

TECHNICAL REGULATION ON ECODSIGN REQUIREMENTS FOR AIR CONDITIONERS
AND COMFORT FANS, NO. (XXX) FOR THE YEAR 2012, ISSUED IN ACCORDANCE TO
ARTICLE (XXX) AND ARTICLE (XXX) OF STANDARDS AND METROLOGY LAW NO.
22/2000

Article 1:

This Technical Regulation shall be referred to as the "Technical Regulation on Ecodesign requirements for air conditioners and comfort fans No. .../2012".

Article 2:

This Technical Regulation represents an implementing Technical Regulation to Technical Regulation on ecodesign requirements for energy related products No. ... /2012 (hereinafter: Framework Technical Regulation), both of which shall be used to establish the ecodesign requirements for air conditioners and comfort fans.

Section 1
Definitions

Article 3:

In addition to the definitions laid down in Article 2 of the Framework Technical Regulation, the following definitions shall apply for the purpose of this implementing Technical Regulation:

3-1 Air conditioner: a device capable of cooling or heating, or both, indoor air, using a vapour compression cycle driven by an electric compressor, including air conditioners that provide additional functionalities such as dehumidification, air-purification, ventilation or supplemental air-heating by means of electric resistance heating, as well as appliances that may use water (either condensate water that is formed on the evaporator side or externally added water) for evaporation on the condenser, provided that the device is also able to function without the use of additional water, using air only;

3-2 Double duct air conditioner: an air conditioner in which, during cooling or heating, the condenser (or evaporator) intake air is introduced from the outdoor environment to the unit by a duct and rejected to the outdoor environment by a second duct, and which is placed wholly inside the space to be conditioned, near a wall;

3-3 Single duct air conditioner: an air conditioner in which, during cooling or heating, the condenser (or evaporator) intake air is introduced from the space containing the unit and discharged outside this space;

3-4 Rated capacity (Prated): the cooling or heating capacity of the vapour compression cycle of the unit at standard rating conditions;

3-5 Comfort fan: an appliance primarily designed for creating air movement around or on part of a human body for personal cooling comfort, including comfort fans that can perform additional functionalities such as lighting;

3-6 Fan power input (PF): the electric power input of a comfort fan in Watt operating at the declared maximum fan flow rate, measured with the oscillating mechanism active (if/when applicable).

For the purposes of the Annexes, additional definitions are set out in Annex A.

Section 1
Subject matter and scope

Article 4:

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

2. This Technical Regulation shall not apply to:

- (a) appliances that use non-electric energy sources;
- (b) air conditioners of which the condenser-side or evaporator- side, or both, do not use air for heat transfer medium.

Section 3

Requirements, conformity assessment and market surveillance

Article 5: Ecodesign requirements and timetable

5-1 The ecodesign requirements for air conditioners and comfort fans are set out in Annex A.

5-2 Each ecodesign requirement shall apply in accordance with the following timetable:

From 1 January 2013:

Single duct and double duct air conditioners shall correspond to requirements as indicated in Annex A, point 2(a).

From 1 January 2013:

(a) air conditioners, except single and double duct air conditioners, shall correspond to requirements as indicated in Annex A, point 2(b) and points 3(a), 3(b), 3(c);

(b) Single ducts and double ducts shall correspond to requirements as indicated in Annex A, points 3(a), 3(b), 3(d);

(c) comfort fans shall correspond to requirements as indicated in Annex A, points 3(a), 3(b), 3(e).

From 1 January 2014:

(a) air conditioners shall correspond to ecodesign requirements as indicated in Annex A, point 2(c);

(b) single duct and double duct air conditioners shall correspond to requirements as indicated in Annex A, point 2(d).

5-3 Compliance with ecodesign requirements shall be measured and calculated in accordance with requirements set out in Annex B.

Article 6: Conformity assessment

6-1 The conformity assessment procedure referred to in Article 10 of the Framework Technical Regulation shall be the internal design control set out in Annex IV to that Technical Regulation or the management system set out in Annex V to that Technical Regulation.

6-2 For the purposes of conformity assessment pursuant to Article 10 of the Framework Technical Regulation, the technical documentation file shall contain the results of the calculation set out in Annex B to this implementing Technical Regulation.

Article 7: Verification procedure for market surveillance purposes

The Organization shall apply the verification procedure described in Annex C to this implementing Technical Regulation when performing the market surveillance checks referred to in Article 15 of the Framework Technical Regulation for compliance with requirements set out in Annex A to this implementing Technical Regulation.

Section 4

Benchmarks

Article 8

The indicative benchmarks for best-performing air conditioners available on the market at the time of entry into force of this Technical Regulation are set out in Annex D.

Section 5
Related documents

Article 9:

9-1 This implementing Technical Regulation represents transposition of Commission Regulation No. 206/2012 on ecodesign requirements for air conditioners and comfort fans.

9-2 Standards and Metrology Law, No. 22/2000.

9-3 Instructions on market surveillance, No.

9-4 Technical Regulation on the ecodesign requirements for energy related products, No. ...

Section 6
Entry into force

Article 10

This Technical Regulation shall enter into force on 1/1/2014.

ANNEX A
ECODESIGN REQUIREMENTS

1. Definitions applicable for the purposes of the annexes

- (1) 'reversible air conditioner' means an air conditioner capable of both cooling and heating;
- (2) 'standard rating conditions' means the combination of indoor (T_{in}) and outdoor temperatures (T_j) that describe the operating conditions while establishing the sound power level, rated capacity, rated air flow rate, rated energy efficiency ratio (EER_{rated}) and/or rated coefficient of performance (COP_{rated}), as set out in Annex B, Table 2;
- (3) 'indoor temperature' (T_{in}) means the dry bulb indoor air temperature [$^{\circ}C$] (with the relative humidity indicated by the corresponding wet bulb temperature);
- (4) 'outdoor temperature' (T_j) means the dry bulb outdoor air temperature [$^{\circ}C$] (with the relative humidity indicated by the corresponding wet bulb temperature);
- (5) 'rated energy efficiency ratio' (EER_{rated}) means the declared capacity for cooling [kW] divided by the rated power input for cooling [kW] of a unit when providing cooling at standard rating conditions;
- (6) 'rated coefficient of performance' (COP_{rated}) means the declared capacity for heating [kW] divided by the rated power input for heating [kW] of a unit when providing heating at standard rating conditions;
- (7) 'global warming potential' (GWP) means the measure of how much 1 kg of the refrigerant applied in the vapour compression cycle is estimated to contribute to global warming, expressed in kg CO₂ equivalents over a 100-year time horizon;
GWP values considered will be those set out in harmonized rules on certain fluorinated greenhouse gases;
for fluorinated refrigerants, the GWP values shall be those published in the Third Assessment Report (TAR), adopted by the Intergovernmental Panel on Climate Change (1) (2001 IPCC GWP values for a 100-year period);
for non-fluorinated gases, the GWP values are those published in the first IPCC assessment (2) over a 100-year period;
GWP values for mixtures of refrigerants shall be based on the formula stated in harmonized rules on certain fluorinated greenhouse gases;
for refrigerants not included in the above references, the IPCC UNEP 2010 report on Refrigeration, Air Conditioning and Heat Pumps, dated February 2011, or newer, shall be used as a reference;
- (8) 'off mode' is a condition in which the air conditioner or comfort fan is connected to the mains power source and is not providing any function. Also considered as off mode are conditions providing only an indication of off mode condition, as well as conditions providing only functionalities intended to ensure electromagnetic compatibility pursuant to rules on electromagnetic compatibility;
- (9) 'standby mode' means a condition where the equipment (air conditioner or comfort fan) 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) 'reactivation function' means a function facilitating the activation of other modes, including active mode, by remote switch including remote control, internal sensor, timer to a condition providing additional functions, including the main function;

(11) 'information or status display' is a continuous function providing information or indicating the status of the equipment on a display, including clocks;

(12) 'sound power level' means the A-weighted sound power level [dB(A)] indoors and/or outdoors measured at standard rating conditions for cooling (or heating, if the product has no cooling function);

(13) 'reference design conditions' means the combination of requirements for the reference design temperature, the maximum bivalent temperature and the maximum operation limit temperature, as set out in Annex B, Table 3;

(14) 'reference design temperature' means the outdoor temperature [$^{\circ}\text{C}$] for either cooling (T_{designc}) or heating (T_{designh}) as described in Annex B, Table 3, at which the part load ratio shall be equal to 1, and which varies according the designated cooling or heating season;

(15) 'part load ratio' ($pl(T_j)$) means the outdoor temperature minus 16°C , divided by the reference design temperature minus 16°C , for either cooling or heating;

(16) 'season' means one of the four sets of operating conditions (available for four seasons: one cooling season, three heating seasons: average/colder/warmer) describing per bin the combination of outdoor temperatures and the number of hours these temperatures occur per season for which the unit is declared fit for purpose;

(17) 'bin' (with index j) means a combination of an outdoor temperature (T_j) and bin hours (h_j), as set out in Annex B, Table 1;

(18) 'bin hours' means the hours per season (h_j) the outdoor temperature occurs for each bin, as set out in Annex B, Table 1;

(19) 'seasonal energy efficiency ratio' (SEER) is the overall energy efficiency ratio of the unit, representative for the whole cooling season, calculated as the Reference annual cooling demand divided by the annual electricity consumption for cooling;

(20) 'reference annual cooling demand' (QC) means the reference cooling demand [kWh/a] to be used as basis for calculation of SEER and calculated as the product of the design load for cooling (P_{designc}) and the equivalent active mode hours for cooling (HCE);

(21) 'equivalent active mode hours for cooling' (HCE) means the assumed annual number of hours [h/a] the unit must provide the design load for cooling (P_{designc}) in order to satisfy the reference annual cooling demand, as set out in Annex B, Table 4;

(22) 'annual electricity consumption for cooling' (QCE) means the electricity consumption [kWh/a] required to meet the reference annual cooling demand and is calculated as the reference annual cooling demand divided by the active mode seasonal energy efficiency ratio (SEERon), and the electricity consumption of the unit for thermostat off-, standby-, off- and crankcase heater-mode during the cooling season;

(23) 'active mode seasonal energy efficiency ratio' (SEERon) means the average energy efficiency ratio of the unit in active mode for the cooling function, constructed from part load and bin-specific energy efficiency ratio's ($EER_{\text{bin}}(T_j)$) and weighted by the bin hours the bin condition occurs;

(24) 'part load' means the cooling load ($P_c(T_j)$) or the heating load ($P_h(T_j)$) [kW] at a specific outdoor temperature T_j , calculated as the design load multiplied by the part load ratio;

(25) 'bin-specific energy efficiency ratio' ($EER_{bin}(T_j)$) means the energy efficiency ratio specific for every bin j with outdoor temperature T_j in a season, derived from the part load, declared capacity and declared energy efficiency ratio ($EER_d(T_j)$) for specified bins (j) and calculated for other bins through inter/extrapolation, when necessary corrected by the degradation coefficient;

(26) 'seasonal coefficient of performance' (SCOP) is the overall coefficient of performance of the unit, representative for the whole designated heating season (the value of SCOP pertains to a designated heating season), calculated as the reference annual heating demand divided by the annual electricity consumption for heating;

(27) 'reference annual heating demand' (Q_H) means the reference heating demand [kWh/a], pertaining to a designated heating season, to be used as basis for calculation of SCOP and calculated as the product of the design load for heating ($P_{designh}$) and the seasonal equivalent active mode hours for heating (HHE);

(28) 'equivalent active mode hours for heating' (HHE) means the assumed annual number of hours [h/a] the unit must provide the design load for heating ($P_{designh}$) in order to satisfy the reference annual heating demand, as set out in Annex B, Table 4;

(29) 'annual electricity consumption for heating' (Q_{HE}) means the electricity consumption [kWh/a] required to meet the indicated reference annual heating demand and which pertains to a designated heating season; and is calculated as the reference annual heating demand divided by the active mode seasonal coefficient of performance ($SCOP_{on}$), and the electricity consumption of the unit for thermostat off-, standby-, off- and crankcase heater-mode during the heating season;

(30) 'active mode seasonal coefficient of performance' ($SCOP_{on}$) means the average coefficient of performance of the unit in active mode for the designated heating season, constructed from the part load, electric back up heating capacity (where required) and bin-specific coefficients of performance ($COP_{bin}(T_j)$) and weighted by the bin hours the bin condition occurs;

(31) 'electric back-up heater capacity' ($elbu(T_j)$) is the heating capacity [kW] of a real or assumed electric back-up heater with COP of 1 that supplements the declared capacity for heating ($P_{dh}(T_j)$) in order to meet the part load for heating ($P_h(T_j)$) in case $P_{dh}(T_j)$ is less than $P_h(T_j)$, for the outdoor temperature (T_j);

(32) 'bin-specific coefficient of performance' ($COP_{bin}(T_j)$) means the coefficient of performance specific for every bin j with outdoor temperature T_j in a season, derived from the part load, declared capacity and declared coefficient of performance ($COP_d(T_j)$) for specified bins (j) and calculated for other bins through inter/extrapolation, when necessary corrected by the degradation coefficient;

(33) 'declared capacity' [kW] is the capacity of the vapour compression cycle of the unit for cooling ($P_{dc}(T_j)$) or heating ($P_{dh}(T_j)$), pertaining to an outdoor temperature T_j and indoor temperature (T_{in}), as declared by the manufacturer;

(34) 'service value' (SV) [(m³/min)/W] means for comfort fans the ratio of the maximum fan flow rate [m³/min] and the fan power input [W];

(35) 'capacity control' means the ability of the unit to change its capacity by changing the volumetric flow rate. Units are to be indicated as 'fixed' if the unit can not change its volumetric flow rate, 'staged' if the volumetric flow rate is changed or varied in series of not more than two

steps, or 'variable' if the volumetric flow rate is changed or varied in series of three or more steps;
(36) 'function' means the indication of whether the unit is capable of indoor air cooling, indoor air heating or both;

(37) 'design load' means the declared cooling load ($P_{designc}$) and/or declared heating load ($P_{designh}$) [kW] at the reference design temperature, whereby

for cooling mode, $P_{designc}$ is equal to the declared capacity for cooling at T_j equal to $T_{designc}$;

for heating mode, $P_{designh}$ is equal to the part load at T_j equal to $T_{designh}$;

(38) 'declared energy efficiency ratio' ($EER_d(T_j)$) means the energy efficiency ratio at a limited number of specified bins (j) with outdoor temperature (T_j), as declared by the manufacturer;

(39) 'declared coefficient of performance' ($COP_d(T_j)$) means the coefficient of performance at a limited number of specified bins (j) with outdoor temperature (T_j), as declared by the manufacturer;

(40) 'bivalent temperature' (T_{biv}) means the outdoor temperature (T_j) [°C] declared by the manufacturer for heating at which the declared capacity equals the part load and below which the declared capacity must be supplemented with electric back up heater capacity in order to meet the part load for heating;

(41) 'operation limit temperature' (T_{ol}) means the outdoor temperature [°C] declared by the manufacturer for heating, below which air conditioner will not be able to deliver any heating capacity. Below this temperature, the declared capacity is equal to zero;

(42) 'cycling interval capacity' [kW] is the (time-weighted) average of the declared capacity over the cycling test interval for cooling (P_{cyc}) or heating (P_{ych});

(43) 'cycling interval efficiency for cooling' (EER_{cyc}) is the average energy efficiency ratio over the cycling test interval (compressor switching on and off), calculated as the integrated cooling capacity over the interval [kWh] divided by the integrated electric power input over that same interval [kWh];

(44) 'cycling interval efficiency for heating' (COP_{cyc}) is the average coefficient of performance over the cycling test interval (compressor switching on and off), calculated as the integrated heating capacity over the interval [kWh] divided by the integrated electric power input over that same interval [kWh];

(45) 'degradation coefficient' is the measure of efficiency loss due to cycling (compressor switching on/off in active mode) established for cooling (C_{dc}), heating (C_{dh}) or chosen as default value 0,25;

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

(47) 'thermostat-off mode' means a mode corresponding to the hours with no cooling or heating load whereby the cooling or heating function of the unit is switched on but the unit is not operational as there is no cooling or heating load. This condition is therefore related to outdoor temperatures and not to indoor loads. Cycling on/off in active mode is not considered as thermostat off;

(48) 'crankcase heater operation mode' means a condition where the unit has activated a heating device to avoid the refrigerant migrating to the compressor in order to limit the refrigerant concentration in oil at compressor start;

(49) 'thermostat-off mode power consumption' (PTO) means the power consumption of the unit [kW] while in thermostat-off mode;

(50) 'standby mode power consumption' (PSB) means the power consumption of the unit [kW] while in standby mode;

(51) 'off-mode power consumption' (POFF) means the power consumption of the unit [kW] while in off-mode;

(52) 'crankcase heater mode power consumption' (PCK) means the power consumption of the unit [kW] while in crankcase heater operation mode;

(53) 'thermostat-off mode operating hours' (HTO) means the annual number of hours [h/a] the unit is considered to be in thermostat-off mode, the value of which depends on the designated season and function;

(54) 'standby mode operating hours' (HSB) means the annual number of hours [h/a] the unit is considered to be in standby mode, the value of which depends on the designated season and function;

(55) 'off-mode operating hours' (HOFF) means the annual number of hours [h/a] the unit is considered to be in off-mode, the value of which depends on the designated season and function;

(56) 'crankcase heater mode operating hours' (HCK) means the annual number of hours [h/a] the unit is considered to be in crankcase heater operation mode, the value of which depends on the designated season and function;

(57) 'nominal air flow rate' means the air flow rate [m³/h] measured at the air outlet of indoor and/or outdoor units (if applicable) of air conditioners at standard rating conditions for cooling (or heating, if the product has no cooling function);

(58) 'rated power input for cooling' (PEER) means the electric power input [kW] of a unit when providing cooling at standard rating conditions;

(59) 'rated power input for heating' (PCOP) means the electric power input [kW] of a unit when providing heating at standard rating conditions;

(60) 'electricity consumption of single and double ducts' (QSD respectively QDD) means the electricity consumption of single or double duct air conditioners for the cooling and/or heating mode (whichever applies) [single duct in kWh/h, double duct in kWh/a];

(61) 'capacity ratio' means the ratio of the total declared cooling or heating capacity of all operating indoor units to the declared cooling or heating capacity of the outdoor unit at standard rating conditions;

(62) 'maximum fan flow rate' (F) means the air flow rate of the comfort fan at its maximum setting [m³/min], measured at the fan outlet with the oscillating mechanism (if applicable) turned off;

(63) 'oscillating mechanism' means the capability of the comfort fan to automatically vary the direction of the air flow while the fan is operating;

(64) 'fan sound power level' means the A-weighted sound power level of the comfort fan while providing the maximum fan flow rate, measured at the outlet side;

(65) 'fan active mode hours' (HCE) means the number of hours [h/a] the comfort fan is assumed to provide the maximum fan flow rate, as described in Annex B, Table 4.

2. REQUIREMENTS FOR MINIMUM ENERGY EFFICIENCY, MAXIMUM POWER CONSUMPTION IN OFF-MODE AND STANDBY MODE AND FOR MAXIMUM SOUND POWER LEVEL

(a) From 1 January 2013, single duct and double duct air conditioners shall correspond to requirements as indicated in Tables 1, 2 and 3 below, calculated in accordance with Annex B. Single duct and double duct air conditioners and comfort fans shall fulfil the requirements on standby and off mode as indicated in Table 2 below. The requirements on minimum energy efficiency and maximum sound power shall relate to the standard rating conditions specified in Annex B, Table 2.

Table 1
Requirements for minimum energy efficiency

	Double duct air conditioners		Single duct air conditioners	
	EER _{rated}	COP _{rated}	EER _{rated}	COP _{rated}
If GWP of refrigerant > 150	2,40	2,36	2,40	1,80
If GWP of refrigerant ≤ 150	2,16	2,12	2,16	1,62

Table 2
Requirements for maximum power consumption in off-mode and standby mode for single duct and double duct air conditioners and comfort fans

Off mode	Power consumption of equipment in any off-mode condition shall not exceed 1,00 W.
Standby mode	The power consumption of equipment in any condition providing only a reactivation function, or providing only a reactivation function and a mere indication of enabled reactivation function, shall not exceed 1,00 W.
	The power consumption of equipment in any condition providing only information or status display, or providing only a combination of reactivation function and information or status display, shall not exceed 2,00 W.
Availability of standby and/or off mode	Equipment shall, except where this is inappropriate for the intended use, provide off mode and/or standby mode, and/or another condition which does not exceed the applicable power consumption requirements for off mode and/or standby mode when the equipment is connected to the mains power source.

Table 3
Requirements for maximum sound power level
Indoor sound power level in dB(A)
65

(b) From 1 January 2013, air conditioners, except single and double duct air conditioners, shall correspond to minimum energy efficiency and maximum sound power level requirements as indicated in Tables 4 and 5 below, calculated in accordance with Annex B. The requirements on energy efficiency shall take into account the reference design conditions specified in Annex B, Table 3 using the 'Average' heating season where applicable. The requirements on sound power

shall relate to the standard rating conditions specified in Annex B, Table 2.

Table 4
Requirements for minimum energy efficiency

	SEER	SCOP (Average heating season)
If GWP of refrigerant > 150	3,60	3,40
If GWP of refrigerant ≤ 150	3,24	3,06

Table 5
Requirements for maximum sound power level

Rated capacity ≤ 6 kW		6 < Rated capacity ≤ 12 kW	
Indoor sound power level in dB(A)	Outdoor sound power level in dB(A)	Indoor sound power level in dB(A)	Outdoor sound power level in dB(A)
60	65	65	70

(c) From 1 January 2014, air conditioners shall correspond to requirements as indicated in the table below, calculated in accordance with Annex B. The requirements on energy efficiency for air conditioners, excluding single and double duct air conditioners, shall relate to the reference design conditions specified in Annex B, Table 3 using the 'Average' heating season where applicable. The requirements on energy efficiency for single and double duct air conditioners shall relate to the standard rating conditions specified in Annex B, Table 2.

Table 6
Requirements for minimum energy efficiency

	Air conditioners, except double and single duct air conditioners		Double duct air conditioners		Single duct air conditioners	
	SEER	SCOP (heating season: Average)	EER	COP	EER	COP
If GWP of refrigerant > 150 for < 6 kW	4,60	3,80	2,60	2,60	2,60	2,04
If GWP of refrigerant ≤ 150 for < 6 kW	4,14	3,42	2,34	2,34	2,34	1,84
If GWP of refrigerant > 150 for 6-12 kW	4,30	3,80	2,60	2,60	2,60	2,04
If GWP of refrigerant ≤ 150 for 6-12 kW	3,87	3,42	2,34	2,34	2,34	1,84

(d) From 1 January 2014, single duct and double duct air conditioners and comfort fans shall correspond to requirements as indicated in Table 7 below, calculated in accordance with Annex B.

Table 7
Requirements for maximum power consumption in off-mode and standby mode

Off mode	Power consumption of equipment in any off-mode condition shall not exceed 0,50 W.
Standby mode	The power consumption of equipment in any condition providing only a reactivation function, or providing only a reactivation function and a mere indication of enabled reactivation function, shall not exceed 0,50 W.
	The power consumption of equipment in any condition providing only information or status display, or providing only a combination of reactivation function and information or status display shall not exceed 1,00 W.
Availability of standby and/or off mode	Equipment shall, except where this is inappropriate for the intended use, provide off mode and/or standby mode, and/or another condition which does not exceed the applicable power consumption requirements for off mode and/or standby mode when the equipment is connected to the mains power source.
Power management	When equipment is not providing the main function, or when other energy- using product(s) are not dependent on its functions, equipment shall, unless inappropriate for the intended use, offer a power management function, or a similar function, that switches equipment after the shortest possible period of time appropriate for the intended use of the equipment, automatically into: <ul style="list-style-type: none"> - standby mode, or - off mode, or - another condition which does not exceed the applicable power consumption requirements for off mode and/or standby mode when the equipment is connected to the mains power source. The power management function shall be activated before delivery.

3. PRODUCT INFORMATION REQUIREMENTS

(a) From 1 January 2013, as regards air conditioners and comfort fans, the information set out in points below and calculated in accordance with Annex B shall be provided on:

- (i) the technical documentation of the product;
- (ii) free access websites of manufacturers of air conditioners and comfort fans;

(b) The manufacturer of air conditioners and comfort fans shall provide laboratories performing market surveillance checks, upon request, the necessary information on the setting of the unit as applied for the establishment of declared capacities, SEER/EER, SCOP/COP values and service values and provide contact information for obtaining such information.

(c) Information requirements for air conditioners, except double duct and single duct air conditioners.

Table 1
Information requirements ⁽¹⁾

(the number of decimals in the box indicates the precision of reporting)

Information to identify the model(s) to which the information relates to:

Function (indicate if present)				If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.			
cooling		Y/N		Average (mandatory)		Y/N	
heating		Y/N		Warmer (if designated)		Y/N	
				Colder (if designated)		Y/N	
Item	symbol	value	unit	Item	symbol	value	unit
Design load				Seasonal efficiency			
cooling	Pdesignc	x,x	kW	cooling	SEER	x,x	—
heating/Average	Pdesignh	x,x	kW	heating/Average	SCOP/A	x,x	—
heating/Warmer	Pdesignh	x,x	kW	heating/Warmer	SCOP/W	x,x	—
heating/Colder	Pdesignh	x,x	kW	heating/Colder	SCOP/C	x,x	—
Declared capacity (*) for cooling, at indoor temperature 27(19) °C and outdoor temperature Tj				Declared energy efficiency ratio (*), at indoor temperature 27(19) °C and outdoor temperature Tj			
cooling		Y/N		Average (mandatory)		Y/N	
heating		Y/N		Warmer (if designated)		Y/N	
				Colder (if designated)		Y/N	
Item	symbol	value	unit	Item	symbol	value	unit
Tj = 35 °C	Pdc	x,x	kW	Tj = 35 °C	EERd	x,x	—
Tj = 30 °C	Pdc	x,x	kW	Tj = 30 °C	EERd	x,x	—
Tj = 25 °C	Pdc	x,x	kW	Tj = 25 °C	EERd	x,x	—
Tj = 20 °C	Pdc	x,x	kW	Tj = 20 °C	EERd	x,x	—
Declared capacity (*) for heating/Average season, at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance (*)/Average season, at indoor temperature 20 °C and outdoor temperature Tj			
Tj = - 7 °C	Pdh	x,x	kW	Tj = - 7 °C	COPd	x,x	—
Tj = 2 °C	Pdh	x,x	kW	Tj = 2 °C	COPd	x,x	—
Tj = 7 °C	Pdh	x,x	kW	Tj = 7 °C	COPd	x,x	—
Tj = 12 °C	Pdh	x,x	kW	Tj = 12 °C	COPd	x,x	—
Tj = bivalent temperature	Pdh	x,x	kW	Tj = bivalent temperature	COPd	x,x	—
Tj = operating limit	Pdh	x,x	kW	Tj = operating limit	COPd	x,x	—
Declared capacity (*) for heating/Warmer season, at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance (*)/Warmer season, at indoor temperature 20 °C and outdoor temperature Tj			

⁽¹⁾ For multisplit appliances, data shall be provided at capacity ratio of 1

Function (indicate if present)				If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.			
Item	symbol	value	unit	Item	symbol	value	unit
Tj = 2 °C	Pdh	x,x	kW	Tj = 2 °C	COPd	x,x	—
Tj = 7 °C	Pdh	x,x	kW	Tj = 7 °C	COPd	x,x	—
Tj = 12 °C	Pdh	x,x	kW	Tj = 12 °C	COPd	x,x	—
Tj = bivalent temperature	Pdh	x,x	kW	Tj = bivalent temperature	COPd	x,x	—
Tj = operating limit	Pdh	x,x	kW	Tj = operating limit	COPd	x,x	—
Declared capacity (*) for heating/Colder season, at indoor temperature 20 °C and outdoor temperature Tj				Declared coefficient of performance (*) /Colder season, at indoor temperature 20 °C and outdoor temperature Tj			
Tj = - 7 °C	Pdh	x,x	kW	Tj = - 7 °C	COPd	x,x	—
Tj = 2 °C	Pdh	x,x	kW	Tj = 2 °C	COPd	x,x	—
cooling	Y/N			Average (mandatory)	Y/N		
heating	Y/N			Warmer (if designated)	Y/N		
				Colder (if designated)	Y/N		
Item	symbol	value	unit	Item	symbol	value	unit
Tj = 7 °C	Pdh	x,x	kW	Tj = 7 °C	COPd	x,x	—
Tj = 12 °C	Pdh	x,x	kW	Tj = 12 °C	COPd	x,x	—
Tj = bivalent temperature	Pdh	x,x	kW	Tj = bivalent temperature	COPd	x,x	—
Tj = operating limit	Pdh	x,x	kW	Tj = operating limit	COPd	x,x	—
Tj = - 15 °C	Pdh	x,x	kW	Tj = - 15 °C	COPd	x,x	—
Bivalent temperature				Operating limit temperature			
heating/Average	Tbiv	x	°C	heating/Average	Tol	x	°C
heating/Warmer	Tbiv	x	°C	heating/Warmer	Tol	x	°C
heating/Colder	Tbiv	x	°C	heating/Colder	Tol	x	°C
Cycling interval capacity				Cycling interval efficiency			
for cooling	Pcycc	x,x	kW	for cooling	EERcyc	x,x	—
for heating	Pcyh	x,x	kW	for heating	COPcyc	x,x	—
Degradation coefficient cooling (**)	Cdc	x,x	—	Degradation coefficient heating (**)	Cdh	x,x	—
Electric power input in power modes other than 'active mode'				Annual electricity consumption			
off mode	POFF	x,x	kW	cooling	QCE	x	kWh/a
standby mode	PSB	x,x	kW	heating/Average	QHE	x	kWh/a
thermostat-off mode	PTO	x,x	kW	heating/Warmer	QHE	x	kWh/a
crankcase heater mode	PCK	x,x	kW	heating/Colder	QHE	x	kWh/a
Capacity control (indicate one of three options)				Other items			

Function (indicate if present)				If function includes heating: Indicate the heating season the information relates to. Indicated values should relate to one heating season at a time. Include at least the heating season 'Average'.			
cooling		Y/N		Average (mandatory)		Y/N	
heating		Y/N		Warmer (if designated)		Y/N	
				Colder (if designated)		Y/N	
Item	symbol	value	unit	Item	symbol	value	unit
fixed		Y/N		Sound power level (indoor/outdoor)	LWA	x,x/x,x	dB(A)
staged		Y/N		Global warming potential	GWP	x	kgCO ₂ eq.
variable		Y/N		Rated air flow (indoor/outdoor)	—	x/x	m ³ /h
Contact details for obtaining more information	Name and address of the manufacturer or of its authorised representative.						
<p>(*) For staged capacity units, two values divided by a slash (/) will be declared in each box in the section 'Declared capacity of the unit' and 'declared EER/COP' of the unit.</p> <p>(**) If default Cd = 0,25 is chosen then (results from) cycling tests are not required. Otherwise either the heating or cooling cycling test value is required.</p>							

In as much as is relevant in view of the functionality, the manufacturer shall supply the information as requested in the above Table 1 in the technical documentation of the product. For units with capacity control marked 'staged', two values for the highest and lowest, noted 'hi/lo' divided by a slash (/) will be declared in each box under 'Declared capacity'.

(d) Information requirements for single duct and double duct air conditioners.

Single duct air conditioners shall be named 'local air conditioners' in packaging, product documentation and in any advertisement material, whether electronic or in paper.

Manufacturer shall provide information as detailed in the table below.

Table 2
Information requirements

Information to identify the model(s) to which the information relates to [fill in as necessary]			
Description	Symbol	Value	Unit
Rated capacity for cooling	Prated for cooling	[x,x]	kW
Rated capacity for heating	Prated for heating	[x,x]	kW
Rated power input for cooling	PEER	[x,x]	kW
Rated power input for heating	PCOP	[x,x]	kW
Rated Energy efficiency ratio	EERd	[x,x]	—
Rated Coefficient of performance	COPd	[x,x]	—
Description	Symbol	Value	Unit
Power consumption in thermostat-off mode	PTO	[x,x]	W
Power consumption in standby mode	PSB	[x,x]	W
Electricity consumption of single/double duct appliances (indicate for cooling and heating separately)	DD: QDD SD: QSD	DD: [x] SD: [x,x]	DD: kWh/a SD: kWh/h
Sound power level	LWA	[x]	dB(A)
Global warming potential	GWP	[x]	kgCO ₂ eq.
Contact details for obtaining more information	Name and address of the manufacturer or of its authorised representative.		

(e) Information requirements for comfort fans.

Manufacturer shall provide information as detailed in the table below.

Table 3
Information requirements

Information to identify the model(s) to which the information relates to
[fill in as necessary]

Description	Symbol	Value	Unit
Maximum fan flow rate	F	[x,x]	m ³ /min
Fan power input	P	[x,x]	W
Service value	SV	[x,x]	(m ³ /min)/W
Standby power consumption	PSB	[x,x]	W
Fan sound power level	LWA	[x]	dB(A)
Maximum air velocity	c	[x,x]	meters/sec
Measurement standard for service value	[state here the reference to measurement standard used]		
Contact details for obtaining more information	Name and address of the manufacturer or of its authorised representative.		

ANNEX B
MEASUREMENTS AND CALCULATIONS

1. For the purposes of compliance and verification of compliance with the requirements of this Technical Regulation, measurements and calculations shall be made using Jordanian standards adopting harmonised standards the reference numbers of which have been published in the Official Gazette, or other reliable, accurate and reproducible method, which takes into account the generally recognised state of the art methods, and whose results are deemed to be of low uncertainty. They shall fulfil all of the following technical parameters.
2. The determination of the seasonal energy consumption and efficiency for seasonal energy efficiency ratio (SEER) and seasonal coefficient of performance (SCOP) shall take into account:
 - (a) European cooling and heating season(s), as defined in Table 1 below;
 - (b) reference design conditions, as defined in Table 3 below;
 - (c) electric energy consumption for all relevant modes of operation, using time periods as defined in Table 4 below;
 - (d) effects of the degradation of the energy efficiency caused by on/off cycling (if applicable) depending on the type of control of the cooling and/or heating capacity;
 - (e) corrections on the seasonal coefficients of performance in conditions where the heating load can not be met by the heating capacity;
 - (f) the contribution of a back-up heater (if applicable) in the calculation of the seasonal efficiency of a unit in heating mode.
3. Where the information relating to a specific model, being a combination of indoor and outdoor unit(s), has been obtained by calculation on the basis of design, and/or extrapolation from other combinations, the documentation should include details of such calculations and/or extrapolations, and of tests undertaken to verify the accuracy of the calculations undertaken (including details of the mathematical model for calculating performance of such combinations, and of measurements taken to verify this model).
4. The rated energy efficiency ratio (EER_{rated}) and, when applicable, rated coefficient of performance (COP_{rated}) for single and double duct air conditioners shall be established at the standard rating conditions as defined in Table 2 below.
5. The calculation of seasonal electricity consumption for cooling (and/or heating) shall take into account electric energy consumption of all relevant modes of operation, as defined in Table 3 below, using operational hours, as defined in Table 4 below.
6. The comfort fan efficiency shall be determined on the basis of the nominal air flow rate of the unit divided by the nominal electric power input of the unit.

Table 1
Cooling and heating season bins (j = bin index, Tj = outdoor temperature, hj = hours per annum per bin) where 'db' = dry bulb temperature

COOLING SEASON			HEATING SEASON				
j #	Tj °C db	hj h/annum	j #	Tj °C db	hj h/annum		
					average	warmer	colder
1	17	205	1 to 8	- 30 to - 23	0	0	0
2	18	227	9	- 22	0	0	1
3	19	225	10	- 21	0	0	6
4	20	225	11	- 20	0	0	13
5	21	216	12	- 19	0	0	17
6	22	215	13	- 18	0	0	19
7	23	218	14	- 17	0	0	26
8	24	197	15	- 16	0	0	39
9	25	178	16	- 15	0	0	41
10	26	158	17	- 14	0	0	35
11	27	137	18	- 13	0	0	52
12	28	109	19	- 12	0	0	37
13	29	88	20	- 11	0	0	41
14	30	63	21	- 10	1	0	43
15	31	39	22	- 9	25	0	54
16	32	31	23	- 8	23	0	90
17	33	24	24	- 7	24	0	125
18	34	17	25	- 6	27	0	169
19	35	13	26	- 5	68	0	195
20	36	9	27	- 4	91	0	278
21	37	4	28	- 3	89	0	306
22	38	3	29	- 2	165	0	454
23	39	1	30	- 1	173	0	385
24	40	0	31	0	240	0	490
			32	1	280	0	533
			33	2	320	3	380
			34	3	357	22	228
			35	4	356	63	261
			36	5	303	63	279
			37	6	330	175	229
			38	7	326	162	269
			39	8	348	259	233
			40	9	335	360	230
			41	10	315	428	243
			42	11	215	430	191
			43	12	169	503	146
			44	13	151	444	150
			45	14	105	384	97
			46	15	74	294	61
Total h.		2 602	Total h.		4 910	3 590	6 446

Table 2
Standard rating conditions, temperatures in 'dry bulb' air temperature
(‘Wet bulb’ indicated in brackets)

Appliance	Function	Indoor air temperature (°C)	Outdoor air temperature (°C)
air conditioners, excluding single duct air conditioners	cooling	27 (19)	35 (24)
	heating	20 (max. 15)	7(6)
single duct air conditioner	cooling	35 (24)	35 (24) (*)
	heating	20 (12)	20 (12) (*)

(*) In case of single duct air conditioners the condenser (evaporator) when cooling (heating) is not supplied with outdoor air, but indoor air.

Table 3
Reference design conditions, temperatures in 'dry bulb' air temperature
(‘Wet bulb’ indicated in brackets)

Function/season	Indoor air temperature (°C)	Outdoor air temperature (°C)	Bivalent temperature (°C)	Operating limit temperature (°C)
	T _{in}	T _{designc} /T _{designh}	T _{biv}	T _{ol}
cooling	27 (19)	T _{designc} = 35 (24)	n.a.	n.a.
heating/Average	20 (15)	T _{designh} = - 10 (- 11)	max. 2	max. - 7
heating/Warmer		T _{designh} = 2 (1)	max. 7	max. 2
heating/Colder		T _{designh} = - 22 (- 23)	max. - 7	max. - 15

Table 4
Operational hours per type of appliance per functional mode to be used for calculation of electricity consumption

Type of appliance/functionality (if applicable)	Unit	Heating season	On mode	Thermostat-off mode	Standby mode	Off mode	Crankcase heater mode
			cooling: HCE heating: HHE	H	H	H	H
Air conditioners , except single and double duct air conditioner							
Cooling mode, if appliance offers cooling only	h/annum		350	221	2 142	5 088	7 760
Cooling and heating modes, if appliance offers both modes	Cooling mode	h/annum	350	221	2 142	0	2 672
	Heating mode	h/annum	Average	1 400	179	0	179
			Warmer	1 400	755	0	755
		Colder	2 100	131	0	0	131

Type of appliance/functionality (if applicable)	Unit	Heating season	On mode	Thermostat-off mode	Standby mode	Off mode	Crankcase heater mode
			cooling: HCE heating: HHE	H	H	H	H
Heating mode, if appliance offers heating only	h/annum	Average	1 400	179	0	3 672	3 851
		Warmer	1 400	755	0	4 345	4 476
		Colder	2 100	131	0	2 189	2 944
Double duct air conditioner							
Cooling mode, if appliance offers cooling only	h/60 min		1	n/a	n/a	n/a	n/a
Cooling and heating modes, if appliance offers both modes	Cooling mode	h/60 min		1	n/a	n/a	n/a
	Heating mode	h/60 min		1	n/a	n/a	n/a
Heating mode, if appliance offers heating only	h/60 min		1	n/a	n/a	n/a	n/a
Single duct air conditioner							
Cooling mode	h/60 min		1	n/a	n/a	n/a	n/a
Heating mode	h/60 min		1	n/a	n/a	n/a	n/a

ANNEX C
VERIFICATION PROCEDURE FOR MARKET SURVEILLANCE PURPOSES

When performing the market surveillance checks referred to in Article 15 of the Framework Technical Regulation, the Organization shall apply the following verification procedure for the requirements set out in Annex A.

1. The Organization shall test one single unit.

2. The air conditioner model, except single and double duct air conditioners, shall be considered to comply with the requirements set out in Annex A, as applicable, to this Technical Regulation, if its seasonal energy efficiency ratio (SEER), or seasonal coefficient for performance (SCOP), if applicable, is not less than the declared value minus 8 % at the declared capacity of the unit. The SEER and SCOP values shall be established in accordance with Annex B.

The model of a single and double duct air conditioner shall be considered to comply with the requirements set out in Annex A, as applicable, to this Technical Regulation, if the results for off-mode and standby-mode conditions do not exceed the limit values by more than 10 %, and if the energy efficiency ratio (EER_{rated}), or coefficient for performance (COP_{rated}), if applicable, is not less than the declared value minus 10 %. The EER and COP values shall be established in accordance with Annex B.

The air conditioner model shall be considered to comply with the requirements set out in this Technical Regulation, as applicable, if the maximum sound power level does not exceed more than 2 dB(A) of the declared value.

3. If the result referred to in point 2 is not achieved, the Organization shall randomly select three additional units of the same model for testing.

4. The air conditioner model, except single and double duct air conditioners, shall be considered to comply with the requirements set out in Annex A, as applicable, to this Technical Regulation, if the average of the three units for the seasonal energy efficiency ratio (SEER), or seasonal coefficient of performance (SCOP), if applicable, is not less than the declared value minus 8 % at the declared capacity of the unit. The SEER and SCOP values shall be established in accordance with Annex B.

The model of a single and double duct air conditioner shall be considered to comply with the requirements set out in Annex A, as applicable, to this Technical Regulation, if the average of the results of the three units for off-mode and standby- mode conditions do not exceed the limit values by more than 10 %, and if the average of the energy efficiency ratio (EER_{rated}), or coefficient of performance (COP_{rated}), if applicable, is not less than the declared value minus 10 %. The EER and COP values shall be established in accordance with Annex B.

The air conditioner model shall be considered to comply with the requirements set out in this Technical Regulation, as applicable, if the average of the maximum sound power level does not exceed more than 2 dB(A) of the declared value.

5. If the results referred to in point 4 are not achieved, the model shall be considered not to comply with this Technical Regulation. For the purposes of checking conformity with the requirements of this Technical Regulation, the Organization shall apply the procedures referred to in Annex B, and Jordanian standards adopting harmonised standards the reference numbers of which have been published in the Official Gazette, or other reliable, accurate and reproducible calculation and measurement methods, which take into account the generally recognised state-of-the-art.

ANNEX D
BENCHMARKS

At the time of entry into force of this Technical Regulation, the best available technology on the market for air conditioners in terms of their energy performance was identified as follows:

Benchmarks for air conditioners

Air conditioners, excluding double duct and single duct air conditioners		Double duct air conditioner		Single duct air conditioner	
SEER	SCOP	EER	COP	EER	COP
8,50	5,10	3,00 (*)	3,15	3,15 (*)	2,60

Benchmark for the level of GWP of the refrigerant used in the air conditioner is $GWP \leq 20$.
 (*) Based on efficiency of evaporatively cooled single duct air conditioners.