A. TECHNICAL APPENDICES

APPENDIX.A.I. Liquid Chilling Packages or Hydronic Heat-Pumps

A.I.1. Purpose

The purpose of this appendix is to establish definitions and specifications for the operation of the Eurovent Certified Performance (ECP) certification programme of LCP-HP.

This appendix describes the rating standards for cooling-only and reversible Liquid Chilling Packages or Hydronic Heat-Pumps.

A.I.2. Definitions

A.I.2.1. General definitions

Standard Ratings: A statement of performance characteristics based on tests performed at standard rating conditions as specified in this Appendix.

Application Ratings: A statement of performance characteristics based on other than standard test conditions.

Liquid Pressure Difference on Indoor side: Liquid internal pressure difference between outlet and inlet of unit on Indoor side (kPa). *It can be Available Pressure or Pressure Drop as defined below.*

Liquid Pressure Difference on Outdoor side: Liquid internal pressure difference between outlet and inlet of unit on Outdoor side (kPa). *It can be Available Pressure or Pressure Drop as defined below.*

Available Pressure: This parameter shall be used when the liquid pump is an integral part of the unit.

Pressure Drop: This parameter shall be used when the liquid pump is not an integral part of the unit.

A-weighted Sound Power Level: Sound power level radiated by the unit, expressed in dB(A).

The following definitions are in accordance with EN 14511-1:2022.

Total Cooling Capacity: Heat given off from the heat transfer medium to the unit per unit time (kW).

Effective Power Input: Average electrical power input of the unit within the defined interval of time (kW) obtained from:

- the power input for operation of the compressor(s) and any power input for defrosting
- the power input of all control and safety devices of the unit
- proportional power input of the conveying devices (e.g., fans, pumps) for ensuring the transport of the heat transfer media inside the unit

Heating Capacity: Heat given off by the unit to the heat transfer medium per unit of time (kW).

Energy Efficiency Ratio (EER): Ratio of the total cooling capacity to the effective power input of the unit (-). Equivalent to the EER_d (declared EER) as defined in EN 14825:2022.

Coefficient of Performance (COP): Ratio of the heating capacity to the effective power input of the unit (-). Equivalent to the COP_d (declared COP) as defined in EN 14825:2022.

Power input in stand-by mode (P_{sb}), in off mode (P_{off}), in thermostat-off mode (P_{to}), in crankcase heater mode (P_{ck}): as defined in EN 14825:2022.

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.

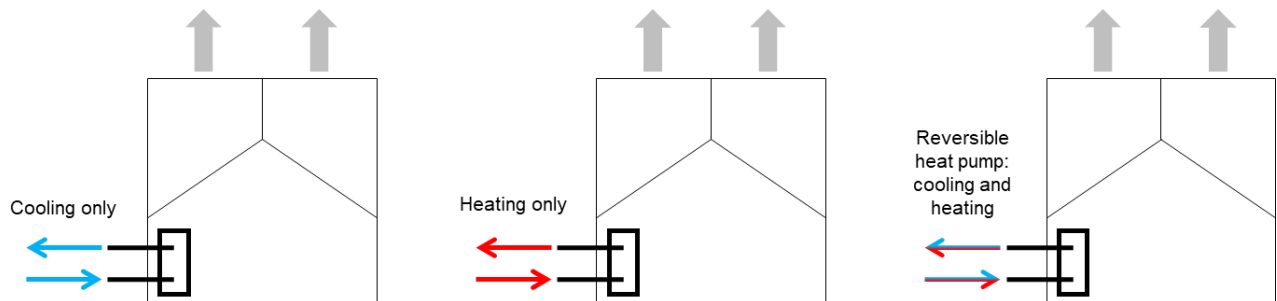
CcpLRcontmin: Ratio of the COP (or EER) at LRcontmin and the COP (or EER) at full load.

A.I.2.2. Types of units

a. 2-pipe units

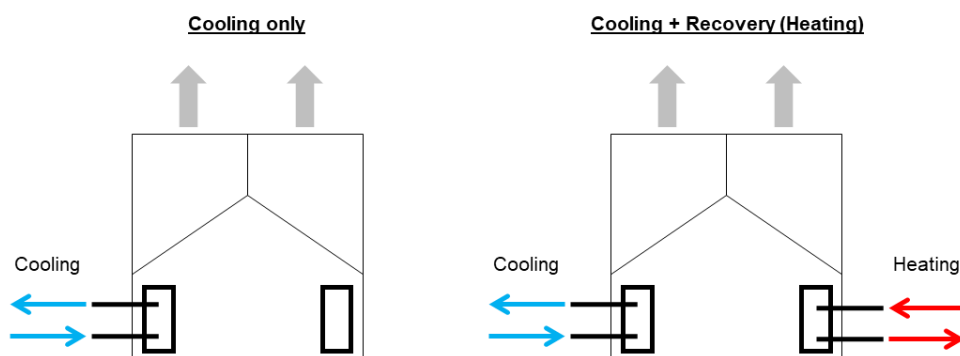
2-pipe units are providing **cooling or heating** to a single water loop.

They can provide cooling only, heating only, can be reversible unit providing seasonal cooling and heating.



b. 2-pipe units + heat recovery

2 pipes + heat recovery (partial or total heat recover) unit are providing **cooling and heating** at the same time. They can provide cooling only, cooling + heating, but cannot provide heating if there is no simultaneous demand of cooling (no heating only operation allowed).



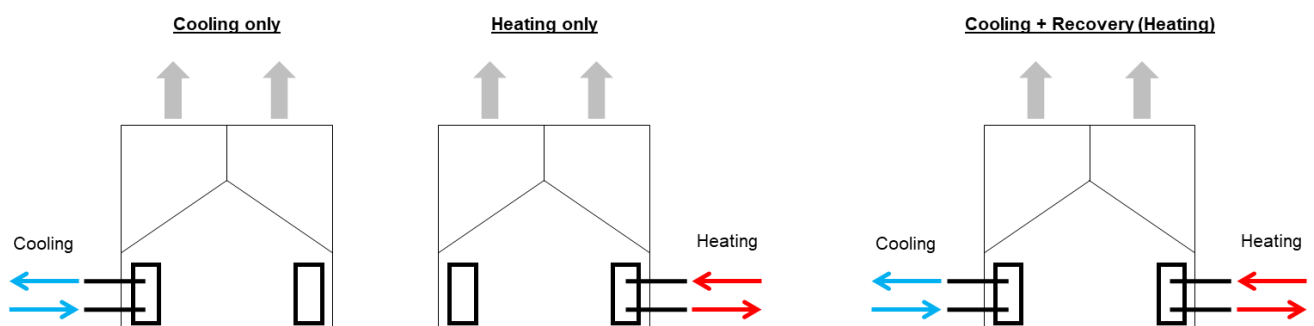
These units are certified only in cooling mode.

c. Polyvalent units

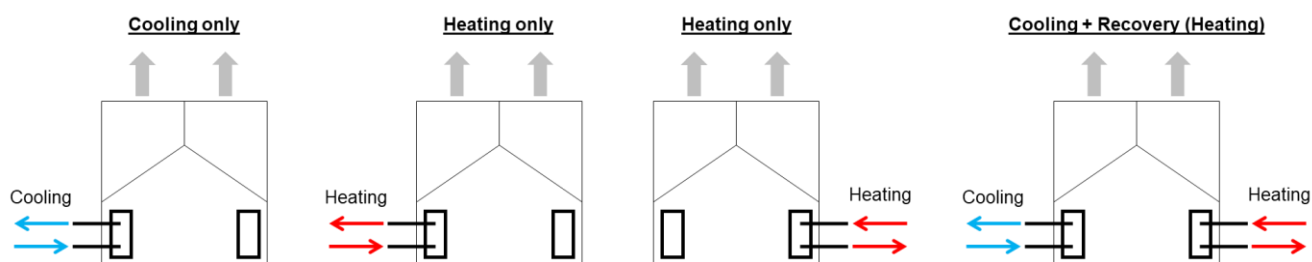
There are two types of *polyvalent* units:

- **1st type: 4-pipe units** can provide **cooling and heating** to two separate water loops. They can provide cooling only, heating only or simultaneously cooling and heating. One loop always provides cooling and the other heating.

When the units provide cooling and heating at the same time, the heating is the recovered energy resulting from unit's cooling operation.



- **2nd type: 2+2-pipe units** can provide either cooling or heating to one loop and only heating to the second loop. These units are connected to two water loops: one loop is for seasonal comfort cooling and heating, the second loop is dedicated to produce hot sanitary water. When the unit provides cooling to the first loop, the heating provided to the second loop is the recovered energy resulting from unit's cooling operation.



The differences between the “2-pipe units + heat recovery” and the “4-pipe units” are clearly identified specially concerning the number of loops which can be controlled:

- for “2-pipe units + heat recovery”, only one loop is controlled (cooling loop)
- for “4-pipe units”, the 2 loops are controlled.

The *polyvalent* units can be classified in 3 technically different types, available in air- and water-to-water.

Table 18: Classification of polyvalent units

Polyvalent units	4-pipe units	2+2-pipe units	
Typical Applications	Commercial & Industrial	Residential	
System	2 separate and independent water loops		
Source side	Air-to-water or Water-to-water		
Can provide Cooling & Heating at the same time	Yes		
Heating on Loop 2	Can be recovered energy resulting from the cooling operation.		
Number of refrigerant circuits	1 or more	1 or more	2 or more
Loop 1	Only cooling	Cooling or Heating	Cooling or Heating*
Loop 2	Only heating	Only heating	Only heating
	Type A	Type B1	Type B2

* Simultaneous production of heating on Loop 1 and Loop 2. The unit can provide heating on one loop at the time.

A.I.3. Testing requirements

All standard ratings shall be verified by the tests conducted by an approved independent laboratory in accordance with the following standards and shall be established at the standard rating conditions specified in A.I.4.

A.I.3.1. Cooling and heating capacity

Test method: **EN 14511-3:2022** “Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling- Part 3: Test methods”.

Test conditions: **EN 14825:2022** “Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling, commercial and process cooling - Testing and rating at part load conditions and calculation of seasonal performance”.

Test method and conditions for the Indian Market Certification option:

IS 16590: “Water cooled Chilling Packages Using the Vapour Compression Cycle – Specification”.

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Test method and conditions for the Middle East Market Certification option:

SASO 2874: "Air conditioners – Minimum Energy Performance Requirements and Testing Requirements".

A.I.3.2. Power input in stand-by mode (P_{sb}), in off mode (P_{off}), in thermostat-off mode (P_{to}), in crankcase heater mode (P_{ck})

EN 14825:2022 "Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling, commercial and process cooling - Testing and rating at part load conditions and calculation of seasonal performance".

A.I.3.3. Sound power level

Standard EN 12102-1:2022 shall be used in conjunction with:

- **ISO 9614:2009** by sound intensity method (Part 1: Measurement by discrete points)
- **ISO 3744:2010** (if ISO 9614 is not applicable) by free field method

or:

- **ISO 3741:2010**, Precision methods for reverberation test rooms

For sound testing the following conditions shall be used:

- Test at the standard rating condition in cooling mode for the AC application,
- With the pump running,
- All fans running at nominal speed,
- For ducted air-to-water units, the same airflow and ESP shall be kept as in cooling mode,
- For non-ducted air-to-water units, the sound power to be tested is the sound power radiated outdoor side,
- For ducted air-to-water chillers, the sound power to be tested is the discharge sound power level,
- For polyvalent units, the sound power to be tested only in the cooling mode at the Air Conditioning application.

Case of reversible chillers:

For air-to-water units with $P_{designh}$ below 70 kW, the sound testing can be carried out also at standard conditions (EN 14511-2:2022) but in heating mode (air temperature at +7 °C) with a water temperature in accordance with the Regulations: +35 °C or +55 °C

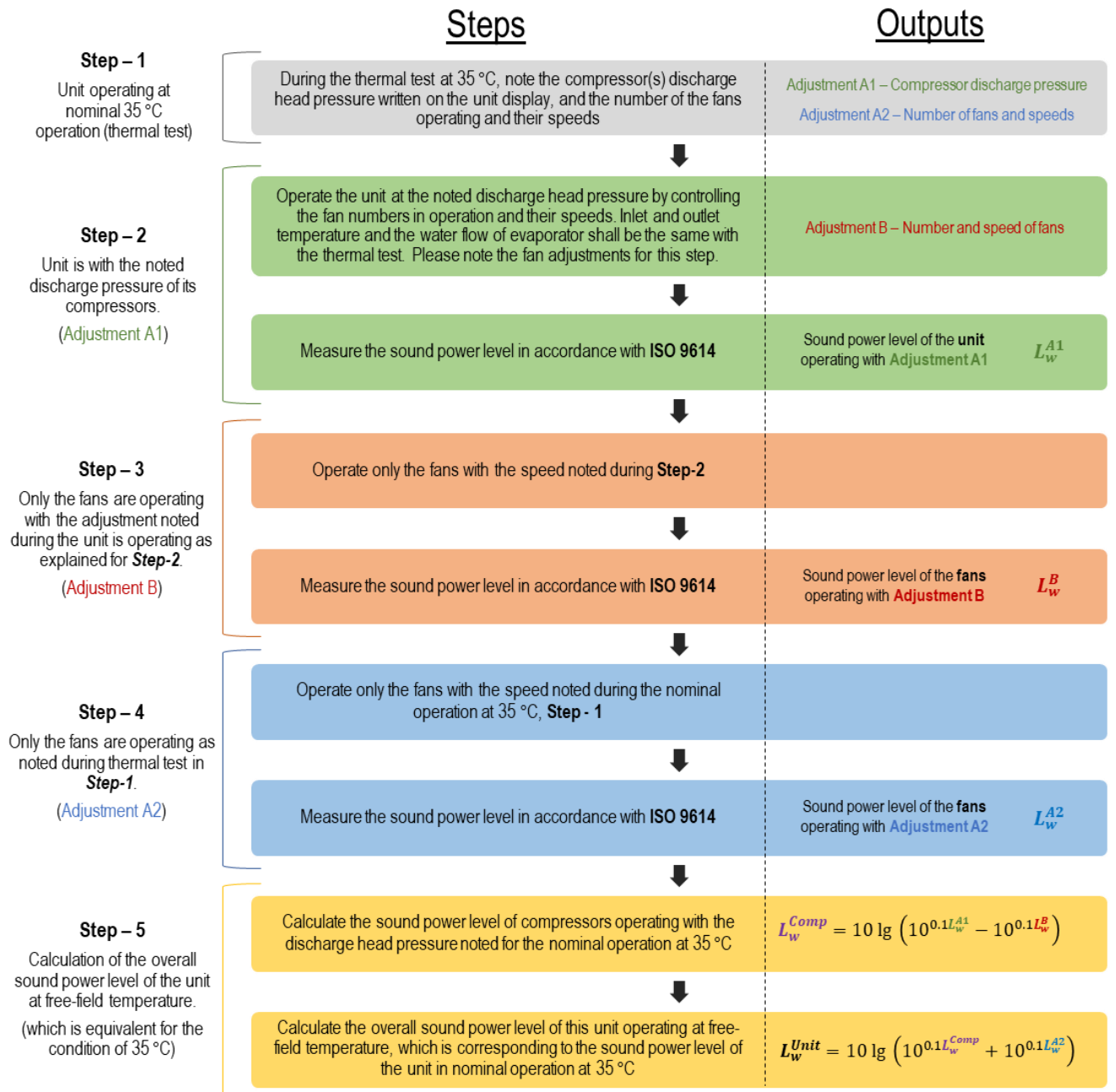
Note: For all the units covered by Commission Regulation (EU) No 811/2013 and No 813/2013 ($P_{designh}$ below 400 kW) regulations, the sound power level measurement on heating mode shall be done in accordance with the Annex A of EN 12102-1:2022.

For water-cooled units, the sound testing can be carried out, as an option, at standard conditions (EN 14511-2:2022) in heating mode with a water temperature in accordance with the Regulations: +35 °C or +55 °C. For cooling mode, the tests can be carried out, as an option, at standard rating conditions of the AC application.

a. Free Field Acoustic Test Procedure for air-to-water units

This procedure shall only be used in case it is not possible to conduct acoustic tests at 35 °C for air-to-water units inside the Participant Laboratory. This procedure shall be used by the independent laboratory who is assigned for the tests. Measuring the related parameters could be done in accordance with ISO 9614.

In order to replicate the standard conditions during the Free Field Acoustic Measurement, the head pressure, which shall be read from the displays of units, inlet/outlet temperatures and water flow on the evaporator side, which shall be measured by independent laboratories, shall be used. Measuring devices of the independent laboratories shall be used. The below procedure shall be followed.



This procedure may be applied, upon the Participant's request, without Step-3 if the sound power level of the fan in the free field is negligible compared to the unit sound power due to low outdoor temperatures. In this case, the calculation is made by considering L_w^{Comp} as equal to L_w^{A1} .

A.I.3.4. Part Load Testing of Comfort and Process Chillers

For comfort and process chillers, part load testing is done as indicated by the Participant to ECC in the Technical Datasheet.

The testing methodology provided by the Participant by filling the Technical Datasheet shall ensure the stable operation of the compression circuit (frequency for inverter driven compressors, slide valve position for slide valve screw chillers, and sequence of activated compressors for capacity staged chillers).

For air-to-water chillers, the condenser fan(s) should be operated by the control of the chiller. Whenever cycling of the condenser fan(s) occurs, the test should be done as follows:

- An acquisition period of 1 hour is required.
- Acceptance criteria on leaving water temperature can exceed the maximum permissible deviation.

- If cycles exceed 1 minute, an entire number of periods shall be acquired.

A.I.3.5. LRcontmin and Ccp_{LRcontmin}

A test shall be performed at LRcontmin under standard condition 7/12 °C in cooling mode (Air Conditioning application) or 30/35 °C in heating mode (Low Temperature application).

If the minimum water flow rate of the unit does not allow to reach the required ΔT (7/12 °C), the test shall be done, example for the cooling mode, at +7 °C as leaving water temperature and the minimum flow is declared by the Participant.

A.I.4. Rating requirements

A.I.4.1. General requirements

The tests with brine shall be carried out with the brine composition as specified in Table 19.

Table 19: Brine composition (Ethylene Glycol)

Applications concerned	MT Process	LT Process
Brine composition	30 % (weight)	50 % (weight)

All tests shall be carried out with clean heat exchangers and that shall be specified in catalogues with published ratings.

For ducted air-to-water chillers tests, the capacity test shall be carried out at the air flow rate specified as nominal in the published ratings. The unit is considered as ducted, if its measured ESP at the declared nominal airflow is higher than 30 Pa.

For the units with ducted outdoor heat exchanger, ESP shall be between 30 Pa and 200 Pa.

A.I.4.2. Treatment of frosting of heat exchangers

The treatment of frosting shall be done according to EN 14511-3:2022.

A.I.4.3. Capacity tests

For the capacity tests the standard rating conditions in Table 20 and Table 21 shall be used:

Table 20: Standard rating conditions for capacity tests in cooling mode, °C

	Code	Evaporator	Condenser
Cooling Floor	LCP/A . . /CF - Air/Water	23 / 18	35 ^a
	LCP/W . . /CF - Water/Water	23 / 18	30 / 35
	LCP/W . . /CF-MB - Water/Brine		
Air Conditioning	LCP/A . . /AC - Air/Water	12 / 7	35 ^a
	LCP/W . . /AC - Water/Water	12 / 7	30 / 35
	LCP/W . . /AC-MB - Water/Brine		
MT Process	LCP/A . . /MP - Air/Water	-2 / -8	35 ^a
	LCP/W . . /MP-MB - Water/Brine	-2 / -8	30 / 35
LT Process	LCP/A . . /LP - Air/Water	-19 / -25	35 ^a
	LCP/W . . /LP-MB - Water/Brine	-19 / -25	30 / 35

a: dry bulb

Table 21: Standard rating conditions for capacity tests in heating mode, °C

	Code	Evaporator	Condenser
Low Temperature	LCP/A . . /LTH - Air/Water	7 ^a (6 ^b)	30 / 35
	LCP/W . . /LTH - Water/Water	10 / 7	30 / 35
	LCP/W . . /LTH-MB -Water/Brine	0 / -3	30 / 35

Intermediate Temperature	LCP/A . . /ITH - Air/Water	7 ^a (6 ^b)	40 / 45
	LCP/W . . /ITH - Water/Water	10 / 7	40 / 45
	LCP/W . . /ITH-MB - Water/Brine	0 / -3	40 / 45
Medium Temperature	LCP/A . . /MTH - Air/Water	7 ^a (6 ^b)	47 / 55
	LCP/W . . /MTH - Water/Water	10 / 7	47 / 55
	LCP/W . . /MTH-MB - Water/Brine	0 / -3	47 / 55
High Temperature	LCP/A . . /HTH - Air/Water	7 ^a (6 ^b)	55 / 65
	LCP/W . . /HTH - Water/Water	10 / 7	55 / 65
	LCP/W . . /HTH-MB - Water/Brine	0 / -3	55 / 65

a: dry bulb, b: wet bulb

A.I.4.4. Part load rating conditions for SEER (cooling mode of comfort chillers)

For each application, the units either allowing or not allowing a variation of the outlet water temperature with the outdoor temperature are considered. The part load conditions for determining the declared capacity and the declared energy efficiency ratio are given in the EN 14825:2022 standard.

The variable outlet temperature ($T_{\text{outlet,average}}$) shall only be applied when the control provides an outdoor air temperature dependant modification of the outlet temperature.

For the units with variable outlet that shall cycle on/off to reach the required part load ratio, the inlet and outlet temperatures of the indoor heat exchanger shall be determined according to formula provided in standard EN 14825:2022, paragraph 11.5.1.

A.I.4.5. Part load rating conditions for SEPR (cooling mode of process chillers)

The part load conditions for determining the declared capacity and the declared energy efficiency ratio are given in the EN 14825:2022 standard for each of high, medium, and low temperature process chillers.

A.I.4.6. Part load rating conditions for SCOP

The part load conditions for determining the declared capacity and the declared COP are given in the EN 14825:2022 standard.

A.I.4.7. Rating conditions for TER

The mandatory testable conditions are defined below:

4-pipe units (type A)

3 tests are required:

		Ambient	Loop 1	Loop 2
Air-cooled unit	Cooling	35	12/7	
	Heating	7		40/45
	TER C+H		*/7	*/45
		Ambient	Loop 1	Loop 2
Water-cooled unit	Cooling	30/35	12/7	
	Heating	10/7		40/45
	TER C+H		*/7	*/45

The same water flow rates, found during the cooling and heating modes, shall be used for the TER test. The total capacity (*heating and cooling*) is measured and divided by total power input (P_e).

2+2-pipe units (type B1 & B2)

3 tests are required: C = Cooling mode + H = Heating mode + DHW = Domestic Hot water

		Ambient	Loop 1	Loop 2
Air-cooled unit	Cooling	35	12/7	
	Heating	7	30/35	
	DHW	7		40/45
	TER C + DHW		*/7	*/45

		Ambient	Loop 1	Loop 2
Water-cooled unit	Cooling	30/35	12/7	
	Heating	10/7	30/35	
	DHW	10/7		40/45
	TER C + DHW		*/7	*/45

The same water flow rates, found during the cooling and heating modes, shall be used for the TER test. The total capacity (*heating and cooling*) is measured and divided by total power input (P_e).

A.I.5. Certified performances

The following performances at standard conditions shall be certified:

- Cooling capacity [kW]
- Energy efficiency ratio (EER) [-]
- Seasonal efficiency in cooling (SEER and/or SEPR) [-]
- Seasonal space cooling efficiency ($\eta_{s,c}$) [-]
- Water pressure difference at indoor side [kPa]
- Water pressure difference at outdoor side for water-to-water units [kPa]
- External static pressure (ESP) for ducted air-cooled units [Pa]
- Heating capacity for reversible units [kW]
- Coefficient of Performance (COP) for reversible units [-]
- A-weighted sound power level for air-cooled units in cooling mode [dB(A)]
- P_{sb} [W], $LR_{contmin}$ [-] and $Ccp_{LRcontmin}$ [-] in cooling and heating modes

For relevant units (see I.2.2):

- Capacity at $P_{designh}$ [kW]
- Seasonal efficiencies in heating (SCOP & $\eta_{s,h}$) [-]
- P_{off} , P_{to} , P_{ck} [W]
- A-weighted sound power level for air-cooled units in heating mode [dB(A)]
- A-weighted sound power level for water-cooled units in heating mode [dB(A)] (Option)

For polyvalent units:

- Cooling capacity [kW]
- Total Efficiency Ratio (TER) [-]
- A-weighted sound power level for air-cooled units in cooling mode [dB(A)]

For low temperature and medium temperature process chillers:

- Cooling capacity [kW]

- Seasonal energy performance ratio (SEPR) [-]

All ratings, *except those for India and Middle East certification*, refer to a fouling factor equal to zero.

All certified performances shall be available in the selection tools.

A.I.6. Acceptance criteria

When tested by the laboratory selected by ECC, the performances obtained shall not differ from the claimed values by more than the acceptance criteria (see Table 22).

High deviation leads to penalty tests (see III.1.3.3.c Failure treatment).

Table 22: Table of acceptance criteria, intermediate and high deviations

	Acceptance criteria	Intermediate	High deviation
Standard Point (EN 14511:2022)			
Cooling or heating capacity, EER, COP or TER	< -5%	< -8%	< -10%
SEER			
Part load B	< -6%	< -9%	< -12%
Part load C	< -8%	< -13%	< -17%
Part load D	< -16%	< -24%	< -33%
SEER, if all points have been tested	< -8%	< -9%	< -10%
Sound			
A-weighted sound power level rounded to the closest integer value	> +3 dB(A) > + 2 dB(A)*	> +5 dB(A)	> +7 dB(A)
(*) in heating mode for units below 70 kW.			
Other			
Water Pressure Drop, ΔP	+3 kPa ($\Delta P \leq 20$ kPa) +15% ($\Delta P > 20$ kPa)		
Available Water Pressure, ΔP	-3 kPa ($\Delta P \leq 20$ kPa) -15% ($\Delta P > 20$ kPa)		
Air External Static Pressure	+/- 20%		
LRcontmin	+/- 5% (point)		
CcpLRcontmin	< - 5% (point)		
P_{Coff}	+1 W ($P_{Coff} < 10$ W) +10 % ($P_{Coff} > 10$ W)		
Auxiliaries			
P_{off}			
P_{sb}	+1 W ($P_{aux} < 10$ W)		
P_{to}	+10 % ($P_{aux} > 10$ W)		
P_{ck}			
SCOP (Average Climate)			
Part load A / T_{biv}	< -7%	< -8%	< -11%
Part load B	< -7.6%	< -11%	< -15%
Part load C	< -10.6%	< -16%	< -21%
Part load D	< -22%	< -33%	< -44%
P at T_{biv}	< -7%	< -8%	< -10%

	Acceptance criteria	Intermediate	High deviation
SCOP (Colder Climate)			
Part load A / T_{biv}	< -6.9%	< -10.4%	< -13.8%
Part load B	< -10.1%	< -15.2%	< -20.2%
Part load C	< -14.5%	< -21.8%	< -29%
Part load D	< -29.3%	< -43.9%	< -58.5%
P at T_{biv}	< -6.9%	< -10.4%	< -13.8%
SCOP (Warmer Climate)			
Part load A / T_{biv}	< -7%	< -8%	< -11%
Part load B	< -5%	< -7.5%	< -10%
Part load C	< -6.7%	< -10%	< -13.4%
Part load D	< -12.3%	< -18.5%	< -24.7%
P at T_{biv}	< -7%	< -8%	< -11%
SEPR (all applications)			
Part load A	< -5%	< -8%	< -10%
Part load B	< -6%	< -8.5%	< -11%
Part load C	< -7%	< -10%	< -12.5%
Part load D	< -12%	< -16%	< -20%

APPENDIX.A.II. Heating-only Hydronic Heat Pumps

A.II.1. Purpose

The purpose of this appendix is to establish definitions and specifications for the operation of the Eurovent Certified Performance (ECP) certification programme for heating-only Hydronic Heat Pumps (LCP-HP).

A.II.2. Definitions

A.II.2.1. General definitions

In addition to the definitions placed in A.I.2.1, general definitions related directly to the heating-only hydronic heat pumps are as follows.

LRcontminh: 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.

CcpLRcontminh: Ratio of the COP at LRcontmin and the COP at Low temperature application (previously Heating floor application).

A.II.3. Testing requirements

All standard ratings shall be verified by tests conducted by an approved independent laboratory in accordance with the following standards and shall be established at the Standard Rating Conditions specified in A.II.4.

A.II.3.1. Heating capacity for heating-only Hydronic Heat Pumps

Test method: **EN 14511-3:2022** "Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling- Part 3: Test methods".

Test method and conditions: **EN 14825:2022** "Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling, commercial and process cooling - Testing and rating at part load conditions and calculation of seasonal performance".

A.II.3.2. Power input in stand-by mode (P_{sb}), in off mode (P_{off}), in thermostat-off mode (P_{to}), in crankcase heater mode (P_{ck})

Test method and conditions: **EN 14825:2022** "Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling, commercial and process cooling - Testing and rating at part load conditions and calculation of seasonal performance".

A.II.3.3. Sound power level

EN 12102-1:2022 shall be used in conjunction with:

- ISO 9614:2009 by sound intensity method (Part 1: Measurement by discrete points), or,
- ISO 3741:2010, Precision methods for reverberation test rooms

For sound testing, the following conditions shall be used:

- Test the standard rating condition in heating mode for the AC application (at 45 °C)
- With the pump running
- All fans running at nominal speed
- For ducted air-cooled units the same airflow and ESP shall be kept as in cooling mode
- Inlet air temperature at the evaporator shall be +7 °C
- For non-ducted air-source units, the sound power to be tested is the sound power radiated outdoor side
- For ducted air-source units the sound power to be tested is the discharge sound power level.

For air-cooled units with $P_{designh}$ below 70 kW, the sound testing can be carried out also always Standard conditions (EN 14511:2022) but in heating mode (air temperature at +7 °C) with a water temperature in accordance with Regulations: +35 °C or +55 °C

Note: For all the units covered by Commission Regulation (EU) No 811/2013 and No 813/2013 ($P_{designh}$ below 400 kW) regulations, the sound power level measurement on heating mode shall be done in accordance with the Annex A of EN 12102-1:2022.

For water-cooled units, the sound testing can be carried out, as an option, at Standard conditions (EN 14511:2022) in heating mode with a water temperature in accordance with Regulations: +35 °C or +55 °C.

A.II.3.4. $LR_{contmin}$ and $C_{cp}LR_{contmin}$

A test shall be performed at $LR_{contmin}$ under standard condition 30/35 °C in heating mode.

If the minimum water flow rate of the unit does not allow to reach the required ΔT , the test shall be done at standard conditions 30/35 °C and the minimum flow rate is declared by Participant.

A.II.4. Rating requirements

A.II.4.1. General requirements

All tests shall be carried out with clean heat exchangers and that shall be specified in catalogues with published ratings.

For ducted air-source heat-pumps, tests for capacity shall be carried out at the air flow rate specified as nominal in the published ratings.

A unit is considered as ducted if the measured ESP at the declared nominal airflow is higher than 30 Pa.

A.II.4.2. Treatment of heat exchangers frosting

The treatment of frosting shall be done according to EN 14511:2022.

A.II.4.3. Capacity tests

For capacity tests the following Standard Rating Conditions Table 23 shall be used:

Table 23: Standard rating conditions for capacity tests in heating mode

	Code	Evaporator	Condenser
Low Temperature	LCP/A . . /LTH ² - Air/Water	7 (6)	30 / 35
		2 (1)	^a / 35
	LCP/W . . /LTH - Water/Water	10 / 7	30 / 35
	LCP/W . . /LTH-MB - Water/Brine	0 / -3	30 / 35
Intermediate Temperature	LCP/A . . /ITH ² - Air/Water	7 (6)	40 / 45
		2 (1)	^a / 45
	LCP/W . . /ITH - Water/Water	10 / 7	40 / 45
	LCP/W . . /ITH-MB - Water/Brine	0 / -3	40 / 45
Medium Temperature	LCP/A . . /MTH ² - Air/Water	7 (6)	47 / 55
		2 (1)	^a / 55
	LCP/W . . /MTH - Water/Water	10 / 7	47 / 55
	LCP/W . . /MTH-MB - Water/Brine	0 / -3	47 / 55
High Temperature	LCP/A . . /HTH ² - Air/Water	7 (6)	55 / 65
		2 (1)	^a / 65
	LCP/W . . /HTH - Water/Water	10 / 7	55 / 65
	LCP/W . . /HTH-MB - Water/Brine	0 / -3	55 / 65

² For air-to-water units, tests at +2 °C are optional.

^a Measurement at the same flow rate as for the test at +7 °C

A.II.4.4. Part load rating conditions for SCOP

The part load conditions for determining the declared capacity and the declared COP are given in the EN 14825:2022 standard.

A.II.5. Certified performances

The following performances at standard conditions shall be certified for heating only heat pumps:

- Heating capacity [kW]
- Coefficient of performance (COP) for the same conditions of the heating capacity [-]
- Water pressure difference at indoor side [kPa]
- Water pressure difference at outdoor side for water-cooled units [kPa]
- External static pressure (ESP) for ducted air-cooled units [Pa]
- A-weighted sound power level for air source units in heating mode at +7 °C [dB(A)]
- P_{sb} [W], $LR_{contmin}$ [-] and $Ccp_{LR_{contmin}}$ [-] in heating mode (Option)

For relevant units (see I.2.2)

- Capacity at $P_{designh}$ [kW]
- Seasonal efficiencies in heating mode (SCOP & $\eta_{s,h}$) [-]
- P_{off} , P_{to} , P_{ck} [W]
- A-weighted sound power level for water-cooled units in heating mode [dB(A)] (Option)

All ratings, *except those for India and Middle East certification*, refer to a fouling factor equal to zero.

A.II.6. Acceptance criteria

When tested by the laboratory selected by ECC, the obtained values shall not differ from the claimed values by more than the acceptance criteria (see Table 24). High deviation leads to penalty tests (see III.1.3.3 Failure treatment).

Table 24: Table of acceptance criteria, intermediate and high deviations

	Acceptance criteria	Intermediate	High deviation
Water Pressure Drop, ΔP	+3 kPa ($\Delta P \leq 20$ kPa)		
	+15% ($\Delta P > 20$ kPa)		
Available Water Pressure, ΔP	-3 kPa ($\Delta P \leq 20$ kPa)		
	-15% ($\Delta P > 20$ kPa)		
Air External Static Pressure	+/- 20%		
LRcontmin	+/- 5% (point)		
CcpLRcontmin	< - 5% (point)		
P_{Coff}	+1 W ($P_{Coff} < 10$ W)		
	+10 % ($P_{Coff} > 10$ W)		
Auxiliaries			
P_{off}			
P_{sb}	+1 W ($P_{aux} < 10$ W)		
P_{to}	+10 % ($P_{aux} > 10$ W)		
P_{ck}			
SCOP (Average Climate)			
Part load A / T_{biv}	< -7%	< -8%	< -11%
Part load B	< -7.6%	< -11%	< -15%
Part load C	< -10.6%	< -16%	< -21%
Part load D	< -22%	< -33%	< -44%
P at T_{biv}	< -7%	< -8%	< -11%
SCOP (Colder Climate)			
Part load A / T_{biv}	< -6.9%	< -10.4%	< -13.5%
Part load B	< -10.1%	< -15.2%	< -20.2%
Part load C	< -14.5%	< -21.8%	< -29%
Part load D	< -29.3%	< -43.9%	< -58.5%
P at T_{biv}	< -6.9%	< -10.4%	< -13.5%
SCOP (Warmer Climate)			
Part load A / T_{biv}	< -7%	< -8%	< -11%
Part load B	< -5%	< -7.5%	< -10%
Part load C	< -6.7%	< -10%	< -13.4%
Part load D	< -12.3%	< -18.5%	< -24.7%
P at T_{biv}	< -7%	< -8%	< -11%

APPENDIX B. FORMS

APPENDIX.B.I. Form LCP-1: Declaration File for certification

The form LCP-1, Declaration File, is sent by ECC to:

- the Applicants, after signing the license agreement,
- the Participants, *for annual update of each campaign or upon request.*

Manufacturing companies (Original Equipment Manufacturer – OEM) shall declare ranges, Basic Model Groups (BMG), performance ratings and technical data. Brand Name (BN) companies shall identify the model names of the *OEM units* equivalent to their units, *with an authorization letter indicating these equivalencies signed by their OEM companies.*

The form is available for the Applicants and Participants in [the restricted area of Eurovent Website](#).

APPENDIX.B.II. Form LCP-2: Technical Data Sheet for the unit to be tested

The form LCP-2, Technical Data Sheet (TDS), *is for the Participants to complete technical details of the unit(s) selected for the tests.*

A template will be available for information and upon request.

APPENDIX.B.III. Form LCP-3: Test Result Sheet for the unit tested

The form LCP-3, Test Result Sheet, shall be sent by ECC to Applicants/Participants together with the test report *issued by the Independent Laboratory. In addition to the results evaluated by ECC, it also shows the units and performances rerated, if any.*

A template will be available for information and upon request.

APPENDIX.B.IV. Form LCP-4: Selection Tool (Software) Precheck Report

The form LCP-4, Selection Tool (Software) Precheck Report, is a checklist which has all generic requirements as per the Certification Manual and the programme specific requirements for the certification of selection tools. It may be used for the qualification procedure (as a precheck list) or the surveillance procedure (for version updates, when required).

A template will be available for information and upon request.

APPENDIX.B.V. Form LCP-5: Selection Tool (Software) Update Record Sheet

The form LCP-5, Selection Tool (Software) Update Record Sheet, shall be submitted by the Participants for each version update of the certified selection tools. *Participants shall indicate the details of modifications affecting the certified performances, if required they shall update their Declaration File. As for editorial modifications (price updates, etc.), Participants can indicate that it is as such.*

A template will be available for information and upon request.

APPENDIX.B.VI. Form LCP-6: Production Site/Sales Office Declaration Form

The form LCP-6, Production Site/Sales Office Declaration Form, shall be filled in by the Applicants and Participants to declare/update their production sites and/or sales offices.

A template will be available for information and upon request.

APPENDIX C. CAMPAIGN SCHEDULE

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

Table 25: Certification Schedule

Beginning of Campaign n	15/12/n-1
ECC asks for the updating of product list	15/12/n-1
Participant confirms the update of product list	15/01/n
Participant sends the selection tool and factory/sales office details	15/01/n
ECC sends the pre-selection	31/01/n
Participant confirms selection list and the number of Witness Test reports to be submitted	28/02/n
ECC sends the official selection	within 2 weeks after the confirmation
Participant declares the component information in the TDS files	within 6 weeks after the official selection
For the units ≤100 kW to be tested in the Independent Laboratory	
Participant submits the filled TDS files and operating procedures	15/06/n
Participant makes the payments/sends the customer orders	15/06/n
Participant delivers the units to the assigned laboratories	15/06/n
For the units >100 kW to be tested in the Independent Laboratory	
Participant submits the filled TDS files and operating procedures	15/09/n
Participant makes the payments/sends the customer orders	15/09/n
Participant delivers the units to the assigned laboratories	15/09/n
For the units >100 kW to be tested in the Participant Laboratory	
Participant submits the filled TDS files and operating procedures	within 6 weeks before the scheduled test date
Participant makes the payments/sends the customer orders	15/09/n
Participant schedules the test dates with the assigned laboratories	15/09/n
Participant submits all the Witness Test reports (see III.1.3.2.b)	31/12/n
Independent Laboratory carries out all the first tests	15/01/n+1
Participant can ask for a second test	within 1 month after the reception of test results
Participant submits the completed TDS files and operating procedures Participant makes the payments/sends the customer orders Participant delivers the units to the assigned laboratories/schedule the test date with the assigned laboratories*	≤100 kW: up to 1 month after the request of 2 nd test >100 kW: up to 3 months after the request of 2 nd test
Independent Laboratory carries out all second tests	15/04/n+1
In case of any failure in the test or witness test reports, Participant modifies their selection tool for all the rerated results and provide the new version to ECC	within 2 months after the reception of the test results
ECC checks the modified software	within 2 weeks after the new version release
In case of any failure, ECC will send a formal notice to the Participant with a resolution deadline of one month. Participant shall modify its selection tool otherwise, can be suspended.	within 1 month after the reception of the formal notice
Certificate is valid until	30/11/n+1

APPENDIX D. CALCULATION METHOD AND IMPLEMENTATION OF MEAN VALUE OF FAILURE (MVF)

APPENDIX.D.I. General

Mean Value of Failure (MVF) is equal, for each Participant, to the ratio between the total numbers of measurements of all the considered characteristics above intermediate deviations and the total performed measurements in the considered years (see Certification Manual).

$$\text{MVF} = \frac{\sum \text{Number of measurements failed with intermediate and/or high deviation}}{\sum \text{Number of measurements performed}}$$

Mean Value of Failure

One global value will be considered. The following tested performances are considered:

- sound power levels
- cooling capacity at full load (P_c)
- heating capacity at full load (P_h)
- EER at full load and part loads
- COP at full load and part loads
- simultaneous cooling and heating capacities for polyvalent units
- TER for polyvalent units

The thresholds to be considered are the intermediate deviations given in Table 22 (A.I.6) and Table 24 (A.II.6).

ECC takes into consideration data of the last three test campaigns of each Participant. If the mean value of failure MVF is higher than 15%, the Participant is suspended from the LCPHP programme until the MVF value comes back under the limit.

APPENDIX.D.II. Notification of being suspended

A Participant, who is going to be suspended, will receive a notification from ECC, with a possible additional selected unit to be tested. The purpose of this additional test is to give the Participant the opportunity to comply with the limits. The response to ECC with confirmation of request for additional testing shall be done within 30 days after this notification, and the unit shall be delivered within 45 days after this notification.

APPENDIX E. SELECTION TOOL (SOFTWARE) CHECK

General selection tool requirements are described in the dedicated appendix and/or articles of the Certification Manual in force. In addition, the following requirements apply.

APPENDIX.E.I. General

The certification of selection tools is mandatory for all the programme participants. A valid selection tool shall be an online, offline, or web-based software (computer programme). Excel files shall not be used as a selection tool. The selection tool is the one used for customers.

Selection tool(s) checks shall be applied during the admission procedure, on-site audits and when required for some certain cases during the surveillance procedure, i.e., checks for rerate corrections or version updates, etc.

The selection tool(s) shall cover all the OEM and BN certified units up to their operating limits: standard chillers used for heating, air conditioning and refrigeration, *polyvalent units*, and heating-only hydronic heat pumps. The options taken by the Participants will be added progressively into the selection tool scope: the process chillers LT and MT.

If declared by the Participant, the units without option and not respecting the EcoDesign limits shall also be available in the selection tool.

ECC certifies the units mentioned above at any condition within their operating maps, on condition that the *brine concentration* is clarified in the printouts by the Participant.

ECC shall verify that the selection tool(s) follow the general requirements defined in the part E.IV.1 and that the performances calculated/displayed as well as the unit characteristics in the selection tool(s) are within the tolerances defined in the part E.IV.3 compared to the tested performances and declared performances and characteristics.

APPENDIX.E.II. Acquisition of the selection tool(s)

During the admission procedure, the *Applicant shall provide the selection tool(s) (with clear name and version)* when submitting the declaration list. For selection tool submittal out of the regular schedule, the requirements defined in APPENDIX.E.VII shall be followed. *Any failure may result in the Applicant receiving formal notice as per the Certification Manual in force.*

All version updates of the certified selection tool shall be declared and provided to ECC, except for the units out of the LCP-HP programme scope, as defined in APPENDIX.B.V with Form LCP-5: Selection Tool (Software) Update Record Sheet

APPENDIX.E.III. Performances to be checked in the selection tool(s)

E.III.1. For Original Equipment Manufacturers (OEM)

Checking for standard conditions:

- Minimum checked units:
 - During the qualification procedure ECC shall check at least the certified performances of each unit tested during the qualification campaign.
 - During the surveillance 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(s).

Note: The units with the performances rerated less than 8 weeks ago are excluded from the minimum checked units.

- Minimum checking per unit:
 - ECC shall check the certified performances of each unit for one application.
 - ECC is entitled to check other applications and other units.

Checking for non-standard conditions:

Among the selected units for testing campaign (qualification or surveillance), some non-standard conditions are chosen by ECC through the selection tool. When possible, minimum two non-standard points will be selected for the same unit.

For a reversible unit, one non-standard point in cooling mode and one non-standard point in heating mode can be selected.

ECC will provide two non-standard conditions for each selected mode (cooling and/or heating), indicate them in the TDS file for the selected unit. The Independent Laboratory assigned for the test will therefore have a chance to directly switch to the other non-standard condition in case the first condition could not be reached. This case will be allowed only for once per a campaign. If there is such a situation, the laboratory will inform ECC. If the laboratory cannot reach any, another condition will be chosen by ECC.

All polyvalent unit tests shall include one test at non-standard condition. For the selected non-standard condition by ECC, the related performances are determined via the selection tool. Preferably a TER test at non-standard condition with full capacity load is added, but it can be cooling-only or heating-only test. The same tolerances given in Table 28 are used.

Until otherwise decided by the Programme Committee, ECC will remove one test at non-standard condition is removed from a regular unit (cooling-/heating-only or reversible) when a test at non-standard condition is added to a polyvalent unit selected for the campaign. This applies on condition that the participant has more than one regular unit which include tests at non-standard conditions, and the number of polyvalent units selected is less than regular units. The number of removed non-standard tests from the regular units cannot exceed the number of polyvalent units selected.

$$N = \min(P, R-1) \quad \text{where} \quad \begin{array}{l} N = \text{maximum number of non-std tests to be removed from regular units} \\ R = \text{number of regular units that include non-std tests} \\ P = \text{number of polyvalent units} \end{array}$$

Checking for the units with options:

Among the units selected for the testing campaign (qualification or surveillance), some units with options are chosen by ECC through the selection tool.

The Participant can provide to ECC a list of ordered units with options among the units in the pre-selection list.

The selected unit with options will be added to the declaration list, but they will not be published. The declared data will be those from the selection tool.

E.III.2. For Brand Name (BN) companies

Minimum checked units:

- The minimum checked units shall be the same as for the last selection tool checking of the corresponding Original Equipment Manufacturer(s).

Minimum checking per unit:

- ECC shall check the certified performances of each unit for one application.
- ECC is entitled to check other applications (including non-standard conditions from OEM tested products) and other units.

E.III.3. For mixed companies (both OEM and BN)

The checked performances and the selection of the units, for which the Applicant/Participant is an OEM, are defined in the previous part E.III.1 (as for OEM).

The checked performances and the selection of the units, for which the Applicant/Participant is a BN, are defined in the previous part E.III.2 (as for BN).

APPENDIX.E.IV. Checking criteria

E.IV.1. General requirements

Scope:

- Each product covered by the Eurovent Certified Performance (ECP) certificate shall be included in one selection tool. The identification of the product(s) shall be possible without ambiguity.
- Each certified brand, commercial range, model name shall be clearly available in the selection tool and in the printouts, as they are certified on the ECC Website.
- Each selection tool shall have only one name and version on the European market.
- All products presented on the commercial documentation shall be available in the selection tool(s).
- If the units or components or functions are out of the scope of the programme, a disclaimer (clear statement/footnote) shall be visible on the corresponding printouts.
- The selection tool shall be able to calculate or display all the certified performances under all the standard and application rating conditions defined in the APPENDIX A, if these conditions are reachable by the unit.

Material and functioning:

- The name and version of selection tool shall be clearly identifiable for no possible confusion between different releases.
- All the units of a same range shall be included in the same selection tool. Only one selection tool is allowed by range. *If a Participant uses more than one selection tool, an entire range can only be available in one tool. The name of the tool in which the range is available shall be indicated in the declaration list for each concerned range.*
- If the selection tool is online, it shall be available on a website with remote access. Other access facilities are only possible in consultation with ECC. The selection tool, when installable, shall be usable under a common operating system.
- The structure of rights and the rights of access to selection tool associated to a password shall be made available to ECC. When rights associated to password can be differentiated, the level of rights given to ECC should be at least equivalent and cover all level of rights given to any kind of customers.
- It shall be possible to run the selection tool as well as its operating manual in English. Outputs shall be delivered at least in English.
- Conditions, characteristics, and performances shall be expressed at least in SI units.
- If any selected option or non-standard condition is out of the operating limits or not operable, an error message is displayed and/or any calculation is blocked by the selection tool. The selection tool could be able to store and restore the selection details in printouts without any alterations of the calculations. It is highly recommended that the output is delivered at least in pdf format. Editable printouts (for example .doc or .xls formats) are allowed as long as one non-editable format is available in the selection tool (for example pdf format).
- After a calculation, the selection tool shall be able to give in the same printout the mandatory input and output data defined above.
- Applicant/Participant shall mention in each page of the printout the following sentence:

“The certified standard performances and the certified software tool version can be verified in www.eurovent-certification.com”.

- Use of the Eurovent Certified Performance (ECP) mark in the selection tool and in the printout shall be in accordance with the Certification Manual (CM).

Input data and output data of the selection tool:

- The minimum requirements for the selection tool input and output data (shall be displayed in the printouts) shall be as given in Table 26.

Table 26: Minimum mandatory data for selection tools

Mandatory input data	<p>Model selection shall be done as allowed by the Certification Manual in force. All the model and commercial range names shall be available in the selection tool as they are declared and certified.</p> <p><u>The operating conditions:</u> For temperatures, the pitch shall be maximum 1 °C, with at least one decimal place. - Air dry bulb temperature (only for air-cooled units) - Air wet bulb temperature* or relative humidity (only for the heating mode of air-cooled units) - Indoor side inlet and outlet water temperature (or adjustable ΔT) For water-cooled units: - Outdoor side inlet and outlet water temperature (or adjustable ΔT) For polyvalent units (TER): - For both cooling and heating side, outlet water temperatures and inlet water temperatures (or adjustable ΔTs) or water flow rates</p>
Mandatory output data	<p>Name of the selected model and its range (in the first page) Unique selection number or name when the printout is separated (in the first page) Selection tool name, and the version to avoid any confusion between releases (in each page) Printout date (in each page) Page numbering with total page number of the printout, i.e., page x of y (in each page) <i>Certified components and</i> selected unit options (such as pump presence, capacity control type, compressor type and number, etc.) shall be clearly available in the printout The following statement shall be available on each page. “The certified standard performances and the certified selection tool version can be verified in www.eurovent-certification.com.” Use of the ECP mark is highly recommended in the printouts for the certified units</p> <p><u>The certified characteristics related to input data:</u> - Type of refrigerant - Voltage, phase, and frequency - Unit dimensions</p> <p><u>The certified performances related to input data:</u> - All the operating conditions given for the input data (<i>if different than 0, brine concentration</i>) - Cooling and/or heating capacity (depending on the product type, i.e., if reversible, both) - EER and/or COP and/or TER (depending on the product type) - Indoor and outdoor side water pressure differences in cooling and/or heating mode - Sound power level in cooling and/or heating mode - Nominal airflow rate in m³/s or m³/h (only for ducted units) - External static pressure (only for ducted units)</p> <p>For the units complying with EU regulations: - SEER / $\eta_{s,c}$ - SCOP / $\eta_{s,h}$ + Sound power level in heating mode - SEPR</p>

* to be linked with the selected dry bulb temperature with the correlation in EN 14511-4:2022 for the tests

The difference between standard and non-standard units is as follows.

Standard unit	Non-standard unit
Product including options available in the selection tool.	Product not available in the selection tool which is ordered specially by the customer (special units).

List of allowed options which can be selected for each unit

- | | |
|--------------------|-----------------|
| - Number of passes | - Type of tubes |
| - Type of fans | - Coating |

- Type of compressor
- Type of the pumps
- Type of refrigerant
- Services valves (expansion valves, etc.)
- Reverse water box
- Type of evaporator/condenser/coil
- Noise options
- All pump options, including no-pump configuration
- Water flow and outlet temperature options

All the options among those above, which cannot operate at required standard rating conditions, are excluded from the certification scope. For example, "number of passes" options are certified up to a number that allow performing the required tests at standard rating conditions.

The following options are excluded:

- Free cooling
- Brine

Note-1: For the units with heat recovery option, a **footnote** shall be available **on the printouts** in order to explain that only the performances, during the heat recovery mode is OFF, are certified by ECC.

Note-2: If optional applications not selected (non-certified) by the Participants, such as SEPR values or sound power level of water-to-water units, are visible in the printouts, there should be a footnote or a clear disclaimer in the printouts to exclude such points from the certified performances.

E.IV.2. Non-conformity cases during certified selection tool checks

*All the **applicants** shall fulfil all the requirements of selection tool certification with identical performances and characteristics as provided in their documents and declaration list. However, during the checks of already certified selection tools, website and documents, the non-conformities are split as below depending on the cases.*

a. Critical non-conformities: *They are the cases given below which are against the major certification rules defined in this TCR and in the Certification Manual in force. The resolution deadlines following the formal notice shall be in line with the Certification Manual in force.*

- misuse of ECP mark and infringement of certify-all
- performances deviated more than the tolerances defined in Table 27 (until 2025 campaign)
- inconsistency of the unit characteristics
- missing disclaimers, footnotes

b. Non-critical non-conformities: *They are the self-penalising cases for the participant which do not cause any critical non-conformity defined above. The resolution deadlines will be defined by ECC and to be between eight weeks and one year.*

- where they cannot promote their certified units via selection tool, such as, missing range/unit/function/option in the certified selection tool,
- performances deviated within the tolerances defined in Table 27 (until 2025 campaign)

Table 27: Tolerances for certified selection tool checks (until 2025 campaign)

Checked parameter	Tolerance
Nominal capacity, efficiency, SEPR	+/- 2% of the certified value
Pressure difference	
Acoustic performances, $\eta_{s,c}$, $\eta_{s,h}$	rounded value of each shall be identical
SEER, SCOP	calculated and rounded η shall be identical as the rounded value of certified η

E.IV.3. Requirements for performances

a. For standard conditions and units with options:

No tolerance between declared value and value provided by the selection tool.

b. For non-standard conditions and units with options:

For any non-standard condition within the restricted map below, with a standard ΔT : The same tolerances defined for the tests at standard conditions are applied.

For any non-standard condition out of the restricted map below or any condition with a ΔT different than the allowed ones in Table 28: A tolerance of 10% is used for the tested capacity and efficiencies.

Table 28: Non-standard conditions/units with options within the restricted map

Heating mode

Type of unit	Application	Indoor Exchanger		Outdoor Exchanger		
		Outlet (Pitch: 1 K)	ΔT (Pitch: 1 K)	Inlet (Pitch: 1 K)	Outlet (Pitch: 1 K)	ΔT (Pitch: 1 K)
Air-to-water	Low Temperature	35°C + 5	5	7 °C + 3	-	-
	Intermediate Temp.	45°C +/-5	5			
	Medium Temp.	55°C +/-5	8			
	High Temperature	65°C +/-5	10			
Water-to-water	Low Temperature	35°C +5	5	-	7 °C +/-3	3
	Intermediate Temp.	45°C +/-5	5			
	Medium Temp.	55°C +/-5	8			
	High Temperature	65°C +/-5	10			

Cooling mode

Type of unit	Application	Indoor Exchanger		Outdoor Exchanger	
		Inlet (Pitch: 1 K)	ΔT (Pitch: 1 K)	Inlet (Pitch: 1 K)	ΔT (Pitch: 1 K)
Air-Cooled	Air Conditioning	12 °C +/- 3 ^(a)	5	35 °C +/- 3	-
	Cooling Floor	23°C +/- 2			
Water-Cooled	Air Conditioning	12 °C +/- 3 ^(a)	5	30 °C +/- 5	5
	Cooling Floor	23 °C +/-2			

(a) Non-standard condition already tested in the programme.

APPENDIX.E.V. Reports and printouts

For standard conditions:

After the checking, ECC shall transmit to the Applicant/Participant the checking reports and the associated printouts as pdf files.

For non-standard conditions:

The deviation is calculated as the difference between claimed value, calculated using the selection tool under the requested conditions, and the result of the test conducted in the independent laboratory or Participant Laboratory. When completed, ECC shall transmit to the Applicant/Participant the test report(s) of the tested unit(s), including the associated printout(s) as pdf files.

If all deviations are inside the allowed acceptance criteria, the test is considered as “Passed”. If at least one deviation is out of the corresponding acceptance criteria, the test is considered as “Failed” and the procedure for treatment shall be applied.

For the units with options:

The current process for standard units is applicable.

APPENDIX.E.VI. Failure treatment

Standard penalties (penalty tests and MVF) should be applied.

For all the type of units, in case of failure during the test, the selection tool shall be adjusted in accordance with the test report in two months following the reception of the test results. There are 2 rechecks:

- In case of failure during the recheck (1), the Participant shall correct and send to ECC the corrected version two months after the reception of the results. The Participant can lose points.
- In case of failure during the recheck (2), the PA can be suspended.

The rerating rules to be applied for the different test and unit type are given in Table 29.

Table 29: Rerating rules in case of a failure

	Standard unit	Standard unit with options
Standard condition	Rerate per range	Rerate per range
Non-standard condition	The tested unit only	The tested unit only

APPENDIX.E.VII. Release of selection tool out of the regular schedule

The Participants shall send any new release to their client managers appointed by ECC. For this purpose, the Participant shall use the 'Software Update Record Sheet' and submit it to ECC with an anticipated release date of the new version. All the modifications affecting the certified performances and characteristics, and editorial modifications related to the general software requirements shall be mentioned in that report.

If possible, ECC will certify the new version as soon as it is released and then apply the software check within 2 weeks following its release at the latest, when the modifications affect the certified performances. In such cases, with the submittal of the 'Software Update Record Sheet', the Participant shall submit their updated declarations such that they are in line with the selection tool.

In case a non-conformity noticed during the checks after the new version release, a formal notice shall be sent to the Participant with a resolution period of 4 weeks and the selection tool might be withdrawn from the certificate and ECC Website.

ECC shall update the certified version on the ECC Website without additional cost.

After the analysis of this synthesis about the modifications made on the selection tool, ECC shall be entitled to make additional verifications.

If non-conformities are found in the first check of a selection tool, the Participant shall update its selection tool within 12 weeks (16 weeks for Brand Name).

In case a Participant declares a new model and/or new range, the rules below apply regarding the selection tools.

- All the units with **DVP** status in the declaration files shall be available in the selection tools once their production starts.
- As all the new units/ranges will be certified with 'New' status when declared by the Participant (the ones which do not require a qualification procedure), they shall be available in the selection tools as soon as they are declared.
- The 6-week period above, will be granted only for the Brand Name units/ranges to be added to the declaration lists. For all the other new declarations, participants shall ensure that new units/ranges are available in the selection tool before their declarations.

APPENDIX F. TESTING IN PARTICIPANT LABORATORY

APPENDIX.F.I. Introduction

Under the suitable condition defined in III.1.3.3, 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. Independent laboratories, who have dedicated personnel for this purpose, are as follows.

- CETIAT, Lyon (France)
- DMT, Essen (Germany)
- IMQ S.p.A., Amaro (Italy)

The test agency is requested to install its own instruments (apart from the calibrated nozzles of participant laboratories for the tests of ducted air-cooled units) and to carry out the complete test under its own responsibility. The Participant's personnel are 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 laboratory are considered by ECC.

APPENDIX.F.II. Basic outline of the procedure

The following procedure shall be applied by assigned responsible for each step. In addition to the given basic outline below, test methods, standard/seasonal performance ratings shall be *as defined in this document*.

- Application for "Approval of Compliance" to ECC by Participant Laboratory
- Approval of Participant Laboratory by the Independent Laboratory assigned by ECC
- Selection of the unit to be tested and the test conditions by ECC
- Assigning of the Independent Laboratory by ECC
- Direct contact to be established between Participant Laboratory and Independent Laboratory by Participant Laboratory for scheduling
- Test date to be agreed between Participant and Independent Laboratory according to the campaign schedule
- Participant to provide the selected Independent Laboratory with all the required information concerning test installation
- The Independent Laboratory to provide detailed request for the following preparations to be executed by Participant Laboratory:
 1. Connection of water flow meters
 2. Adaptor for temperature probes
 3. Adaptor for pressure transducers
- Installation and start-up of the unit to be tested by Participant according to the test schedule
- Participant Laboratory to get prepared for the selected testing conditions
- On the agreed date of test, Independent Laboratory installs its own instruments
- Tests are conducted as required in accordance with the related standards

In addition to the above shared points, Participant Laboratory is responsible to get prepared for the test conditions selected by ECC and similarly is also responsible to know test methods and procedures and to calculate required corrections *as defined in standards given in this document*.

It is highly recommended that the Participant and Independent Laboratory to keep record for the detailed timing of arrival and leaving of the independent laboratory, installation, and testing of the unit(s), and that both mutually agree upon that log.

For **double measurement purpose**, a unit is specifically selected by ECC among the units to be tested in Participant Laboratory. During the thermal tests of this unit, the raw parameters given on Table 30 shall be measured with the measuring instruments of the Participant Laboratory and independent laboratory. Both tests shall be conducted by independent laboratory. Two reports are generated by Participant Laboratory and independent laboratory separately, and they are submitted to ECC. These test reports are evaluated and compared each other by ECC, by using the acceptance criteria given below to validate the results and to check the conformity of Participant Laboratory's results. In case of any non-conformity, a proposal for a corrective action shall be provided to ECC by the Participant.

For double measurement, each raw parameter is measured with one or more measuring probes over a data acquisition period of the thermal tests. If there are more than one probes for one raw parameter, the recordings of them shall be averaged to be submitted on the reports. All further calculations shall not be allowed, except for wet bulb temperature, if required.

If the deviation of efficiency values (EER/COP) is within the tolerance corresponding to the application as defined in Technical Appendices APPENDIX A, the failure on the electrical parameters will be negligible.

Table 30: Acceptance criteria for raw parameters

Raw Parameters	Unit	Acceptance Criteria [+/-]
WATER HEAT EXCHANGER		
Liquid temperatures inlet/outlet	°C	0,15
Liquid temperature difference	°C	0,2
Liquid volume flow	m³/s	1,40%
Liquid static pressure difference (≤ 20 kPa)	kPa	1,4
Liquid static pressure difference (> 20 kPa)	kPa	7,00%
AIR HEAT EXCHANGER		
Dry bulb temperature	°C	0,3
Wet bulb temperature	°C	0,6
Air volume flow (for ducted units)	m³/s	7,00%
Static pressure difference (≤ 100 Pa)	Pa	7
Static pressure difference (> 100 Pa)	Pa	7,00%
ELECTRICAL PARAMETERS		
Power	W	1,40%
Voltage	V	0,70%
Current	A	0,70%

APPENDIX.F.III. Detailed procedure

F.III.1. 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 and based on the double measurement results.

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. If the Participant has no failure in the last double measurement results of the Participant Laboratory used for a surveillance test, the capacity tested during a valid Witness Test, can be used to increase the maximum capacity of this laboratory in its Approval of Compliance document. The same rounding rule above applies.

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.

For the airflow measurement on the ducted units (indoor and/or outdoor), if a calibration certificate, established by an accredited laboratory, of the complete measurement chain of the Participant is provided to ECC:

- this certificate shall include the following elements in order to be accepted:
 - for each checking point: Participant's airflow measurement, test agency's airflow measurement, relative deviation, temperature, relative humidity, pressure drop across **the nozzles** measured by the Participant ³.
 - for all checking points the relative deviation between the airflow rate measured by the Participant 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 14511-3:2022.

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).

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.*

F.III.2. Organisation 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.

³ For air-cooled units, ducted outdoor

The test agency shall provide detailed request for the following preparations 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. The test is then performed under full responsibility of the test agency.

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

It is highly recommended that the Participant and the Independent Laboratory shall keep a separate log for the timing of test(s) and have an agreement on that if additional working hour is required.

APPENDIX G. REMOTE TESTING PROCEDURE

This procedure includes the conditions and the requirements for using the remote testing method in the participant laboratory which already has a valid Approval of Compliance document. The application always requires the approval of ECC and the independent laboratory. Available independent laboratories for the application of this procedure are CETIAT and DMT.

APPENDIX.G.I. Conditions

In case of force majeure (e.g., accidents, labour disputes, natural events, acts of war) which would not allow the independent laboratory to travel and to perform the tests in the Participant laboratories, ECC can either ask the Participant to send selected unit(s) to the independent laboratories, for this purpose selection may be changed by ECC, or choose remote testing method for the completion of the tests.

The communication about remote testing always shall be between ECC and the independent laboratory prior to inform the Participant. Once confirmed by ECC, the Participant shall be informed.

If any of the requirements is not met, ECC shall be notified in advance by the Participant and the independent laboratory.

APPENDIX.G.II. Requirements for the Participant

In the participant laboratory, testing area needs to be covered by **constant and stable 4G (or higher), Wi-Fi or other network connection**. The recommended connection characteristics is above 1.2 Mbit/s.

The Participant shall have;

- **a mobile video and audio platform** for the preliminary checks. It will be used to visit the laboratory, to validate the test installation, to check the instrument set up (participant and independent laboratory). It shall have the ability to take and send screen shots with time stamps. During the tests, this equipment shall also be used for discussions, explanations on how to proceed with the independent laboratory's instruments, and document exchange.
- **a webcam dedicated to show the unit under test**. If applicable, the independent laboratory shall have a full control on the direction of this video equipment.
- **a laptop or desktop computer** which shall be used only to share the 'data acquisition system' of the Participant. It shall allow continuously the independent laboratory to follow up the entire completion of tests by screen sharing.
- **an additional wired internet connection** in the testing area for independent laboratory's laptop which shall be used by the independent laboratory to control its own data acquisition system.

APPENDIX.G.III. Requirements for the Independent Laboratory

The independent laboratory shall check each point (unit inspection, calibration certificates, etc.) which is checked during the Participant Laboratory tests.

All the instruments (power meters, transmitters, data acquisition system, laptop, etc.) which are brought by the independent laboratory for the regular Participant Laboratory testing shall be sent to the participant laboratory. In case the independent laboratory cannot send its acoustic measuring devices to the participant laboratory, ECC shall be notified prior to the decision of the remote testing.

The test reports issued by the independent laboratories shall have a statement or a logo which indicates the reports are accredited. For all contrary cases, ECC shall be informed.

APPENDIX.G.IV. Procedure

Once the procedure accepted to be applied, the scheduling process shall be the same as the testing in the participant laboratories. All the following procedure shall be followed by the independent laboratory assigned for the test and the Participant.

G.IV.1. Measuring devices of the Independent Laboratory

The independent laboratory shall send its instrumentation kit to the Participant in advance, on the scheduled date. The Participant shall set up the test equipment according to instructions of the independent laboratory and confirm the installation details by photo or video with the independent laboratory.

G.IV.2. Preliminary checks before tests

Maximum 2 days after the delivery of the independent laboratory's instrument at the participant laboratory, and before the effective test starting date, the Participant shall organize a "preliminary checks" session with the independent laboratory. The purpose is to check the quality of the connection of all required specific tools listed in APPENDIX.G.II and to ensure that the unit label and its settings are coherent with the declarations on the TDS file by a real-time inspection of the unit.

G.IV.3. Remote testing process

The Participant shall send all required test documents per the TCR to the independent laboratory and ECC for confirmation before testing and guide the independent laboratory's representative(s) to review the test setup.

Photos of the test setup shall be taken at all angles, and all equipment involved in the setup shall also be photographed.

The Participant shall guide the independent laboratory's representative(s) to review calibration stickers and the photos of all the accessible calibration stickers shall be taken.

The Participant shall notify the independent laboratory's representative(s) when the test conditions have been met. The fulfilment of all requirements of tolerances and steady-state conditions will also be checked by the independent laboratory.

When the testing conditions are met, the independent laboratory announces the beginning of the data acquisition period to the Participant. A screenshot of the stable test condition shall be provided by the Participant and recorded by the independent laboratory. All the parameters measured during the tests shall be followed by the independent laboratory via remote connection

After the test period is completed, all relevant test data are analysed by the independent laboratory (on their own data acquisition system). If the data is validated by the independent laboratory, the test may be completed, and moved to the next test point. If the data is invalid or significant video conference interruptions occur, the test shall restart following this procedure.

G.IV.4. Daily working times

Each independent laboratory and participant laboratory shall respect its National Law in terms of daily working hours. Time constraints shall be shared between the participant laboratory and the independent laboratory prior to the test. In case the working hours exceeded in a day, the price of additional working hours might be charged

APPENDIX.G.V. Responsibility and management of the instrumentation kit

G.V.1. Delivery of the instrumentation kit of the Independent Laboratory at the Participant Laboratory

The Participant shall inform the independent laboratory by email on the day the instrumentation kit is delivered in its Lab. The Participant shall take a picture with time stamp of the parcel closed (as delivered) and opened. The Participant shall also check visually that no instrument was damaged during transport.

G.V.2. Packaging, collection, and shipment of the instruments back to the Independent Laboratory

After the end of the tests, the Participant shall pack the instrumentation the way it was packed in the first place. The Participant shall send pictures with time stamps of the parcel before and after its locking, just before the shipment.

After the end of the tests, the Participant shall have a limited period to send back the parcel which will be determined by the assigned independent laboratory.

G.V.3. Damages and loss

Shall any damage or loss occur to any piece of equipment belonging to the independent laboratory between the arrival and departure of instruments at the Participant Lab, all responsibility shall be held by the Participant.



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