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Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors

Part 2: Test conditions

National foreword

This British Standard is the UK implementation of [EN 14511-2:2022](#) and supersedes [BS EN 14511-2:2018](#), which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee RHE/17, Testing of air conditioning units.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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English Version

Air conditioners, liquid chilling packages and heat pumps
for space heating and cooling and process chillers, with
electrically driven compressors - Part 2: Test conditions

Climatiseurs, groupes refroidisseurs de liquide
et pompes à chaleur pour le chauffage et le
refroidissement des locaux et refroidisseurs
industriels avec compresseur entraîné par
moteur électrique - Partie 2 : Conditions d'essai

Luftkonditionierer, Flüssigkeitskühlsätze und
Wärmepumpen für die Raumbeheizung und
-kühlung und Prozess-Kühler mit elektrisch
angetriebenen Verdichtern - Teil 2: Prüfbedingungen

This European Standard was approved by CEN on 10 July 2022.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Annex ZA
(informative)

Relationship between this European Standard and the ecodesign requirements of Commission Regulation (EU) No 2015/1095 aimed to be covered

This European Standard has been prepared under a Commission's standardization request M/495 of 27th July 2011 Amendment N°1 of 30th September 2013 (Annex B of M/495) to provide one voluntary means of conforming to the ecodesign requirements of Commission Regulation (EU) 2015/1095 of 5 May 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers.

Once this standard is cited in the Official Journal of the European Union under that Regulation, compliance with the normative clauses of this standard given in [Table ZA.1](#) confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding ecodesign requirements of that Regulation and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and Commission Regulation (EU) 2015/1095 of 5 May 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers and Commission's standardisation request M/495 and Amendment N°1

Ecodesign requirements of Commission Regulation (EU) No 2015/1095	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
Annex VIII	Table 25	

WARNING 1 Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 Other Union legislation may be applicable to the products falling within the scope of this standard.

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European foreword

This document ([EN 14511-2:2022](#)) has been prepared by Technical Committee CEN/TC 113 “Heat pumps and air conditioning units”, the secretariat of which is held by UNE.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2023, and conflicting national standards shall be withdrawn at the latest by March 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 14511-2:2018.

The main changes compared with EN 14511-2:2018 are as follows:

- update of normative references;
- deletion of Annex ZB on the relationship with Commission Regulation (EU) No 206/2012.

This document has been prepared in the frame of:

- Commission Regulation (EU) No 206/2012 of 6 March 2012 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for air conditioners and comfort fans;
- Commission Delegated Regulation (EU) No 626/2011 of 4 May 2011 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of air conditioners;
- Commission Regulation (EU) No 813/2013 of 2 August 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for space heaters and combination heaters;
- Commission Delegated Regulation (EU) No 811/2013 of 18 February 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of space heaters, combination heaters, packages of space heater, temperature control and solar device and packages of combination heater, temperature control and solar device;
- Commission Regulation (EU) 2015/1095 of 5 May 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers;
- Commission Regulation (EU) 2016/2281 of 30 November 2016 implementing Directive 2009/125/EC of the European Parliament and of the Council establishing a framework for the setting of ecodesign requirements for energy-related products, with regard to ecodesign requirements for air heating products, cooling products, high temperature process chillers and fan coil units.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Regulation(s).

For relationship with Regulation(s), see informative [Annex ZA](#), which is an integral part of this document.

[EN 14511](#), *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors*, currently comprises the following parts:

- *Part 1: Terms and definitions;*
- *Part 2: Test conditions;*
- *Part 3: Test methods;*

— *Part 4: Requirements.*

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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1 Scope

1.1 The scope of [EN 14511-1:2022](#) is applicable.

1.2 This document specifies the test conditions for the rating of air conditioners, liquid chilling packages and heat pumps, using either, air, water or brine as heat transfer media, with electrically driven compressors when used for space heating and/or cooling. The document also specifies the test conditions for the rating of air-cooled and water(brine)-cooled process chillers.

1.3 This document specifies the conditions for which performance data are to be declared for single duct and double duct units for compliance to the Ecodesign Regulation 206/2012 and Energy Labelling Regulation 626/2011.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

[EN 14511-1:2022](#), *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers with electrically driven compressors — Part 1: Terms and definitions*

[EN 14511-4:2022](#), *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors — Part 4: Requirements*

[EN 15218:2013](#), *Air conditioners and liquid chilling packages with evaporatively cooled condenser and with electrically driven compressors for space cooling — Terms, definitions, test conditions, test methods and requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in [EN 14511-1:2022](#) apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Test conditions

4.1 Environmental conditions and electrical power supply requirements

The tests shall be carried out under the environmental conditions specified in [Table 1](#) or [Table 2](#) depending on the location of the unit.

For all units, electrical power voltage and frequency shall be given by the manufacturer.

Table 1 — Environmental conditions for units designed for installation indoors

Type	Measured quantities	Rating test
Water(brine)-to-water(brine) units	Dry bulb temperature	15 °C to 30 °C
Air-to-water(brine) units with duct connection on the air inlet and outlet side	Dry bulb temperature	15 °C to 30 °C

Type	Measured quantities	Rating test
Air-to-water(brine) units without duct connection on the air inlet side	Dry bulb temperature Wet bulb temperature	15 °C to 30 °C
Water(brine)-to-air units with duct connection on the air inlet and outlet side	Dry bulb temperature	15 °C to 30 °C
Water(brine)-to-air units without duct connection on the air inlet and outlet side	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Table 5 or Table 6)
Air-to-air units with duct connection on the outdoor air inlet and outlet side	Dry bulb temperature	15 °C to 30 °C
Air-to-air units without duct connection on the outdoor air inlet and outlet side	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Table 3 or Table 4)
Air-cooled process chillers ducted on the air side	Dry bulb temperature	15 °C to 30 °C
Water(brine)-cooled process chillers	Dry bulb temperature	15 °C to 30 °C

Table 2 — Environmental conditions for units designed for installation outdoors

Type	Measured quantities	Rating test
Air-to-water(brine) units	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Tables 12 to 16)
Water(brine)-to-air units without duct connection on the air inlet side	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Table 5 or Table 6)
Water(brine)-to-water(brine) units operating in cooling mode	Dry bulb temperature	15 °C to 30 °C
Water(brine)-to-water(brine) units operating in heating mode	Dry bulb temperature	0 °C to 7 °C
Air-to-air units with duct connection on the indoor air inlet and outlet side	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Table 3 or Table 4)
Air-cooled process chillers (non-ducted on the air side)	Dry bulb temperature Wet bulb temperature	Inlet temperature (see Table 25)
Water(brine)-cooled process chillers	Dry bulb temperature	15 °C to 30 °C

4.2 Rating conditions

For the rating tests, the appropriate test conditions shall be applied in accordance with:

- [Table 3](#) for air-to-air units in heating mode;
- [Table 4](#) for air-to-air units in cooling mode;
- [Table 5](#) for water(brine)-to-air units in heating mode;
- [Table 6](#) for water(brine)-to-air units in cooling mode;
- [Tables 7 to 10](#) for water(brine)-to-water(brine) units in heating mode, depending on the temperature applications;
- [Table 11](#) for water(brine)-to-water(brine) units in cooling mode;
- [Tables 12 to 15](#) for air-to-water(brine) in heating mode, depending on the temperature applications;
- [Table 16](#) for air-to-water(brine) units in cooling mode;
- [Table 17](#) for liquid chilling packages with remote condenser;

- [Table 18](#) for liquid chilling packages for heat recovery condenser;
- [Table 19](#) for air-cooled multisplit systems and modular air-cooled multisplit systems in the heating mode;
- [Table 20](#) for air-cooled multisplit systems and modular air-cooled multisplit systems in the cooling mode;
- [Table 21](#) for modular heat recovery air-cooled multisplit systems;
- [Table 22](#) for water-cooled multisplit systems and modular water-cooled multisplit systems in the heating mode;
- [Table 23](#) for water-cooled multisplit systems and modular water-cooled multisplit systems in the cooling mode;
- [Table 24](#) for modular heat recovery water-cooled multisplit systems.
- [Table 25](#) for process chillers

For units with brine, the test shall be carried out with the brine specified by the manufacturer, see [EN 14511-4:2022](#), 6.2.1.

For air-to-water(brine), and water(brine)-to-water(brine) heat pumps, the manufacturer may declare the water(brine) temperatures levels (low, intermediate, medium, and high) applicable to the heating mode.

NOTE For comparison purposes between reverse cycle and non-reverse cycle units, the conditions on water(brine) are given by the inlet and outlet temperatures, possibly leading to different flow rates in heating and cooling modes.

The rating tests in heating mode also apply to units having evaporatively cooled condenser, whose performance in cooling mode is determined in accordance with [EN 15218:2013](#), and which can operate in heating mode.

The standard rating conditions, extracted from [Table 3](#) for heating mode, shall be used to determine the rated capacity (P_{rated}), the rated power input (P_{COP}), the rated coefficient of performance (COP_{rated}) and the electricity consumption (Q_{DD} , Q_{SD}) in heating mode.

Table 3 — Air-to-air units - Heating mode

		Outdoor heat exchanger		Indoor heat exchanger	
		Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C
Standard rating conditions	Outdoor air / recycled air ^a	7	6	20	15 max
	Exhaust air / recycled air ^b	20	12	20	12
	Exhaust air / outdoor air	20	12	7	6
Application rating conditions	Outdoor air / recycled air ^a	2	1	20	15 max.
	Outdoor air / recycled air ^a	-7	-8	20	15 max.
	Outdoor air / recycled air ^a	-15	—	20	15 max.
	Outdoor air / recycled air ^a	12	11	20	15 max.
	Exhaust air / outdoor air	20	12	2	1
	Exhaust air / outdoor air	20	12	-7	-8
^a For example, window, double duct, split units					
^b For example, single duct units					

Table 4 — Air-to-air units - Cooling mode

		Outdoor heat exchanger		Indoor heat exchanger	
		Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C
Standard rating conditions	Outdoor air / recycled air ^a	35	24 ^b	27	19
	Exhaust air / recycled air	27	19	27	19
	Exhaust air / outdoor air	27	19	35	24
	Single duct ^{c,d}	35	24	35	24
	Control cabinet	35	24	35	24
	Close control	35	24	24	17
Application rating conditions	Outdoor air / recycled air ^a	27	19 ^b	21	15
	Single duct ^{c,d}	27	19	27	19
	Outdoor air / recycled air ^a	46	24 ^b	29	19
	Control cabinet	50	30	35	24
	Close control	27	19	21	15

^a For example, window, double duct, split units

^b The wet bulb temperature condition is not required when testing units which do not evaporate condensate.

^c When using the calorimeter room method, pressure equilibrium between indoor and outdoor compartments shall be obtained by introducing into indoor compartment, air at the same rating temperature conditions.

^d The pressure difference between the two compartments of the calorimeter room shall not be greater than 1,25 Pa. This pressure equilibrium can be achieved by using an equalizing device or by creating an open space area in the separation partition wall, which dimensions shall be calculated for the maximum airflow of the unit to be tested. If an open space is created in the partition wall, an air sampling device or several temperature sensors shall be used to measure the temperature of the air from the outdoor compartment to the indoor compartment.

Table 5 — Water(brine)-to-air units - Heating mode

		Outdoor heat exchanger		Indoor heat exchanger	
		Inlet temperature °C	Outlet temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C
Standard rating conditions	Water ^a	10	7	20	15 max.
	Brine	0	-3	20	15 max.
	Water loop	20	17	20	15 max.
Application rating conditions	Water(brine)	15	b	20	15 max.
	Brine	10	b	20	15 max.
	Water(brine)	5	b	20	15 max.
	Brine	-5	b	20	15 max.

^a The term “water” includes indifferently water from a river or a lake, ground water.

^b The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the inlet temperature.

Table 6 — Water(brine)-to-air units - Cooling mode

		Outdoor heat exchanger		Indoor heat exchanger	
		Inlet temperature °C	Outlet temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C
Standard rating conditions	Cooling tower or water loop	30	35	27	19
	Ground coupled (water or brine)	10	15	27	19
	Control cabinet	15	20	35	24
	Close control	30	35	24	17
Application rating conditions	Cooling tower or water loop	40	a	27	19
	Ground coupled (water or brine)	15	a	27	19
	Close control	15	a	21	15
	Close control	40	a	24	17

^a The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the inlet temperature.

Table 7 — Water(brine)-to-water(brine) units - Heating mode (Low temperature)

		Outdoor heat exchanger		Indoor heat exchanger low temperature application	
		Inlet temperature °C	Outlet temperature °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	Water ^a	10	7	30	35
	Brine	0	-3	30	35
Application rating conditions	Water(brine)	15	b	c	35
	Brine	10	b	c	35
	Water(brine)	5	b	c	35
	Brine	-5	b	c	35

^a The term “water” includes indifferently water from a river or a lake, ground water or water in a close water loop.

^b The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the inlet temperature.

^c The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the outlet temperature.

Table 8 — Water(brine)-to-water(brine) units - Heating mode (Intermediate temperature)

		Outdoor heat exchanger		Indoor heat exchanger intermediate temperature application	
		Inlet temperature °C	Outlet temperature °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	Water ^a	10	7	40	45
	Brine	0	-3	40	45

		Outdoor heat exchanger		Indoor heat exchanger intermediate temperature application	
		Inlet temperature °C	Outlet temperature °C	Inlet temperature °C	Outlet temperature °C
Application rating conditions	Water(brine)	15	b	c	45
	Brine	10	b		45
	Water(brine)	5	b	c	45
	Brine	-5	b	c	45

a The term “water” includes indifferently water from a river or a lake, ground water or water in a close water loop.

b The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the inlet temperature.

c The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the outlet temperature.

Table 9 — Water(brine)-to-water(brine) units - Heating mode (Medium temperature)

		Outdoor heat exchanger		Indoor heat exchanger medium temperature application	
		Inlet temperature °C	Outlet temperature °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	Water ^a	10	7	47	55
	Brine	0	-3	47	55
Application rating conditions	Water(brine)	15	b	c	55
	Brine	10	b	c	55
	Water(brine)	5	b	c	55
	Brine	-5	b	c	55

a The term “water” includes indifferently water from a river or a lake, ground water or water in a close water loop.

b The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the inlet temperature.

c The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the outlet temperature.

Table 10 — Water(brine)-to-water(brine) units - Heating mode (High temperature)

		Outdoor heat exchanger		Indoor heat exchanger High temperature application	
		Inlet temperature °C	Outlet temperature °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	Water ^a	10	7	55	65
	Brine	0	-3	55	65
Application rating conditions	Water(brine)	15	b	c	65
	Brine	10	b	c	65
	Water(brine)	5	b	c	65
	Brine	-5	b	c	65

	Outdoor heat exchanger		Indoor heat exchanger High temperature application	
	Inlet temperature °C	Outlet temperature °C	Inlet temperature °C	Outlet temperature °C
<p>a The term “water” includes indifferently water from a river or a lake, ground water or water in a closed water loop.</p> <p>b The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the inlet temperature.</p> <p>c The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the outlet temperature.</p>				

Table 11 — Water(brine)-to-water(brine) heat pumps, water-cooled and brine-cooled comfort chillers - Cooling mode

		Outdoor heat exchanger		Indoor heat exchanger	
		Inlet temperature °C	Outlet temperature °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	Water(brine)-to-water(brine)	30	35	12	7
	Water(brine)-to-water(brine) for mild temperature applications	30	35	23	18

Table 12 — Air-to-water(brine) units - Heating mode (Low temperature)

		Outdoor heat exchanger		Indoor heat exchanger Low temperature application	
		Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	Outdoor air	7	6	30	35
	Exhaust air	20	12	30	35
Application rating conditions	Outdoor air	2	1	a	35
	Outdoor air	-7	-8	a	35
	Outdoor air	-15	—	a	35
	Outdoor air	12	11	a	35

a The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the outlet temperature.

Table 13 — Air-to-water(brine) units - Heating mode (Intermediate temperature)

		Outdoor heat exchanger		Indoor heat exchanger intermediate temperature application	
		Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	Outdoor air	7		40	45
	Exhaust air	20	12	40	45
Application rating conditions	Outdoor air		1	a	45
	Outdoor air	-7	-8	a	45
	Outdoor air	-15	—	a	45
	Outdoor air	12	11	a	45

^a The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the outlet temperature.

Table 14 — Air-to-water(brine)units - Heating mode (Medium temperature)

		Outdoor heat exchanger		Indoor heat exchanger medium temperature application	
		Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	Outdoor air	7	6	47	55
	Exhaust air	20	12	47	55
Application rating conditions	Outdoor air	2	1	a	55
	Outdoor air	-7	-8	a	55
	Outdoor air	-15	—	a	55
	Outdoor air	12	11	a	55

^a The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the outlet temperature.

Table 15 — Air-to-water(brine) units - Heating mode (High temperature)

		Outdoor heat exchanger		Indoor heat exchanger High temperature application	
		Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	Outdoor air	7	6	55	65
	Exhaust air	20	12	55	65
Application rating conditions	Outdoor air	2	1	a	65
	Outdoor air	-7	-8	a	65
	Outdoor air	-15	—	a	65
	Outdoor air	12	11	a	65

^a The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the outlet temperature.

Table 16 — Air-to-water(brine) units - Cooling mode

		Outdoor heat exchanger		Indoor heat exchanger	
		Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	Water(brine)	35	—	12	7
	Water(brine) for mild temperature applications	35	—	23	18
Application rating conditions	Water(brine)	27	—	a	7
	Water(brine) for mild temperature applications	27	—	a	18
	Water(brine)	16	—	a	7

^a The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the outlet temperature.

Table 17 — Liquid chilling packages with remote condenser

		Indoor heat exchanger		Refrigerant side	
		Inlet temperature °C	Outlet temperature °C	Saturated liquid bubble point temperature °C	Liquid temperature °C
Standard rating conditions	Water(brine)-to-water(brine)	12	7	45	40
	Water(brine)-to-water(brine) for mild temperature applications	23	18	45	40
Application rating conditions	Water(brine)-to-water(brine)	a	7	35	30
	Water(brine)-to-water(brine) for mild temperature applications	a	18	35	30

^a The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the outlet temperature.

Table 18 — Liquid chilling packages with heat recovery condenser

	Condenser		Evaporator		Heat recovery water heat exchanger	
	Air inlet dry bulb temperature ^a °C	Water inlet temperature ^b °C	Water outlet temperature (e.g. for fan coil units) °C	Water outlet temperature (e.g. for chilled beams) °C	Inlet temperature °C	Outlet temperature °C
Standard rating conditions	35	30	7 °C	18 °C	40	45

	Condenser		Evaporator		Heat recovery water heat exchanger	
	Air inlet dry bulb temperature ^a °C	Water inlet temperature ^b °C	Water outlet temperature (e.g. for fan coil units) °C	Water outlet temperature (e.g. for chilled beams) °C	Inlet temperature °C	Outlet temperature °C
<p>^a If the air-cooled condenser is ducted then the test shall be conducted at the minimum flow rate specified by the manufacturer.</p> <p>^b At the minimum flow rate specified by the manufacturer.</p> <p>^c With the flow rate as determined during the test at the corresponding standard rating conditions (see Table 11 or Table 16).</p>						

Table 19 — Heating capacity conditions for air-cooled multisplit systems

	Outdoor heat exchanger		Indoor heat exchanger	
	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C
Standard rating conditions	7	6	20	15 max.
Application rating conditions	2	1	20	15 max.
	-7	-8	20	15 max.
	12	11	20	15 max.
	-15	—	20	15 max.

Table 20 — Cooling capacity conditions for air-cooled multisplit systems

	Outdoor heat exchanger		Indoor heat exchanger	
	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C
Standard rating conditions	35	24 ^a	27	19
Application rating conditions	27	19 ^a	21	15
	46	24 ^a	29	19

^a The wet bulb temperature condition is not required when testing units which do not evaporate condensate.

Table 21 — Heat recovery conditions for air-cooled multisplit systems

		Three room calorimeter or air enthalpy		Two room Air enthalpy		
		Dry bulb temperature °C	Wet bulb temperature °C	Dry bulb temperature °C	Wet bulb temperature °C	
Application rating conditions	Outdoor side	7	6	7	6	
	Indoor side	Heating	20	—	20	19
		Cooling	27	19	20	19

Table 22 — Heating capacity conditions for water-cooled or brine-cooled multisplit systems

		Outdoor heat exchanger		Indoor heat exchanger	
		Inlet temperature °C	Outlet temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C
Standard rating conditions	Water	10	7	20	15 max.
	Brine	0	-3	20	15 max.
	Water loop	20	17	20	15 max.
Application rating conditions	Water	15	a	20	15 max.
	Brine	5	a	20	15 max.
	Brine	5	a	20	15 max.

^a The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the inlet temperature.

Table 23 — Cooling capacity conditions for water-cooled and brine-cooled multisplit systems

	Outdoor heat exchanger		Indoor heat exchanger	
	Inlet temperature °C	Outlet temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C
Standard rating conditions	30	35	27	19
Application rating conditions	15	a	27	19
	40	a	27	19

^a The test is performed with the fixed flow rate or with the ΔT obtained during the test at the corresponding standard rating conditions for units with variable flow rate. If the resulting flow rate is below the minimum flow rate then this minimum is used with the inlet temperature.

Table 24 — Heating recovery conditions for water-cooled and brine-cooled multisplit systems

	Outdoor heat exchanger		Indoor heat exchanger for units in heating mode		Indoor heat exchanger for units in cooling mode	
	Inlet temperature °C	Outlet temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C	Inlet dry bulb temperature °C	Inlet wet bulb temperature °C
Water	10	7	20	15 max.	27	19
Brine	0	-3	20	15 max.	27	19
Water loop	20	17	20	15 max.	27	19

Table 25 — Cooling capacity conditions for air-cooled, water-cooled and brine-cooled process chillers

	Outdoor heat exchanger air-cooled	Outdoor heat exchanger water(brine)-cooled		Indoor heat exchanger	
	Inlet temperature °C	Inlet temperature °C	Outlet temperature °C	Inlet temperature °C	Outlet temperature °C
High temperature	35	30	35	12	7
Medium temperature	35	30	35	-2 ^a	-8

	Outdoor heat exchanger air-cooled	Outdoor heat exchanger water(brine)-cooled		Indoor heat exchanger	
	Inlet temperature °C	Inlet temperature °C	Outlet temperature °C	Inlet temperature °C	Outlet temperature °C
Low temperature	35	30	35	19	-25
^a For units that do not allow to achieve a ΔT of 6 K, the minimum flow rate of the fluid as declared by the manufacturer is used with the outlet temperature.					

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Annex ZA
(informative)

Relationship between this European Standard and the ecodesign requirements of Commission Regulation (EU) No 2015/1095 aimed to be covered

This European Standard has been prepared under a Commission's standardization request M/495 of 27th July 2011 Amendment N°1 of 30th September 2013 (Annex B of M/495) to provide one voluntary means of conforming to the ecodesign requirements of Commission Regulation (EU) 2015/1095 of 5 May 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers.

Once this standard is cited in the Official Journal of the European Union under that Regulation, compliance with the normative clauses of this standard given in [Table ZA.1](#) confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding ecodesign requirements of that Regulation and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and Commission Regulation (EU) 2015/1095 of 5 May 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers and Commission's standardisation request M/495 and Amendment N°1

Ecodesign requirements of Commission Regulation (EU) No 2015/1095	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
Annex VIII	Table 25	

WARNING 1 Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 Other Union legislation may be applicable to the products falling within the scope of this standard.

Bibliography

- [1] [EN 14511-3:2022](#), *Air conditioners, liquid chilling packages and heat pumps for space heating and cooling and process chillers, with electrically driven compressors — Part 3: Test methods*
- [2] [EN 14825](#), *Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors, for space heating and cooling — Testing and rating at part load conditions and calculation of seasonal performance*

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