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[1] Text with EEA relevance

EN

Acts whose titles are printed in light type are those relating to day-to-day management of agricultural matters, and are generally valid for a limited period.

The titles of all other acts are printed in bold type and preceded by an asterisk.

II

(Non-legislative acts)

REGULATIONS

COMMISSION DELEGATED REGULATION (EU) No 811/2013

of 18 February 2013

supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of space heaters, combination heaters, packages of space heater, temperature control and solar device and packages of combination heater, temperature control and solar device

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

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

Having regard to Directive 2010/30/EU of the European Parliament and of the Council of 19 May 2010 on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products [1], and in particular Article 10 thereof,

Whereas:

(1) Directive 2010/30/EU requires the Commission to adopt delegated acts as regards the labelling of energy-related products that have a significant potential for energy savings but exhibit a wide disparity in performance levels with equivalent functionality.

(2) The energy consumed by space heaters and by combination heaters providing space and water heating, accounts for a significant share of the total energy demand in the Union. Space heaters and combination heaters with equivalent functionality exhibit a wide disparity in terms of energy efficiency. The scope for reducing their energy consumption is significant and includes combining them with appropriate temperature controls and solar devices. Space heaters, combination heaters and packages of such heaters in combination with temperature controls and solar devices should therefore be covered by energy labelling requirements.

(3) Space heaters and combination heaters that are designed for using gaseous or liquid fuels predominantly (more than 50 %) produced from biomass have specific technical characteristics which require further technical, economic and environmental analyses. Depending on the outcome of the analyses, energy labelling requirements for those heaters should be set at a later stage, if appropriate.

(4) Harmonised provisions should be laid down on labelling and standard product information regarding the energy efficiency of space heaters and combination heaters in order to provide incentives for manufacturers to improve the energy efficiency of these heaters, to encourage end-users to purchase energy-efficient products and to contribute to the functioning of the internal market.

(5) As regards significant energy and cost savings for each type of heater, this Regulation should introduce a new labelling scale from A^{++} to G for the space heating function of boiler space heaters, cogeneration space heaters, heat pump space heaters, boiler combination heaters and heat pump combination heaters. While classes A to G cover the various types of conventional boilers when not combined with cogeneration or renewable energy technologies, classes A^{+} and A^{++} should promote the use of cogeneration and renewable energy sources.

(6) Furthermore, a new A-G labelling scale should be introduced for the water heating function of boiler combination heaters and heat pump combination heaters, in line with Commission Delegated Regulation (EU) No 812/2013 of 18 February 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of water heaters, hot water storage tanks and packages of water heater and solar device [2].

[1] OJ L 153, 18.6.2010, p. 1.

[2] See page 83 of this Official Journal.

(7) Further classes A^{+++} and A^{+} should be added after four years to the seasonal space heating and water heating classes, respectively, unless the review of the Regulation proves otherwise, to accelerate the market penetration of high-efficiency space heaters and combination heaters using renewable energy sources.

(8) This Regulation should ensure that consumers get more accurate comparative information about the performance of heat pump heaters, based on a seasonal efficiency calculation and measurement method for three European climate zones. The Commission mandated the European standardisation bodies to investigate whether a similar method should be developed for other heaters. European standardised heating seasons for boiler heaters, cogeneration heaters and solar heaters could be considered in the review of this Regulation.

(9) The sound power level of a heater can be an important consideration for end-users. Information on sound power levels should be included on the labels of space heaters and combination heaters.

(10) The combined effect of this Regulation and Commission Regulation (EU) No 813/2013 of 2 August 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for space heaters and combination heaters [1] is expected to result in estimated annual energy savings of around 1 900 PJ (about 45 Mtoe) by 2020, corresponding to about 110 Mt CO_2 emissions, compared to what would happen if no measures were taken.

(11) The information provided on the label should be obtained through reliable, accurate and reproducible measurement and calculation procedures that take into account recognised state-of-the-art measurement and calculation methods including, where available, harmonised standards adopted by the European standardisation bodies under a request from the Commission, in accordance with the procedures laid down in the Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on Information Society services [2], for the purpose of establishing ecodesign requirements.

(12) This Regulation should specify a uniform design and content of product labels for space heaters and combination heaters.

(13) In addition, this Regulation should specify requirements for the product fiche and technical documentation for space heaters and combination heaters.

(14) Moreover, this Regulation should specify requirements for the information to be provided for any form of distance selling of space heaters and combination heaters and in any advertisements and technical promotional material for such heaters.

(15) In addition to the product labels and fiches for stand-alone space heaters and combination heaters laid down in this Regulation, package labels and fiches based on product fiches from suppliers should ensure that the end-user has easy access to information on the energy performance of packages of heaters combined with solar devices and/or temperature controls. The most efficient class A^{+++} may be reached by such a package.

(16) It is appropriate to provide for a review of the provisions of this Regulation taking into account technological progress,

HAS ADOPTED THIS REGULATION:

Article 1

Subject matter and scope

1. This Regulation establishes requirements for the energy labelling of, and the provision of supplementary product information on, space heaters and combination heaters with a rated heat output ≤ 70 kW, packages of space heater ≤ 70 kW, temperature control and solar device and packages of combination heater ≤ 70 kW, temperature control and solar device.

2. This Regulation shall not apply to:

(a) heaters specifically designed for using gaseous or liquid fuels predominantly produced from biomass;

(b) heaters using solid fuels;

(c) heaters within the scope of Directive 2010/75/EU of the European Parliament and of the Council [3];

(d) heaters generating heat only for the purpose of providing hot drinking or sanitary water;

(e) heaters for heating and distributing gaseous heat transfer media such as vapour or air;

(f) cogeneration space heaters with a maximum electrical capacity of 50 kW or above.

[1] See page 136 of this Official Journal.
[2] OJ L 204, 21.7.1998, p. 37.
[3] OJ L 334, 17.12.2010, p. 17.

Article 2

Definitions

In addition to the definitions set out in Article 2 of Directive 2010/30/EC, the following definitions shall apply for the purposes of this Regulation:

(1) 'heater' means a space heater or combination heater;

(2) 'space heater' means a device that

(a) provides heat to a water-based central heating system in order to reach and maintain at a desired level the indoor temperature of an enclosed space such as a building, a dwelling or a room; and

(b) is equipped with one or more heat generators;

(3) 'combination heater' means a space heater that is designed to also provide heat to deliver hot drinking or sanitary water at given temperature levels, quantities and flow rates during given intervals, and is connected to an external supply of drinking or sanitary water;

(4) 'water-based central heating system' means a system using water as a heat transfer medium to distribute centrally generated heat to heat emitters for the space heating of buildings, or parts thereof;

(5) 'heat generator' means the part of a heater that generates the heat using one or more of the following processes:

(a) combustion of fossil fuels and/or biomass fuels;

(b) use of the Joule effect in electric resistance heating elements;

(c) capture of ambient heat from an air source, water source or ground source, and/or waste heat;

(6) 'rated heat output' (*Prated*) means the declared heat output of a heater when providing space heating and, if applicable, water heating at standard rating conditions, expressed in kW; for heat pump space heaters and heat pump combination heaters the standard rating conditions for establishing the rated heat output are the reference design conditions, as set out in Annex VII, Table 10;

(7) 'standard rating conditions' means the operating conditions of heaters under average climate conditions for establishing the rated heat output, seasonal space heating energy efficiency, water heating energy efficiency and sound power level;

(8) 'biomass' means the biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste;

(9) 'biomass fuel' means a gaseous or liquid fuel produced from biomass;

(10) 'fossil fuel' means a gaseous or liquid fuel of fossil origin;

(11) 'cogeneration space heater' means a space heater simultaneously generating heat and electricity in a single process;

(12) 'temperature control' means the equipment that interfaces with the end-user regarding the values and timing of the desired indoor temperature, and communicates relevant data to an interface of the heater such as a central processing unit, thus helping to regulate the indoor temperature(s);

(13) 'solar device' means a solar-only system, a solar collector, a solar hot water storage tank or a pump in the collector loop, which are placed on the market separately;

(14) 'solar-only system' means a device that is equipped with one or more solar collectors and solar hot water storage tanks and possibly pumps in the collector loop and other parts, which is placed on the market as one unit and is not equipped with any heat generator except possibly one or more back-up immersion heaters;

(15) 'solar collector' means a device designed to absorb global solar irradiance and to transfer the heat energy so produced to a fluid passing through it;

(16) 'hot water storage tank' means a vessel for storing hot water for water and/or space heating purposes, including any additives, which is not equipped with any heat generator except possibly one or more back-up immersion heaters;

(17) 'solar hot water storage tank' means a hot water storage tank storing heat energy produced by one or more solar collectors;

(18) 'back-up immersion heater' means a Joule effect electric resistance heater that is part of a hot water storage tank and generates heat only when the external heat source is disrupted (including during maintenance periods) or out of order, or that is part of a solar hot water storage tank and provides heat when the solar heat source is not sufficient to satisfy required comfort levels;

(19) 'package of space heater, temperature control and solar device' means a package offered to the end-user containing one or more space heaters combined with one or more temperature controls and/or one or more solar devices;

(20) 'package of combination heater, temperature control and solar device' means a package offered to the end-user containing one or more combination heaters combined with one or more temperature controls, and/or one or more solar devices;

(21) 'seasonal space heating energy efficiency' (η_s) means the ratio between the space heating demand for a designated heating season, supplied by a space heater, a combination heater, a package of space heater, temperature control and solar device or a package of combination heater, temperature control and solar device, and the annual energy consumption required to meet this demand, expressed in %;

(22) 'water heating energy efficiency' (η_{wh}) means the ratio between the useful energy in the drinking or sanitary water provided by a combination heater or a package of combination heater, temperature control and solar device, and the energy required for its generation, expressed in %;

(23) 'sound power level' (L_{WA}) means the A-weighted sound power level, indoors and/or outdoors, expressed in dB.

For the purposes of Annexes II to VIII, additional definitions are set out in Annex I.

Article 3

Responsibilities of suppliers and timetable

1. From 26 September 2015 suppliers placing space heaters on the market and/or putting them into service, including those integrated in packages of space heater, temperature control and solar device, shall ensure that:

(a) a printed label complying with the format and content of information set out in point 1.1 of Annex III is provided for each space heater conforming to the seasonal space heating energy efficiency classes set out in point 1 of Annex II, whereby: for heat pump space heaters, the printed label is provided at least in the packaging of the heat generator; for space heaters intended for use in packages of space heater, temperature control and solar device, a second label complying with the format and content of information set out in point 3 of Annex III is provided for each space heater;

(b) a product fiche, as set out in point 1 of Annex IV, is provided for each space heater, whereby: for heat pump space heaters, the product fiche is provided at least for the heat generator; for space heaters intended for use in packages of space heater, temperature control and solar device, a second fiche, as set out in point 5 of Annex IV, is provided;

(c) the technical documentation, as set out in point 1 of Annex V, is provided on request to the authorities of the Member States and to the Commission;

(d) any advertisement relating to a specific space heater model and containing energy-related or price information includes a reference to the seasonal space heating energy efficiency class under average climate conditions for that model;

(e) any technical promotional material concerning a specific space heater model and describing its specific technical parameters includes a reference to the seasonal space heating energy efficiency class under average climate conditions for that model.

From 26 September 2019 a printed label complying with the format and content of information set out in point 1.2 of Annex III shall be provided for each space heater conforming to the seasonal space heating energy efficiency classes set out in point 1 of Annex II, whereby: for heat pump space heaters, the printed label shall be provided at least in the packaging of the heat generator.

2. From 26 September 2015 suppliers placing combination heaters on the market and/or putting them into service, including those integrated in packages of combination heater, temperature control and solar device, shall ensure that:

(a) a printed label complying with the format and content of information set out in point 2.1 of Annex III is provided for each combination heater conforming to the seasonal space heating energy efficiency classes and water heating energy efficiency classes set out in points 1 and 2 of Annex II, whereby: for heat pump combination heaters, the printed label is provided at least in the packaging of the heat generator; for combination heaters intended for use in packages of combination heater, temperature control and solar device, a second label complying with the format and content of information set out in point 4 of Annex III is provided for each combination heater;

(b) a product fiche, as set out in point 2 of Annex IV, is provided for each combination heater, whereby: for heat pump combination heaters, the product fiche is provided at least for the heat generator; for combination heaters intended for use in packages of combination heater, temperature control and solar device, a second fiche, as set out in point 6 of Annex IV, is provided;

(c) the technical documentation, as set out in point 2 of Annex V, is provided on request to the authorities of the Member States and to the Commission;

(d) any advertisement relating to a specific combination heater model and containing energy-related or price information includes a reference to the seasonal space heating energy efficiency class and water heating energy efficiency class under average climate conditions for that model;

(e) any technical promotional material concerning a specific combination heater model and describing its specific technical parameters includes a reference to the seasonal space heating energy efficiency class and water heating energy efficiency class under average climate conditions for that model.

From 26 September 2019 a printed label complying with the format and content of information set out in point 2.2 of Annex III shall be provided for each combination heater conforming to the seasonal space heating energy efficiency classes and water heating energy efficiency classes set out in points 1 and 2 of Annex II, whereby: for heat pump combination heaters, the printed label shall be provided at least in the packaging of the heat generator.

3. From 26 September 2015 suppliers placing temperature controls on the market and/or putting them into service shall ensure that:

(a) a product fiche, as set out in point 3 of Annex IV, is provided;

(b) the technical documentation, as set out in point 3 of Annex V, is provided on request to the authorities of the Member States and to the Commission.

4. From 26 September 2015 suppliers placing solar devices on the market and/or putting them into service shall ensure that:

(a) a product fiche, as set out in point 4 of Annex IV, is provided;

(b) the technical documentation, as set out in point 4 of Annex V, is provided on request to the authorities of the Member States and to the Commission.

5. From 26 September 2015 suppliers placing packages of space heater, temperature control and solar device on the market and/or putting them into service shall ensure that:

(a) a printed label complying with the format and content of information set out in point 3 of Annex III is provided for each package of space heater, temperature control and solar device conforming to the seasonal space heating energy efficiency classes set out in point 1 of Annex II;

(b) a product fiche, as set out in point 5 of Annex IV, is provided for each package of space heater, temperature control and solar device;

(c) the technical documentation, as set out in point 5 of Annex V, is provided on request to the authorities of the Member States and to the Commission;

(d) any advertisement relating to a specific package of space heater, temperature control and solar device model and containing energy-related or price information includes a reference to the seasonal space heating energy efficiency class under average climate conditions for that model;

(e) any technical promotional material concerning a specific package of space heater, temperature control and solar device model and describing its specific technical parameters includes a reference to the seasonal space heating energy efficiency class under average climate conditions for that model.

6. From 26 September 2015 suppliers placing packages of combination heater, temperature control and solar device on the market and/or putting them into service shall ensure that:

(a) a printed label complying with the format and content of information set out in point 4 of Annex III is provided for each package of combination heater, temperature control and solar device conforming to the seasonal space heating energy efficiency classes and water heating energy efficiency classes set out in points 1 and 2 of Annex II;

(b) a product fiche, as set out in point 6 of Annex IV, is provided for each package of combination heater, temperature control and solar device;

(c) the technical documentation, as set out in point 6 of Annex V, is provided on request to the authorities of the Member States and to the Commission;

(d) any advertisement relating to a specific package of combination heater, temperature control and solar device model and containing energy-related or price information includes a reference to the seasonal space heating energy efficiency class and water heating energy efficiency class under average climate conditions for that model;

(e) any technical promotional material concerning a specific package of combination heater, temperature control and solar device model and describing its specific technical parameters includes a reference to the seasonal space heating energy efficiency class and water heating energy efficiency class under average climate conditions for that model.

Article 4

Responsibilities of dealers

1. Dealers of space heaters shall ensure that:

(a) each space heater, at the point of sale, bears the label provided by suppliers in accordance with Article 3(1), as set out in point 1 of Annex III, on the outside of the front of the appliance, in such a way as to be clearly visible;

(b) space heaters offered for sale, hire or hire-purchase, where the end-user cannot be expected to see the space heater displayed, are marketed with the information provided by the suppliers in accordance with point 1 of Annex VI;

(c) any advertisement relating to a specific space heater model and containing energy-related or price information includes a reference to the seasonal space heating energy efficiency class under average climate conditions for that model;

(d) any technical promotional material concerning a specific space heater model and describing its specific technical parameters includes a reference to the seasonal space heating energy efficiency class under average climate conditions for that model.

2. Dealers of combination heaters shall ensure that:

(a) each combination heater, at the point of sale, bears the label provided by suppliers in accordance with Article 3(2), as set out in point 2 of Annex III, on the outside of the front of the appliance, in such a way as to be clearly visible;

(b) combination heaters offered for sale, hire or hire-purchase, where the end-user cannot be expected to see the combination heater displayed, are marketed with the information provided by the suppliers in accordance with point 2 of Annex VI;

(c) any advertisement relating to a specific combination heater model and containing energy-related or price information includes a reference to the seasonal space heating energy efficiency class and water heating energy efficiency class under average climate conditions for that model;

(d) any technical promotional material concerning a specific combination heater model and describing its specific technical parameters includes a reference to the seasonal space heating energy efficiency class and water heating energy efficiency class under average climate conditions for that model.

3. Dealers of packages of space heater, temperature control and solar device shall ensure, based on the label and fiches provided by suppliers in accordance with Article 3(1), (3), (4) and (5), that:

(a) any offer for a specific package includes the seasonal space heating energy efficiency and the seasonal space heating energy efficiency class for that package under average, colder or warmer climate conditions, as applicable, by displaying with the package the label set out in point 3 of Annex III and providing the fiche set out in point 5 of Annex IV, duly filled in according to the characteristics of that package;

(b) packages of space heater, temperature control and solar device offered for sale, hire or hire-purchase, where the end-user cannot be expected to see the package of space heater, temperature control and solar device displayed, are marketed with the information provided in accordance with point 3 of Annex VI;

(c) any advertisement relating to a specific package of space heater, temperature control and solar device model and containing energy-related or price information includes a reference to the seasonal space heating energy efficiency class under average climate conditions for that model;

(d) any technical promotional material concerning a specific package of space heater, temperature control and solar device model and describing its specific technical parameters includes a reference to the seasonal space heating energy efficiency class under average climate conditions for that model.

4. Dealers of packages of combination heater, temperature control and solar device shall ensure, based on the label and fiches provided by suppliers in accordance with Article 3(2), (3), (4) and (6), that:

(a) any offer for a specific package of combination heater, temperature control and solar device includes the seasonal space heating energy efficiency, the water heating energy efficiency, the seasonal space heating energy efficiency class and the water heating energy efficiency class for that package under average, colder or warmer climate conditions, as applicable, by displaying with the package the label set out in point 4 of Annex III and providing the fiche set out in point 6 of Annex IV, duly filled in according to the characteristics of that package;

(b) packages of combination heater, temperature control and solar device offered for sale, hire or hire-purchase, where the end-user cannot be expected to see the package of combination heater, temperature control and solar device displayed, are marketed with the information provided in accordance with point 4 of Annex VI;

(c) any advertisement relating to a specific package of combination heater, temperature control and solar device model and containing energy-related or price information includes a reference to the seasonal space heating energy efficiency class and water heating energy efficiency class under average climate conditions for that model;

(d) any technical promotional material concerning a specific package of combination heater, temperature control and solar device model and describing its specific technical parameters includes a reference to the seasonal space heating energy efficiency class and water heating energy efficiency class under average climate conditions for that model.

Article 5

Measurement and calculation methods

The information to be provided pursuant to Articles 3 and 4 shall be obtained by reliable, accurate and reproducible measurement and calculation methods which take into account the recognised state-of-the-art measurement and calculation methods, as set out in Annex VII.

Article 6

Verification procedure for market surveillance purposes

Member States shall apply the procedure set out in Annex VIII when assessing the conformity of the declared seasonal space heating energy efficiency class, water heating energy efficiency class, seasonal space heating energy efficiency, water heating energy efficiency and sound power level of heaters.

Article 7

Review

The Commission shall review this Regulation in the light of technological progress no later than five years after its entry into force. The review shall in particular assess any significant changes in the market shares of various types of heaters related to the labels set out in points 1.2. and 2.2. of Annex III, the feasibility and usefulness of indicating heater efficiency other than heat pump efficiency based on standardised heating seasons, the appropriateness of the package fiches and labels set out in points 3 and 4 of Annex III and points 5 and 6 of Annex IV, and the appropriateness of including passive flue heat recovery devices in the scope of this Regulation.

Article 8

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*.

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

Done at Brussels, 18 February 2013.

For the Commission
The President
José Manuel BARROSO

ANNEX I

Definitions applicable for Annexes II to VIII

For the purposes of Annexes II to VIII the following definitions shall apply:

Definitions related to heaters:

(1) 'boiler space heater', for the purposes of Figures 1 to 4 in Annex IV referred to as 'boiler', means a space heater that generates heat using the combustion of fossil fuels and/or biomass fuels, and/or using the Joule effect in electric resistance heating elements;

(2) 'boiler combination heater', for the purposes of Figures 1 to 4 in Annex IV referred to as 'boiler', means a boiler space heater that is designed to also provide heat to deliver hot drinking or sanitary water at given temperature levels, quantities and flow rates during given intervals, and is connected to an external supply of drinking or sanitary water;

(3) 'heat pump space heater', for the purposes of Figures 1 and 3 in Annex IV referred to as 'heat pump', means a space heater using ambient heat from an air source, water source or ground source, and/or waste heat for heat generation; a heat pump space heater may be equipped with one or more supplementary heaters using the Joule effect in electric resistance heating elements or the combustion of fossil and/or biomass fuels;

(4) 'heat pump combination heater', for the purposes of Figures 1 and 3 in Annex IV referred to as 'heat pump', means a heat pump space heater that is designed to also provide heat to deliver hot drinking or sanitary water at given temperature levels, quantities and flow rates during given intervals, and is connected to an external supply of drinking or sanitary water;

(5) 'supplementary heater' means a non-preferential heater that generates heat in cases where the heat demand is greater than the rated heat output of the preferential heater;

(6) 'rated heat output of supplementary heater' (*Psup*) means the declared heat output of the supplementary heater when providing space heating and, if applicable, water heating at standard rating conditions, expressed in kW; if the supplementary heater is a heat pump space heater or heat pump combination heater, the standard rating condition for establishing the rated heat output of supplementary heater is the outdoor temperature $Tj = +7\ °C$;

(7) 'outdoor temperature' (T_j) means the dry bulb outdoor air temperature, expressed in degrees Celsius; the relative humidity may be indicated by a corresponding wet bulb temperature;

(8) 'annual energy consumption' (Q_{HE}) means the annual energy consumption of a heater required for space heating to meet the reference annual heating demand for a designated heating season, expressed in kWh in terms of the final energy and/or in GJ in terms of *GCV*;

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

(10) 'standby mode power consumption' (P_{SB}) means the power consumption of a heater in standby mode, expressed in kW;

(11) 'conversion coefficient' (*CC*) means a coefficient reflecting the estimated 40 % average EU generation efficiency referred to in Directive 2012/27/EU of the European Parliament and of the Council [1]; the value of the conversion coefficient is $CC = 2{,}5$;

(12) 'gross calorific value' (*GCV*) means the total amount of heat released by a unit quantity of fuel when it is burned completely with oxygen and when the products of combustion are returned to ambient temperature; this quantity includes the condensation heat of any water vapour contained in the fuel and of the water vapour formed by the combustion of any hydrogen contained in the fuel;

[1] OJ L 315, 14.11.2012, p. 1.

Definitions related to boiler space heaters, boiler combination heaters and cogeneration space heaters:

(13) 'seasonal space heating energy efficiency in active mode' (η_{son}) means

— for fuel boiler space heaters and fuel boiler combination heaters, a weighted average of the useful efficiency at rated heat output and the useful efficiency at 30 % of the rated heat output, expressed in %;

— for electric boiler space heaters and electric boiler combination heaters, the useful efficiency at rated heat output, expressed in %;

— for cogeneration space heaters not equipped with supplementary heaters, the useful efficiency at rated heat output, expressed in %;

— for cogeneration space heaters equipped with supplementary heaters, a weighted average of the useful efficiency at rated heat output with supplementary heater disabled, and the useful efficiency at rated heat output with supplementary heater enabled, expressed in %;

(14) 'useful efficiency' (η) means the ratio of the useful heat output and the total energy input of a boiler space heater, boiler combination heater or cogeneration space heater, expressed in %, whereby the total energy input is expressed in terms of *GCV* and/or in terms of final energy multiplied by *CC*;

(15) 'useful heat output' (*P*) means the heat output of a boiler space heater, boiler combination heater or cogeneration space heater transmitted to the heat carrier, expressed in kW;

(16) 'electrical efficiency' (η_{el}) means the ratio of the electricity output and the total energy input of a cogeneration space heater, expressed in %, whereby the total energy input is expressed in terms of *GCV* and/or in terms of final energy multiplied by *CC*;

(17) 'ignition burner power consumption' (P_{ign}) means the power consumption of a burner intended to ignite the main burner, expressed in W in terms of *GCV*;

(18) 'condensing boiler' means a boiler space heater or boiler combination heater in which, under normal operating conditions and at given operating water temperatures, the water vapour in the combustion products is partially condensed, in order to make use of the latent heat of this water vapour for heating purposes;

(19) 'auxiliary electricity consumption' means the annual electricity required for the designated operation of a boiler space heater, boiler combination heater or cogeneration space heater, calculated from the electric power consumption at full load (*elmax*), at part load (*elmin*), in standby mode and default operating hours at each mode, expressed in kWh in terms of final energy;

(20) 'standby heat loss' (P_{stby}) means the heat loss of a boiler space heater, boiler combination heater or cogeneration space heater in operating modes without heat demand, expressed in kW;

Definitions related to heat pump space heaters and heat pump combination heaters:

(21) 'rated coefficient of performance' (COP_{rated}) or 'rated primary energy ratio' (PER_{rated}) means the declared heat capacity, expressed in kW, divided by the energy input, expressed in kW in terms of *GCV* and/or in kW in terms of final energy multiplied by *CC*, for heating provided at standard rating conditions;

(22) 'reference design conditions' means the combination of the reference design temperature, the maximum bivalent temperature and the maximum operation limit temperature, as set out in Annex VII, Table 10;

(23) 'reference design temperature' (*Tdesignh*) means the outdoor temperature, expressed in degrees Celsius, as set out in Annex VII, Table 10, at which the part load ratio is equal to 1;

(24) 'part load ratio' ($pl(T_j)$) means the outdoor temperature minus 16 °C divided by the reference design temperature minus 16 °C;

(25) 'heating season' means a set of operating conditions for average, colder and warmer climate conditions, describing per bin the combination of outdoor temperatures and the number of hours these temperatures occur per season;

(26) 'bin' (bin_j) means a combination of an outdoor temperature and bin hours, as set out in Annex VII, Table 12;

(27) 'bin hours' (H_j) means the hours per heating season, expressed in hours per year, at which an outdoor temperature occurs for each bin, as set out in Annex VII, Table 12;

(28) 'part load for heating' (*Ph(T_j)*) means the heating load at a specific outdoor temperature, calculated as the design load multiplied by the part load ratio and expressed in kW;

(29) 'seasonal coefficient of performance' (*SCOP*) or 'seasonal primary energy ratio' (*SPER*) means the overall coefficient of performance of a heat pump space heater or heat pump combination heater using electricity or the overall primary energy ratio of a heat pump space heater or heat pump combination heater using fuels, representative of the designated heating season, calculated as the reference annual heating demand divided by the annual energy consumption;

(30) 'reference annual heating demand' (Q_H) means the reference heating demand for a designated heating season, to be used as the basis for calculating *SCOP* or *SPER* and calculated as the product of the design load for heating and the annual equivalent active mode hours, expressed in kWh;

(31) 'annual equivalent active mode hours' (H_{HE}) means the assumed annual number of hours a heat pump space heater or heat pump combination heater has to provide the design load for heating to satisfy the reference annual heating demand, expressed in h;

(32) 'active mode coefficient of performance' ($SCOP_{on}$) or 'active mode primary energy ratio' ($SPER_{on}$) means the average coefficient of performance of the heat pump space heater or heat pump combination heater using electricity in active mode or the average primary energy ratio of the heat pump space heater or heat pump combination heater using fuels in active mode for the designated heating season;

(33) 'supplementary capacity for heating' (*sup(Tj)*) means the rated heat output *Psup* of a supplementary heater that supplements the declared capacity for heating to meet the part load for heating, if the declared capacity for heating is less than the part load for heating, expressed in kW;

(34) 'bin-specific coefficient of performance' (*COPbin(T_j)*) or 'bin-specific primary energy ratio' (*PERbin(T_j)*) means the coefficient of performance of the heat pump space heater or heat pump combination heater using electricity or primary energy ratio of the heat pump space heater or heat pump combination heater using fuel specific for every bin in a season, derived from the part load for heating, declared capacity for heating and declared coefficient of performance for specified bins and calculated for other bins by interpolation or extrapolation, corrected where necessary by the degradation coefficient;

(35) 'declared capacity for heating' (*Pdh(T_j)*) means the heating capacity a heat pump space heater or heat pump combination heater is able to deliver, for an outdoor temperature, expressed in kW;

(36) 'capacity control' means the ability of a heat pump space heater or heat pump combination heater to change its capacity by changing the volumetric flow rate of at least one of the fluids needed to operate the refrigeration cycle, to be indicated as 'fixed' if the volumetric flow rate cannot be changed or 'variable' if the volumetric flow rate is changed or varied in series of two or more steps;

(37) 'design load for heating' (*Pdesignh*) means the rated heat output (*Prated*) of a heat pump space heater or heat pump combination heater at the reference design temperature, whereby the design load for heating is equal to the part load for heating with outdoor temperature equal to reference design temperature, expressed in kW;

(38) 'declared coefficient of performance' (*COPd(T_j)*) or 'declared primary energy ratio' (*PERd(T_j)*) means the coefficient of performance or primary energy ratio at a limited number of specified bins;

(39) 'bivalent temperature' (T_{biv}) means the outdoor temperature declared by the supplier for heating at which the declared capacity for heating equals the part load for heating and below which the declared capacity for heating requires supplementary capacity for heating to meet the part load for heating, expressed in degrees Celsius;

(40) 'operation limit temperature' (*TOL*) means the outdoor temperature declared by the supplier for heating, below which the air-to-water heat pump space heater or air-to-water heat pump combination heater will not be able to deliver any heating capacity and the declared capacity for heating is equal to zero, expressed in degrees Celsius;

(41) 'heating water operation limit temperature' (*WTOL*) means the outlet water temperature declared by the supplier for heating, above which the heat pump space heater or heat pump combination heater will not be able to deliver any heating capacity and the declared capacity heating is equal to zero, expressed in degrees Celsius;

(42) 'cycling interval capacity for heating' (*Pcych*) means the integrated heating capacity over the cycling test interval for heating, expressed in kW;

(43) 'cycling interval efficiency' (*COPcyc* or *PERcyc*) means the average coefficient of performance or average primary energy ratio over the cycling test interval, calculated as the integrated heating capacity over the interval, expressed in kWh, divided by the integrated energy input over that same interval, expressed in kWh in terms of *GCV* and/or in kWh in terms of final energy multiplied by *CC*;

(44) 'degradation coefficient' (*Cdh*) means the measure of efficiency loss due to cycling of a heat pump space heater or heat pump combination heater; if *Cdh* is not determined by measurement then the default degradation coefficient is *Cdh* = 0,9;

(45) 'active mode' means the condition corresponding to the hours with a heating load for the enclosed space and activated heating function; this condition may involve cycling of the heat pump space heater or heat pump combination heater to reach or maintain a required indoor air temperature;

(46) 'off mode' means a condition in which the heat pump space heater or heat pump combination heater is connected to the mains power source and is not providing any function, including conditions providing only an indication of off mode condition and conditions providing only functionalities intended to ensure electromagnetic compatibility pursuant to Directive 2004/108/EC of the European Parliament and of the Council [1];

(47) 'thermostat-off mode' means the condition corresponding to the hours with no heating load and activated heating function, whereby the heating function is switched on but the heat pump space heater or heat pump combination heater is not operational; cycling in active mode is not considered as thermostat-off mode;

(48) 'crankcase heater mode' means the condition in which a heating device is activated to avoid the refrigerant migrating to the compressor so as to limit the refrigerant concentration in oil when the compressor is started;

(49) 'off mode power consumption' (P_{OFF}) means the power consumption of a heat pump space heater or heat pump combination heater in off mode, expressed in kW;

(50) 'thermostat-off mode power consumption' (P_{TO}) means the power consumption of the heat pump space heater or heat pump combination heater while in thermostat-off mode, expressed in kW;

(51) 'crankcase heater mode power consumption' (P_{CK}) means the power consumption of the heat pump space heater or heat pump combination heater while in crankcase heater mode, expressed in kW;

(52) 'low-temperature heat pump' means a heat pump space heater that is specifically designed for low-temperature application, and that cannot deliver heating water with an outlet temperature of 52 °C at an inlet dry (wet) bulb temperature of – 7 °C (– 8 °C) in the reference design conditions for average climate;

(53) 'low-temperature application' means an application where the heat pump space heater delivers its declared capacity for heating at an indoor heat exchanger outlet temperature of 35 °C;

(54) 'medium-temperature application' means an application where the heat pump space heater or heat pump combination heater delivers its declared capacity for heating at an indoor heat exchanger outlet temperature of 55 °C;

Definitions related to water heating in combination heaters:

(55) 'load profile' means a given sequence of water draw-offs, as specified in Annex VII, Table 15; each combination heater meets at least one load profile;

(56) 'water draw-off' means a given combination of useful water flow rate, useful water temperature, useful energy content and peak temperature, as specified in Annex VII, Table 15;

(57) 'useful water flow rate' (*f*) means the minimum flow rate, expressed in litres per minute, for which hot water is contributing to the reference energy, as specified in Annex VII, Table 15;

(58) 'useful water temperature' (T_m) means the water temperature, expressed in degrees Celsius, at which hot water starts contributing to the reference energy, as specified in Annex VII, Table 15;

(59) 'useful energy content' (Q_{tap}) means the energy content of hot water, expressed in kWh, provided at a temperature equal to, or above, the useful water temperature, and at water flow rates equal to, or above, the useful water flow rate, as specified in Annex VII, Table 15;

(60) 'energy content of hot water' means the product of the specific heat capacity of water, the average temperature difference between the hot water output and cold water input, and the total mass of the hot water delivered;

[1] OJ L 390, 31.12.2004, p. 24.

(61) 'peak temperature' (T_p) means the minimum water temperature, expressed in degrees Celsius, to be achieved during water draw-off, as specified in Annex VII, Table 15;

(62) 'reference energy' (Q_{ref}) means the sum of the useful energy content of water draw-offs, expressed in kWh, in a particular load profile, as specified in Annex VII, Table 15;

(63) 'maximum load profile' means the load profile with the greatest reference energy that a combination heater is able to provide while fulfilling the temperature and flow rate conditions of that load profile;

(64) 'declared load profile' means the load profile applied when determining water heating energy efficiency;

(65) 'daily electricity consumption' (Q_{elec}) means the consumption of electricity for water heating over 24 consecutive hours under the declared load profile, expressed in kWh in terms of final energy;

(66) 'daily fuel consumption' (Q_{fuel}) means the consumption of fuels for water heating over 24 consecutive hours under the declared load profile, expressed in kWh in terms of *GCV* and, for the purposes of point 5(f) in Annex VII, expressed in GJ in terms of *GCV*;

(67) 'annual electricity consumption' (*AEC*) means the annual electricity consumption of a combination heater for water heating under the declared load profile and under given climate conditions, expressed in kWh in terms of final energy;

(68) 'annual fuel consumption' (*AFC*) means the annual fossil fuel and/or biomass fuel consumption of a combination heater for water heating under the declared load profile and under given climate conditions, expressed in GJ in terms of *GCV*;

Definitions related to solar devices:

(69) 'annual non-solar heat contribution' (Q_{nonsol}), means the annual contribution of electricity (expressed in kWh in terms of primary energy) and/or fuels (expressed in kWh in terms of *GCV*) to the useful heat output of a package of combination heater, temperature control and solar device, taking into account the annual amount of heat captured by the solar collector and the heat losses of the solar hot water storage tank;

(70) 'collector aperture area' (A_{sol}), for the purposes of Figures 1 to 4 in Annex IV referred to as 'collector size', means the maximum projected area through which unconcentrated solar radiation enters the collector, expressed in m^2;

(71) 'collector efficiency' (η_{col}) means the efficiency of the solar collector at a temperature difference between the solar collector and the surrounding air of 40 K and a global solar irradiance of 1 000 W/m^2, expressed in %;

(72) 'standing loss' (*S*) means the heating power dissipated from a solar hot water storage tank at given water and ambient temperatures, expressed in W;

(73) 'storage volume' (*V*), for the purposes of Figures 1 to 4 in Annex IV referred to as 'tank volume', means the rated volume of a solar hot water storage tank, expressed in litres or m^3;

(74) 'auxiliary electricity consumption' (Q_{aux}), for the purpose of Figure 5 in Annex IV referred to as 'auxiliary electricity', means the annual electricity consumption of a solar-only system that is due to the pump power consumption and the standby power consumption, expressed in kWh in terms of final energy;

(75) 'pump power consumption' (*solpump*) means the rated electrical power consumption of the pump in the collector loop of a solar-only system, expressed in W;

(76) 'standby power consumption' (*solstandby*) means the rated electrical power consumption of a solar-only system when the pump and the heat generator are inactive, expressed in W;

Other definitions:

(77) 'average climate conditions', 'colder climate conditions' and 'warmer climate conditions' mean the temperature and global solar irradiance conditions characteristic for the cities of Strasbourg, Helsinki and Athens, respectively;

(78) 'model identifier' means the code, usually alphanumeric, which distinguishes a specific space heater, combination heater, temperature control, solar device, package of space heater, temperature control and solar device, or package of combination heater, temperature control and solar device model from other models with the same trade mark, supplier's name or dealer's name.

ANNEX II

Energy efficiency classes

1. SEASONAL SPACE HEATING ENERGY EFFICIENCY CLASSES

The seasonal space heating energy efficiency class of a heater, with the exception of low-temperature heat pumps and heat pump space heaters for low-temperature application, shall be determined on the basis of its seasonal space heating energy efficiency as set out in Table 1.

The seasonal space heating energy efficiency classes of a low-temperature heat pump and a heat pump space heater for low-temperature application shall be determined on the basis of its seasonal space heating energy efficiency as set out in Table 2.

The seasonal space heating energy efficiency of a heater shall be calculated in accordance with points 3 and 4 of Annex VII, for heat pump space heaters, heat pump combination heaters and low-temperature heat pumps under average climate conditions.

Table 1

Seasonal space heating energy efficiency classes of heaters, with the exception of low-temperature heat pumps and heat pump space heaters for low-temperature application

Seasonal space heating energy efficiency class	Seasonal space heating energy efficiency η_s in %
A^{+++}	$\eta_s \geq 150$
A^{++}	$125 \leq \eta_s < 150$
A^{+}	$98 \leq \eta_s < 125$
A	$90 \leq \eta_s < 98$
B	$82 \leq \eta_s < 90$
C	$75 \leq \eta_s < 82$
D	$36 \leq \eta_s < 75$
E	$34 \leq \eta_s < 36$
F	$30 \leq \eta_s < 34$
G	$\eta_s < 30$

Table 2

Seasonal space heating energy efficiency classes of low-temperature heat pumps and heat pump space heaters for low-temperature application

Seasonal space heating energy efficiency class	Seasonal space heating energy efficiency η_s in %
A^{+++}	$\eta_s \geq 175$
A^{++}	$150 \leq \eta_s < 175$
A^{+}	$123 \leq \eta_s < 150$
A	$115 \leq \eta_s < 123$
B	$107 \leq \eta_s < 115$
C	$100 \leq \eta_s < 107$
D	$61 \leq \eta_s < 100$
E	$59 \leq \eta_s < 61$
F	$55 \leq \eta_s < 59$
G	$\eta_s < 55$

2. WATER HEATING ENERGY EFFICIENCY CLASSES

The water heating energy efficiency class of a combination heater shall be determined on the basis of its water heating energy efficiency as set out in Table 3.

The water heating energy efficiency of a combination heater shall be calculated in accordance with point 5 of Annex VII.

Table 3

Water heating energy efficiency classes of combination heaters, categorised by declared load profiles, η_{wh} in %

	3XS	XXS	XS	S	M	L	XL	XXL
A^{+++}	$\eta_{wh} \geq 62$	$\eta_{wh} \geq 62$	$\eta_{wh} \geq 69$	$\eta_{wh} \geq 90$	$\eta_{wh} \geq 163$	$\eta_{wh} \geq 188$	$\eta_{wh} \geq 200$	$\eta_{wh} \geq 213$
A^{++}	$53 \leq \eta_{wh} < 62$	$53 \leq \eta_{wh} < 62$	$61 \leq \eta_{wh} < 69$	$72 \leq \eta_{wh} < 90$	$130 \leq \eta_{wh} < 163$	$150 \leq \eta_{wh} < 188$	$160 \leq \eta_{wh} < 200$	$170 \leq \eta_{wh} < 213$
A^{+}	$44 \leq \eta_{wh} < 53$	$44 \leq \eta_{wh} < 53$	$53 \leq \eta_{wh} < 61$	$55 \leq \eta_{wh} < 72$	$100 \leq \eta_{wh} < 130$	$115 \leq \eta_{wh} < 150$	$123 \leq \eta_{wh} < 160$	$131 \leq \eta_{wh} < 170$
A	$35 \leq \eta_{wh} < 44$	$35 \leq \eta_{wh} < 44$	$38 \leq \eta_{wh} < 53$	$38 \leq \eta_{wh} < 55$	$65 \leq \eta_{wh} < 100$	$75 \leq \eta_{wh} < 115$	$80 \leq \eta_{wh} < 123$	$85 \leq \eta_{wh} < 131$
B	$32 \leq \eta_{wh} < 35$	$32 \leq \eta_{wh} < 35$	$35 \leq \eta_{wh} < 38$	$35 \leq \eta_{wh} < 38$	$39 \leq \eta_{wh} < 65$	$50 \leq \eta_{wh} < 75$	$55 \leq \eta_{wh} < 80$	$60 \leq \eta_{wh} < 85$
C	$29 \leq \eta_{wh} < 32$	$29 \leq \eta_{wh} < 32$	$32 \leq \eta_{wh} < 35$	$32 \leq \eta_{wh} < 35$	$36 \leq \eta_{wh} < 39$	$37 \leq \eta_{wh} < 50$	$38 \leq \eta_{wh} < 55$	$40 \leq \eta_{wh} < 60$
D	$26 \leq \eta_{wh} < 29$	$26 \leq \eta_{wh} < 29$	$29 \leq \eta_{wh} < 32$	$29 \leq \eta_{wh} < 32$	$33 \leq \eta_{wh} < 36$	$34 \leq \eta_{wh} < 37$	$35 \leq \eta_{wh} < 38$	$36 \leq \eta_{wh} < 40$
E	$22 \leq \eta_{wh} < 26$	$23 \leq \eta_{wh} < 26$	$26 \leq \eta_{wh} < 29$	$26 \leq \eta_{wh} < 29$	$30 \leq \eta_{wh} < 33$	$30 \leq \eta_{wh} < 34$	$30 \leq \eta_{wh} < 35$	$32 \leq \eta_{wh} < 36$
F	$19 \leq \eta_{wh} < 22$	$20 \leq \eta_{wh} < 23$	$23 \leq \eta_{wh} < 26$	$23 \leq \eta_{wh} < 26$	$27 \leq \eta_{wh} < 30$	$27 \leq \eta_{wh} < 30$	$27 \leq \eta_{wh} < 30$	$28 \leq \eta_{wh} < 32$
G	$\eta_{wh} < 19$	$\eta_{wh} < 20$	$\eta_{wh} < 23$	$\eta_{wh} < 23$	$\eta_{wh} < 27$	$\eta_{wh} < 27$	$\eta_{wh} < 27$	$\eta_{wh} < 28$

3. ENERGY EFFICIENCY CLASSES OF SOLAR HOT WATER STORAGE TANKS, IF (PART OF) A SOLAR DEVICE

The energy efficiency class of a solar hot water storage tank, if (part of) a solar device, shall be determined on the basis of its standing loss as set out in Table 4.

Table 4

Energy efficiency classes of solar hot water storage tanks, if (part of) a solar device

Energy efficiency class	Standing loss S in Watts, with storage volume V in litres
A+	$S < 5{,}5 + 3{,}16 \cdot V^{0,4}$
A	$5{,}5 + 3{,}16 \cdot V^{0,4} \leq S < 8{,}5 + 4{,}25 \cdot V^{0,4}$
B	$8{,}5 + 4{,}25 \cdot V^{0,4} \leq S < 12 + 5{,}93 \cdot V^{0,4}$
C	$12 + 5{,}93 \cdot V^{0,4} \leq S < 16{,}66 + 8{,}33 \cdot V^{0,4}$
D	$16{,}66 + 8{,}33 \cdot V^{0,4} \leq S < 21 + 10{,}33 \cdot V^{0,4}$
E	$21 + 10{,}33 \cdot V^{0,4} \leq S < 26 + 13{,}66 \cdot V^{0,4}$
F	$26 + 13{,}66 \cdot V^{0,4} \leq S < 31 + 16{,}66 \cdot V^{0,4}$
G	$S > 31 + 16{,}66 \cdot V^{0,4}$

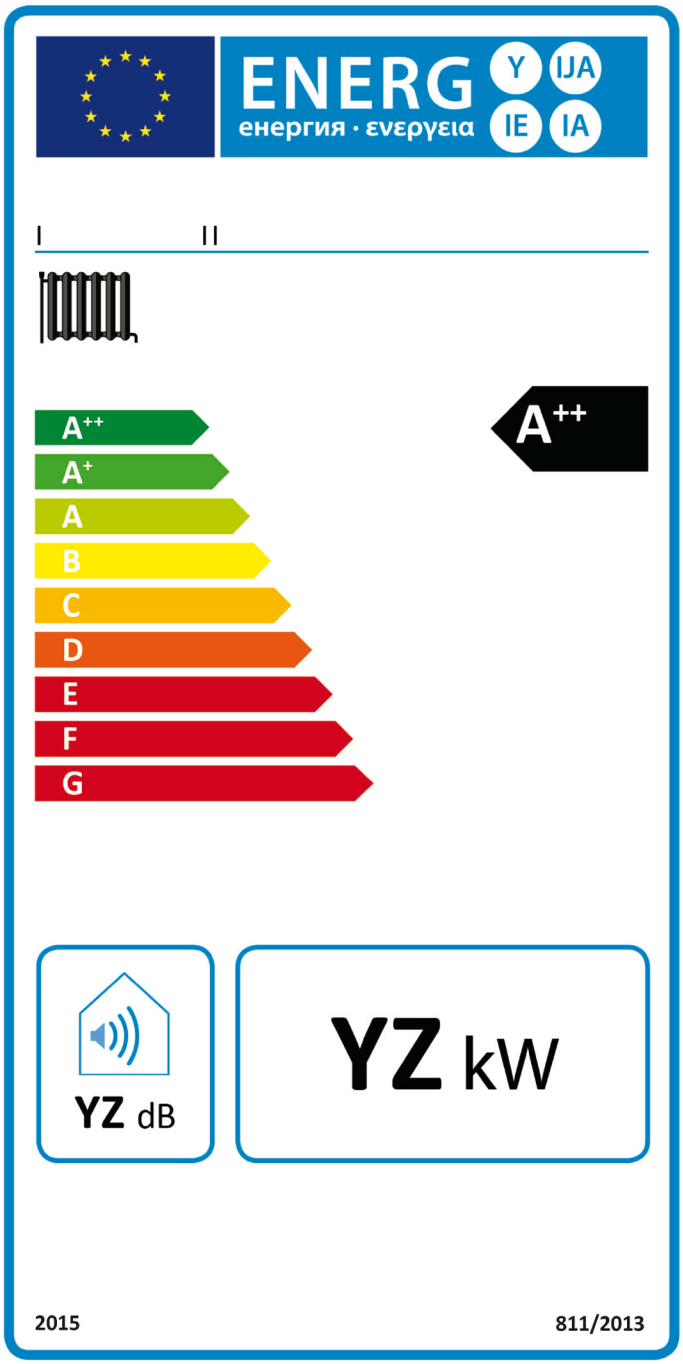
ANNEX III

The labels

1. SPACE HEATERS

1.1. **Label 1**

1.1.1. *Boiler space heaters in seasonal space heating energy efficiency classes A^{++} to G*



I, II

III

IV

VI, V

(a) The following information shall be included in the label:

I. supplier's name or trade mark;

II. supplier's model identifier;

III. the space heating function;

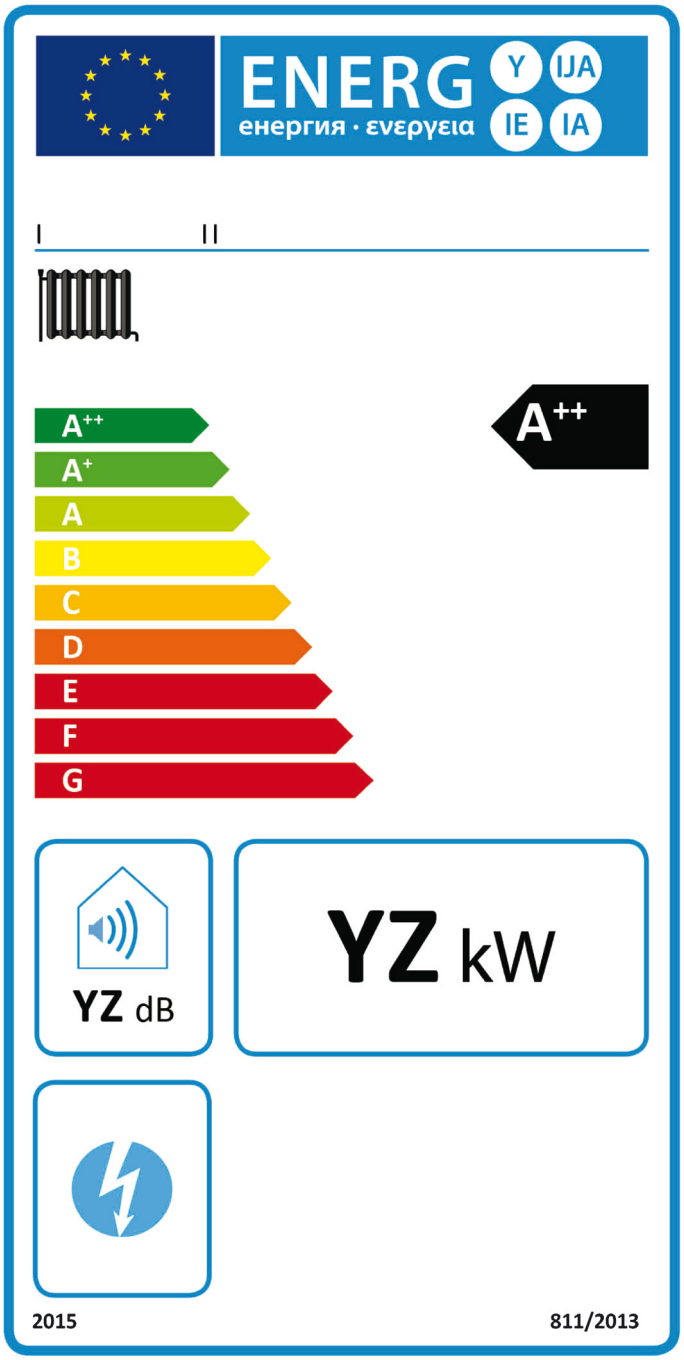
IV. the seasonal space heating energy efficiency class, determined in accordance with point 1 of Annex II; the head of the arrow containing the seasonal space heating energy efficiency class of the boiler space heater shall be placed at the same height as the head of the relevant energy efficiency class;

V. the rated heat output in kW, rounded to the nearest integer;

VI. the sound power level L_{WA}, indoors, in dB, rounded to the nearest integer.

(b) The design aspects of the label for boiler space heaters shall be in accordance with point 5 of this Annex.

1.1.2. *Cogeneration space heaters in seasonal space heating energy efficiency classes A^{++} to G*



I, II

III

IV

VI, V

VII

(a) The following information shall be included in the label:

I. supplier's name or trade mark;

II. supplier's model identifier;

III. the space heating function;

IV. the seasonal space heating energy efficiency class, determined in accordance with point 1 of Annex II; the head of the arrow containing the seasonal space heating energy efficiency class of the cogeneration space heater shall be placed at the same height as the head of the relevant energy efficiency class;

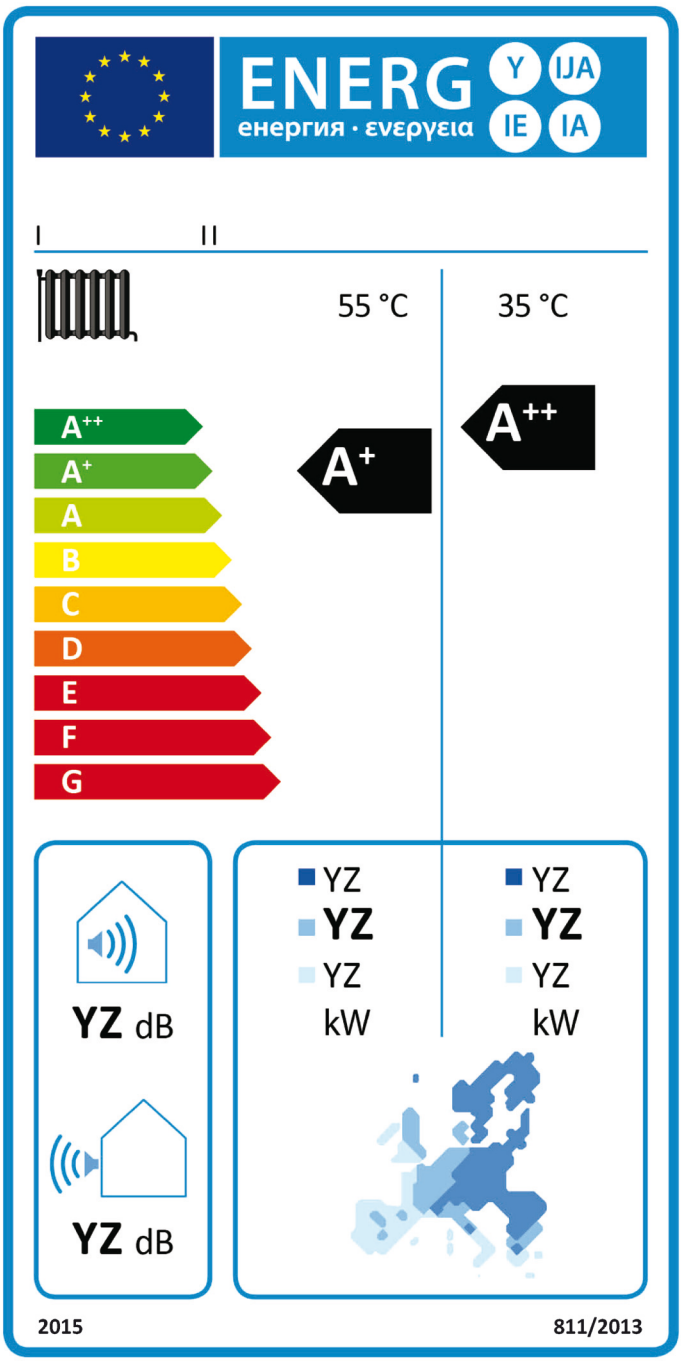
V. the rated heat output, including the rated heat output of any supplementary heater, in kW, rounded to the nearest integer;

VI. the sound power level L_{WA}, indoors, in dB, rounded to the nearest integer;

VII. the additional electricity generation function.

(b) The design aspects of the label for cogeneration space heaters shall be in accordance with point 6 of this Annex.

1.1.3. *Heat pump space heaters, except low-temperature heat pumps, in seasonal space heating energy efficiency classes* A^{++} *to G*



I, II

III

IV

VII, V

VI

(a) The following information shall be included in the label:

I. supplier's name or trade mark;

II. supplier's model identifier;

III. the space heating function for medium- and low-temperature application, respectively;

IV. the seasonal space heating energy efficiency class under average climate conditions for medium- and low-temperature application, respectively, determined in accordance with point 1 of Annex II; the head of the arrow containing the seasonal space heating energy efficiency class of the heat pump space heater for medium- and low-temperature application, respectively, shall be placed at the same height as the head of the relevant energy efficiency class;

V. the rated heat output, including the rated heat output of any supplementary heater, in kW, under average, colder and warmer climate conditions for medium- and low-temperature application, respectively, rounded to the nearest integer;

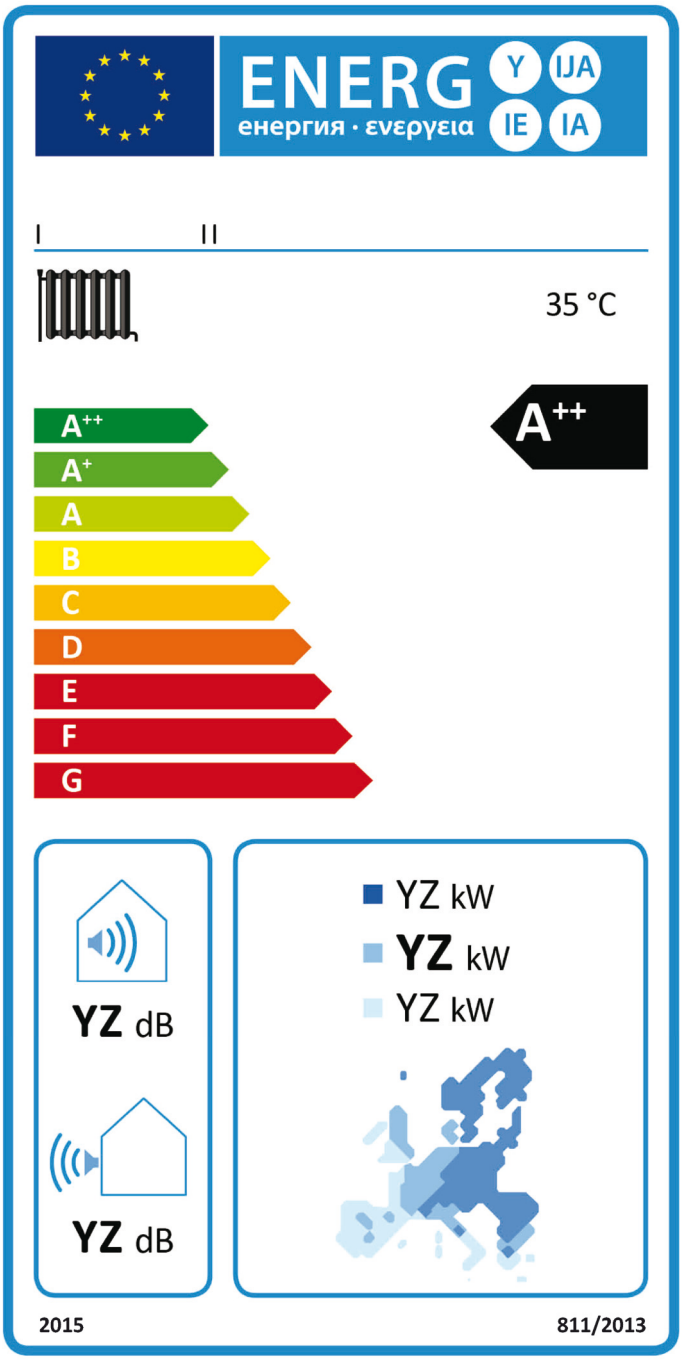
VI. European temperature map displaying three indicative temperature zones;

VII. the sound power level L_{WA}, indoors (if applicable) and outdoors, in dB, rounded to the nearest integer.

(b) The design aspects of the label for heat pump space heaters shall be in accordance with point 7 of this Annex. By way of exception, where a model has been granted an 'EU Ecolabel' under Regulation (EC) No 66/2010 of the European Parliament and of the Council [1], a copy of the EU Ecolabel may be added.

[1] OJ L 27, 30.1.2010, p. 1.

1.1.4. *Low-temperature heat pumps in seasonal space heating energy efficiency classes A^{++} to G*



I, II

III

IV

VII, V

VI

(a) The following information shall be included in the label:

I. supplier's name or trade mark;

II. supplier's model identifier;

III. the space heating function for low-temperature application;

IV. the seasonal space heating energy efficiency class under average climate conditions, determined in accordance with point 1 of Annex II; the head of the arrow containing the seasonal space heating energy efficiency class of the low-temperature heat pump shall be placed at the same height as the head of the relevant energy efficiency class;

V. the rated heat output, including the rated heat output of any supplementary heater, in kW, under average, colder and warmer climate conditions, rounded to the nearest integer;

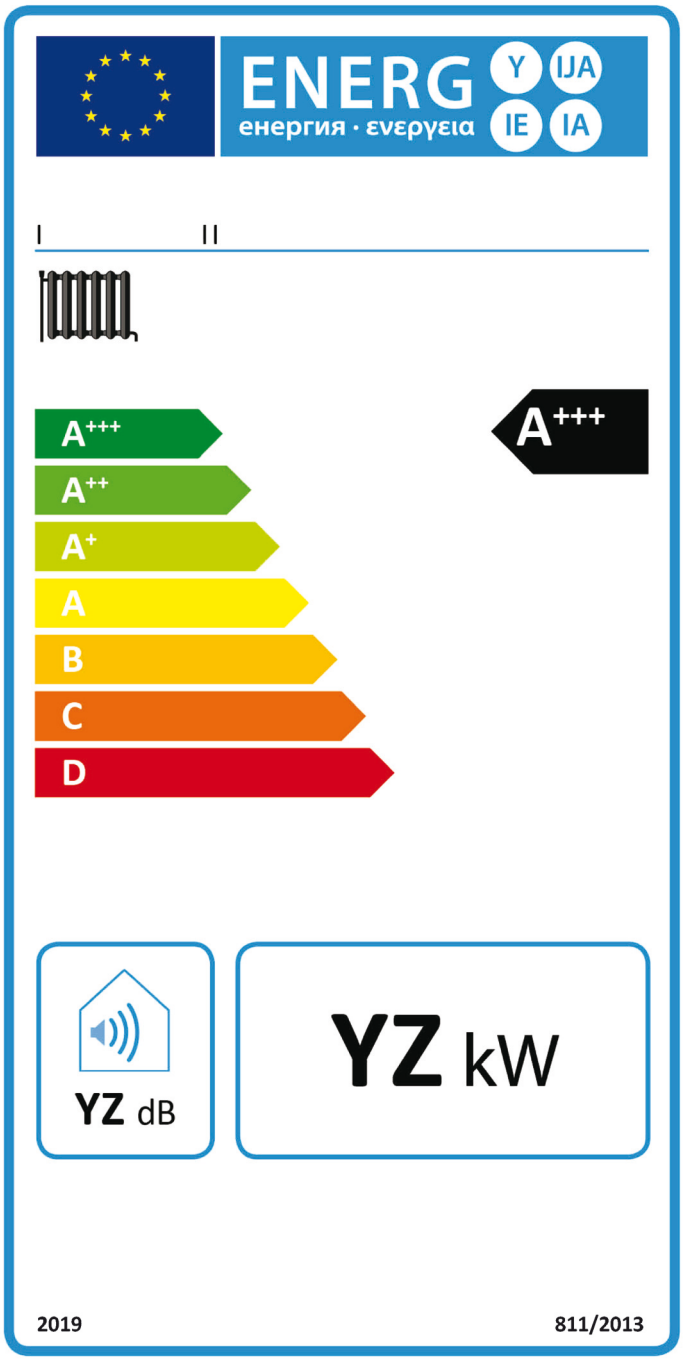
VI. European temperature map displaying three indicative temperature zones;

VII. the sound power level L_{WA}, indoors (if applicable) and outdoors, in dB, rounded to the nearest integer.

(b) The design aspects of the label for low-temperature heat pumps shall be in accordance with point 8 of this Annex. By way of exception, where a model has been granted an 'EU Ecolabel' under Regulation (EC) No 66/2010 of the European Parliament and of the Council, a copy of the EU Ecolabel may be added.

1.2. **Label 2**

1.2.1. *Boiler space heaters in seasonal space heating energy efficiency classes A^{+++} to D*



I, II

III

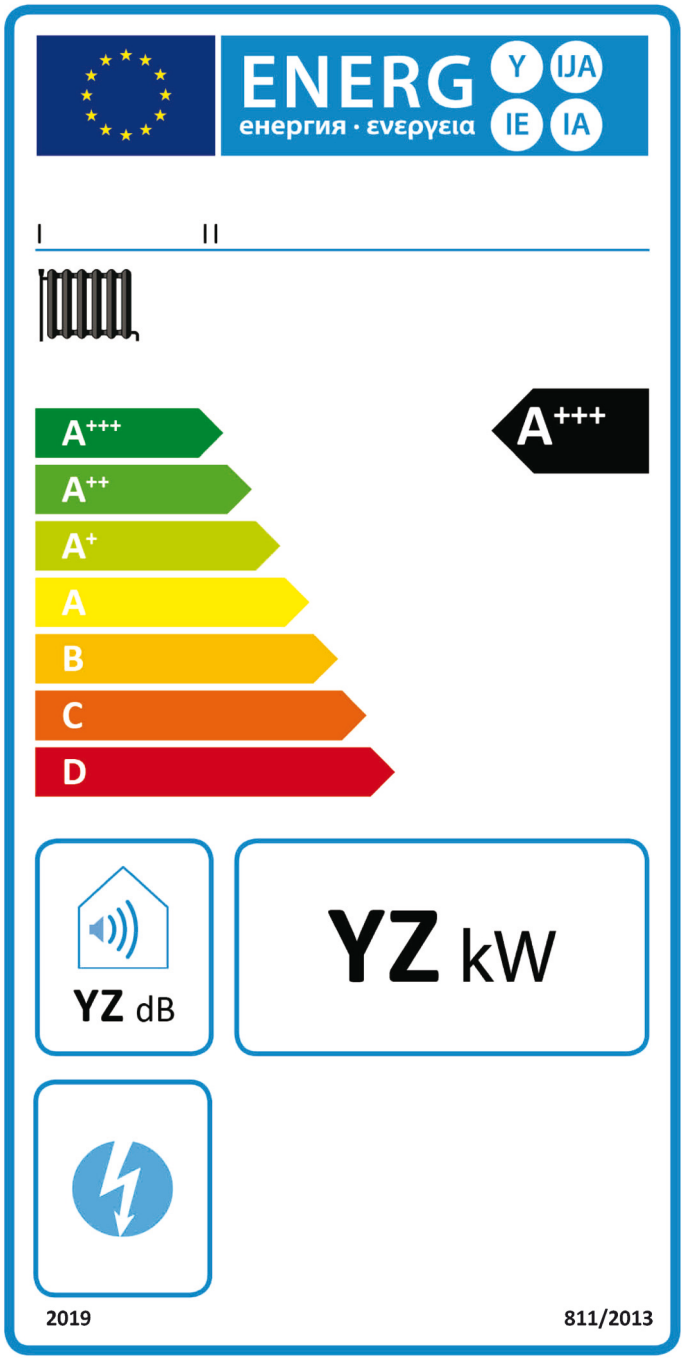
IV

VI, V

(a) The information listed in point 1.1.1(a) of this Annex shall be included in the label.

(b) The design aspects of the label for boiler space heaters shall be in accordance with point 5 of this Annex.

1.2.2. *Cogeneration space heaters in seasonal space heating energy efficiency classes A^{+++} to D*



I, II

III

IV

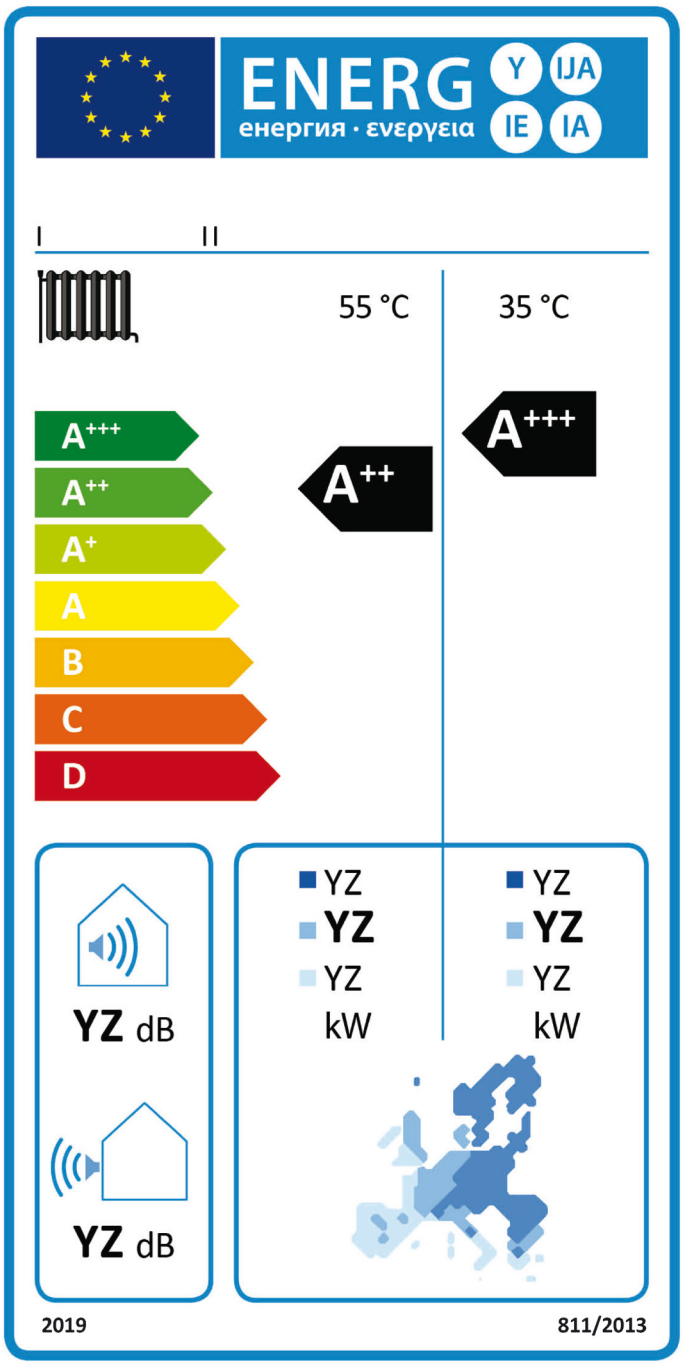
VI, V

VII

(a) The information listed in point 1.1.2(a) of this Annex shall be included in the label.

(b) The design aspects of the label for cogeneration space heaters shall be in accordance with point 6 of this Annex.

1.2.3. *Heat pump space heaters, except low-temperature heat pumps, in seasonal space heating energy efficiency classes A^{+++} to D*



I, II

III

IV

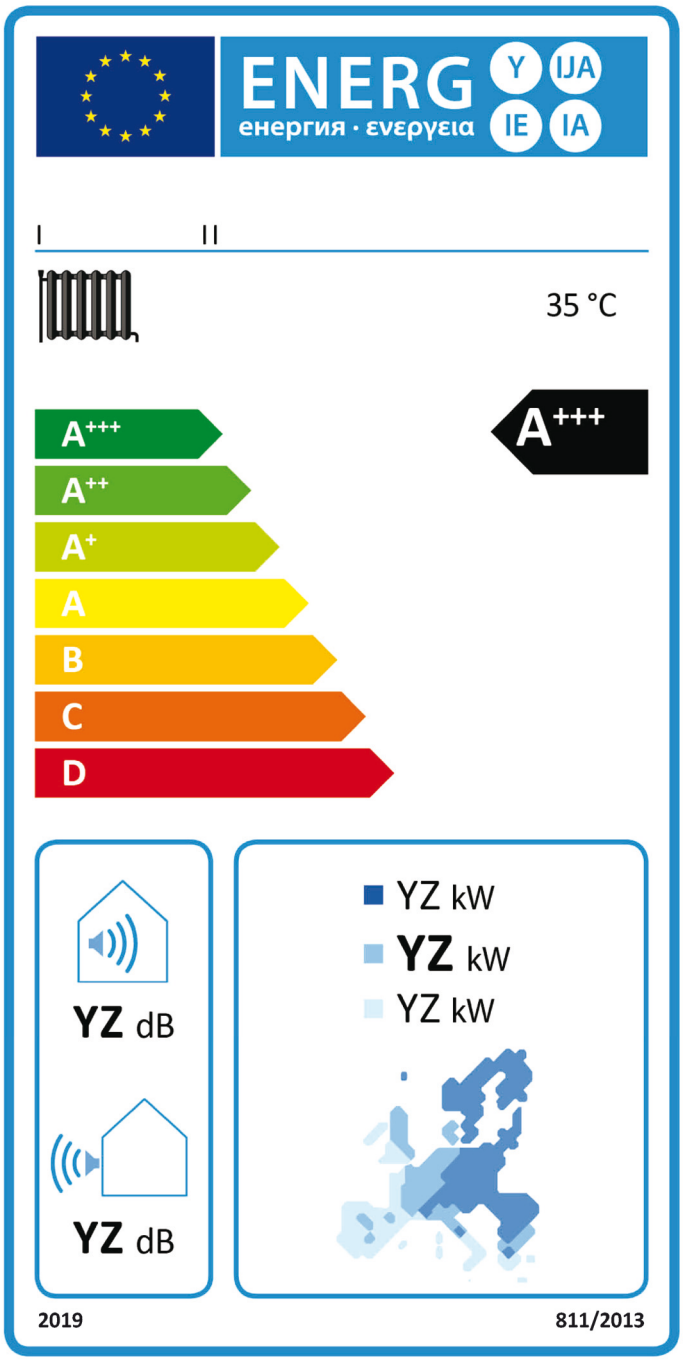
VII, V

VI

(a) The information listed in point 1.1.3(a) of this Annex shall be included in the label.

(b) The design aspects of the label for heat pump space heaters shall be in accordance with point 7 of this Annex.

1.2.4. *Low-temperature heat pumps in seasonal space heating energy efficiency classes A^{+++} to D*



I, II

III

IV

VII, V

VI

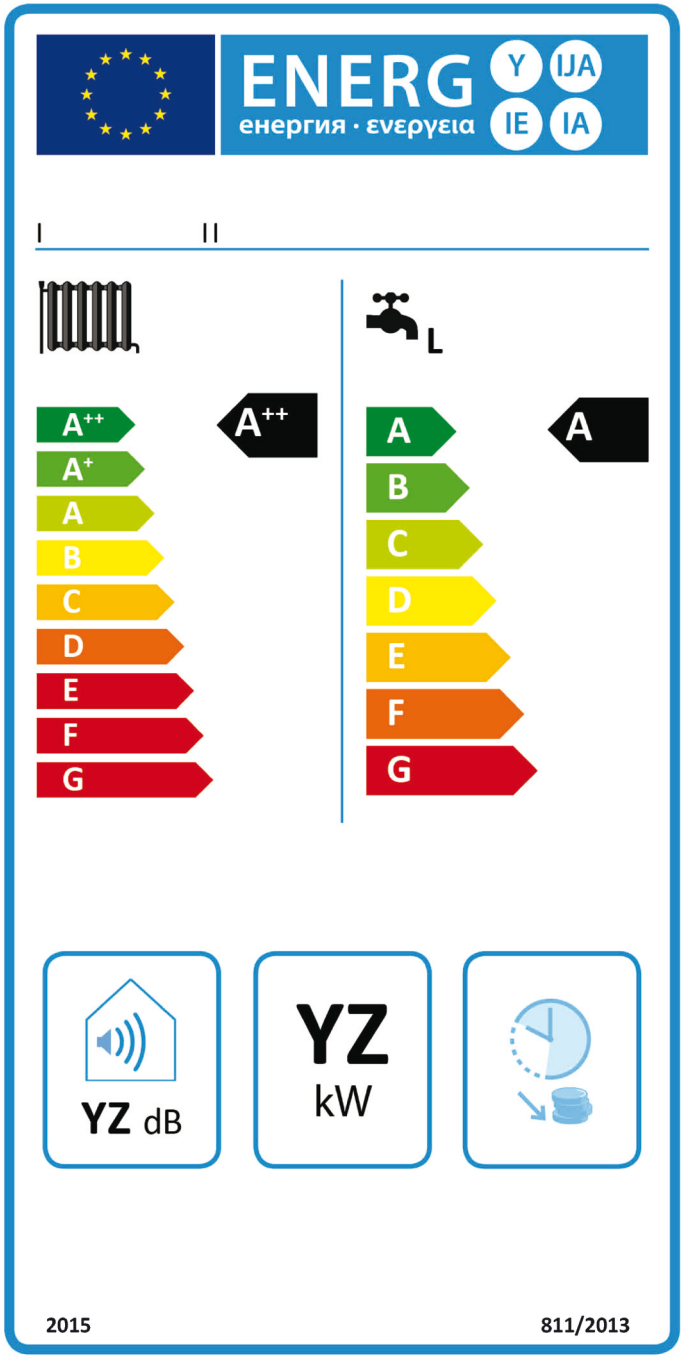
(a) The information listed in point 1.1.4(a) of this Annex shall be included in the label.

(b) The design aspects of the label for low-temperature heat pumps shall be in accordance with point 8 of this Annex.

2. COMBINATION HEATERS

2.1. **Label 1**

2.1.1 *Boiler combination heaters in seasonal space heating energy efficiency classes A^{++} to G and in water heating energy efficiency classes A to G*



I, II

III

IV

VI, V, VII

(a) The following information shall be included in the label:

I. supplier's name or trade mark;

II. supplier's model identifier;

III. the space heating function and the water heating function, including the declared load profile expressed as the appropriate letter in accordance with Table 15 of Annex VII;

IV. the seasonal space heating energy efficiency class and the water heating energy efficiency class, determined in accordance with points 1 and 2 of Annex II; the head of the arrows containing the seasonal space heating energy efficiency class and water heating energy efficiency class of the boiler combination heater shall be placed at the same height as the head of the relevant energy efficiency class;

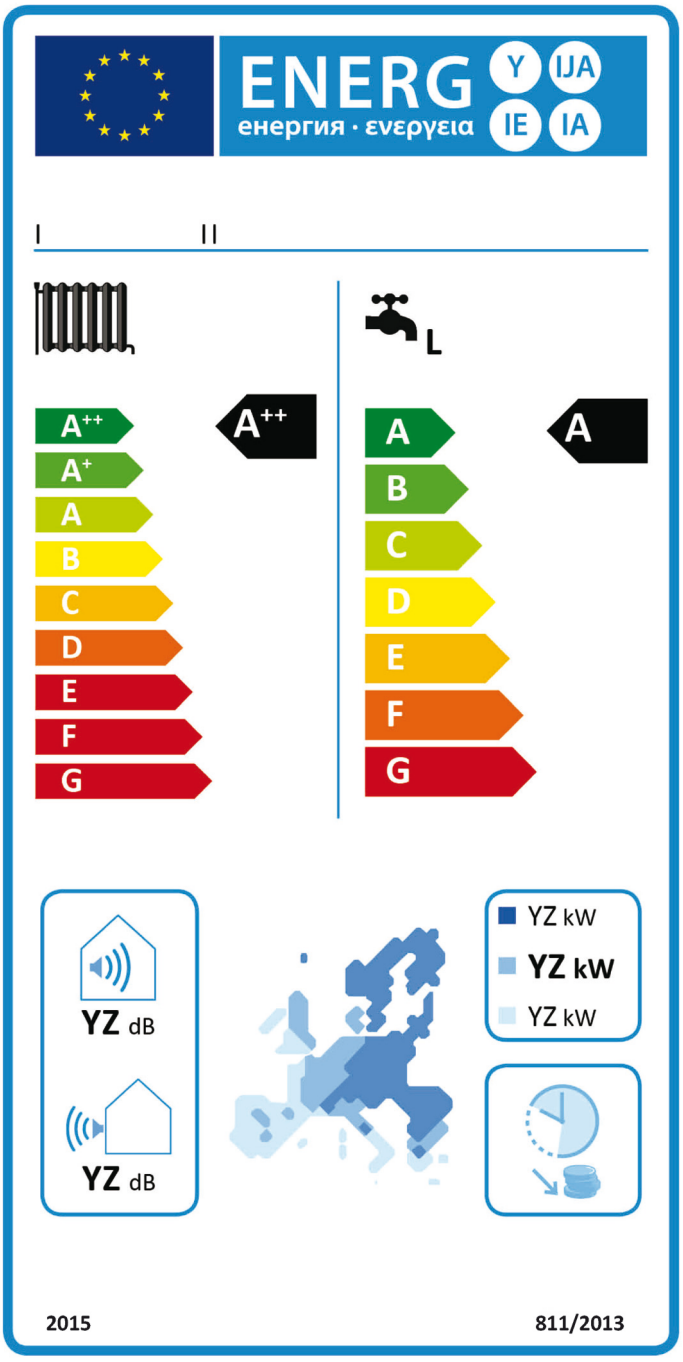
V. the rated heat output in kW, rounded to the nearest integer;

VI. the sound power level L_{WA}, indoors, in dB, rounded to the nearest integer.

VII. for boiler combination heaters able to work only during off-peak hours, the pictogram referred to in point 9(d)(11) of this Annex may be added.

(b) The design aspects of the label for boiler combination heaters shall be in accordance with point 9 of this Annex.

2.1.2. *Heat pump combination heaters in seasonal space heating energy efficiency classes A^{++} to G and in water heating energy efficiency classes A to G*



I, II

III

IV

VII, VI, V

VIII

(a) The following information shall be included in the label:

I. supplier's name or trade mark;

II. supplier's model identifier;

III. the space heating function for medium-temperature application and the water heating function, including the declared load profile expressed as the appropriate letter in accordance with Table 15 of Annex VII;

IV. the seasonal space heating energy efficiency class under average climate conditions for medium-temperature application and the water heating energy efficiency class under average climate conditions, determined in accordance with points 1 and 2 of Annex II; the head of the arrows containing the seasonal space heating energy efficiency class and water heating energy efficiency class of the heat pump combination heater shall be placed at the same height as the head of the relevant energy efficiency class;

V. the rated heat output, including the rated heat output of any supplementary heater, in kW, under average, colder and warmer climate conditions, rounded to the nearest integer;

VI. European temperature map displaying three indicative temperature zones;

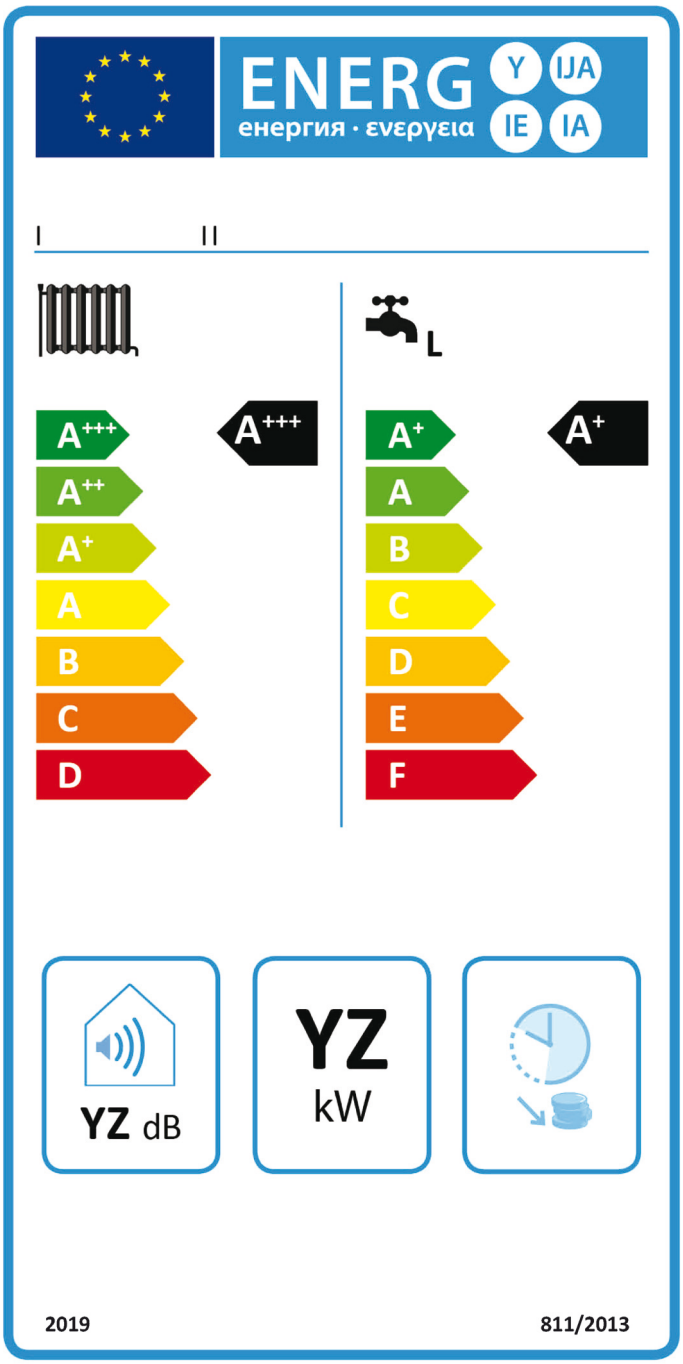
VII. the sound power level L_{WA}, indoors (if applicable) and outdoors, in dB, rounded to the nearest integer;

VIII. for heat pump combination heaters able to work only during off-peak hours, the pictogram referred to in point 10(d)(12) of this Annex may be added.

(b) The design aspects of the label for heat pump combination heaters shall be in accordance with point 10 of this Annex.

2.2. **Label 2**

2.2.1. *Boiler combination heaters in seasonal space heating energy efficiency classes A^{+++} to D and in water heating energy efficiency classes A^{+} to F*



I, II

III

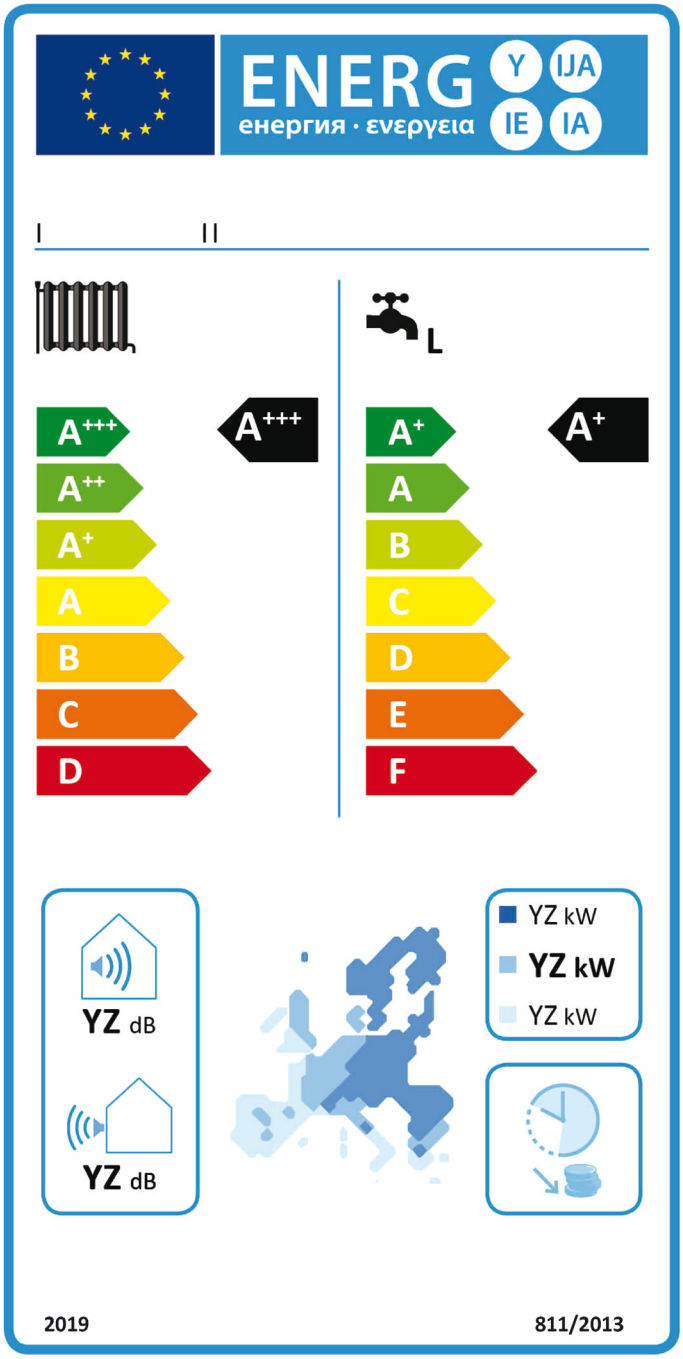
IV

VI, V, VII

(a) The information listed in point 2.1.1(a) of this Annex shall be included in the label.

(b) The design aspects of the label for boiler combination heaters shall be in accordance with point 9 of this Annex.

2.2.2. *Heat pump combination heaters in seasonal space heating energy efficiency classes A^{+++} to D and in water heating energy efficiency classes A^{+} to F*



I, II

III

IV

VII, VI, V

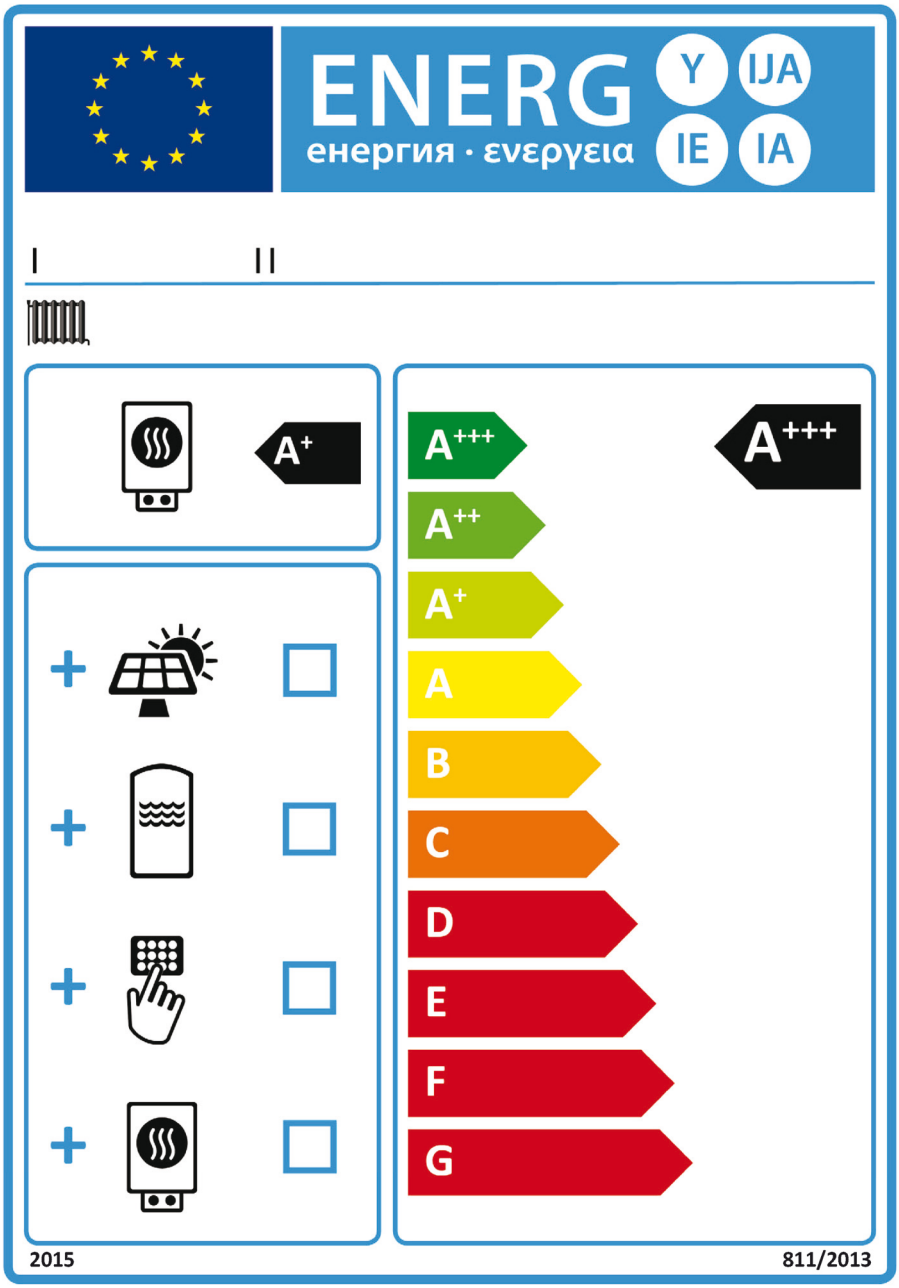
VIII

(a) The information listed in point 2.1.2(a) of this Annex shall be included in the label.

(b) The design aspects of the label for heat pump combination heaters shall be in accordance with point 10 of this Annex.

3. PACKAGES OF SPACE HEATER, TEMPERATURE CONTROL AND SOLAR DEVICE

Label for packages of space heater, temperature control and solar device in seasonal space heating energy efficiency classes A^{+++} to G



(a) The following information shall be included in the label:

I. dealer's and/or supplier's name or trade mark;

II. dealer's and/or supplier's model(s) identifier;

III. the space heating function;

IV. the seasonal space heating energy efficiency class of the space heater, determined in accordance with point 1 of Annex II;

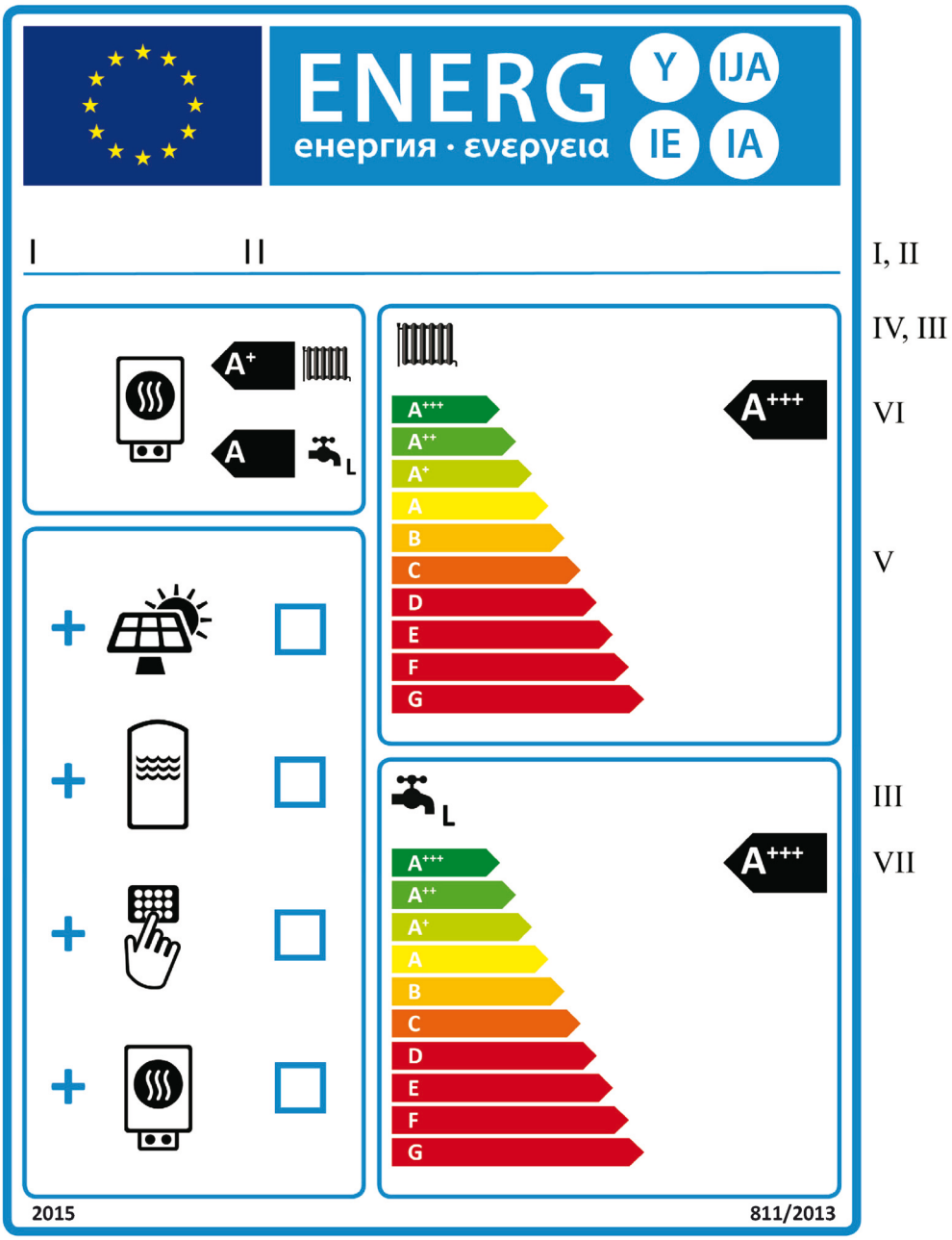
V. indication of whether a solar collector, hot water storage tank, temperature control and/or supplementary space heater may be included in the package of space heater, temperature control and solar device;

VI. the seasonal space heating energy efficiency class of the package of space heater, temperature control and solar device, determined in accordance with point 5 of Annex IV; the head of the arrow containing the seasonal space heating energy efficiency class of the package of space heater, temperature control and solar device shall be placed at the same height as the head of the relevant energy efficiency class.

(b) The design aspects of the label for packages of space heater, temperature control and solar device shall be in accordance with point 11 of this Annex. For packages of space heater, temperature control and solar device in seasonal space heating energy efficiency classes A^{+++} to D, the last classes E to G in the A^{+++} to G scale may be omitted.

4. PACKAGES OF COMBINATION HEATER, TEMPERATURE CONTROL AND SOLAR DEVICE

Label for packages of combination heater, temperature control and solar device in seasonal space heating and water heating energy efficiency classes A^{+++} to G



(a) The following information shall be included in the label:

I. dealer's and/or supplier's name or trade mark;

II. dealer's and/or supplier's model(s) identifier;

III. the space heating function and the water heating function, including the declared load profile expressed as the appropriate letter in accordance with Table 15 of Annex VII;

IV. the seasonal space heating and water heating energy efficiency classes of the combination heater, determined in accordance with points 1 and 2 of Annex II;

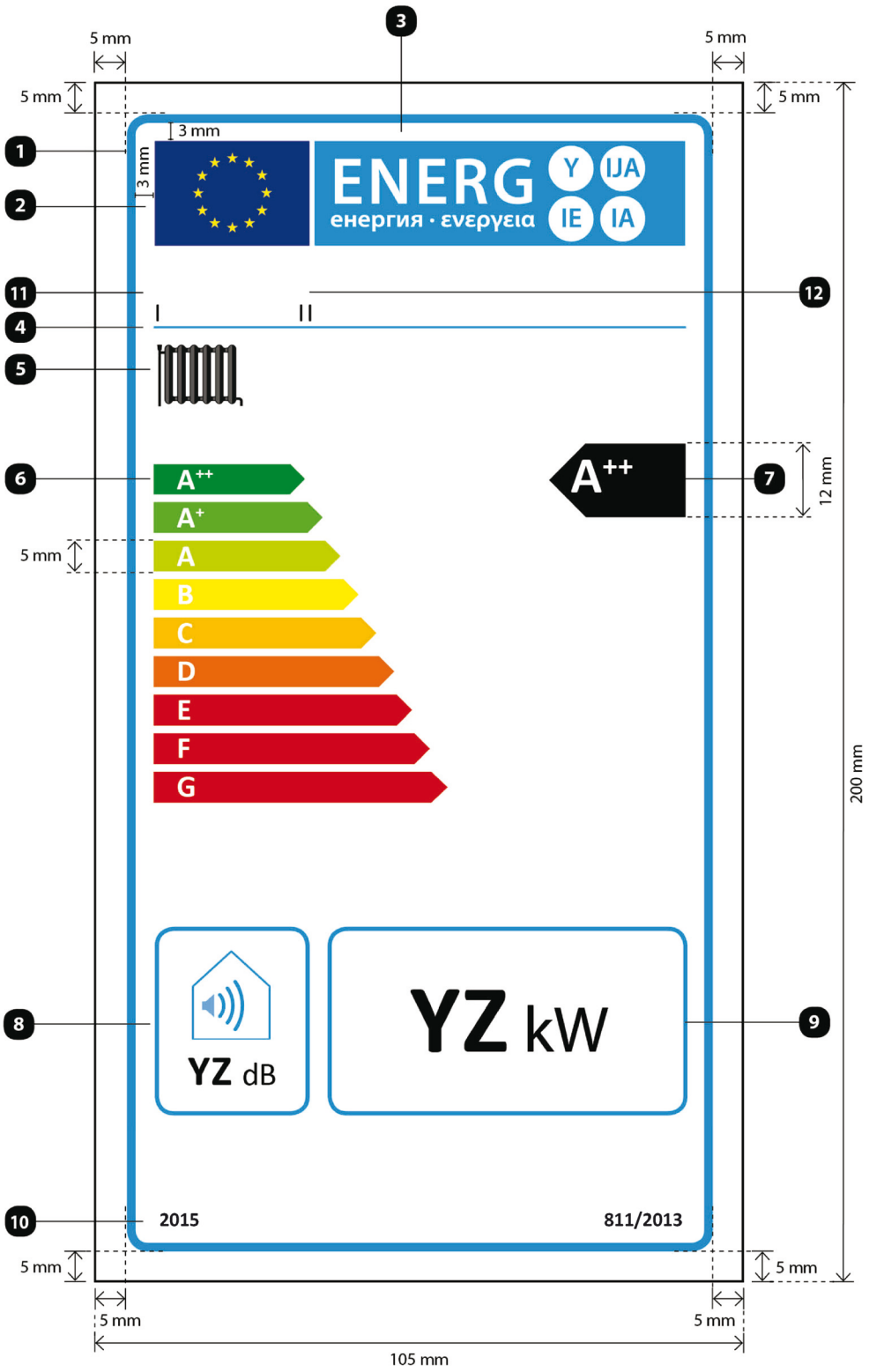
V. indication of whether a solar collector, hot water storage tank, temperature control and/or supplementary heater, may be included in the package of combination heater, temperature control and solar device;

VI. the seasonal space heating energy efficiency class of the package of combination heater, temperature control and solar device, determined in accordance with point 6 of Annex IV; the head of the arrow containing the seasonal space heating energy efficiency class of the package of combination heater, temperature control and solar device shall be placed at the same height as the head of the relevant energy efficiency class;

VII. the water heating energy efficiency class of the package of combination heater, temperature control and solar device, determined in accordance with point 6 of Annex IV; the head of the arrow containing the water heating energy efficiency class of the package of combination heater, temperature control and solar device shall be placed at the same height as the head of the relevant energy efficiency class.

(b) The design aspects of the label for packages of combination heater, temperature control and solar device shall be in accordance with point 12 of this Annex. For packages of combination heater, temperature control and solar device in seasonal space heating and/or water heating energy efficiency classes A^{+++} to D, the last classes E to G in the A^{+++} to G scale may be omitted.

5. The design of the label for boiler space heaters shall be the following:



Whereby:

(a) The label shall be at least 105 mm wide and 200 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 4 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 86 mm, height: 17 mm.

❹ **Sub-logos border:** 1 pt, colour: cyan 100 %, length: 86 mm.

❺ **Space heating function:**

— **Pictogram** as depicted.

❻ **A^{++}-G and A^{+++}-D scales, respectively:**

— **Arrow:** height: 5 mm, gap: 1,3 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Seventh class: 00-X-X-00,

Eighth class: 00-X-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 14 pt, capitals, white, '+' symbols: superscript, aligned on a single row;

— **Arrow:** height: 7 mm, gap: 1 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 16 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❼ **Seasonal space heating energy efficiency class:**

— **Arrow:** width: 22 mm, height: 12 mm, 100 % black,

— **Text:** Calibri bold 24 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❽ **Sound power level, indoors**:

— **Pictogram** as depicted,

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Value 'YZ':** Calibri bold 20 pt, 100 % black,

— **Text 'dB':** Calibri regular 15 pt, 100 % black.

❾ **Rated heat output:**

— **Border:** 2 pt – colour: cyan 100 % – round corners: 3,5 mm,

— **Value 'YZ':** Calibri bold 45 pt, 100 % black,

— **Text 'kW':** Calibri regular 30 pt, 100 % black.

❿ **Year of label introduction and number of Regulation:**

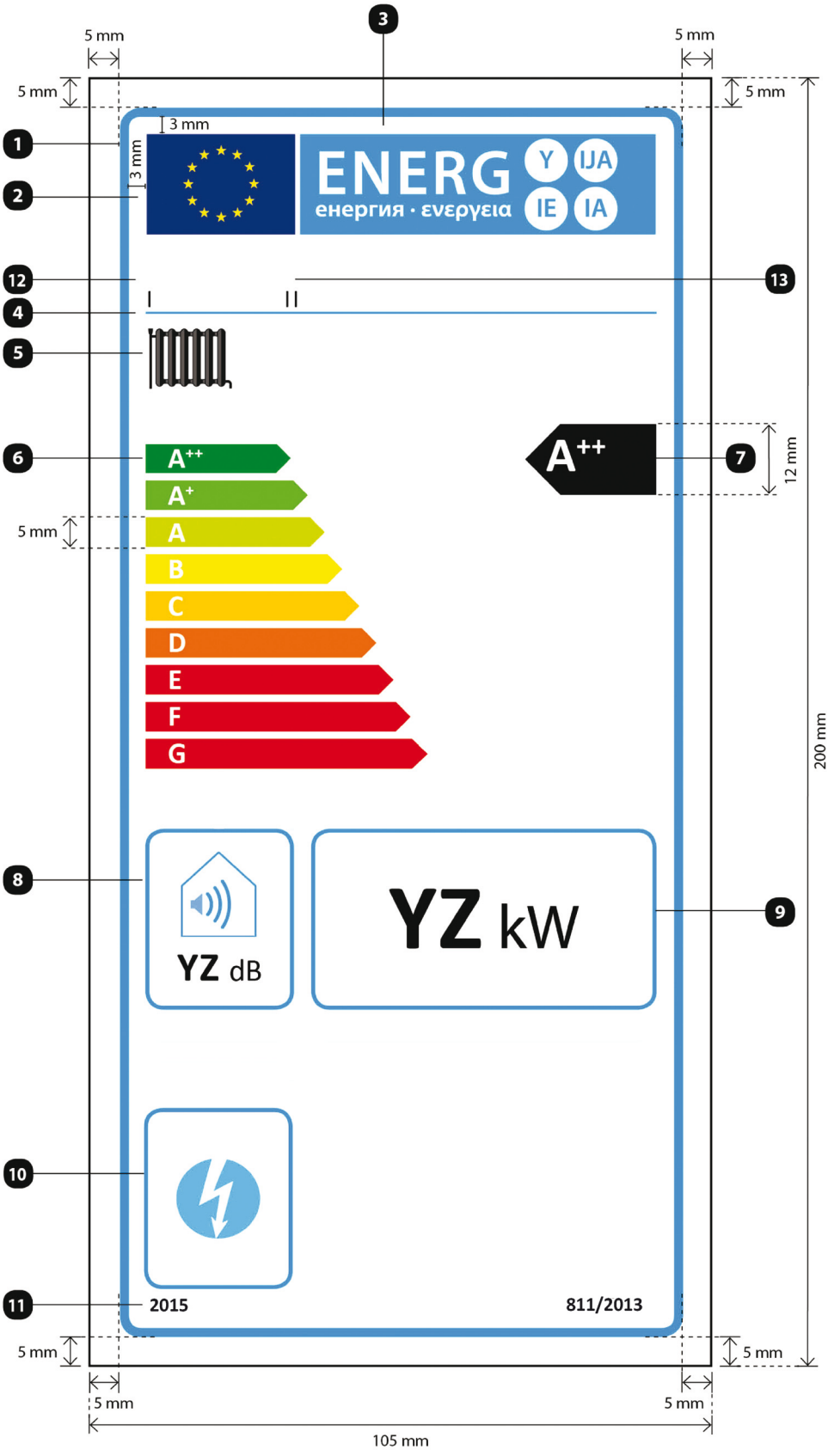
— **Text:** Calibri bold 10 pt.

⓫ **Supplier's name or trademark.**

⓬ **Supplier's model identifier:**

The supplier's name or trade mark and model identifier shall fit in a space of 86 × 12 mm.

6. The design of the label for cogeneration space heaters shall be the following:



Whereby:

(a) The label shall be at least 105 mm wide and 200 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 4 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 86 mm, height: 17 mm.

❹ **Sub-logos border:** 1 pt, colour: cyan 100 %, length: 86 mm.

❺ **Space heating function:**

— **Pictogram** as depicted.

❻ **A^{++}-G and A^{+++}-D scales, respectively:**

— **Arrow:** height: 5 mm, gap: 1,3 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Seventh class: 00-X-X-00,

Eighth class: 00-X-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 14 pt, capitals, white, '+' symbols: superscript, aligned on a single row;

— **Arrow:** height: 7 mm, gap: 1 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 16 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❼ **Seasonal space heating energy efficiency class:**

— **Arrow:** width: 22 mm, height: 12 mm, 100 % black,

— **Text:** Calibri bold 24 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❽ **Sound power level, indoors:**

— **Pictogram** as depicted,

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Value 'YZ':** Calibri bold 20 pt, 100 % black,

— **Text 'dB':** Calibri regular 15 pt, 100 % black.

❾ **Rated heat output:**

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Value 'YZ':** Calibri bold 45 pt, 100 % black,

— **Text 'kW':** Calibri regular 30 pt, 100 % black.

❿ **Electricity function:**

— **Pictogram** as depicted,

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm.

⓫ **Year of label introduction and number of Regulation:**

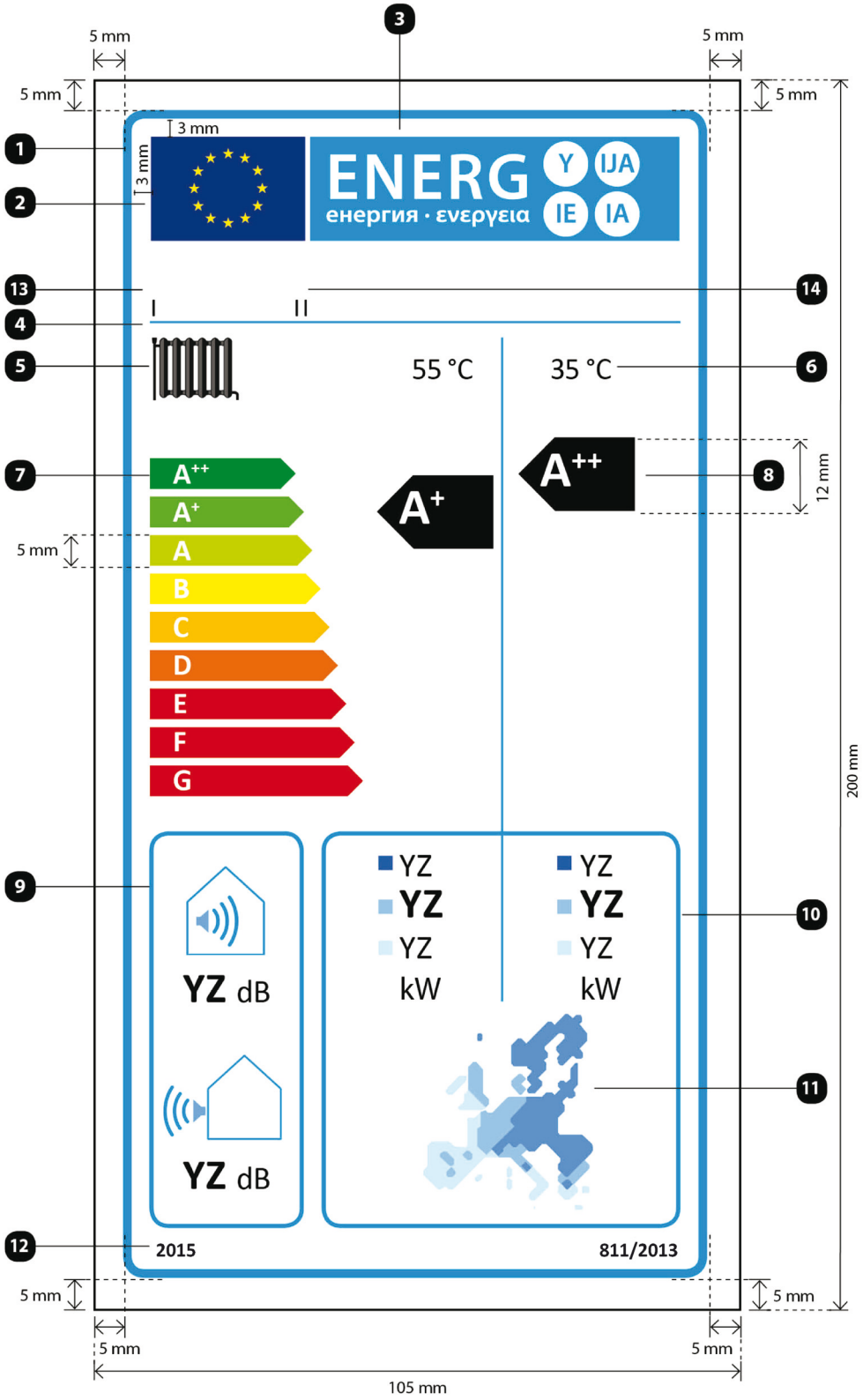
— **Text:** Calibri bold 10 pt.

⓬ **Supplier's name or trademark.**

⓭ **Supplier's model identifier:**

The supplier's name or trade mark and model identifier shall fit in a space of 86 × 12 mm.

7. The design of the label for heat pump space heaters shall be the following:



Whereby:

(a) The label shall be at least 105 mm wide and 200 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 4 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 86 mm, height: 17 mm.

❹ **Sub-logos border:** 1 pt, colour: cyan 100 %, length: 86 mm.

❺ **Space heating function:**

— **Pictogram** as depicted.

❻ **Medium- and low-temperature application:**

— **Text '55 °C' and '35 °C':** Calibri regular 14 pt, 100 % black.

❼ **A^{++}-G and A^{+++}-D scales, respectively:**

— **Arrow:** height: 5 mm, gap: 1,3 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Seventh class: 00-X-X-00,

Eighth class: 00-X-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 14 pt, capitals, white, '+' symbols: superscript, aligned on a single row;

— **Arrow:** height: 7 mm, gap: 1 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 16 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❽ **Seasonal space heating energy efficiency class:**

— **Arrow:** width: 19 mm, height: 12 mm, 100 % black,

— **Text:** Calibri bold 24 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❾ **Sound power level, indoors (if applicable) and outdoors:**

— **Pictogram** as depicted,

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Value 'YZ':** Calibri bold 20 pt, 100 % black,

— **Text 'dB':** Calibri regular 15 pt, 100 % black.

❿ **Rated heat output:**

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Values 'YZ':** Calibri at least 15 pt, 100 % black,

— **Text 'kW':** Calibri regular 15 pt, 100 % black.

⓫ **European temperature map and colour squares:**

— **Pictogram** as depicted,

— Colours:

Dark blue: 86-51-00-00,

Middle blue: 53-08-00-00,

Light blue: 25-00-02-00.

⓬ **Year of label introduction and number of Regulation:**

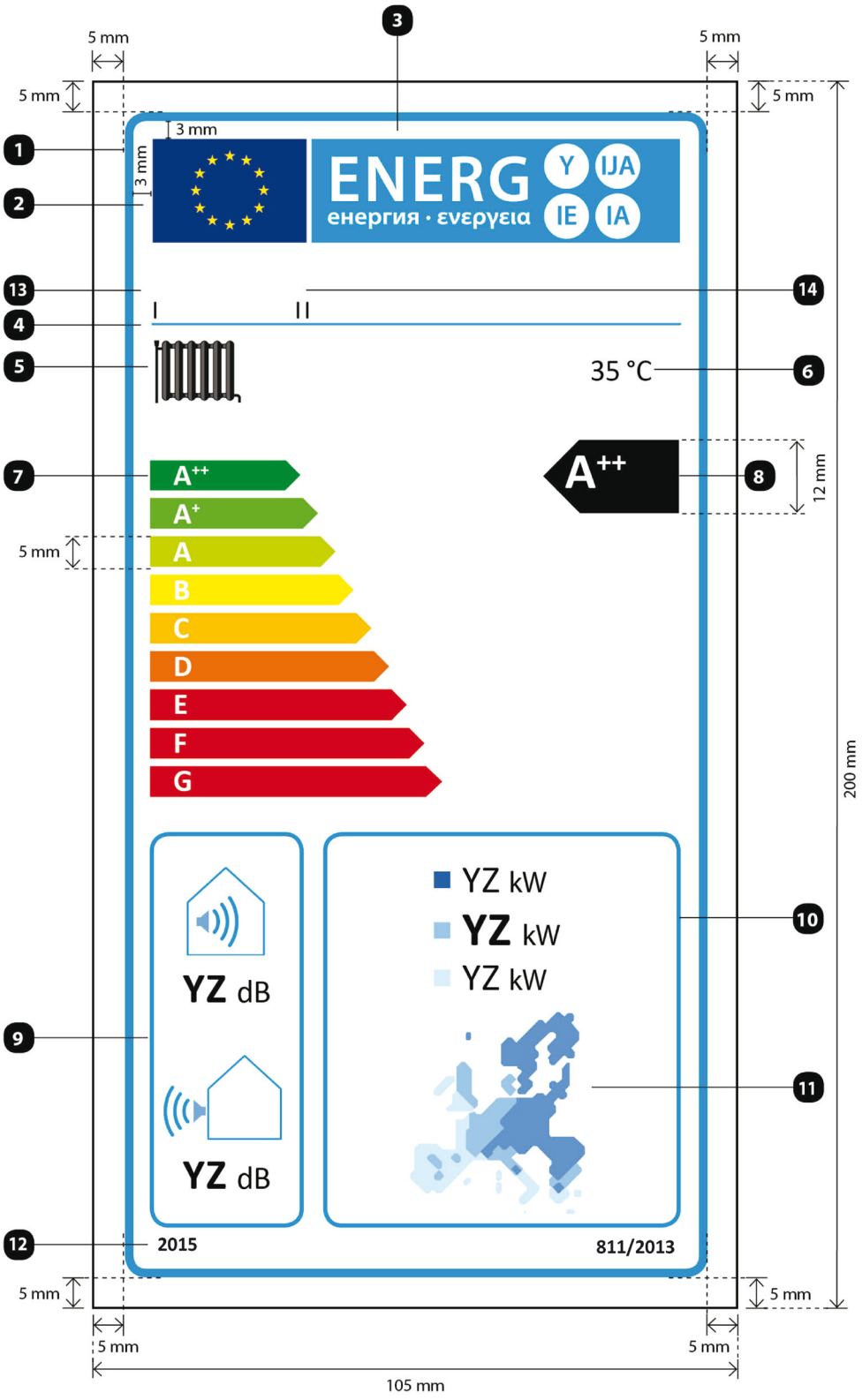
— **Text:** Calibri bold 10 pt.

⓭ **Supplier's name or trademark.**

⓮ **Supplier's model identifier:**

The supplier's name or trade mark and model identifier shall fit in a space of 86 × 12 mm.

8. The design of the label for low-temperature heat pumps shall be the following:



Whereby:

(a) The label shall be at least 105 mm wide and 200 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 4 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 86 mm, height: 17 mm.

❹ **Sub-logos border:** 1 pt, colour: cyan 100 %, length: 86 mm.

❺ **Space heating function:**

— **Pictogram** as depicted.

❻ **Low-temperature application:**

Text '35 °C': Calibri regular 14 pt, 100 % black.

❼ **A^{++}-G and A^{+++}-D scales, respectively:**

— **Arrow:** height: 5 mm, gap: 1,3 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Seventh class: 00-X-X-00,

Eighth class: 00-X-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 14 pt, capitals, white, '+' symbols: superscript, aligned on a single row;

— **Arrow:** height: 7 mm, gap: 1 mm – colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 16 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❽ **Seasonal space heating energy efficiency class:**

— **Arrow:** width: 22 mm, height: 12 mm, 100 % black,

— **Text:** Calibri bold 24 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❾ **Sound power level, indoors (if applicable) and outdoors:**

— **Pictogram** as depicted,

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Value 'YZ':** Calibri bold 20 pt, 100 % black,

— **Text 'dB':** Calibri regular 15 pt, 100 % black.

❿ **Rated heat output:**

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Values 'YZ':** Calibri at least 18 pt, 100 % black,

— **Text 'kW':** Calibri regular 13,5 pt, 100 % black.

⓫ **European temperature map and colour squares:**

— **Pictogram** as depicted,

Colours:

Dark blue: 86-51-00-00,

Middle blue: 53-08-00-00,

Light blue: 25-00-02-00.

⓬ **Year of label introduction and number of Regulation:**

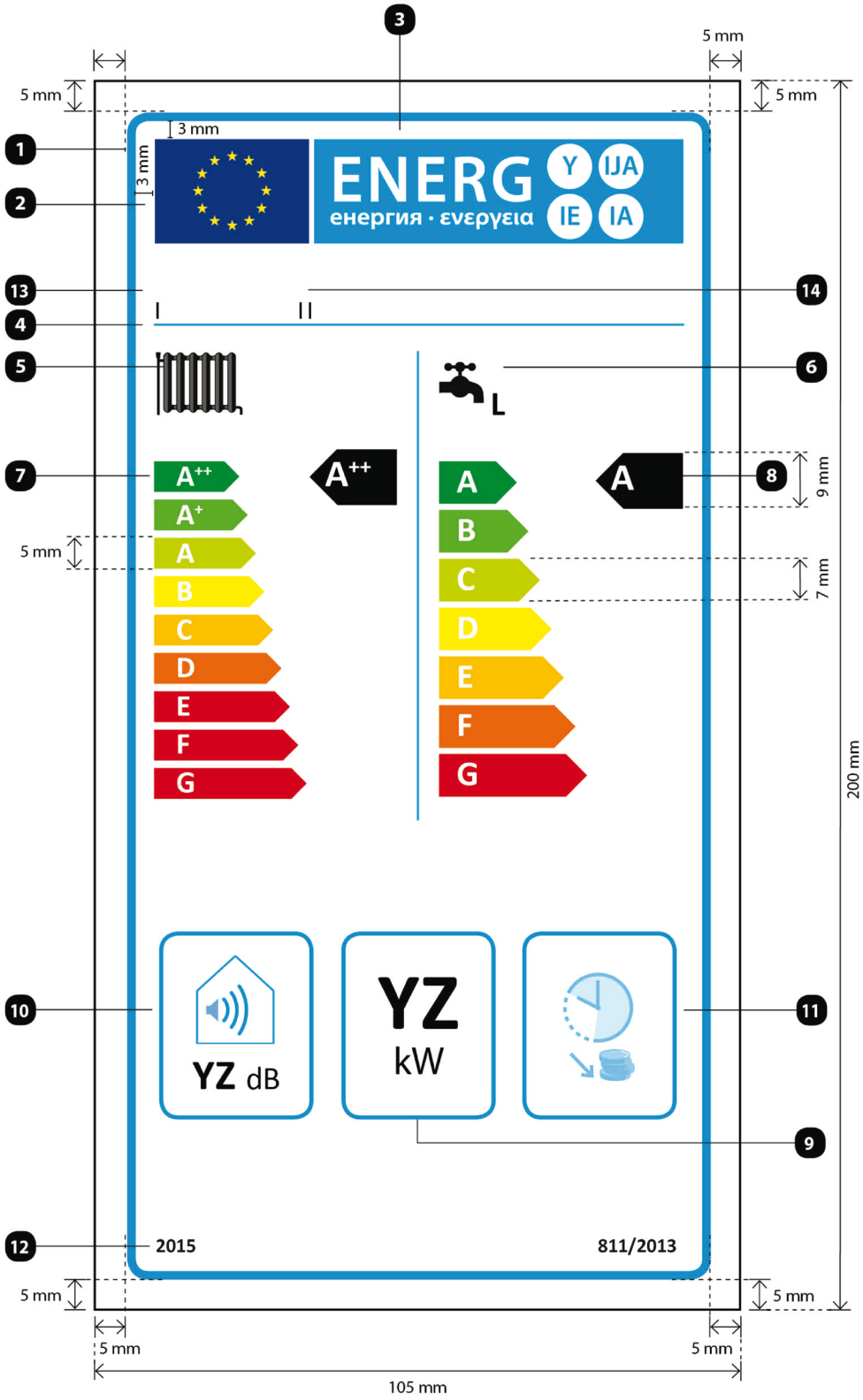
— **Text:** Calibri bold 10 pt.

⓭ **Supplier's name or trademark.**

⓮ **Supplier's model identifier:**

The supplier's name or trade mark and model identifier shall fit in a space of 86 × 12 mm.

9. The design of the label for boiler combination heaters shall be the following:



Whereby:

(a) The label shall be at least 105 mm wide and 200 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 4 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 86 mm, height: 17 mm.

❹ **Sub-logos border:** 1 pt, colour: cyan 100 %, length: 86 mm.

❺ **Space heating function:**

— **Pictogram** as depicted.

❻ **Water heating function:**

— **Pictogram** as depicted, including the declared load profile expressed as the appropriate letter in accordance with Table 15 of Annex VII: Calibri bold 16 pt, 100 % black.

❼ **A^{++}-G and A-G, A^{+++}-D or A^{+}-F scales, respectively:**

— **Arrow:** height: 5 mm, gap: 1,3 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Seventh class: 00-X-X-00,

Eighth class: 00-X-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 14 pt, capitals, white, '+' symbols: superscript, aligned on a single row;

— **Arrow:** height: 7 mm, gap: 1 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 16 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❽ **Seasonal space heating and water heating energy efficiency classes:**

— **Arrow:** width: 14 mm, height: 9 mm, 100 % black,

— **Text:** Calibri bold 18 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❾ **Rated heat output:**

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Value 'YZ':** Calibri bold 37,5 pt, 100 % black,

— **Text 'kW':** Calibri regular 18 pt, 100 % black.

❿ **Sound power level, indoors:**

— **Pictogram** as depicted,

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Value 'YZ':** Calibri bold 20 pt, 100 % black,

— **Text 'dB':** Calibri regular 15 pt, 100 % black.

⓫ **If applicable, off-peak fitness:**

— **Pictogram** as depicted,

— **Border:** 2 pt – colour: cyan 100 % – round corners: 3,5 mm.

⓬ **Year of label introduction and number of Regulation:**

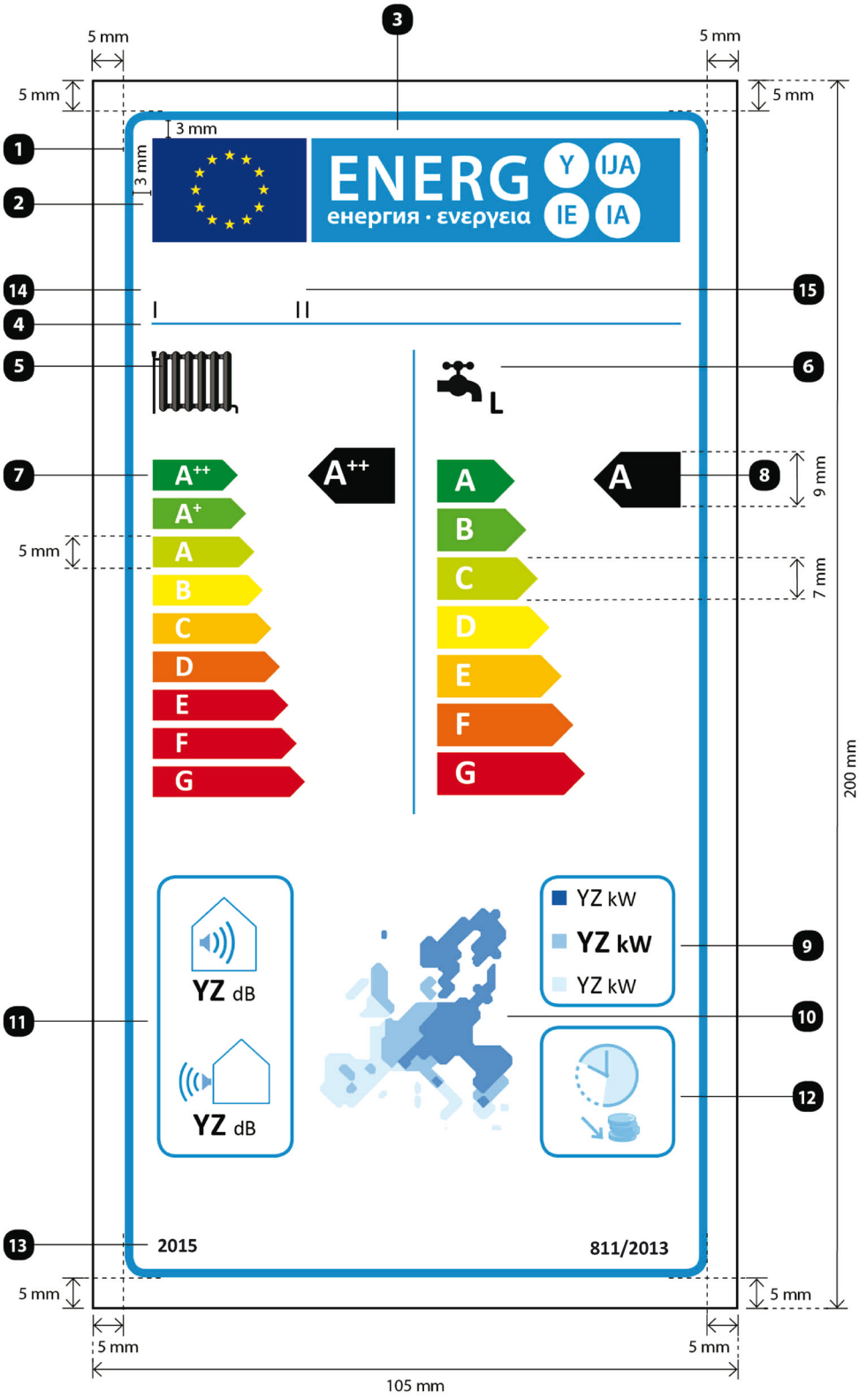
— **Text:** Calibri bold 10 pt.

⓭ **Supplier's name or trademark.**

⓮ **Supplier's model identifier:**

The supplier's name or trade mark and model identifier shall fit in a space of 86 × 12 mm.

10. The design of the label for heat pump combination heaters shall be the following:



Whereby:

(a) The label shall be at least 105 mm wide and 200 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 4 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 86 mm, height: 17 mm.

❹ **Sub-logos border:** 1 pt, colour: cyan 100 %, length: 86 mm.

❺ **Space heating function**:

— **Pictogram** as depicted.

❻ **Water heating function:**

— **Pictogram** as depicted, including the declared load profile expressed as the appropriate letter in accordance with Table 15 of Annex VII: Calibri bold 16 pt, 100 % black.

❼ **A^{++}-G and A-G, A^{+++}-D or A^{+}-F scales, respectively:**

— **Arrow:** height: 5 mm, gap: 1,3 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Seventh class: 00-X-X-00,

Eighth class: 00-X-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 14 pt, capitals, white, '+' symbols: superscript, aligned on a single row;

— **Arrow**: height: 7 mm, gap: 1 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 16 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❽ **Seasonal space heating and water heating energy efficiency classes:**

— **Arrow:** width: 14 mm, height: 9 mm, 100 % black,

— **Text:** Calibri bold 18 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❾ **Rated heat output:**

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Values 'YZ':** Calibri at least 12 pt, 100 % black,

— **Text 'kW':** Calibri regular 10 pt, 100 % black.

❿ **European temperature map and colour squares:**

— **Pictogram** as depicted,

— Colours:

Dark blue: 86-51-00-00,

Middle blue: 53-08-00-00,

Light blue: 25-00-02-00.

⓫ **Sound power level, indoors (if applicable) and outdoors:**

— **Pictogram** as depicted,

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Value 'YZ':** Calibri bold 15 pt, 100 % black,

— **Text 'dB':** Calibri regular 10 pt, 100 % black.

⓬ **If applicable, off-peak fitness:**

— **Pictogram** as depicted,

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm.

⓭ **Year of label introduction and number of Regulation:**

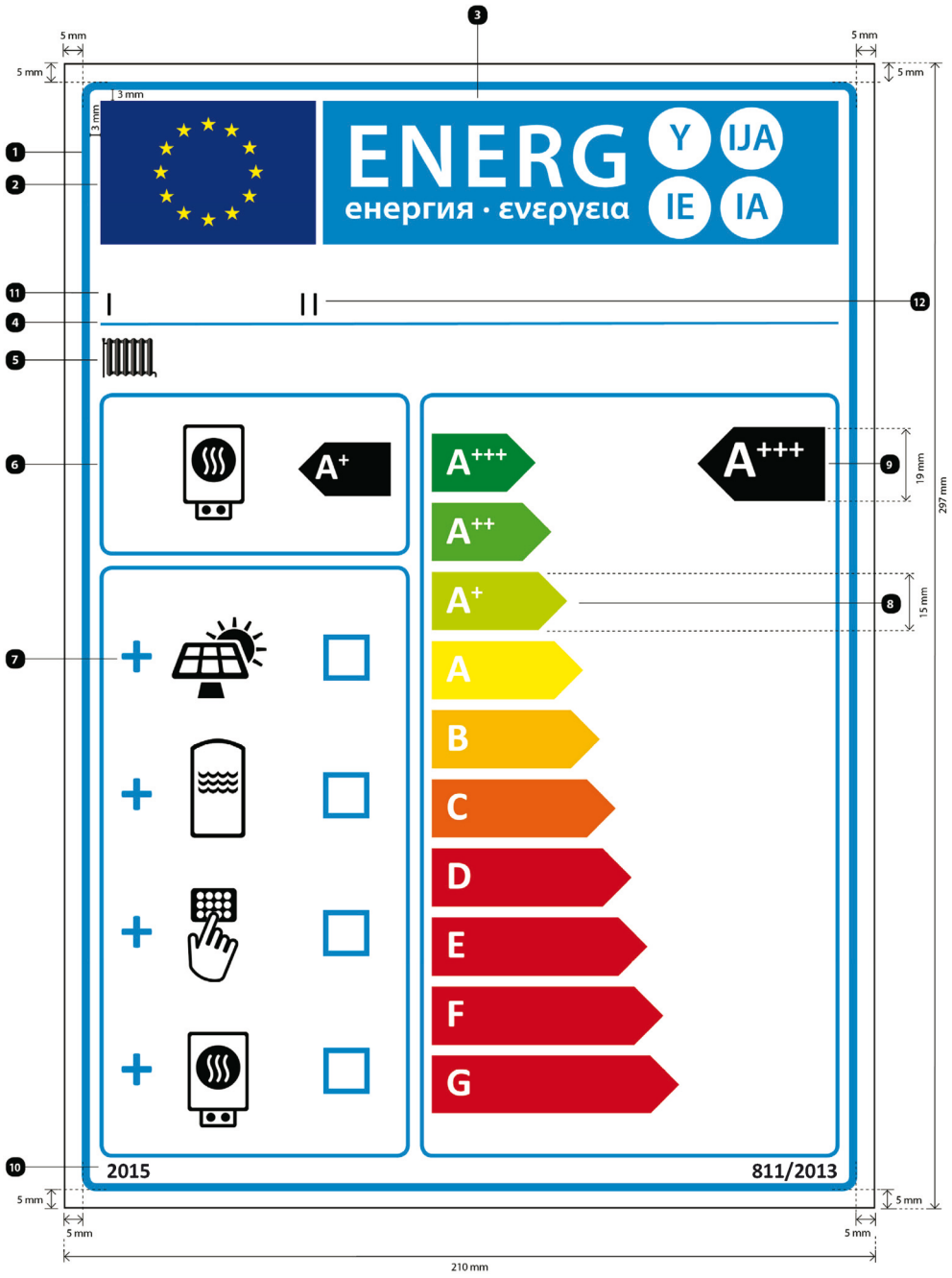
— **Text:** Calibri bold 10 pt.

⓮ **Supplier's name or trademark.**

⓯ **Supplier's model identifier:**

The supplier's name or trade mark and model identifier shall fit in a space of 86 × 12 mm.

11. The design of the label for packages of space heater, temperature control and solar device shall be the following:



Whereby:

(a) The label shall be at least 210 mm wide and 297 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 6 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 191 mm, height: 37 mm.

❹ **Sub-logos border:** 2 pt, colour: cyan 100 %, length: 191 mm.

❺ **Space heating function:**

— **Pictogram** as depicted.

❻ **Space heater:**

— **Pictogram** as depicted,

— Seasonal space heating energy efficiency class of space heater:

Arrow: width: 24 mm, height: 14 mm, 100 % black;

Text: Calibri bold 28 pt, capitals, white, '+' symbols: superscript, aligned on a single row,

— **Border:** 3 pt, colour: cyan 100 %, round corners: 3,5 mm.

❼ **Package with solar collector, hot water storage tank, temperature control and/or supplementary heater:**

— **Pictograms** as depicted,

— **'+' symbol:** Calibri bold 50 pt, cyan 100 %,

— **Boxes:** width: 12 mm, height: 12 mm, border: 4 pt, cyan 100 %,

— **Border:** 3 pt, colour: cyan 100 %, round corners: 3,5 mm.

❽ **A^{+++}-G scale with border:**

— **Arrow:** height: 15 mm, gap: 3 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Seventh class: 00-X-X-00,

If applicable, last classes: 00-X-X-00,

— **Text:** Calibri bold 30 pt, capitals, white, '+' symbols: superscript, aligned on a single row,

— **Border:** 3 pt, colour: cyan 100 %, round corners: 3,5 mm.

❾ **Seasonal space heating energy efficiency class for package of space heater, temperature control and solar device:**

— **Arrow:** width: 33 mm, height: 19 mm, 100 % black,

— **Text:** Calibri bold 40 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❿ **Year of label introduction and number of Regulation:**

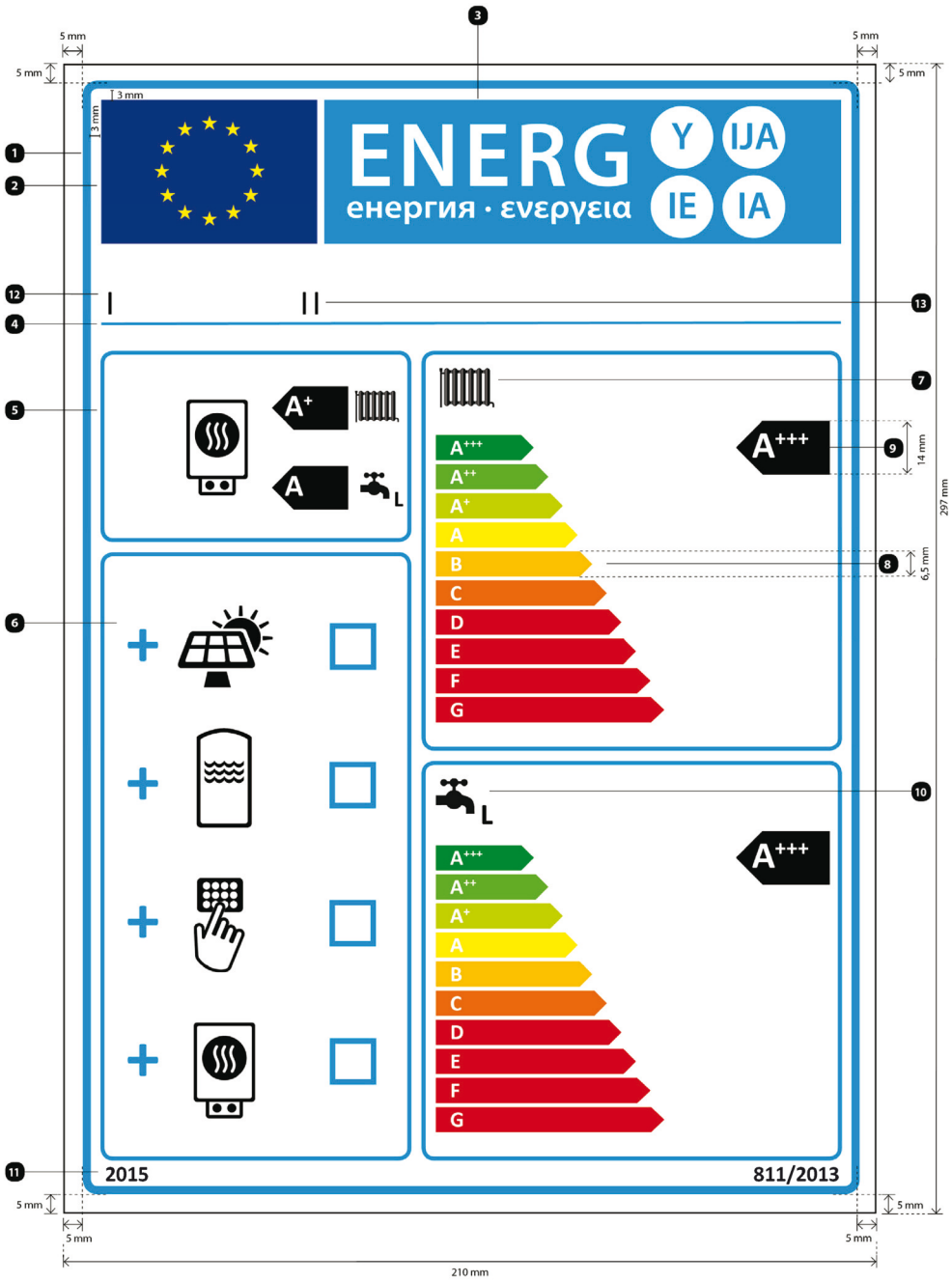
— **Text:** Calibri bold 12 pt.

⓫ **Dealer's and/or supplier's name or trademark.**

⓬ **Dealer's and/or supplier's model identifier:**

The dealer's and/or supplier's name or trade mark and model identifier shall fit in a space of 191 × 19 mm.

12. The design of the label for packages of combination heater, temperature control and solar device shall be the following:



Whereby:

(a) The label shall be at least 210 mm wide and 297 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 6 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 191 mm, height: 37 mm.

❹ **Sub-logos border:** 2 pt, colour: cyan 100 %, length: 191 mm.

❺ **Combination heater:**

— **Pictograms** as depicted; for water heating function, including the declared load profile expressed as the appropriate letter in accordance with Table 15 of Annex VII: Calibri bold 16 pt, 100 % black.

— Seasonal space heating and water heating energy efficiency class of combination heater:

Arrow: width: 19 mm, height: 11 mm, 100 % black,

Text: Calibri bold 23 pt, capitals, white, '+' symbols: superscript, aligned on a single row,

— **Border:** 3 pt, colour: cyan 100 %, round corners: 3,5 mm.

❻ **Package with solar collector, hot water storage tank, temperature control and/or supplementary heater:**

— **Pictograms** as depicted,

— **'+' symbol:** Calibri bold 50 pt, cyan 100 %,

— **Boxes:** width: 12 mm, height: 12 mm, border: 4 pt, cyan 100 %,

— **Border:** 3 pt, colour: cyan 100 %, round corners: 3,5 mm.

❼ **Space heating function:**

— **Pictogram** as depicted.

❽ **A^{+++}-G scale with border:**

— **Arrow:** height: 6,5 mm, gap: 1 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Seventh class: 00-X-X-00,

If applicable, last classes: 00-X-X-00,

— **Text:** Calibri bold 16 pt, capitals, white, '+' symbols: superscript, aligned on a single row,

— **Border:** 3 pt, colour: cyan 100 %, round corners: 3,5 mm.

❾ **Seasonal space heating and water heating energy efficiency class, respectively, for package of combination heater, temperature control and solar device:**

— **Arrow:** width: 24 mm, height: 14 mm, 100 % black,

— **Text:** Calibri bold 28 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❿ **Water heating function:**

— **Pictogram** as depicted, including the declared load profile expressed as the appropriate letter in accordance with Table 15 of Annex VII: Calibri bold 22 pt, 100 % black.

⓫ **Year of label introduction and number of Regulation:**

— **Text:** Calibri bold 12 pt.

⓬ **Dealer's and/or supplier's name or trademark.**

⓭ **Dealer's and/or supplier's model identifier:**

The dealer's and/or supplier's name or trade mark and model identifier shall fit in a space of 191 × 19 mm.

ANNEX IV

Product fiche

1. SPACE HEATERS

1.1. The information in the product fiche of the space heater shall be provided in the following order and shall be included in the product brochure or other literature provided with the product:

(a) supplier's name or trademark;

(b) supplier's model identifier;

(c) the seasonal space heating energy efficiency class of the model, determined in accordance with point 1 of Annex II;

(d) the rated heat output, including the rated heat output of any supplementary heater, in kW, rounded to the nearest integer (for heat pump space heaters under average climate conditions);

(e) the seasonal space heating energy efficiency in %, rounded to the nearest integer and calculated in accordance with points 3 and 4 of Annex VII (for heat pump space heaters under average climate conditions);

(f) the annual energy consumption in kWh in terms of final energy and/or in GJ in terms of *GCV*, rounded to the nearest integer and calculated in accordance with points 3 and 4 of Annex VII (for heat pump space heaters under average climate conditions);

(g) the sound power level L_{WA}, indoors, in dB, rounded to the nearest integer (for heat pump space heaters if applicable);

(h) any specific precautions that shall be taken when the space heater is assembled, installed or maintained;

in addition, for cogeneration space heaters:

(i) the electrical efficiency in %, rounded to the nearest integer;

in addition, for heat pump space heaters:

(j) the rated heat output, including the rated heat output of any supplementary heater, in kW, under colder and warmer climate conditions, rounded to the nearest integer;

(k) the seasonal space heating energy efficiency in %, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VII;

(l) the annual energy consumption in kWh in terms of final energy and/or in GJ in terms of *GCV*, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VII;

(m) the sound power level L_{WA}, outdoors, in dB, rounded to the nearest integer.

1.2. One fiche may cover a number of space heater models supplied by the same supplier.

1.3. The information contained in the fiche may be given in the form of a copy of the label, either in colour or in black and white. Where this is the case, the information listed in point 1.1 not already displayed on the label shall also be provided.

2. COMBINATION HEATERS

2.1. The information in the product fiche of the combination heater shall be provided in the following order and shall be included in the product brochure or other literature provided with the product:

(a) supplier's name or trademark;

(b) supplier's model identifier;

(c) for space heating, the medium-temperature application (and for heat pump combination heaters the low-temperature application, if applicable); for water heating, the declared load profile, expressed as the appropriate letter and typical usage in accordance with Table 15 of Annex VII;

(d) the seasonal space heating energy efficiency class and the water heating energy efficiency class of the model, determined in accordance with points 1 and 2 of Annex II;

(e) the rated heat output, including the rated heat output of any supplementary heater, in kW, rounded to the nearest integer (for heat pump combination heaters under average climate conditions);

(f) for space heating, the annual energy consumption in kWh in terms of final energy and/or in GJ in terms of *GCV*, rounded to the nearest integer and calculated in accordance with points 3 and 4 of Annex VII (for heat pump combination heaters under average climate conditions); for water heating, the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, rounded to the nearest integer and calculated in accordance with point 5 of Annex VII (for heat pump combination heaters under average climate conditions);

(g) the seasonal space heating energy efficiency in %, rounded to the nearest integer and calculated in accordance with points 3 and 4 of Annex VII (for heat pump combination heaters under average climate conditions); the water heating energy efficiency in %, rounded to the nearest integer and calculated in accordance with point 5 of Annex VII (for heat pump combination heaters under average climate conditions);

(h) the sound power level L_{WA}, indoors, in dB, rounded to the nearest integer (for heat pump combination heaters if applicable);

(i) if applicable, an indication that the combination heater is able to work only during off-peak hours;

(j) any specific precautions that shall be taken when the combination heater is assembled, installed or maintained;

in addition, for heat pump combination heaters:

(k) the rated heat output, including the rated heat output of any supplementary heater, in kW, under colder and warmer climate conditions, rounded to the nearest integer;

(l) for space heating, the annual energy consumption in kWh in terms of final energy and/or in GJ in terms of *GCV*, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VII; for water heating, the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 5 of Annex VII;

(m) the seasonal space heating energy efficiency in %, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VII; the water heating energy efficiency in %, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 5 of Annex VII;

(n) the sound power level L_{WA}, outdoors, in dB, rounded to the nearest integer.

2.2. One fiche may cover a number of combination heater models supplied by the same supplier.

2.3. The information contained in the fiche may be given in the form of a copy of the label, either in colour or in black and white. Where this is the case, the information listed in point 2.1 not already displayed on the label shall also be provided.

3. TEMPERATURE CONTROLS

3.1. The information in the product fiche of the temperature control shall be provided in the following order and shall be included in the product brochure or other literature provided with the product:

(a) supplier's name or trade mark;

(b) supplier's model identifier;

(c) the class of the temperature control;

(d) the contribution of the temperature control to seasonal space heating energy efficiency in %, rounded to one decimal place.

3.2. One fiche may cover a number of temperature control models supplied by the same supplier.

4. SOLAR DEVICES

4.1. The information in the product fiche of the solar device shall be provided in the following order and shall be included in the product brochure or other literature provided with the product (for pumps in the collector loop if applicable):

(a) supplier's name or trade mark;

(b) supplier's model identifier;

(c) the collector aperture area in m^2, to two decimal places;

(d) the collector efficiency in %, rounded to the nearest integer;

(e) the energy efficiency class of the solar hot water storage tank, determined in accordance with point 3 of Annex II;

(f) the standing loss of the solar hot water storage tank in W, rounded to the nearest integer;

(g) the storage volume of the solar hot water storage tank in litres and m^3;

(h) the annual non-solar heat contribution Q_{nonsol} in kWh in terms of primary energy for electricity and/or in kWh in terms of *GCV* for fuels, for the load profiles M, L, XL and XXL under average climate conditions, rounded to the nearest integer;

(i) the pump power consumption in W, rounded to the nearest integer;

(j) the standby power consumption in W, to two decimal places;

(k) the annual auxiliary electricity consumption Q_{aux} in kWh in terms of final energy, rounded to the nearest integer.

4.2. One fiche may cover a number of solar device models supplied by the same supplier.

5. PACKAGES OF SPACE HEATER, TEMPERATURE CONTROL AND SOLAR DEVICE

The fiche for packages of space heater, temperature control and solar device shall contain the elements set out in Figure 1, Figure 2, Figure 3 and Figure 4, respectively, for evaluating the seasonal space heating energy efficiency of a package of space heater, temperature control and solar device, including the following information:

— I: the value of the seasonal space heating energy efficiency of the preferential space heater, expressed in %;

— II: the factor for weighting the heat output of preferential and supplementary heaters of a package as set out in Tables 5 and 6 of this Annex, respectively;

— III: the value of the mathematical expression: $294/(11 \cdot Prated)$, whereby *Prated* is related to the preferential space heater;

— IV: the value of the mathematical expression $115/(11 \cdot Prated)$, whereby *Prated* is related to the preferential space heater;

in addition, for preferential heat pump space heaters:

— V: the value of the difference between the seasonal space heating energy efficiencies under average and colder climate conditions, expressed in %;

— VI: the value of the difference between the seasonal space heating energy efficiencies under warmer and average climate conditions, expressed in %.

6. PACKAGES OF COMBINATION HEATER, TEMPERATURE CONTROL AND SOLAR DEVICE

The fiche for packages of combination heater, temperature control and solar device shall contain the elements set out in points (a) and (b):

(a) the elements set out in Figure 1 and Figure 3, respectively, for evaluating the seasonal space heating energy efficiency of a package of combination heater, temperature control and solar device, including the following information:

— I: the value of the seasonal space heating energy efficiency of the preferential combination heater, expressed in %;

— II: the factor for weighting the heat output of the preferential and supplementary heaters of a package as set out in Tables 5 and 6 of this Annex, respectively;

— III: the value of the mathematical expression: $294/(11 \cdot Prated)$, whereby *Prated* is related to the preferential combination heater;

— IV: the value of the mathematical expression $115/(11 \cdot Prated)$, whereby *Prated* is related to the preferential combination heater;

in addition, for preferential heat pump combination heaters:

— V: the value of the difference between the seasonal space heating energy efficiencies under average and colder climate conditions, expressed in %;

— VI: the value of the difference between the seasonal space heating energy efficiencies under warmer and average climate conditions, expressed in %;

(b) the elements set out in Figure 5 for evaluating the water heating energy efficiency of a package of combination heater, temperature control and solar device, where the following information shall be included:

— I: the value of the water heating energy efficiency of the combination heater, expressed in %;

— II: the value of the mathematical expression $(220 \cdot Q_{ref})/Q_{nonsol}$, where Q_{ref} is taken from Table 15 in Annex VII and Q_{nonsol} from the product fiche of the solar device for the declared load profile M, L, XL or XXL of the combination heater;

— III: the value of the mathematical expression $(Q_{aux} \cdot 2{,}5)/(220 \cdot Q_{ref})$, expressed in %, where Q_{aux} is taken from the product fiche of the solar device and Q_{ref} from Table 15 in Annex VII for the declared load profile M, L, XL or XXL.

Table 5

For the purposes of Figure 1 of this Annex, weighting of preferential boiler space heater or boiler combination heater and supplementary heater (*)

Psup/(*Prated* + *Psup*) (**)	II, package without hot water storage tank	II, package with hot water storage tank
0	0	0
0,1	0,30	0,37
0,2	0,55	0,70
0,3	0,75	0,85
0,4	0,85	0,94
0,5	0,95	0,98
0,6	0,98	1,00
≥ 0,7	1,00	1,00

(*) The intermediate values are calculated by linear interpolation between the two adjacent values.
(**) *Prated* is related to the preferential space heater or combination heater.

Table 6

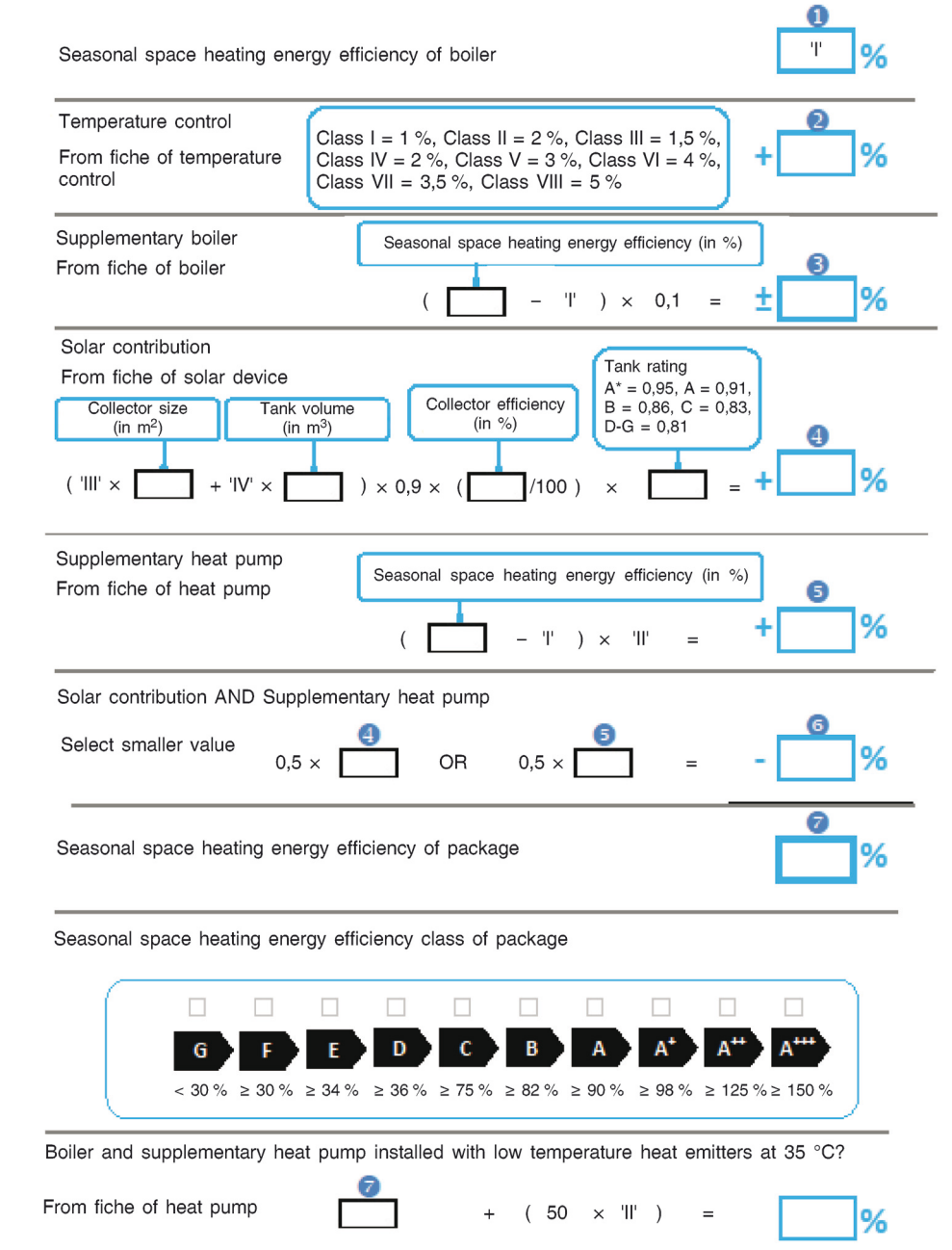
For the purposes of Figures 2 to 4 of this Annex, weighting of preferential cogeneration space heater, heat pump space heater, heat pump combination heater or low-temperature heat pump and supplementary heater (*)

Prated/(*Prated* + *Psup*) (**)	II, package without hot water storage tank	II, package with hot water storage tank
0	1,00	1,00
0,1	0,70	0,63
0,2	0,45	0,30
0,3	0,25	0,15
0,4	0,15	0,06
0,5	0,05	0,02
0,6	0,02	0
≥ 0,7	0	0

(*) The intermediate values are calculated by linear interpolation between the two adjacent values.
(**) *Prated* is related to the preferential space heater or combination heater.

Figure 1

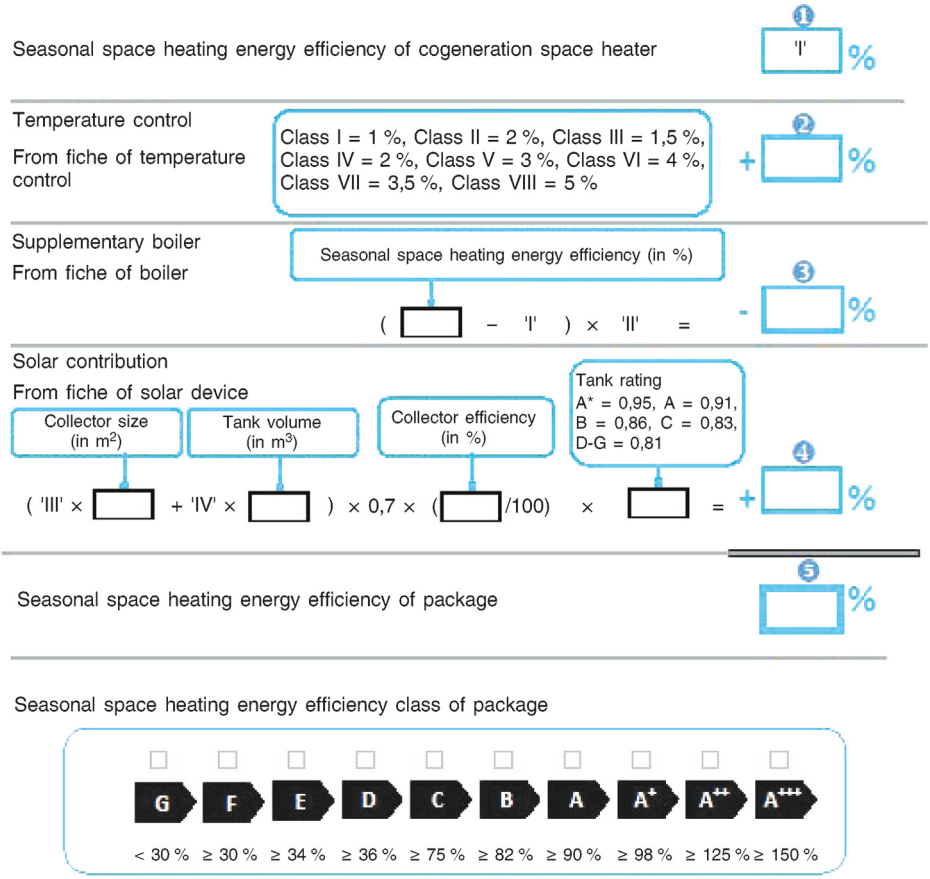
For preferential boiler space heaters and preferential boiler combination heaters, element of the fiche for a package of space heater, temperature control and solar device and a package of combination heater, temperature control and solar device, respectively, indicating the seasonal space heating energy efficiency of the package offered



The energy efficiency of the package of products provided for in this fiche may not correspond to its actual energy efficiency once installed in a building, as the efficiency is influenced by further factors such as heat loss in the distribution system and the dimensioning of the products in relation to building size and characteristics.

Figure 2

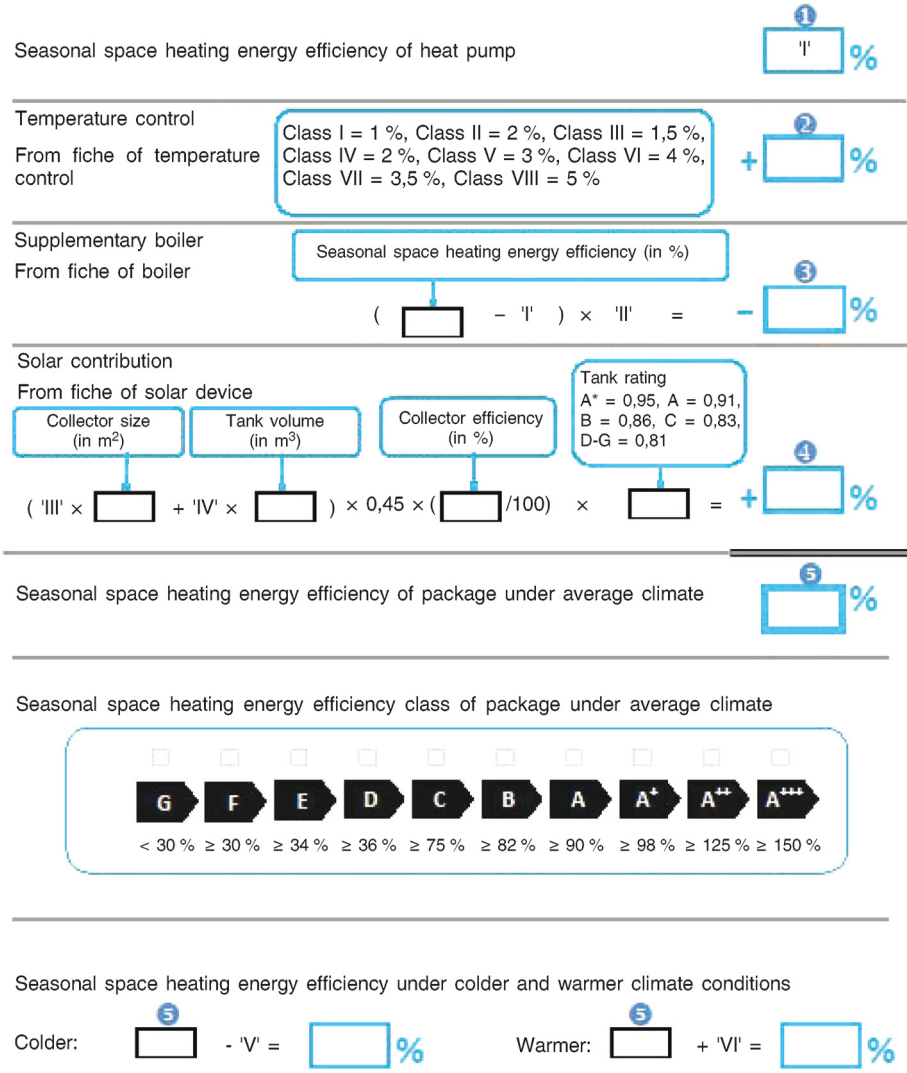
For preferential cogeneration space heaters, element of the fiche for a package of space heater, temperature control and solar device indicating the seasonal space heating energy efficiency of the package offered



The energy efficiency of the package of products provided for in this fiche may not correspond to its actual energy efficiency once installed in a building, as the efficiency is influenced by further factors such as heat loss in the distribution system and the dimensioning of the products in relation to building size and characteristics.

Figure 3

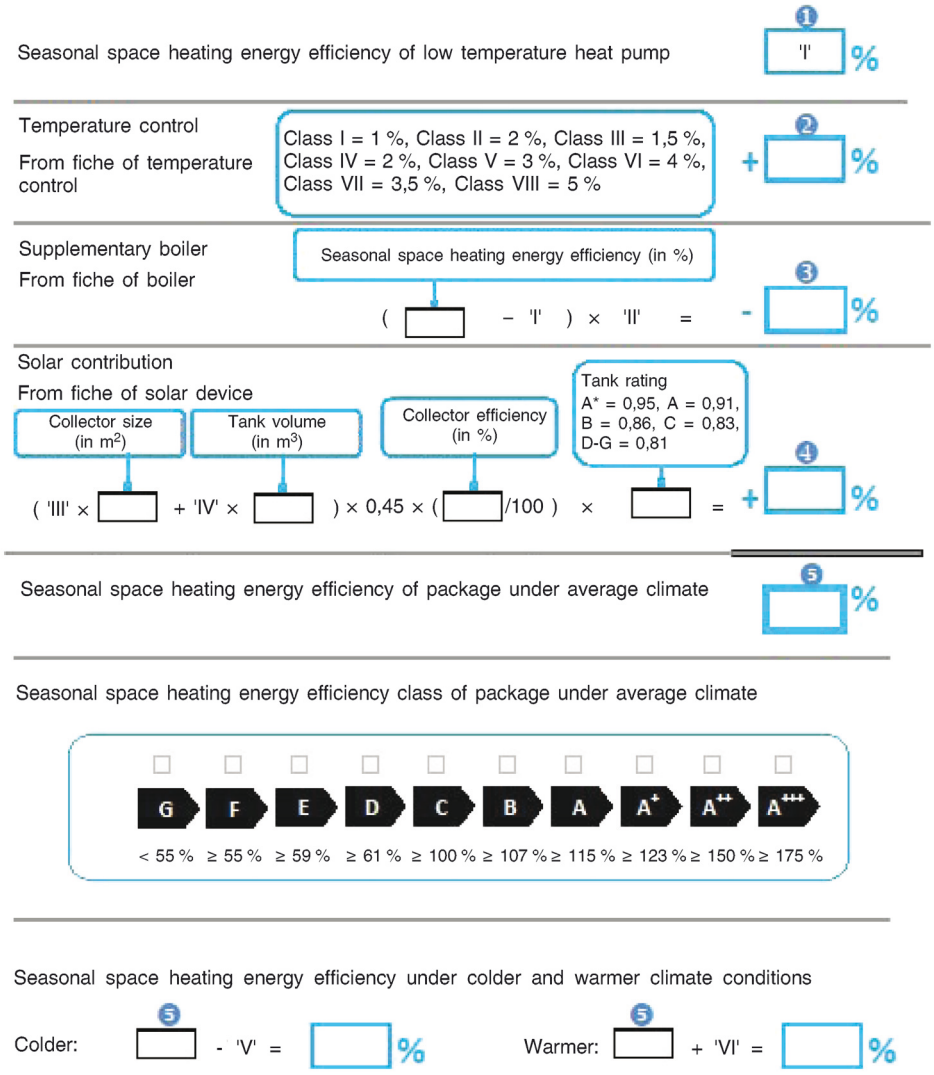
For preferential heat pump space heaters and preferential heat pump combination heaters, element of the fiche for a package of space heater, temperature control and solar device and a package of combination heater, temperature control and solar device, respectively, indicating the seasonal space heating energy efficiency of the package offered



The energy efficiency of the package of products provided for in this fiche may not correspond to its actual energy efficiency once installed in a building, as the efficiency is influenced by further factors such as heat loss in the distribution system and the dimensioning of the products in relation to building size and characteristics.

Figure 4

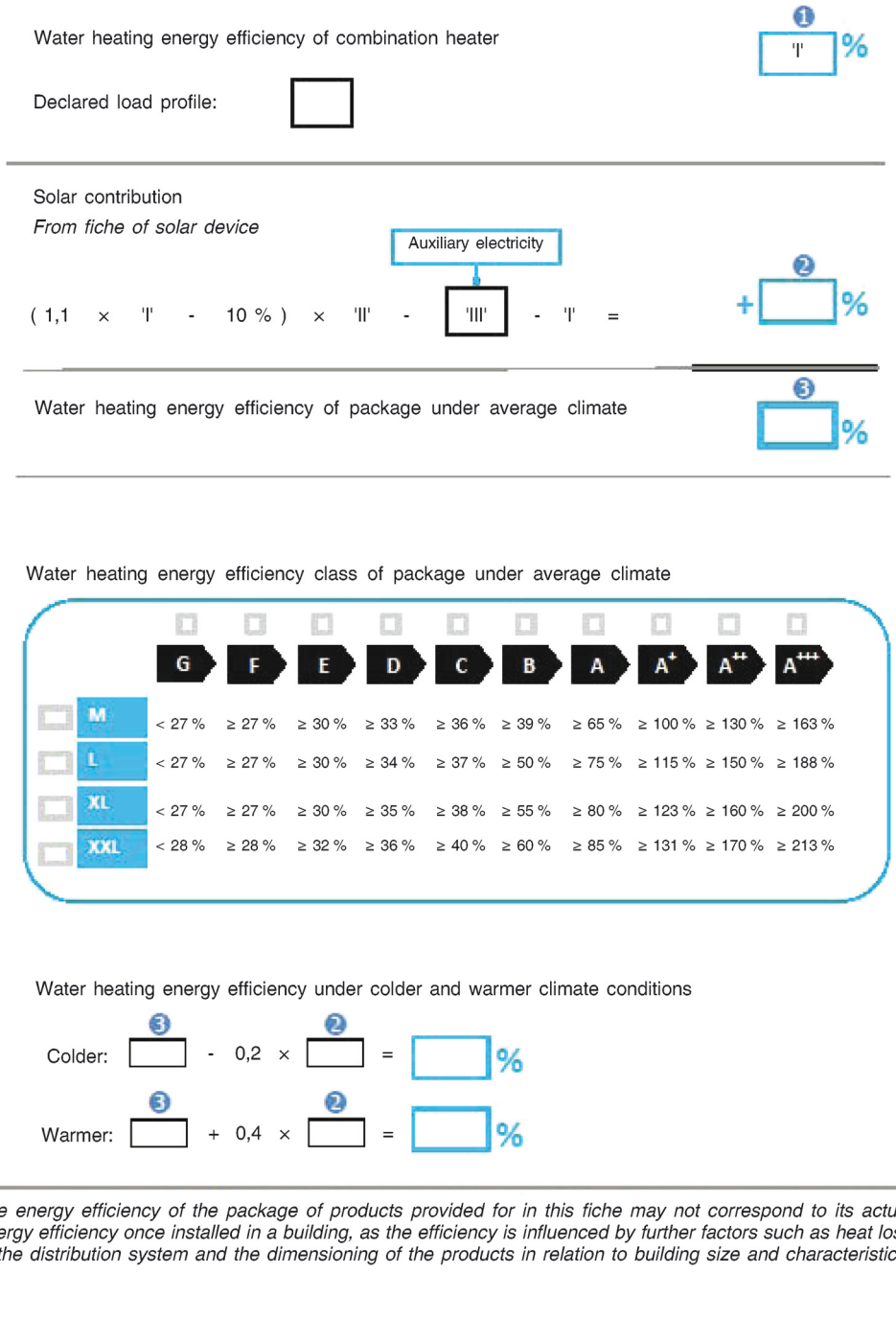
For preferential low-temperature heat pumps, element of the fiche for a package of space heater, temperature control and solar device indicating the seasonal space heating energy efficiency of the package offered



The energy efficiency of the package of products provided for in this fiche may not correspond to its actual energy efficiency once installed in a building, as the efficiency is influenced by further factors such as heat loss in the distribution system and the dimensioning of the products in relation to building size and characteristics.

Figure 5

For preferential boiler combination heaters and preferential heat pump combination heaters, element of the fiche for a package of combination heater, temperature control and solar device indicating the water heating energy efficiency of the package offered



The energy efficiency of the package of products provided for in this fiche may not correspond to its actual energy efficiency once installed in a building, as the efficiency is influenced by further factors such as heat loss in the distribution system and the dimensioning of the products in relation to building size and characteristics.

ANNEX V

Technical documentation

1. SPACE HEATERS

For space heaters, the technical documentation referred to in Article 3(1)(c) shall include:

(a) the name and address of the supplier;

(b) a description of the space heater model sufficient for its unambiguous identification;

(c) where appropriate, the references of the harmonised standards applied;

(d) where appropriate, the other technical standards and specifications used;

(e) the identification and signature of the person empowered to bind the supplier;

(f) technical parameters:

— for boiler space heaters and cogeneration space heaters, the technical parameters set out in Table 7, measured and calculated in accordance with Annex VII;

— for heat pump space heaters, the technical parameters set out in Table 8, measured and calculated in accordance with Annex VII;

— for heat pump space heaters where the information relating to a specific model comprising a combination of indoor and outdoor units has been obtained by calculation on the basis of design and/or extrapolation from other combinations, the details of such calculations and/or extrapolations, and of any tests undertaken to verify the accuracy of the calculations, including details of the mathematical model for calculating the performance of such combinations and details of the measurements taken to verify this model;

(g) any specific precautions that shall be taken when the space heater is assembled, installed or maintained.

2. COMBINATION HEATERS

For combination heaters, the technical documentation referred to in Article 3(2)(c) shall include:

(a) the name and address of the supplier;

(b) a description of the combination heater model sufficient for its unambiguous identification;

(c) where appropriate, the references of the harmonised standards applied;

(d) where appropriate, the other technical standards and specifications used;

(e) the identification and signature of the person empowered to bind the supplier;

(f) technical parameters:

— for boiler combination heaters, the technical parameters set out in Table 7, measured and calculated in accordance with Annex VII;

— for heat pump combination heaters, the technical parameters set out in Table 8, measured and calculated in accordance with Annex VII;

— for heat pump combination heaters where the information relating to a specific model comprising a combination of indoor and outdoor units has been obtained by calculation on the basis of design and/or extrapolation from other combinations, the details of such calculations and/or extrapolations, and of any tests undertaken to verify the accuracy of the calculations, including details of the mathematical model for calculating the performance of such combinations and details of the measurements taken to verify this model;

(g) any specific precautions that shall be taken when the combination heater is assembled, installed or maintained.

Table 7

Technical parameters for boiler space heaters, boiler combination heaters and cogeneration space heaters

Model(s): [information identifying the model(s) to which the information relates]

Condensing boiler: [yes/no]

Low-temperature (**) boiler: [yes/no]

B11 boiler: [yes/no]

Cogeneration space heater: [yes/no] If yes, equipped with a supplementary heater: [yes/no]

Combination heater: [yes/no]

Item	Symbol	Value	Unit
Rated heat output	*Prated*	x	kW
For boiler space heaters and boiler combination heaters: Useful heat output			
At rated heat output and high-temperature regime (*)	P_4	x,x	kW
At 30 % of rated heat output and low-temperature regime (**)	P_1	x,x	kW
For cogeneration space heaters: Useful heat output			
At rated heat output of cogeneration space heater with supplementary heater disabled	P_{CHP100} *+Sup0*	x,x	kW
At rated heat output of cogeneration space heater with supplementary heater enabled	P_{CHP100} *+Sup100*	x,x	kW
For cogeneration space heaters: Electrical efficiency			
At rated heat output of cogeneration space heater with supplementary heater disabled	$\eta_{el,CHP100}$ *+Sup0*	x,x	%
At rated heat output of cogeneration space heater with supplementary heater enabled	$\eta_{el,CHP100}$ *+Sup100*	x,x	%
Auxiliary electricity consumption			
At full load	*elmax*	x,x	kW
At part load	*elmin*	x,x	kW
In standby mode	P_{SB}	x,xxx	kW

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	η_s	x	%
For boiler space heaters and boiler combination heaters: Useful efficiency			
At rated heat output and high-temperature regime (*)	η_4	x,x	%
At 30 % of rated heat output and low-temperature regime (**)	η_1	x,x	%
For cogeneration space heaters: Useful efficiency			
At rated heat output of cogeneration space heater with supplementary heater disabled	η_{CHP100} *+Sup0*	x,x	%
At rated heat output of cogeneration space heater with supplementary heater enabled	η_{CHP100} *+Sup100*	x,x	%
Supplementary heater			
Rated heat output	*Psup*	x,x	kW
Type of energy input			
Other items			
Standby heat loss	P_{stby}	x,x	kW
Ignition burner power consumption	P_{ign}	x,x	kW
Annual energy consumption	Q_{HE}	x	kWh or GJ
Sound power level, indoors	L_{WA}	x	dB

For combination heaters:

Declared load profile				**Water heating energy efficiency**	η_{wh}	x	%
Daily electricity consumption	Q_{elec}	x,xxx	kWh	Daily fuel consumption	Q_{fuel}	x,xxx	kWh
Annual electricity consumption	*AEC*	x	kWh	Annual fuel consumption	*AFC*	x	GJ
Contact details	Name and address of the supplier.						

(*) High-temperature regime means 60 °C return temperature at heater inlet and 80 °C feed temperature at heater outlet.
(**) Low temperature means for condensing boilers 30 °C, for low-temperature boilers 37 °C and for other heaters 50 °C return temperature (at heater inlet).

Table 8

Technical parameters for heat pump space heaters and heat pump combination heaters

Model(s): [information identifying the model(s) to which the information relates]

Air-to-water heat pump: [yes/no]

Water-to-water heat pump: [yes/no]

Brine-to-water heat pump: [yes/no]

Low-temperature heat pump: [yes/no]

Equipped with a supplementary heater: [yes/no]

Heat pump combination heater: [yes/no]

Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.

Parameters shall be declared for average, colder and warmer climate conditions.

Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Rated heat output (*)	*Prated*	x	kW	**Seasonal space heating energy efficiency**	η_s	x	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T_j				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j			
T_j = – 7 °C	*Pdh*	x,x	kW	T_j = – 7 °C	*COPd or PERd*	x,xx or x,x	– or %
T_j = + 2 °C	*Pdh*	x,x	kW	T_j = + 2 °C	*COPd or PERd*	x,xx or x,x	– or %
T_j = + 7 °C	*Pdh*	x,x	kW	T_j = + 7 °C	*COPd or PERd*	x,xx or x,x	– or %
T_j = + 12 °C	*Pdh*	x,x	kW	T_j = + 12 °C	*COPd or PERd*	x,xx or x,x	– or %
T_j = bivalent temperature	*Pdh*	x,x	kW	T_j = bivalent temperature	*COPd or PERd*	x,xx or x,x	– or %

T_j = operation limit temperature	*Pdh*	x,x	kW	T_j = operation limit temperature	*COPd or PERd*	x,xx or x,x	– or %
For air-to-water heat pumps: T_j = – 15 °C (if *TOL* < – 20 °C)	*Pdh*	x,x	kW	For air-to-water heat pumps: T_j = – 15 °C (if *TOL* < – 20 °C)	*COPd or PERd*	x,xx or x,x	– or %
Bivalent temperature	T_{biv}	x	°C	For air-to-water heat pumps: Operation limit temperature	*TOL*	x	°C
Cycling interval capacity for heating	*Pcych*	x,x	kW	Cycling interval efficiency	*COPcyc or PERcyc*	x,xx or x,x	– or %
Degradation co-efficient (**)	*Cdh*	x,x	—	Heating water operating limit temperature	*WTOL*	x	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	P_{OFF}	x,xxx	kW	Rated heat output (**)	*Psup*	x,x	kW
Thermostat-off mode	P_{TO}	x,xxx	kW				
Standby mode	P_{SB}	x,xxx	kW	Type of energy input			
Crankcase heater mode	P_{CK}	x,xxx	kW				
Other items							
Capacity control	fixed/variable			For air-to-water heat pumps: Rated air flow rate, outdoors	—	x	m^3/h
Sound power level, indoors/ outdoors	L_{WA}	x / x	dB	For water- or brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	—	x	m^3/h
Annual energy consumption	Q_{HE}	x	kWh or GJ				
For heat pump combination heater:							
Declared load profile	x			**Water heating energy efficiency**	η_{wh}	x	%
Daily electricity consumption	Q_{elec}	x,xxx	kWh	Daily fuel consumption	Q_{fuel}	x,xxx	kWh
Annual electricity consumption	*AEC*	x	kWh	Annual fuel consumption	*AFC*	x	GJ
Contact details	Name and address of the supplier.						

(*) For heat pump space heaters and heat pump combination heaters, the rated heat output *Prated* is equal to the design load for heating *Pdesignh*, and the rated heat output of a supplementary heater *Psup* is equal to the supplementary capacity for heating *sup(Tj)*.
(**) If *Cdh* is not determined by measurement then the default degradation coefficient is *Cdh* = 0,9.

3. TEMPERATURE CONTROLS

For temperature controls, the technical documentation referred to in Article 3(3)(b) shall include:

(a) the name and address of the supplier;

(b) a description of the temperature control model sufficient for its unambiguous identification;

(c) where appropriate, the references of the harmonised standards applied;

(d) where appropriate, the other technical standards and specifications used;

(e) the identification and signature of the person empowered to bind the supplier;

(f) technical parameters:

— the class of the temperature control;

— the contribution of the temperature control to seasonal space heating energy efficiency in %, rounded to one decimal place;

(g) any specific precautions that shall be taken when the temperature control is assembled, installed or maintained.

4. SOLAR DEVICES

For solar devices, the technical documentation referred to in Article 3(4)(b) shall include:

(a) the name and address of the supplier;

(b) a description of the solar device model sufficient for its unambiguous identification;

(c) where appropriate, the references of the harmonised standards applied;

(d) where appropriate, the other technical standards and specifications used;

(e) the identification and signature of the person empowered to bind the supplier;

(f) technical parameters (for pumps in the collector loop if applicable):

— the collector aperture area A_{sol} in m^2, to two decimal places;

— the collector efficiency η_{col} in %, rounded to the nearest integer;

— the energy efficiency class of the solar hot water storage tank, determined in accordance with point 3 of Annex II;

— the standing loss S of the solar hot water storage tank in W, rounded to the nearest integer;

— the storage volume V of the solar hot water storage tank in litres and m^3;

— the annual non-solar heat contribution Q_{nonsol} in kWh in terms of primary energy for electricity and/or in kWh in terms of *GCV* for fuels, for the load profiles M, L, XL and XXL under average climate conditions, rounded to the nearest integer;

— the pump power consumption *solpump* in W, rounded to the nearest integer;

— the standby power consumption *solstandby* in W, to two decimal places;

— the annual auxiliary electricity consumption Q_{aux} in kWh in terms of final energy, rounded to the nearest integer;

(g) any specific precautions that shall be taken when the solar device is assembled, installed or maintained.

5. PACKAGES OF SPACE HEATER, TEMPERATURE CONTROL AND SOLAR DEVICE

For packages of space heater, temperature control and solar device, the technical documentation referred to in Article 3(5)(c) shall include:

(a) the name and address of the supplier;

(b) a description of the package of space heater, temperature control and solar device model sufficient for its unambiguous identification;

(c) where appropriate, the references of the harmonised standards applied;

(d) where appropriate, the other technical standards and specifications used;

(e) the identification and signature of the person empowered to bind the supplier;

(f) technical parameters:

— the seasonal space heating energy efficiency in %, rounded to the nearest integer;

— the technical parameters set out in points 1, 3 and 4 of this Annex;

(g) any specific precautions that shall be taken when the package of space heater, temperature control and solar device is assembled, installed or maintained.

6. PACKAGES OF COMBINATION HEATER, TEMPERATURE CONTROL AND SOLAR DEVICE

For packages of combination heater, temperature control and solar device, the technical documentation referred to in Article 3(6)(c) shall include:

(a) the name and address of the supplier;

(b) a description of the package of combination heater, temperature control and solar device model sufficient for its unambiguous identification;

(c) where appropriate, the references of the harmonised standards applied;

(d) where appropriate, the other technical standards and specifications used;

(e) the identification and signature of the person empowered to bind the supplier;

(f) technical parameters:

— the seasonal space heating energy efficiency and water heating energy efficiency in %, rounded to the nearest integer;

— the technical parameters set out in points 2, 3 and 4 of this Annex;

(g) any specific precautions that shall be taken when the package of combination heater, temperature control and solar device is assembled, installed or maintained.

ANNEX VI

Information to be provided in cases where end-users cannot be expected to see the product displayed

1. SPACE HEATERS

1.1. The information referred to in Article 4(1)(b) shall be provided in the following order:

(a) the seasonal space heating energy efficiency class of the model, determined in accordance with point 1 of Annex II;

(b) the rated heat output, including the rated heat output of any supplementary heater, in kW, rounded to the nearest integer (for heat pump space heaters, under average climate conditions);

(c) the seasonal space heating energy efficiency in %, rounded to the nearest integer and calculated in accordance with points 3 and 4 of Annex VII (for heat pump space heaters, under average climate conditions);

(d) the annual energy consumption in kWh in terms of final energy and/or in GJ in terms of *GCV*, rounded to the nearest integer and calculated in accordance with points 3 and 4 of Annex VII (for heat pump space heaters, under average climate conditions);

(e) the sound power level L_{WA}, indoors, in dB, rounded to the nearest integer (for heat pump space heaters if applicable);

in addition, for cogeneration space heaters:

(f) the electrical efficiency in %, rounded to the nearest integer;

in addition, for heat pump space heaters:

(g) the rated heat output, including the rated heat output of any supplementary heater, in kW, under colder and warmer climate conditions, rounded to the nearest integer;

(h) the seasonal space heating energy efficiency in %, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VII;

(i) the annual energy consumption in kWh in terms of final energy and/or in GJ in terms of *GCV*, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VII;

(j) the sound power level L_{WA}, outdoors, in dB, rounded to the nearest integer;

in addition, for low-temperature heat pumps:

(k) an indication that the low-temperature heat pump is only suitable for low-temperature application;

1.2. The size and font in which the information referred in point 1.1 is printed or shown shall be legible.

2. COMBINATION HEATERS

2.1. The information referred to in Article 4(2)(b) shall be provided in the following order:

(a) for space heating, the medium-temperature application; for water heating, the declared load profile, expressed as the appropriate letter and typical usage in accordance with Table 15 of Annex VII;

(b) the seasonal space heating energy efficiency class and the water heating energy efficiency class of the model, determined in accordance with points 1 and 2 of Annex II;

(c) the rated heat output, including the rated heat output of any supplementary heater, in kW, rounded to the nearest integer (for heat pump combination heaters, under average climate conditions);

(d) for space heating, the annual energy consumption in kWh in terms of final energy and/or in GJ in terms of *GCV*, rounded to the nearest integer and calculated in accordance with points 3 and 4 of Annex VII (for heat pump combination heaters, under average climate conditions); for water heating, the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, rounded to the nearest integer and calculated in accordance with point 5 of Annex VII (for heat pump combination heaters, under average climate conditions);

(e) the seasonal space heating energy efficiency in %, rounded to the nearest integer and calculated in accordance with points 3 and 4 of Annex VII (for heat pump combination heaters, under average climate conditions); the water heating energy efficiency in %, rounded to the nearest integer and calculated in accordance with point 5 of Annex VII (for heat pump combination heaters, under average climate conditions);

(f) the sound power level L_{WA}, indoors, in dB, rounded to the nearest integer (for heat pump combination heaters if applicable);

(g) if applicable, an indication that the combination heater is able to work only during off-peak hours;

in addition, for heat pump combination heaters:

(h) the rated heat output, including the rated heat output of any supplementary heater, in kW, under colder and warmer climate conditions, rounded to the nearest integer;

(i) for space heating, the annual energy consumption in kWh in terms of final energy and/or in GJ in terms of *GCV*, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VII; for water heating, the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 5 of Annex VII;

(j) the seasonal space heating energy efficiency in %, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VII; the water heating energy efficiency in %, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 5 of Annex VII;

(k) the sound power level L_{WA}, outdoors, in dB, rounded to the nearest integer.

2.2. The size and font in which the information referred in point 2.1 is printed or shown shall be legible.

3. PACKAGES OF SPACE HEATER, TEMPERATURE CONTROL AND SOLAR DEVICE

3.1. The information referred to in Article 4(3)(b) shall be provided in the following order:

(a) the seasonal space heating energy efficiency class of the model, determined in accordance with point 1 of Annex II;

(b) the seasonal space heating energy efficiency in %, rounded to the nearest integer;

(c) the elements set out in Figure 1, Figure 2, Figure 3 and Figure 4, respectively, of Annex IV.

3.2. The size and font in which the information referred in point 3.1 is printed or shown shall be legible.

4. PACKAGES OF COMBINATION HEATER, TEMPERATURE CONTROL AND SOLAR DEVICE

4.1. The information referred to in Article 4(4)(b) shall be provided in the following order:

(a) the seasonal space heating energy efficiency class and the water heating energy efficiency class of the model, determined in accordance with points 1 and 2 of Annex II;

(b) the seasonal space heating energy efficiency and the water heating energy efficiency in %, rounded to the nearest integer;

(c) the elements set out in Figure 1 and Figure 3, respectively, of Annex IV;

(d) the elements set out in Figure 5 of Annex IV.

4.2. The size and font in which the information referred in point 4.1 is printed or shown shall be legible.

ANNEX VII

Measurements and calculations

1. For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements and calculations shall be made using harmonised standards the reference numbers of which have been published for this purpose in the *Official Journal of the European Union*, or using other reliable, accurate and reproducible methods that take into account the generally recognised state-of-the-art methods. They shall meet the conditions and technical parameters set out in points 2 to 6.

2. **General conditions for measurements and calculations**

(a) For the purposes of the measurements set out in points 3 to 7, the indoor ambient temperature shall be set at 20 °C.

(b) For the purposes of the calculations set out in points 3 to 7, electricity consumption shall be multiplied by a conversion coefficient *CC* of 2,5, unless the annual electricity consumption is expressed in final energy for the end-user, as set out in points 3(b), 4(g), 5(e) and 6.

(c) For heaters equipped with supplementary heaters, the measurement and calculation of rated heat output, seasonal space heating energy efficiency, water heating energy efficiency, sound power level and emissions of nitrogen oxides shall take account of the supplementary heater.

(d) Declared values for rated heat output, seasonal space heating energy efficiency, water heating energy efficiency, annual energy consumption and sound power level shall be rounded to the nearest integer.

3. **Seasonal space heating energy efficiency and consumption of boiler space heaters, boiler combination heaters and cogeneration space heaters**

(a) The seasonal space heating energy efficiency η_s shall be calculated as the seasonal space heating energy efficiency in active mode η_{son}, corrected by contributions accounting for temperature controls, auxiliary electricity consumption, standby heat loss, ignition burner power consumption (if applicable) and, for cogeneration space heaters, corrected by adding the electrical efficiency multiplied by a conversion coefficient *CC* of 2,5.

(b) The annual energy consumption Q_{HE} in kWh in terms of final energy and/or in GJ in terms of *GCV* shall be calculated as the ratio of the reference annual heating demand and the seasonal space heating energy efficiency.

4. **Seasonal space heating energy efficiency and consumption of heat pump space heaters and heat pump combination heaters**

(a) For establishing the rated coefficient of performance COP_{rated} or rated primary energy ratio PER_{rated}, or the sound power level, the operating conditions shall be the standard rating conditions set out in Table 9 and the same declared capacity for heating shall be used.

(b) The active mode coefficient of performance $SCOP_{on}$ for average, colder and warmer climate conditions shall be calculated on the basis of the part load for heating $Ph(T_j)$, the supplementary capacity for heating $sup(T_j)$ (if applicable), and the bin-specific coefficient of performance *COPbin(Tj)* or bin-specific primary energy ratio $PERbin(T_j)$, weighted by the bin-hours for which the bin conditions apply, using the following conditions:

— the reference design conditions set out in Table 10;

— the European reference heating season under average, colder and warmer climate conditions set out in Table 12;

— if applicable, the effects of any degradation of energy efficiency caused by cycling, depending on the type of control of the heating capacity.

(c) The reference annual heating demand Q_H shall be the design load for heating *Pdesignh* for average, colder and warmer climate conditions, multiplied by the annual equivalent active mode hours H_{HE} of 2 066, 2 465 and 1 336 for average, colder and warmer climate conditions, respectively.

(d) The annual energy consumption Q_{HE} shall be calculated as the sum of:

— the ratio of the reference annual heating demand Q_H and the active mode coefficient of performance $SCOP_{on}$ or active mode primary energy ratio $SPER_{on}$; and

— the energy consumption for off, thermostat-off, standby, and crankcase heater mode during the heating season.

(e) The seasonal coefficient of performance *SCOP* or seasonal primary energy ratio *SPER* shall be calculated as the ratio of the reference annual heating demand Q_H and the annual energy consumption Q_{HE}.

(f) The seasonal space heating energy efficiency η_s shall be calculated as the seasonal coefficient of performance *SCOP* divided by the conversion coefficient *CC* or the seasonal primary energy ratio *SPER*, corrected by contributions accounting for temperature controls and, for water-/brine-to-water heat pump space heaters and heat pump combination heaters, the electricity consumption of one or more ground water pumps.

(g) The annual energy consumption Q_{HE} in kWh in terms of final energy and/or GJ in terms of *GCV* shall be calculated as the ratio of the reference annual heating demand Q_H and the seasonal space heating energy efficiency η_s.

5. **Water heating energy efficiency of combination heaters**

The water heating energy efficiency η_{wh} of a combination heater shall be calculated as the ratio between the reference energy Q_{ref} and the energy required for its generation under the following conditions:

(a) measurements shall be carried out using the load profiles set out in Table 15;

(b) measurements shall be carried out using a 24-hour measurement cycle as follows:

— 00:00 to 06:59: no water draw-off;

— from 07:00: water draw-offs according to the declared load profile;

— from end of last water draw-off until 24:00: no water draw-off;

(c) the declared load profile shall be the maximum load profile or the load profile one below the maximum load profile;

(d) for heat pump combination heaters, the following additional conditions apply:

— heat pump combination heaters shall be tested under the conditions set out in Table 9;

— heat pump combination heaters which use ventilation exhaust air as the heat source shall be tested under the conditions set out in Table 11;

(e) the annual electricity consumption *AEC* in kWh in terms of final energy shall be calculated as daily electricity consumption Q_{elec} in kWh in terms of final energy multiplied by 220;

(f) the annual fuel consumption *AFC* in GJ in terms of *GCV* shall be calculated as daily fuel consumption Q_{fuel} multiplied by 220.

6. **Conditions for measurements and calculations of solar devices**

The solar collector, solar hot water storage tank and pump in the collector loop (if applicable) shall be tested separately. Where the solar collector and solar hot water storage tank cannot be tested separately, they shall be tested in combination.

The results shall be used for the determination of the standing loss *S* and the calculations of the collector efficiency η_{col}, the annual non-solar heat contribution Q_{nonsol} for the load profiles M, L, XL and XXL under the average climate conditions set out in Tables 13 and 14, and the annual auxiliary electricity consumption Q_{aux} in kWh in terms of final energy.

Table 9

Standard rating conditions for heat pump space heaters and heat pump combination heaters

Heat source	Outdoor heat exchanger		Indoor heat exchanger			
	Climate condition	Inlet dry bulb (wet bulb) temperature	Heat pump space heaters and heat pump combination heaters, except low-temperature heat pumps		Low-temperature heat pumps	
			Inlet temperature	Outlet temperature	Inlet temperature	Outlet temperature
Outdoor air	Average	+ 7 °C (+ 6 °C)	+ 47 °C	+ 55 °C	+ 30 °C	+ 35 °C
	Colder	+ 2 °C (+ 1 °C)				
	Warmer	+ 14 °C (+ 13 °C)				
Exhaust air	All	+ 20 °C (+ 12 °C)				
		Inlet / outlet temperature				
Water	All	+ 10 °C / + 7 °C				
Brine	All	0 °C/– 3 °C				

Table 10

Reference design conditions for heat pump space heaters and heat pump combination heaters, temperatures in dry bulb air temperature (wet bulb air temperature indicated in brackets)

Climate condition	Reference design temperature	Bivalent temperature	Operation limit temperature
	Tdesignh	T_{biv}	*TOL*
Average	– 10 (– 11) °C	maximum + 2 °C	maximum – 7 °C
Colder	– 22 (– 23) °C	maximum – 7 °C	maximum – 15 °C
Warmer	+ 2 (+ 1) °C	maximum + 7 °C	maximum + 2 °C

Table 11

Maximum ventilation exhaust air available [m^3/h], with humidity of 5,5 g/m^3

Declared load profile	XXS	XS	S	M	L	XL	XXL
Maximum ventilation exhaust air available	109	128	128	159	190	870	1 021

Table 12

European reference heating season under average, colder and warmer climate conditions for heat pump space heaters and heat pump combination heaters

bin_j	T_j [°C]	Average climate conditions	Colder climate conditions	Warmer climate conditions
		H_j [h/annum]	H_j [h/annum]	H_j [h/annum]
1 to 8	–30 to –23	0	0	0
9	– 22	0	1	0

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

Table 13

Average daytime temperature [°C]

	January	February	March	April	May	June	July	August	September	October	November	December
Average climate conditions	+ 2,8	+ 2,6	+ 7,4	+ 12,2	+ 16,3	+ 19,8	+ 21,0	+ 22,0	+ 17,0	+ 11,9	+ 5,6	+ 3,2

Table 14

Average global solar irradiance [W/m^2]

	January	February	March	April	May	June	July	August	September	October	November	December
Average climate conditions	70	104	149	192	221	222	232	217	176	129	80	56

Table 15

Water heating load profiles of combination heaters

h	3XS			XXS			XS			S			
	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	T_p
	kWh	l/min	°C	**kWh**	l/min	°C	**kWh**	l/min	°C	**kWh**	l/min	°C	°C
07:00	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
07:05	**0,015**	2	25										
07:15	**0,015**	2	25										
07:26	**0,015**	2	25										
07:30	**0,015**	2	25	**0,105**	2	25	**0,525**	3	35	**0,105**	3	25	
07:45													
08:01													
08:05													
08:15													
08:25													
08:30				**0,105**	2	25				**0,105**	3	25	
08:45													
09:00	**0,015**	2	25										
09:30	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
10:00													
10:30													
11:00													
11:30	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
11:45	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
12:00	**0,015**	2	25	**0,105**	2	25							
12:30	**0,015**	2	25	**0,105**	2	25							
12:45	**0,015**	2	25	**0,105**	2	25	**0,525**	3	35	**0,315**	4	10	55
14:30	**0,015**	2	25										
15:00	**0,015**	2	25										
15:30	**0,015**	2	25										
16:00	**0,015**	2	25										
16:30													
17:00													
18:00				**0,105**	2	25				**0,105**	3	25	

h	3XS			XXS			XS			S			
	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	T_p
	kWh	l/min	°C	**kWh**	l/min	°C	**kWh**	l/min	°C	**kWh**	l/min	°C	°C
18:15				**0,105**	2	25				**0,105**	3	40	
18:30	**0,015**	2	25	**0,105**	2	25							
19:00	**0,015**	2	25	**0,105**	2	25							
19:30	**0,015**	2	25	**0,105**	2	25							
20:00				**0,105**	2	25							
20:30							**1,05**	3	35	**0,42**	4	10	55
20:45				**0,105**	2	25							
20:46													
21:00				**0,105**	2	25							
21:15	**0,015**	2	25	**0,105**	2	25							
21:30	**0,015**	2	25							**0,525**	5	45	
21:35	**0,015**	2	25	**0,105**	2	25							
21:45	**0,015**	2	25	**0,105**	2	25							
Q_{ref}	**0,345**			**2,100**			**2,100**			**2,100**			

Continued Table 15

Water heating load profiles of combination heaters

h	M				L				XL			
	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p
	kWh	l/min	°C	°C	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C
07:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
07:05	**1,4**	6	40		**1,4**	6	40					
07:15									**1,82**	6	40	
07:26									**0,105**	3	25	
07:30	**0,105**	3	25		**0,105**	3	25					
07:45					**0,105**	3	25		**4,42**	10	10	40
08:01	**0,105**	3	25						**0,105**	3	25	
08:05					**3,605**	10	10	40				
08:15	**0,105**	3	25						**0,105**	3	25	
08:25					**0,105**	3	25					
08:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
08:45	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	

h	M				L				XL			
	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p
	kWh	l/min	°C	°C	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C
09:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
09:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
10:00									**0,105**	3	25	
10:30	**0,105**	3	10	40	**0,105**	3	10	40	**0,105**	3	10	40
11:00									**0,105**	3	25	
11:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
11:45	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
12:00												
12:30												
12:45	**0,315**	4	10	55	**0,315**	4	10	55	**0,735**	4	10	55
14:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
15:00									**0,105**	3	25	
15:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
16:00									**0,105**	3	25	
16:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
17:00									**0,105**	3	25	
18:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
18:15	**0,105**	3	40		**0,105**	3	40		**0,105**	3	40	
18:30	**0,105**	3	40		**0,105**	3	40		**0,105**	3	40	
19:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
19:30												
20:00												
20:30	**0,735**	4	10	55	**0,735**	4	10	55	**0,735**	4	10	55
20:45												
20:46									**4,42**	10	10	40
21:00					**3,605**	10	10	40				
21:15	**0,105**	3	25						**0,105**	3	25	
21:30	**1,4**	6	40		**0,105**	3	25		**4,42**	10	10	40
21:35												
21:45												
Q_{ref}	**5,845**				**11,655**				**19,07**			

Continued Table 15

Water heating load profiles of combination heaters

h	XXL			
	Q_{tap}	f	T_m	T_p
	kWh	l/min	°C	°C
07:00	**0,105**	3	25	
07:05				
07:15	**1,82**	6	40	
07:26	**0,105**	3	25	
07:30				
07:45	**6,24**	16	10	40
08:01	**0,105**	3	25	
08:05				
08:15	**0,105**	3	25	
08:25				
08:30	**0,105**	3	25	
08:45	**0,105**	3	25	
09:00	**0,105**	3	25	
09:30	**0,105**	3	25	
10:00	**0,105**	3	25	
10:30	**0,105**	3	10	40
11:00	**0,105**	3	25	
11:30	**0,105**	3	25	
11:45	**0,105**	3	25	
12:00				
12:30				
12:45	**0,735**	4	10	55
14:30	**0,105**	3	25	
15:00	**0,105**	3	25	
15:30	**0,105**	3	25	
16:00	**0,105**	3	25	
16:30	**0,105**	3	25	
17:00	**0,105**	3	25	
18:00	**0,105**	3	25	
18:15	**0,105**	3	40	
18:30	**0,105**	3	40	

h	XXL			
	Q_{tap}	f	T_m	T_p
	kWh	l/min	°C	°C
19:00	**0,105**	3	25	
19:30				
20:00				
20:30	**0,735**	4	10	55
20:45				
20:46	**6,24**	16	10	40
21:00				
21:15	**0,105**	3	25	
21:30	**6,24**	16	10	40
21:35				
21:45				
Q_{ref}	**24,53**			

ANNEX VIII

Verification procedure for market surveillance purposes

For the purposes of assessing the conformity with the requirements laid down in Articles 3 and 4, the authorities of the Member States shall apply the following verification procedure:

1. The Member State authorities shall test one single unit per heater, temperature control, solar device, package of space heater, temperature control and solar device, and package of combination heater, temperature control and solar device model and provide the information on the test results to the authorities of the other Member States.

2. The model shall be considered to comply with the applicable requirements if:

   (a) for heaters, packages of space heater, temperature control and solar device, and packages of combination heater, temperature control and solar device, the seasonal space heating energy efficiency η_s is not more than 8 % lower than the declared value at the rated heat output of the unit;

   (b) for combination heaters and packages of combination heater, temperature control and solar device, the water heating energy efficiency η_{wh} is not more than 8 % lower than the declared value at the rated heat output of the unit;

   (c) for heaters, the sound power level L_{WA} is not more than 2 dB higher than the declared value of the unit;

   (d) for temperature controls, the class of the temperature control complies with the declared class of the unit;

   (e) for solar devices, the collector efficiency η_{col} is not more than 5 % lower than the declared value of the unit;

   (f) for solar devices, the standing loss S of the solar hot water storage tank is not more than 5 % higher than the declared value of the unit; and

   (g) for solar devices, the auxiliary electricity consumption Q_{aux} is not more than 5 % higher than the declared value of the unit.

3. If the result referred to in point 2 is not achieved, the Member State authorities shall randomly select three additional units of the same model for testing and provide the information on the test results to the authorities of the other Member States and to the Commission within one month of testing.

4. The model shall be considered to comply with the applicable requirements if:

   (a) for heaters, packages of space heater, temperature control and solar device, and packages of combination heater, temperature control and solar device, the average of the three units for seasonal space heating energy efficiency η_s is not more than 8 % lower than the declared value at the rated heat output of the unit;

   (b) for combination heaters and packages of combination heater, temperature control and solar device, the average of the three units for water heating energy efficiency η_{wh} is not more than 8 % lower than the declared value at the rated heat output of the unit;

   (c) for heaters, the average of the three units for sound power level L_{WA} is not more than 2 dB higher than the declared value of the unit;

   (d) for temperature controls, the class of the temperature control of the three units complies with the declared class of the unit;

   (e) for solar devices, the average of the three units for collector efficiency η_{col} is not more than 5 % lower than the declared value of the unit;

   (f) for solar devices, the average of the three units for standing loss S of the solar hot water storage tank is not more than 5 % higher than the declared value of the unit; and

   (g) for solar devices, the average of the three units for auxiliary electricity consumption Q_{aux} is not more than 5 % higher than the declared value of the unit.

5. If the results referred to in point 4 are not achieved, the model shall be considered not to comply with this Regulation.

   Member State authorities shall use the measurement and calculation methods set out in Annex VII.

COMMISSION DELEGATED REGULATION (EU) No 812/2013

of 18 February 2013

supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to the energy labelling of water heaters, hot water storage tanks and packages of water heater and solar device

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

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

Having regard to Directive 2010/30/EU of the European Parliament and of the Council of 19 May 2010 on the indication by labelling and standard product information of the consumption of energy and other resources by energy-related products [1], and in particular Article 10 thereof,

Whereas:

(1) Directive 2010/30/EU requires the Commission to adopt delegated acts as regards the labelling of energy-related products that have a significant potential for energy savings but exhibit a wide disparity in performance levels with equivalent functionality.

(2) The energy consumed by water heaters and hot water storage tanks accounts for a significant share of the total energy demand in the Union, and water heaters and hot water storage tanks with equivalent functionality exhibit a wide disparity in terms of water heating energy efficiency and standing loss. The scope for reducing their energy consumption is significant and includes combining water heaters with appropriate solar devices. Water heaters, hot water storage tanks and packages of water heaters and solar devices should therefore be covered by energy labelling requirements.

(3) Water heaters that are designed for using gaseous or liquid fuels predominantly (more than 50 %) produced from biomass have specific technical characteristics which require further technical, economic and environmental analyses. Depending on the outcome of the analyses, energy labelling requirements for those water heaters should be set at a later stage, if appropriate.

(4) Harmonised provisions should be laid down on labelling and standard product information regarding the energy efficiency of water heaters and hot water storage tanks in order to provide incentives for manufacturers to improve the energy efficiency of these products, to encourage end-users to purchase energy-efficient products and to contribute to the functioning of the internal market.

(5) As regards significant energy and cost savings for each type of water heater and for hot water storage tanks, this Regulation should introduce a new single labelling scale from A to G for conventional water heaters, solar water heaters and heat pump water heaters and for hot water storage tanks. A dynamic class A^+ should be added to the classification after two years to accelerate the market penetration of the most efficient water heaters and hot water storage tanks.

(6) This Regulation should ensure that consumers get more accurate comparative information about the performance of solar water heaters and heat pump water heaters in three European climate zones.

(7) The sound power level of a water heater could be an important consideration for end-users. Information on sound power levels should be included on the labels of water heaters.

(8) The combined effect of this Regulation and Commission Regulation (EU) No 814/2013 of 2 August 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for water heaters and hot water storage tanks [2] is expected to result in estimated annual energy savings of around 450 PJ (11 Mtoe) by 2020, corresponding to about 26 Mt CO_2 emissions, compared to what would happen if no measures were taken.

(9) The information provided on the labels should be obtained through reliable, accurate and reproducible measurement and calculation procedures that take into account recognised state-of-the-art measurement and calculation methods including, where available, harmonised standards adopted by the European standardisation bodies under a request from the Commission, in accordance with the procedures laid down in the Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on Information Society services [3], for the purpose of establishing ecodesign requirements.

(10) This Regulation should specify a uniform design and content of product labels for water heaters and hot water storage tanks.

[1] OJ L 153, 18.6.2010, p. 1.

[2] See page 162 of this Official Journal.

[3] OJ L 204, 21.7.1998, p. 37.

(11) In addition, this Regulation should specify requirements for the product fiche and technical documentation for water heaters and hot water storage tanks.

(12) Moreover, this Regulation should specify requirements for the information to be provided for any form of distance selling of water heaters and hot water storage tanks and in any advertisements and technical promotional material for such products.

(13) In addition to the product labels and fiches for water heaters and hot water storage tanks laid down in this Regulation, a package label and fiche based on product fiches from suppliers should ensure that the end-user has easy access to information on the energy performance of water heaters in combination with solar devices. The most efficient class A^{+++} may be reached by such a package.

(14) It is appropriate to provide for a review of the provisions of this Regulation taking into account technological progress,

HAS ADOPTED THIS REGULATION:

Article 1

Subject matter and scope

1. This Regulation establishes requirements for the energy labelling of, and the provision of supplementary product information on, water heaters with a rated heat output ≤ 70 kW, hot water storage tanks with a storage volume ≤ 500 litres and packages of water heater ≤ 70 kW and solar device.

2. This Regulation shall not apply to:

(a) water heaters specifically designed for using gaseous or liquid fuels predominantly produced from biomass;

(b) water heaters using solid fuels;

(c) water heaters within the scope of Directive 2010/75/EU of the European Parliament and of the Council [1];

(d) combination heaters as defined in Article 2 of Commission Delegated Regulation (EU) No 811/2013 [2];

(e) water heaters which do not meet at least the load profile with the smallest reference energy, as specified in Annex VII, Table 3;

(f) water heaters designed for making hot drinks and/or food only.

Article 2

Definitions

In addition to the definitions set out in Article 2 of Directive 2010/30/EU, the following definitions shall apply for the purposes of this Regulation:

(1) 'water heater' means a device that:

(a) is connected to an external supply of drinking or sanitary water;

(b) generates and transfers heat to deliver drinking or sanitary hot water at given temperature levels, quantities and flow rates during given intervals; and

(c) is equipped with one or more heat generators;

(2) 'heat generator' means the part of a water heater that generates the heat using one or more of the following processes:

(a) combustion of fossil fuels and/or biomass fuels;

(b) use of the Joule effect in electric resistance heating elements;

(c) capture of ambient heat from an air source, water source or ground source, and/or waste heat;

(3) 'rated heat output' means the declared heat output of the water heater when providing water heating at standard rating conditions, expressed in kW;

(4) 'storage volume' (V) means the rated volume of a hot water storage tank, expressed in litres;

(5) 'standard rating conditions' means the operating conditions of water heaters for establishing the rated heat output, water heating energy efficiency and sound power level, and of hot water storage tanks for establishing the standing loss;

(6) 'biomass' means the biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste;

(7) 'biomass fuel' means a gaseous or liquid fuel produced from biomass;

(8) 'fossil fuel' means a gaseous or liquid fuel of fossil origin;

[1] OJ L 334, 17.12.2010, p. 17.
[2] See page 1 of this Official Journal.

(9) 'hot water storage tank' means a vessel for storing hot water for water and/or space heating purposes, including any additives, which is not equipped with any heat generator except possibly one or more back-up immersion heaters;

(10) 'back-up immersion heater' means a Joule effect electric resistance heater that is part of a hot water storage tank and generates heat only when the external heat source is disrupted (including during maintenance periods) or out of order, or that is part of a solar hot water storage tank and provides heat when the solar heat source is not sufficient to satisfy required comfort levels;

(11) 'solar device' means a solar-only system, a solar collector, a solar hot water storage tank or a pump in the collector loop, which are placed on the market separately;

(12) 'solar-only system' means a device that is equipped with one or more solar collectors and solar hot water storage tanks and possibly pumps in the collector loop and other parts, which is placed on the market as one unit and is not equipped with any heat generator except possibly one or more back-up immersion heaters;

(13) 'package of water heater and solar device' means a package offered to the end-user containing one or more water heaters and one or more solar devices;

(14) 'water heating energy efficiency' (η_{wh}) means the ratio between the useful energy provided by a water heater or a package of water heater and solar device and the energy required for its generation, expressed in %;

(15) 'sound power level' (L_{WA}) means the A-weighted sound power level, indoors and/or outdoors, expressed in dB;

(16) 'standing loss' (S) means the heating power dissipated from a hot water storage tank at given water and ambient temperatures, expressed in W;

(17) 'heat pump water heater' means a water heater that uses ambient heat from an air source, water source or ground source, and/or waste heat for heat generation.

For the purposes of Annexes II to IX, additional definitions are set out in Annex I.

Article 3

Responsibilities of suppliers and timetable

1. From 26 September 2015 suppliers placing water heaters on the market and/or putting them into service, including those integrated in packages of water heater and solar device, shall ensure that:

(a) a printed label complying with the format and content of information set out in point 1.1 of Annex III is provided for each water heater conforming to the water heating energy efficiency classes set out in point 1 of Annex II, whereby: for heat pump water heaters, the printed label is provided at least in the packaging of the heat generator; for water heaters intended for use in packages of water heater and solar device, a second label complying with the format and content of information set out in point 3 of Annex III is provided for each water heater;

(b) a product fiche, as set out in point 1 of Annex IV, is provided for each water heater, whereby: for heat pump water heaters, the product fiche is provided at least for the heat generator; for water heaters intended for use in packages of water heater and solar device, a second fiche, as set out in point 4 of Annex IV, is provided;

(c) the technical documentation, as set out in point 1 of Annex V, is provided on request to the authorities of the Member States and to the Commission;

(d) any advertisement relating to a specific water heater model and containing energy-related or price information includes a reference to the water heating energy efficiency class under average climate conditions for that model;

(e) any technical promotional material concerning a specific water heater model and describing its specific technical parameters includes a reference to the water heating energy efficiency class under average climate conditions for that model.

From 26 September 2017 a printed label complying with the format and content of information set out in point 1.2 of Annex III shall be provided for each water heater conforming to the water heating energy efficiency classes set out in point 1 of Annex II, whereby: for heat pump water heaters, the printed label shall be provided at least in the packaging of the heat generator.

2. From 26 September 2015 suppliers placing hot water storage tanks on the market and/or putting them into service shall ensure that:

(a) a printed label complying with the format and content of information set out in point 2.1 of Annex III is provided for each hot water storage tank conforming to the energy efficiency classes set out in point 2 of Annex II;

(b) a product fiche, as set out in point 2 of Annex IV, is provided;

(c) the technical documentation, as set out in point 2 of Annex V, is provided on request to the authorities of the Member States and to the Commission;

(d) any advertisement relating to a specific hot water storage tank model and containing energy-related or price information includes a reference to the energy efficiency class for that model;

(e) any technical promotional material concerning a specific hot water storage tank model and describing its specific technical parameters includes a reference to the energy efficiency class for that model.

From 26 September 2017 a printed label complying with the format and content of information as set out in point 2.2 of Annex III shall be provided for each hot water storage tank conforming to the energy efficiency classes set out in point 2 of Annex II.

3. From 26 September 2015 suppliers placing solar devices on the market and/or putting them into service shall ensure that:

(a) a product fiche, as set out in point 3 of Annex IV, is provided;

(b) the technical documentation, as set out in point 3 of Annex V, is provided on request to the authorities of the Member States and to the Commission.

4. From 26 September 2015 suppliers placing packages of water heater and solar device on the market and/or putting them into service shall ensure that:

(a) a printed label complying with the format and content of information set out in point 3 of Annex III is provided for each package of water heater and solar device conforming to the water heating energy efficiency classes set out in point 1 of Annex II;

(b) a product fiche, as set out in point 4 of Annex IV, is provided for each package of water heater and solar device;

(c) the technical documentation, as set out in point 4 of Annex V, is provided on request to the authorities of the Member States and to the Commission;

(d) any advertisement relating to a specific package of water heater and solar device model and containing energy-related or price information includes a reference to the water heating energy efficiency class under average climate conditions for that model;

(e) any technical promotional material concerning a specific package of water heater and solar device model and describing its specific technical parameters includes a reference to the water heating energy efficiency class under average climate conditions for that model.

Article 4

Responsibilities of dealers

1. Dealers of water heaters shall ensure that:

(a) each water heater, at the point of sale, bears the label provided by suppliers in accordance with Article 3(1), as set out in point 1 of Annex III, on the outside of the front of the appliance, in such a way as to be clearly visible;

(b) water heaters offered for sale, hire or hire-purchase, where the end-user cannot be expected to see the water heater displayed, are marketed with the information provided by the suppliers in accordance with point 1 of Annex VI;

(c) any advertisement relating to a specific water heater model and containing energy-related or price information includes a reference to the water heating energy efficiency class under average climate conditions for that model;

(d) any technical promotional material concerning a specific water heater model and describing its specific technical parameters includes a reference to the water heating energy efficiency class under average climate conditions for that model.

2. Dealers of hot water storage tanks shall ensure that:

(a) each hot water storage tank, at the point of sale, bears the label provided by suppliers in accordance with Article 3(2), as set out in point 2 of Annex III, on the outside of the front of the appliance, in such a way as to be clearly visible;

(b) hot water storage tanks offered for sale, hire or hire-purchase, where the end-user cannot be expected to see the hot water storage tank displayed, are marketed with the information provided by the suppliers in accordance with point 2 of Annex VI;

(c) any advertisement relating to a specific hot water storage tank model and containing energy-related or price information includes a reference to the energy efficiency class for that model;

(d) any technical promotional material concerning a specific hot water storage tank model and describing its specific technical parameters includes a reference to the energy efficiency class for that model.

3. Dealers of packages of water heater and solar device shall ensure, based on the label and fiches provided by suppliers in accordance with Article 3(1), (3) and (4), that:

(a) any offer for a specific package includes the water heating energy efficiency and the water heating energy efficiency class for that package under average, colder or warmer climate conditions, as applicable, by displaying with the package the label set out in point 3 of Annex III and providing the fiche set out in point 4 of Annex IV, duly filled in according to the characteristics of that package;

(b) packages of water heater and solar device offered for sale, hire or hire-purchase, where the end-user cannot be expected to see the package of water heater and solar device displayed, are marketed with the information provided in accordance with point 3 of Annex VI;

(c) any advertisement relating to a specific package of water heater and solar device model and containing energy-related or price information includes a reference to the water heating energy efficiency class under average climate conditions for that model;

(d) any technical promotional material concerning a specific package of water heater and solar device model and describing its specific technical parameters includes a reference to the water heating energy efficiency class under average climate conditions for that model.

Article 5

Measurement and calculation methods

The information to be provided pursuant to Articles 3 and 4 shall be obtained by reliable, accurate and reproducible measurement and calculation methods which take into account the recognised state-of-the-art measurement and calculation methods, as set out in Annex VII and Annex VIII.

Article 6

Verification procedure for market surveillance purposes

Member States shall apply the procedure set out in Annex IX when assessing the conformity of the declared water heating energy efficiency class, water heating energy efficiency, annual energy consumption and sound power level of water heaters and the declared energy efficiency class and standing loss of hot water storage tanks.

Article 7

Review

The Commission shall review this Regulation in the light of technological progress no later than five years after its entry into force. The review shall in particular assess any significant changes in the market shares of various types of appliances and the appropriateness of the package fiche and label set out in point 3 of Annex III and point 4 of Annex IV.

Article 8

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*.

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

Done at Brussels, 18 February 2013.

For the Commission
The President
José Manuel BARROSO

ANNEX I

Definitions applicable for Annexes II to IX

For the purposes of Annexes II to IX, the following definitions shall apply:

(1) 'conventional water heater' means a water heater that generates heat using the combustion of fossil and/or biomass fuels and/or the Joule effect in electric resistance heating elements;

(2) 'solar water heater' means a water heater equipped with one or more solar collectors, solar hot water storage tanks, heat generators and possibly pumps in the collector loop and other parts, a solar water heater is placed on the market as one unit;

(3) 'load profile' means a given sequence of water draw-offs, as specified in Annex VII, Table 3; each water heater meets at least one load profile;

(4) 'water draw-off' means a given combination of useful water flow rate, useful water temperature, useful energy content and peak temperature, as specified in Annex VII, Table 3;

(5) 'useful water flow rate' (f) means the minimum flow rate, expressed in litres per minute, for which hot water is contributing to the reference energy, as specified in Annex VII, Table 3;

(6) 'useful water temperature' (T_m) means the water temperature, expressed in degrees Celsius, at which hot water starts contributing to the reference energy, as specified in Annex VII, Table 3;

(7) 'useful energy content' (Q_{tap}) means the energy content of hot water, expressed in kWh, provided at a temperature equal to, or above, the useful water temperature, and at water flow rates equal to, or above, the useful water flow rate, as specified in Annex VII, Table 3;

(8) 'energy content of hot water' means the product of the specific heat capacity of water, the average temperature difference between the hot water output and cold water input, and the total mass of the hot water delivered;

(9) 'peak temperature' (T_p) means the minimum water temperature, expressed in degrees Celsius, to be achieved during water draw-off, as specified in Annex VII, Table 3;

(10) 'reference energy' (Q_{ref}) means the sum of the useful energy content of water draw-offs, expressed in kWh, in a particular load profile, as specified in Annex VII, Table 3;

(11) 'maximum load profile' means the load profile with the greatest reference energy that a water heater is able to provide while fulfilling the temperature and flow rate conditions of that load profile;

(12) 'declared load profile' means the load profile applied when determining water heating energy efficiency;

(13) 'conversion coefficient' (CC) means a coefficient reflecting the estimated 40 % average EU generation efficiency referred to in Directive 2012/27/EU of the European Parliament and of the Council [1]; the value of the conversion coefficient is $CC = 2{,}5$;

(14) 'daily electricity consumption' (Q_{elec}) means the consumption of electricity over 24 consecutive hours under the declared load profile and under given climate conditions, expressed in kWh in terms of final energy;

(15) 'daily fuel consumption' (Q_{fuel}) means the consumption of fuels over 24 consecutive hours under the declared load profile and under given climate conditions, expressed in kWh in terms of GCV, and for the purposes of point 4 in Annex VIII expressed in GJ in terms of GCV;

(16) 'gross calorific value' (GCV) means the total amount of heat released by a unit quantity of fuel when it is burned completely with oxygen and when the products of combustion are returned to ambient temperature; this quantity includes the condensation heat of any water vapour contained in the fuel and of the water vapour formed by the combustion of any hydrogen contained in the fuel;

(17) 'smart control' means a device that automatically adapts the water heating process to individual usage conditions with the aim of reducing energy consumption;

[1] OJ L 315, 14.11.2012, p. 1.

(18) 'smart control compliance' (*smart*) means the measure of whether a water heater equipped with smart controls fulfils the criterion set out in point 5 of Annex VIII;

(19) 'smart control factor' (*SCF*) means the water heating energy efficiency gain due to smart control under the conditions set out in point 3 of Annex VII;

(20) 'weekly electricity consumption with smart controls' ($Q_{elec,week,smart}$) means the weekly electricity consumption of a water heater with the smart control function enabled, expressed in kWh in terms of final energy;

(21) 'weekly fuel consumption with smart controls' ($Q_{fuel,week,smart}$) means the weekly fuel consumption of a water heater with the smart control function enabled, expressed in kWh in terms of *GCV*;

(22) 'weekly electricity consumption without smart controls' ($Q_{elec,week}$) means the weekly electricity consumption of a water heater with the smart control function disabled, expressed in kWh in terms of final energy;

(23) 'weekly fuel consumption without smart controls' ($Q_{fuel,week}$) means the weekly fuel consumption of a water heater with the smart control function disabled, expressed in kWh in terms of *GCV*;

(24) 'annual electricity consumption' (*AEC*) means the annual electricity consumption of a water heater under the declared load profile and under given climate conditions, expressed in kWh in terms of final energy;

(25) 'annual fuel consumption' (*AFC*) means the annual fossil and/or biomass fuel consumption of a water heater under the declared load profile and under given climate conditions, expressed in GJ in terms of *GCV*;

(26) 'ambient correction term' (Q_{cor}) means a term which takes into account the fact that the place where the water heater is installed is not an isothermal place, expressed in kWh;

(27) 'standby heat loss' (P_{stby}) means the heat loss of a heat pump water heater in operating modes without heat demand, expressed in kW;

(28) 'average climate conditions', 'colder climate conditions' and 'warmer climate conditions' mean the temperatures and global solar irradiance conditions characteristic for the cities of Strasbourg, Helsinki and Athens, respectively;

(29) 'annual energy consumption' (Q_{tota}) means the annual energy consumption of a solar water heater, expressed in kWh in terms of primary energy and/or kWh in terms of *GCV*;

(30) 'annual non-solar heat contribution' (Q_{nonsol}), means the annual contribution of electricity (expressed in kWh in terms of primary energy) and/or fuels (expressed in kWh in terms of *GCV*) to the useful heat output of a solar water heater or a package of water heater and solar device, taking into account the annual amount of heat captured by the solar collector and the heat losses of the solar hot water storage tank;

(31) 'solar collector' means a device designed to absorb global solar irradiance and to transfer the heat energy so produced to a fluid passing through it; it is characterised by the collector aperture area, the zero-loss efficiency, the first order coefficient, the second-order coefficient and the incidence angle modifier;

(32) 'global solar irradiance' means the rate of total incoming solar energy, both direct and diffuse, on a collector plane with an inclination of 45 degrees and southward orientation at the Earth's surface, expressed in W/m^2;

(33) 'collector aperture area' (A_{sol}) means the maximum projected area through which unconcentrated solar radiation enters the collector, expressed in m^2;

(34) 'zero-loss efficiency' (η_0) means the efficiency of the solar collector, when the solar collector mean fluid temperature is equal to the ambient temperature;

(35) 'first-order coefficient' (a_1) means the heat loss coefficient of a solar collector, expressed in $W/(m^2\ K)$;

(36) 'second-order coefficient' (a_2) means the coefficient measuring the temperature dependence of the first order coefficient, expressed in $W/(m^2\ K^2)$;

(37) 'incidence angle modifier' (*IAM*) means the ratio of the useful heat output of the solar collector at a given incidence angle and its useful heat output at an incidence angle of 0 degrees;

(38) 'incidence angle' means the angle between the direction to the sun and the direction perpendicular to the solar collector aperture;

(39) 'solar hot water storage tank' means a hot water storage tank storing heat energy produced by one or more solar collectors;

(40) 'heat generator water heating energy efficiency' ($\eta_{wh,nonsol}$) means the water heating energy efficiency of a heat generator which is part of a solar water heater, expressed in %, established under average climate conditions and without using solar heat input;

(41) 'auxiliary electricity consumption' (Q_{aux}), for the purpose of Figure 1 in Annex IV referred to as 'auxiliary electricity', means the annual electricity consumption of a solar water heater or a solar-only system that is due to the pump power consumption and the standby power consumption, expressed in kWh in terms of final energy;

(42) 'pump power consumption' (*solpump*) means the rated electrical power consumption of the pump in the collector loop of a solar water heater or solar-only system, expressed in W;

(43) 'standby power consumption' (*solstandby*) means the rated electrical power consumption of a solar water heater or solar-only system when the pump and the heat generator are inactive, expressed in W;

(44) 'model identifier' means the code, usually alphanumeric, which distinguishes a specific water heater, hot water storage tank, solar device or package of water heater and solar device model from other models with the same trade mark, supplier's name or dealer's name.

ANNEX II

Energy efficiency classes

1. WATER HEATING ENERGY EFFICIENCY CLASSES OF WATER HEATERS

The water heating energy efficiency class of a water heater shall be determined on the basis of its water heating energy efficiency as set out in Table 1.

The water heating energy efficiency of a water heater shall be calculated in accordance with point 3 of Annex VIII, for solar water heaters and heat pump water heaters under average climate conditions.

Table 1

Water heating energy efficiency classes of water heaters, categorised by declared load profiles, η_{wh} in %

	3XS	XXS	XS	S	M	L	XL	XXL
A^{+++}	$\eta_{wh} \geq 62$	$\eta_{wh} \geq 62$	$\eta_{wh} \geq 69$	$\eta_{wh} \geq 90$	$\eta_{wh} \geq 163$	$\eta_{wh} \geq 188$	$\eta_{wh} \geq 200$	$\eta_{wh} \geq 213$
A^{++}	$53 \leq \eta_{wh} < 62$	$53 \leq \eta_{wh} < 62$	$61 \leq \eta_{wh} < 69$	$72 \leq \eta_{wh} < 90$	$130 \leq \eta_{wh} < 163$	$150 \leq \eta_{wh} < 188$	$160 \leq \eta_{wh} < 200$	$170 \leq \eta_{wh} < 213$
A^{+}	$44 \leq \eta_{wh} < 53$	$44 \leq \eta_{wh} < 53$	$53 \leq \eta_{wh} < 61$	$55 \leq \eta_{wh} < 72$	$100 \leq \eta_{wh} < 130$	$115 \leq \eta_{wh} < 150$	$123 \leq \eta_{wh} < 160$	$131 \leq \eta_{wh} < 170$
A	$35 \leq \eta_{wh} < 44$	$35 \leq \eta_{wh} < 44$	$38 \leq \eta_{wh} < 53$	$38 \leq \eta_{wh} < 55$	$65 \leq \eta_{wh} < 100$	$75 \leq \eta_{wh} < 115$	$80 \leq \eta_{wh} < 123$	$85 \leq \eta_{wh} < 131$
B	$32 \leq \eta_{wh} < 35$	$32 \leq \eta_{wh} < 35$	$35 \leq \eta_{wh} < 38$	$35 \leq \eta_{wh} < 38$	$39 \leq \eta_{wh} < 65$	$50 \leq \eta_{wh} < 75$	$55 \leq \eta_{wh} < 80$	$60 \leq \eta_{wh} < 85$
C	$29 \leq \eta_{wh} < 32$	$29 \leq \eta_{wh} < 32$	$32 \leq \eta_{wh} < 35$	$32 \leq \eta_{wh} < 35$	$36 \leq \eta_{wh} < 39$	$37 \leq \eta_{wh} < 50$	$38 \leq \eta_{wh} < 55$	$40 \leq \eta_{wh} < 60$
D	$26 \leq \eta_{wh} < 29$	$26 \leq \eta_{wh} < 29$	$29 \leq \eta_{wh} < 32$	$29 \leq \eta_{wh} < 32$	$33 \leq \eta_{wh} < 36$	$34 \leq \eta_{wh} < 37$	$35 \leq \eta_{wh} < 38$	$36 \leq \eta_{wh} < 40$
E	$22 \leq \eta_{wh} < 26$	$23 \leq \eta_{wh} < 26$	$26 \leq \eta_{wh} < 29$	$26 \leq \eta_{wh} < 29$	$30 \leq \eta_{wh} < 33$	$30 \leq \eta_{wh} < 34$	$30 \leq \eta_{wh} < 35$	$32 \leq \eta_{wh} < 36$
F	$19 \leq \eta_{wh} < 22$	$20 \leq \eta_{wh} < 23$	$23 \leq \eta_{wh} < 26$	$23 \leq \eta_{wh} < 26$	$27 \leq \eta_{wh} < 30$	$27 \leq \eta_{wh} < 30$	$27 \leq \eta_{wh} < 30$	$28 \leq \eta_{wh} < 32$
G	$\eta_{wh} < 19$	$\eta_{wh} < 20$	$\eta_{wh} < 23$	$\eta_{wh} < 23$	$\eta_{wh} < 27$	$\eta_{wh} < 27$	$\eta_{wh} < 27$	$\eta_{wh} < 28$

2. ENERGY EFFICIENCY CLASSES OF HOT WATER STORAGE TANKS

The energy efficiency class of a hot water storage tank shall be determined on the basis of its standing loss as set out in Table 2.

Table 2

Energy efficiency classes of hot water storage tanks

Energy efficiency class	Standing loss S in Watts, with storage volume V in litres
A+	$S < 5{,}5 + 3{,}16 \cdot V^{0,4}$
A	$5{,}5 + 3{,}16 \cdot V^{0,4} \leq S < 8{,}5 + 4{,}25 \cdot V^{0,4}$
B	$8{,}5 + 4{,}25 \cdot V^{0,4} \leq S < 12 + 5{,}93 \cdot V^{0,4}$
C	$12 + 5{,}93 \cdot V^{0,4} \leq S < 16{,}66 + 8{,}33 \cdot V^{0,4}$
D	$16{,}66 + 8{,}33 \cdot V^{0,4} \leq S < 21 + 10{,}33 \cdot V^{0,4}$
E	$21 + 10{,}33 \cdot V^{0,4} \leq S < 26 + 13{,}66 \cdot V^{0,4}$
F	$26 + 13{,}66 \cdot V^{0,4} \leq S < 31 + 16{,}66 \cdot V^{0,4}$
G	$S > 31 + 16{,}66 \cdot V^{0,4}$

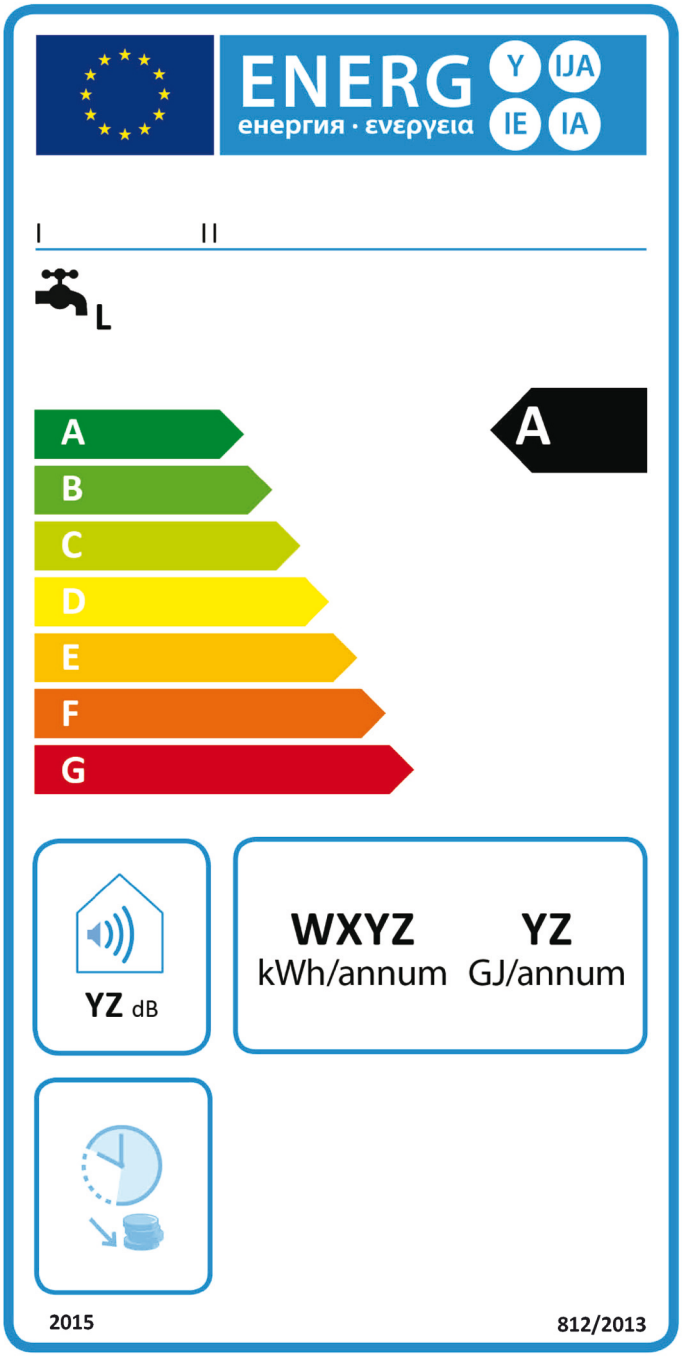
ANNEX III

The labels

1. WATER HEATERS

1.1. **Label 1**

1.1.1. *Conventional water heaters in water heating energy efficiency classes A to G*



I, II

III

IV

VI, V

VII

(a) The following information shall be included in the label:

I. supplier's name or trade mark;

II. supplier's model identifier;

III. the water heating function, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII;

IV. the water heating energy efficiency class, determined in accordance with point 1 of Annex II; the head of the arrow containing the water heating energy efficiency class of the water heater shall be placed at the same height as the head of the relevant energy efficiency class;

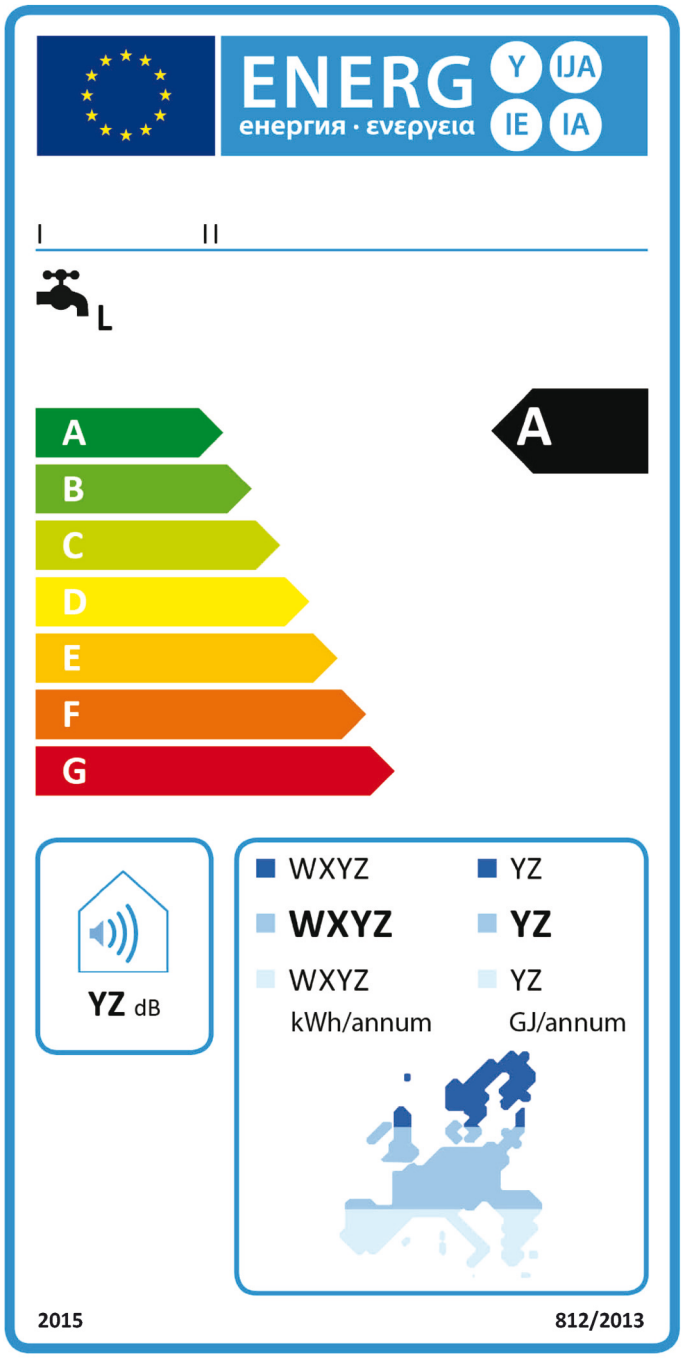
V. the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII;

VI. the sound power level L_{WA}, indoors, in dB, rounded to the nearest integer;

VII. for conventional water heaters able to work only during off-peak hours, the pictogram referred to in point 4(d)(10) of this Annex may be added.

(b) The design aspects of the label for conventional water heaters shall be in accordance with point 4 of this Annex.

1.1.2. *Solar water heaters in water heating energy efficiency classes A to G*



I, II

III

IV

VII, V

VI

(a) The following information shall be included in the label:

I. supplier's name or trade mark;

II. supplier's model identifier;

III. the water heating function, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII;

IV. the water heating energy efficiency class under average climate conditions, determined in accordance with point 1 of Annex II; the head of the arrow containing the water heating energy efficiency class of the water heater shall be placed at the same height as the head of the relevant energy efficiency class;

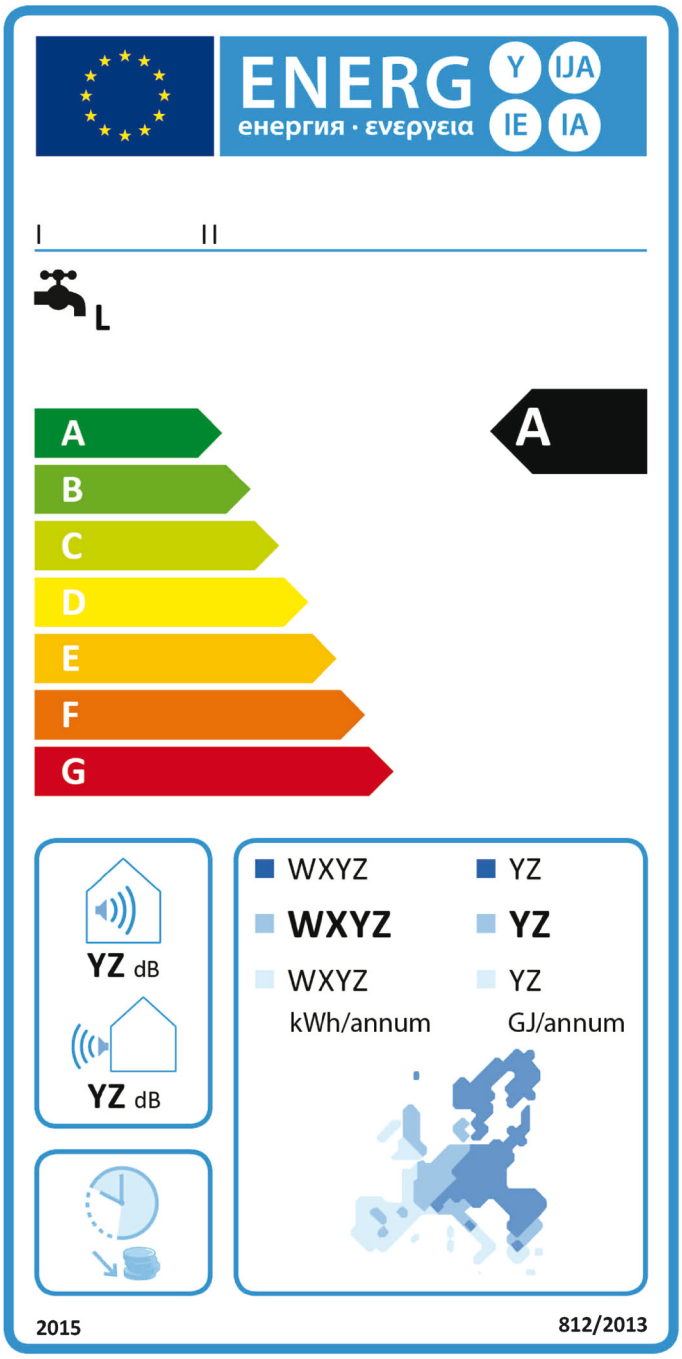
V. the annual electricity consumption in kWh in terms of final energy or the annual fuel consumption in GJ in terms of *GCV*, under average, colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII;

VI. European solar map displaying three indicative global solar irradiance zones;

VII. the sound power level L_{WA}, indoors, in dB, rounded to the nearest integer.

(b) The design aspects of the label for solar water heaters shall be in accordance with point 5 of this Annex.

1.1.3. *Heat pump water heaters in water heating energy efficiency classes A to G*



I, II

III

IV

VII, V

VIII, VI

(a) The following information shall be included in the label:

I. supplier's name or trade mark;

II. supplier's model identifier;

III. the water heating function, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII;

IV. the water heating energy efficiency class under average climate conditions, determined in accordance with point 1 of Annex II; the head of the arrow containing the water heating energy efficiency class of the water heater shall be placed at the same height as the head of the relevant energy efficiency class;

V. the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, under average, colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII;

VI. European temperature map displaying three indicative temperature zones;

VII. the sound power level L_{WA}, indoors (if applicable) and outdoors, in dB, rounded to the nearest integer;

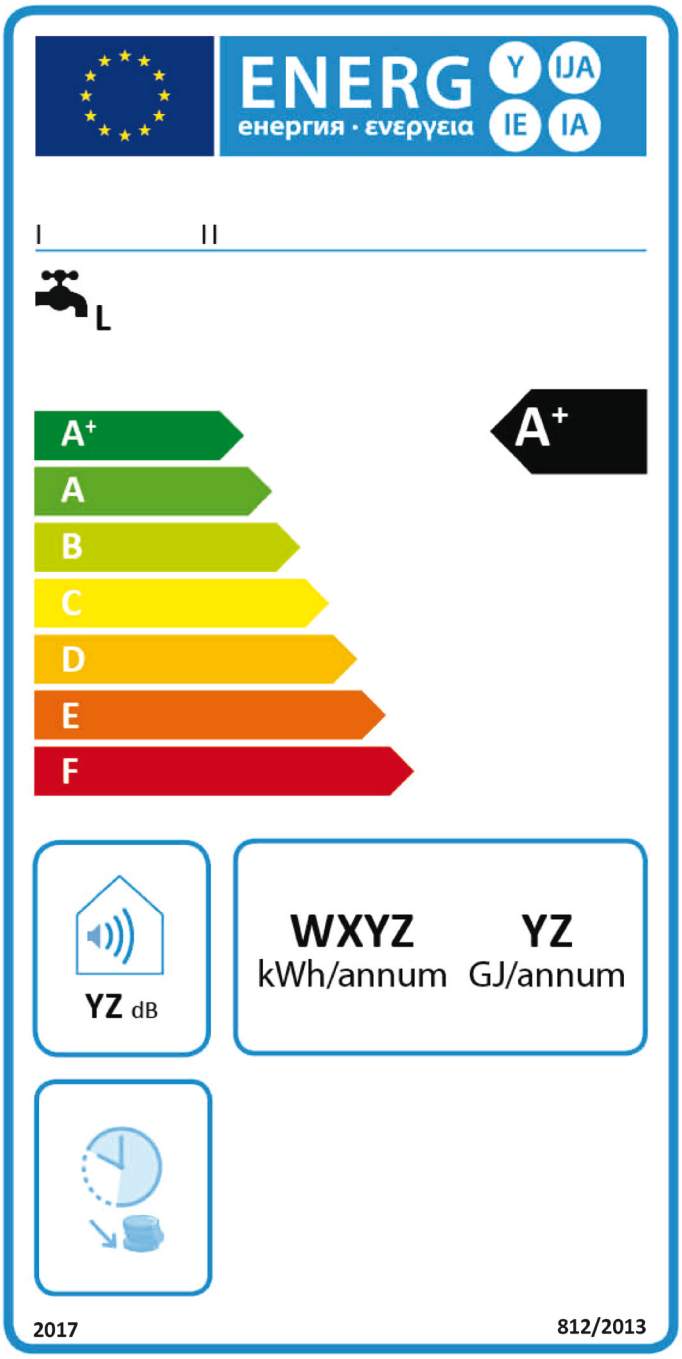
VIII. for heat pump water heaters able to work only during off-peak hours, the pictogram referred to in point 6(d)(11) of this Annex may be added.

(b) The design aspects of the label for heat pump water heaters shall be in accordance with point 6 of this Annex. By way of exception, where a model has been granted an 'EU Ecolabel' under Regulation (EC) No 66/2010 of the European Parliament and of the Council [1], a copy of the EU Ecolabel may be added.

[1] OJ L 27, 30.1.2010, p. 1.

1.2. **Label 2**

1.2.1. *Conventional water heaters in water heating energy efficiency classes A^+ to F*



I, II

III

IV

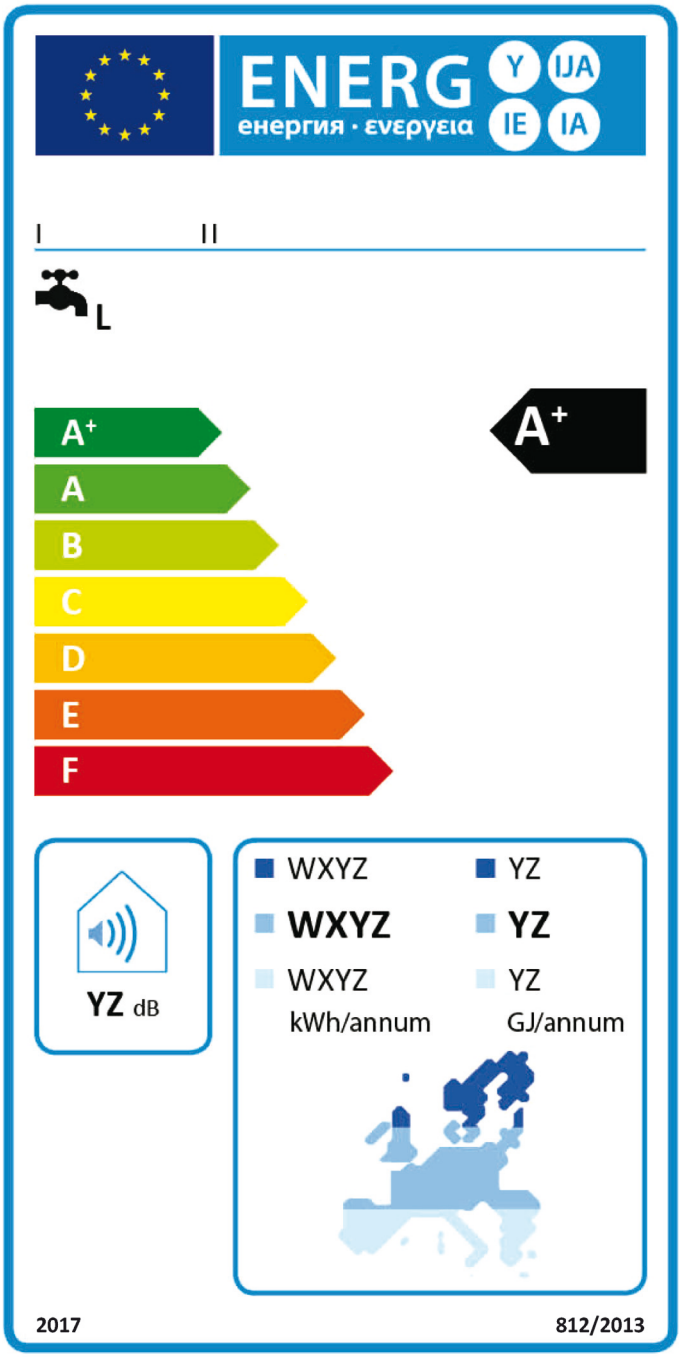
VI, V

VII

(a) The information listed in point 1.1.1(a) of this Annex shall be included in the label.

(b) The design aspects of the label for conventional water heaters shall be in accordance with point 4 of this Annex.

1.2.2. *Solar water heaters in water heating energy efficiency classes A^+ to F*



I, II

III

IV

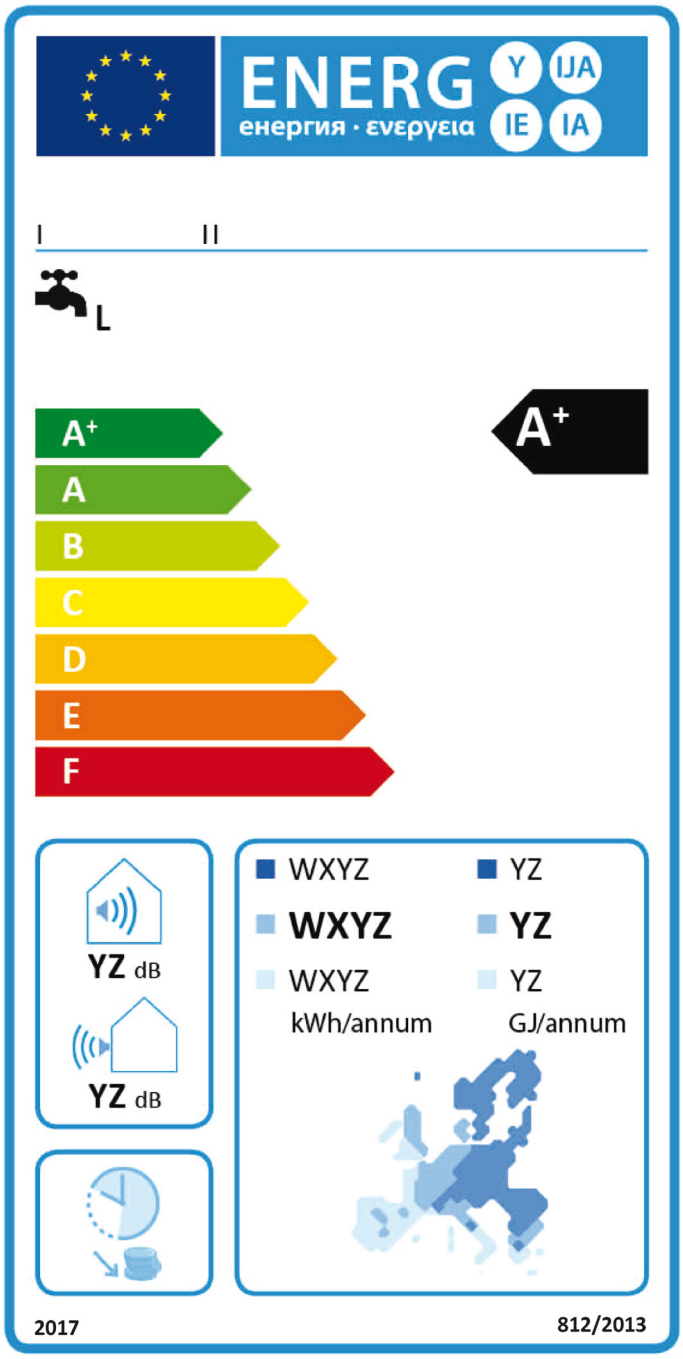
VII, V

VI

(a) The information listed in point 1.1.2(a) of this Annex shall be included in the label.

(b) The design aspects of the label for solar water heaters shall be in accordance with point 5 of this Annex.

1.2.3. *Heat pump water heaters in water heating energy efficiency classes A^+ to F*



I, II

III

IV

VII, V

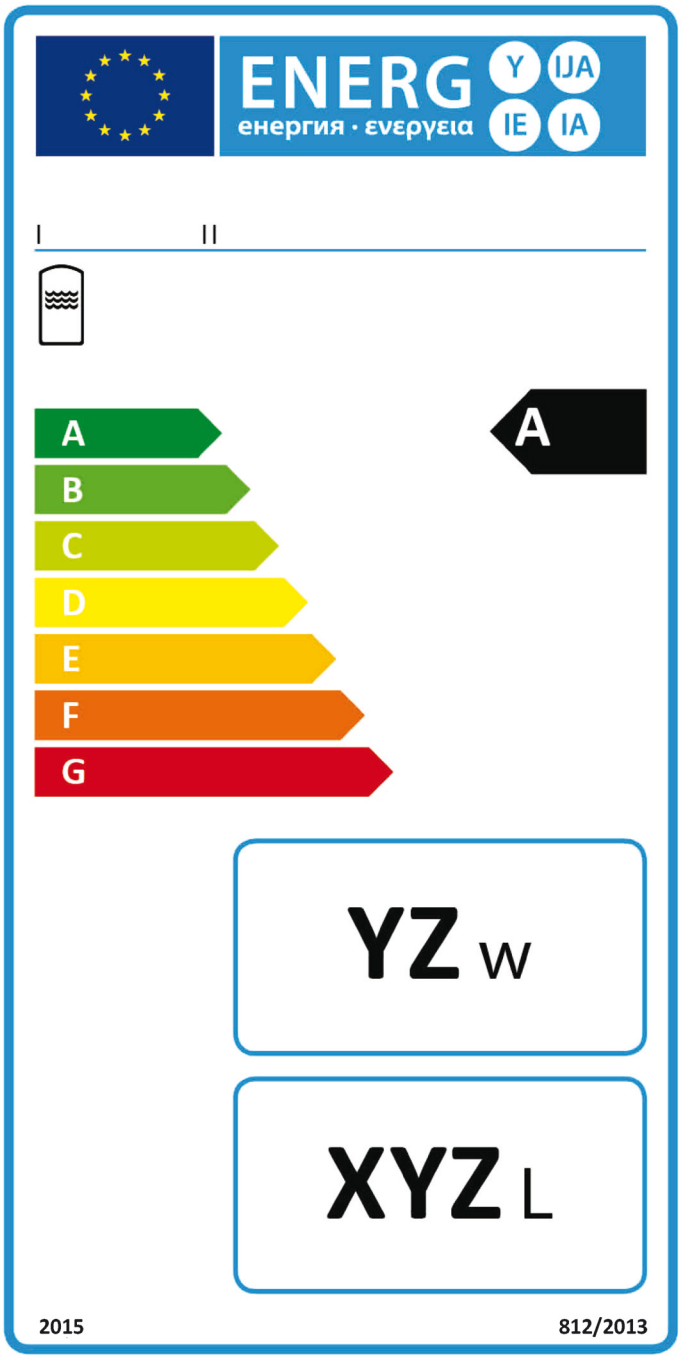
VIII, VI

(a) The information listed in point 1.1.3(a) of this Annex shall be included in the label.

(b) The design aspects of the label for heat pump water heaters shall be in accordance with point 6 of this Annex.

2. HOT WATER STORAGE TANKS

2.1. **Label 1 for hot water storage tanks in energy efficiency classes A to G**



I, II

III

IV

V

VI

(a) The following information shall be included in the label:

I. supplier's name or trade mark;

II. supplier's model identifier;

III. the water storage function;

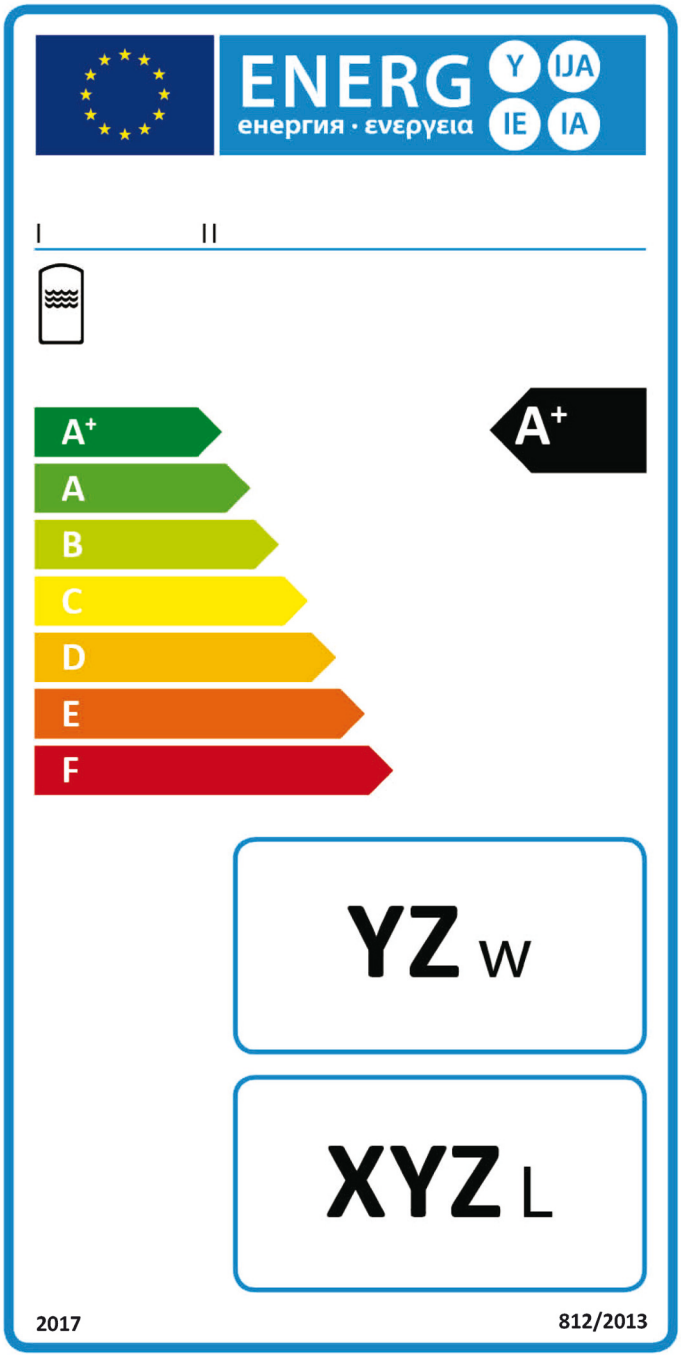
IV. the energy efficiency class, determined in accordance with point 2 of Annex II; the head of the arrow containing the energy efficiency class of the hot water storage tank shall be placed at the same height as the head of the relevant energy efficiency class;

V. the standing loss in W, rounded to the nearest integer;

VI. the hot water storage tank volume in litres, rounded to the nearest integer.

(b) The design aspects of the label for hot water storage tanks shall be in accordance with point 7 of this Annex.

2.2. **Label 2 for hot water storage tanks in energy efficiency classes A^+ to F**

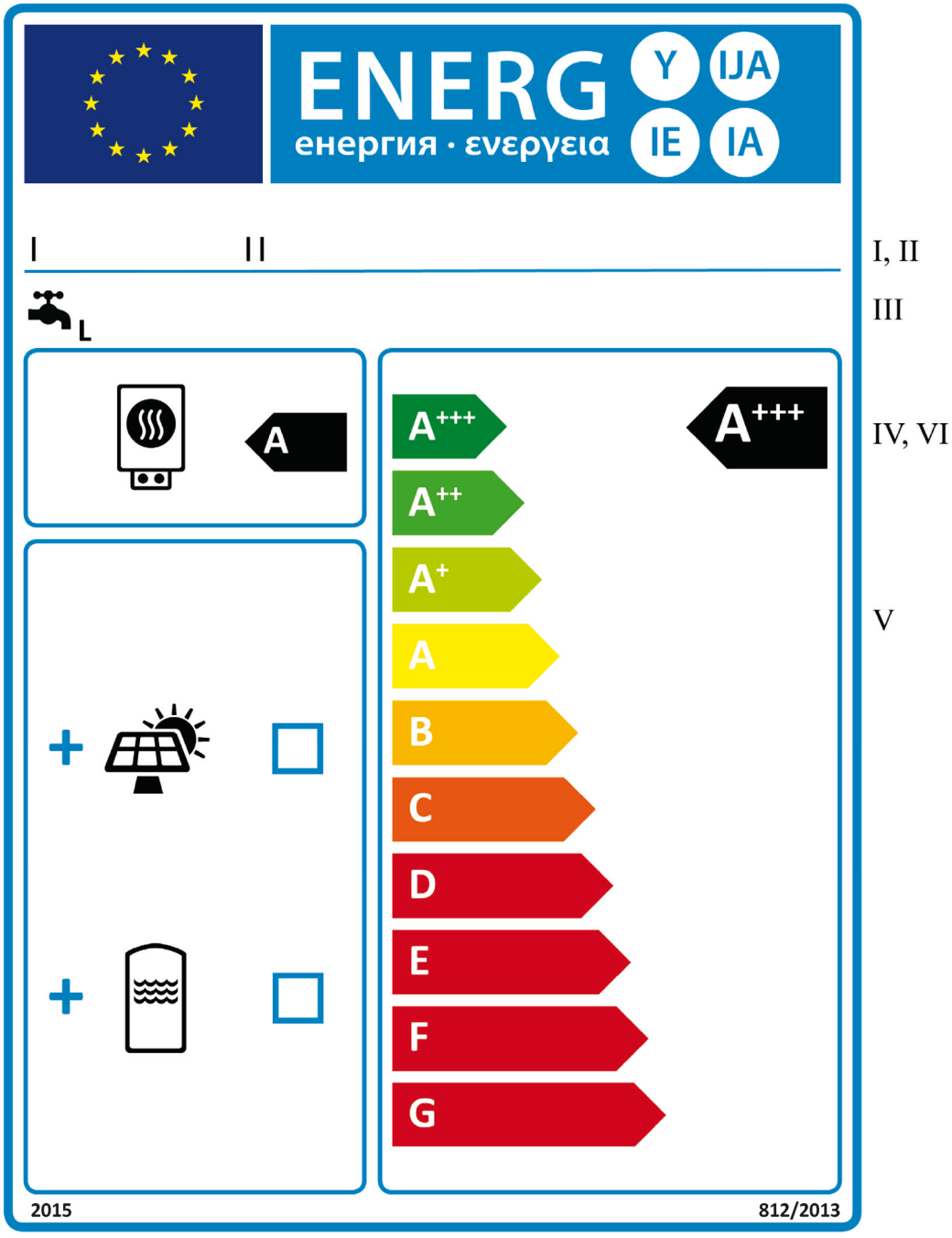


(a) The information listed in point 2.1(a) of this Annex shall be included in the label.

(b) The design aspects of the label for hot water storage tanks shall be in accordance with point 7 of this Annex.

3. PACKAGES OF WATER HEATER AND SOLAR DEVICE

Label for packages of water heater and solar device in water heating energy efficiency classes A^{+++} to G



(a) The following information shall be included in the label:

I. dealer's and/or supplier's name or trade mark;

II. dealer's and/or supplier's model(s) identifier;

III. the water heating function, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII;

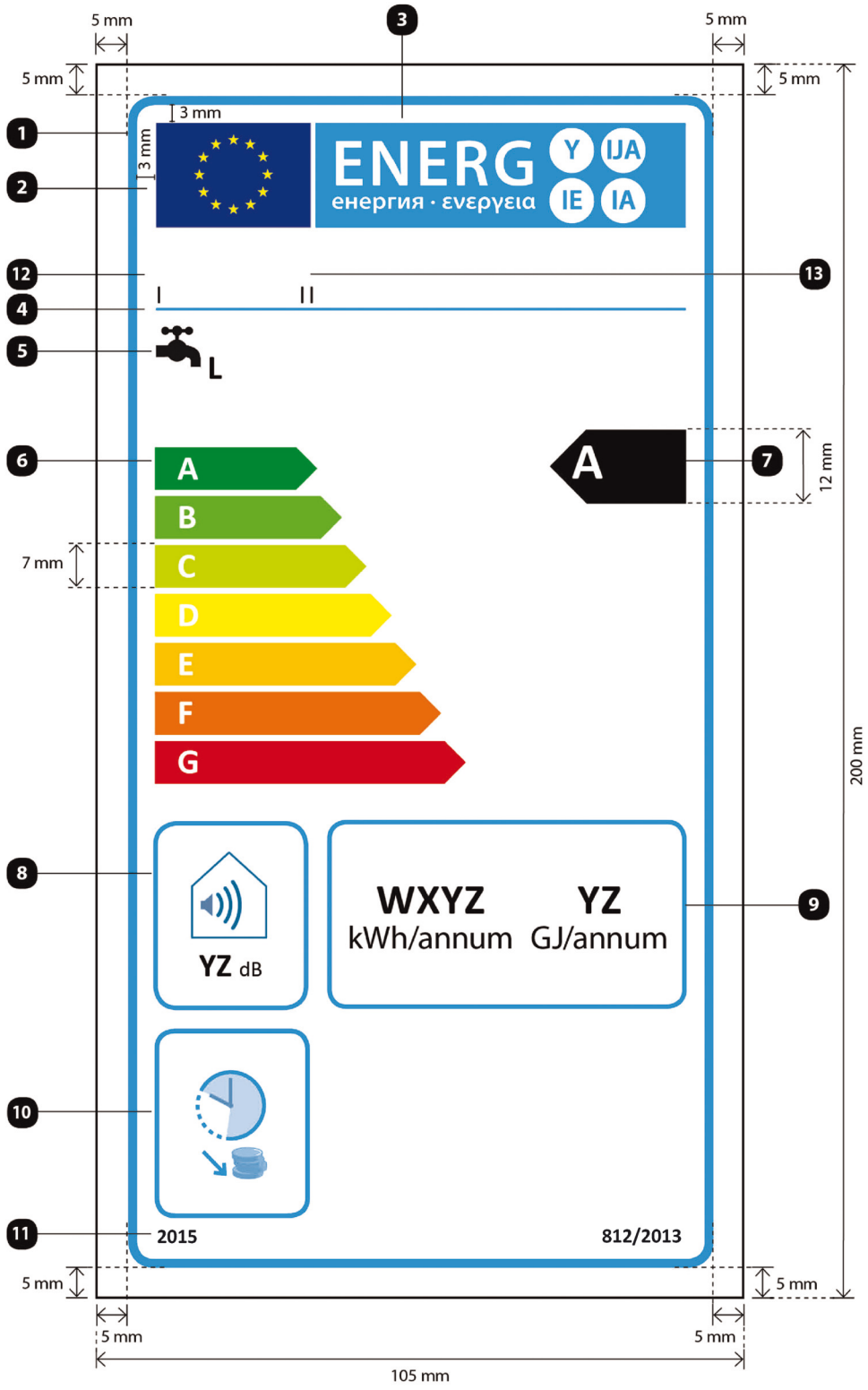
IV. the water heating energy efficiency class of the water heater, determined in accordance with point 1 of Annex II;

V. indication of whether a solar collector and hot water storage tank may be included in the package of water heater and solar device;

VI. the water heating energy efficiency class of the package of water heater and solar device, determined in accordance with point 4 of Annex IV; the head of the arrow containing the water heating energy efficiency class of the package of water heater and solar device shall be placed at the same height as the head of the relevant energy efficiency class.

(b) The design aspects of the label for packages of water heater and solar device shall be in accordance with point 8 of this Annex. For packages of water heater and solar device in water heating energy efficiency classes A^{+++} to D, the last classes E to G in the A^{+++} to G scale may be omitted.

4. The design of the label for conventional water heaters shall be the following:



Whereby:

(a) The label shall be at least 105 mm wide and 200 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 4 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 86 mm, height: 17 mm.

❹ **Sub-logos border:** 1 pt, colour: cyan 100 %, length: 86 mm.

❺ **Water heating function:**

— **Pictogram** as depicted, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII: Calibri bold 16 pt, 100 % black.

❻ **A-G or A^+-F scale:**

— **Arrow:** height: 7 mm, gap: 1 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 16 pt, capitals, white, '+' symbol: superscript.

❼ **Water heating energy efficiency class:**

— **Arrow:** width: 22 mm, height: 12 mm, 100 % black,

— **Text:** Calibri bold 24 pt, capitals, white, '+' symbol: superscript.

❽ **Sound power level, indoors:**

— **Pictogram** as depicted,

— **Border:** 2 pt – colour: cyan 100 % – round corners: 3,5 mm,

— **Value 'YZ':** Calibri bold 15 pt, 100 % black,

— **Text 'dB':** Calibri regular 10 pt, 100 % black.

❾ **Annual energy consumption in kWh/annum or GJ/annum:**

— **Border:** 2 pt – colour: cyan 100 % – round corners: 3,5 mm,

— **Value 'WXYZ' or 'YZ':** Calibri bold at least 20 pt, 100 % black,

— **Text 'kWh/annum' or 'GJ/annum':** Calibri regular at least 15 pt, 100 % black.

❿ **If applicable, off-peak fitness:**

— **Pictogram** as depicted,

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm.

⓫ **Year of label introduction and number of Regulation:**

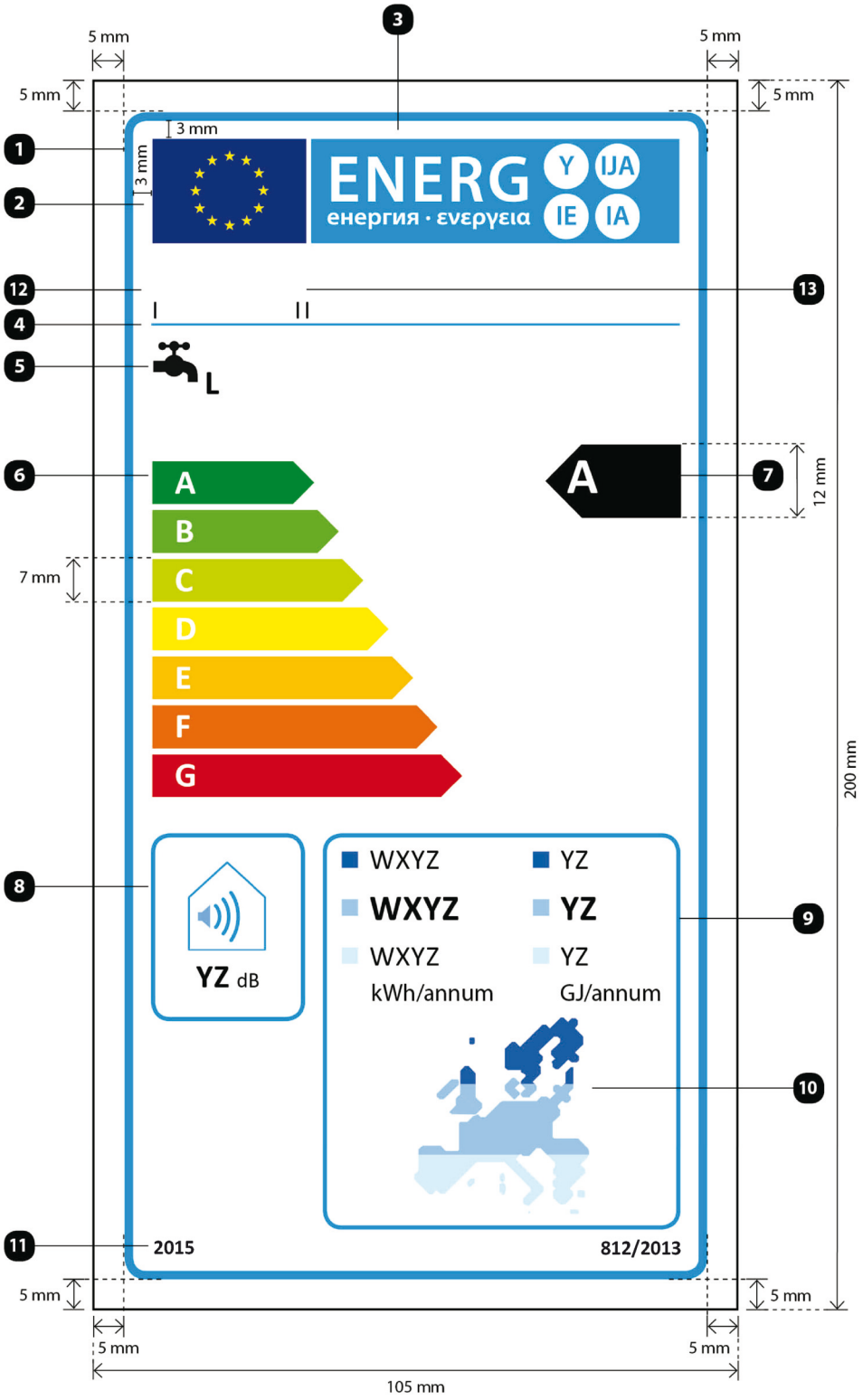
— **Text:** Calibri bold 10 pt.

⓬ **Supplier's name or trademark.**

⓭ **Supplier's model identifier:**

The supplier's name or trade mark and model identifier shall fit in a space of 86 × 12 mm.

5. The design of the label for solar water heaters shall be the following:



Whereby:

(a) The label shall be at least 105 mm wide and 200 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 4 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 86 mm, height: 17 mm.

❹ **Sub-logos border:** 1 pt, colour: cyan 100 %, length: 86 mm.

❺ **Water heating function:**

— **Pictogram** as depicted, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII: Calibri bold 16 pt, 100 % black.

❻ **A-G or A^+-F scale:**

— **Arrow:** height: 7 mm, gap: 1 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 16 pt, capitals, white, '+' symbol: superscript.

❼ **Water heating energy efficiency class:**

— **Arrow:** width: 22 mm, height: 12 mm, 100 % black,

— **Text:** Calibri bold 24 pt, capitals, white, '+' symbol: superscript.

❽ **Sound power level, indoors:**

— **Pictogram** as depicted,

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Value 'YZ':** Calibri bold 15 pt, 100 % black,

— **Text 'dB':** Calibri regular 10 pt, 100 % black.

❾ **Annual energy consumption in kWh/annum or GJ/annum:**

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Values 'WXYZ' or 'YZ':** Calibri at least 13 pt, 100 % black,

— **Text 'kWh/annum' or 'GJ/annum':** Calibri regular at least 11 pt, 100 % black.

❿ **European solar map and colour squares:**

— **Pictogram** as depicted,

— **Colours**: Dark blue: 86-51-00-00,

Middle blue: 53-08-00-00,

Light blue: 25-00-02-00.

⓫ **Year of label introduction and number of Regulation:**

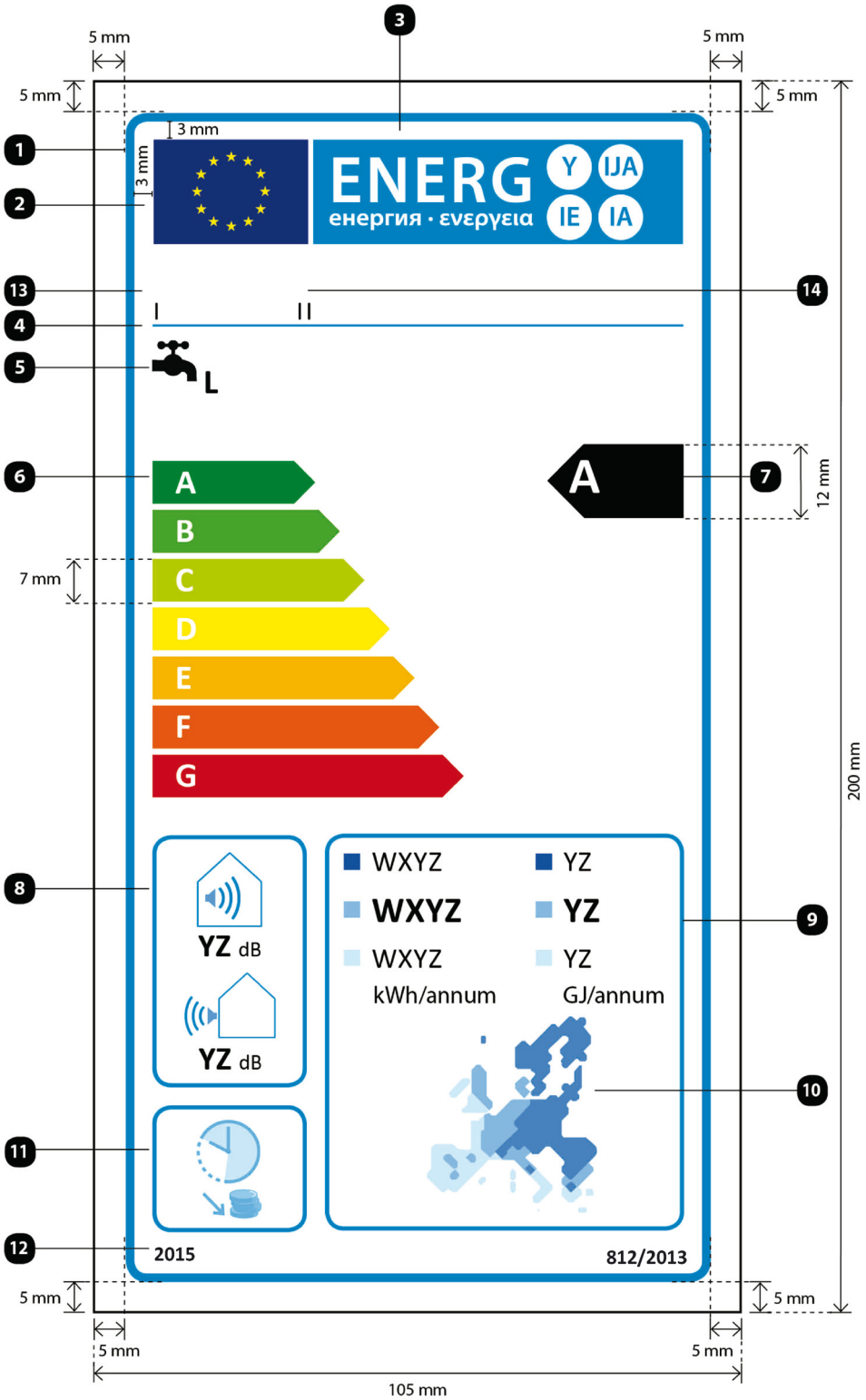
— **Text:** Calibri bold 10 pt.

⓬ **Supplier's name or trademark.**

⓭ **Supplier's model identifier:**

The supplier's name or trade mark and model identifier shall fit in a space of 86 × 12 mm.

6. The design of the label for heat pump water heaters shall be the following:



Whereby:

(a) The label shall be at least 105 mm wide and 200 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 4 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 86 mm, height: 17 mm.

❹ **Sub-logos border:** 1 pt, colour: cyan 100 %, length: 86 mm.

❺ **Water heating function:**

— **Pictogram** as depicted, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII: Calibri bold 16 pt, 100 % black.

❻ **A-G or A^+-F scale:**

— **Arrow:** height: 7 mm, gap: 1 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 16 pt, capitals, white, '+' symbol: superscript.

❼ **Water heating energy efficiency class:**

— **Arrow:** width: 22 mm, height: 12 mm, 100 % black,

— **Text:** Calibri bold 24 pt, capitals, white, '+' symbol: superscript.

❽ **Sound power level, indoors (if applicable) and outdoors:**

— **Pictogram** as depicted,

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Value 'YZ':** Calibri bold 15 pt, 100 % black,

— **Text 'dB':** Calibri regular 10 pt, 100 % black.

❾ **Annual energy consumption in kWh/annum or GJ/annum:**

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Values 'WXYZ' or 'YZ':** Calibri at least 13 pt, 100 % black,

— **Text 'kWh/annum' or 'GJ/annum':** Calibri regular at least 11 pt, 100 % black.

❿ **European temperature map and colour squares:**

— **Pictogram** as depicted,

— **Colours**: Dark blue: 86-51-00-00,

Middle blue: 53-08-00-00,

Light blue: 25-00-02-00.

⓫ **If applicable, off-peak fitness:**

— **Pictogram** as depicted,

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm.

⓬ **Year of label introduction and number of Regulation:**

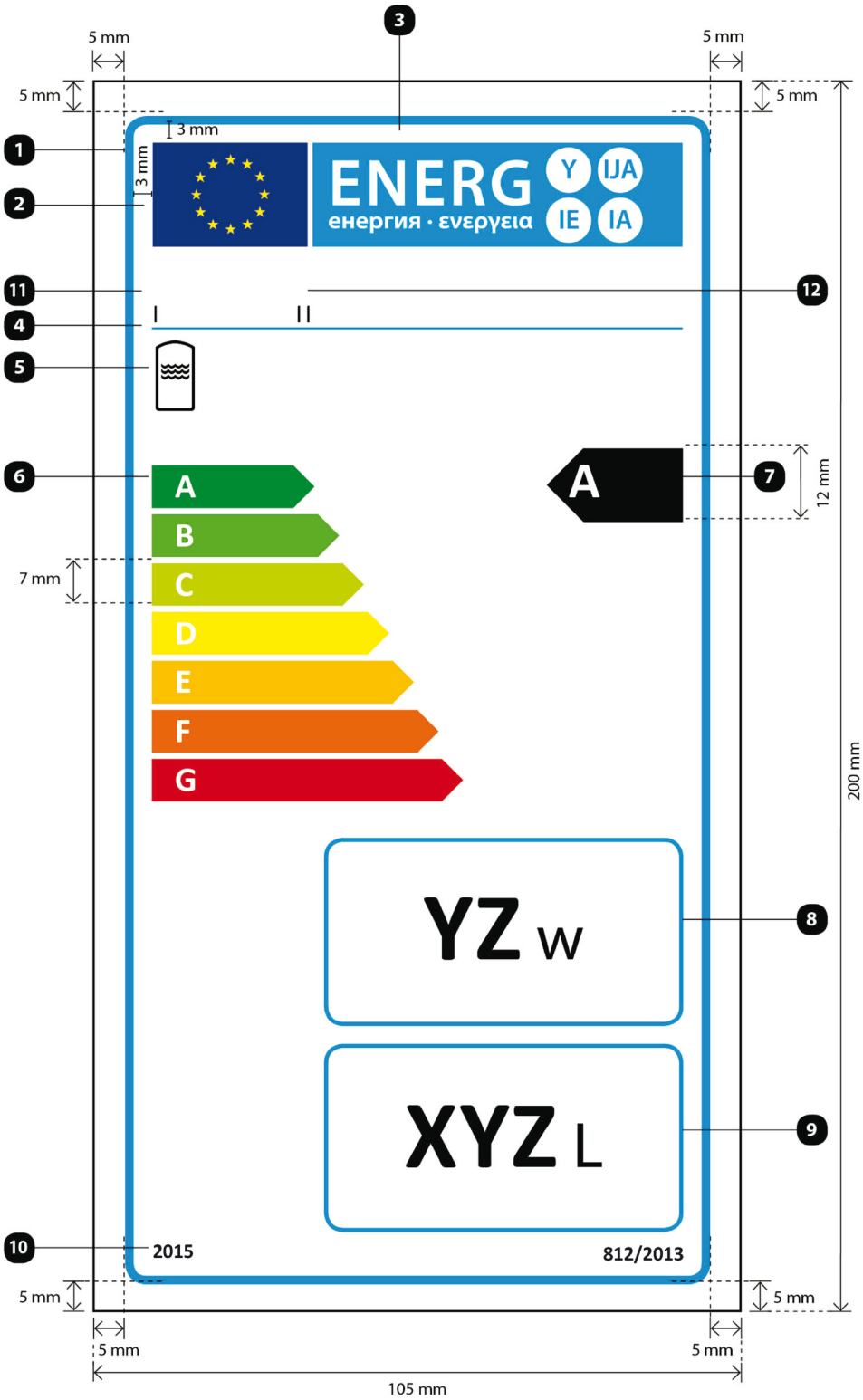
— **Text:** Calibri bold 10 pt.

⓭ **Supplier's name or trademark.**

⓮ **Supplier's model identifier:**

The supplier's name or trade mark and model identifier shall fit in a space of 86 × 12 mm.

7. The design of the label for hot water storage tanks shall be the following:



Whereby:

(a) The label shall be at least 105 mm wide and 200 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 4 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 86 mm, height: 17 mm.

❹ **Sub-logos border:** 1 pt, colour: cyan 100 %, length: 86 mm.

❺ **Storage function:**

— **Pictogram** as depicted.

❻ **A-G or A^+-F scale:**

— **Arrow:** height: 7 mm, gap: 1 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Last class: 00-X-X-00,

— **Text:** Calibri bold 16 pt, capitals, white, '+' symbol: superscript.

❼ **Energy efficiency class:**

— **Arrow:** width: 22 mm, height: 12 mm, 100 % black,

— **Text:** Calibri bold 24 pt, capitals, white, '+' symbol: superscript.

❽ **Standing loss:**

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Value 'YZ':** Calibri bold 45 pt, 100 % black,

— **Text 'W':** Calibri regular 30 pt, 100 % black.

❾ **Storage volume:**

— **Border:** 2 pt, colour: cyan 100 %, round corners: 3,5 mm,

— **Value 'XYZ':** Calibri bold 45 pt, 100 % black,

— **Text 'L':** Calibri regular 30 pt, 100 % black.

❿ **Year of label introduction and number of Regulation:**

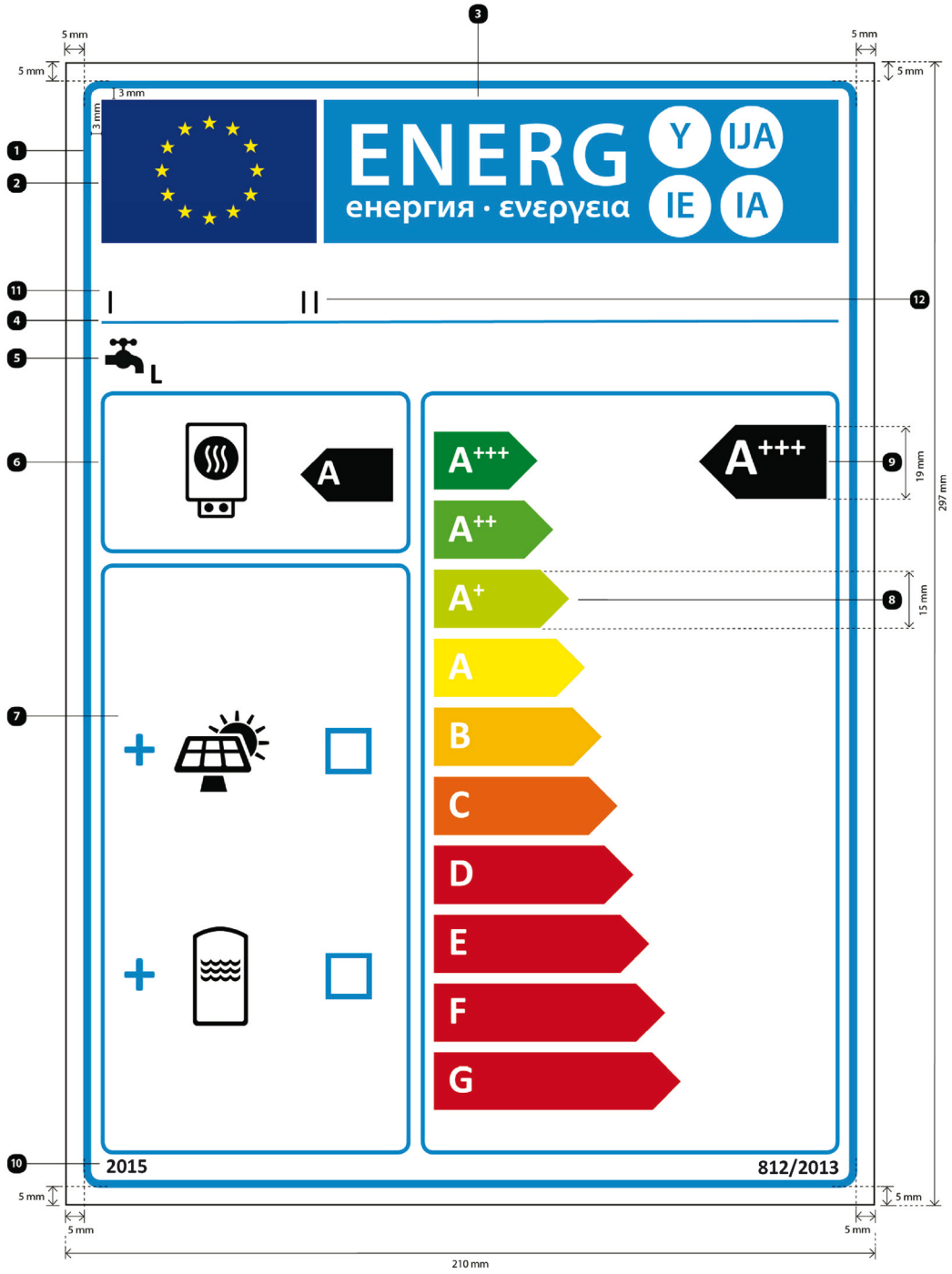
— **Text:** Calibri bold 10 pt.

⓫ **Supplier's name or trademark.**

⓬ **Supplier's model identifier:**

The supplier's name or trade mark and model identifier shall fit in a space of 86 × 12 mm.

8. The design of the label for packages of water heater and solar device shall be the following:



Whereby:

(a) The label shall be at least 210 mm wide and 297 mm high. Where the label is printed in a larger format, its content shall nevertheless remain proportionate to the specifications above.

(b) The background shall be white.

(c) Colours are coded as CMYK — cyan, magenta, yellow and black, following this example: 00-70-X-00: 0 % cyan, 70 % magenta, 100 % yellow, 0 % black.

(d) The label shall fulfil all of the following requirements (numbers refer to the figure above):

❶ **EU label border stroke:** 6 pt, colour: cyan 100 %, round corners: 3,5 mm.

❷ **EU logo:** Colours: X-80-00-00 and 00-00-X-00.

❸ **Energy label:** Colour: X-00-00-00. Pictogram as depicted: EU logo + energy label: width: 191 mm, height: 37 mm.

❹ **Sub-logos border:** 2 pt, colour: cyan 100 %, length: 191 mm.

❺ **Water heating function:**

— **Pictogram** as depicted, including the declared load profile expressed as the appropriate letter in accordance with Table 3 of Annex VII: Calibri bold 22 pt, 100 % black.

❻ **Water Heater:**

— **Pictogram** as depicted.

— **Water heating energy efficiency class of water heater:**

Arrow: width: 24 mm, height: 14 mm, 100 % black,

Text: Calibri bold 28 pt, capitals, white,

— **Border:** 3 pt, colour: cyan 100 %, round corners: 3,5 mm.

❼ **Package with solar collector and/or hot water storage tank:**

— **Pictograms** as depicted,

— **'+' symbol:** Calibri bold 50 pt, cyan 100 %,

— **Boxes:** width: 12 mm, height: 12 mm, border: 4 pt, cyan 100 %,

— **Border:** 3 pt – colour: cyan 100 % – round corners: 3,5 mm.

❽ **A^{+++}-G scale with border:**

— **Arrow:** height: 15 mm, gap: 3 mm, colours:

Highest class: X-00-X-00,

Second class: 70-00-X-00,

Third class: 30-00-X-00,

Fourth class: 00-00-X-00,

Fifth class: 00-30-X-00,

Sixth class: 00-70-X-00,

Seventh class: 00-X-X-00,

If applicable, last classes: 00-X-X-00,

— **Text:** Calibri bold 30 pt, capitals, white, '+' symbols: superscript, aligned on a single row,

— **Border:** 3 pt, colour: cyan 100 %, round corners: 3,5 mm.

❾ **Water heating energy efficiency class for package of water heater and solar device:**

— **Arrow:** width: 33 mm, height: 19 mm, 100 % black,

— **Text:** Calibri bold 40 pt, capitals, white, '+' symbols: superscript, aligned on a single row.

❿ **Year of label introduction and number of Regulation:**

— **Text:** Calibri bold 12 pt.

⓫ **Dealer's and/or supplier's name or trademark.**

⓬ **Dealer's and/or supplier's model identifier:**

The dealer's and/or supplier's name or trade mark and model identifier shall fit in a space of 191 × 19 mm.

ANNEX IV

Product Fiche

1. WATER HEATERS

1.1. The information in the product fiche of the water heater shall be provided in the following order and shall be included in the product brochure or other literature provided with the product:

(a) supplier's name or trade mark;

(b) supplier's model identifier;

(c) the declared load profile, expressed by the appropriate letter and typical usage in accordance with Table 3 of Annex VII;

(d) the water heating energy efficiency class of the model, determined in accordance with point 1 of Annex II, whereby: for solar water heaters and heat pump water heaters, under average climate conditions;

(e) the water heating energy efficiency in %, rounded to the nearest integer and calculated in accordance with point 3 of Annex VIII, whereby: for solar water heaters and heat pump water heaters, under average climate conditions;

(f) the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII, whereby: for solar water heaters and heat pump water heaters, under average climate conditions;

(g) if applicable, other load profiles for which the water heater is suitable to use and the corresponding water heating energy efficiency and annual electricity consumption as set out in points (e) and (f);

(h) the thermostat temperature settings of the water heater, as placed on the market by the supplier;

(i) the sound power level L_{WA}, indoors, in dB, rounded to the nearest integer (for heat pump water heaters if applicable);

(j) if applicable, an indication that the water heater is able to work only during off-peak hours;

(k) any specific precautions that shall be taken when the water heater is assembled, installed or maintained;

(l) where the value of *smart* is declared as being '1', an indication that the information on water heating energy efficiency, annual electricity and fuel consumption, as applicable, relate to enabled smart control settings only;

in addition, for solar water heaters and heat pump water heaters:

(m) the water heating energy efficiency in %, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 3 of Annex VIII;

(n) the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII;

in addition, for solar water heaters:

(o) the collector aperture area in m^2, to two decimal places;

(p) the zero-loss efficiency, to three decimal places;

(q) the first-order coefficient in $W/(m^2\ K)$, to two decimal places;

(r) the second-order coefficient in $W/(m^2\ K^2)$, to three decimal places;

(s) the incidence angle modifier, to two decimal places;

(t) the storage volume in litres, rounded to the nearest integer;

(u) the pump power consumption in W, rounded to the nearest integer;

(v) the standby power consumption in W, to two decimal places;

in addition, for heat pump water heaters:

(w) the sound power level L_{WA}, outdoors, in dB, rounded to the nearest integer.

1.2. One fiche may cover a number of water heater models supplied by the same supplier.

1.3. The information contained in the fiche may be given in the form of a copy of the label, either in colour or in black and white. Where this is the case, the information listed in point 1.1 not already displayed on the label shall also be provided.

2. HOT WATER STORAGE TANKS

2.1. The information in the product fiche of the hot water storage tank shall be provided in the following order and shall be included in the product brochure or other literature provided with the product:

(a) supplier's name or trade mark;

(b) supplier's model identifier;

(c) the energy efficiency class of the model, determined in accordance with point 2 of Annex II;

(d) the standing loss in W, rounded to the nearest integer;

(e) the storage volume in litres, rounded to the nearest integer.

2.2. One fiche may cover a number of hot water storage tank models supplied by the same supplier.

2.3. The information contained in the fiche may be given in the form of a copy of the label, either in colour or in black and white. Where this is the case, the information listed in point 2.1 not already displayed on the label shall also be provided.

3. SOLAR DEVICES

3.1. The information in the product fiche of the solar device shall be provided in the following order and shall be included in the product brochure or other literature provided with the product (for pumps in the collector loop if applicable):

(a) supplier's name or trade mark;

(b) supplier's model identifier;

(c) the collector aperture area in m^2, to two decimal places;

(d) the zero-loss efficiency, to three decimal places;

(e) the first-order coefficient in $W/(m^2\ K)$, to two decimal places;

(f) the second-order coefficient in $W/(m^2\ K^2)$, to three decimal places;

(g) the incidence angle modifier, to two decimal places;

(h) the storage volume in litres, rounded to the nearest integer;

(i) the annual non-solar heat contribution Q_{nonsol} in kWh in terms of primary energy for electricity and/or in kWh in terms of *GCV* for fuels, for the load profiles M, L, XL and XXL under average climate conditions, rounded to the nearest integer;

(j) the pump power consumption in W, rounded to the nearest integer;

(k) the standby power consumption in W, to two decimal places;

(l) the annual auxiliary electricity consumption Q_{aux} in kWh in terms of final energy, rounded to the nearest integer.

3.2. One fiche may cover a number of solar device models supplied by the same supplier.

4. PACKAGES OF WATER HEATER AND SOLAR DEVICE

The fiche for packages of water heater and solar device shall contain the elements set out in Figure 1 for evaluating the water heating energy efficiency of a package of water heater and solar device, where the following information shall be included:

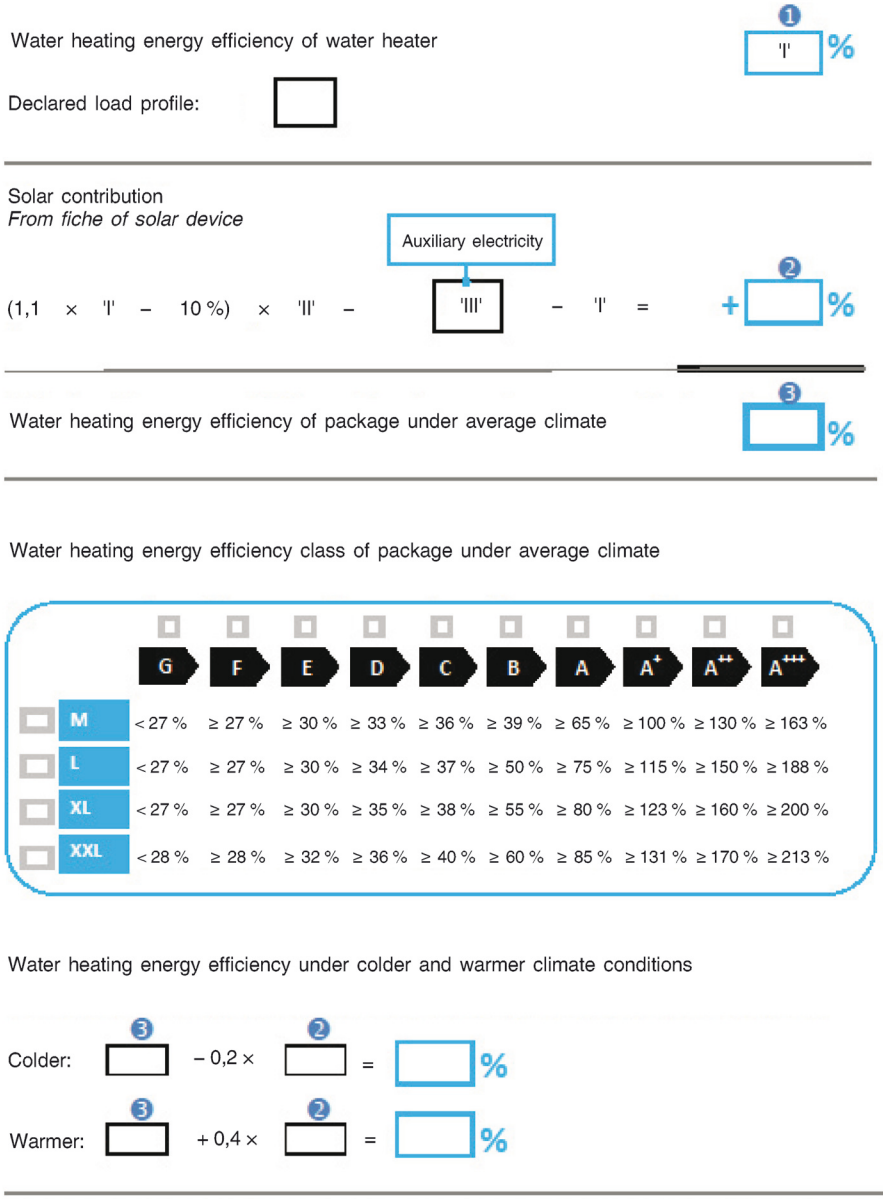
— I: the value of the water heating energy efficiency of the water heater, expressed in %,

— II: the value of the mathematical expression $(220 \cdot Q_{ref})/Q_{nonsol}$, where Q_{ref} is taken from Table 3 in Annex VII and Q_{nonsol} from the product fiche of the solar device for the declared load profile M, L, XL or XXL of the water heater,

— III: the value of the mathematical expression $(Q_{aux} \cdot 2{,}5)/(220 \cdot Q_{ref})$, expressed in %, where Q_{aux} is taken from the product fiche of the solar device and Q_{ref} from Table 3 in Annex VII for the declared load profile M, L, XL or XXL.

Figure 1

Fiche for a package of water heater and solar device indicating the water heating energy efficiency of the package offered



The energy efficiency of the package of products provided for in this fiche may not correspond to its actual energy efficiency once installed in a building, as this efficiency is influenced by further factors such as heat loss in the distribution system and the dimensioning of the products in relation to building size and characteristics.

ANNEX V

Technical documentation

1. WATER HEATERS

For water heaters, the technical documentation referred to in Article 3(1)(c) shall include:

(a) the name and address of the supplier;

(b) a description of the water heater model sufficient for its unambiguous identification;

(c) where appropriate, the references of the harmonised standards applied;

(d) where appropriate, the other technical standards and specifications used;

(e) the identification and signature of the person empowered to bind the supplier;

(f) the results of the measurements for the technical parameters specified in point 7 of Annex VII;

(g) the results of the calculations for the technical parameters specified in point 2 of Annex VIII;

(h) any specific precautions that shall be taken when the water heater is assembled, installed or maintained.

2. HOT WATER STORAGE TANKS

For hot water storage tanks, the technical documentation referred to in Article 3(2)(c) shall include:

(a) the name and address of the supplier;

(b) a description of the hot water storage tank model sufficient for its unambiguous identification;

(c) where appropriate, the references of the harmonised standards applied;

(d) where appropriate, the other technical standards and specifications used;

(e) the identification and signature of the person empowered to bind the supplier;

(f) the results of the measurements for the technical parameters specified in point 8 of Annex VII;

(g) any specific precautions that shall be taken when the hot water storage tank is assembled, installed or maintained.

3. SOLAR DEVICES

The technical documentation of solar devices referred to in Article 3(3)(b) shall include:

(a) the name and address of the supplier;

(b) a description of the solar device model sufficient for its unambiguous identification;

(c) where appropriate, the references of the harmonised standards applied;

(d) where appropriate, the other technical standards and specifications used;

(e) the identification and signature of the person empowered to bind the supplier;

(f) the results of the measurements for the technical parameters as specified in point 9 of Annex VII;

(g) any specific precautions that shall be taken when the solar device is assembled, installed or maintained.

4. PACKAGES OF WATER HEATER AND SOLAR DEVICE

For packages of water heater and solar device, the technical documentation referred to in Article 3(4)(c) shall include:

(a) the name and address of the supplier;

(b) a description of the package of water heater and solar device model sufficient for its unambiguous identification;

(c) where appropriate, the references of the harmonised standards applied;

(d) where appropriate, the other technical standards and specifications used;

(e) the identification and signature of the person empowered to bind the supplier;

(f) technical parameters:

— the water heating energy efficiency in %, rounded to the nearest integer,

— the technical parameters set out in points 1, 2 and 3 of this Annex;

(g) any specific precautions that shall be taken when the package of water heater and solar device is assembled, installed or maintained.

ANNEX VI

Information to be provided in cases where end-users cannot be expected to see the product displayed

1. WATER HEATERS

1.1. The information referred to in Article 4(1)(b) shall be provided in the following order:

(a) the declared load profile, expressed by the appropriate letter and typical usage in accordance with Table 3 of Annex VII;

(b) the water heating energy efficiency class of the model, under average climate conditions, in accordance with point 1 of Annex II;

(c) the water heating energy efficiency in %, under average climate conditions, rounded to the nearest integer and calculated in accordance with point 3 of Annex VIII;

(d) the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, under average climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII;

(e) the sound power level, indoors, in dB, rounded to the nearest integer (for heat pump water heaters, if applicable);

in addition, for solar water heaters and heat pump water heaters:

(f) the water heating energy efficiency in %, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 3 of Annex VIII;

(g) the annual electricity consumption in kWh in terms of final energy and/or the annual fuel consumption in GJ in terms of *GCV*, under colder and warmer climate conditions, rounded to the nearest integer and calculated in accordance with point 4 of Annex VIII;

in addition, for solar water heaters:

(h) the collector aperture area in m^2, to two decimal places;

(i) the storage volume in litres, rounded to the nearest integer;

in addition, for heat pump water heaters:

(j) the sound power level, outdoors, in dB, rounded to the nearest integer.

1.2. Where other information contained in the product fiche is also provided, it shall be in the form and order specified in point 1 of Annex IV.

1.3. The size and font in which the information referred in points 1.1 and 1.2 is printed or shown shall be legible.

2. HOT WATER STORAGE TANKS

2.1. The information referred to in Article 4(2)(b) shall be provided in the following order:

(a) the energy efficiency class of the model, determined in accordance with point 2 of Annex II;

(b) the standing loss in W, rounded to the nearest integer;

(c) the storage volume in litres, rounded to the nearest integer.

2.2. The size and font in which the information referred in point 2.1 is printed or shown shall be legible.

3. PACKAGES OF WATER HEATER AND SOLAR DEVICE

3.1. The information referred to in Article 4(3)(b) shall be provided in the following order:

(a) the water heating energy efficiency class of the model, determined in accordance with point 1 of Annex II;

(b) the water heating energy efficiency in %, rounded to the nearest integer;

(c) the elements set out in Figure 1 of Annex IV.

3.2. The size and font in which the information referred in point 3.1 is printed or shown shall be legible.

ANNEX VII

Measurements

1. For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements shall be made using harmonised standards the reference numbers of which have been published for this purpose in the *Official Journal of the European Union*, or using other reliable, accurate and reproducible measurement methods that take into account the generally recognised state-of-the-art methods. They shall meet the conditions and technical parameters set out in points 2 to 9.

2. General conditions for testing water heaters:

   (a) measurements shall be carried out using the load profiles set out in Table 3;

   (b) measurements shall be carried out using a 24-hour measurement cycle as follows:

   — 00:00 to 06:59: no water draw-off,

   — from 07:00: water draw-offs according to the declared load profile,

   — from end of last water draw-off until 24:00: no water draw-off;

   (c) the declared load profile shall be the maximum load profile or the load profile one below the maximum load profile.

Table 3

Load profiles of water heaters

h	3XS			XXS			XS			S			
	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	T_p
	kWh	l/min	°C	kWh	l/min	°C	kWh	l/min	°C	kWh	l/min	°C	°C
07:00	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
07:05	**0,015**	2	25										
07:15	**0,015**	2	25										
07:26	**0,015**	2	25										
07:30	**0,015**	2	25	**0,105**	2	25	**0,525**	3	35	**0,105**	3	25	
07:45													
08:01													
08:05													
08:15													
08:25													
08:30				**0,105**	2	25				**0,105**	3	25	
08:45													
09:00	**0,015**	2	25										
09:30	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
10:00													
10:30													
11:00													

h	3XS			XXS			XS			S			
	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	T_p
	kWh	l/min	°C	kWh	l/min	°C	kWh	l/min	°C	kWh	l/min	°C	°C
11:30	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
11:45	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
12:00	**0,015**	2	25	**0,105**	2	25							
12:30	**0,015**	2	25	**0,105**	2	25							
12:45	**0,015**	2	25	**0,105**	2	25	**0,525**	3	35	**0,315**	4	10	55
14:30	**0,015**	2	25										
15:00	**0,015**	2	25										
15:30	**0,015**	2	25										
16:00	**0,015**	2	25										
16:30													
17:00													
18:00				**0,105**	2	25				**0,105**	3	25	
18:15				**0,105**	2	25				**0,105**	3	40	
18:30	**0,015**	2	25	**0,105**	2	25							
19:00	**0,015**	2	25	**0,105**	2	25							
19:30	**0,015**	2	25	**0,105**	2	25							
20:00				**0,105**	2	25							
20:30							**1,05**	3	35	**0,42**	4	10	55
20:45				**0,105**	2	25							
20:46													
21:00				**0,105**	2	25							
21:15	**0,015**	2	25	**0,105**	2	25							
21:30	**0,015**	2	25							**0,525**	5	45	
21:35	**0,015**	2	25	**0,105**	2	25							
21:45	**0,015**	2	25	**0,105**	2	25							
Q_{ref}	**0,345**			**2,100**			**2,100**			**2,100**			

Continued Table 3

Load profiles of water heaters

h	M				L				XL			
	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p
	kWh	l/min	°C	°C	kWh	l/min	°C	°C	kWh	l/min	°C	°C
07:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
07:05	**1,4**	6	40		**1,4**	6	40					

h	M				L				XL			
	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p
	kWh	l/min	°C	°C	kWh	l/min	°C	°C	kWh	l/min	°C	°C
07:15									**1,82**	6	40	
07:26									**0,105**	3	25	
07:30	**0,105**	3	25		**0,105**	3	25					
07:45					**0,105**	3	25		**4,42**	10	10	40
08:01	**0,105**	3	25						**0,105**	3	25	
08:05					**3,605**	10	10	40				
08:15	**0,105**	3	25						**0,105**	3	25	
08:25					**0,105**	3	25					
08:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
08:45	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
09:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
09:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
10:00									**0,105**	3	25	
10:30	**0,105**	3	10	40	**0,105**	3	10	40	**0,105**	3	10	40
11:00									**0,105**	3	25	
11:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
11:45	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
12:00												
12:30												
12:45	**0,315**	4	10	55	**0,315**	4	10	55	**0,735**	4	10	55
14:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
15:00									**0,105**	3	25	
15:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
16:00									**0,105**	3	25	
16:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
17:00									**0,105**	3	25	
18:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
18:15	**0,105**	3	40		**0,105**	3	40		**0,105**	3	40	
18:30	**0,105**	3	40		**0,105**	3	40		**0,105**	3	40	

h	M				L				XL			
	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p
	kWh	l/min	°C	°C	kWh	l/min	°C	°C	kWh	l/min	°C	°C
19:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
19:30												
20:00												
20:30	**0,735**	4	10	55	**0,735**	4	10	55	**0,735**	4	10	55
20:45												
20:46									**4,42**	10	10	40
21:00					**3,605**	10	10	40				
21:15	**0,105**	3	25						**0,105**	3	25	
21:30	**1,4**	6	40		**0,105**	3	25		**4,42**	10	10	40
21:35												
21:45												
Q_{ref}	**5,845**				**11,655**				**19,07**			

Continued Table 3

Load profiles of water heaters

h	XXL			
	Q_{tap}	f	T_m	T_p
	kWh	l/min	°C	°C
07:00	**0,105**	3	25	
07:05				
07:15	**1,82**	6	40	
07:26	**0,105**	3	25	
07:30				
07:45	**6,24**	16	10	40
08:01	**0,105**	3	25	
08:05				
08:15	**0,105**	3	25	
08:25				
08:30	**0,105**	3	25	
08:45	**0,105**	3	25	
09:00	**0,105**	3	25	
09:30	**0,105**	3	25	
10:00	**0,105**	3	25	

h	XXL			
	Q_{tap}	f	T_m	T_p
	kWh	l/min	°C	°C
10:30	**0,105**	3	10	40
11:00	**0,105**	3	25	
11:30	**0,105**	3	25	
11:45	**0,105**	3	25	
12:00				
12:30				
12:45	**0,735**	4	10	55
14:30	**0,105**	3	25	
15:00	**0,105**	3	25	
15:30	**0,105**	3	25	
16:00	**0,105**	3	25	
16:30	**0,105**	3	25	
17:00	**0,105**	3	25	
18:00	**0,105**	3	25	
18:15	**0,105**	3	40	
18:30	**0,105**	3	40	
19:00	**0,105**	3	25	
19:30				
20:00				
20:30	**0,735**	4	10	55
20:45				
20:46	**6,24**	16	10	40
21:00				
21:15	**0,105**	3	25	
21:30	**6,24**	16	10	40
21:35				
21:45				
Q_{ref}	**24,53**			

3. **Conditions for testing the smart control compliance (*smart*) of water heaters**

Where the supplier deems it appropriate to declare the value of *smart* as being '1', measurements of the weekly electricity and/or fuel consumption with smart controls and the weekly electricity and/or fuel consumption without smart controls shall be carried out using a two-week measurement cycle as follows:

— days 1 to 5: random sequence of load profiles chosen from the declared load profile and the load profile one below the declared load profile, and smart control disabled,

— days 6 and 7: no water draw-offs, and smart control disabled,

— days 8 to 12: repetition of the same sequence applied for days 1 to 5, and smart control enabled,

— days 13 and 14: no water draw-offs, and smart control enabled,

— the difference between the useful energy content measured during days 1 to 7 and the useful energy content measured during days 8 to 14 shall not exceed 2 % of Q_{ref} of the declared load profile.

4. **Conditions for testing solar water heaters**

The solar collector, solar hot water storage tank, pump in the collector loop (if applicable) and heat generator shall be tested separately. Where the solar collector and solar hot water storage tank cannot be tested separately, they shall be tested in combination. The heat generator shall be tested under the conditions set out in point 2 of this Annex.

The results shall be used for the calculations set out in point 3(b) of Annex VIII under the conditions set out in Tables 4 and 5. For the purpose of establishing Q_{tota} the efficiency of the heat generator using the Joule effect in electric resistance heating elements is assumed to be 100/CC, expressed in %.

5. **Conditions for testing heat pump water heaters**

— Heat pump water heaters shall be tested under the conditions set out in Table 6,

— Heat pump water heaters which use ventilation exhaust air as the heat source shall be tested under the conditions set out in Table 7.

6. **Conditions for testing solar devices**

The solar collector, solar hot water storage tank and pump in the collector loop (if applicable) shall be tested separately. Where the solar collector and solar hot water storage tank cannot be tested separately, they shall be tested in combination.

The results shall be used for the calculations of Q_{nonsol} for the load profiles M, L, XL and XXL under the average climate conditions set out in Tables 4 and 5 and Q_{aux}.

Table 4

Average daytime temperature [°C]

	January	February	March	April	May	June	July	August	September	October	November	December
Average climate conditions	+ 2,8	+ 2,6	+ 7,4	+ 12,2	+ 16,3	+ 19,8	+ 21,0	+ 22,0	+ 17,0	+ 11,9	+ 5,6	+ 3,2
Colder climate conditions	– 3,8	– 4,1	– 0,6	+ 5,2	+ 11,0	+ 16,5	+ 19,3	+ 18,4	+ 12,8	+ 6,7	+ 1,2	– 3,5
Warmer climate conditions	+ 9,5	+ 10,1	+ 11,6	+ 15,3	+ 21,4	+ 26,5	+ 28,8	+ 27,9	+ 23,6	+ 19,0	+ 14,5	+ 10,4

Table 5

Average global solar irradiance [W/m^2]

	January	February	March	April	May	June	July	August	September	October	November	December
Average climate conditions	70	104	149	192	221	222	232	217	176	129	80	56
Colder climate conditions	22	75	124	192	234	237	238	181	120	64	23	13
Warmer climate conditions	128	137	182	227	248	268	268	263	243	175	126	109

Table 6

Standard rating conditions for heat pump water heaters, temperatures in dry bulb air temperature (wet bulb air temperature in brackets)

Heat source	Outdoor air			Indoor air	Exhaust air	Brine	Water
Climate conditions	Average climate conditions	Colder climate conditions	Warmer climate conditions	Not applicable	All climate conditions		
Temperature	+ 7 °C (+ 6 °C)	+ 2 °C (+ 1 °C)	+ 14 °C (+ 13 °C)	+ 20 °C (maximum + 15 °C)	+ 20 °C (+ 12 °C)	0 °C (inlet)/ – 3 °C (outlet)	+ 10 °C (inlet)/ + 7 °C (outlet)

Table 7

Maximum ventilation exhaust air available [m^3/h], at a temperature of 20 °C and with humidity of 5,5 g/m^3

Declared load profile	XXS	XS	S	M	L	XL	XXL
Maximum ventilation exhaust air available	109	128	128	159	190	870	1 021

7. **Technical parameters of water heaters**

The following parameters shall be established for water heaters:

(a) the daily electricity consumption Q_{elec} in kWh, rounded to three decimal places;

(b) the declared load profile, expressed by the appropriate letter in accordance with Table 3 of this Annex;

(c) the sound power level in dB, indoors, rounded to the nearest integer (for heat pump water heaters, if applicable);

in addition, for water heaters using fossil and/or biomass fuels:

(d) the daily fuel consumption Q_{fuel} in kWh in terms of *GCV*, rounded to three decimal places;

in addition, for water heaters for which the value of smart is declared as being '1':

(e) the weekly fuel consumption with smart controls $Q_{fuel,week,smart}$ in kWh in terms of *GCV*, rounded to three decimal places;

(f) the weekly electricity consumption with smart controls $Q_{elec,week,smart}$ in kWh, rounded to three decimal places;

(g) the weekly fuel consumption without smart controls $Q_{fuel,week}$ in kWh in terms of *GCV*, rounded to three decimal places;

(h) the weekly electricity consumption without smart controls $Q_{elec,week}$ in kWh, rounded to three decimal places;

in addition, for solar water heaters:

(i) the collector aperture area A_{sol} in m^2, rounded to two decimal places;

(j) the zero-loss efficiency η_0, rounded to three decimal places;

(k) the first-order coefficient a_1 in W/(m^2 K), rounded to two decimal places;

(l) the second-order coefficient a_2 in W/(m^2 K^2), rounded to three decimal places;

(m) the incidence angle modifier *IAM*, rounded to two decimal places;

(n) the pump power consumption *solpump* in W, rounded to two decimal places;

(o) the standby power consumption *solstandby* in W, rounded to two decimal places;

in addition, for heat pump water heaters:

(p) the sound power level L_{WA} in dB, outdoors, rounded to the nearest integer.

8. **Technical parameters of hot water storage tanks**

The following parameters shall be established for hot water storage tanks:

(a) the storage volume *V* in litres, rounded to one decimal place;

(b) the standing loss *S* in W, rounded to one decimal place.

9. **Technical parameters of solar devices**

The following parameters shall be established for solar devices:

(a) the collector aperture area A_{sol} in m^2, rounded to two decimal places;

(b) the zero-loss efficiency η_0, rounded to three decimal places;

(c) the first-order coefficient a_1 in $W/(m^2\ K)$, rounded to two decimal places;

(d) the second-order coefficient a_2 in $W/(m^2\ K^2)$, rounded to three decimal places;

(e) the incidence angle modifier *IAM*, rounded to two decimal place;

(f) the pump power consumption *solpump* in W, rounded to two decimal places;

(g) the standby power consumption, *solstandby* in W, rounded to two decimal places.

ANNEX VIII

Method for calculating the water heating energy efficiency of water heaters

1. For the purposes of compliance and verification of compliance with the requirements of this Regulation, calculations shall be made using harmonised standards the reference numbers of which have been published for this purpose in the *Official Journal of the European Union*, or using other appropriate calculation methods that take into account the generally recognised state-of-the-art methods. They shall meet the technical parameters and calculations set out in points 2 to 6.

   Technical parameters used for the calculations shall be measured in accordance with Annex VII.

2. **Technical parameters of water heaters**

   The following parameters shall be calculated for water heaters under average climate conditions:

   (a) the water heating energy efficiency η_{wh} in %, rounded to one decimal place;

   (b) the annual electricity consumption *AEC* in kWh in terms of final energy, rounded to the nearest integer;

   in addition, for water heaters using fuels under average climate conditions:

   (c) the annual fuel consumption *AFC* in kWh in terms of *GCV*, rounded to the nearest integer;

   in addition, for solar water heaters under average climate conditions:

   (d) the heat generator water heating energy efficiency $\eta_{wh,nonsol}$ in %, rounded to one decimal place;

   (e) the annual auxiliary electricity consumption Q_{aux} in kWh in terms of final energy, rounded to one decimal place;

   in addition, for solar water heaters and heat pump water heaters under colder and warmer climate conditions:

   (f) the parameters set out in points (a) to (c);

   in addition for solar water heaters under average, colder and warmer climate conditions:

   (g) the annual non-solar heat contribution Q_{nonsol} in kWh in terms of primary energy for electricity and/or in kWh in terms of *GCV* for fuels, rounded to one decimal place.

3. **Calculation of the water heating energy efficiency η_{wh}**

   (a) Conventional water heaters and heat pump water heaters:

   The water heating energy efficiency is calculated as follows:

$$\eta_{wh} = \frac{Q_{ref}}{(Q_{fuel} + CC \cdot Q_{elec})(1 - SCF \cdot smart) + Q_{cor}}$$

   For water-/brine-to-water heat pump water heaters, the electricity consumption of one or more ground water pumps shall be taken into account.

   (b) Solar water heaters:

   The water heating energy efficiency is calculated as follows:

$$\eta_{wh} = \frac{0{,}6 \cdot 366 \cdot Q_{ref}}{Q_{tota}}$$

Where:

$$Q_{tota} = \frac{Q_{nonsol}}{1{,}1 \cdot \eta_{wh,nonsol} - 0{,}1} + Q_{aux} \cdot CC$$

4. **Calculation of the annual electricity consumption AEC and the annual fuel consumption AFC**

(a) Conventional water heaters and heat pump water heaters:

The annual electricity consumption *AEC* in kWh in terms of final energy is calculated as follows:

$$AEC = 0{,}6 \cdot 366 \cdot \left(Q_{elec} \cdot (1 - SCF \cdot smart) + \frac{Q_{cor}}{CC} \right)$$

The annual fuel consumption *AFC* in GJ in terms of *GCV* is calculated as follows:

$$AFC = 0{,}6 \cdot 366 \cdot (Q_{fuel} \cdot (1 - SCF \cdot smart) + Q_{cor})$$

(b) Solar water heaters:

The annual electricity consumption *AEC* in kWh in terms of final energy is calculated as follows:

$$AEC = \frac{CC \cdot Q_{elec}}{Q_{fuel} + CC \cdot Q_{elec}} \cdot \frac{Q_{tota}}{CC}$$

The annual fuel consumption *AFC* in GJ in terms of *GCV* is calculated as follows:

$$AFC = \frac{Q_{fuel}}{Q_{fuel} + CC \cdot Q_{elec}} \cdot Q_{tota}$$

5. **Determination of the smart control factor *SCF* and of smart control compliance *smart***

(a) The smart control factor is calculated as follows:

$$SCF = 1 - \frac{Q_{fuel,week,smart} + CC \cdot Q_{elec,week,smart}}{Q_{fuel,week} + CC \cdot Q_{elec,week}}$$

(b) If $SCF \geq 0{,}07$, the value of *smart* shall be 1. In all other cases, the value of *smart* shall be 0.

6. **Determination of the ambient correction term Q_{cor}**

The ambient correction term is calculated as follows:

(a) for conventional water heaters using electricity:

$$Q_{cor} = -k \cdot (CC \cdot (Q_{elec} \cdot (1 - SCF \cdot smart) - Q_{ref}))$$

(b) for conventional water heaters using fuels:

$$Q_{cor} = -k \cdot (Q_{fuel} \cdot (1 - SCF \cdot smart) - Q_{ref})$$

(c) for heat pump water heaters:

$$Q_{cor} = -k \cdot 24h \cdot P_{stby}$$

Where:

the k-values are given in Table 8 for each load profile.

Table 8

k-values

	3XS	XXS	XS	S	M	L	XL	XXL
k	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,0

ANNEX IX

Verification procedure for market surveillance purposes

For the purposes of assessing the conformity with the requirements laid down in Articles 3 and 4, Member State authorities shall test a single water heater, hot water storage tank, solar device or package of water heater and solar device and provide the information on the test results to the authorities of the other Member States. If the measured parameters do not meet the values declared by the supplier within the ranges set out in Table 9, the measurement shall be carried out on three additional water heaters, hot water storage tanks, solar devices or packages of water heater and solar device and the information on the test results shall be provided to the authorities of the other Member States and to the Commission within one month of testing. The arithmetic mean of the measured values of these three water heaters, hot water storage tanks, solar devices or packages of water heater and solar device shall meet the values declared by the supplier within the range set out in Table 9.

Otherwise, the model and all other equivalent water heater models, hot water storage tanks models, solar device models or package of water heater and solar device models shall be considered not to comply.

Member State authorities shall use the procedures set out in Annexes VII and VIII.

Table 9

Verification tolerances

Measured parameter	Verification tolerance
Daily electricity consumption Q_{elec}	The measured value shall not be more than 5 % higher than the rated value (*).
Sound power level L_{WA}, indoors and/or outdoors	The measured value shall not be more than 2 dB higher than the rated value.
Daily fuel consumption Q_{fuel}	The measured value shall not be more than 5 % higher than the rated value.
Weekly fuel consumption with smart controls $Q_{fuel,week,smart}$	The measured value shall not be more than 5 % higher than the rated value.
Weekly fuel consumption without smart controls $Q_{fuel,week}$	The measured value shall not be more than 5 % higher than the rated value.
Weekly electricity consumption with smart controls $Q_{elec,week,smart}$	The measured value shall not be more than 5 % higher than the rated value.
Weekly electricity consumption without smart controls $Q_{elec,week}$	The measured value shall not be more than 5 % higher than the rated value.
Collector aperture area A_{sol}	The measured value shall not be more than 2 % lower than the rated value.
Pump power consumption *solpump*	The measured value shall not be more than 3 % higher than the rated value.
Standby power consumption *solstandby*	The measured value shall not be more than 5 % higher than the rated value.
Storage volume *V*	The measured value shall not be more than 2 % lower than the rated value.
Standing loss *S*	The measured value shall not be more than 5 % higher than the rated value.

(*) 'Rated value' means the value declared by the supplier.

COMMISSION REGULATION (EU) No 813/2013

of 2 August 2013

implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for space heaters and combination heaters

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to 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 Article 15(1) thereof,

After consulting the Ecodesign Consultation Forum,

Whereas:

(1) Under Directive 2009/125/EC ecodesign requirements should be set by the Commission for energy-related products representing significant volumes of sales and trade, having a significant environmental impact and presenting significant potential for improvement through design in terms of their environmental impact without entailing excessive costs.

(2) Provisions on the efficiency of boilers were established by Council Directive 92/42/EEC of 21 May 1992 on efficiency requirements for new hot-water boilers fired with liquid or gaseous fuels [2].

(3) Article 16(2)(a) of Directive 2009/125/EC provides, that in accordance with the procedure referred to in Article 19(3) and the criteria set out in Article 15(2), and after consulting the Ecodesign Consultation Forum, the Commission should, as appropriate, introduce implementing measures for products offering a high potential for cost-effective reduction of greenhouse gas emissions, such as for heating and water heating equipment.

(4) The Commission has carried out a preparatory study on the technical, environmental and economic aspects of space heaters and combination (space and water) heaters typically used in the Union. The study was devised together with stakeholders and interested parties from the Union and third countries, and the results have been made publicly available.

(5) The environmental aspects of space heaters and combination heaters that have been identified as significant for the purposes of this Regulation are energy consumption in the use phase and (for heat pump heaters) sound power levels. In addition, for heaters using fossil fuels, emissions of nitrogen oxides, carbon monoxide, particulate matter and hydrocarbons are identified as significant environmental aspects.

(6) It is not appropriate to set ecodesign requirements for emissions of carbon monoxide, particulate matter and hydrocarbons as no suitable European measurement methods are as yet available. With a view to developing such measurement methods, the Commission mandated the European standardisation organisations to consider ecodesign requirements for those emissions during the review of this Regulation. National provisions for ecodesign requirements on emissions of carbon monoxides, particulate matter and hydrocarbons of space heaters and combination heaters may be maintained or introduced until the corresponding Union ecodesign requirements enter into force. The provisions of Directive 2009/142/EC of the European Parliament and of the Council of 30 November 2009 relating to appliances burning gaseous fuels [3], which limit the combustion products of appliances burning gaseous fuels in relation to health and safety, are not affected.

(7) The preparatory study shows that requirements regarding the other ecodesign parameters referred to in Annex I, Part 1 to Directive 2009/125/EC are not necessary in the case of space heaters and combination heaters. In particular, greenhouse gas emissions related to refrigerants used in heat pump heaters for heating today's European building stock are not identified as significant. The appropriateness of setting ecodesign requirements for these greenhouse gas emissions will be reassessed when reviewing this Regulation.

[1] OJ L 285, 31.10.2009, p. 10.
[2] OJ L 167, 22.6.1992, p. 17.
[3] OJ L 330, 16.12.2009, p. 10.

(8) The scope of this Regulation should include boiler space heaters, cogeneration space heaters and heat pump space heaters providing heat to water-based central heating systems for space heating purposes, and boiler combination heaters and heat pump combination heaters providing heat to water-based central heating systems for space heating purposes and heat to deliver hot drinking and sanitary water. These heaters are designed to use gaseous or liquid fuels, including from biomass (unless predominantly), electricity and ambient or waste heat.

(9) Heaters that are designed for using gaseous or liquid fuels predominantly (more than 50 %) produced from biomass have specific technical characteristics which require further technical, economic and environmental analyses. Depending on the outcome of the analyses, ecodesign requirements for those heaters should be set at a later stage, if appropriate.

(10) Annual energy consumption related to space heaters and combination heaters was estimated to have been 12 089 PJ (about 289 Mtoe) in the Union in 2005, corresponding to 698 Mt CO_2 emissions. Unless specific measures are taken, annual energy consumption is expected to be 10 688 PJ in 2020. Annual emissions of nitrogen oxides related to space heaters and combination heaters were estimated to have been 821 kt SO_x equivalent in the Union in 2005. Unless specific measures are taken, annual emissions are expected to be 783 kt SO_x equivalent in 2020. The preparatory study shows that the use-phase energy consumption and emissions of nitrogen oxides of space heaters and combination heaters can be significantly reduced.

(11) The energy consumption of space heaters and combination heaters can be reduced by applying existing cost-effective non-proprietary technologies which lead to a reduction in the combined costs of purchasing and operating these products.

(12) In the Union there are almost five million dwellings with shared open-flue systems. For technical reasons it is not possible to replace existing boiler space heaters and boiler combination heaters by efficient condensing boilers in dwellings with a shared open-flue system. The requirements contained in this Regulation allow non-condensing boilers specifically designed for such a configuration to remain on the market; this is to prevent undue costs for consumers, to give manufacturers time to develop boilers dedicated to more efficient heating technologies, and to give Member States time to reflect on national building codes.

(13) The combined effect of the ecodesign requirements set out in this Regulation and the Commission Delegated Regulation (EU) No 811/2013 of 18 February 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of space heaters, combination heaters, packages of space heater, temperature control and solar device and packages of combination heater, temperature control and solar device [1] is expected to result by 2020 in estimated annual energy savings of about 1 900 PJ (about 45 Mtoe), corresponding to around 110 Mt CO_2 emissions, and a reduction in annual nitrogen oxides emissions of some 270 kt SO_x equivalent, compared to what would happen if no measures were taken.

(14) Ecodesign requirements should harmonise energy consumption, sound power level and nitrogen oxides emission requirements for space heaters and combination heaters throughout the Union, thus helping to make the internal market operate better and to improve the environmental performance of these products.

(15) The ecodesign requirements should not affect the functionality or affordability of space heaters or combination heaters from the end-user's perspective and should not negatively affect health, safety or the environment.

(16) The ecodesign requirements should be introduced gradually to give manufacturers a sufficient timeframe to redesign their products subject to this Regulation. The timing should be such that cost impact for manufacturers, in particular for small and medium-sized enterprises, is taken into account, while ensuring timely achievement of the objectives of this Regulation.

(17) Product parameters should be measured and calculated using reliable, accurate and reproducible methods which take into account recognised state-of-the-art measurement and calculation methods, including, where available, harmonised standards adopted by the European standardisation organisations under a request from the Commission, in accordance with the procedures laid down in the Regulation (EU) No 1025/2012 of the European Parliament and of the Council of 25 October 2012 on European standardisation [2].

[1] See page 1 of this Official Journal.
[2] OJ L 316, 14.11.2012, p. 12.

(18) In accordance with Article 8(2) of Directive 2009/125/EC, this Regulation specifies which conformity assessment procedures apply.

(19) To facilitate compliance checks, manufacturers should provide information in the technical documentation referred to in Annexes IV and V to Directive 2009/125/EC insofar as that information relates to the requirements laid down in this Regulation.

(20) To further limit the environmental impact of space heaters and combination heaters, manufacturers should provide information on disassembly, recycling and/or disposal.

(21) In addition to the legally binding requirements laid down in this Regulation, indicative benchmarks for best available technologies should be identified to ensure that information on the life-cycle environmental performance of space heaters and combination heaters is widely available and easily accessible.

(22) Directive 92/42/EEC should be repealed, except for Articles 7(2) and 8 thereof and Annexes III to V thereto, and new provisions should be laid down by this Regulation to ensure that the scope is extended to heaters other than boilers, to further improve the energy efficiency of space heaters and combination heaters, and to improve other significant environmental aspects of space heaters and combination heaters.

(23) 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 the placing on the market and/or putting into service of space heaters and combination heaters with a rated heat output ≤ 400 kW, including those integrated in packages of space heater, temperature control and solar device or packages of combination heater, temperature control and solar device as defined in Article 2 of Commission Delegated Regulation (EU) No 811/2013.

2. This Regulation shall not apply to:

(a) heaters specifically designed for using gaseous or liquid fuels predominantly produced from biomass;

(b) heaters using solid fuels;

(c) heaters within the scope of Directive 2010/75/EU of the European Parliament and of the Council [1];

(d) heaters generating heat only for the purpose of providing hot drinking or sanitary water;

(e) heaters for heating and distributing gaseous heat transfer media such as vapour or air;

(f) cogeneration space heaters with a maximum electrical capacity of 50 kW or above;

(g) heat generators designed for heaters and heater housings to be equipped with such heat generators placed on the market before 1 January 2018 to replace identical heat generators and identical heater housings. The replacement product or its packaging shall clearly indicate the heater for which it is intended.

Article 2

Definitions

In addition to the definitions set out in Article 2 of Directive 2009/125/EC, the following definitions shall apply for the purposes of this Regulation:

(1) 'heater' means a space heater or combination heater;

(2) 'space heater' means a device that

(a) provides heat to a water-based central heating system in order to reach and maintain at a desired level the indoor temperature of an enclosed space such as a building, a dwelling or a room; and

(b) is equipped with one or more heat generators;

(3) 'combination heater' means a space heater that is designed to also provide heat to deliver hot drinking or sanitary water at given temperature levels, quantities and flow rates during given intervals, and is connected to an external supply of drinking or sanitary water;

(4) 'water-based central heating system' means a system using water as a heat transfer medium to distribute centrally generated heat to heat emitters for the space heating of buildings, or parts thereof;

[1] OJ L 334, 17.12.2010, p. 17.

(5) 'heat generator' means the part of a heater that generates the heat using one or more of the following processes:

(a) combustion of fossil fuels and/or biomass fuels;

(b) use of the Joule effect in electric resistance heating elements;

(c) capture of ambient heat from an air source, water source or ground source, and/or waste heat;

whereby a heat generator designed for a heater and a heater housing to be equipped with such a heat generator shall be also considered a heater;

(6) 'heater housing' means the part of a heater designed to have a heat generator fitted;

(7) 'rated heat output' (*Prated*) means the declared heat output of a heater when providing space heating and, if applicable, water heating at standard rating conditions, expressed in kW; for heat pump space heaters and heat pump combination heaters the standard rating conditions for establishing the rated heat output are the reference design conditions, as set out in Annex III, Table 4;

(8) 'standard rating conditions' means the operating conditions of heaters under average climate conditions for establishing the rated heat output, seasonal space heating energy efficiency, water heating energy efficiency, sound power level and nitrogen oxide emissions;

(9) 'biomass' means the biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste;

(10) 'biomass fuel' means a gaseous or liquid fuel produced from biomass;

(11) 'fossil fuel' means a gaseous or liquid fuel of fossil origin;

(12) 'boiler space heater' means a space heater that generates heat using the combustion of fossil fuels and/or biomass fuels, and/or using the Joule effect in electric resistance heating elements;

(13) 'boiler combination heater' means a boiler space heater that is designed to also provide heat to deliver hot drinking or sanitary water at given temperature levels, quantities and flow rates during given intervals, and is connected to an external supply of drinking or sanitary water;

(14) 'electric boiler space heater' means a boiler space heater that generates heat using the Joule effect in electric resistance heating elements only;

(15) 'electric boiler combination heater' means a boiler combination heater that generates heat using the Joule effect in electric resistance heating elements only;

(16) 'cogeneration space heater' means a space heater simultaneously generating heat and electricity in a single process;

(17) 'heat pump space heater' means a space heater using ambient heat from an air source, water source or ground source, and/or waste heat for heat generation; a heat pump space heater may be equipped with one or more supplementary heaters using the Joule effect in electric resistance heating elements or the combustion of fossil and/or biomass fuels;

(18) 'heat pump combination heater' means a heat pump space heater that is designed to also provide heat to deliver hot drinking or sanitary water at given temperature levels, quantities and flow rates during given intervals, and is connected to an external supply of drinking or sanitary water;

(19) 'supplementary heater' means a non-preferential heater that generates heat in cases where the heat demand is greater than the rated heat output of the preferential heater;

(20) 'seasonal space heating energy efficiency' (η_s) means the ratio between the space heating demand for a designated heating season, supplied by a heater and the annual energy consumption required to meet this demand, expressed in %;

(21) 'water heating energy efficiency' (η_{wh}) means the ratio between the useful energy in the drinking or sanitary water provided by a combination heater and the energy required for its generation, expressed in %;

(22) 'sound power level' (L_{WA}) means the A-weighted sound power level, indoors and/or outdoors, expressed in dB;

(23) 'conversion coefficient' (CC) means a coefficient reflecting the estimated 40 % average EU generation efficiency referred to in Directive 2012/27/EU of the European Parliament and of the Council [1]; the value of the conversion coefficient is CC = 2,5.

For the purposes of Annexes II to V, additional definitions are set out in Annex I.

Article 3

Ecodesign requirements and timetable

1. The ecodesign requirements for heaters are set out in Annex II.

2. Each ecodesign requirements shall apply in accordance with the following timetable:

(a) from 26 September 2015:

(i) heaters shall meet the requirements set out in Annex II, points 1(a), 3 and 5;

(ii) combination heaters shall meet the requirements set out in Annex II, point 2(a);

(b) from 26 September 2017:

(i) electric space heaters, electric combination heaters, cogeneration space heaters, heat pump space heaters and heat pump combination heaters shall meet the requirements set out in Annex II, point 1(b);

(ii) combination heaters shall meet the requirements set out in Annex II, point 2(b);

(c) from 26 September 2018 heaters shall meet the requirements set out in Annex II, point 4(a).

3. Compliance with ecodesign requirements shall be measured and calculated in accordance with the requirements set out in Annex III.

Article 4

Conformity assessment

1. The conformity assessment procedure referred to in Article 8(2) of Directive 2009/125/EC shall be the internal design control set out in Annex IV to that Directive or the management system set out in Annex V to that Directive without prejudice to Articles 7(2) and 8 of and Annexes III to V to Council Directive 92/42/EEC.

2. For the purposes of conformity assessment, the technical documentation shall contain the product information set out in point 5(b) of Annex II to this Regulation.

Article 5

Verification procedure for market surveillance purposes

When performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC to ensure compliance with the requirements set out in Annex II to this Regulation, the Member States' authorities shall apply the verification procedure set out in Annex IV to this Regulation.

Article 6

Indicative benchmarks

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

Article 7

Review

The Commission shall review this Regulation in the light of technological progress with heaters and present the result of that review to the Ecodesign Consultation Forum no later than five years from the date of entry into force of this Regulation. In particular, the review shall include an assessment of the following aspects:

(a) the appropriateness of setting ecodesign requirements for greenhouse gas emissions related to refrigerants;

(b) on the basis of the measurement methods under development, the level of the ecodesign requirements for emissions of carbon monoxide, hydrocarbons and particulate matter that may be introduced;

(c) the appropriateness of setting stricter ecodesign requirements for the energy efficiency of boiler space heaters and boiler combination heaters, for the sound power level and for emissions of nitrogen oxides;

(d) the appropriateness of setting ecodesign requirements for heaters specifically designed for using gaseous or liquid fuels predominantly produced from biomass;

(e) the validity of the conversion coefficient value;

(f) the appropriateness of third party certification.

[1] OJ L 315, 14.11.2012, p. 1.

Article 8

Transitional provisions

1. Until 26 September 2015 Member States may allow the placing on the market and/or putting into service of heaters which are in conformity with the national provisions in force when this Regulation is adopted regarding seasonal space heating energy efficiency, water heating energy efficiency and sound power level.

2. Until 26 September 2018 Member States may allow the placing on the market and/or putting into service of heaters, which are in conformity with the national provisions in force when this Regulation is adopted regarding emissions of nitrogen oxides.

Article 9

Repeal

Council Directive 92/42/EEC is repealed, except for Articles 7(2) and 8 thereof and Annexes III to V thereto, without prejudice to the obligations of the Member States relating to the transposition into national law and application of that Directive until the ecodesign requirements set out in Annex II of this Regulation start to apply.

Article 10

Entry into force

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

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

Done at Brussels, 2 August 2013.

For the Commission
The President
José Manuel BARROSO

ANNEX I

Definitions applicable for Annexes II to V

For the purposes of Annexes II to V the following definitions shall apply:

Definitions related to heaters

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

(2) 'standby mode power consumption' (P_{SB}) means the power consumption of a heater in standby mode, expressed in kW;

(3) 'average climate conditions' mean the temperature conditions characteristic for the city of Strasbourg;

(4) 'temperature control' means the equipment that interfaces with the end-user regarding the values and timing of the desired indoor temperature, and communicates relevant data to an interface of the heater such as a central processing unit, thus helping to regulate the indoor temperature(s);

(5) 'gross calorific value' (*GCV*) means the total amount of heat released by a unit quantity of fuel when it is burned completely with oxygen and when the products of combustion are returned to ambient temperature; this quantity includes the condensation heat of any water vapour contained in the fuel and of the water vapour formed by the combustion of any hydrogen contained in the fuel;

(6) 'equivalent model' means a model placed on the market with the same technical parameters set out in Table 1 or Table 2 (as applicable) of Annex II, point 5, as another model placed on the market by the same manufacturer;

Definitions related to boiler space heaters, boiler combination heaters and cogeneration space heaters

(7) 'fuel boiler space heater' means a boiler space heater that generates heat by burning fossil fuels and/or biomass fuels, and which may be equipped with one or more additional heat generators using the Joule effect in electric resistance heating elements;

(8) 'fuel boiler combination heater' means a boiler combination heater that generates heat by burning fossil fuels and/or biomass fuels, and which may be equipped with one or more additional heat generators using the Joule effect in electric resistance heating elements;

(9) 'type B1 boiler' means a fuel boiler space heater incorporating a draught diverter, intended to be connected to a natural draught flue that evacuates the residues of combustion to the outside of the room containing the fuel boiler space heater, and drawing the combustion air directly from the room; a type B1 boiler is marketed as type B1 boiler only;

(10) 'type B1 combination boiler' means a fuel boiler combination heater incorporating a draught diverter, intended to be connected to a natural draught flue that evacuates the residues of combustion to the outside of the room containing the fuel boiler combination heater, and drawing the combustion air directly from the room; a type B1 combination boiler is marketed as type B1 combination boiler only;

(11) 'seasonal space heating energy efficiency in active mode' (η_{son}) means

— for fuel boiler space heaters and fuel boiler combination heaters, a weighted average of the useful efficiency at rated heat output and the useful efficiency at 30 % of the rated heat output, expressed in %;

— for electric boiler space heaters and electric boiler combination heaters, the useful efficiency at rated heat output, expressed in %;

— for cogeneration space heaters not equipped with supplementary heaters, the useful efficiency at rated heat output, expressed in %;

— for cogeneration space heaters equipped with supplementary heaters, a weighted average of the useful efficiency at rated heat output with supplementary heater disabled, and the useful efficiency at rated heat output with supplementary heater enabled, expressed in %;

(12) 'useful efficiency' (η) means the ratio of the useful heat output and the total energy input of a boiler space heater, boiler combination heater or cogeneration space heater, expressed in %, whereby the total energy input is expressed in terms of *GCV* and/or in terms of final energy multiplied by *CC*;

(13) 'useful heat output' (*P*) means the heat output of a boiler space heater, boiler combination heater or cogeneration space heater transmitted to the heat carrier, expressed in kW;

(14) 'electrical efficiency' (η_{el}) means the ratio of the electricity output and the total energy input of a cogeneration space heater, expressed in %, whereby the total energy input is expressed in terms of *GCV* and/or in terms of final energy multiplied by *CC*;

(15) 'ignition burner power consumption' (P_{ign}) means the power consumption of a burner intended to ignite the main burner, expressed in W in terms of *GCV*;

(16) 'condensing boiler' means a boiler space heater or boiler combination heater in which, under normal operating conditions and at given operating water temperatures, the water vapour in the combustion products is partially condensed, in order to make use of the latent heat of this water vapour for heating purposes;

(17) 'auxiliary electricity consumption' means the annual electricity required for the designated operation of a boiler space heater, boiler combination heater or cogeneration space heater, calculated from the electric power consumption at full load (*elmax*), at part load (*elmin*), in standby mode and default operating hours at each mode, expressed in kWh in terms of final energy;

(18) 'standby heat loss' (P_{stby}) means the heat loss of a boiler space heater, boiler combination heater or cogeneration space heater in operating modes without heat demand, expressed in kW;

Definitions related to heat pump space heaters and heat pump combination heaters

(19) 'outdoor temperature' (T_j) means the dry bulb outdoor air temperature, expressed in degrees Celsius; the relative humidity may be indicated by a corresponding wet bulb temperature;

(20) 'rated coefficient of performance' (COP_{rated}) or 'rated primary energy ratio' (PER_{rated}) means the declared capacity for heating, expressed in kW, divided by the energy input, expressed in kW in terms of *GCV* and/or in kW in terms of final energy multiplied by *CC*, for heating provided at standard rating conditions;

(21) 'reference design conditions' means the combination of the reference design temperature, the maximum bivalent temperature and the maximum operation limit temperature, as set out in Annex III, Table 4;

(22) 'reference design temperature' (*Tdesignh*) means the outdoor temperature, expressed in degrees Celsius, as set out in Annex III, Table 4, at which the part load ratio is equal to 1;

(23) 'part load ratio' ($pl(T_j)$) means the outdoor temperature minus 16 °C divided by the reference design temperature minus 16 °C;

(24) 'heating season' means a set of operating conditions describing per bin the combination of outdoor temperatures and the number of hours these temperatures occur per season;

(25) 'bin' (bin_j) means a combination of an outdoor temperature and bin hours, as set out in Annex III, Table 5;

(26) 'bin hours' (H_j) means the hours per heating season, expressed in hours per year, at which an outdoor temperature occurs for each bin, as set out in Annex III, Table 5;

(27) 'part load for heating' ($Ph(T_j)$) means the heating load at a specific outdoor temperature, calculated as the design load multiplied by the part load ratio and expressed in kW;

(28) 'seasonal coefficient of performance' (*SCOP*) or 'seasonal primary energy ratio' (*SPER*) is the overall coefficient of performance of a heat pump space heater or heat pump combination heater using electricity or the overall primary energy ratio of a heat pump space heater or heat pump combination heater using fuels, representative of the designated heating season, calculated as the reference annual heating demand divided by the annual energy consumption;

(29) 'reference annual heating demand' (Q_H) means the reference heating demand for a designated heating season, to be used as the basis for calculating *SCOP* or *SPER* and calculated as the product of the design load for heating and the annual equivalent active mode hours, expressed in kWh;

(30) 'annual energy consumption' (Q_{HE}) means the energy consumption required to meet the reference annual heating demand for a designated heating season, expressed in kWh in terms of *GCV* and/or in kWh in terms of the final energy multiplied by *CC*;

(31) 'annual equivalent active mode hours' (H_{HE}) means the assumed annual number of hours a heat pump space heater or heat pump combination heater has to provide the design load for heating to satisfy the reference annual heating demand, expressed in h;

(32) 'active mode coefficient of performance' ($SCOP_{on}$) or 'active mode primary energy ratio' ($SPER_{on}$) means the average coefficient of performance of the heat pump space heater or heat pump combination heater using electricity in active mode, or the average primary energy ratio of the heat pump space heater or heat pump combination heater using fuels in active mode for the designated heating season;

(33) 'supplementary capacity for heating' ($sup(T_j)$) means the rated heat output *Psup* of a supplementary heater that supplements the declared capacity for heating to meet the part load for heating, if the declared capacity for heating is less than the part load for heating, expressed in kW;

(34) 'bin-specific coefficient of performance' ($COPbin(T_j)$) or 'bin-specific primary energy ratio' ($PERbin(T_j)$) means the coefficient of performance of the heat pump space heater or heat pump combination heater using electricity, or primary energy ratio of the heat pump space heater or heat pump combination heater using fuel specific for every bin in a season, derived from the part load for heating, declared capacity for heating and declared coefficient of performance for specified bins and calculated for other bins by interpolation or extrapolation, corrected where necessary by the degradation coefficient;

(35) 'declared capacity for heating' ($Pdh(T_j)$) means the heating capacity a heat pump space heater or heat pump combination heater is able to deliver, for an outdoor temperature, expressed in kW;

(36) 'capacity control' means the ability of a heat pump space heater or heat pump combination heater to change its capacity by changing the volumetric flow rate of at least one of the fluids needed to operate the refrigeration cycle, to be indicated as 'fixed' if the volumetric flow rate cannot be changed or 'variable' if the volumetric flow rate is changed or varied in series of two or more steps;

(37) 'design load for heating' (*Pdesignh*) means the rated heat output (*Prated*) of a heat pump space heater or heat pump combination heater at the reference design temperature, whereby the design load for heating is equal to the part load for heating with outdoor temperature equal to reference design temperature, expressed in kW;

(38) 'declared coefficient of performance' ($COPd(T_j)$) or 'declared primary energy ratio' ($PERd(T_j)$) means the coefficient of performance or primary energy ratio at a limited number of specified bins;

(39) 'bivalent temperature' (T_{biv}) means the outdoor temperature declared by the manufacturer for heating at which the declared capacity for heating equals the part load for heating and below which the declared capacity for heating requires supplementary capacity for heating to meet the part load for heating, expressed in degrees Celsius;

(40) 'operation limit temperature' (*TOL*) means the outdoor temperature declared by the manufacturer for heating, below which the air-to-water heat pump space heater or air-to-water heat pump combination heater will not be able to deliver any heating capacity and the declared capacity for heating is equal to zero, expressed in degrees Celsius;

(41) 'heating water operation limit temperature' (*WTOL*) means the outlet water temperature declared by the manufacturer for heating, above which the heat pump space heater or heat pump combination heater will not be able to deliver any heating capacity and the declared capacity for heating is equal to zero, expressed in degrees Celsius;

(42) 'cycling interval capacity for heating' (*Pcych*) means the integrated heating capacity over the cycling test interval for heating, expressed in kW;

(43) 'cycling interval efficiency' (*COPcyc* or *PERcyc*) means the average coefficient of performance or average primary energy ratio over the cycling test interval, calculated as the integrated heating capacity over the interval, expressed in kWh, divided by the integrated energy input over that same interval, expressed in kWh in terms of *GCV* and/or in kWh in terms of final energy multiplied by *CC*;

(44) 'degradation coefficient' (*Cdh*) means the measure of efficiency loss due to cycling of heat pump space heaters or heat pump combination heaters; if *Cdh* is not determined by measurement then the default degradation coefficient is *Cdh* = 0,9;

(45) 'active mode' means the condition corresponding to the hours with a heating load for the enclosed space and activated heating function; this condition may involve cycling of the heat pump space heater or heat pump combination heater to reach or maintain a required indoor air temperature;

(46) 'off mode' means a condition in which the heat pump space heater or heat pump combination heater is connected to the mains power source and is not providing any function, including conditions providing only an indication of off mode condition and conditions providing only functionalities intended to ensure electromagnetic compatibility pursuant to Directive 2004/108/EC of the European Parliament and of the Council [1];

(47) 'thermostat-off mode' means the condition corresponding to the hours with no heating load and activated heating function, whereby the heating function is switched on but the heat pump space heater or heat pump combination heater is not operational; cycling in active mode is not considered as thermostat-off mode;

(48) 'crankcase heater mode' means the condition in which a heating device is activated to avoid the refrigerant migrating to the compressor so as to limit the refrigerant concentration in oil when the compressor is started;

(49) 'off mode power consumption' (P_{OFF}) means the power consumption of a heat pump space heater or heat pump combination heater in off mode, expressed in kW;

(50) 'thermostat-off mode power consumption' (P_{TO}) means the power consumption of the heat pump space heater or heat pump combination heater while in thermostat-off mode, expressed in kW;

(51) 'crankcase heater mode power consumption' (P_{CK}) means the power consumption of the heat pump space heater or heat pump combination heater while in crankcase heater mode, expressed in kW;

(52) 'low-temperature heat pump' means a heat pump space heater that is specifically designed for low-temperature application, and that cannot deliver heating water with an outlet temperature of 52 °C at an inlet dry (wet) bulb temperature of – 7 °C (– 8 °C) in the reference design conditions for average climate;

[1] OJ L 390, 31.12.2004, p. 24.

(53) 'low-temperature application' means an application where the heat pump space heater delivers its declared capacity for heating at an indoor heat exchanger outlet temperature of 35 °C;

(54) 'medium-temperature application' means an application where the heat pump space heater or heat pump combination heater delivers its declared capacity for heating at an indoor heat exchanger outlet temperature of 55 °C;

Definitions related to water heating in combination heaters

(55) 'load profile' means a given sequence of water draw-offs, as specified in Annex III, Table 7; each combination heater meets at least one load profile;

(56) 'water draw-off' means a given combination of useful water flow rate, useful water temperature, useful energy content and peak temperature, as specified in Annex III, Table 7;

(57) 'useful water flow rate' (f) means the minimum flow rate, expressed in litres per minute, for which hot water is contributing to the reference energy, as specified in Annex III, Table 7;

(58) 'useful water temperature' (T_m) means the water temperature, expressed in degrees Celsius, at which hot water starts contributing to the reference energy, as specified in Annex III, Table 7;

(59) 'useful energy content' (Q_{tap}) means the energy content of hot water, expressed in kWh, provided at a temperature equal to, or above, the useful water temperature, and at water flow rates equal to, or above, the useful water flow rate, as specified in Annex III, Table 7;

(60) 'energy content of hot water' means the product of the specific heat capacity of water, the average temperature difference between the hot water output and cold water input, and the total mass of the hot water delivered;

(61) 'peak temperature' (T_p) means the minimum water temperature, expressed in degrees Celsius, to be achieved during water draw-off, as specified in Annex III, Table 7;

(62) 'reference energy' (Q_{ref}) means the sum of the useful energy content of water draw-offs, expressed in kWh, in a particular load profile, as specified in Annex III, Table 7;

(63) 'maximum load profile' means the load profile with the greatest reference energy that a combination heater is able to provide while fulfilling the temperature and flow rate conditions of that load profile;

(64) 'declared load profile' means the load profile applied for conformity assessment;

(65) 'daily electricity consumption' (Q_{elec}) means the consumption of electricity for water heating over 24 consecutive hours under the declared load profile, expressed in kWh in terms of final energy;

(66) 'daily fuel consumption' (Q_{fuel}) means the consumption of fuels for water heating over 24 consecutive hours under the declared load profile, expressed in kWh in terms of *GCV*.

ANNEX II

Ecodesign requirements

1. REQUIREMENTS FOR SEASONAL SPACE HEATING ENERGY EFFICIENCY

(a) From 26 September 2015 the seasonal space heating energy efficiency and useful efficiencies of heaters shall not fall below the following values:

Fuel boiler space heaters with rated heat output ≤ 70 kW and fuel boiler combination heaters with rated heat output ≤ 70 kW, with the exception of type B1 boilers with rated heat output ≤ 10 kW and type B1 combination boilers with rated heat output ≤ 30 kW:

The seasonal space heating energy efficiency shall not fall below 86 %.

Type B1 boilers with rated heat output ≤ 10 kW and type B1 combination boilers with rated heat output ≤ 30 kW:

The seasonal space heating energy efficiency shall not fall below 75 %.

Fuel boiler space heaters with rated heat output > 70 kW and ≤ 400 kW and fuel boiler combination heaters with rated heat output > 70 kW and ≤ 400 kW:

The useful efficiency at 100 % of the rated heat output shall not fall below 86 %, and the useful efficiency at 30 % of the rated heat output shall not fall below 94 %.

Electric boiler space heaters and electric boiler combination heaters:

The seasonal space heating energy efficiency shall not fall below 30 %.

Cogeneration space heaters:

The seasonal space heating energy efficiency shall not fall below 86 %.

Heat pump space heaters and heat pump combination heaters, with the exception of low-temperature heat pumps:

The seasonal space heating energy efficiency shall not fall below 100 %.

Low-temperature heat pumps:

The seasonal space heating energy efficiency shall not fall below 115 %.

(b) From 26 September 2017 the seasonal space heating energy efficiency of electric boiler space heaters, electric boiler combination heaters, cogeneration space heaters, heat pump space heaters and heat pump combination heaters shall not fall below the following values:

Electric boiler space heaters and electric boiler combination heaters:

The seasonal space heating energy efficiency shall not fall below 36 %.

Cogeneration space heaters:

The seasonal space heating energy efficiency shall not fall below 100 %.

Heat pump space heaters and heat pump combination heaters, with the exception of low-temperature heat pumps:

The seasonal space heating energy efficiency shall not fall below 110 %.

Low-temperature heat pumps:

The seasonal space heating energy efficiency shall not fall below 125 %.

2. REQUIREMENTS FOR WATER HEATING ENERGY EFFICIENCY

(a) From 26 September 2015 the water heating energy efficiency of combination heaters shall not fall below the following values:

Declared load profile	**3XS**	**XXS**	**XS**	**S**	**M**	**L**	**XL**	**XXL**	**3XL**	**4XL**
Water heating energy efficiency	22 %	23 %	26 %	26 %	30 %	30 %	30 %	32 %	32 %	32 %

(b) From 26 September 2017 the water heating energy efficiency of combination heaters shall not fall below the following values:

Declared load profile	**3XS**	**XXS**	**XS**	**S**	**M**	**L**	**XL**	**XXL**	**3XL**	**4XL**
Water heating energy efficiency	32 %	32 %	32 %	32 %	36 %	37 %	38 %	60 %	64 %	64 %

3. REQUIREMENTS FOR SOUND POWER LEVEL

From 26 September 2015 the sound power level of heat pump space heaters and heat pump combination heaters shall not exceed the following values:

Rated heat output ≤ 6 kW		Rated heat output > 6 kW and ≤ 12 kW		Rated heat output > 12 kW and ≤ 30 kW		Rated heat output > 30 kW and ≤ 70 kW	
Sound power level (L_{WA}), indoors	Sound power level (L_{WA}), outdoors	Sound power level (L_{WA}), indoors	Sound power level (L_{WA}), outdoors	Sound power level (L_{WA}), indoors	Sound power level (L_{WA}), outdoors	Sound power level (L_{WA}), indoors	Sound power level (L_{WA}), outdoors
60 dB	65 dB	65 dB	70 dB	70 dB	78 dB	80 dB	88 dB

4. REQUIREMENTS FOR EMISSIONS OF NITROGEN OXIDES

(a) From 26 September 2018 emissions of nitrogen oxides, expressed in nitrogen dioxide, of heaters shall not exceed the following values:

— fuel boiler space heaters and fuel boiler combination heaters using gaseous fuels: 56 mg/kWh fuel input in terms of *GCV*;

— fuel boiler space heaters and fuel boiler combination heaters using liquid fuels: 120 mg/kWh fuel input in terms of *GCV*;

— cogeneration space heaters equipped with external combustion using gaseous fuels: 70 mg/kWh fuel input in terms of *GCV*;

— cogeneration space heaters equipped with external combustion using liquid fuels: 120 mg/kWh fuel input in terms of *GCV*;

— cogeneration space heaters equipped with an internal combustion engine using gaseous fuels: 240 mg/kWh fuel input in terms of *GCV*;

— cogeneration space heaters equipped with an internal combustion engine using liquid fuels: 420 mg/kWh fuel input in terms of *GCV*;

— heat pump space heaters and heat pump combination heaters equipped with external combustion using gaseous fuels: 70 mg/kWh fuel input in terms of *GCV*;

— heat pump space heaters and heat pump combination heaters equipped with external combustion using liquid fuels: 120 mg/kWh fuel input in terms of *GCV*;

— heat pump space heaters and heat pump combination heaters equipped with an internal combustion engine using gaseous fuels: 240 mg/kWh fuel input in terms of *GCV*;

— heat pump space heaters and heat pump combination heaters equipped with an internal combustion engine using liquid fuels: 420 mg/kWh fuel input in terms of *GCV*.

5. REQUIREMENTS FOR PRODUCT INFORMATION

From 26 September 2015 the following product information on heaters shall be provided:

(a) the instruction manuals for installers and end-users, and free access websites of manufacturers, their authorised representatives and importers shall contain the following elements:

— for boiler space heaters, boiler combination heaters and cogeneration space heaters, the technical parameters set out in Table 1, measured and calculated in accordance with Annex III;

— for heat pump space heaters and heat pump combination heaters, the technical parameters set out in Table 2, measured and calculated in accordance with Annex III;

— any specific precautions that shall be taken when the heater is assembled, installed or maintained;

— for type B1 boilers and type B1 combination boilers, their characteristics and the following standard text: 'This natural draught boiler is intended to be connected only to a flue shared between multiple dwellings in existing buildings that evacuates the residues of combustion to the outside of the room containing the boiler. It draws the combustion air directly from the room and incorporates a draught diverter. Due to lower efficiency, any other use of this boiler shall be avoided and would result in higher energy consumption and higher operating costs.';

— for heat generators designed for heaters, and heater housings to be equipped with such heat generators, their characteristics, the requirements for assembly, to ensure compliance with the ecodesign requirements for heaters and, where appropriate, the list of combinations recommended by the manufacturer;

— information relevant for disassembly, recycling and/or disposal at end-of-life;

(b) the technical documentation for the purposes of conformity assessment pursuant to Article 4 shall contain the following elements:

— the elements specified in point (a);

— for heat pump space heaters and heat pump combination heaters where the information relating to a specific model comprising a combination of indoor and outdoor units has been obtained by calculation on the basis of design and/or extrapolation from other combinations, the details of such calculations and/or extrapolations, and of any tests undertaken to verify the accuracy of the calculations, including details of the mathematical model for calculating the performance of such combinations and details of the measurements taken to verify this model;

(c) the following information shall be durably marked on the heater:

— if applicable, 'type B1 boiler' or 'type B1 combination boiler';

— for cogeneration space heaters, the electrical capacity.

Table 1

Information requirements for boiler space heaters, boiler combination heaters and cogeneration space heaters

Model(s): [information identifying the model(s) to which the information relates]

Condensing boiler: [yes/no]

Low-temperature (**) boiler: [yes/no]

B1 boiler: [yes/no]

Cogeneration space heater: [yes/no] If yes, equipped with a supplementary heater: [yes/no]

Combination heater: [yes/no]

Item	Symbol	Value	Unit
Rated heat output	*Prated*	x	kW
For boiler space heaters and boiler combination heaters: Useful heat output			
At rated heat output and high-temperature regime (*)	P_4	x,x	kW
At 30 % of rated heat output and low-temperature regime (**)	P_1	x,x	kW
For cogeneration space heaters: Useful heat output			
At rated heat output of cogeneration space heater with supplementary heater disabled	$P_{CHP100 + Sup0}$	x,x	kW
At rated heat output of cogeneration space heater with supplementary heater enabled	$P_{CHP100 + Sup100}$	x,x	kW
For cogeneration space heaters: Electrical efficiency			
At rated heat output of cogeneration space heater with supplementary heater disabled	$\eta_{el,CHP100 + Sup0}$	x,x	%
At rated heat output of cogeneration space heater with supplementary heater enabled	$\eta_{el,CHP100 + Sup100}$	x,x	%
Auxiliary electricity consumption			
At full load	*elmax*	x,xxx	kW
At part load	*elmin*	x,xxx	kW
In standby mode	P_{SB}	x,xxx	kW

Item	Symbol	Value	Unit
Seasonal space heating energy efficiency	η_s	x	%
For boiler space heaters and boiler combination heaters: Useful efficiency			
At rated heat output and high-temperature regime (*)	η_4	x,x	%
At 30 % of rated heat output and low-temperature regime (**)	η_1	x,x	%
For cogeneration space heaters: Useful efficiency			
At rated heat output of cogeneration space heater with supplementary heater disabled	$\eta_{CHP100 + Sup0}$	x,x	%
At rated heat output of cogeneration space heater with supplementary heater enabled	$\eta_{CHP100 + Sup100}$	x,x	%
Supplementary heater			
Rated heat output	*Psup*	x,x	kW
Type of energy input			
Other items			
Standby heat loss	P_{stby}	x,xxx	kW
Ignition burner power consumption	P_{ign}	x,xxx	kW
Emissions of nitrogen oxides	NO_x	x	mg/kWh

For combination heaters:

Declared load profile				**Water heating energy efficiency**	η_{wh}	x	%
Daily electricity consumption	Q_{elec}	x,xxx	kWh	Daily fuel consumption	Q_{fuel}	x,xxx	kWh
Contact details	Name and address of the manufacturer or its authorised representative.						

(*) High-temperature regime means 60 °C return temperature at heater inlet and 80 °C feed temperature at heater outlet.
(**) Low temperature means for condensing boilers 30 °C, for low-temperature boilers 37 °C and for other heaters 50 °C return temperature (at heater inlet).

Table 2

Information requirements for heat pump space heaters and heat pump combination heaters

Model(s): [information identifying the model(s) to which the information relates]
Air-to-water heat pump: [yes/no]
Water-to-water heat pump: [yes/no]
Brine-to-water heat pump: [yes/no]
Low-temperature heat pump: [yes/no]
Equipped with a supplementary heater: [yes/no]
Heat pump combination heater: [yes/no]
Parameters shall be declared for medium-temperature application, except for low-temperature heat pumps. For low-temperature heat pumps, parameters shall be declared for low-temperature application.
Parameters shall be declared for average climate conditions.

Item	**Symbol**	**Value**	**Unit**	**Item**	**Symbol**	**Value**	**Unit**
Rated heat output (*)	*Prated*	x	kW	**Seasonal space heating energy efficiency**	η_s	x	%
Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature T_j				Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j			
T_j = – 7 °C	*Pdh*	x,x	kW	T_j = – 7 °C	*COPd or PERd*	x,xx or x,x	– or %
T_j = + 2 °C	*Pdh*	x,x	kW	T_j = + 2 °C	*COPd or PERd*	x,xx or x,x	– or %
T_j = + 7 °C	*Pdh*	x,x	kW	T_j = + 7 °C	*COPd or PERd*	x,xx or x,x	– or %
T_j = + 12 °C	*Pdh*	x,x	kW	T_j = + 12 °C	*COPd or PERd*	x,xx or x,x	– or %
T_j = bivalent temperature	*Pdh*	x,x	kW	T_j = bivalent temperature	*COPd or PERd*	x,xx or x,x	– or %

T_j = operation limit temperature	*Pdh*	x,x	kW	T_j = operation limit temperature	*COPd or PERd*	x,xx or x,x	– or %
For air-to-water heat pumps: T_j = – 15 °C (if *TOL* < – 20 °C)	*Pdh*	x,x	kW	For air-to-water heat pumps: T_j = – 15 °C (if *TOL* < – 20 °C)	*COPd or PERd*	x,xx or x,x	– or %
Bivalent temperature	T_{biv}	x	°C	For air-to-water heat pumps: Operation limit temperature	*TOL*	x	°C
Cycling interval capacity for heating	*Pcych*	x,x	kW	Cycling interval efficiency	*COPcyc or PERcyc*	x,xx or x,x	– or %
Degradation co-efficient (**)	*Cdh*	x,x	—	Heating water operating limit temperature	*WTOL*	x	°C
Power consumption in modes other than active mode				Supplementary heater			
Off mode	P_{OFF}	x,xxx	kW	Rated heat output (*)	*Psup*	x,x	kW
Thermostat-off mode	P_{TO}	x,xxx	kW				
Standby mode	P_{SB}	x,xxx	kW	Type of energy input			
Crankcase heater mode	P_{CK}	x,xxx	kW				
Other items							
Capacity control	fixed/variable			For air-to-water heat pumps: Rated air flow rate, outdoors	—	x	m^3/h
Sound power level, indoors/outdoors	L_{WA}	x/x	dB	For water-/brine-to-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger	—	x	m^3/h
Emissions of nitrogen oxides	NO_x	x	mg/kWh				
For heat pump combination heater:							
Declared load profile	x			**Water heating energy efficiency**	η_{wh}	x	%
Daily electricity consumption	Q_{elec}	x,xxx	kWh	Daily fuel consumption	Q_{fuel}	x,xxx	kWh
Contact details	Name and address of the manufacturer or its authorised representative.						

(*) For heat pump space heaters and heat pump combination heaters, the rated heat output *Prated* is equal to the design load for heating *Pdesignh*, and the rated heat output of a supplementary heater *Psup* is equal to the supplementary capacity for heating *sup(Tj)*.

(**) If *Cdh* is not determined by measurement then the default degradation coefficient is *Cdh* = 0,9.

ANNEX III

Measurements and calculations

1. For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements and calculations shall be made using harmonised standards the reference numbers of which have been published for this purpose in the *Official Journal of the European Union*, or using other reliable, accurate and reproducible methods that take into account the generally recognised state-of-the-art methods. They shall meet the conditions and technical parameters set out in points 2 to 5.

2. General conditions for measurements and calculations

   (a) For the purposes of the measurements set out in points 2 to 5, the indoor ambient temperature shall be set at 20 °C ± 1 °C.

   (b) For the purposes of the calculations set out in points 3 to 5, consumption of electricity shall be multiplied by a conversion coefficient *CC* of 2,5.

   (c) Emissions of nitrogen oxides shall be measured as the sum of nitrogen monoxide and nitrogen dioxide, and expressed in nitrogen dioxide.

   (d) For heaters equipped with supplementary heaters, the measurement and calculation of rated heat output, seasonal space heating energy efficiency, water heating energy efficiency, sound power level and emissions of nitrogen oxides shall take account of the supplementary heater.

   (e) Declared values for rated heat output, seasonal space heating energy efficiency, water heating energy efficiency, sound power level and emissions of nitrogen oxides shall be rounded to the nearest integer.

   (f) Any heat generator designed for a heater, and any heater housing to be equipped with such a heat generator, shall be tested with an appropriate heater housing and heat generator, respectively.

3. Seasonal space heating energy efficiency of boiler space heaters, boiler combination heaters and cogeneration space heaters

   The seasonal space heating energy efficiency η_s shall be calculated as the seasonal space heating energy efficiency in active mode η_{son}, corrected by contributions accounting for temperature controls, auxiliary electricity consumption, standby heat loss, ignition burner power consumption (if applicable) and, for cogeneration space heaters, corrected by adding the electrical efficiency multiplied by a conversion coefficient *CC* of 2,5.

4. Seasonal space heating energy efficiency of heat pump space heaters and heat pump combination heaters

   (a) For establishing the rated coefficient of performance COP_{rated} or rated primary energy ratio PER_{rated}, the sound power level or emissions of nitrogen oxides, the operating conditions shall be the standard rating conditions set out in Table 3 and the same declared capacity for heating shall be used.

   (b) The active mode coefficient of performance $SCOP_{on}$ or active mode primary energy ratio $SPER_{on}$ shall be calculated on the basis of the part load for heating $Ph(T_j)$, the supplementary capacity for heating $sup(T_j)$ (if applicable) and the bin-specific coefficient of performance $COPbin(T_j)$ or bin-specific primary energy ratio $PERbin(T_j)$, weighted by the bin-hours for which the bin conditions apply, using the following conditions:

      — the reference design conditions set out in Table 4;

      — the European reference heating season under average climate conditions set out in Table 5;

      — if applicable, the effects of any degradation of energy efficiency caused by cycling depending on the type of control of the heating capacity.

   (c) The reference annual heat demand Q_H shall be the design load for heating *Pdesignh* multiplied by the annual equivalent active mode hours H_{HE} of 2 066.

   (d) The annual energy consumption Q_{HE} shall be calculated as the sum of:

      — the ratio of the reference annual heating demand Q_H and the active mode coefficient of performance $SCOP_{on}$ or active mode primary energy ratio $SPER_{on}$ and

      — the energy consumption for off, thermostat-off, standby, and crankcase heater mode during the heating season.

(e) The seasonal coefficient of performance *SCOP* or seasonal primary energy ratio *SPER* shall be calculated as the ratio of the reference annual heat demand Q_H and the annual energy consumption Q_{HE}.

(f) The seasonal space heating energy efficiency η_s shall be calculated as the seasonal coefficient of performance *SCOP* divided by the conversion coefficient *CC* or the seasonal primary energy ratio *SPER*, corrected by contributions accounting for temperature controls and, for water-/brine-to-water heat pump space heaters and heat pump combination heaters, the electricity consumption of one or more ground water pumps.

5. Water heating energy efficiency of combination heaters

The water heating energy efficiency η_{wh} of a combination heater shall be calculated as the ratio between the reference energy Q_{ref} of the declared load profile and the energy required for its generation under the following conditions:

(a) measurements shall be carried out using the load profiles set out in Table 7;

(b) measurements shall be carried out using a 24-hour measurement cycle as follows:

— 00:00 to 06:59: no water draw-off;

— from 07:00: water draw-offs according to the declared load profile;

— from end of last water draw-off until 24:00: no water draw-off;

(c) the declared load profile shall be the maximum load profile or the load profile one below the maximum load profile;

(d) for heat pump combination heaters, the following additional conditions apply:

— heat pump combination heaters shall be tested under the conditions set out in Table 3;

— heat pump combination heaters which use ventilation exhaust air as the heat source shall be tested under the conditions set out in Table 6.

Table 3

Standard rating conditions for heat pump space heaters and heat pump combination heaters

Heat source	Outdoor heat exchanger	Indoor heat exchanger			
	Inlet dry bulb (wet bulb) temperature	Heat pump space heaters and heat pump combination heaters, except low-temperature heat pumps		Low-temperature heat pumps	
		Inlet temperature	Outlet temperature	Inlet temperature	Outlet temperature
Outdoor air	+ 7 °C (+ 6 °C)	+ 47 °C	+ 55 °C	+ 30 °C	+ 35 °C
Exhaust air	+ 20 °C (+ 12 °C)				
	Inlet/outlet temperature				
Water	+ 10 °C/+ 7 °C				
Brine	0 °C/– 3 °C				

Table 4

Reference design conditions for heat pump space heaters and heat pump combination heaters, temperatures in dry bulb air temperature (wet bulb air temperature indicated in brackets)

Reference design temperature	Bivalent temperature	Operation limit temperature
Tdesignh	T_{biv}	*TOL*
– 10 (– 11) °C	maximum + 2 °C	maximum – 7 °C

Table 5

European reference heating season under average climate conditions for heat pump space heaters and heat pump combination heaters

bin_j	T_j [°C]	H_j [h/annum]
1 to 20	– 30 to – 11	0
21	– 10	1
22	– 9	25
23	– 8	23
24	– 7	24
25	– 6	27
26	– 5	68
27	– 4	91
28	– 3	89
29	– 2	165
30	– 1	173
31	0	240
32	1	280
33	2	320
34	3	357
35	4	356
36	5	303
37	6	330
38	7	326
39	8	348
40	9	335
41	10	315
42	11	215
43	12	169
44	13	151
45	14	105
46	15	74
Total hours:		4 910

Table 6

Maximum ventilation exhaust air available [m^3/h], at humidity of 5,5 g/m^3

Declared load profile	XXS	XS	S	M	L	XL	XXL	3XL	4XL
Maximum ventilation exhaust air available	109	128	128	159	190	870	1 021	2 943	8 830

Table 7

Water heating load profiles of combination heaters

	3XS			XXS			XS			S			
	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	T_p
h	**kWh**	l/min	°C	**kWh**	l/min	°C	**kWh**	l/min	°C	**kWh**	l/min	°C	°C
07:00	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
07:05	**0,015**	2	25										
07:15	**0,015**	2	25										
07:26	**0,015**	2	25										
07:30	**0,015**	2	25	**0,105**	2	25	**0,525**	3	35	**0,105**	3	25	
07:45													
08:01													
08:05													
08:15													
08:25													
08:30				**0,105**	2	25				**0,105**	3	25	
08:45													
09:00	**0,105**	2	25										
09:30	**0,105**	2	25	**0,105**	2	25				**0,105**	3	25	
10:00													
10:30													
11:00													
11:30	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
11:45	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
12:00	**0,015**	2	25	**0,105**	2	25							
12:30	**0,015**	2	25	**0,105**	2	25							
12:45	**0,015**	2	25	**0,105**	2	25	0,525	3	35	**0,315**	4	10	55
14:30	**0,015**	2	25										
15:00	**0,015**	2	25										
15:30	**0,015**	2	25										
16:00	**0,015**	2	25										
16:30													
17:00													
18:00				**0,105**	2	25				**0,105**	3	25	
18:15				**0,105**	2	25				**0,105**	3	40	
18:30	**0,015**	2	25	**0,105**	2	25							
19:00	**0,015**	2	25	**0,105**	2	25							
19:30	**0,015**	2	25	**0,105**	2	25							

	3XS			XXS			XS			S			
	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	T_p
h	**kWh**	l/min	°C	**kWh**	l/min	°C	**kWh**	l/min	°C	**kWh**	l/min	°C	°C
20:00				**0,105**	2	25							
20:30							**1,05**	3	35	**0,42**	4	10	55
20:45				**0,105**	2	25							
20:46													
21:00				**0,105**	2	25							
21:15	**0,015**	2	25	**0,105**	2	25							
21:30	**0,015**	2	25							**0,525**	5	45	
21:35	**0,015**	2	25	**0,105**	2	25							
21:45	**0,015**	2	25	**0,105**	2	25							
Q_{ref}	**0,345**			**2,100**			**2,100**			**2,100**			

	M				L				XL			
	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p
h	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C
07:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
07:05	**1,4**	6	40		**1,4**	6	40					
07:15									**1,82**	6	40	
07:26									**0,105**	3	25	
07:30	**0,105**	3	25		**0,105**	3	25					
07:45					**0,105**	3	25		**4,42**	10	10	40
08:01	**0,105**	3	25						**0,105**	3	25	
08:05					**3,605**	10	10	40				
08:15	**0,105**	3	25						**0,105**	3	25	
08:25					**0,105**	3	25					
08:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
08:45	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
09:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
09:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
10:00									**0,105**	3	25	
10:30	**0,105**	3	10	40	**0,105**	3	10	40	**0,105**	3	10	40
11:00									**0,105**	3	25	
11:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
11:45	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
12:00												
12:30												

	M				**L**				**XL**			
	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p
h	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C
12:45	**0,315**	4	10	55	**0,315**	4	10	55	**0,735**	4	10	55
14:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
15:00									**0,105**	3	25	
15:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
16:00									**0,105**	3	25	
16:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
17:00									**0,105**	3	25	
18:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
18:15	**0,105**	3	40		**0,105**	3	40		**0,105**	3	40	
18:30	**0,105**	3	40		**0,105**	3	40		**0,105**	3	40	
19:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
19:30												
20:00												
20:30	**0,735**	4	10	55	**0,735**	4	10	55	**0,735**	4	10	55
20:45												
20:46									**4,42**	10	10	40
21:00					**3,605**	10	10	40				
21:15	**0,105**	3	25						**0,105**	3	25	
21:30	**1,4**	6	40		**0,105**	3	25		**4,42**	10	10	40
21:35												
21:45												
Q_{ref}	**5,845**				**11,655**				**19,07**			

	XXL				**3XL**				**4XL**			
	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p
h	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C
07:00	**0,105**	3	25		**11,2**	48	40		**22,4**	96	40	
07:05												
07:15	**1,82**	6	40									
07:26	**0,105**	3	25									
07:30												
07:45	**6,24**	16	10	40								
08:01	**0,105**	3	25		**5,04**	24	25		**10,08**	48	25	
08:05												
08:15	**0,105**	3	25									

	XXL				3XL				4XL			
	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p
h	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C
08:25												
08:30	**0,105**	3	25									
08:45	**0,105**	3	25									
09:00	**0,105**	3	25		**1,68**	24	25		**3,36**	48	25	
09:30	**0,105**	3	25									
10:00	**0,105**	3	25									
10:30	**0,105**	3	10	40	**0,84**	24	10	40	**1,68**	48	10	40
11:00	**0,105**	3	25									
11:30	**0,105**	3	25									
11:45	**0,105**	3	25		**1,68**	24	25		**3,36**	48	25	
12:00												
12:30												
12:45	**0,735**	4	10	55	**2,52**	32	10	55	**5,04**	64	10	55
14:30	**0,105**	3	25									
15:00	**0,105**	3	25									
15:30	**0,105**	3	25		**2,52**	24	25		**5,04**	48	25	
16:00	**0,105**	3	25									
16:30	**0,105**	3	25									
17:00	**0,105**	3	25									
18:00	**0,105**	3	25									
18:15	**0,105**	3	40									
18:30	**0,105**	3	40		**3,36**	24	25		**6,72**	48	25	
19:00	**0,105**	3	25									
19:30												
20:00												
20:30	**0,735**	4	10	55	**5,88**	32	10	55	**11,76**	64	10	55
20:45												
20:46	**6,24**	16	10	40								
21:00												
21:15	**0,105**	3	25									
21:30	**6,24**	16	10	40	**12,04**	48	40		**24,08**	96	40	
21:35												
21:45												
Q_{ref}	**24,53**				**46,76**				**93,52**			

ANNEX IV

Verification procedure for market surveillance purposes

When performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC, the authorities of the Member States shall apply the following verification procedure for the requirements set out in Annex II:

1. The Member State authorities shall test one single unit per model.

2. The heater model shall be considered to comply with the applicable requirements set out in Annex II to this Regulation if:

   (a) the declared values comply with the requirements set out in Annex II;

   (b) the seasonal space heating energy efficiency η_s is not more than 8 % lower than the declared value at the rated heat output of the unit;

   (c) the water heating energy efficiency η_{wh} is not more than 8 % lower than the declared value at the rated heat output of the unit;

   (d) the sound power level L_{WA} is not more than 2 dB higher than the declared value of the unit; and

   (e) the emissions of nitrogen oxides, expressed in nitrogen dioxide, are not more than 20 % higher than the declared value of the unit.

3. If the result referred to in point 2(a) is not achieved, the model and all other equivalent models shall be considered not to comply with this Regulation. If the result referred to in point 2(b) to (e) is not achieved, the Member State authorities shall randomly select three additional units of the same model for testing.

4. The heater model shall be considered to comply with the applicable requirements set out in Annex II to this Regulation if:

   (a) the declared values of each of the three units comply with the requirements set out in Annex II;

   (b) the average of the three units for seasonal space heating energy efficiency η_s is not more than 8 % lower than the declared value at the rated heat output of the unit;

   (c) the average of the three units for water heating energy efficiency η_{wh} is not more than 8 % lower than the declared value at the rated heat output of the unit;

   (d) the average of the three units for the sound power level L_{WA} is not more than 2 dB higher than the declared value of the unit; and

   (e) the average of the three units for emissions of nitrogen oxides, expressed in nitrogen dioxide, are not more than 20 % higher than the declared value of the unit.

5. If the results referred to in point 4 are not achieved, the model and all other equivalent models shall be considered not to comply with this Regulation. The Member State authorities shall provide the test results and other relevant information to the authorities of the other Member States and to the Commission within one month of the decision being taken on the non-compliance of the model.

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

ANNEX V

Indicative benchmarks referred to in Article 6

At the time of entry into force of this Regulation, the best available technology on the market for heaters in terms of seasonal space heating energy efficiency, water heating energy efficiency, sound power level and emissions of nitrogen oxides was identified as follows:

1. Benchmark for seasonal space heating energy efficiency in medium-temperature application: 145 %;

2. Benchmarks for water heating energy efficiency of combination heaters:

Declared load profile	**3XS**	**XXS**	**XS**	**S**	**M**	**L**	**XL**	**XXL**	**3XL**	**4XL**
Water heating energy efficiency	35 %	35 %	38 %	38 %	75 %	110 %	115 %	120 %	130 %	130 %

3. Benchmarks for sound power level (L_{WA}), outdoor, of heat pump space heaters and of heat pump combination heaters with rated heat output:

   (a) ≤ 6 kW: 39 dB;

   (b) > 6 kW and ≤ 12 kW: 40 dB;

   (c) > 12 kW and ≤ 30 kW: 41 dB;

   (d) > 30 kW and ≤ 70 kW: 67 dB.

4. Benchmarks for emissions of nitrogen oxides, expressed in nitrogen dioxide:

   (a) of boiler space heaters and boiler combination heaters using gaseous fuels: 14 mg/kWh fuel input in terms of *GCV*;

   (b) of boiler space heaters and boiler combination heaters using liquid fuels: 50 mg/kWh fuel input in terms of *GCV*.

The benchmarks specified in points 1 to 4 do not necessarily imply that a combination of these values is achievable for a single heater.

COMMISSION REGULATION (EU) No 814/2013

of 2 August 2013

implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for water heaters and hot water storage tanks

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to 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 Article 15(1) thereof,

After consulting the Ecodesign Consultation Forum,

Whereas:

(1) Under Directive 2009/125/EC ecodesign requirements should be set by the Commission for energy-related products representing significant volumes of sales and trade, having a significant environmental impact and presenting significant potential for improvement through design in terms of their environmental impact, without entailing excessive costs.

(2) Article 16(2)(a) of Directive 2009/125/EC provides that, in accordance with the procedure referred to in Article 19(3) and the criteria set out in Article 15(2), and after consulting the Ecodesign Consultation Forum, the Commission should, as appropriate, introduce implementing measures for products offering a high potential for cost-effective reduction of greenhouse gas emissions, such as for water heating equipment.

(3) The Commission has carried out a preparatory study on the technical, environmental and economic aspects of water heaters and hot water storage tanks typically used in the domestic and commercial sector. The study was devised together with stakeholders and interested parties from the Union and third countries, and the results have been made publicly available.

(4) The environmental aspects of water heaters that have been identified as significant for the purposes of this Regulation are energy consumption in the use phase and (for heat pump water heaters) sound power levels. In addition, for water heaters using fossil fuels, emissions of nitrogen oxides, carbon monoxide and hydrocarbons are also identified as significant environmental aspects. The significant environmental aspect of hot water storage tanks is energy consumption due to their standing losses.

(5) It is not appropriate to set ecodesign requirements for emissions of carbon monoxide and hydrocarbons as no suitable European measurement methods are as yet available. With a view to developing such measurement methods, the Commission mandated the European standardisation organisations to consider ecodesign requirements for those emissions during the review of this Regulation. National provisions for ecodesign requirements on emissions of carbon monoxides and hydrocarbons of water heaters may be maintained until the corresponding Union ecodesign requirements enter into force. The provisions of Directive 2009/142/EC of the European Parliament and of the Council of 30 November 2009 relating to appliances burning gaseous fuels [2], which limit the combustion products of appliances burning gaseous fuels in relation to health and safety, are not affected.

(6) The preparatory study shows that requirements regarding the other ecodesign parameters referred to in Annex I, Part 1 to Directive 2009/125/EC are not necessary in the case of water heaters and hot water storage tanks. In particular, greenhouse gas emissions related to refrigerants used in heat pump water heaters for heating today's European building stock are not identified as significant. The appropriateness of setting ecodesign requirements for these greenhouse gas emissions will be reassessed when reviewing this Regulation.

(7) The scope of this Regulation should be limited to water heaters which are dedicated to providing hot drinking and sanitary water.

(8) Water heaters that are designed for using gaseous or liquid fuels predominantly (more than 50 %) produced from biomass have specific technical characteristics which require further technical, economic and environmental analyses. Depending on the outcome of the analyses, ecodesign requirements for those water heaters should be set at a later stage, if appropriate.

[1] OJ L 285, 31.10.2009, p. 10.

[2] OJ L 330, 16.12.2009, p. 10.

(9) Annual energy consumption related to water heaters and hot water storage tanks was estimated to have been 2 156 PJ (51 Mtoe) in the Union in 2005, corresponding to 124 Mt CO_2 emissions. Unless specific measures are taken, annual energy consumption is expected to be 2 243 PJ in 2020. Annual emissions of nitrogen oxides related to water heaters and hot water storage tanks were estimated to have been 559 kt SO_x equivalent in the Union in 2005. Unless specific measures are taken, annual emissions are expected to be 603 kt SO_x equivalent in 2020. The preparatory study shows that the use-phase energy consumption and the nitrogen oxides emissions of water heaters can be significantly reduced.

(10) The energy consumption of water heaters and hot water storage tanks can be reduced by applying existing cost-effective non-proprietary technologies which lead to a reduction in the combined costs of purchasing and operating these products.

(11) The combined effect of the ecodesign requirements set out in this Regulation and the Commission Delegated Regulation (EU) No 812/2013 of 18 February 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of water heaters, hot water storage tanks and packages of water heater and solar device [1] is expected to result by 2020 in estimated annual energy savings of about 450 PJ (11 Mtoe), corresponding to around 26 Mt CO_2 emissions, and a reduction in annual nitrogen oxides emissions of some 130 kt SO_x equivalent, compared to what would happen if no measures were taken.

(12) Ecodesign requirements should harmonise energy consumption, sound power level and nitrogen oxides emission requirements for water heaters, and requirements for standing losses of hot water storage tanks throughout the Union, thus helping to make the internal market operate better and to improve the environmental performance of these products.

(13) The ecodesign requirements should not affect the functionality or affordability of water heaters or hot water storage tanks from the end-user's perspective and should not negatively affect health, safety or the environment.

(14) The ecodesign requirements should be introduced gradually to give manufacturers a sufficient timeframe to redesign their products subject to this Regulation. The timing should be such that cost impact for manufacturers, in particular for small and medium-sized enterprises, is taken into account, while ensuring timely achievement of the objectives of this Regulation.

(15) Product parameters should be measured and calculated using reliable, accurate and reproducible methods which take into account recognised state-of-the-art measurement and calculation methods, including, where available, harmonised standards adopted by the European standardisation organisations under a request from the Commission, in accordance with the procedures laid down in the Regulation (EU) No 1025/2012 of the European Parliament and of the Council of 25 October 2012 on European standardisation [2].

(16) In accordance with Article 8(2) of Directive 2009/125/EC, this Regulation specifies which conformity assessment procedures apply.

(17) To facilitate compliance checks, manufacturers should provide information in the technical documentation referred to in Annexes IV and V to Directive 2009/125/EC in so far as that information relates to the requirements laid down in this Regulation.

(18) To further limit the environmental impact of water heaters and hot water storage tanks, manufacturers should provide information on disassembly, recycling and/or disposal.

(19) In addition to the legally binding requirements laid down in this Regulation, indicative benchmarks for best available technologies should be identified to ensure that information on the life-cycle environmental performance of water heaters and hot water storage tanks is widely available and easily accessible.

(20) 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 the placing on the market and/or putting into service of water heaters with a rated heat output ≤ 400 kW and hot water storage tanks with a storage volume ≤ 2 000 litres, including those integrated in packages of water heater and solar device as defined in Article 2 of Delegated Regulation (EU) No 812/2013.

[1] See page 83 of this Official Journal.

[2] OJ L 316, 14.11.2012, p. 12.

2. This Regulation shall not apply to:

(a) water heaters specifically designed for using gaseous or liquid fuels predominantly produced from biomass;

(b) water heaters using solid fuels;

(c) water heaters within the scope of Directive 2010/75/EU of the European Parliament and of the Council [1];

(d) combination heaters as defined in Article 2 of Commission Regulation (EU) No 813/2013 [2];

(e) water heaters which do not meet at least the load profile with the smallest reference energy, as specified in Annex III, Table 1;

(f) water heaters designed for making hot drinks and/or food only;

(g) heat generators designed for water heaters and water heater housings to be equipped with such heat generators placed on the market before 1 January 2018 to replace identical heat generators and identical water heater housings. The replacement product or its packaging shall clearly indicate the water heater for which it is intended.

Article 2

Definitions

In addition to the definitions set out in Article 2 of Directive 2009/125/EC, the following definitions shall apply for the purposes of this Regulation:

(1) 'water heater' means a device that

(a) is connected to an external supply of drinking or sanitary water;

(b) generates and transfers heat to deliver drinking or sanitary hot water at given temperature levels, quantities and flow rates during given intervals; and

(c) is equipped with one or more heat generators;

(2) 'heat generator' means the part of a water heater that generates the heat using one or more of the following processes:

(a) combustion of fossil fuels and/or biomass fuels;

(b) use of the Joule effect in electric resistance heating elements;

(c) capture of ambient heat from an air source, water source or ground source, and/or waste heat;

whereby a heat generator designed for a water heater and a water heater housing to be equipped with such a heat generator shall be also considered a water heater;

(3) 'water heater housing' means the part of a water heater designed to have a heat generator fitted;

(4) 'rated heat output' means the declared heat output of the water heater when providing water heating at standard rating conditions, expressed in kW;

(5) 'storage volume' (*V*) means the rated volume of a hot water storage tank or a storage water heater, expressed in litres;

(6) 'standard rating conditions' means the operating conditions of water heaters for establishing the rated heat output, water heating energy efficiency, sound power level and nitrogen oxide emissions, and of hot water storage tanks for establishing the standing loss;

(7) 'biomass' means the biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste;

(8) 'biomass fuel' means a gaseous or liquid fuel produced from biomass;

(9) 'fossil fuel' means a gaseous or liquid fuel of fossil origin;

(10) 'conventional water heater' means a water heater that generates heat using the combustion of fossil and/or biomass fuels and/or the Joule effect in electric resistance heating elements;

(11) 'heat pump water heater' means a water heater using ambient heat from an air source, water source or ground source, and/or waste heat for heat generation;

[1] OJ L 334, 17.12.2010, p. 17.
[2] See page 136 of this Official Journal.

(12) 'solar water heater' means a water heater equipped with one or more solar collectors, solar hot water storage tanks, heat generators and possibly pumps in the collector loop and other parts; a solar water heater is placed on the market as one unit;

(13) 'hot water storage tank' means a vessel for storing hot water for water and/or space heating purposes, including any additives, which is not equipped with any heat generator except possibly one or more back-up immersion heaters;

(14) 'back-up immersion heater' means a Joule effect electric resistance heater that is part of a hot water storage tank and generates heat only when the external heat source is disrupted (including during maintenance periods) or out of order, or that is part of a solar hot water storage tank and provides heat when the solar heat source is not sufficient to satisfy required comfort levels;

(15) 'water heating energy efficiency' (η_{wh}) means the ratio between the useful energy provided by a water heater and the energy required for its generation, expressed in %;

(16) 'sound power level' (L_{WA}) means the A-weighted sound power level, indoors and/or outdoors, expressed in dB;

(17) 'standing loss' (S) means the heating power dissipated from a hot water storage tank at given water and ambient temperatures, expressed in W;

(18) 'conversion coefficient' (CC) means a coefficient reflecting the estimated 40 % average EU generation efficiency referred to in Directive 2012/27/EU of the European Parliament and of the Council [1]; the value of the conversion coefficient is $CC = 2{,}5$.

For the purposes of Annexes II to VI, additional definitions are set out in Annex I.

Article 3

Ecodesign requirements and timetable

1. The ecodesign requirements for water heaters and hot water storage tanks are set out in Annex II.

2. Each ecodesign requirement shall apply in accordance with the following timetable:

(a) from 26 September 2015:

(i) water heaters shall meet the requirements set out in Annex II, points 1.1(a), 1.2, 1.3, 1.4 and 1.6;

(ii) hot water storage tanks shall meet the requirements set out in Annex II, point 2.2;

(b) from 26 September 2017:

(i) water heaters shall meet the requirements set out in Annex II, point 1.1(b);

(ii) hot water storage tanks shall meet the requirements set out in Annex II, point 2.1;

(c) from 26 September 2018:

(i) water heaters shall meet the requirements set out in Annex II, point 1.1(c);

(ii) water heaters shall meet the requirements set out in Annex II, point 1.5(a).

3. Compliance with ecodesign requirements shall be measured and calculated in accordance with the requirements set out in Annexes III and IV.

Article 4

Conformity assessment

1. The conformity assessment procedure referred to in Article 8(2) of Directive 2009/125/EC shall be the internal design control 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, the technical documentation shall contain the product information set out in point 1.6 of Annex II to this Regulation.

Article 5

Verification procedure for market surveillance purposes

When performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC to ensure compliance with the requirements set out in Annex II to this Regulation, the Member States' authorities shall apply the verification procedure set out in Annex V to this Regulation.

Article 6

Indicative benchmarks

The indicative benchmarks for best-performing water heaters and hot water storage tanks available on the market at the time of entry into force of this Regulation are set out in Annex VI.

[1] OJ L 315, 14.11.2012, p. 1.

Article 7

Review

1. The Commission shall review this Regulation in the light of technological progress with water heaters and hot water storage tanks and present the result of that review to the Ecodesign Consultation Forum no later than five years from the date of entry into force of this Regulation. In particular, the review shall include an assessment of the following aspects:

(a) the appropriateness of setting ecodesign requirements for greenhouse gas emissions related to refrigerants;

(b) on the basis of the measurement methods under development, the level of the ecodesign requirements for emissions of carbon monoxide and hydrocarbons that may be introduced;

(c) the appropriateness of setting stricter ecodesign requirements for emissions of nitrogen oxides;

(d) the appropriateness of setting ecodesign requirements for water heaters specifically designed for using gaseous or liquid fuels predominantly produced from biomass;

(e) the validity of the conversion coefficient value;

(f) the appropriateness of third party certification.

2. The Commission shall also review this Regulation in the light of technological progress with water heaters and present the result of that review to the Ecodesign Consultation Forum no later than three years from the date of entry into force of this Regulation. The review shall only include an assessment of the appropriateness of setting separate ecodesign requirements for different types of water heaters.

Article 8

Transitional provisions

1. Until 26 September 2015 Member States may allow the placing on the market and/or putting into service of water heaters which are in conformity with the national provisions in force when this Regulation is adopted regarding water heating energy efficiency and sound power level.

2. Until 26 September 2018 Member States may allow the placing on the market and/or putting into service of water heaters which are in conformity with the national provisions in force when this Regulation is adopted regarding emissions of nitrogen oxides.

3. Until 26 September 2017 Member States may allow the placing on the market and/or putting into service of hot water storage tanks, which are in conformity with the national provisions in force upon adoption of this Regulation regarding standing losses.

Article 9

Entry into force

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

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

Done at Brussels, 2 August 2013.

For the Commission
The President
José Manuel BARROSO

ANNEX I

Definitions applicable for Annexes II to VI

For the purposes of Annexes II to VI the following definitions shall apply:

(1) 'storage water heater' means a water heater equipped with hot water storage tank(s), heat generator(s) and possibly other parts, which are contained in a single housing;

(2) 'load profile' means a given sequence of water draw-offs, as specified in Annex III, Table 1; each water heater meets at least one load profile;

(3) 'water draw-off' means a given combination of useful water flow rate, useful water temperature, useful energy content and peak temperature, as specified in Annex III, Table 1;

(4) 'useful water flow rate' (f) means the minimum flow rate, expressed in litres per minute, for which hot water is contributing to the reference energy, as specified in Annex III, Table 1;

(5) 'useful water temperature' (T_m), means the water temperature, expressed in degrees Celsius, at which hot water starts contributing to the reference energy, as specified in Annex III, Table 1;

(6) 'useful energy content' (Q_{tap}) means the energy content of hot water, expressed in kWh, provided at a temperature equal to, or above, the useful water temperature, and at water flow rates equal to, or above, the useful water flow rate, as specified in Annex III, Table 1;

(7) 'energy content of hot water' means the product of the specific heat capacity of water, the average temperature difference between the hot water output and cold water input, and the total mass of the hot water delivered;

(8) 'peak temperature' (T_p) means the minimum water temperature, expressed in degrees Celsius, to be achieved during water draw-off, as specified in Annex III, Table 1;

(9) 'reference energy' (Q_{ref}) means the sum of the useful energy content of water draw-offs, expressed in kWh, in a particular load profile, as specified in Annex III, Table 1;

(10) 'maximum load profile' means the load profile with the greatest reference energy that a water heater is able to provide while fulfilling the temperature and flow rate conditions of that load profile;

(11) 'declared load profile' means the load profile applied for conformity assessment;

(12) 'daily electricity consumption' (Q_{elec}) means the consumption of electricity over 24 consecutive hours under the declared load profile, expressed in kWh in terms of final energy;

(13) 'daily fuel consumption' (Q_{fuel}) means the consumption of fuels over 24 consecutive hours under the declared load profile, expressed in kWh in terms of *GCV*;

(14) 'gross calorific value' (*GCV*) means the total amount of heat released by a unit quantity of fuel when it is burned completely with oxygen and when the products of combustion are returned to ambient temperature; this quantity includes the condensation heat of any water vapour contained in the fuel and of the water vapour formed by the combustion of any hydrogen contained in the fuel;

(15) 'smart control' means a device that automatically adapts the water heating process to individual usage conditions with the aim of reducing energy consumption;

(16) 'smart control compliance' (*smart*) means the measure of whether a water heater equipped with smart controls fulfils the criterion set out in point 4 of Annex IV;

(17) 'smart control factor' (*SCF*) means the water heating energy efficiency gain due to smart control under the conditions set out in point 3 of Annex III;

(18) 'weekly electricity consumption with smart controls' ($Q_{elec,week,smart}$) means the weekly electricity consumption of a water heater with the smart control function enabled, measured under the conditions set out in point 3 of Annex III, expressed in kWh in terms of final energy;

(19) 'weekly fuel consumption with smart controls' ($Q_{fuel,week,smart}$) means the weekly fuel consumption of a water heater with the smart control function enabled, measured under the conditions set out in point 3 of Annex III, expressed in kWh in terms of *GCV*;

(20) 'weekly electricity consumption without smart controls' ($Q_{elec,week}$) means the weekly electricity consumption of a water heater with the smart control function disabled, measured under the conditions set out in point 3 of Annex III, expressed in kWh in terms of final energy;

(21) 'weekly fuel consumption without smart controls' ($Q_{fuel,week}$) means the weekly fuel consumption of a water heater with the smart control function disabled, measured under the conditions set out in point 3 of Annex III, expressed in kWh in terms of *GCV*;

(22) 'ambient correction term' (Q_{cor}) means a term which takes into account the fact that the place where the water heater is installed is not an isothermal place, expressed in kWh;

(23) 'standby heat loss' (P_{stby}) means the heat loss of a heat pump water heater in operating modes without heat demand, expressed in kW;

(24) 'mixed water at 40 °C' (*V40*) means the quantity of water at 40 °C, which has the same heat content (enthalpy) as the hot water which is delivered above 40 °C at the output of the water heater, expressed in litres;

(25) 'average climate conditions' mean the temperature and global solar irradiance conditions characteristic for the city of Strasbourg;

(26) 'annual energy consumption' (Q_{tota}) means the annual energy consumption of a solar water heater, expressed in kWh in terms of primary energy and/or kWh in terms of *GCV*;

(27) 'annual non-solar heat contribution' (Q_{nonsol}) means the annual contribution of electricity (expressed in kWh in terms of primary energy) and/or fuel (expressed in kWh in terms of *GCV*) to the useful heat output of a solar water heater, taking into account the annual amount of heat captured by the solar collector and the heat losses of the solar hot water storage tank;

(28) 'solar collector' means a device designed to absorb global solar irradiance and to transfer the heat energy so produced to a fluid passing through it; it is characterised by the collector aperture area, the zero-loss efficiency, the first-order coefficient, the second-order coefficient and the incidence angle modifier;

(29) 'global solar irradiance' means the rate of total incoming solar energy, both direct and diffuse, on a collector plane with an inclination of 45 degrees and southward orientation at the Earth's surface, expressed in W/m^2;

(30) 'collector aperture area' (A_{sol}) means the maximum projected area through which unconcentrated solar radiation enters the collector, expressed in m^2;

(31) 'zero-loss efficiency' (η_0) means the efficiency of the solar collector, when the solar collector mean fluid temperature is equal to the ambient temperature;

(32) 'first-order coefficient' (a_1) means the heat loss coefficient of a solar collector, expressed in $W/(m^2\ K)$;

(33) 'second-order coefficient' (a_2) means the coefficient measuring the temperature dependence of the first-order coefficient, expressed in $W/(m^2\ K^2)$;

(34) 'incidence angle modifier' (*IAM*) means the ratio of the useful heat output of a solar collector at a given incidence angle and its useful heat output at an incidence angle of 0 degrees;

(35) 'incidence angle' means the angle between the direction to the sun and the direction perpendicular to the solar collector aperture;

(36) 'solar hot water storage tank' means a hot water storage tank storing heat energy produced by one or more solar collectors;

(37) 'heat generator water heating energy efficiency' ($\eta_{wh,nonsol}$) means the water heating energy efficiency of a heat generator which is part of a solar water heater, expressed in %, established under average climate conditions and without using solar heat input;

(38) 'auxiliary electricity consumption' (Q_{aux}) means the annual electricity consumption of a solar water heater that is due to the pump power consumption and the standby power consumption, expressed in kWh in terms of final energy;

(39) 'pump power consumption' (*solpump*) means the rated electrical power consumption of the pump in the collector loop of a solar water heater, expressed in W;

(40) 'standby power consumption' (*solstandby*) means the rated electrical power consumption of a solar water heater when the pump and the heat generator of a solar water heater are inactive, expressed in W;

(41) 'equivalent model' means a model placed on the market with the same technical parameters set out in the applicable product information requirements of Annex II as another model placed on the market by the same manufacturer.

ANNEX II

Ecodesign requirements

1. ECODESIGN REQUIREMENTS FOR WATER HEATERS

1.1. **Requirements for water heating energy efficiency**

(a) From 26 September 2015 the water heating energy efficiency of water heaters shall not fall below the following values:

Declared load profile	**3XS**	**XXS**	**XS**	**S**	**M**	**L**	**XL**	**XXL**	**3XL**	**4XL**
Water heating energy efficiency	22 %	23 %	26 %	26 %	30 %	30 %	30 %	32 %	32 %	32 %
In addition, for water heaters with *smart* being declared as '1': water heating energy efficiency calculated for *smart* = 0, tested under the declared load profile	19 %	20 %	23 %	23 %	27 %	27 %	27 %	28 %	28 %	28 %

(b) From 26 September 2017 the water heating energy efficiency of water heaters shall not fall below the following values:

Declared load profile	**3XS**	**XXS**	**XS**	**S**	**M**	**L**	**XL**	**XXL**	**3XL**	**4XL**
Water heating energy efficiency	32 %	32 %	32 %	32 %	36 %	37 %	37 %	37 %	37 %	38 %
In addition, for water heaters with *smart* being declared as '1': water heating energy efficiency calculated for *smart* = 0, tested under the declared load profile	29 %	29 %	29 %	29 %	33 %	34 %	35 %	36 %	36 %	36 %

(c) From 26 September 2018 the water heating energy efficiency of water heaters shall not fall below the following values:

Declared load profile	**XXL**	**3XL**	**4XL**
Water heating energy efficiency	60 %	64 %	64 %

1.2. **Requirements for storage volume of storage water heaters with declared load profiles 3XS, XXS, XS and S**

From 26 September 2015:

(a) for storage water heaters with declared load profile 3XS the storage volume shall not exceed 7 litres;

(b) for storage water heaters with declared load profiles XXS and XS, the storage volume shall not exceed 15 litres;

(c) for storage water heaters with declared load profile S the storage volume shall not exceed 36 litres.

1.3. **Requirements for mixed water at 40 °C of storage water heaters with declared load profiles M, L, XL, XXL, 3XL and 4XL**

From 26 September 2015 the amount of mixed water at 40 °C shall not fall below the following values:

Declared load profile	**M**	**L**	**XL**	**XXL**	**3XL**	**4XL**
Mixed water at 40 °C	65 litres	130 litres	210 litres	300 litres	520 litres	1 040 litres

1.4. **Requirements for sound power level**

From 26 September 2015 the sound power level of heat pump water heaters shall not exceed the following values:

Rated heat output ≤ 6 kW		Rated heat output > 6 kW and ≤ 12 kW		Rated heat output > 12 kW and ≤ 30 kW		Rated heat output > 30 kW and ≤ 70 kW	
Sound power level (L_{WA}), indoors	Sound power level (L_{WA}), outdoors	Sound power level (L_{WA}), indoors	Sound power level (L_{WA}), outdoors	Sound power level (L_{WA}), indoors	Sound power level (L_{WA}), outdoors	Sound power level (L_{WA}), indoors	Sound power level (L_{WA}), outdoors
60 dB	65 dB	65 dB	70 dB	70 dB	78 dB	80 dB	88 dB

1.5. **Requirements for emissions of nitrogen oxides**

(a) From 26 September 2018 emissions of nitrogen oxides, expressed in nitrogen dioxide, of water heaters shall not exceed the following values:

— conventional water heaters using gaseous fuels: 56 mg/kWh fuel input in terms of *GCV*,

— conventional water heaters using liquid fuels: 120 mg/kWh fuel input in terms of *GCV*,

— heat pump water heaters equipped with external combustion using gaseous fuels and solar water heaters using gaseous fuels: 70 mg/kWh fuel input in terms of *GCV*,

— heat pump water heaters equipped with external combustion using liquid fuels and solar water heaters using liquid fuels: 120 mg/kWh fuel input in terms of *GCV*,

— heat pump water heaters equipped with an internal combustion engine using gaseous fuels: 240 mg/kWh fuel input in terms of *GCV*,

— heat pump water heaters equipped with an internal combustion engine using liquid fuels: 420 mg/kWh fuel input in terms of *GCV*.

1.6. **Requirements for product information related to water heaters**

From 26 September 2015 the instruction manuals for installers and end-users, free access websites of manufacturers, their authorised representatives and importers and technical documentation for the purposes of conformity assessment pursuant to Article 4 shall contain the following elements:

(a) information identifying the model(s), including equivalent models, to which the information relates;

(b) the results of the measurements for the technical parameters specified in point 6 of Annex III;

(c) the results of the calculations for the technical parameters specified in point 2 of Annex IV;

(d) any specific precautions that shall be taken when the water heater is assembled, installed or maintained;

(e) for heat generators designed for water heaters and water heater housings to be equipped with such heat generators, their characteristics, the requirements for assembly, to ensure compliance with the ecodesign requirements for water heaters and, where appropriate, the list of combinations recommended by the manufacturer;

(f) information relevant for disassembly, recycling and/or disposal at end-of-life.

2. ECODESIGN REQUIREMENTS FOR HOT WATER STORAGE TANKS

2.1. **Requirement for standing loss**

From 26 September 2017 the standing loss S of hot water storage tanks with storage volume V, expressed in litres, shall not exceed the following limit:

$$16{,}66 + 8{,}33 \cdot V^{0{,}4} \text{ Watts}$$

2.2. **Requirements for product information related to hot water storage tanks**

From 26 September 2015 the instruction manuals for installers and end-users, the free access websites of manufacturers, their authorised representatives and importers and technical documentation for the purposes of conformity assessment pursuant to Article 4 shall contain the following elements:

(a) information identifying the model(s), including equivalent models, to which the information relates;

(b) the results of the measurements for the technical parameters specified in point 7 of Annex III;

(c) any specific precautions that shall be taken when the hot water storage tank is assembled, installed or maintained;

(d) information relevant for disassembly, recycling and/or disposal at end-of-life.

ANNEX III

Measurements

1. For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements shall be made using harmonised standards the reference numbers of which have been published for this purpose in the *Official Journal of the European Union*, or using other reliable, accurate and reproducible methods that take into account the generally recognised state-of-the-art methods. They shall meet the conditions and technical parameters set out in points 2 to 7.

2. GENERAL CONDITIONS FOR TESTING WATER HEATERS

(a) Measurements shall be carried out using the load profiles set out in Table 1;

(b) measurements shall be carried out using a 24-hour measurement cycle as follows:

— 00:00 to 06:59: no water draw-off,

— from 07:00: water draw-offs according to the declared load profile,

— from end of last water draw-off until 24:00: no water draw-off;

(c) the declared load profile shall be the maximum load profile or the load profile one below the maximum load profile;

(d) any heat generator designed for a water heater, and any water heater housing to be equipped with such a heat generator, shall be tested with an appropriate water heater housing and heat generator, respectively;

(e) water heaters to be classified as off-peak water heaters are energised for a maximum period of 8 consecutive hours between 22:00 and 07:00 of the 24-hour tapping pattern. At the end of the 24-hour tapping pattern the water heaters are energised till the end of the step.

Table 1

Load profiles of water heaters

	3XS			**XXS**			**XS**			**S**			
	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	T_p
h	**kWh**	l/min	°C	**kWh**	l/min	°C	**kWh**	l/min	°C	**kWh**	l/min	°C	°C
07:00	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
07:05	**0,015**	2	25										
07:15	**0,015**	2	25										
07:26	**0,015**	2	25										
07:30	**0,015**	2	25	**0,105**	2	25	**0,525**	3	35	**0,105**	3	25	
07:45													
08:01													
08:05													
08:15													
08:25													
08:30				**0,105**	2	25				**0,105**	3	25	
08:45													
09:00	**0,015**	2	25										
09:30	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	

	3XS			XXS			XS			S			
	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	Q_{tap}	f	T_m	T_p
h	**kWh**	l/min	°C	**kWh**	l/min	°C	**kWh**	l/min	°C	**kWh**	l/min	°C	°C
10:00													
10:30													
11:00													
11:30	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
11:45	**0,015**	2	25	**0,105**	2	25				**0,105**	3	25	
12:00	**0,015**	2	25	**0,105**	2	25							
12:30	**0,015**	2	25	**0,105**	2	25							
12:45	**0,015**	2	25	**0,105**	2	25	**0,525**	3	35	**0,315**	4	10	55
14:30	**0,015**	2	25										
15:00	**0,015**	2	25										
15:30	**0,015**	2	25										
16:00	**0,015**	2	25										
16:30													
17:00													
18:00				**0,105**	2	25				**0,105**	3	25	
18:15				**0,105**	2	25				**0,105**	3	40	
18:30	**0,015**	2	25	**0,105**	2	25							
19:00	**0,015**	2	25	**0,105**	2	25							
19:30	**0,015**	2	25	**0,105**	2	25							
20:00				**0,105**	2	25							
20:30							**1,05**	3	35	**0,42**	4	10	55
20:45				**0,105**	2	25							
20:46													
21:00				**0,105**	2	25							
21:15	**0,015**	2	25	**0,105**	2	25							
21:30	**0,015**	2	25							**0,525**	5	45	
21:35	**0,015**	2	25	**0,105**	2	25							
21:45	**0,015**	2	25	**0,105**	2	25							
Q_{ref}	**0,345**			**2,100**			**2,100**			**2,100**			

	M				L				XL			
	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p
h	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C
07:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
07:05	**1,4**	6	40		**1,4**	6	40					
07:15									**1,82**	6	40	
07:26									**0,105**	3	25	
07:30	**0,105**	3	25		**0,105**	3	25					
07:45					**0,105**	3	25		**4,42**	10	10	40
08:01	**0,105**	3	25						**0,105**	3	25	
08:05					**3,605**	10	10	40				
08:15	**0,105**	3	25						**0,105**	3	25	
08:25					**0,105**	3	25					
08:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
08:45	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
09:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
09:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
10:00									**0,105**	3	25	
10:30	**0,105**	3	10	40	**0,105**	3	10	40	**0,105**	3	10	40
11:00									**0,105**	3	25	
11:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
11:45	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
12:00												
12:30												
12:45	**0,315**	4	10	55	**0,315**	4	10	55	**0,735**	4	10	55
14:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
15:00									**0,105**	3	25	
15:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
16:00									**0,105**	3	25	
16:30	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
17:00									**0,105**	3	25	
18:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
18:15	**0,105**	3	40		**0,105**	3	40		**0,105**	3	40	
18:30	**0,105**	3	40		**0,105**	3	40		**0,105**	3	40	

	M				L				XL			
	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p
h	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C
19:00	**0,105**	3	25		**0,105**	3	25		**0,105**	3	25	
19:30												
20:00												
20:30	**0,735**	4	10	55	**0,735**	4	10	55	**0,735**	4	10	55
20:45												
20:46									**4,42**	10	10	40
21:00					**3,605**	10	10	40				
21:15	**0,105**	3	25						**0,105**	3	25	
21:30	**1,4**	6	40		**0,105**	3	25		**4,42**	10	10	40
21:35												
21:45												
Q_{ref}	**5,845**				**11,655**				**19,07**			

	XXL				3XL				4XL			
	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p
h	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C
07:00	**0,105**	3	25		**11,2**	48	40		**22,4**	96	40	
07:05												
07:15	**1,82**	6	40									
07:26	**0,105**	3	25									
07:30												
07:45	**6,24**	16	10	40								
08:01	**0,105**	3	25		**5,04**	24	25		**10,08**	48	25	
08:05												
08:15	**0,105**	3	25									
08:25												
08:30	**0,105**	3	25									
08:45	**0,105**	3	25									
09:00	**0,105**	3	25		**1,68**	24	25		**3,36**	48	25	
09:30	**0,105**	3	25									
10:00	**0,105**	3	25									

	XXL				3XL				4XL			
	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p	Q_{tap}	f	T_m	T_p
h	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C	**kWh**	l/min	°C	°C
10:30	**0,105**	3	10	40	**0,84**	24	10	40	**1,68**	48	10	40
11:00	**0,105**	3	25									
11:30	**0,105**	3	25									
11:45	**0,105**	3	25		**1,68**	24	25		**3,36**	48	25	
12:00												
12:30												
12:45	**0,735**	4	10	55	**2,52**	32	10	55	**5,04**	64	10	55
14:30	**0,105**	3	25									
15:00	**0,105**	3	25									
15:30	**0,105**	3	25		**2,52**	24	25		**5,04**	48	25	
16:00	**0,105**	3	25									
16:30	**0,105**	3	25									
17:00	**0,105**	3	25									
18:00	**0,105**	3	25									
18:15	**0,105**	3	40									
18:30	**0,105**	3	40		**3,36**	24	25		**6,72**	48	25	
19:00	**0,105**	3	25									
19:30												
20:00												
20:30	**0,735**	4	10	55	**5,88**	32	10	55	**11,76**	64	10	55
20:45												
20:46	**6,24**	16	10	40								
21:00												
21:15	**0,105**	3	25									
21:30	**6,24**	16	10	40	**12,04**	48	40		**24,08**	96	40	
21:35												
21:45												
Q_{ref}	**24,53**				**46,76**				**93,52**			

3. CONDITIONS FOR TESTING THE SMART CONTROL COMPLIANCE (*SMART*) OF WATER HEATERS

Where the manufacturer deems it appropriate to declare the value of *smart* as being '1', measurements of the weekly electricity and/or fuel consumption with or without smart controls shall be carried out using a two-week measurement cycle as follows:

— days 1 to 5: random sequence of load profiles chosen from the declared load profile and the load profile one below the declared load profile, and smart control disabled,

— days 6 and 7: no water draw-offs, and smart control disabled,

— days 8 to 12: repetition of the same sequence applied for days 1 to 5, and smart control enabled,

— days 13 and 14: no water draw-offs, and smart control enabled,

— the difference between the useful energy content measured during days 1 to 7 and the useful energy content measured during days 8 to 14 shall not exceed 2 % of Q_{ref} of the declared load profile.

4. CONDITIONS FOR TESTING SOLAR WATER HEATERS

The solar collector, solar hot water storage tank, pump in the collector loop (if applicable) and heat generator shall be tested separately. Where the solar collector and solar hot water storage tank cannot be tested separately, they shall be tested in combination. The heat generator shall be tested under the conditions set out in point 2 of this Annex.

The results shall be used for the calculations set out in point 3(b) of Annex IV under the conditions set out in Tables 2 and 3. For the purpose of establishing Q_{tota} the efficiency of the heat generator using the Joule effect in electric resistance heating elements is assumed to be 100/*CC*.

5. CONDITIONS FOR TESTING HEAT PUMP WATER HEATERS

— Heat pump water heaters shall be tested under the conditions set out in Table 4;

— heat pump water heaters which use ventilation exhaust air as the heat source shall be tested under the conditions set out in Table 5.

Table 2

Average daytime temperature [°C]

	January	February	March	April	May	June	July	August	September	October	November	December
Average climate conditions	2,8	2,6	7,4	12,2	16,3	19,8	21,0	22,0	17,0	11,9	5,6	3,2

Table 3

Average global solar irradiance [W/m^2]

	January	February	March	April	May	June	July	August	September	October	November	December
Average climate conditions	70	104	149	192	221	222	232	217	176	129	80	56

Table 4

Standard rating conditions for heat pump water heaters, temperatures in dry bulb air temperature (wet bulb air temperature indicated in brackets)

Heat source	Outdoor air	Indoor air	Exhaust air	Brine	Water
Temperature	+ 7 °C (+ 6 °C)	+ 20 °C (maximum + 15 °C)	+ 20 °C (+ 12 °C)	0 °C (inlet)/ – 3 °C (outlet)	+ 10 °C (inlet)/ + 7 °C (outlet)

Table 5

Maximum ventilation exhaust air available [m^3/h], at a temperature of 20 °C and with humidity of 5,5 g/m^3

Declared load profile	**XXS**	**XS**	**S**	**M**	**L**	**XL**	**XXL**	**3XL**	**4XL**
Maximum ventilation exhaust air available	109	128	128	159	190	870	1 021	2 943	8 830

6. TECHNICAL PARAMETERS OF WATER HEATERS

The following parameters shall be established for water heaters:

(a) the daily electricity consumption Q_{elec} in kWh, rounded to three decimal places;

(b) the declared load profile, expressed by the appropriate letter in accordance with Table 1 of this Annex;

(c) the sound power level L_{WA}, in dB, indoors, rounded to the nearest integer (for heat pump water heaters, if applicable);

in addition, for water heaters using fossil and/or biomass fuels:

(d) the daily fuel consumption Q_{fuel} in kWh in terms of *GCV*, rounded to three decimal places;

(e) the emissions of nitrogen oxides, expressed in nitrogen dioxide, in mg/kWh fuel input in terms of *GCV*, rounded to the nearest integer;

in addition, for water heaters for which the value of *smart* is declared as being '1':

(f) the weekly fuel consumption with smart controls $Q_{fuel,week,smart}$ in kWh in terms of *GCV*, rounded to three decimal places;

(g) the weekly electricity consumption with smart controls $Q_{elec,week,smart}$ in kWh, rounded to three decimal places;

(h) the weekly fuel consumption without smart controls $Q_{fuel,week}$ in kWh in terms of *GCV*, rounded to three decimal places;

(i) the weekly electricity consumption without smart controls $Q_{elec,week}$ in kWh, rounded to three decimal places;

in addition, for storage water heaters with declared load profiles 3XS, XXS and XS:

(j) the storage volume *V* in litres, rounded to one decimal place;

in addition, for storage water heaters with declared load profiles M, L, XL, XXL, 3XL and 4XL:

(k) the mixed water at 40 °C *V40* in litres, rounded to the nearest integer;

in addition, for solar water heaters:

(l) the collector aperture area A_{sol} in m^2, rounded to two decimal places;

(m) the zero-loss efficiency η_0, rounded to three decimal places;

(n) the first-order coefficient a_1 in W/(m^2 K), rounded to two decimal places;

(o) the second-order coefficient a_2 in W/(m^2 K^2), rounded to three decimal places;

(p) the incidence angle modifier *IAM*, rounded to two decimal places;

(q) the pump power consumption *solpump* in W, rounded to two decimal places;

(r) the standby power consumption *solstandby* in W, rounded to two decimal places;

in addition, for heat pump water heaters:

(s) the sound power level L_{WA} in dB, outdoors, rounded to the nearest integer.

7. TECHNICAL PARAMETERS OF HOT WATER STORAGE TANKS

The following parameters shall be established for hot water storage tanks:

(a) the storage volume *V* in litres, rounded to one decimal place;

(b) the standing loss *S* in W, rounded to one decimal place.

ANNEX IV

Calculations

1. For the purposes of compliance and verification of compliance with the requirements of this Regulation, calculations shall be made using harmonised standards the reference numbers of which have been published for this purpose in the *Official Journal of the European Union*, or using other appropriate calculation methods that take into account the generally recognised state-of-the-art methods. They shall meet the technical parameters and calculations set out in points 2 to 5.

   Technical parameters used for the calculations shall be measured in accordance with Annex III.

2. TECHNICAL PARAMETERS OF WATER HEATERS

   The following parameters shall be calculated for water heaters under average climate conditions:

   (a) the water heating energy efficiency η_{wh} in %, rounded to one decimal place;

   in addition, for solar water heaters under average climate conditions:

   (b) the annual non-solar heat contribution Q_{nonsol} in kWh in terms of primary energy for electricity and/or in kWh in terms of *GCV* for fuels, rounded to one decimal place;

   (c) the heat generator water heating energy efficiency $\eta_{wh,nonsol}$ in %, rounded to one decimal place;

   (d) the annual auxiliary electricity consumption Q_{aux} in kWh, rounded to one decimal place.

3. CALCULATION OF THE WATER HEATING ENERGY EFFICIENCY η_{wh}

   (a) Conventional water heaters and heat pump water heaters

   The water heating energy efficiency is calculated as follows:

$$\eta_{wh} = \frac{Q_{ref}}{(Q_{fuel} + CC \cdot Q_{elec})(1 - SCF \cdot smart) + Q_{cor}}$$

   For water-/brine-to-water heat pump water heaters, the electricity consumption of one or more ground water pumps shall be taken into account.

   (b) Solar water heaters

   The water heating energy efficiency is calculated as follows:

$$\eta_{wh} = \frac{0{,}6 \cdot 366 \cdot Q_{ref}}{Q_{tota}}$$

   Where:

$$Q_{tota} = \frac{Q_{nonsol}}{1{,}1 \cdot \eta_{wh,nonsol} - 0{,}1} + Q_{aux} \cdot CC$$

4. DETERMINATION OF THE SMART CONTROL FACTOR *SCF* AND OF SMART CONTROL COMPLIANCE *smart*

(a) The smart control factor is calculated as follows:

$$SCF = 1 - \frac{Q_{fuel,week,smart} + CC \cdot Q_{elec,week,smart}}{Q_{fuel,week} + CC \cdot Q_{elec,week}}$$

(b) If SCF ≥ 0,07, the value of smart shall be 1. In all other cases, the value of smart shall be 0.

5. DETERMINATION OF THE AMBIENT CORRECTION TERM Q_{cor}

The ambient correction term is calculated as follows:

(a) for conventional water heaters using electricity:

$$Q_{cor} = -k \cdot (CC \cdot (Q_{elec} \cdot (1 - SCF \cdot smart) - Q_{ref}))$$

(b) for conventional water heaters using fuels:

$$Q_{cor} = -k \cdot (Q_{fuel} \cdot (1 - SCF \cdot smart) - Q_{ref})$$

(c) for heat pump water heaters:

$$Q_{cor} = -k \cdot 24h \cdot P_{stby}$$

Where:

the k-values are given in Table 6 for each load profile.

Table 6

k-values

	3XS	**XXS**	**XS**	**S**	**M**	**L**	**XL**	**XXL**	**3XL**	**4XL**
k	0,23	0,23	0,23	0,23	0,23	0,23	0,23	0,0	0,0	0,0

ANNEX V

Verification procedure for market surveillance purposes

For the purposes of checking conformity with the requirements laid down in Annex II, Member State authorities shall test a single water heater or hot water storage tank. The values declared by the manufacturer shall meet the requirements set out in Annex II. If the measured parameters do not meet the values declared by the manufacturer, in accordance with Article 4(2), within the ranges set out in Table 7, the measurement shall be carried out on three additional water heaters or hot water storage tanks. The arithmetic mean of the measured values of these three water heaters or hot water storage tanks shall meet the requirements laid down in Annex II within the ranges set out in Table 7.

Otherwise, the model and all other equivalent water heater models or hot water storage tanks models shall be considered not to comply. The Member States authorities shall provide the test results and other relevant information to the authorities of the other Member States and to the Commission within one month of the decision being taken on the non-compliance of the model.

Member State authorities shall use the procedures set out in Annexes III and IV.

Table 7

Verification tolerances

Measured parameter	Verification tolerance
Daily electricity consumption Q_{elec}	The measured value shall not be more than 5 % higher than the rated value (*).
Sound power level L_{WA}, indoors and/or outdoors	The measured value shall not be more than 2 dB higher than the rated value.
Daily fuel consumption Q_{fuel}	The measured value shall not be more than 5 % higher than the rated value.
Emissions of nitrogen oxides	The measured value shall not be more than 20 % higher than the rated value.
Weekly fuel consumption with smart controls $Q_{fuel,week,smart}$	The measured value shall not be more than 5 % higher than the rated value.
Weekly fuel consumption without smart controls $Q_{fuel,week}$	The measured value shall not be more than 5 % higher than the rated value.
Weekly electricity consumption with smart controls $Q_{elec,week,smart}$	The measured value shall not be more than 5 % higher than the rated value.
Weekly electricity consumption without smart controls $Q_{elec,week}$	The measured value shall not be more than 5 % higher than the rated value.
Storage volume V	The measured value shall not be more than 2 % lower than the rated value.
Mixed water at 40 °C $V40$	The measured value shall not be more than 3 % lower than the rated value.
Collector aperture area A_{sol}	The measured value shall not be more than 2 % lower than the rated value.
Pump power consumption *solpump*	The measured value shall not be more than 3 % higher than the rated value.
Standby power consumption *solstandby*	The measured value shall not be more than 5 % higher than the rated value.
Standing loss S	The measured value shall not be more than 5 % higher than the rated value.

(*) 'Rated value' means the value declared by the manufacturer.

ANNEX VI

Indicative benchmarks referred to in Article 6

At the time of entry into force of this Regulation, the best available technology on the market for water heaters and hot water storage tanks in terms of water heating energy efficiency, sound power level, standing loss and emissions of nitrogen oxides was identified as follows:

1. BENCHMARKS FOR WATER HEATING ENERGY EFFICIENCY OF WATER HEATERS:

Declared load profile	**3XS**	**XXS**	**XS**	**S**	**M**	**L**	**XL**	**XXL**	**3XL**	**4XL**
Water heating energy efficiency	35 %	35 %	38 %	38 %	75 %	110 %	115 %	120 %	130 %	130 %

2. BENCHMARKS FOR SOUND POWER LEVEL (L_{WA}), OUTDOORS, OF HEAT PUMP WATER HEATERS WITH:

   (a) rated heat output ≤ 6 kW: 39 dB;

   (b) rated heat output > 6 kW and ≤ 12 kW: 40 dB;

   (c) rated heat output > 12 kW and ≤ 30 kW: 41 dB;

   (d) rated heat output > 30 kW and ≤ 70 kW: 67 dB.

3. BENCHMARK FOR STANDING LOSS OF HOT WATER STORAGE TANKS WITH STORAGE VOLUME *V*, EXPRESSED IN LITRES:

$$5 + 4{,}16\ V^{0{,}4} \text{ Watts}$$

4. BENCHMARK FOR EMISSIONS OF NITROGEN OXIDES, EXPRESSED IN NITROGEN OXIDE, OF CONVENTIONAL WATER HEATERS USING GASEOUS FUELS:

35 mg/kWh fuel input in terms of *GCV*

The benchmarks specified in points 1, 2 and 4 do not necessarily imply that a combination of these values is achievable for a single water heater.

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