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COMMISSION REGULATION (EU) …/…

of XXX

implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for air-to-air air conditioners, air-to-air air heat pumps and comfort fans

and repealing Regulation (EU) No 206/2012

(Text with EEA relevance)

Disclaimer

This is a working document supporting the revision of COMMISSION REGULATION (EU) 206/2012 laying down ecodesign requirements for air conditioners and comfort fans. It sets out an initial draft of the revised legal text to support the stakeholders' consultation process, in particular the Consultation Forum meeting of 7 March 2023.

Please note that while this draft document has been prepared by DG ENER staff and its consultants, it is by no means an official document endorsed by the European Commission.

COMMISSION REGULATION (EU) …/…

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implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for air-to-air air conditioners, air-to-air air heat pumps and comfort fans

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(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to Article 114 of the Treaty on the Functioning of the European Union,

Having regard to Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products[1], and in particular point 1 of Article 15 thereof,

Whereas:

1) Pursuant to Directive 2009/125/EC the Commission should set ecodesign requirements for energy-related products which account for significant volumes of sales and trade in the Union and which have a significant environmental impact and presenting significant potential for improvement through design in terms of their environmental impact, without entailing excessive costs.

2) The Commission in its Communication[2], establishing an energy label and ecodesign working plan for the period 2016-19, considered air conditioners and comfort fans among its priorities for the undertaken of prepatory studies and eventual adoption of measures. The Commission in its energy labelling and ecodesign working plan for the period 2022-2024[3], confirms that air conditioners and comfort fans are one of the three main groups earmarked for review before the end of 2025. .

3) Measures envisaged by the energy labelling and ecodesign working plan 2022-2024 have an estimated potential to deliver a total in excess of 260 TWh of annual final energy savings in 2030, which is equivalent to reducing greenhouse gas emissions by approximately 100 million tonnes per year in 2030. Air conditioners and comfort fans is one of the product groups listed in the Working Plan.

4) The Commission established ecodesign requirements for the air conditioners and comfort

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1 OJ L 285, 31.10.2009, p. 10.

2 Communication from the Commission. Ecodesign working plan 2016-2019, COM(2016)773 final, 30.11.2016.

3 Communication from the Commission Ecodesign and Energy Labelling Working Plan 2022-2024, COM 2022/ final TO BE COMPLETED (OJ C 182, 4.5.2022, p. 1)

fans in Commission Regulation (EU) No 206/2012[4] and pursuant to that Regulation, the Commission should regularly review the Regulation in the light of technological progress.

5) The Commission has reviewed Commission Regulation (EU) No 206/2012 and analysed the technical, environmental and economic aspects of air conditioners, heat pumps and comfort fans as well as real-life user behaviour. The review was carried out in close cooperation with stakeholders and interested parties from the Union and third countries. The results of the review were made public and presented to the Consultation Forum established by Article 18 of Directive 2009/125/EC.

6) The review study shows the benefit of continued and improved requirements, adapted in stringency to the technological process of air conditioners, heat pumps and comfort fans, not only to industry but also to the consumers.

7) The annual final energy consumption of products subject to this Regulation in the Union was estimated at 45.4 TWh in the EU in 2020, corresponding to 9.7 million tonnes of CO2 equivalent. In a business as usual scenario the energy consumption is estimated to increase to 64.7 TWh by 2030 and 81.6 TWh by 2040.

8) The environmental aspects of air conditioners, heat pumps and comfort fans identified as significant for the purposes of this Regulation are energy use in the use-phase.

9) The Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions COM(2015)0614[5] (circular economy action plan) and the energy labelling and ecodesign working plan 2022-2024 underline the importance of using the ecodesign framework to support the move towards a more resource efficient and circular economy. Directive 2012/19/EU of the European Parliament and of the Council[6] refers to Directive 2009/125/EC and indicates that ecodesign requirements should facilitate the re-use, dismantling and recovery of waste electrical and electronic equipment (WEEE) by tackling the issues upstream. This Regulation should therefore lay down appropriate requirements for this.

10) The relevant product parameters should be measured using reliable, accurate and reproducible methods. Those methods should take into account recognised state-of-the-art measurement methods including, where available, harmonised standards adopted by the European standardisation bodies, as listed in Annex I to Regulation (EU) No 1025/2012 of the European Parliament and of the Council[7].

11) In accordance with Article 8 of Directive 2009/125/EC, this Regulation should specify the applicable conformity assessment procedures.

12) To facilitate compliance checks, manufacturers, importers or authorised representatives should provide information in the technical documentation referred to in Annexes IV and

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4 OJ L 72, 10.03.2012, p.7.

5 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Closing the loop - An EU action plan for the circular economy, COM/2015/0614 final, 02.12/2015.

6 Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE) (OJ L 197, 24.7.2012, p. 38).

7 OJ L 316, 14.11.2012, p. 12.

V to Directive 2009/125/EC in so far as that information relates to the requirements laid down in this Regulation.

13) For market surveillance purposes, manufacturers, importers or authorised representatives should be allowed to refer to the product database if the technical documentation as per Commission Delegated Regulation [enter the Regulation number of the Energy Labelling Regulation for air-to-air heat pumps, air-to-air air conditioners and comfort fans] contains the same information.

14) To improve the effectiveness and credibility of the Regulation and to protect consumers, products that automatically alter their performance in test conditions to improve the declared parameters should be prohibited. In the same way, software and firmware updates to the product should not worsen performance in terms of the declared parameters unless the user gives their express consent, and should in no circumstances worsen the performance to a level below the minimum levels required in this Regulation

15) In addition to the legally binding requirements laid down in this Regulation, indicative benchmarks for best available technologies should be identified to make information on the products' environmental performance over their life cycle subject to this Regulation widely available and easily accessible, in accordance with Directive 2009/125/EC, Annex 1, part 3, point 2.

16) A review of this Regulation should assess the appropriateness and effectiveness of its provisions in achieving its goals. The timing of the review should be sufficient for all provisions to be implemented and show an effect on the market.

17) Commission Regulation (EU) No 260/2012 should therefore be repealed.

18) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 19(1) of Directive 2009/125/EC.

HAS ADOPTED THIS REGULATION:

Article 1
Subject matter and scope

1) This Regulation establishes ecodesign requirements for placing on the market or putting into service of electric mains operated air-to-air air conditioners and air-to-air heat pumps with a rated capacity of ≤ 12 kW for cooling, or heating if the product has no cooling function, and comfort fans with an electric fan power input ≤ 125W.

2) This Regulation shall not apply to:

   a) ventilation units as covered under [insert reference to Ventilation Units regulation 1253/2014[8], or the revised ventilation units regulation], also if equipped with heat pumps;

   b) close control air-to-air air conditioners and air-to-air heat pumps.

[8] OJ L 337 25.11.2014, p. 8

Article 2
Definitions

For the purpose of this Regulation, the following definitions shall apply:

1) 'air-to-air air conditioner' means a unit that is primarily intended to provide thermal comfort to humans by cooling of indoor air and which:
   a) uses a vapour compression cycle driven by electric motor(s) to capture heat from indoor air (using an evaporator) and release this exclusively to outdoor air (using a condenser);
   b) may provide additional functionalities such as dehumidification and indoor air filtration;
   c) may use water (either condensate water that is formed on the evaporator or externally added water) for evaporation on the condenser, provided that the device is also able to function without the use of additional water, using air only;
   d) may operate in reverse in which case the unit is also an air-to-air heat pump;
2) 'air-to-air heat pump' means a unit that is primarily intended to provide thermal comfort to humans by heating of indoor air and which:
   a) uses a vapour compression cycle driven by electric motor(s) to capture heat exclusively from outdoor air (using an evaporator) and release this to indoor air (using a condenser);
   b) may provide additional functionalities such as indoor air filtration;
   c) may use water (either condensate water that is formed on the evaporator or externally added water) for evaporation on the condenser, provided that the device is also able to function without the use of additional water, using air only; and
   d) may operate in reverse in which case the unit is also an air-to-air air conditioner;
   e) may be equipped with an electric supplementary heater;
3) 'rated capacity' (P_{rated}) means the cooling or heating capacity of the vapour compression cycle of the unit at standard rating conditions, expressed in kW;
4) 'comfort fan' means a mains powered device which uses one or more fan(s) to create air movement around or on (part of) a human body for personal cooling comfort. Other functionalities such as lighting, air cleaning and heating may be provided as well;
5) 'fan power input' (P_F) means the electric power input of a comfort fan operating at the declared rated air delivery, measured with the oscillating mechanism active (if/when applicable), expressed in watt (W);
6) 'close control air-to-air air conditioner' means a unit using a vapour compression cycle driven by electric motor(s), which is primarily intended for providing cooled air to devices or processes in confined spaces, is not intended for providing thermal comfort to human beings and the evaporator and condenser of which are not combined in a single package;
7) 'close control air-to-air heat pump' means a unit using a vapour compression cycle driven by electric motor(s), which is primarily intended for providing heated air to devices or processes in confined spaces, is not intended for providing thermal comfort to human beings and the evaporator and condenser of which are not combined in a single package;
8) 'seasonal energy efficiency ratio' (SEER) is the overall energy efficiency ratio of the air-to-air air conditioner, representative of the cooling season;

9) ‘seasonal coefficient of performance’ (SCOP) means the overall coefficient of performance of an air-to-air heat pump, representative of the heating season, calculated as the reference annual heating demand (QH) divided by the annual electricity consumption for heating (QHE);

10) ‘degradation coefficient’ means a factor taking into account the efficiency loss due to cycling (compressor switching on/off in active mode) during cooling (Cdc) or heating (Cdh), equal to 0,25;

11) ‘declaration of identity’ means a declaration by the manufacturer that a model which is placed on the market or put into service by another manufacturer, importer or authorised representative has the same technical characteristics relevant for the technical information to be provided;

12) “declared values” means the values provided by the manufacturer, importer or authorised representative for the stated, calculated or measured technical parameters in accordance with Article 5, for the verification of compliance by the Member State authorities.’;

In addition, the definitions of *‘equivalent model’, ‘model identifier’ and ’product database’* in Article 2, points (5), (6) and (25), of Regulation (EU) 2017/1369[9] shall apply.

For the purposes of Annexes II to VI definitions set out in Annex I shall apply.

Article 3
Ecodesign requirements

The ecodesign requirements set out in Annex II shall apply from 1 January 2026.

Article 4
Conformity assessment

1) The conformity assessment procedure referred to in Article 8 of Directive 2009/125/EC shall be the internal design control system set out in Annex IV to that Directive or the management system set out in Annex V to that Directive.

2) For the purposes of conformity assessment pursuant to Article 8 of Directive 2009/125/EC, the technical documentation shall contain a copy of the product information provided in accordance with point 4 of Annex II, and the details and the results of the calculations set out in Annex III to this Regulation.

3) Where the information included in the technical documentation for a particular model has been obtained:

[9] Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU (OJ L 198, 28.7.2017, p. 1).

a) from a model that has the same technical characteristics relevant for the technical information to be provided but is produced by a different manufacturer; or

b) by calculation on the basis of design or extrapolation from another model of the same or a different manufacturer, or both.

The technical documentation shall include the details of such calculation, the assessment undertaken by the manufacturer to verify the accuracy of the calculation and, where appropriate, the declaration of identity between the models of different manufacturers.

The technical documentation shall include a list of all equivalent models, including the model identifiers.

4) The technical documentation shall include the information in the order and as set out in Annex VI of Regulation (EU) *[insert references of the energy labelling regulation for air-to-air heat pumps, air-to-air air conditioners and comfort fans]*[10]. For market surveillance purposes, manufacturers, importers or authorised representatives may, without prejudice to Annex IV, point 2(g) of Directive 2009/125/EC, refer to the technical documentation uploaded to the product database set out pursuant Article 12 of Directive 2009/125/EC which contains the same information laid down in Regulation (EU) *[OP - Please insert here references of the energy labelling regulation for air-to-air heat pumps, air-to-air air conditioners and comfort fans]*.

Article 5
Verification procedure for market surveillance purposes

Member States shall apply the verification procedure set out in Annex IV to this Regulation when performing the market surveillance checks referred to in point 2 of Article 3 of Directive 2009/125/EC.

Article 6
Circumvention

1) Manufacturers, importers or authorised representatives shall not place on the market or put into service products designed to alter their behaviour or properties when being tested, to achieve a more favourable result for any declared value of the parameters regulated in this Regulation. That includes, but is not limited to, products designed to detect they are being tested by recognising the test conditions or test cycle and to automatically alter their behaviour or properties in response, and products pre-set to alter their behaviour or properties at the time of testing.

2) Manufacturers, importers or authorised representatives shall not prescribe specific test instructions which alter the behaviour or the properties of products to achieve a more favourable result for any of the declared value of the parameters regulated in this Regulation. That includes, but is not limited to, prescribing a manual alteration of a product in preparation for the test which alters the product's behaviour or properties compared with when it is in normal use and operated by the user.

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[10] *insert references of the energy labelling regulation for air-to-air heat pumps, air-to-air air conditioners and comfort fans.*

3) Manufacturers, importers or authorised representatives shall not place on the market or put into service products designed to alter their behaviour or properties within a short period of being put into service in a way that worsens any declared value for the parameters regulated in this Regulation

Article 7
Software update

The energy consumption of the product and any of the other declared parameters shall not become worse after a software or firmware update when measured with the same test standard originally used for the declaration of conformity, except with explicit consent of the end-user prior to the update. No performance change shall occur as a result of rejecting the update.

A software update shall not modify the product's performance in a way that makes it non-compliant with the ecodesign requirements applicable at the moment it was placed on the market or put into service.

Article 8
Indicative benchmarks

The indicative benchmarks for the best-performing products covered by this Regulation and technologies available on the market at the time of entry into force of this Regulation are set out in Annex V.

Article 9
Review

1) The Commission shall review this Regulation in the light of technological progress and present the results of this assessment, including, if appropriate, a draft revision proposal, to the Consultation Forum no later than *[enter date - five years after its entry into force]*.

   This review shall among other matters assess:

   a) the appropriateness of raising further the level of the ecodesign requirements for minimum energy efficiency;

   b) the appropriateness of reducing further the level of the ecodesign requirements for maximum sound power;

   c) the appropriateness of the ecodesign requirements for air-to-air air conditioners and air-to-air heat pumps related to the maximum indoor air flow rate and the controls verification procedure;

   d) the appropriateness to set revised or additional resource efficiency requirements in accordance with the objectives of the circular economy, including whether more spare parts should be included, and/or a minimum ecodesign requirement for reparability rating and/or recoverability rating can be introduced;

   e) the appropriateness of a mandatory device for logging, analysing and displaying energy flows and related information, allowing optimization of in-situ energy efficiency;

   f) the appropriateness to introduce a third party conformity assessment;

   g) the appropriateness to increase the scope of products to be covered, including currently exempted products such as close control air conditioners and close control heat pumps;

2) The Commission shall review this Regulation in the light of alternative test methods for measuring energy efficiency of air-to-air air conditioners and air-to-air heat pumps and present the results of this assessment, including, if appropriate, a draft revision proposal, to the Consultation Forum no later than *[enter date - three years after its entry into force]*.

This review shall among other matters assess:

a) existing standards and ongoing standardisation work for the establishment of capacities, SCOP values, SEER values, values for Cdc and Cdh and seasonal energy efficiencies for cooling and/or heating under normal operation modes (using the real-life controls and without fixing the compressor frequency) and without the need of information from the manufacturer on the setting of the unit to be applied;

b) how the ecodesign requirements for minimum energy efficiency would be affected by changes in the test methods applied.

Article 10
Repeal

Commission Regulation (EU) No 206/2012 shall be repealed with effect from 1 January 2026.

Article 11
Entry into force and application

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

It shall apply from 1 January 2026.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels,

For the Commission
xxx
The President

EUROPEAN
COMMISSION

Brussels, XXX
[…](2019) XXX draft

ANNEXES 1 to 5

ANNEXES

to the

COMMISSION REGULATION

implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for air-to-air air conditioners, air-to-air air heat pumps and comfort fans

and repealing Regulation (EU) No 206/2012

ANNEX I Definitions

Definitions

In addition to the definitions set out in Directive 2009/125/EC and the definitions set out in Article 1 of this Regulation, the following definitions shall apply:

Power management

1) 'standby mode' means a condition where the unit is connected to the mains power source, depends on energy input from the mains power source to work as intended and provides only one or more the following functions, which may persist for an indefinite time: reactivation function, or reactivation function and indication of enabled reactivation function, and/or information or status display;

2) 'reactivation function' means a function facilitating the activation of other modes, including active mode, by remote switch including remote control, internal sensor, timer to a condition providing additional functions, including the main function;

3) 'information or status display' is a continuous function providing information or indicating the status of the product on a display, including clocks;

4) 'active mode(s)' means a condition in which the equipment is connected to the mains power source and at least one of the main function(s) providing the intended service of the equipment has been activated;

5) 'off mode' means a condition in which the equipment is connected to the mains power source and is not providing any function; the following shall also be considered as off mode: conditions providing only an indication of off-mode condition; conditions providing only functionalities intended to ensure electromagnetic compatibility pursuant to Directive 2004/108/EC of the European Parliament and of the Council [11];

6) 'networked standby' means a condition in which the product is able to resume a function by way of a remotely initiated trigger from a network connection;

7) 'network' means a communication infrastructure with a topology of links, an architecture, including the physical components, organisational principles, communication procedures and formats (protocols);

8) 'remotely initiated trigger' means a signal that comes from outside the equipment via a network;

9) 'networked equipment with high network availability' (HiNA equipment) means equipment with one or more of the following functionalities, but no other, as the main function(s): router, network switch, wireless network access point, hub, modem, VoIP telephone, video phone;

10) 'networked equipment with high network availability functionality' (equipment with HiNA functionality) means equipment with the functionality of a router, network switch, wireless network access point or combination thereof included, but not being

[11] OJ L 390, 31.12.2004, p. 24. Directive 2004/108/EC of the European Parliament and of the Council of 15 December 2004 on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC

HiNA equipment;

Definitions for resource efficiency requirements

11) ‘spare part’ means a separate part that can replace a part with the same or similar function in a product;

12) ‘professional repairer’ means an operator or undertaking which provides services of repair and/or professional maintenance of the product;

13) ‘commonly available tool’ means a tool that is available to professional repairers and/or end-users through multiple distribution channels;

14) ‘guarantee’ means any undertaking by the retailer or a manufacturer, importer or authorised representative to the consumer, to reimburse the price paid or to replace, repair or service the unit in any way if they do not meet the specifications set out in the guarantee statement or in the relevant advertising available at the time of, or before the conclusion of the contract;

Definitions for air-to-air air conditioners and heat pumps

15) ‘single duct’ means an air-to-air air conditioner in which the intake air for the condenser is introduced from the space containing the unit and discharged outside this space and the evaporator and condenser of which are integrated in a single package;

16) ‘spot cooler’ means a unit using a vapour compression cycle driven by electric motor(s) that is primarily intended to be used in industrial environments in which the intake air for the condenser is introduced from the space containing the unit and ultimately discharged in this same space, and the evaporator and condenser of which are integrated in a single package;

17) ‘double duct’ means an air-to-air air conditioner or air-to-air heat pump which is placed wholly inside the space to be conditioned of which the intake air for the condenser when cooling, or evaporator when heating, is introduced from the outdoor environment via a duct and ejected back to the outdoor environment by a second duct;

18) ‘fixed double duct’ means a double duct air-to-air air conditioner or air-to-air heat pump designed to function while permanently fastened in a specific location, the placement of which requires changes to (and, after removal, repairs of) the building envelope;

19) ‘portable double duct’ means an air-to-air air conditioner designed to function while not permanently fastened to the building, possibly requiring removable seals to separate indoor and outdoor environments, and which is not a single duct or a spot cooler;

20) ‘other’ means an air-to-air air conditioner or air-to-air heat pump which is not a double duct (portable or fixed) or single duct;

21) ‘reversible’ means the capability of an air-to-air air conditioner or air-to-air heat pump to operate as either;

22) ‘multi-split air conditioner (heat pump)’ means an air-to-air air conditioners (heat pump) incorporating more than one indoor unit, one or more refrigerating circuit, one or more compressors and one or more outdoor units, where the indoor units may or may not be individually controlled;

23) ‘indoor temperature’ (Tin) means the dry bulb indoor air temperature, expressed in degrees Celsius (°C). The relative humidity may be indicated by the corresponding wet bulb temperature, expressed in degrees Celsius (°C);

24) ‘outdoor temperature’ (Tj) means the dry bulb outdoor air temperature, expressed in degrees Celsius (°C). The relative humidity may be indicated by a corresponding wet bulb temperature, expressed in degrees Celsius (°C);

25) ‘season’ means a set of ambient conditions, designated as either a cooling season or a heating season, describing per bin the combination of outdoor temperatures and bin hours pertaining to that season;

26) ‘bin’ (j) means a combination of an outdoor temperature (Tj) and bin hours (hj) as set out in Annex III, Table 15 for cooling and Table 19 for heating seasons;

27) ‘bin hours’ (hj) means the hours per season the outdoor temperature occurs for each bin, as set out in Annex III, Table 15 for cooling and Table 19 for heating seasons, expressed in hours (h);

28) ‘bivalent temperature’ (Tbiv) means the outdoor temperature (Tj) declared by the manufacturer at which the declared heating capacity equals the heating load and below which the declared capacity must be supplemented with supplementary capacity for heating in order to satisfy the heating load, expressed in degrees Celsius (°C) as an integer;

29) ‘operation limit temperature’ (Tol) means the outdoor temperature declared by the manufacturer, below which the air-to-air heat pump will not be able to deliver any heating capacity and the declared capacity is equal to zero, expressed in degrees Celsius (°C) as an integer;

30) ‘switch temperature heat pump off’ (Thp,off) means the temperature below which the vapour compression cycle is switched off and if applicable heat is only provided by the supplementary heater, expressed in °C as an integer;

31) ‘conversion coefficient’ (CC) means a coefficient reflecting a 52,6 % average EU generation efficiency, as established in Annex IV of Directive 2012/27/EU of the European Parliament and of the Council12. The value of the conversion coefficient shall be CC = 1,9;

32) ‘declared capacity’ means the capacity of the vapour compression cycle of the air-to-air air conditioner for cooling (Pd,c(Tj)) or air-to-air heat pump for heating (Pd,h(Tj)), pertaining to an outdoor temperature Tj and indoor temperature (Tin), expressed in kilowatt (kW);

33) ‘part load ratio’ (pl(Tj)) means the outdoor temperature minus 16 °C, divided by the reference design temperature minus 16 °C, in either cooling or heating season(s);

34) ‘reference design temperature’ means the outdoor temperature for cooling (Tdesignc) or heating (Tdesignh) as described in Annex III, Table 16 for cooling and Table 21 for heating, at which the part load ratio is equal to 1 and which varies according to the cooling or heating season, expressed in degrees Celsius (°C);

35) ‘reference design conditions’ means the combination of requirements for the reference design temperature, the maximum bivalent temperature, the maximum operation limit

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[12] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC (OJ L 315, 14.11.2012, p. 1).

temperature and the maximum switch temperature heat pump off Thp,off, if applicable to the unit, as set out in Annex III, Table 16 for cooling and Table 21 for heating;

36) ‘standard rating conditions’ means a combination of indoor (Tin) and outdoor temperatures (Tj) and part load ratio for that outdoor temperature, as set out in Annex III, Table 18, Table 23 and Table 28;

37) ‘system capacity ratio’ (SCR) means the ratio of the total rated cooling or heating capacity of all operating indoor units to the rated cooling or heating capacity of the outdoor unit at standard rating conditions;

38) 'capacity ratio' (CR(Tj)) means the cooling or heating load (Pc(Tj) or Ph(Tj)) divided by the declared cooling or heating capacity (Pdc(Tj) or Pdh(Tj)) of the unit at the same temperature conditions, with a maximum value of 1;

Cooling

39) ‘seasonal room cooling energy efficiency’ (ηrc) means the ratio between the reference annual cooling demand pertaining to the cooling season covered by an air-to-air air conditioner, and the annual energy consumption for cooling, corrected by contributions accounting for the temperature control, expressed in percentage (%);

40) ‘design load for cooling’ (Pdesignc) means the space cooling load to be met by the unit at Tdesignc, as declared by the manufacturer, expressed in kilowatt hours (kW);

41) ‘reference annual cooling demand’ (QC) means the total cooling demand in the cooling season, expressed in kilowatt hour per annum (kWh/a);

42) ‘annual electricity consumption for cooling’ (QCE) means the energy consumption required to meet the reference annual cooling demand (other) or to generate the supplied annual cooling energy (portable), expressed in kilowatt (kWh);

43) ‘equivalent active mode hours for cooling’ (HCE) means the assumed annual number of hours the unit must provide the design load for cooling (Pdesignc) to satisfy the reference annual cooling demand, as set out in Annex III, Table 14, expressed in hours per annum (h/a);

44) ‘active mode seasonal energy efficiency ratio’ (SEERon) means the average energy efficiency ratio of the unit in active mode for the cooling function;

45) ‘bin-specific energy efficiency ratio’ (EERbin(Tj)) means the energy efficiency ratio specific for every bin j with outdoor temperature Tj in a season;

46) ‘declared energy efficiency ratio’ (EERd(Tj)) means the energy efficiency ratio at a limited number of specified bins (j) with outdoor temperature (Tj);

47) ‘part load for cooling’ (Pc(Tj)) means the cooling load at a specific outdoor temperature, calculated as the design cooling load multiplied by the part load ratio, expressed in kilowatt (kW);

48) ‘supplied annual cooling energy’ (QCS) means the cooling energy supplied by the unit during the cooling season, to be used as basis for calculation of SEER, expressed in kilowatt (kW);

49) ‘cooling load for single duct air-to-air air conditioner’ (Pc_SD(Tj)) means the cooling load the single duct RAC has to meet for the Tj indicated , expressed in kilowatt (kW);

50) ‘equilibrium temperature’ (Teq) means the temperature at which the cooling load for single duct air-to-air air conditioner Pc_SD(Tj) equals the corrected declared capacity (Pdc_corr(Tj)), expressed in degrees Celsius (°C) as an integer;

51) ‘corrected declared capacity for cooling’ (Pdc_corr(Tj)) means the capacity of the vapour compression cycle of the unit for cooling corrected for infiltration, expressed in kilowatt (kW);

52) ‘infiltration load’ (PINF(Tj))) means the additional cooling or heating load that is created by the air drawn in by the single duct air-to-air air conditioner or heat pump;

53) ‘infiltration air flow rate (AF) means the outdoor air flow rate of a single duct air conditioner as this volume flow rate is considered equal to the volume flow rate of air drawn into the area conditioned by the single duct air conditioner;

Heating

54) ‘seasonal room heating energy efficiency’ (ηrh) means the reference annual heating demand of an air-to-air heat pump pertaining to the heating season indicated, divided by the annual energy consumption for heating of which, corrected by contributions accounting for the temperature control, expressed in percentage (%);

55) ‘electric supplementary heater’ means a real or assumed electric heater that supplements the heating capacity of the vapour compression cycle in order to meet the heating load;

56) ‘reference annual heating demand’ (QH) means the total heating demand in the designated heating season, expressed in kilowatt hour per annum (kWh/a);

57) ‘seasonal coefficient of performance’ (SCOP) means the overall coefficient of performance of an air-to-air heat pump, representative of the heating season, calculated as the reference annual heating demand (QH) divided by the annual electricity consumption for heating (QHE);

58) ‘annual electricity consumption for heating’ (QHE) means the energy consumption required to meet the reference annual heating demand pertaining to a designated heating season, and is calculated as the reference annual heating demand divided by the active mode seasonal coefficient of performance (SCOPon) and the electricity consumption of the unit for thermostat-off, standby, off and crankcase heater mode during the heating season, expressed in kilowatt hour (kWh);

59) ‘active mode seasonal coefficient of performance’ (SCOPon) means the average coefficient of performance of the unit in active mode for the designated heating season, constructed from the part load, supplementary capacity for heating (where required) and bin-specific coefficients of performance (COPbin(Tj) and weighted by the bin hours the bin condition occurs;

60) ‘equivalent active mode hours for heating’ (HHE) means the assumed annual number of hours the unit must provide the design load for heating (Pdesignh) to satisfy the reference annual heating demand, as set out in Annex III, Table 19, expressed in hours per annum (h/a);

61) ‘heating load’ (Ph(Tj)) means the calculated heating need of a room or space for that specific outdoor temperature, expressed in kilowatt (kW);

62) ‘design load for heating’ (Pdesignh) means the heating load to be met by the unit at Tdesignh, as declared by the manufacturer, expressed in kilowatt hours (kW);

63) ‘bin-specific coefficient of performance’ (COPbin(Tj)) means the coefficient of performance specific for every bin j with outdoor temperature Tj in a season;

64) ‘declared coefficient of performance’ (COPd(Tj)) means the coefficient of performance at a limited number of specified bins (j) with outdoor temperature (Tj);

65) ‘supplementary heater’ means a heater that generates heat in case the heat load is greater

than the declared capacity of the heat pump, using the Joule effect in electric heating elements;

66) ‘supplementary capacity for heating’ (elbu(Tj)) is the heat output of a real or assumed supplementary heater with COP of 1 that supplements the declared heating capacity (Pdh(Tj)) in order to satisfy the heating load (Ph(Tj)) in case Pdh(Tj) is less than Ph(Tj) for the outdoor temperature (Tj), expressed in kilowatt (kW);

67) ‘corrected declared capacity for heating’ (Pdh_corr(Tj)) means the capacity of the vapour compression cycle of a portable single duct heat pump corrected for infiltration, expressed in kilowatt (kW);

Operating modes and hours for air-to-air conditioners and air-to-air heat pumps

68) ‘thermostat-off mode’ means a mode corresponding to the hours with no cooling or heating load whereby the cooling or heating function of the unit is switched on but the air-to-air air conditioner or air-to-air heat pump is not operational. Cycling in active mode is not considered as thermostat-off mode;

69) ‘crankcase heater mode’ means a condition where the unit has activated a heating device to avoid the refrigerant migrating to the compressor to limit the refrigerant concentration in oil at compressor start;

70) ‘standby mode power consumption’ (PSB) means the sum of the power consumption of the unit while in standby mode and in networked standby mode, expressed in kilowatt (kW);

71) ‘thermostat-off mode operating hours’ (HTO) means the annual number of hours the unit is considered to be in thermostat-off mode, the value depends on the designated season and function, expressed in hours per annum (h/a);

72) ‘thermostat-off mode power consumption’ (PTO) means the power consumption of the unit while in thermostat- off mode, expressed in kilowatt (kW);

73) ‘standby mode operating hours’ (HSB) means the annual number of hours the unit is considered to be in standby mode, the value of which depends on the designated season and function, expressed in hours per annum (h/a);

74) ‘crankcase heater mode operating hours’ (HCK) means the annual number of hours the unit is considered to be in crankcase heater mode, the value of which depends on the designated season and function, expressed in hours per annum (h/a);

75) ‘crankcase heater mode power consumption’ (PCK) means the power consumption of the unit while in crankcase heater mode, expressed in kilowatt (kW);

76) ‘off-mode operating hours’ (HOFF) means the annual number of hours the unit is considered to be in off-mode, the value of which depends on the designated season and function, expressed in hours per annum (h/a);

77) ‘off-mode power consumption’ (POFF) means the power consumption of the unit while in off-mode, expressed in kilowatt (kW);

78) ‘active mode’ means the mode corresponding to the hours with a cooling or heating load of the building and whereby the cooling or heating function of the unit is activated. This condition may involve on/off-cycling of the unit in order to reach or maintain a required indoor air temperature;

79) ‘fixed capacity control’ means the unit cannot change its volumetric flow rate of the refrigerant;

80) ‘variable capacity control’ means the unit can change the volumetric flow rate of the refrigerant in two or more steps;

81) ‘indoor air flow rate’ means the air flow rate over the evaporator of air-to-air air conditioners or condenser of air-to-air heat pumps, expressed in cubic meters per hour (m^3/h);

82) ‘outdoor air flow rate’ means the air flow rate over the condenser of air-to-air air conditioners or evaporator of air-to-air heat pumps, expressed in cubic meters per hour (m^3/h);

83) ‘marketed’ means placed on the market for the operating condition, application or season mentioned, as evidenced by the technical documentation, information on the packaging and/or any advertising or marketing materials;

84) ‘sound power’ (LWA) means the sound power produced by air-to-air air conditioners, air-to-air heat pumps measured indoors, and/or outdoors where applicable, at standard rating conditions when providing cooling (or heating, if the unit has no cooling function), expressed in A-weighted decibels (dB(A));

Definitions related to comfort fans

85) ‘service value’ (SV) means the rated air delivery divided by the fan power input, expressed in cub meters per minute per watt (m^3/min)/W;

86) ‘rated air delivery’ (F) means the highest volumetric flow rate of air that can be delivered by the comfort fan, expressed in cubic meters per minute (m^3/min);

87) ‘ceiling fan’ means a comfort fan that is non-portable and designed to be mounted onto or suspended from the ceiling;

88) ‘tower fan’ means a comfort fan that is:

   a) a comfort fan of any type that is not fitted with a propeller for creation of air movement, and

   b) has a vertically elongated design, and

   c) is portable, and

   d) is intended to be used on the floor;

89) ‘other fan’ means a comfort fan that is:

   a) not ceiling fan, and not a tower fan, and

   b) is intended to be used on a table, floor or mounted on a wall;

90) ‘table fan’ means an ‘other fan’ that is intended to be used on a table, or optionally mounted to a wall;

91) ‘pedestal fan’ means an ‘other fan’ that is fitted on a pedestal that may be adjustable in height, and intended to be used on the floor;

92) ‘floor fan’ means an ‘other fan’ that is not a pedestal fan, and intended to be used on the floor, or optionally mounted to a wall;

93) ‘propeller’ means a device with a rotating hub and radiating blades that are set at a pitch which, when rotated, exert linear thrust upon a working fluid such as air;

94) ‘bladeless fan’ means a comfort fan of any type that is not fitted with a propeller for creation of air movement;

95) ‘fan diameter’ means the diameter of the circle traced out by the extreme tips of the

rotating blades of the fan;

96) ‘fan sound power’ means the sound power produced by the comfort fan while providing the rated air delivery, measured at the outlet side, expressed in A-weighted decibels (dB(A));

97) ‘oscillation mechanism’ means a mechanism which when activated results in the comfort fan to automatically vary the direction of the air flow the fan produces when operating;

Definitions related to correction factors

98) 'Control correction factor' (Fcorr) means the sum of the individual factors for each control feature present in the model supplied;

99) ‘single stage heat output, no room temperature control’ means the product is not capable of varying its heat output automatically and that no feedback of room temperature is present to adapt the heat output automatically;

100) ‘two or more manual stages, no room temperature control’ means for air-to-air air conditioners or air-to-air heat pumps the unit is capable of varying its heat output manually by two or more levels of output and is not equipped with a device that automatically regulates the heat output in relation to a desired indoor temperature, and for comfort fans means the fan air flow rate can be adjusted manually and meaningfully in two or more levels;

101) ‘with mechanic thermostat room temperature control’ means the product is equipped with a non-electronic device that allows the product to automatically vary its heat output over a certain time period, in relation to a certain required level of indoor heating comfort;

102) ‘with electronic room temperature control’ means the product is equipped with an electronic device, either integrated or external, that allows the product to automatically vary its heat output over a certain time period, in relation to a certain required level of indoor heating comfort;

103) ‘with electronic room temperature control plus day timer’ means the product is equipped with an electronic device, either integrated or external, that allows the product to automatically vary its heat output over a certain time period and in relation to a certain required level of indoor heating comfort according to settings entered by the user, allowing the user to set timing and temperature level for a 24-hours timer interval;

104) ‘with electronic room temperature control plus week timer’ means the product is equipped with a function that allows the product to automatically vary its heat output over a certain time period and in relation to a certain required level of indoor heating comfort according to settings entered by the user, allowing the user to set timing and temperature levels for a full week. During the 7-day period the settings must allow a variation on a day-to-day basis;

105) ‘room temperature control, with presence detection’ means for air-to-air air conditioners or air-to-air heat pumps the unit is equipped with a function that reduces or switches off the heating or cooling output, and for a comfort fan reduces or stops its air flow, when no person is detected in the room and resumes operation when a person is detected in the room or after user intervention;

106) ‘room temperature control, with open window detection’ means the product is equipped with a function or device, either integrated or external, that can detect a door or window is opened and responds by reducing or turning off its heating or cooling output for a

limited time period or until the unit detects the window or door is closed again and/or user input is received;

107) ‘distance control option’ means the function that allows remote interaction from outside the building in which the product is installed with the control of the product;

108) ‘adaptive start control’ means the function which predicts and initiates the optimal start of heating up in order to reach the set-point temperature at the desired time;

109) ‘working time limitation’ means a function that automatically switches the product to off-mode or standby-mode after a pre-set period of time;

110) ‘black bulb sensor’ means the model is equipped with a device that measures air and mean radiant temperature as input for room temperature control;

111) ‘self-learning functionality’ means the appliance has a functionality that automatically captures the user’s use patterns of the appliance, and based on those patterns can automatically program setpoints for room temperatures;

112) ‘control accuracy’ (CA) means the control of the appliance has a minimum degree of ability of the to react to changes in the zone temperature in order to keep that zone temperature as close as possible to the set zone temperature;

113) ‘room temperature controlled air delivery’ means the comfort fan can automatically change the fan air flow rate it produces in relation to the room temperature;

ANNEX II Ecodesign requirements

Ecodesign requirements

1) Energy efficiency requirements

a) The seasonal space cooling energy efficiency of air-to-air air conditioners, including reversible air-to-air heat pumps, shall not be less than the values in Table 1:

Table 1
Minimum SEER, expressed in decimals

	The value of SEER shall not be less than
Single duct air-to-air air conditioners	2.3
Portable double duct air-to-air air conditioners	2.3
Fixed double duct air-to-air air conditioners	3.3
Other air-to-air air conditioners	6.0

b) The seasonal space heating energy efficiency of fixed double duct and other air-to-air heat pumps, including reversible double duct and other air-to-air air conditioners, established for the 'average' heating season, shall not be less than the values in Table 2:

Table 2
Minimum SCOP, expressed as decimals

	The value of SCOP shall not be less than
Fixed double duct air-to-air heat pumps	2.5
Other air-to-air heat pumps	4.0

c) The service value (SV) of comfort fans shall not be less than the values in Table 3:

Table 3
Minimum service value of comfort fans, expressed in m^3/min/W

	Minimum service value SV (m^3/min)/W
Ceiling fans	the SV of ceiling fans shall be higher than or equal to 0,024*F - 0,10 and not less than 0.45
Tower fans	the SV of tower fans shall not be less than 0.45
Other fans	the SV of other fans shall be higher than or equal to 0,006*F + 0,44 and not less than 0.45

Where 'F' is the rated air delivery of the comfort fan.

d) The off-mode, standby-mode and networked standby mode(s) of portable air-to-air air conditioners and portable air-to-air heat pumps and comfort fans shall not exceed the values in Table 4:

Table 4
Maximum power consumption in off mode, standby modes and networked standby

Power mode, if applicable	**Maximum power consumption (W)**
Off mode	0,5
Standby mode	0,5
Standby mode for networked equipment	0,8
Networked standby for HiNA equipment or equipment with HiNA functionality	8
Networked standby for networked equipment that is not HiNA equipment or equipment with HiNA functionality	2

2) Sound power requirements:

a) The sound power of air-to-air air conditioners, air-to-air heat pumps and comfort fans shall not exceed the values in Table 5:

Table 5
Maximum sound power of air-to-air air conditioners or air-to-air heat pumps

Air-to-air air conditioners and/or air-to-air heat pumps:	Sound power L_{WA}, dB(A)	
	Indoor	Outdoor
Single and double duct air-to-air air conditioners and air-to-air heat pumps	65	69
Other air-to-air air conditioners and air-to-air heat pumps, with a rated capacity < 6 kW	60	65
Other air-to-air air conditioners and air-to-air heat pumps, with a rated capacity ≥ 6 kW	65	70

b) and comfort fans shall not exceed the values in Table 6:

Table 6

Maximum sound power of comfort fans

Comfort fans	Maximum fan sound power, dB(A)
Ceiling fans	55
Tower fans	60
Other fans, with F $\leq$ 80 m^3/min	65
Other fans, with F > 80 m^3/min	0,0625 * F + 60

Where 'F' is the rated air delivery of the comfort fan.

3) Functional requirements

a) Single duct and portable double duct air-to-air heat pumps and 'reversible' single duct and portable double duct air-to-air air conditioners shall not be placed on the market.

b) The maximum indoor air flow rate shall be limited.

i) The indoor air flow rate over the condenser of an air-to-air heat pump at operating condition Tj = -7°C when providing the same or higher heating capacity as declared for this condition, shall not exceed 300 m^3/h per kW of heating capacity to ensure sufficient thermal comfort when heating.

ii) For air-to-air heat pumps that are not also reversible air-to-air air conditioners the air flow over the evaporator in condition Tj = 35°C when providing the same or higher cooling capacity as declared for this condition, shall not exceed 300 m^3/h per kW of cooling capacity to ensure sufficient dehumidification. For units with multiple indoor units the requirement applies to each indoor unit individually.

c) The Controls Verification Procedure shall be met.

i) An air-to-air air conditioner or air-to-air heat pump with variable capacity shall pass the Controls Verification Procedure as described in Annex III in cooling mode, or in heating mode if no cooling mode is applicable.

d) Power management shall be enabled.

i) Products shall, except where it is inappropriate for the intended use, provide off mode and/or standby mode, and/or another condition which does not exceed the applicable power consumption requirements for standby mode and/or off mode and/or networked standby mode in Table 4 when the product is connected to the mains power source;

ii) When products are not providing the main function and are in thermostat-off mode, or when other energy-using product(s) are not dependent on its function, equipment shall, unless inappropriate for the intended use, offer a power management function, or a similar function, that switches equipment after the

shortest possible period of time appropriate for the intended use of the equipment, automatically into:

- standby mode, or;
- off mode, or;
- another condition which does not exceed the applicable power consumption requirements for standby mode and/or off mode and/or networked standby mode in Table 4 when the product is connected to the mains power source;

The power management function shall be activated before delivery;

e) Filter cleaning signalling shall be enabled.

i) Air-to-air air conditioners and air-to-air heat pumps with a filter for indoor air shall be equipped with an automatically cleaning filter, or a cleanable or replaceable filter with at least a visual indicator to signal the need for filter change;

4) Resource efficiency requirements:

1) From 1 January 2026, air-to-air air conditioners, air-to-air heat pumps and comfort fans shall meet the following requirements regarding:

a) Availability of spare parts for air-to-air air conditioners, air-to-air heat pumps and comfort fans:

i) for all air-to-air air conditioners and air-to-air heat pumps for which units are placed on the market as from the date of application of this Regulation, manufacturers, importers or authorised representatives of air-to-air air conditioners and air-to-air heat pumps shall make available to **professional repairers** at least the following spare parts:

- heat exchangers;
- printed circuit boards;
- fan motors;

ii) availability of spare parts or compatible parts referred to in point (i), shall be ensured for a minimum period starting at the latest on (*OJ please insert date of application of this Regulation*) or two years after the placing on the market of the first unit of the model, whichever is the later date, and ending at least, 7 years after placing on the market the last unit of the model concerned. For that purpose, the list of spare parts, the procedure for ordering them and the repair instructions shall be publicly available on the free access website of the manufacturer, importer or authorised representative, at least during the whole period mentioned in this point.

iii) for all air-to-air air conditioners and air-to-air heat pumps for which units are placed on the market as from the date of application of this Regulation, manufacturers, importers or authorised representatives of air-to-air air conditioners and air-to-air heat pumps shall make available to professional repairers and end-users at least the following spare parts:

- grilles, shutters, flaps, louvres and similar parts of air entry and exhaust points;

– remote controls;

– air filters;

– for portable double duct and single duct units: ducts for air supply, exhaust and the window seal kit;

– thermostats;

iv) availability of spare parts or compatible parts referred to in point (iii), shall be ensured for a minimum period starting on the date of placing that unit on the market and ending at least 7 years after placing the last unit of the concerned model on the market. For that purpose, the list of spare parts and the procedure for ordering them and the repair and maintenance information shall be publicly available on the free access website of the manufacturer, importer or authorised representative, at least during the whole period mentioned in this point.

b) Availability of spare parts for comfort fans:

i) for all comfort fans for which units are placed on the market as from the date of application of this Regulation, manufacturers, importers or authorised representatives of comfort fans shall make available to professional repairers at least the following spare parts:

– fan motors;

– fan blades, complete impellers or fan/motor assemblies;

– oscillation mechanisms;

ii) availability of spare parts or compatible parts for comfort fans referred to in point (i), shall be ensured for a minimum period starting at the latest on *(OJ please insert date of application of this Regulation*) or two years after the placing on the market of the first unit of the model, whichever is the later date, and ending at least, 7 years after placing on the market the last unit of the model concerned. For that purpose, the list of spare parts, the procedure for ordering them and the repair instructions shall be publicly available on the free access website of the manufacturer, importer or authorised representative, at least during the whole period mentioned in this point.

iii) for all comfort fans for which units are placed on the market as from the date of application of this Regulation, manufacturers, importers or authorised representatives of comfort fans shall make available to professional repairers and end-users at least the following spare parts

– grilles, shutters, flaps, louvres and similar parts located at air entry and exhaust points;

– remote controls;

– light fixtures, if applicable;

iv) availability of spare parts or compatible parts referred to in point (iii), shall be ensured for a minimum period starting on the date of placing that unit on the market and ending at least 7 years after placing the last unit of the concerned model on the market. For that purpose, the list of spare parts and the procedure for ordering them and the repair and maintenance information shall be publicly available on the free access website of the manufacturer, importer or authorised representative, at least during the same period and starting at the date referred to in this point.

v) Manufacturers, importers or authorised representatives shall ensure that the spare parts mentioned in points (i) and (iii) of subparagraph a) and points (i) subparagraph b) can be installed with the use of commonly available tools and without permanent damage to the appliance and the repair does not negatively affect the product performances required under this regulation.

c) Maximum delivery time of spare parts:

i) During the period mentioned mentioned in points (i) and (iv) of subparagraph a) and points (ii) subparagraph b) the manufacturer, importer or authorised representatives shall ensure the delivery of the spare parts for air-to-air air conditioners, air-to-air heat pumps and comfort fans within 10 working days after having received the order.

d) Access to repair and maintenance information:

i) After a period of two years after the placing on the market of the first unit of a model or of an equivalent model, and until the end of the period mentioned in points (i) and (iv) of subparagraph a) and points (ii) subparagraph b), the manufacturer, importer or authorised representative shall provide access to the appliance repair and maintenance information to professional repairers in the following conditions:

(1) the manufacturer's, importer's or authorised representative's website shall indicate the process for professional repairers to register for access to information; to accept such a request, manufacturers, importers or authorised representative may require the professional repairer to demonstrate that:

(2) the professional repairer has the technical competence to repair the relevant product and complies with the applicable regulations for repairers of electrical equipment in the Member States where it operates. Reference to an official registration system as professional repairer, where such system exists in the Member States concerned, shall be accepted as proof of compliance with this point;

(3) the professional repairer is covered by insurance covering liabilities resulting from its activity regardless of whether this is required by the Member State.

ii) the manufacturers, importers or authorised representatives shall accept or refuse the registration within five working days from the date of the request;

iii) manufacturers, importers or authorised representatives may charge reasonable and proportionate fees for access to the repair and maintenance information or for receiving regular updates. A fee is reasonable if it does not discourage access by failing to take into account the extent to which the professional repairer uses the information.

iv) Once registered, a professional repairer shall have access, within one working day after requesting it, to the requested repair and maintenance information. The information may be provided for an equivalent model or model of the same family, if relevant.

The available repair and maintenance information shall include:

– the unequivocal appliance identification;

- a disassembly map or exploded view;
- technical manual of instructions for repair;
- list of necessary repair and test equipment;
- component and diagnosis information (such as minimum and maximum theoretical values for measurements);
- wiring and connection diagrams;
- diagnostic fault and error codes (including manufacturer-specific codes, where applicable);
- instructions for installation of relevant software and firmware including reset software; and
- information on how to access data records of reported failure incidents stored on the product (where applicable).

e) Requirements for dismantling for material recovery and recycling:

i) Manufacturers, importers or authorised representatives shall ensure that products are designed in such a way that the materials and components referred to in Annex VII to Directive 2012/19/EU13 can be removed with the use of commonly available tools.

ii) Manufacturers, importers and authorised representatives shall fulfil the obligations laid down in point 1 of Article 15 of Directive 2012/19/EU.

5) Information requirements

a) From 1 January 2026, instruction manuals for installers and end-users, and free access websites of manufacturers, importers and authorised representatives of air-to-air air conditioners, air-to-air heat pumps and comfort fans shall include the following information:

i) instructions for the correct installation and maintenance, including cleaning, and correct disposal of the air-to-air air conditioner, air-to-air heat pump or comfort fan;

ii) instructions for the prevention of refrigerant leakage from air-to-air air conditioner or air-to-air heat pump;

iii) information on the frequency of air filter cleaning intervals for air-to-air air conditioners or air-to-air heat pumps, including instructions for filter cleaning and a note on health aspects and efficiency degradation if not cleaned regularly;

iv) for air-to-air air conditioners or air-to-air heat pumps for which the seasonal

[13] Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE) (OJ L 197, 24.7.2012, p. 38)

space heating energy efficiency is not determined for cold climate a paragraph stating: 'this appliance is not intended to be used cold climates in Europe';

v) information on how to access professional repair services (e.g. internet webpages, addresses, contact details);

vi) information for ordering spare parts from the manufacturer or through other channels;

vii) the minimum period during which spare parts are available;

viii) instructions on how to find the model information in the product database, as set out in Regulation (EU) 2019/XXX [insert the references of the energy labelling regulation for air-to-air air conditioner, air-to-air heat pump or comfort fans] by means of a weblink that links the model information as stored in the product database or a link to the product database and information on how to find the model identifier on the product;

ix) information regarding where to find information allowing the independent setting of the units to establish the regulated parameters;

x) The technical information as set out in Table 7, Table 8, Table 9 and Table 10 for the respective products. For multi-split air-to-air air conditioners and heat pumps, data shall be provided at a system capacity ratio of 1.

Table 7. Product information sheet for air-to-air air conditioners / reversible air-to-air heat pumps

Supplier's name or trademark:					
Supplier's address:					
Model identifier:					
Product parameters for cooling					
Seasonal room cooling efficiency (η_{rc}) (%)		x	%	Energy efficiency class for room cooling	[A/B/C/D /E/F/G]
Rated cooling capacity	P_{ratedc}	x,xx	kW		
for single duct: Cooling capacity (includes air infiltration load)	*Pdc_corr at Teq.*				
for single duct: Equilibrium temperature for cooling	*Teq.*	x	°C		
Indoor sound power		x	dB(A)	Indoor sound power class	[A/B/C /D]
Outdoor sound power if applicable		x	dB(A)	Outdoor sound class if applicable	[A/B/C /D]
Power consumption standby	*Psb*	x,x	W		
GWP of refrigerant used		x	kg CO_2 eq./100 y	Control correction factor	F_{corr} x,x
Controls delivered with the product					
Controls F2 (only one option may apply)				**Controls F(3)**	
single stage heat output, no room temperature control		[yes / no]		room temperature control with presence detection	[yes / no]
two or more manual stages, no temperature control		[yes / no]		room temperature control with open window detection	[yes / no]
with mechanic thermostat room temperature control		[yes / no]		distance control option	[yes / no]

with electronic room temperature control	[yes / no]		adaptive start control	[yes / no]	
with electronic room temperature control plus day timer	[yes / no]		working time limitation	[yes / no]	
with electronic room temperature control plus week timer	[yes / no]		black bulb sensor	[yes / no]	
			self-learning functionality	[yes / no]	
			control accuracy	[yes / no]	
			room temperature controlled air delivery	[yes / no]	

Product type specific parameters (only rows that are relevant may be shown)

for other and fixed double duct air-to-air air conditioner

Cooling capacity Pdc at 27/35 °C in/outdoor	x,x	kW	EER at 27/35 °C in/outdoor	x,x	
Cooling capacity Pdc at 27/30 °C in/outdoor	x,x	kW	EER at 27/30 °C in/outdoor	x,x	
Cooling capacity Pdc at 27/25 °C in/outdoor	x,x	kW	EER at 27/25 °C in/outdoor	x,x	
Cooling capacity Pdc at 27/20 °C in/outdoor	x,x	kW	EER at 27/20 °C in/outdoor	x,x	
Temperature heat pump off	x,x	°C			

for portable double duct air conditioner

Maximum cooling capacity Pdc at 27/35 °C in/outdoor	x,x	kW	EER100% at 27/35 °C in/outdoor	x,x	
Max. cooling capacity Pdc at 27/27 °C in/outdoor	x,x	kW	EER100% at 27/27 °C in/outdoor	x,x	
33% of max cooling capacity Pdc at 27/27 °C in/outdoor	x,x	kW	EER33% at 27/27 °C in/outdoor	x,x	
Temperature heat pump off *Thp,off*	x,x	°C			

for single duct air conditioner

Maximum cooling capacity Pdc at 27/35 °C in/outdoor	x,x	kW	EER at max.cooling capacity	x,x	
if variable capacity: Part load cooling capacity Pdc at 27/27 °C in/outdoor	x,x	kW	EER at part load cooling capacity	x,x	
Corrected cooling capacity at equilibrium temperature *Pdc_SD*	x,x	kW			
Equilibrium temperature (no decimals, value must be integer) T_{eq}	x	°C			
Outdoor air flow rate	x	m³/h			
Indoor air flow rate	x	m³/h			

Other information

Minimum duration of the guarantee offered by the supplier	x	months
Product weight	x	kg
Product dimensions:		
- indoor unit (LxWxH)	x	mm
- outdoor unit (LxWxH) (if applicable)	x	mm

Table 8. Product information sheet for air-to-air heat pumps / reversible air-to-air air conditioners

Supplier's name or trademark:	
Supplier's address:	
Model identifier:	
Product parameters for heating	
Season (if applicable)	Season (if applicable)

	Warmer	Avg	Colder	
Seasonal room heating efficiency (η_{rh})	x	x	x	%

Rated heating capacity	P_{ratedh}	x,xx	kW
Indoor sound power		x	dB(A)
Outdoor sound power if applicable		x	dB(A)
Power consumption standby	*Psb*	x,x	W
GWP of refrigerant used		x	kg CO2 eq./100 y

	Warmer	Avg	Colder

Energy efficiency class for room heating	[A/B/C/D/E/F/G]
Indoor sound power class	[A/B/C/D]
Outdoor sound power class if applicable	[A/B/C/D]

Controls delivered with the product

Controls F2 (only one option may apply)

single stage heat output, no room temperature control	[yes / no]
two or more manual stages, no temperature control	[yes / no]
with mechanic thermostat room temperature control	[yes / no]
with electronic room temperature control	[yes / no]
with electronic room temperature control plus day timer	[yes / no]
with electronic room temperature control plus week timer	[yes / no]

Controls F(3)

room temperature control with presence detection	[yes / no]
room temperature control with open window detection	[yes / no]
distance control option	[yes / no]
adaptive start control	[yes / no]
working time limitation	[yes / no]
black bulb sensor	[yes / no]
self-learning functionality	[yes / no]
control accuracy	[yes / no]
room temperature controlled air delivery	[yes / no]

Product specific parameters (only rows that are relevant may be shown)

*for **other** heat pump and **portable double duct** heat pump*

	Season (warmer/colder if applicable)			
	Warmer	Avg	Colder	
Heating capacity at -7 °C outdoor	x,x	x,x	x,x	kW
Heating capacity at +2 °C outdoor	x,x	x,x	x,x	kW
Heating capacity at +7 °C outdoor	x,x	x,x	x,x	kW
Heating capacity at +12 °C outdoor	x,x	x,x	x,x	kW
Heating capacity at Tj = T_{ol}	x,x	x,x	x,x	kW
Heating capacity at Tj = T_{biv}	x,x	x,x	x,x	kW
if declared for 'Colder' season: Heating capacity at -15 °C outdoor	x,x	x,x	x,x	kW

Operating limit temperature (no decimals, value must be integer)	T_{ol}	x	°C
Bivalent temperature (no decimals, value must be integer)	T_{biv}	x	°C
Maximum capacity electric backup (if applicable)		x,x	kW

	Season (warmer/colder if applicable)		
	Warmer	Avg	Colder
COP at -7 °C outdoor	x,x	x,x	x,x
COP at +2 °C outdoor	x,x	x,x	x,x
COP at +7 °C outdoor	x,x	x,x	x,x
COP at +12 °C outdoor	x,x	x,x	x,x
COP at Tj = T_{ol}	x,x	x,x	x,x
COP at Tj = T_{biv}	x,x	x,x	x,x
if declared for 'Colder' season: COP at -15 °C outdoor	(n.a.)	(n.a.)	x,x

Other information

Minimum duration of the guarantee offered by the supplier: x months

Product weight		x	kg
Product dimensions			
- indoor unit (LxWxH)		x	mm
- outdoor unit (LxWxH) (if applicable)		x	mm

Table 9. Product information sheet for spot coolers

Supplier's name or trademark:					
Supplier's address:					
Model identifier:					
Product parameters for cooling:					
Max. cooling capacity Pdc at 27/27 °C in/outdoor		x,x	kW		
Infiltration air flow rate at 27/27 °C in/outdoor		x	m3/h		
EER at max.cooling capacity at 27/27 °C in/outdoor		x		Energy efficiency class for room cooling	[A/B/C/D/E/F/G]
Indoor sound power		x	dB(A)	Indoor sound power class	[A/B/C/D]
Outdoor sound power if applicable		x	dB(A)	Outdoor sound power class if applicable	[A/B/C/D]
Product parameters for heating:					
Max. heating capacity Pdh at 20/20 °C in/outdoor		x,x	kW		
Infiltration air flow rate at 27/27 °C in/outdoor		x	m^3/h		
COP at max. heating capacity at 20/20 °C in/outdoor		x		Energy efficiency class for room heating	[A/B/C/D/E/F/G]
Power consumption standby	*Psb*	x,x	W		
Power consumption off-mode		x,x	W		
GWP of refrigerant used		x	kg CO2 eq./100 y		
Other information					
Minimum duration of the guarantee offered by the supplier			x	months	
Product weight			x	kg	
Product dimensions					
- indoor unit (LxWxH)			x	mm	
- outdoor unit (LxWxH) (if applicable)			x	mm	

Table 10. Product information sheet for comfort fans

Supplier's name or trademark:							
Supplier's address:							
Model identifier:							
Type of comfort fan: [table] / [tower] / [pedestal] / [floor] / [ceiling]							
General product parameters:							
Service Value	*SV*	x	$(m^3/min)/W$	Service Value with control factors	SV_{corr}	x	$(m^3/min)/W$
Rated air delivery	*F*	x	m^3/min	Energy efficiency class		[A/B/C/D/ E/F/G]	
Sound power		x	dB(A)	Fan power input		x	
Power consumption standby		x,x	W	Sound power class		[A/B/C/ D/E]	
Controls delivered with the product							
Controls F2 (only one option may apply)				**Controls F(3)**			
single stage heat output, no room temperature control		[yes / no]		room temperature control with presence detection		[yes / no]	
two or more manual stages, no temperature control		[yes / no]		working time limitation		[yes / no]	
				room temperature controlled air delivery		[yes / no]	
Diameter of comfort fan (if applicable)		x	cm				

ANNEX III Measurement and calculations

Measurements and calculations

For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements and calculations shall be made using harmonised standards, or other reliable, accurate and reproducible methods, which take into account the generally recognised state-of-the-art methods and are in line with the provisions set out below. The reference numbers of these harmonised standards have been published for this purpose in the *Official Journal of the European Union*:

1) General conditions for air-to-air air conditioners, air-to-air heat pumps and comfort fans

   a) The test set-up and environmental conditions for testing of air-to-air air conditioners, air-to-air heat pumps and comfort fans shall be in accordance with test standards as identified in Annex IIIa where applicable;

   b) When measuring off-mode and standby-mode, networked equipment having one or more standby mode(s) shall be assessed with all wired network ports disconnected and all wireless network ports deactivated.

Single duct air-to-air air conditioners

2) Seasonal room cooling energy efficiency of **single duct** air-to-air air conditioners

   a) The seasonal room cooling energy efficiency of **single duct air-to-air air conditioners** (SD AC) is calculated as:

Equation 1

$$\eta_c = \frac{SEER}{CC} * \left(0.75 + \sum_{i}^{xii} F_{corr} \right)$$

Where

SEER	is the seasonal energy efficiency ratio of the SD AC
CC	is the conversion efficiency, with default value 1,9
Fcorr	is (the sum of) the applicable Fcorr value(s)

   b) The seasonal energy efficiency ratio (SEER) of SD AC is calculated as:

Equation 2

$$SEER = \frac{Q_C}{Q_{CE}}$$

Where

Q_C	is reference annual cooling demand of SD AC
Q_{CE}	is the reference electricity consumption for cooling by SD AC

   c) The reference annual cooling demand Q_C of SD ACs is calculated as:

Equation 3

$$Q_C = \frac{10}{24} * \sum_{j=1}^{n} h_j * P_{c\_SD}(Tj)$$

Where
hj is the number of hours the bin condition j occurs, from Table 11
Pc_SD(Tj) is the cooling load for single duct RACs at bin Tj

d) The cooling load for single duct ACs (Pc_SD(Tj)) is calculated as

i) For $T_j \leq$ Teq as:

Equation 4 $$P_{c\_SD(Tj)} = P_{dc(27;100\%)} * \frac{Tj-23}{35-23}$$

Where
$P_{dc(27;100\%)}$ is the cooling capacity at condenser inlet temperature of 27°C and maximum cooling capacity
Tj is the outdoor temperature for bin j

ii) For Tj > Teq as:

Equation 5 $$P_{c\_SD(Tj)} = P_{dc\_corr(Teq)}$$

Where
Pdc_corr(Teq) is the corrected cooling capacity at equilibrium temperature Tj=Teq
Tj is the outdoor temperature for bin j

e) The equilibrium temperature Teq for SD AC is the temperature where the cooling load for SD RAC equals the corrected cooling capacity Pdc_corr(Tj) and is calculated as:

Equation 6

$$T_{eq} = \frac{P_{dc(27,100\%)} + \left(AF * 19.96 * \frac{27}{35-27}\right) + \left(P_{dc(27,100\%)} * \frac{23}{35-23}\right)}{\frac{P_{dc(27,100\%)}}{35-23} + \frac{P_{inf,c(35)}}{35-23}}$$

where:
$P_{dc(27;100\%)}$ is the cooling capacity at maximum capacity and condensor temperature 27°C
AF the infiltration air flow rate for Tj 27°C at maximum capacity, expressed in m³/s
19,96 is the result of rho_air35*spec.enth35 - rho_air27*spec.enth27, with values respectively (1,15*72,5 - 1,17*54,2):
- rhoair27 density of air at 27 °C, equal to 1,17 kg/m³;
- rhoair35 density of air at 35 °C, equal to 1,15 kg/m³;
- h27 the specific enthalpy of infiltration air at 27 °C dry bulb and 19 °C wet bulb temperature per kg dry air, equal to 54,2 kJ/kgda;
- h35 the specific enthalpy of infiltration air at 35 °C dry bulb and 24 °C wet bulb temperature per kg dry air, equal to 72,5 kJ/kgda

$P_{inf,c(35)}$ the infiltration load at Tj=35°C

The equilibrium temperature Teq shall be rounded to the nearest Tj, without decimals.

f) The infiltration load for cooling $P_{inf,c(35°C)}$ is calculated as:

Equation 7

$$P_{inf,c}(35°C) = \frac{(27\ -\ 35)}{(35\ -27)} \times \text{AF}\ \times\ 19{,}96$$

where:
AF the infiltration air flow rate for Tj 27°C at maximum capacity, expressed in m³/s
19,96 is the result of rho_air35*spec.enth35 - rho_air27*spec.enth27, with values respectively (1,15*72,5 - 1,17*54,2):
- rhoair27 density of air at 27 °C, equal to 1,17 kg/m³;
- rhoair35 density of air at 35 °C, equal to 1,15 kg/m³;
- h27 the specific enthalpy of infiltration air at 27 °C dry bulb and 19 °C wet bulb temperature per kg dry air, equal to 54,2 kJ/kgda;

h35 the specific enthalpy of infiltration air at 35 °C dry bulb and 24 °C wet bulb temperature per kg dry air, equal to 72,5 kJ/kgda

g) The corrected cooling capacity for single duct room air conditioners ($P_{dc\text{-}corr}$) for bins corresponding to outdoor temperature Tj is calculated for each bin as:

Equation 8

$$P_{dc\_corr}(Tj) = P_{dc(27,100\%)} + P_{inf,c}(Tj)$$

Where:

$P_{dc(27,100\%)}$ is the maximum cooling capacity at Tj = 27 °C, equal to P_{ratedc} for single duct ACs, in kW

$P_{inf,c}(Tj)$ is the infiltration load for cooling, in kW

h) The infiltration load for cooling $P_{inf,c(Tj)}$ is calculated:

i) for outdoor temperatures Tj < 27 °C as:

Equation 9

$$P_{inf,c}(Tj) = \frac{(27 - Tj)}{(27 - 20)} \times \text{AF} \times 12.77$$

where:

Tj the outdoor temperature in °C

AF the infiltration air flow rate, expressed in m³/s

12.77 is the result of rho_air27*spec.enth27 - rho_air20*spec.enth20, with values respectively (1,17*54,2 - 1,20*42,2):

- rhoair20 density of air at 20 °C, equal to 1,20 kg/m³;
- rhoair27 density of air at 27 °C, equal to 1,17 kg/m³;
- h20 the specific enthalpy of infiltration air at 20 °C dry bulb and 15 °C wet bulb temperature per kg dry air, equal to 42,2 kJ/kgda;
- h27 the specific enthalpy of infiltration air at 27 °C dry bulb and 19 °C wet bulb temperature per kg dry air, equal to 54,2 kJ/kgda;

ii) for outdoor temperatures Tj > 27 °C as:

Equation 10

$$P_{inf,c}(Tj) = \frac{(27 - Tj)}{(35 - 27)} \times \text{AF} \times 19{,}96$$

where:

Tj the outdoor temperature in °C

AF the infiltration air flow rate, expressed in m³/s

19,96 is the result of rho_air35*spec.enth35 - rho_air27*spec.enth27, with values respectively (1,15*72,5 - 1,17*54,2):

- rhoair27 density of air at 27 °C, equal to 1,17 kg/m³;
- rhoair35 density of air at 35 °C, equal to 1,15 kg/m³;
- h27 the specific enthalpy of infiltration air at 27 °C dry bulb and 19 °C wet bulb temperature per kg dry air, equal to 54,2 kJ/kgda;
- h35 the specific enthalpy of infiltration air at 35 °C dry bulb and 24 °C wet bulb temperature per kg dry air, equal to 72,5 kJ/kgda

i) The annual electricity consumption for cooling Q_{CE} by SD ACs is calculated as

Equation 11

$$Q_{CE} = \frac{Q_C}{SEERon} + (Pto * Hto) + (Psb * Hsb)$$

Where

Q_C is the reference annual cooling demand QC for portable RACs

SEERon is active mode seasonal energy efficiency ratio

Hto & Hsb are the annual operating hours for respectively thermostat off-mode and standby-mode for cooling as provided in Table 12

Pto & Psb is the power consumption for respectively thermostat off-mode and standby-mode for cooling.

j) Power consumption in thermostat-off mode and standby shall be established in accordance with the standards mentioned in Annex IIIa. The electric power input in thermostat-off mode and standby mode shall include the networked standby electric power input where applicable.

k) The number of hours per mode to be used for calculation of SEER are presented in Table 12:

l) The active mode seasonal energy efficiency ratio (SEERon) of single duct room air conditioners is calculated as:

Equation 12

$$SEERon = \frac{\sum_{j=1}^{n} hj * Pc\_SD(Tj)}{\sum_{j=1}^{n} hj * \left(\frac{Pc\_SD(Tj)}{EERbin(Tj)}\right)}$$

Where

Tj	is the bin temperature
j	is the bin number
hj	is the number of hours the bin at Tj occurs in a season
n	is the amount of bins per season
Pc_SD(Tj)	is cooling load for single duct AC at bin temperature Tj
EERbin(Tj)	is the EER value for bin temperature Tj
Hto, Hsb	is the number of hours the unit works in thermostat-off mode and standby mode respectively
Pto, Psb	is the power consumption (kW) of the unit when in thermostat-off mode and standby mode respectively

m) The $EER_{bin(Tj)}$ is calculated for each bin:

i) for fixed capacity single duct ACs as:

Equation 13 $$\boldsymbol{EER_{bin}(Tj) = EER_{corr}(Tj) * \left(1 - Cdc * \left(1 - CRc(Tj)\right)\right)}$$

ii) for variable capacity single ducts with CR > 0,33 as:

Equation 14 $$\boldsymbol{EER_{bin}(Tj) = EER_{corr}(Tj) * \left(1 + PLc * \left(1 - CRc(Tj)\right)\right)}$$

iii) and for variable capacity single ducts with CR < 0,33 as:

Equation 15 $$\boldsymbol{EER_{bin}(Tj) = EER_{corr}(Tj) * \left(1 + PLc * (1 - 0,33)\right) * \left(1 - Cdc * \left(1 - \frac{CRc(Tj)}{0,33}\right)\right)}$$

Where:

EERcorr(Tj)	is the corrected energy efficiency ratio for outdoor condition Tj
Cdc	is the cycling degradation factor for cooling, either measured or default 0.25
CR(Tj)	is the capacity ratio for outdoor condition Tj
PLc	is the part load correction for cooling

n) The corrected energy efficiency ratio EERcorr(Tj) is calculated:

i) for Tj < Teq. as:

Equation 16 $$\boldsymbol{EER_{corr}(Tj) = P_{dc\_corr}(Tj) * \frac{EER_{(35;100\%)}}{P_{dc(35;100\%)}}}$$

Where:

Pdc_corr(Tj)	is the corrected cooling capacity at outdoor condition Tj
$P_{dc(35;100\%)}$	is the cooling capacity at Tj = 35 °C while providing maximum cooling capacity, in kW
$EERd_{(35;100\%)}$	is the energy efficiency ratio at Tj = 35 °C while providing maximum cooling capacity

ii) for Tj > Teq. as:

Equation 17 $EER_{corr}(Tj) = P_{dc\_corr}(Teq) * \frac{EER_{d(35;100\%)}}{P_{dc(35;100\%)}}$

Where:

$P_{dc\_corr(Teq.)}$	is the corrected cooling capacity at equilibrium temperature Tj =Teq.
$P_{dc(35,100\%)}$	is the maximum cooling capacity at Tj = 35 °C while providing maximum cooling capacity, in kW
$EER_{d(35;100\%)}$	is the energy efficiency ration at Tj = 35 °C while providing maximum cooling capacity

o) The capacity ratio for cooling CRc(Tj) is calculated as:

Equation 18

$$CRc(Tj) = \frac{P_{c\_SD(Tj)}}{P_{dc\_SD(Tj)}}, with\ minimum\ 0\ and\ maximum\ 1$$

Where

Pc_SD(Tj)	is the cooling load per bin;
Pdc_SD(Tj)	is the declared cooling capacity per bin

p) The part load coefficient PLc is calculated as:

$$PL_{c} = \frac{EER_{d(27;33\%)} - EER_{d(35;100\%)}}{EER_{d(35;100\%)}} * \frac{P_{dc(35;100\%)}}{P_{dc(35;100\%)} - P_{dc(27;33\%)}}$$

Where:

$EERd_{(27;33\%)}$	is the energy efficiency ratio at Tj = 27 °C and 33% of the maximum cooling capacity
$EERd_{(35;100\%)}$	is the energy efficiency ratio at Tj = 35 °C while providing maximum cooling capacity
$Pdc_{(27;33\%)}$	is the cooling capacity at Tj = 27 °C and 33% of the maximum cooling capacity
$Pdc_{(35;100\%)}$	is the cooling capacity at Tj = 35 °C while providing maximum cooling capacity

q) The rated capacity P_{ratedc} of single duct air-to-air air conditioners is the corrected cooling capacity at Tj=Teq, or $P_{dc\_corr(Teq)}$, calculated for an indoor temperature set-point of 27°C.

Portable double duct air-to-air air conditioners

3) Seasonal cooling efficiency of portable double duct air-to-air air conditioners

a) The seasonal room cooling energy efficiency of portable double duct room air conditioners is calculated as:

Equation 19

$$\eta_c = \frac{SEER}{CC} * \left(0.75 + \sum_{i}^{xii} F_{corr}\right)$$

Where

SEER	is the seasonal energy efficiency ratio of the portable room air conditioner
CC	is the conversion efficiency, with default value 1,9
Fcorr	is (the sum of) the applicable Fcorr value(s).

b) The seasonal energy efficiency ratio (SEER) of portable double duct RACs is calculated as:

Equation 20

$$SEER = \frac{Q_C}{Q_{CE}}$$

Where
Q_C is reference annual cooling demand for portable double duct RACs
Q_{CE} is the reference electricity consumption for cooling by portable double duct RACs

c) The reference annual cooling demand Q_C of portable double duct RACs is calculated as:

Equation 21

$$Q_C = \frac{10}{24} * \sum_{j=1}^{n} h_j * Pc\_op(Tj)$$

Where
h_j is the number of hours the bin condition occurs, from Table 11
Pc_op(Tj) is the cooling load for portable double duct RACs at bin Tj

d) The cooling season for portable double duct RACs is:

Table 11. Cooling season (bins) for portable room air conditioners

Bin j (#)	**Outdoor temperature** T_j (°C)	**Portable room air conditioners** bin hours h_j (h/a)
1	17	(not used)
2	18	
3	19	
4	20	
5	21	
6	22	
7	23	218
8	24	197
9	25	178
10	26	158
11	27	137
12	28	109
13	29	88
14	30	63
15	31	39
16	32	31
17	33	24
18	34	17
19	35	13
20	36	9
21	37	4
22	38	3
23	39	1
24	40	0

e) The cooling load for portable double duct ACs (Pc_op(Tj)) is calculated as

$$\textbf{Equation 22} \quad P_{c\_op(Tj)} = P_{dc(35;100\%)} * \frac{Tj-23}{35-23}$$

Where

Pdc(35;100%)	is the cooling capacity at Tj=35ºC while providing maximum cooling capacity
Tj	is the outdoor temperature for bin j

f) The annual electricity consumption for cooling QCE for portable double duct ACs is calculated as

Equation 23

$$Q_{CE} = \frac{Q_C}{SEERon} + (Pto * Hto) + (Psb * Hsb)$$

Where

Q_C	is the reference annual cooling demand Q_C for portable double duct RACs
SEERon	is active mode seasonal energy efficiency ratio for portable double duct RACs
Hto & Hsb	are the annual operating hours for respectively thermostat off-mode and standby-mode for cooling as provided in Table 12
Pto & Psb	is the power consumption for respectively thermostat off-mode and standby-mode for cooling.

g) The number of hours per mode to be used for calculation of SEERon are:

Table 12. Operating hours for portable room air conditioners

Operating hours (h/a)	
Thermostat Off mode, H_{TO}	Standby mode, H_{SB}
91	750

h) Power consumption in thermostat-off mode and standby shall be established in accordance with the standards mentioned in Annex IVa. The electric power input in thermostat-off mode and standby mode shall include the networked standby electric power input where applicable.

i) The active mode seasonal energy efficiency ratio (SEERon) of portable double duct room air conditioners is calculated as:

Equation 24

$$SEERon = \frac{\sum_{j=1}^{n} hj * Pc\_op(Tj)}{\sum_{j=1}^{n} hj * \left(\frac{Pc(Tj)}{EERbin(Tj)}\right)}$$

Where

Tj	is the bin temperature
j	is the bin number
hj	is the number of hours the bin at Tj occurs in a season
n	is the amount of bins per season
Pc_op(Tj)	is the cooling load for portable double duct RACs at bin j
EERbin(Tj)	is the EER value for the corresponding temperature Tj
Hto, Hsb	is the number of hours the unit works in thermostat-off mode and standby mode respectively
Pto, Psb	is the power consumption (kW) of the unit when in thermostat-off mode and standby mode respectively

j) The EERbin(Tj) of portable double duct ACs is calculated for each bin:

i) if fixed capacity as:

Equation 25 $$\boldsymbol{EER_{bin}(Tj) = EER_d(Tj) * \left(1 - Cdc * \left(1 - CR(Tj)\right)\right)}$$

ii) if variable capacity and CR > 0,33 as:

Equation 26 $$\boldsymbol{EER_{bin}(Tj) = EER_d(Tj) * \left(1 + PLc * \left(1 - (CR(Tj))\right)\right)}$$

iii) if variable capacity and CR < 0,33 as:

Equation 27 $$\boldsymbol{EER_{bin}(Tj) = EER_d(Tj) * \left(1 + PLc * (1 - 0,33)\right) * \left(1 - Cdc * \left(1 - \frac{CR(Tj)}{0,33}\right)\right)}$$

Where:

EERd (Tj)	is the corrected energy efficiency ratio for outdoor condition Tj
Cdc	is the cycling degradation factor for cooling, either measured or default 0.25
CR(Tj)	is the capacity ratio for outdoor condition Tj
PLc	is the part load correction for cooling

k) With the energy efficiency ratio EERd(Tj) for each bin calculated as:

Equation 28

$$EER_d(Tj) = EER_{d(27,100\%)} + \frac{EER_{d(35,100\%)} - EER_{d(27,100\%)}}{8} * (Tj - 27)$$

l) For units having variable capacity the energy efficiency ratio EERd(35,100%) and EERd(27,33%) shall be determined in the following part load conditions:

Table 13. Part load conditions for portable double duct room air conditioners

For units with capacity control:	**Air temperature dry(wet) bulb °C**		**Load condition**	**Parameters determined**
	to condensor (outdoor air)	to evaporator (indoor air)		
fixed or variable	35	27(19)	full load: maximum cooling capacity at 35ºC	Pdc(35;100%), EERd(35;100%), AF, sound power
variable only	27	27(19)	35% of full load if the unit is capable of variable capacity	Pdc(27;33%), EERd(27;33%), AF

m) The cycling degradation factor for cooling (Cdc) shall be determined in a test, in accordance with Annex IIa, or shall be the default value 0.25.

n) The capacity ratio for cooling CRc(Tj) is calculated as:

Equation 29

$$CRc(Tj) = \frac{P_{c\_op}(Tj)}{P_{dc}(Tj)}, \textit{with a minimum value of } 0 \textit{ and maximum value of } 1$$

Where

Pc_op(Tj)	is the cooling load per bin (defined above);
Pdc(Tj)	is the declared cooling capacity per bin

o) The declared cooling capacity Pdc(Tj) is calculated for each bin:

Equation 30

$$P_{dc}(Tj) = P_{dc(35;100\%)} + \frac{P_{dc(35;100\%)} - P_{dc(27;33\%)}}{8} \times (Tj - 27)$$

Where

Tj is the outdoor temperature, in °C

Pdc(27;33%) is the cooling capacity for Tj = 27 °C closest to part load 33%, in kW

Pdc(35;100%) is the cooling capacity for Tj = 35 °C while providing maximum cooling capacity, in kW

p) The part load coefficient PLc for portable double duct RAC (with variable capacity) is calculated as:

$$PL_c = \frac{EER_{d(27;33\%)} - EER_{d(35;100\%)}}{EER_{d(35;100\%)}} * \frac{P_{dc(35;100\%)}}{P_{dc(35;100\%)} - P_{dc(27;33\%)}}$$

Where:

EERd(27;33%) is the energy efficiency at the part load condition at Tj=27ºC outdoor temperature and 33% of maximum cooling capacity

EERd(35;100%) is the energy efficiency at Tj=35ºC outdoor temperature and maximum cooling capacity

Pdc(27;33%) is the cooling capacity at the part load condition at Tj=27ºC outdoor temperature and of 33% of maximum cooling capacity

Pdc(35;100%) is the maximum cooling capacity at Tj=35ºC outdoor temperature

q) The rated capacity of portable double duct air-to-air air conditioners is the cooling capacity at Tj=35°C, at maximum load, calculated with indoor temperature setpoint of 27°C.

Other air-to-air air conditioners and fixed double duct air condtioners

4) Seasonal cooling efficiency of other air-to-air air conditioners and fixed double duct air condtioners

a) The seasonal room cooling energy efficiency η_c of other air-to-air air conditioners and fixed double duct air condtioners is calculated as:

Equation 31

$$\eta_c = \frac{SEER}{CC} * \left(0.75 + \sum_{i}^{xii} F_{corr}\right)$$

Where

SEER is the seasonal energy efficiency ratio of the fixed room air conditioner

CC is the conversion efficiency, with default value 1,9

Fcorr is (the sum of) the applicable Fcorr value(s)

b) The seasonal energy efficiency ratio (SEER) of other air-to-air air conditioners and fixed double duct air condtioners is calculated as:

Equation 32

$$SEER = \frac{Q_C}{Q_{CE}}$$

Where

QC is reference annual cooling demand

QCE is the reference electricity consumption for cooling

c) The reference annual cooling demand QC of other air-to-air air conditioners and fixed double duct air condtioners is calculated as:

Equation 33

$$Q_C = P_{designc} * H_{CE}$$

Where

$P_{designc}$	is the design load for cooling (kW)
H_{CE}	is the equivalent active mode hours for cooling, from Table 14

d) The design load for cooling Pdesignc for other air-to-air air conditioners and fixed double duct air condtioners is declared by the manufacturer. The equivalent active mode hours for cooling by fixed room air conditioners are presented in Table 14.

e) The annual electricity consumption for cooling (QCE) by other air-to-air air conditioners and fixed double duct air condtioners is calculated as:

Equation 34

$$Q_{HE} = \frac{Q_C}{SEER_{on}} + (H_{to} * P_{to}) + (H_{sb} * P_{sb}) + (H_{ck} * P_{tock}) + (H_{off} * P_{off})$$

Where

Q_C	is the equivalent active mode hours for heating
$SEER_{on}$	is active mode seasonal energy efficiency ratio
H_{to}, H_{sb}, H_{ck} and H_{off}	are the annual operating hours for respectively thermostat off-mode, standby-mode, crankcase heater mode and off-mode for cooling as provided in Table 14
P_{to}, P_{sb}, P_{ck} and P_{off}	is the power consumption for respectively thermostat off-mode, standby-mode, crankcase heater mode and off-mode for cooling

f) The annual operating hours per mode to be used for the calculation of SEER of other air-to-air air conditioners and fixed double duct air condtioners are:

Table 14. Annual operating hours for fixed room air conditioners

Function	**Annual operating hours**				
	On-mode	Thermostat Off mode	Standby mode	Off mode	Crankcase heater mode
	H_{CE}	H_{TO}	H_{SB}	H_{off}	H_{CK}
Cooling only	350	221	2142	5088	2363
Reversible	350	221	2142	0	2363

g) Power consumption in thermostat-off mode and standby-mode of other air-to-air air conditioners and fixed double duct air condtioners shall be established in accordance with the standards mentioned in Annex IVa. The electric power input in thermostat-off mode, standby mode, crankcase heating mode and off-mode shall include the networked standby electric power input where applicable.

h) The active mode seasonal energy efficiency ratio SEERon of other air-to-air air conditioners and fixed double duct air condtioners is calculated as:

Equation 35

$$SEER_{on} = \frac{\sum_{j=1}^{n} h_j * [P_c(Tj)]}{\sum_{j=1}^{n} h_j * \left[\frac{P_c(Tj)}{EER_{bin}(Tj)}\right]}$$

Where
n is the total of bins of the cooling season, from Table 15;
j is the bin number, from Table 15;
h_j is the number of hours the bin condition occurs, from Table 15;
Pc is the cooling load per bin;
EERbin is the energy efficiency ratio of the RAC for the corresponding bin, including corrections related to part load behaviour;

i) The cooling season for other air-to-air air conditioners and fixed double duct air condtioners is:

Table 15. Cooling season (bins) for other air-to-air air conditioners and fixed double duct air condtioners

Bin j (#)	**Outdoor temperature** T_j (°C)	**Fixed room air conditioners** bin hours h_j (h/a)
1	17	205
2	18	227
3	19	225
4	20	225
5	21	216
6	22	215
7	23	218
8	24	197
9	25	178
10	26	158
11	27	137
12	28	109
13	29	88
14	30	63
15	31	39
16	32	31
17	33	24
18	34	17
19	35	13
20	36	9
21	37	4
22	38	3
23	39	1
24	40	0

j) The cooling load Pc(Tj) for each bin is calculated as:

Equation 36

$$Pc(Tj) = P_{designc} * \frac{(Tj - 16)}{(T_{designc} - 16)}$$

Where
Pdesignc is the design load for cooling (kW)
Tj is the outdoor temperature for bin j, from Table 15
Tdesignc is the reference design temperature from Table 16

k) The value for Tdesignc is stated in Table 16.

Table 16. Reference conditions for fixed RAC

Function	**Reference design temperature (°C)** dry bulb (wet bulb)

	$T_{designc}$
Cooling	35 (24)

l) The EERd(Tj) at test conditions in Table 17 shall be established at the closest step or increment of the capacity control of the unit to reach the required cooling load. If the cooling capacity deviates more than 10% from the required capacity the two settings closest to opposite sides of the required load shall be used and the EERd(Tj) shall be calculated by interpolation. If that values deviates more than 10% from the required cooling load, the EERbin(Tj) shall be calculated as if the unit has fixed capacity control.

m) For bins that correspond to test conditions in Table 17 the bin-specific energy efficiency ratio EERbin(Tj) is equal to the EERd(Tj).

n) The bin-specific energy efficiency ratio EERbin(Tj) for fixed capacity RACs takes into account effects of degradation from cycling behaviour and is calculated as:

Equation 37

$$EERbin(Tj) = EERd(Tj) * [1 - C_{dc} * (1 - CR(Tj))]$$

o) Values for EERd(Tj) for bins j that do not correspond to test conditions in Table 17 are calculated on the basis of inter- and extrapolations from the closest known EERd(Tj) values as established in the test conditions.

p) For part load conditions above part load condition A, the same EERd values as for condition A are used. For part load conditions below part load condition D, the same EERd values as for condition D are used.

q) For multi-split other air-to-air air conditioners and fixed double duct air condtioners, the EERbin(Tj) used for the calculation of the SEERon shall include the energy consumption of the outdoor units and indoor units for a system capacity ratio of 1.

Table 17. Part load conditions for fixed room air conditioners

Product (sub)group and test condition	**Inlet temperature dry(wet) bulb °C**		**Load condition**	**Parameters established**
	Outdoor temperature (condensor)	Indoor temperature (evaporator)		
A = P_{ratedc}, Tj=35	35	27 (19)	100% of Pdesignc	Prated,c=Pdc(Tj) EERd(Tj) sound power
B, Tj=30	30	27 (19)	74% of Pdesignc	Pdc(Tj), EERd(Tj)
C, Tj=25	25	27 (19)	47% of Pdesignc	Pdc(Tj), EERd(Tj)
D, Tj=20	20	27 (19)	21% of Pdesignc	Pdc(Tj), EERd(Tj)

r) The part load ratio for cooling plrc(Tj) per bin is calculated as:

Equation 38

$$plr_c(Tj) = \frac{(Tj - 16)}{(Tdesignc - 16)}$$

Where
Tj is the outdoor air temperature for the bin assessed
Tdesignc is the reference design temperature for cooling, in accordance with Table 16.

s) Where the value for the degradation coefficient for cooling Cdc shall be established either by measurement according the applicable standards mentioned in Annex IIIa, or by using the default value of 0.25.

t) The capacity ratio CRc(Tj) is established for each applicable bin, and is calculated as:

Equation 39

$$CRc(Tj) = \frac{P_c(Tj)}{P_{dc}(Tj)}$$

Where
Pc is the cooling load for bin Tj
Pdc is the declared cooling capacity for bin Tj

u) The value for CRc(Tj) cannot be higher than 1.

v) The declared cooling capacity Pdc(Tj) for bins that do not correspond to test conditions shall be calculated by interpolation from nearest Pdc(Tj) in the test conditions presented in Table 17

w) The rated cooling capacity Pratedc and the sound power LWA of other air-to-air air conditioners and fixed double duct air condtioners is established with the room air conditioner operating in the standard rating conditions as stated in Table 18.

Table 18. Standard rating conditions for other air-to-air air conditioners and fixed double duct air condtioners

Product (sub)group	**Air inlet temperature dry(wet) bulb °C**		**Load condition**	**Parameters measured**
	Outdoor temperature (for evaporator)	Indoor temperature (for condensor)		
other air-to-air air conditioners and fixed double duct air condtioners	35(24*)	27(19)	Maximum cooling output attainable in this condition	Pratedc (kW) sound power

x) The rated capacity of other air-to-air air conditioners and fixed double duct air condtioners is the cooling capacity at Tj=35°C, at maximum load, calculated with indoor temperature setpoint of 27°C.

Other air-to-air heat pumps and fixed double duct heat pumps

5) Seasonal room heating efficiency of other air-to-air heat pumps and fixed double duct heat pumps

a) The seasonal room heating energy efficiency of other air-to-air heat pumps and fixed double duct heat pumps is calculated as:

Equation 40

$$\eta_{rh} = \frac{SCOP}{CC} * \left(0.75 + \sum_{i}^{xii} F_{corr} \right)$$

Where

SCOP	is the seasonal coefficient of performance of the other air-to-air heat pumps and fixed double duct heat pumps
CC	is the conversion efficiency, with default value 1,9
Fcorr	is (the sum of) the applicable Fcorr value(s)

b) The seasonal coefficient of performance (SCOP) of other air-to-air heat pumps and fixed double duct heat pumps is calculated as:

Equation 41

$$SCOP = \frac{Q_H}{Q_{HE}}$$

Where

Q_H	is reference annual heating demand
Q_{HE}	is the reference electricity consumption for heating

c) The reference annual heating demand QH of other air-to-air heat pumps and fixed double duct heat pumps is calculated as:

Equation 42

$$Q_H = P_{designh} * H_{HE}$$

Where

$P_{designh}$	is the design load for heating (kW)
H_{HE}	is the equivalent active mode hours for heating

d) The design load for heating Pdesignh for other air-to-air heat pumps and fixed double duct heat pumps is declared by the manufacturer.

e) The equivalent active mode hours for heating by other air-to-air heat pumps and fixed double duct heat pumps are presented in Table 19.

f) The annual electricity consumption for heating (QHE) by other air-to-air heat pumps and fixed double duct heat pumps is calculated as:

Equation 43

$$Q_{HE} = \frac{Q_H}{SCOP_{on}} + (H_{to} * P_{to}) + (H_{sb} * P_{sb}) + (H_{ck} * P_{tock}) + (H_{off} * P_{off})$$

Where

Q_H	is the equivalent active mode hours for heating
$SCOP_{on}$	is active mode seasonal efficiency ratio SCOPon
H_{to}, H_{sb}, H_{ck} and H_{off}	are the annual operating hours for respectively thermostat off-mode, standby-mode, crankcase heater mode and off-mode for heating as provided in Table 19

P_{to}, P_{sb}, P_{ck} and P_{off} is the power consumption for respectively thermostat off-mode, standby-mode, crankcase heater mode and off-mode for heating

g) The annual operating hours per mode to be used for the calculation of the SCOP are:

Table 19. Annual operating hours for other air-to-air heat pumps and fixed double duct heat pumps

Function	**Season**	**Annual operating hours**				
		Equivalent active mode hours for heating	Thermostat Off mode	Standby mode	Off mode	Crankcase heater mode
		H_{HE}	**H_{TO}**	**H_{SB}**	**H_{off}**	**H_{CK}**
Reversible	Average	1400	179	0	0	179
	Colder	2100	131	0	0	131
	Warmer	1400	755	0	0	755
Heating only	Average	1 400	179	0	3672	3815
	Colder	2 100	131	0	2184	2315
	Warmer	1 400	755	0	4416	5171

h) The electric power input in thermostat-off mode, standby mode, crankcase heating mode and off-mode of other air-to-air heat pumps and fixed double duct heat pumps shall include the networked standby electric power input where applicable.

i) The active mode seasonal efficiency ratio SCOPon for other air-to-air heat pumps and fixed double duct heat pumps is calculated as:

Equation 44

$$SCOP_{on} = \frac{\sum_{j=1}^{n} h_j * P_h(Tj)}{\sum_{j=1}^{n} h_j * \left[\frac{P_h(Tj) - elbu(Tj)}{COP_{bin}(Tj)} + elbu(Tj)\right]}$$

Where
n is the total of bins for the heating season the unit is marketed for;
j is the bin number;
hj is the number of hours the bin conditions occur in a heating season;
Ph is the heat load per bin;
elbu(Tj) is the heating capacity supplied by the (assumed) backup heater, using a COP of 1;
COPinf is the coefficient of performance of the RHP for the corresponding bin, including corrections related to part load behaviour;

j) The average heating season for the calculation of the SCOP is presented in Table 20. This table also shows bins for the Warmer and Colder heating season.

Table 20. Heating season (bins) for fixed room heat pumps

Bin j (#)	**Outdoor temperature** T_j (°C)	**bin hours for all room heat pumps** bin hours h_j (h/a)		
		Warmer	**Average**	**Colder**
1 to 8	-30 to -23	0	0	0
9	-22	0	0	1
10	-21	0	0	6
11	-20	0	0	13

12	-19	0	0	17
13	-18	0	0	19
14	-17	0	0	26
15	-16	0	0	39
16	-15	0	0	41
17	-14	0	0	35
18	-13	0	0	52
19	-12	0	0	37
20	-11	0	0	41
21	-10	0	1	43
22	-9	0	25	54
23	-8	0	23	90
24	-7	0	24	125
25	-6	0	27	169
26	-5	0	68	195
27	-4	0	91	278
28	-3	0	89	306
29	-2	0	165	454
30	-1	0	173	385
31	0	0	240	490
32	1	0	280	533
33	2	3	320	380
34	3	22	357	228
35	4	63	356	261
36	5	63	303	279
37	6	175	330	229
38	7	162	326	269
39	8	259	348	233
40	9	360	335	230
41	10	428	315	243
42	11	430	215	191
43	12	503	169	146
44	13	444	151	150
45	14	384	105	97
46	15	294	74	61
	Total hours:	3 590	4 910	6 446

k) The heating load Ph(Tj) for each bin is calculated as:

Equation 45

$$Ph(Tj) = P_{designh} * \frac{(16 - Tj)}{(16 - T_{designh})}$$

Where
Pdesignh is the design load for heating (kW)
Tj is the outdoor temperature for bin j, from Table 20
Tdesignc is the reference design temperature for the applicable heating season, from Table 21

l) The values for Tdesignh, Tbiv and Thp,off are stated in Table 21.

Table 21. Reference conditions for other air-to-air heat pumps and fixed double duct heat pumps

Function	**Season**	**Reference design temperature (°C)** dry bulb (wet bulb)	**Bivalent temperature maximum (°C)**	**Operation limit temperature maximum (°C)**

		$T_{designh}$	T_{biv}	$T_{hp,off}$
Heating	Average	- 10 (- 11)	+ 2	- 7
	Warmer	2 (-1)	7	2
	Colder	-22 (-23)	-7	-15

m) The electric supplementary heating capacity elbu(tj) is calculated as the difference between the required heat load Pc(Tj) and the heating capacity provided by the refrigeration cycle of the heat pump Pdh(Tj) for each bin.

n) For variable capacity other air-to-air heat pumps and fixed double duct heat pumps the COPd(Tj) at test conditions in Table 22 shall be established at the closest step or increment of the capacity control of the unit to reach the required heating load. If the heating capacity in that condition deviates more than 10% from the required heat load, the two settings closest to opposite sides of the required load shall be used and the COPd(Tj) for that condition shall be calculated by interpolation. If that value deviates more than 10% from the required heating load, the COPbin(Tj) shall be calculated as if the unit has fixed capacity control.

o) The bin-specific coefficient of performance COPbin(Tj) for other air-to-air heat pumps and fixed double duct heat pumps takes into account effects of degradation from cycling behaviour and is calculated as:

Equation 46

$$COPbin(Tj) = COPd(Tj) * \left(1 - Cdh * \left(1 - CRh(Tj)\right)\right)$$

p) Values for COPd(Tj) for bins j that do not correspond to test conditions in Table 22 are calculated on the basis of inter- and extrapolations from the closest known COPd(Tj) values as established in the test conditions.

q) For part load conditions with Tj above the highest Tj at which is tested, the COPd shall be the same as the COPd for that highest test condition. For part load conditions with Tj below the lowest Tj tested, the COPd shall be the same as the COPd for that lowest test condition.

r) For multi-split other air-to-air heat pumps the COPbin(Tj) used for the calculation of the SCOPon shall include the energy consumption of the outdoor units and indoor units for a system capacity ratio of 1.

Table 22. Part load conditions for other air-to-air heat pumps and fixed double duct heat pumps

Test conditions	**Inlet temperature dry(wet) bulb °C**		**Part load ratio plrh(Tj) per heating season (%)**			**Parameters established**
	Outdoor temperature (evaporator)	**Indoor temperature (condensor)**	**Average (mandatory)**	**Warmer**	**Colder**	
A (bin Tj = -7°)	-7(-8)	+20(+15)	88%	n/a	61%	Pdh(Tj), COPd(Tj)
B (bin Tj = +2°)	+2(+1)		54%	100%	37%	
C (bin Tj = +7°)	+7(+6)		35%	64%	24%	
D (bin Tj = +12°)	+12(+11)		15%	29%	11%	
E			(Tol-16)/(Tdesignh-16) %			

(if Tol≥Tdesign: bin Tj = Tol or Thp,off)	Tol (or Thp,off)		(Tol-16)/(Tdesignh-16) %			
(if Tol<Tdesignh: bin Tj = Tdesignh)	Tdesignh		100%			
F (bin Tj = Tbiv)	Tbiv		(Tbiv-16)/(Tdesignh-16) %			
G (bin Tj = -15°)	-15		(not applicable)	(not applicable)	82	

s) The part load ratio for heating plrh(Tj) per bin is calculated as:

Equation 47

$$plr_h(Tj) = \frac{(Tj - 16)}{(Tdesign - 16)}$$

Where
Tj is the outdoor air temperature for the bin assessed
Tdesign is the reference design temperature for the heating season the unit is marketed for, in accordance with Table 21.

t) The value for the degradation coefficient for heating Cdh shall be established either by measurement according the applicable standards mentioned in Annex IIIa, or by using the default value of 0.25.

u) The capacity ratio for cooling CRh(Tj) is established for each bin, and is calculated as:

Equation 48

$$CRh(Tj) = \frac{P_h(Tj)}{P_{dh}(Tj)}$$

Where
Ph is the heating load for bin Tj
Pdh is the declared heating capacity for bin Tj

v) The value for CRh(Tj) cannot be higher than 1.

w) The declared heating capacity Pdh(Tj) for bins that do not correspond to test conditions shall be calculated by interpolation from nearest Pdh(Tj) in the test conditions presented in Table 22.

x) The rated heating capacity Pratedh and the sound power of other air-to-air heat pumps and fixed double duct heat pumps shall be established with the unit operating in the standard rating conditions as stated in Table 23.

Table 23. Standard rating conditions for other air-to-air heat pumps and fixed double duct heat pumps

Product (sub)group	**Inlet temperature dry(wet) bulb °C**		**Load condition**	**Parameters measured**
	Outdoor temperature (evaporator)	Indoor temperature (condensor)		
Room heat pump	+7(+6)	+20(+15)	Maximum heat output attainable in this condition (using the vapour compression cycle only)	Pratedh (kW), sound power (indoor/outdoor)

Comfort fans

6) Seasonal energy efficiency of comfort fans

a) The test shall be carried out at an ambient temperature of 20 °C;

b) The rated voltage and the rated frequency shall be used for the test. If the fan is specified for two or more distinct rated voltages, the tests shall be carried out at the most unfavourable voltage. When a rated voltage range is given, the test voltage shall be:

i) the highest and the lowest values of the range when the voltage range is in excess of 10 % of the mean of the range;

ii) the mean of the upper and lower limits when the voltage range is 10 % or less of the mean of the range.

c) For a fan with a range of frequencies, the tests shall be made at the frequency which gives the most unfavourable results;

d) The fan is set at maximum speed, with the oscillating mechanism (if any) turned 'off'. The maximum flow rate is calculated by summing the maximum air flow rates established at measurement points that are positioned at incrementing distances from the vertical axis of the fan. See Table 29 for the starting position and increments.

e) The maximum flow rate at each distance is calculated by multiplying the air velocity measured at maximum speed at each distance by the surface area of the annulus, with radius in Table 29, over which is measured;

f) Air velocity measurements start at the initial position, as set out in Table 29. From that position, measurements shall be done in increments along a horizontal line until the air velocity falls below 24 m/min for ceiling fans or 9 m/min for other comfort fans;

Table 29. Measurement positions and air velocity limits for comfort fans

Type comfort fan	Start position (mm)	Increment step (mm) along semi-diagonal of test chamber	Increment impeller radius / annulus (mm)	Air velocity limit (m^3/min)
Ceiling fans	40 mm from axis of fan blades	80 mm	80 mm	9
Other fans	20 mm from the vertical axis	40	40	24

g) The maximum fan power input is measured with capacitors (if any) retained in the circuit, and with the oscillating mechanism 'on', and with other electric or electronic circuitry required or allowing control over the fan air flow turned 'on' (this can include remote control, thermostat functions, etc.). Functions that are not related to control of fan flow rate such as lighting, music, etc. can be turned 'off'.

h) The service value SV in (m^3/min)/W for comfort fans shall be calculated as follows:

Equation 59

$$SV = \frac{F}{PF}$$

where
F is the maximum fan flow rate in m^3/min;

P_{fan} is the fan power input at maximum flow, in W;

i) For electric power in stand-by (Psb) and off-mode (Poff) the same testing methods apply as for room heat pumps.

j) The seasonal comfort fan efficiency (eta_{cf}) is calculated as the product of the service value and the sum of the applicable correction factors Fcorr:

Equation 60

$$\eta_{cf} = SV * \left(0.75 + \sum_{i}^{xii} F_{corr}\right) * F_{aux}$$

k) The correction for auxiliary comfort fan electricity consumption Faux is calculated as:

Equation 61

$$F_{aux} = \frac{1}{1 + \left(\frac{1{,}3 * el_{sb}}{P_{fan}}\right)}$$

Where:
el_{sb} is the standby power input of the comfort fan, in W,
P_{fan} is the nominal fan power input at maximum flow, in W

Correction factors

7) Correction factors

a) For the products within the scope of this regulation the seasonal efficiencies take into account the effect of certain control features by a control correction factor Fcorr, which is based upon the sum of the corrections for each control feature, where applicable. Note: The correction factors are designated F(2) and F(3) in order to keep alignment with measures that address similar or the same products.

b) where F(2) is a correction factor accounting for a positive contribution to the seasonal space heating (or cooling) energy efficiency due to adjusted contributions of controls of indoor heating (or cooling) comfort, the values of which are mutually exclusive, cannot be added to each other, expressed in %;

Table 30 Correction factor F(2)

Correction factor *F*(2)

Controls (only one option may apply)	**F(2)**		
	Portable and single duct air-to-air air conditioners and heat pumps	**Other and fixed double duct air-to-air air conditioners and heat pumps**	**Comfort fans**
single stage heat output, no room temperature control	0	0	0
two or more manual stages, no temperature control	0	0	0.05
with mechanic thermostat room temperature control	0	0	0
with electronic room temperature control	0.10	0.05	0

with electronic room temperature control plus day timer	0.15	0.075	0
with electronic room temperature control plus week timer	0.15	0.10	0

c) F(3) is a correction factor accounting for a positive contribution to the seasonal space heating (or cooling) energy efficiency due to adjusted contributions of controls for indoor heating (or cooling) comfort the values of which can be added to each other, expressed in %;

Table 31 Correction factor F(3)

Correction factor F(3)

If the product is equipped with (multiple options may apply):	**F(3)**		
	Portable and single duct air-to-air air conditioners and heat pumps	**Other and fixed double duct air-to-air air conditioners and heat pumps**	**Comfort fans**
room temperature control with presence detection	0.05	0.025	0.10
room temperature control with open window detection	0	0.025	0
distance control option	0	0.025	0
adaptive start control	0	0.025	0
working time limitation	0.05	0.025	0.05
black bulb sensor	0	0	0
self-learning functionality	0	0.0125	0
control accuracy	0	0.0125	0
room temperature controlled air delivery	0	0	0.05

d) The control accuracy shall be measured by placing the product in a test chamber and applying different thermal loads (both heating and cooling if applicable) to which the unit will adjust its output using its controls and measuring the zone temperature after defined periods of time. The control accuracy shall consider the ability of the product to maintain a constant zone temperature under different constant load conditions (control variation, CV) and the difference between the mean zone temperature and the setpoint (control to setpoint deviation, CSD). The supplier of the unit can claim control accuracy if the value for the control accuracy is less than 2 K and the control to setpoint deviation is less than 2 K, for both heating and cooling loads (if applicable);

e) Room temperature controlled air delivery [method to be developed following a request for standardisation] .

Functional requirements

8) Comfort requirements

a) The maximum indoor air flow rate shall be assessed with the unit operating in the in the following conditions

i) for air-to-air air conditioners, in cooling mode, at test condition A (Tj=35°C);

ii) for fixed double duct heat pumps, when in heating mode, at $Tj=T_{hp,off}$.

iii) for other air-to-air heat pumps, when in heating mode, in test condition A (Tj=-7°C) or in case Tbiv < -7°C at test condition F (Tj=Tbiv);

9) Controls verification procedure

a) The 'controls verification procedure' (CVP) is a method to assess whether the unit, using the controls that are expected to be used in real-life, is capable of achieving the compressor frequency/-ies that have been used to determine the performance in test condition(s) D by subjecting the unit to dynamic (changing) conditions above, below and including test condition D.

b) The CVP to be used shall include the following elements:

i) The unit shall be tested using similar settings for air grills, dampers, air flow rates, etc. as during the test(s) in condition D. The unit shall be controlled using the controls that are expected to be used in real-life (no overriding of controls by test-modes etc.);

ii) The temperature in the test room(s) for the indoor unit shall be set at a starting temperature within the range indicated in Table 32 and the room shall be allowed to achieve stable conditions that last at least 30 minutes;

iii) Once the test room temperatures are stable the unit shall be turned on with setpoint temperatures as indicated in Table 32. The temperatures in the test room (with the unit turned on) shall be allowed to achieve stable conditions that last at least 30 minutes;

iv) Once stable conditions are achieved it shall be confirmed by contactless measurement that the compressor frequency is higher than the compressor frequency declared for test condition D. If this is not the case, the setpoint shall be changed so that the frequency is higher than declared and stable conditions have been achieved again for at least 30 minutes;

v) Once stable conditions are achieved the setpoint temperature shall be ramped up or down (when cooling respectively heating) with a pace within the range as indicated in Table 32;

vi) The ramping of the indoor air temperature shall continue until thermostat-off mode is achieved and the compressor stops, or, only in case of units tested with multiple indoor units, the compressor frequency measured is half the initial compressor frequency before ramping up or down started, whichever comes first;

vii) The compressor frequencies that occurred during the above procedure shall be assessed and it shall be determined whether the frequency/-ies as used for performance assessment in condition(s) D has/have occurred.

c) The unit is considered to have passed the Controls Verification Procedure if the declared frequency has occurred for at least 20 seconds continuously during the above procedure. If this criterion is not met, the unit has failed the Controls Verification Procedure.

Table 32 Start up temperature and pace of ramping up/down

	Cooling	**Heating**

Dry bulb temperature of test room at start up	> 25°C and ≤ 30°C	≥ 17°C and < 20°C
Pace of ramping up/down indoor air temperature (dry bulb)	≥ -2.0 K/h and ≤ -0.3 K/h	≥ 3.0 K/h and ≤ 2.0 K/h

ANNEX III a Transitional methods

Transitional Methods

Table 33 Transitional methods

References and qualifying notes for air-to-air air conditioners and air-to-air heat pumps and comfort fans

(The source of all references are CEN-CENELEC unless otherwise indicated)

Parameter	Reference / Clause	Notes / remarks
General parameters		
CC	this regulation	
Fcorr	this regulation	
Pto	EN 14825:2016, Clause 9.1	
Psb	EN 14825:2016, Clause 9.2	
Pck	EN 14825:2016, Clause 9.3	
Poff	EN 14825:2016, Clause 9.4	
Hto	this regulation	
Hsb	this regulation	
Hck	this regulation	
Hoff	this regulation	
Hhe, Hce	this regulation	
Cdc, Cdh		
CR(Tj)		
Sound power	EN 12102-1:2017 Chapter 7	The unit shall be tested (can be a test mode) using the same fan and compressor frequencies as applied when establishing the rated capacity (Pratedh). Annex A, Clause A.4 for variable speed units shall be disregarded as the rated capacity to be observed is established with the unit running at its highest heat output and not a lower part load condition declared for bin Tj = +7 °C (as stated in Clause A.4). The indoor sound power stated on the label and product information sheet shall either be the noise radiated by the inlet and outlet and the casing ('1'), the noise radiated by the unit ('3'), or the noise radiated by the unit inlet and outlet openings ('4') on the indoor-side, whichever applies and is highest. The outdoor sound power stated on the label and product information sheet shall either be the noise radiated by the inlet and outlet and the casing ('1'), or the noise radiated by the unit inlet and outlet openings ('2') on the outdoor-side, whichever applies and is highest.
Air-to-air air conditioners		
η_c	this regulation	
SEER	EN 14825:2022	
QC	EN 14825:2022	
QCE	EN 14825:2022	
Pc, Pc_SD	EN 14825:2022, Clause 7.5	Pc is the cooling load for other air-to-air heat pumps and fixed double duct heat pumps. Pc_SD is the cooling load for single duct AC/HP
Teq	this regulation	
Pdc(Tj)	EN 14511-3:2022	
Pdc_corr	this regulation	

Parameter	Reference / Clause	Notes / remarks
AF	EN 14825:2022	
Pinf,c	this regulation	
SEERon	EN 14825:2022	
EERbin(Tj)	this regulation	
EERd(Tj)	EN 14511-3:2022	
EERcorr(Tj)	this regulation	
PLc	this regulation	
Prated_SD = Pdc_corr(Tj=Teq)	this regulation	
Pratedc	EN 14511-3:2018, Clause 4.4.4 insofar compliant with the approach laid down in this regulation	The calculation methods, and the underlying measurement methods based on EN 14511-3:2018 can be applied but the conditions and adaptations to calculation methods as laid down in this regulation shall be observed
Pdesignc	This regulation	Pdesignc equals the rated cooling capacity
outdoor air flow rate	EN 14511-3:2018, Clause 6 and Annex I, as used for establishing the Pratedc, Pdc, EERd and noise in the relevant conditions	The outdoor air flow rate shall be declared for SD for the standard rating condition and the part load conditions as desribed in this regulation
Air-to-air heat pumps		
Pratedh	EN 14511-3:2018, Clause 4.4.4 insofar compliant with the approach laid down in this regulation	The calculation methods, and the underlying measurement methods based on EN 14511-3:2018 can be applied but the conditions and adaptations to calculation methods as laid down in this regulation shall be observed
Pdesignh	This document, see remarks right	for other air-to-air heat pumps and fixed double duct heat pumps: Pdesignh is declared by the supplier; for single duct: The supplier declares the Tol for the model. If Tol≤ Tdesign: Pdesignh = Pratedh + elbu(Tj = Tdesignh); If Tol > Tdesignh: Pdesignh = elbu(Tj = Tdesignh).
plh(Tj)	EN 14528:2016, Clause 7.5	plh(Tj) = (Tj-16)/(Tdesign-16)
Ph(Tj)	EN 14528:2016, Clause 7.5	Ph(Tj) = plh(Tj)*Pdesignh (for the heating season the unit is marketed for)
Pdh	EN 14511-3:2018	As established for the part load conditions described in this document
outdoor air flow rate	EN 14511-3:2018, Clause 6 and Annex I, as used for establishing the Pratedh, Pdh, COPd and noise in the relevant conditions	The outdoor volume air flow rate shall be declared for SD by the supplier for the standard rating condition and the part load condition as desribed in this regulation and declared by the supplier in this regulation.
Pinfh	This document	See Annex IV Measurement & calculation methods
elbu(Tj)	This document	This is the backup electric input power calculated for a heat load of a bin
COPd	EN 14511-3:2018	
COPbin	This document	See Annex IV Measurement & calculation methods
Cdh	EN 14511-3:2018, Clause 8.4.3 or this document	The supplier shall either declare the Cdh as established through testing or use the defualt value provided by this regulation
SCOP	EN 14825:2018 Clause 7.2 - calculation of SCOP, insofar compliant with the approach laid down in this regulation	The calculation methods, and the underlying measurement methods based on the series EN 14511-1:2018 to EN 14511-4:2018, can be applied but the conditions and adaptations to calculation methods as laid down in this regulation shall be observed, in particular for SD units as the approach and methods to calculate the SCOP for these units deviates from EN 14825:2018
eta_rh	This document	Note that the seasonal room heating energy efficiency deviates from the calculation method descrbed in EN 14825:2018 for

Parameter	Reference / Clause	Notes / remarks
		RHPs.
Comfort fans		
Fan flow rate	IEC 60879:2019, Clause 5.2.2.5 & 5.2.2.7	Nominal air flow rate
Fan power input	IEC 60879:2019, Clause 5.4	
Fan diameter	See remark	This is the sweep size of the fan rotor (the outer diameter of the circal in which the fan blades rotte). For tower and bladeless fans it calculated as the circumference of the fan outlet or nozzle divided by 3.14, according definition 3.20 of IEC 60879:2019
Service value	See regulation text, Annex III on comfort fans	
electric power in stand-by (PSB)	IEC 60879:2019, Clause 5.6	
comfort fan sound power	IEC 60704-2-7:2020-1	Household and similar electrical appliances – Test code for the determination of airborne acoustical noise – Part 2-7: Particular requirements for fans
electric power in off-mode (Poff)		IEC 62301 Ed. 2.0 b:2011 § 5.3
Correction factors		
single stage heat output, no room temperature control		as declared by supplier
two or more manual stages, no temperature control	this regulation	for AC/HP: follows from testing at part loads for comfort fans: follows from
with mechanic thermostat room temperature control	this regulation	as declared by supplier
with electronic room temperature control	this regulation	as declared by supplier
with electronic room temperature control plus day timer	this regulation	as declared by supplier, verified by assessment of instruction or user manuals
room temperature control with presence detection	this regulation	as declared by supplier, verified by assessment of instruction or user manuals
room temperature control with open window detection	this regulation	as declared by supplier, verified by assessment of instruction or user manuals
distance control option	this regulation	as declared by supplier, verified by assessment of instruction or user manuals
adaptive start control	this regulation	as declared by supplier, verified by assessment of instruction or user manuals
working time limitation	this regulation	as declared by supplier, verified by assessment of instruction or user manuals
black bulb sensor	this regulation	as declared by supplier, verified by assessment of instruction or user manuals
self-learning functionality	[TBD]	[awaiting request for standardisation]
Control accuracy	CEN/TR 15500-2:2016	
room temperature controlled air delivery	[TBD]	as declared by supplier, verified by assessment of instruction or user manuals

ANNEX IV Verification procedure for market surveillance

Verification procedure for market surveillance purposes

1) The verification tolerances defined in this Annex relate only to the verification of the declared parameters by Member State authorities and shall not be used by the manufacturer, importer or authorised representative as an allowed tolerance to establish the values in the technical documentation or in interpreting these values with a view to achieving compliance or to communicate better performance by any means.

2) Where a model has been designed to be able to detect it is being tested (e.g. by recognising the test conditions or test cycle), and to react specifically by automatically altering its performance during the test with the objective of reaching a more favourable level for any of the parameters specified in this Regulation or included in the technical documentation or included in any of the documentation provided, the model and all equivalent models shall be considered not compliant.

3) When verifying the compliance of a product model with the requirements laid down in this Regulation pursuant to point 2 of Article 3 of Directive 2009/125/EC, for the requirements referred to in this Annex, the authorities of the Member States shall apply the following procedure:

   a) The Member State authorities shall verify one single unit of the model.

   b) The model shall be considered to comply with the applicable requirements if:

      i) the values given in the technical documentation pursuant to point 2 of Annex IV to Directive 2009/125/EC (declared values), and, where applicable, the values used to calculate these values, are not more favourable for the manufacturer, importer or authorised representative than the results of the corresponding measurements carried out pursuant to paragraph (g) thereof; and

      ii) the declared values meet any requirements laid down in this Regulation, and any required product information published by the manufacturer, importer or authorised representative does not contain values that are more favourable for the manufacturer, importer or authorised representative than the declared values; and

      iii) when the Member States authorities check the unit of the model, they find that the manufacturer, importer or authorised representative has put in place a system that complies with the requirements in the second paragraph of Article 6; and

      iv) when the Member States authorities check the unit of the model, it complies with the requirements in the third paragraph of Article 6, the functional requirements in point 3 of Annex II and on resource efficiency in point 4 of Annex II; and

      v) when the Member State authorities test the unit of the model, the determined values (the values of the relevant parameters as measured in testing and the values calculated from these measurements) comply with the respective verification tolerances as given in Table 34.

   c) If the results referred to in point 2(a), (b), (c) or (d) are not achieved, the model and all equivalent models shall be considered not to comply with this Regulation.

   d) If the result referred to in point 2(e) is not achieved the Member State authorities shall select three additional units of the same model for testing. As an alternative, the three additional units selected may be of one or more equivalent models.

e) The model shall be considered to comply with the applicable requirements if, for these three units, the arithmetical mean of the determined values complies with the respective verification tolerances given in Table 34.

f) If the result referred to in point e) is not achieved, the model and all equivalent models shall be considered not to comply with this Regulation.

g) The Member State authorities shall provide all relevant information to the authorities of the other Member States and to the Commission without delay after a decision being taken on the non-compliance of the model according to points 3 or 6.

4) The Member State authorities shall use the measurement and calculation methods set out in Annex III.

5) The Member State authorities shall apply for the parameters listed in Table 34 the verification tolerances set out in Table 34 and shall use only the procedure described in points a) to g) referred to in this Annex. For the parameters in Table 34, no other tolerances, such as those set out in harmonised standards or in any other measurement method, shall be applied.

6) For values of parameters required as product information and not listed in Table 34 tolerances as set out in harmonised standards or considered standard industry practice shall be accepted.

Table 34
Verification tolerances

Parameter	**(sub)type or condition**	**Verification tolerance**
Main regulated parameters		
η_c	of ' other air-to-air heat pumps and fixed double duct heat pumps ' and 'portable double duct'	The determined value shall not be more than 8 % lower than the declared value
η_c	of 'single duct'	The determined value shall not be more than 6 % lower than the declared value
η_h	of ' other air-to-air heat pumps and fixed double duct heat pumps '	The determined value shall not be more than 8 % lower than the declared value
η_{cf}	for comfort fans	The determined value shall not be more than 8 % lower than the declared value
Prated,c	of ' other air-to-air heat pumps and fixed double duct heat pumps' and 'portable double duct'	The determined value shall not be more than 7 % lower than the declared value
Pdc_SD	for single duct units, at Tj = 35°C	The determined value shall not be more than 6 % lower than the declared value
Pdc_corr at Tj=Teq.	for single duct units, at Teq.	The determined value shall not be more than 6 % lower than the declared value
SEER, SEERon	for all of air-to-air air conditioners	The determined value shall not be more than 8 % lower than the declared value
Pdc	Condition A (Tj=35°C)	The determined value shall not be more than 6 % lower than the declared value
	Condition B (Tj=30°C)	The determined value shall not be more than 7 % lower than the declared value
	Condition C (Tj=25°C)	The determined value shall not be more than 10 % lower than the declared value

Parameter	(sub)type or condition	Verification tolerance		
	Condition D (Tj=20°C)	The determined value shall not be more than 15 % lower than the declared value		
EERd(Tj)	Condition A (Tj=35°C)	The determined value shall not be more than 6 % lower than the declared value		
	Condition B (Tj=30°C)	The determined value shall not be more than 7 % lower than the declared value		
	Condition C (Tj=25°C)	The determined value shall not be more than 10 % lower than the declared value		
	Condition D (Tj=20°C)	The determined value shall not be more than 15 % lower than the declared value		
Pdh(Tj)	For heating season (right)	The determined value shall not be more than (%) lower than the declared value (value for % shown below)		
		Average	Warmer	Colder
	Condition A (Tj=-7°C)	5	n.a.	5
	Condition B (Tj=2°C)	5	5	10
	Condition C (Tj=7°C)	10	5	10
	Condition D (Tj=12°C)	15	10	15
	Condition E (Tj=Tol)	5	5	5
	Condition F (Tj=Tbiv)	5	5	5
	Condition G (Tj=-15°C)	n.a.	n.a.	5
COPd(Tj)	For heating season (right)	The determined value shall not be more than (%) lower than the declared value (value for % shown below)		
		Average	Warmer	Colder
	Condition A (Tj=-7°C)	5	n.a.	5
	Condition B (Tj=2°C)	5	5	10
	Condition C (Tj=7°C)	10	5	10
	Condition D (Tj=12°C)	15	10	15
	Condition E (Tj=Tol)	5	5	5
	Condition F (Tj=Tbiv)	5	5	5
	Condition G (Tj=-15°C)	n.a.	n.a.	5
SCOP, SCOPon	for all RHP	The determined value shall not be more than 8 % lower than the declared value		
Teq	for SD only	The determined value shall not deviate more than 1 K from the declared value		
rated air delivery	Comfort fans	The determined value shall not be more than 10 % lower than the declared value		
sound power	all products	The determined value shall not be more than 2 dB(A) higher than the declared value.		
fan power input	Comfort fans	The determined value shall not be more than 5 % lower than the declared value		
Power in off-mode, thermostat off mode, crankcase heater mode	AC and HP only	The determined value shall not be more than 5 % lower than the declared value		
standby mode, networked standby mode(s)	all products	The determined value shall not be more than 5 % lower than the declared value		
control accuracy	AC and HP only	The determined value shall not be more than 20% lower than the declared value		
correction factors	all products	no deviation allowed between declared value and determined value		
controls verification procedure	AC and HP only	The determined value shall not deviate more than 10 Hz from the declared value		
maximum air flow rate	AC and HP only	The determined value shall not be more than 10% higher than the declared value		

Parameter	(sub)type or condition	Verification tolerance
For parameters the exact values of which are provided for in this regulation (e.g. CC, Hhe, Hce, etc.) or that are not to be verified using testing (e.g. $P_{designc}$, $P_{designh}$) no deviation is allowed.		
For all other parameters not mentioned above a deviation shall be allowed with tolerances according industry test standards. In case these test standards do not provide tolerances for such parameters the common accepted practice between the industries involved and their clients for handling of tolerances shall be applied.		

ANNEX V Benchmarks

Benchmarks

At the time of entry into force of this Regulation, the best available technology on the market for air-to-air air conditioners, air-to-air heat pumps and comfort fans in terms of their respective SEER, SCOP, SV and sound power was identified as outlined below.

Table 37 Benchmarks

Benchmarks for air-to-air air conditioners and air-to-air heat pumps				
Category	SEER	SCOP	Sound power (dBA)	
			Indoor	Outdoor
Other air-to-air air conditioners and air-to-air heat pumps	10,5	6,2	48	51
Portable air-to-air air conditioners	2,8	NA*	51	51

* NA: not applicable

The above benchmark values for SEER, SCOP and sound for a category of products do not necessarily apply to the same model in that category.

Benchmarks for comfort fans		
Comfort fans	SV (m^3/min/W)	Sound power (dBA)
- ceiling fans	13.7 (at 211 m^3/min)	32 (at 93 m^3/min)
- tower fans	1.65 (at 43 m^3/min)	56 (26 m^3/min)
- other fans	2.15 (at 65 m^3/min)	35 (at 80 m^3/min)