

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’ ($T_{designh}$) 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 P_{sup} 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’ ($COP_{bin}(T_j)$) or ‘bin-specific primary energy ratio’ ($PER_{bin}(T_j)$) 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’ ($P_{dh}(T_j)$) 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’ ($P_{designh}$) means the rated heat output (P_{rated}) 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’ ($COP_d(T_j)$) or ‘declared primary energy ratio’ ($PER_d(T_j)$) 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’ (P_{cyc}) means the integrated heating capacity over the cycling test interval for heating, expressed in kW;
- (43) ‘cycling interval efficiency’ (COP_{cyc} or PER_{cyc}) 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’ (C_{dh}) means the measure of efficiency loss due to cycling of heat pump space heaters or heat pump combination heaters; if C_{dh} is not determined by measurement then the default degradation coefficient is $C_{dh} = 0,9$;
- (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 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	BXS	XXS	XS	S	M	L	XL	XXL	3XL	4XL
Water heating energy efficiency	22 %	23 %	26 %	26 %	30 %	30 %	30 %	32 %	32 %	32 %

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- (b) From 26 September 2017 the water heating energy efficiency of combination heaters shall not fall below the following values:

Declared load profile	XXS	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.

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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 ^b 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	P_{rated}	x	kW
For boiler space heaters and boiler combination heaters: Useful heat output			
At rated heat output and high-temperature regime ^a	P_4	x,x	kW
At 30 % of rated heat output and low-temperature regime ^b	P_l	x,x	kW
For cogeneration space heaters: Useful heat output			
At rated heat output of cogeneration space heater with	$P_{CHP100} + Sup0$	x,x	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 ^a	η_4	x,x	%
At 30 % of rated heat output and low-temperature regime ^b	η_l	x,x	%
For cogeneration space heaters: Useful efficiency			
At rated heat output of cogeneration space heater with	$\eta_{CHP100} + Sup0$	x,x	%
a High-temperature regime means 60 °C return temperature at heater inlet and 80 °C feed temperature at heater outlet.			
b 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).			

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supplementary heater disabled				supplementary heater disabled			
At rated heat output of cogeneration space heater with supplementary heater enabled	$P_{CHP100} + P_{Sup100}$	x,x	kW	At rated heat output of cogeneration space heater with supplementary heater enabled	$\eta_{CHP100} + \eta_{Sup100}$	x,x	%
For cogeneration space heaters: Electrical efficiency				Supplementary heater			
At rated heat output of cogeneration space heater with supplementary heater disabled	$\eta_{el,CHP100} + \eta_{Sup0}$	x,x	%	Rated heat output	P_{sup}	x,x	kW
At rated heat output of cogeneration space heater with supplementary heater enabled	$\eta_{el,CHP100} + \eta_{Sup100}$	x,x	%	Type of energy input			
Auxiliary electricity consumption				Other items			
At full load	el_{max}	x,xxx	kW	Standby heat loss	P_{stby}	x,xxx	kW
At part load	el_{min}	x,xxx	kW	Ignition burner power consumption	P_{ign}	x,xxx	kW

a High-temperature regime means 60 °C return temperature at heater inlet and 80 °C feed temperature at heater outlet.

b 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).

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In standby mode	P_{SB}	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.						
a	High-temperature regime means 60 °C return temperature at heater inlet and 80 °C feed temperature at heater outlet.						
b	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 ^a	P_{rated}	x	kW	Seasonal space heating energy efficiency	η_s	x	%

a For heat pump space heaters and heat pump combination heaters, the rated heat output P_{rated} is equal to the design load for heating $P_{designh}$, and the rated heat output of a supplementary heater P_{sup} is equal to the supplementary capacity for heating $sup(T_j)$.

b If C_{dh} is not determined by measurement then the default degradation coefficient is $C_{dh} = 0,9$.

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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	P_{dh}	x,x	kW	$T_j = -7$ °C	COP_d or PER_d	x,xx or x,x	– or %
$T_j = +2$ °C	P_{dh}	x,x	kW	$T_j = +2$ °C	COP_d or PER_d	x,xx or x,x	– or %
$T_j = +7$ °C	P_{dh}	x,x	kW	$T_j = +7$ °C	COP_d or PER_d	x,xx or x,x	– or %
$T_j = +12$ °C	P_{dh}	x,x	kW	$T_j = +12$ °C	COP_d or PER_d	x,xx or x,x	– or %
$T_j =$ bivalent temperature	P_{dh}	x,x	kW	$T_j =$ bivalent temperature	COP_d or PER_d	x,xx or x,x	– or %
$T_j =$ operation limit temperature	P_{dh}	x,x	kW	$T_j =$ operation limit temperature	COP_d or PER_d	x,xx or x,x	– or %
For air- to-water heat pumps: T_j = – 15 °C (if TOL < – 20 °C)	P_{dh}	x,x	kW	For air- to-water heat pumps: T_j = – 15 °C (if TOL < – 20 °C)	COP_d or PER_d	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	P_{cyc}	x,x	kW	Cycling interval efficiency	COP_{cyc} or PER_{cyc}	x,xx or x,x	– or %
Degradation co- efficient ^b	C_{dh}	x,x	—	Heating water operating	$WTOL$	x	°C

a For heat pump space heaters and heat pump combination heaters, the rated heat output P_{rated} is equal to the design load for heating $P_{designh}$, and the rated heat output of a supplementary heater P_{sup} is equal to the supplementary capacity for heating $sup(T_j)$.

b If C_{dh} is not determined by measurement then the default degradation coefficient is $C_{dh} = 0,9$.

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				limit temperature			
Power consumption in modes other than active mode				Supplementary heater			
Off mode	P_{OFF}	x,xxx	kW	Rated heat output ^a	P_{sup}	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	%
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a For heat pump space heaters and heat pump combination heaters, the rated heat output P_{rated} is equal to the design load for heating $P_{design,h}$, and the rated heat output of a supplementary heater P_{sup} is equal to the supplementary capacity for heating $sup(T_j)$.

b If C_{dh} is not determined by measurement then the default degradation coefficient is $C_{dh} = 0,9$.

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.							
a	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 $sup(Tj)$.							
b	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 $20\text{ °C} \pm 1\text{ °C}$.
 - (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 $COP_{bin}(T_j)$ or bin-specific primary energy ratio $PER_{bin}(T_j)$, 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 $P_{designh}$ 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;

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- (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
<i>T_{designh}</i>	<i>T_{biv}</i>	<i>TOL</i>

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- 10 (- 11) °C	maximum + 2 °C	maximum - 7 °C
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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

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TABLE 6

Maximum ventilation exhaust air available [m³/h], at humidity of 5,5 g/m³

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

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	0,105	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							

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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			2,1			2,1			2,1			
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	
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												
<i>Q_{ref}</i>	5,845				11,655				19,07			

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h	XXL				3XL				4XL			
	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		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									
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												
<i>Q_{ref}</i>	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	XXS	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 \leq 12 kW: 40 dB;
 - (c) > 12 kW and \leq 30 kW: 41 dB;
 - (d) > 30 kW and \leq 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.

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(1) [OJ L 390, 31.12.2004, p. 24.](#)