The Hong Kong Voluntary Energy Efficiency Labelling Scheme for

Room Air Conditioners
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Energy Efficiency EMSD

Electrical and Mechanical Services Department

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1. Purpose

1.1 This set of document is intended to give a general description to the Hong Kong Voluntary Energy Efficiency Labelling Scheme for Room Air Conditioners.

2. Background

2.1 The Energy Efficiency Labelling Scheme (EELS) is an energy conservation initiative that the Government of the Hong Kong Special Administrative Region has adopted. Under the EELS, some common types of household appliances/ gas appliances and office equipment will incorporate an energy label that serves to inform consumers of the product's energy consumption and efficiency. Consumers should then be able to take these factors into account in making their purchasing decision.

2.2 The concept of EELS has been implemented in several forms and in different stages of development in many countries. The EELS generally aims to achieve –

- greater public awareness of energy conservation and environmental improvement needs;
- provision of readily available, pre-purchase information on energy consumption and efficiency data to enable ordinary consumers to select more energy efficient products;
- stimulation to the manufacturers/market for phasing out less energy efficient models; and
- motivation of the actual energy savings behaviors and environmental improvements.

2.3 Hong Kong aims at achieving the above objectives. At present, the Hong Kong Voluntary Energy Efficiency Labelling Scheme covers 22 types of household appliances / gas appliances and office equipment. Amongst them, 13 types are household appliances, 7 types are office equipment and 2 types are gas appliances.

3. Scope

3.1 The scheme will only apply to the manufacturers and importers (i.e. local agents, retailers and the related parties) who are interested to or have participated in the scheme.

3.2 The Scheme commenced on 15 June 1996. It is further revised on 1 January 2025. The existing and newly registered labels will remain valid till 31 December 2028 By then, renew of the application may be required subject to the review of the Scheme.

Remarks: The scheme will be under review with respect to the latest international/ national standards.

3.3 The scheme applies to ceiling-mounted type or floor standing type room air conditioners with a rated cooling capacity not exceeding 10kW, and other types with cooling capacity larger than 7.5kW but not exceeding 10kW.

3.4 The scheme covers air-cooled non-ducted room air-conditioners powered by electric current, either single unit or split system with a rated cooling capacity not exceeding 10kW, and does not apply to fan-coil air conditioning units, heat pump, and water-cooled units. For room air conditioners with reverse cycle heat pump, both the cooling function and heating function will be considered.

3.5. The scheme covers split system utilizing single refrigeration circuit and having one evaporator and one condenser but does not cover multi-circuit system.

3.6 The scheme covers all new room air conditioners stated in clauses 3.3 to 3.5, imported to or manufactured in Hong Kong with effect from the date that is declared by the participant but does not cover second-hand products, products already in existing use, under trans-shipment or manufactured for export, etc.

3.7 The scheme is operated as a 'Grading Type' labelling system. All participating room air conditioners will be registered under this scheme provided that they have met the testing requirement specified in the scheme.

4. Definitions

Unless otherwise specified, the following definitions shall apply throughout this document:-

Government	means the Government of the Hong Kong Special Administrative Region.
authority	means the Electrical and Mechanical Services Department, the Government of the Hong Kong Special Administrative Region.
Director	means the Director of Electrical and Mechanical Services.
inspecting officer	means the officer authorized by the Director to carry out inspection on room air conditioners.
mains electricity	means the electricity that is supplied in Hong Kong at a voltage of 380/220V and a frequency of 50 Hz.
air-cooled	in relation to a room air conditioner, means the employment of air-cooled condensers in the room air conditioner.
air-heated	in relation to a room air conditioner, means the employment of air-heated evaporators in the room air conditioners.
ceiling-mounted type room air-conditioner	means a split type room air conditioner whose indoor unit – (a) is equipped with mounting brackets or hooks on its body at appropriate locations; (b) is intended to be installed with mounting rods or mounting bolts fastened on the ceiling in accordance with the manufacturer's installation procedures; (c) is intended to be installed directly under the ceiling; and (d) has an intake grille, which may or may not be installed at the same level as the adjacent false ceiling panels (if there are such false ceiling panels).
cooling	means the amount of sensible and latent heat that a room air

capacity	conditioner can remove from the conditioned space in a defined interval of time.
cooling only type	means a room air conditioner which is used for cooling, but not for heating.
cooling seasonal total load (CSTL)	means the total annual amount of heat that is removed from the indoor air when the equipment is operated for cooling in active mode.
cooling seasonal energy consumption (CSEC)	means the total annual amount of energy consumed by the equipment when it is operated for cooling in active mode.
cooling seasonal performance factor (CSPF)	means the ratio of the total annual amount of heat that the equipment can remove from the indoor air when operated for cooling in active mode to the total annual amount of energy consumed by the equipment during the same period.
effective power input (PE)	means the average electrical power input to the room air conditioner obtained from – (a) the power input from the compressor(s) (b) the power input to electric heating devices used only for deforesting, (c) the power input of all control and safety devices of the room air conditioner, and (d) the power input for operation of all fans Note : This is expressed in units of watts.
fan-coil air-conditioning unit	means an air-conditioning unit equipped with a fan re-circulating air from the conditioned space through the coil, that contains either chilled or hot water for cooling or heating.
fixed capacity type	means a room air conditioner which does not have possibility to change its capacity.

room air-conditioner	
floor standing type air-conditioner	means a split type room air conditioner whose indoor unit is intended to be installed directly on the floor in accordance with the manufacturer's installation procedures.
heat pump	means an encased assembly or assemblies designed as a unit to provide delivery of heat, which includes an electrically operated refrigeration system for heating.
heating capacity	means the amount of sensible and latent heat that a room air conditioner can add to the conditioned space in a defined interval of time.
heating seasonal energy consumption (HSEC)	means the total annual amount of energy consumed by the equipment when it is operated for heating in active mode.
heating seasonal total load (HSTL)	means the total annual amount of heat that is added to the indoor air when the equipment is operated for heating in active mode.
heating seasonal performance factor (HSPF)	means the ratio of the total annual amount of heat that the equipment can add to the indoor air when operated for heating in active mode to the total annual amount of energy consumed by the equipment during the same period.
ISO	means International Organization for Standardization.
multiple split-system	means a split system that (a) incorporates a single or multiple refrigerant circuits; (b) has one or more compressors; (c) has multiple indoor units;

(d) has one or more outdoor units; and

(e) is capable of operating either as an air conditioner or a heat pump.

multi-stage capacity type room air-conditioner	means a room air conditioner where the capacity is varied by three or four steps.
non-ducted	means not having any additional ductings or pipes required for air intake and exhaust.
non-fixed capacity type room air-conditioner	means a room air conditioner which has possibility to change its capacity.
rated cooling capacity	means the cooling capacity of a room air conditioner as determined and declared by the manufacturer or importer of the room air conditioner in accordance with the standard and requirements specified in the Scheme.
rated heating capacity	means the heating capacity of a room air conditioner as determined and declared by the manufacturer or importer of the room air conditioner in accordance with the standard and requirements specified in the Scheme.
rated power consumption	means the power input of a room air conditioner as determined and declared by the manufacturer or importer of the room air conditioner in accordance with the standard and requirements specified in the Scheme.
refrigeration circuit	means a physical circuit through which a refrigerant is compressed and liquefied, allowed to cool in a condenser, and then allowed to expand to become a gas in an evaporator (the expansion is accompanied by a strong cooling effect). In this operation the condenser becomes warm and the evaporator becomes cold as the heat is removed from the evaporator to the condenser.

reverse cycle type	means a room air conditioner which can operate in normal or reverse vapour compression cycle, used for both cooling and heating.
single package type	means a room air conditioner which consists of components of a refrigeration system fixed on a common mounting to form a discrete unit.
split type	means a room air conditioner which has separate indoor and outdoor components that are connected with the refrigerant piping, and the indoor unit of which usually lies within the conditioned space.
two-stage capacity type room air-conditioner	means a room air conditioner where the capacity is varied by two steps.
variable capacity type room air-conditioner	means a room air conditioner where the capacity is varied by five or more steps to represent continuously variable capacity.
water-cooled	in relation to a room air conditioner, means the employment of water-cooled condensers in the room air conditioner.
water-heated	in relation to a room air conditioner, means the employment of water-heated evaporators in the room air conditioner.
vapour compression cycle	means a mechanism employed by a room air conditioner throughout which the refrigerant undergoes alternate compression and expansion to achieve the cooling or heating function.
ISO 5151	means ISO 5151:2010
ISO 16358-1	means ISO 16358-1:2013
ISO 16358-2	means ISO 16358-2:2013

5. Classification of Room Air Conditioners

5.1 All room air conditioners covered in the Scheme are classified in accordance with Table 1 –

Table 1 : Overall Classification of Room Air Conditioners

Type	Function	Category	Description
Single Package	Cooling Only	Category 1	A single package type room air conditioner with cooling function only
	Reverse Cycle	Category 2	A single package type room air conditioner with both cooling and heating functions
Split	Cooling Only	Category 3	A split type room air conditioner with cooling function only
	Reverse Cycle	Category 4	A split type room air conditioner with both cooling and heating functions

For all categories of room air conditioner, room air conditioner is further classified into four types, they are namely, fixed capacity type room air conditioner, two-stage capacity type room air conditioner, multi-stage capacity type room air conditioner, and variable capacity type.

6. Test Methodology and Standards

Tests required to be carried out

6.1 The tests specified below are required to be carried out, in accordance with ISO 5151, ISO16358-1, ISO 16358-2 or other equivalent international standards approved by the Director, in order to find out the energy efficiency and performance characteristics of a room air conditioner. The accuracy of the instruments used for tests shall conform to the test methods and uncertainties of measurements specified in ISO 5151.

(a) Cooling capacity tests required to be carried out are shown in Table 2.

(b) Heating capacity tests required to be carried out for room air conditioners of reverse cycle type are shown in Table 3.

(c) Maximum cooling performance test.

(d) Maximum heating performance test for room air conditioners of reverse cycle type.

6.2 Any test report required to be submitted to the Director under this Scheme shall contain the results of these tests:

Table 2 – Test required to be carried out, test conditions and default values

Test	Characteristics	Fixed	Two - stage	Multi - stage	Variable
Standard cooling capacity Indoor DB 27℃, WB 19℃ Outdoor DB 35℃, WB 24℃	Full capacity, $\Phi_{ful}(35)$(W)	Test Required	Test Required	Test Required	Test Required
	Full power input, $P_{ful}(35)$(W)				
	Half capacity, $\Phi_{haf}(35)$(W)	-	-	Note 1	Test Required
	Half power input, $P_{haf}(35)$(W)				
	Minimum capacity, $\Phi_{min}(35)$(W)	-	Note 1	-	-
	Minimum power input, $P_{min}(35)$(W)				
Low temp. cooling capacity Indoor DB 27℃, WB 19℃ Outdoor DB 29℃, WB 24℃	Full capacity, $\Phi_{ful}(29)$(W)	Note 1	Note 1	Note 1	Note 1
	Full power input, $P_{ful}(29)$(W)				
	Half capacity, $\Phi_{haf}(29)$(W)	-	-	Test Required	Note 1
	Half power input, $P_{haf}(29)$(W)				
	Minimum capacity, $\Phi_{min}(29)$(W)	-	Test Required	-	-
	Minimum power input, $P_{min}(29)$(W)				

Note 1 : Default values shall be used : $\Phi_{ful}(35) = \Phi_{ful}(29)/1.077$, $P_{ful}(35) = P_{ful}(29)/0.914$,
$\Phi_{haf}(35) = \Phi_{haf}(29)/1.077$, $P_{haf}(35) = P_{haf}(29)/0.914$,
$\Phi_{min}(35) = \Phi_{min}(29)/1.077$, $P_{min}(35) = P_{min}(29)/0.914$

Note 2 : Default value of degradation coefficient: C_D=0.25

Table 3 – Heating performance test required to be carried out, test conditions and default values for room air conditioners of reverse cycle type

Test	Characteristics	Fixed	Two-stage	Multi-stage	Variable
Standard heating capacity Indoor DB 20°C WB 15°C Max. Outdoor DB 7°C WB 6°C	Full capacity $\phi_{ful}(7)$ (W)	*Test Required*	*Test Required*	*Test Required*	*Test Required*
	Full power input $P_{ful}(7)$ (W)				
	Half capacity $\phi_{haf}(7)$ (W)	---	---	*Test Required*	*Test Required*
	Half power input $P_{haf}(7)$ (W)				
	Minimum capacity $\phi_{min}(7)$ (W)	---	*Test Required*	----	---
	Minimum power input $P_{min}(7)$ (W)				
Low temp. heating capacity Indoor DB 20°C WB 15°C Max. Outdoor DB 2°C WB 1°C	Full capacity $\phi_{ful,f}(2)$ (W)	*Note 1*	*Note 1*	*Note 1*	*Note 1*
	Full power input $P_{ful,f}(2)$ (W)				
	Half capacity $\phi_{haf,f}(2)$ (W)	---	---	*Note 1*	*Note 1*
	Half power input $P_{haf,f}(2)$ (W)				
	Minimum capacity $\phi_{min,f}(2)$ (W)	---	*Note 1*	---	---
	Minimum power input $P_{min,f}$ (2) (W)				

Note 1: Default values shall be used: $\phi_{ful,f}(2) = \phi_{ful}(2)/1.12$, $P_{ful,f}(2) = P_{ful}(2)/1.06$

$\phi_{haf,f}(2) = \phi_{haf}(2)/1.12$, $P_{haf,f}(2) = P_{haf}(2)/1.06$

$\phi_{min.f}(2) = \phi_{min}(2)/1.12$, $P_{min,f}(2) = P_{min}(2)/1.06$

Note 2: The following two equations apply to the full capacity, half capacity and minimum capacity when ϕx,f (2) and Px,f (2) are calculated:

$$\emptyset x(2) = \emptyset x(-7) + \frac{\emptyset x(7) - \emptyset x(-7)}{7-(-7)} \text{ x(2-(-7))} \qquad Px(2) = Px(-7) + \frac{Px(7) - Px(-7)}{7-(-7)} \text{ x(2-(-7))}$$

Note 3: Default value of degradation coefficient: $C_D = 0.25$

Testing Methodology

6.3 Standard Cooling Capacity Tests and Heating Capacity Tests

The standard cooling capacity tests and heating capacity tests, if applicable, shall be conducted in accordance with Annex A of ISO 5151. The cooling capacity and its corresponding effective power input shall be measured during the standard cooling capacity tests whereas the heating capacity and its corresponding effective input shall be measured during the heating capacity tests.

The cooling full capacity test and heating full capacity test shall be conducted at full load operating conditions.

The cooling half capacity test, if required, shall be conducted at 50 % of full load operation. The test tolerance shall be ± 5 % of the tested full load capacity for continuously variable room air conditioner.

The heating half capacity test, if required, shall be conducted at 50% of full load operation. The test tolerance shall be ± 5 % of the tested full load capacity for continuously variable room air conditioner.

For multi-stage room air conditioner, if 50% heating capacity is not achievable, then the test shall be conducted at the next step above 50%.

For two stage room air conditioner, the heating minimum capacity test shall be conducted at the lowest capacity control setting which allows steady-state operation of the room air conditioner at the given test conditions.

The method of fixing the capacity shall be clearly indicated in the test report.

6.4 Low Temperature Cooling Capacity Tests

The low temperature cooling capacity test, if required, shall be conducted in accordance with Annex A of ISO 5151.

For multi-stage room air conditioner, the cooling half capacity test shall be conducted at 50% of full load operation. If 50% capacity if not achievable, then the tests shall be conducted at the next step above 50%.

For two stage room air conditioner, the cooling minimum capacity test shall be conducted at the lowest capacity control setting which allows steady-state operation of the room air conditioner at the given test conditions.

The method of fixing the capacity shall be clearly indicated in the test report.

6.5 Measurement of Cooling Capacity, Heating Capacity and Power Consumption

The test conditions and the test methodology for measurement of cooling capacity, heating capacity and power consumption shall follow ISO 5151, ISO 16358-1, ISO 16358-2 or other equivalent international standards approved by the Director. The room air conditioner shall be tested at a voltage and frequency of mains electricity in Hong Kong with tolerances as specified in the standard. The power

consumption shall be measured correspondingly when the output is fixed at specific cooling capacity or heating capacity.

The measured cooling capacity of the room air conditioner shall be calculated based on the mean of the measured values taken over the test period from the cooling capacity test in accordance with the test requirements and the method of calculation in ISO 5151 or other equivalent international standards approved by the Director. The measured heating capacity of the room air conditioner shall be calculated based on the mean of the measured values taken over the test period from the heating capacity test in accordance with the test requirements and the method of calculation in ISO 5151 or other equivalent international standards approved by the Director. The value shall be in watts (W), or in kilowatts (kW).

The measured power consumption of the room air conditioner shall be measured during the cooling and heating capacity tests as described in ISO 5151 or other equivalent international standards approved by the Director. This is the effective power input to the room air conditioner taken over the test period from the cooling capacity test and heating capacity tests, in watts (W), or in kilowatts (kW).

6.6 Maximum Cooling Performance and Heating Performance Tests

The maximum cooling performance test shall be conducted in accordance with the test methodology and performance requirements as specified in clause 5.2 of ISO 5151. The maximum heating performance test shall be conducted for room air conditioners of reverse cycle type in accordance with the test methodology and performance requirements as specified in clause 6.2 of ISO 5151.

7. Energy Efficiency Grading

Cooling Seasonal Performance Factor (CSPF) and Heating Seasonal Performance Factor (HSPF)

7.1 The cooling seasonal performance factor (CSPF), F_{CSP}, of the room air conditioner shall be calculated as follows-

$$F_{CSP} = \frac{L_{CST}}{C_{CSE}} \quad \text{.....(eq. 1)}$$

where L_{CST} is the cooling seasonal total load (CSTL) to be calculated in accordance with ISO 16358-1 (Unit: Wh) using the defined cooling load

and the outdoor temperature bin distribution specified in below Table 4 and Table 6 of the Scheme respectively,

C_{CSE} is the cooling seasonal energy consumption (CSEC) to be calculated in accordance with ISO 16358-1 (Unit: Wh) using the defined cooling load and the outdoor temperature bin distribution specified in the below Table 4 and Table 6 respectively.

The cooling seasonal performance factor shall be calculated based on the measurement results and default values as specified in Table 2. Data from other sources are not allowed for use in the calculation.

The heating seasonal performance factor (HSPF), F_{HSP} of the room air conditioner of reverse cycle type shall be calculated as follows –

$$F_{HSP} = \frac{L_{HST}}{C_{HSE}} \quad \text{.....(eq. 2)}$$

where L_{HST} is the heating seasonal total load (HSTL) to be calculated in accordance with ISO 16358-2 (Unit: Wh) using the defined heating load and the outdoor temperature bin distribution specified in Table 5 and Table 7 of the Scheme respectively.

C_{HSE} is the heating seasonal energy consumption (HSEC) to be calculated in accordance with ISO 16358-2 (Unit: Wh) using the defined heating load and the outdoor temperature bin distribution specified in Table 5 and Table 7 of the Scheme respectively.

The heating seasonal performance factor shall be calculated based on the measurement results and default values as specified in Table 3. Data from other sources are not allowed for use in the calculation.

Cooling Load and Heating Load

7.2 The defined cooling load is assumed linearly changing depending on the change in outdoor temperature as shown in Table 4.

Table 4: Defined cooling load

Parameter	Load zero (0)	Load 100%
Cooling load (W)	0	$\Phi_{ful}(t_{100})$
Outdoor Temperature (℃)	t_0 =23℃	t_{100} = 35℃

where $\Phi_{ful}(t100)$ is the cooling capacity at $t100$ at full load operation condition. $t100$is the outdoor temperature at 100% load and $t0$ is the outdoor temperature at 0% load.

The defined heating load is assumed linearly changing depending on the change in outdoor temperature as shown in Table 5.

Table 5 – Defined heating load

Parameter	Load zero (0)	Load 100%
Heating load (W)	0	$\phi_{ful}(t_{100})$
Outdoor Temperature (°C)	t_0 = 16°C	t_{100} = 0°C

where $\phi_{ful}(t_{100})$ is the heating capacity at t_{100} at full load operation condition, where $\phi_{ful}(t_{100})$ = 0.82 x $\phi_{ful}(7)$
t_{100} is the outdoor temperature at 100 % load and t_0 is the outdoor temperature at 0 % load.

Outdoor Temperature Bin Distribution for Cooling and Heating

7.3 The cooling seasonal performance factor (CSPF) shall be calculated at outdoor temperature bin distribution shown in Table 6.

Table 6 : Outdoor temperature bin distribution for cooling

Bin no. j	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
Outdoor temperature t_j (℃)	24	25	26	27	28	29	30	31	32	33	34	35	36	---
Bin hours n_j (hour)	67	117	147	177	210	183	114	75	56	33	15	5	1	1200

The heating seasonal performance factor (HSPF) shall be calculated at outdoor temperature bin distribution shown in Table 7.

Table 7 – Outdoor temperature bin distribution for heating

Bin no. j	1	2	3	4	5	6	7	8	9	10	11	12	Total
Outdoor temperature t_j (°C)	5	6	7	8	9	10	11	12	13	14	15	16	---
Bin hours n_j (hour)	0	1	4	6	11	15	19	24	29	38	44	49	240

Energy Efficiency Grading

7.4 The energy efficiency grade for cooling performance of the room air conditioner shall be determined as shown in Table 8, with Grade 1 having the best performance and Grade 5 having the worst performance.

Table 8 : Derivation of energy efficiency grades for cooling performance

Cooling Seasonal Performance Factor (CSPF), F_{CSP}		Energy Efficiency Grade for Cooling Performance *(Note)*
Single Package Type Categories 1 - 2	Split Type Categories 3 - 4	
$3.00 \leq F_{CSP}$	$4.50 \leq F_{CSP}$	1
$2.80 \leq F_{CSP} < 3.00$	$3.50 \leq F_{CSP} < 4.50$	2
$2.60 \leq F_{CSP} < 2.80$	$3.15 \leq F_{CSP} < 3.50$	3
$2.40 \leq F_{CSP} < 2.60$	$2.80 \leq F_{CSP} < 3.15$	4
$F_{CSP} < 2.40$	$F_{CSP} < 2.80$	5

Note: In order to obtain Grade 1 to 4 for cooling performance, the room cooler concerned shall also pass the maximum cooling performance test. Only Grade 5 will be accorded if the room cooler does not pass the maximum cooling performance test; or the F_{CSP}<2.40 for single package type room cooler or the F_{CSP}<2.80 for split type room cooler.

The energy efficiency grade for heating performance of the room air conditioner of reverse cycle type shall be determined as shown in Table 9, with Grade 1 having the best performance and Grade 5 having the worst performance.

7.5 The energy efficiency grade for heating performance of the room air conditioner of reverse cycle type shall be determined as shown in Table 9, with Grade 1 having the best performance and Grade 5 having the worst performance.

Table 9 – Derivation of energy efficiency grades for heating performance

Heating Seasonal Performance Factor (HSPF), F_{HSP}		Energy Efficiency Grade for Heating Performance *(Note)*
Single Package Type Category 2	Split Type Category 4	
$2.60 \leq F_{HSP}$	$3.60 \leq F_{HSP}$	1
$2.40 \leq F_{HSP} < 2.60$	$3.10 \leq F_{HSP} < 3.60$	2
$2.20 \leq F_{HSP} < 2.40$	$2.80 \leq F_{HSP} < 3.10$	3

$2.00 \leq F_{HSP} < 2.20$	$2.50 \leq F_{HSP} < 2.80$	4
$F_{HSP} < 2.00$	$F_{HSP} < 2.50$	5

Note:
In order to obtain Grade 1 to 4 for heating performance, the room air conditioner of reverse cycle type concerned shall also pass the maximum heating performance test. Only Grade 5 for heating will be accorded if the room air conditioner of reverse cycle type does not pass the maximum heating performance test; or the $F_{HSP} < 2.00$ for single package type room air conditioner or the $F_{HSP} < 2.50$ for split type room air conditioner.

Examples illustrating the method on how to determine the energy efficiency grade of room air conditioner are shown in Annex 8.

8. Performance Requirements

Energy Efficiency Performance Requirements

8.1 In the test report submitted to the Director under clause 11.4, the results of the tests carried out in accordance with the relevant clauses of ISO 5151, ISO 16358-1, ISO 16358-2 or other equivalent international standards approved by the Director shall show that the concerned model f room air conditioner conforms with the following performance requirements –

(a) The measured cooling capacity $\Phi_{ful}(35)$ from cooling full capacity test at standard cooling condition (T1 climate) for both cooling only type and reverse cycle type room air conditioner shall not be less than 95% of the rated cooling capacity of the room air conditioner. The measured heating capacity $\phi_{ful}(7)$ from heating full capacity test at standard heating condition (H1 climate) for reverse cycle type room air conditioners shall not be less than 95% of the rated heating capacity of the room air conditioner.

(b) The measured power consumption $P_{ful}(35)$ from cooling full capacity test at standard cooling condition (T1 climate) shall not be greater than 110% of the rated power consumption for both cooling only type and reverse cycle type of the room air conditioner. The measured power consumption $P_{ful}(7)$ from heating full capacity test at standard heating condition (H1 climate) shall not be greater than 110% of the rated power consumption of the reverse cycle type room air conditioner.

(c) The calculated cooling seasonal performance factor shall not be less than 92% of the rated cooling seasonal performance factor for both cooling only type and reverse cycle type of room air conditioners. The calculated heating seasonal performance factor shall not be less than 92% of the rated heating seasonal performance factor for reverse cycle type room air conditioners.

(d) The cooling only type and reverse cycle room air conditioners shall pass the maximum cooling performance test. Any room air conditioner failing the maximum cooling performance test can only obtain Grade 5 for its cooling function. The reverse cycle type room air conditioner shall also pass the maximum heating performance test. Any reverse cycle type room air conditioner failing the maximum heating performance test can only obtain Grade 5 for its heating function.

8.2 The rated cooling and heating capacities, rated power consumption and heating rated cooling seasonal performance factor as declared by the manufacturer or importer shall meet the requirements specified in clause 8.1 of the Scheme.

Safety Requirements

8.3 In addition to the energy efficiency performance requirements, all room air conditioners shall comply with the Electrical Products (Safety) Regulation, Chapter 406G of the Laws of Hong Kong, and the safety standards specified under the Regulation, and all other legislations concerning the safety of the room air conditioners, e.g. the Gas Safety Ordinance and its subsidiary legislations, as appropriate.

Number of Samples to be tested

8.4 For submission of product information of a model under clause 11.4 of the Scheme, a test report on one sample of the model shall be submitted.

8.5 However, if the test results of one sample indicate that the measured cooling capacity ϕful(35) from cooling full capacity test at standard cooling condition (T1 climate) or measured heating capacity ϕful(7) from heating full capacity test at standard heating condition (H1 climate), if applicable, is equal to or greater than 95%, and is less than 97.5% of its corresponding rated capacity, and the corresponding measured power consumption is greater than 106%, and is equal to or less than 110% of the rated power consumption, the test report shall include the tests of two samples of the same model. In such case, each individual sample shall meet all the performance requirements in clause 8 of the Scheme. Also, the information on the energy label shall be based on the test results of the tested sample with a lower cooling seasonal performance factor (FCSP) or a lower heating seasonal performance factor (FHSP), if applicable.

9. Energy Label

9.1 The specification of the energy label for room air conditioner is shown in Annex 1. After a reference number has been assigned to a product model in the name of a specified person and included in the Director's record, the specified person shall produce the energy label for his/her products showing the energy efficiency grade and associated information in strict accordance with the requirements in Annex 1.

9.2 (a) Subject to clause 9.2 (c), the energy label should be attached or affixed to a prominent location of the room air conditioner and is to be clearly visible. The participant should ensure that the energy label appears on every registered room air conditioner on display, sale or hire.

(b) For the avoidance of doubt, if only part of the room air conditioner is being exhibited, the energy label is to be attached or affixed to a prominent position of that part and is to be clearly visible.

(c) The energy label may be attached to the room air conditioner or its packaging in a manner specified by the Director where the Director has approved its being so attached.

9.3 The energy label shall be of cardboard, if it is to be attached as a swing tag, or be self-adhesive and shall be cut to the outline shown in Annex 1 or otherwise approved by the Director. A trim or die cut margin of up to 2 mm around the energy label is acceptable.

9.4 The paper used for the energy label shall be durable with good wear and tear characteristics.

9.5 The energy label shall be printed in both Chinese and English. Soft copy of the energy label can be obtained from Energy Efficiency Office, Electrical and Mechanical Services Department.

10. Test Facilities, Laboratories & Accreditation Bodies

10.1 The testing shall be carried out either by independent test institutes or by the manufacturers or by the importers themselves at their own test facilities. The Authority will accept the results and certificates issued by the test laboratory which fulfils one of the following criteria as specified in clauses 10.2, 10.3 or 10.4.

10.2 The laboratory is accredited by the Hong Kong Accreditation Service (HKAS) for the relevant test under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) or a scheme for which HKAS has concluded a mutual recognition agreement (MRA)[#], and the results are issued in a test report or certificate bearing the accreditation mark.

10.3 The Authority will also consider the following –

a) Self-certification by original manufacturers with laboratories satisfying ISO/IEC 17025; and

b) The manufacturers are currently operating according to a recognized international quality system (such as ISO9001) ; and

c) The manufacturer's in-house laboratories had successful carried out tests on room air conditioners based on ISO 5151, or other internationally recognized room air conditioners standards and where these tests had been evaluated and certified by third party internationally recognized certification organizations.

10.4 The Authority will also consider the test results issued by a laboratory which is accredited by HKAS (or is under accreditation scheme operated by a laboratory accreditation body with which HKAS has concluded a MRA) for the relevant testing on electrical and mechanical appliances other than the tests based on the technical standards stipulated in the Scheme; if the laboratory can demonstrate their capability of carrying out tests on room air conditioners in accordance with ISO 5151.

[#] *HKAS has concluded mutual recognition arrangements with overseas accreditation bodies for testing laboratory accreditation. The list of mutual recognition arrangement partners may change from time to time and the up-to-date list is available from the HKAS website of www.info.gov.hk/itc/hkas. Partners to these arrangements recognize the accreditations granted by one another as equivalent.*

Laboratory Accreditation

10.5 Government takes cognizance of the need to ensure acceptable and compatible quality standards of testing laboratories, and considers that they need to be accredited by some independent bodies.

10.6 The criteria of accreditation should be based on ISO/IEC 17025 and the certification bodies should operate in accordance with ISO/IEC Guide 17011.

10.7 The Authority will recognize the accreditation granted by the HKAS under the HOKLAS and by overseas accreditation bodies with which HKAS has concluded MRA. For the accreditation by other certification bodies, the Authority will consider on a case-by-case basis.

Energy Efficiency Certification Service

10.8 An increasing number of countries now accept, as proof of product conformance, energy efficiency certification services provided by the organization that has been accredited as a certification body. In accordance with this trend, the Authority will also consider test results that have been evaluated and certified according to the ISO 5151 standards by reputable certification organizations.

11. Registration and Participation

Registration Procedures

11.1 All manufacturers, importers and the other parties involved in the room air conditioner distribution network are welcome and encouraged to participate in the Scheme. The Authority will send invitation to those known manufacturers and importers. However, no matter whether invited or not, any interested parties may submit their applications for the registration.

11.2 The proforma letter of invitation is shown in Annex 2.

11.3 Applicant should submit formal application to

Chief Engineer/Energy Efficiency A Energy
Efficiency Office
Electrical and Mechanical Services Department 3
Kai Shing Street, Kowloon
Hong Kong

by means of an application letter through mail, facsimile or electronic mail. In order to ensure effective implementation of the Scheme, the applicant must commit himself to fully comply with the duties, responsibilities and obligations set out in the Scheme. The proforma letter of application as shown in Annex 3 details the aforesaid obligations and should be used for application. To facilitate the application process, the application form can be downloaded from EMSD website.

Information/Documents to be Submitted for Registration

11.4 Each make and model of room air conditioner participating in the Scheme should be

provided with a test report issued by a recognized laboratory. The test report should contain energy consumption tests and performance test results. The details of the technical information to be submitted together with the application are listed as follows:-

a) Information on the company

Name, Address, Telephone number, Fax number, Contact person, Email address, Importer, Distributor etc.

b) Product to apply for participating in the Scheme:

Name of products, types, makes, models, countries of origin

c) The parties which will be responsible for making and fixing the Energy Label

d) Commencement date to affix energy label on room air conditioner

Year_____, Month_____

e) Completion of the Information stated in the Energy Label for each product including the following:

Brand and Model (English & Chinese)
Model
Room Air Conditioner Category Cooling
Capacity
Heating Capacity
Annual Energy Consumption Energy
Efficiency Grade Refrigerant

f) Supporting Technical Information and Calculations

Test reports : -
Standard Cooling and Heating Capacity Tests
Low Temperature Cooling Capacity Tests /Energy Consumption Test (Effective power input)
Maximum Cooling Performance and Heating performance Tests
Calculations :-
Cooling Seasonal Performance Factor (CSPF) and Heating
Seasonal Performance Factor (HSPF)
Cooling Seasonal Total LOAD (CSTL) and Heating seasonal total load (HSTL)
Cooling Seasonal Energy Consumption (CSEC) and Heating seasonal energy consumption (HSEC)
Energy Efficiency Grading

g) Miscellaneous Technical Information:

Product information catalogue

Information on compressor and refrigerant Others

h) Certificate of Safety Compliance prescribed by the Electrical Products (Safety) Regulation.

The above list of information can also be found in the Annex 4, Information to be submitted to Energy Efficiency Office.

11.5 Company's name and chop should be stamped on all the documents provided. All photocopy test reports submitted to the Authority shall be certified true copy by appropriate organization.

Acceptance of Registration

11.6 On receipt of the application, the Authority will process the application and verify whether the room air conditioner to be registered falls into the appropriate room air conditioner category, and the energy efficiency grade is correctly obtained based on the submitted data. The accuracy of the energy consumption data and the cooling capacity and Heating capacity, their inconsistencies and non-compliance will be dealt with in accordance with clause 13.2.

11.7 If the application is accepted, the participants will be notified of the result in writing within 17 working days. The participants will then be allowed to affix the energy label onto the 'registered' room air conditioners. Both manufacturer and importer of the registered room air conditioner should ensure that the energy label is correctly printed and affixed on the room air conditioner in accordance with Section 9. The proforma letter of acceptance is shown in Annex 5.

11.8 If the application is rejected, the notification letter (proforma letter of rejection as shown in Annex 6) will also be given within 17 working days upon receipt of all necessary information requested.

11.9 The flow chart for registration is shown in Annex 7.

Participant's Duties, Responsibilities and Obligations

11.10 The participant is obliged to :-

a) submit application and information including test results in accordance with format & procedures set out in clauses 11.4 and 11.5;

b) conduct tests via recognized laboratories and to comply with the specified test methodology and classification scheme;

c) produce and affix energy labels at his own costs;

d) fully inform other sales agents in his distribution network once the particular make and model of a room air conditioner is registered under the Scheme;

e) allow random/ad-hoc inspection to be conducted by persons authorized by the Authority on registered room air conditioner at his premises;

f) conduct re-test(s) at his own costs at some recognized laboratories, if non-compliance is found on his registered room air conditioner, or if the results of inspection suggest inaccurate energy label information being displayed. The result of re-test(s) shall reach the Authority within the prescribed period of time specified by the Authority;

g) inform the Authority of any change in the technical information and data that were previously submitted to the Authority together with the application letter;

h) accept the fact that if registered room air conditioner fails to perform in accordance with the required standard performance as given in section 8 and this cannot be readily rectified, the Authority may order it be de-registered from the Scheme; and

i) remove all energy labels from the de-registered room air conditioner immediately.

11.11 The details of the registered room air conditioners will be kept in a register list maintained by the Authority. The registration records will be regularly uploaded and maintained in the EMSD internet for public and interested parties for browsing and reference.

Termination

11.12 Under circumstances of poor performance such as:

(a) (repeated) failure to fulfil obligations set out under clause 11.10;

(b) false, inaccurate or misleading information is given on the energy label; or

(c) in any other case where the Director is of the opinion that registration of a room air conditioner is contrary to the public interest,

the Authority may de-register the concerned room air conditioner from the Scheme with immediate effect by giving the participant a notice in writing. Once the room air conditioner is de-registered, energy label is not allowed to fix on it. However, participant will normally be given a grace period of three months to remove all energy labels from the de-registered room air conditioners.

The concerned room air conditioner could be de-registered even when there is no

legal action taken under either the Trade Description Ordinance (Chapter 362) or the Copyright Ordinance (Chapter 528).

11.13 Participant who decides to discontinue participating in the Scheme or to withdraw any registered model from the registered room air conditioners list shall give at least three months' advance notice to the Authority.

12. Legal Provisions

12.1 The Scheme is a voluntary scheme. However, a participant who abuses the Scheme by giving false information on an energy label may contravene provisions of the Trade Description Ordinance (Chapter 362).

12.2 No one could take advantage of the Scheme by using the energy label on his room air conditioners without authorization from the Authority as that shall constitute an infringement of copyright under the Copyright Ordinance (Chapter 528).

13. Compliance, Monitoring & Inspection

Purpose

13.1 To uphold the credibility of the Scheme and to continue maintaining the confidence of the consumers, compliance check on energy labels on those room air conditioners participating in the Scheme are needed. Also to avoid the non-participating parties from taking advantage of the Scheme by using unauthorized energy labels, suitable form of inspection shall be conducted on those room air conditioners which have not been registered under the Scheme.

Scope

13.2 The scope of inspection includes sample **checking** and **testing** of the following items :-

(a) whether the energy label is affixed on the registered room air conditioner;

(b) whether the energy label on the registered room air conditioner is affixed to a prominent position in accordance with clause 9.2;

(c) whether the energy label being displayed is of correct format in accordance with clause 9.2;

(d) whether the information on energy label accords with record;

(e) whether the registered room air conditioner complies with the energy consumption and performance requirements;

(f) whether the data submitted by the participants are correct by random re-testing; and

(g) whether the unregistered room air conditioners display unauthorized energy labels.

13.3 The participants will be requested to take immediate remedial action and report the follow-up action taken if non-compliance is found on their room air conditioners.

13.4 For a registered room air conditioner which is found with inaccurate energy performance data (i.e. discrepancy between the registration data and test result is more than 10%) on the energy label during random checking, the Authority may request the participant to conduct a separate energy consumption test at his own cost, in accordance with the test methodology as stated in section 6 in one of the testing laboratories agreed by the Authority. In case the energy grading is found 2 level or more lower than the declared energy grading, the test should be carried out further on at least three similar room air conditioners. The energy grading from the average of these three room air conditioners should be the same as the declared grading level. Otherwise, the Authority will require the participant to take appropriate remedial action including replacing an energy label with correct grading value for the registered room air conditioner.

Inspecting Officers

13.5 The Authority will authorize inspecting officers to carry out compliance monitoring and inspection on room air conditioners. The officers will carry proper identification cards which will be produced upon request during their inspection operations. However, the officer will not inform the participants in advance of their intended inspection operation.

13.6 It is the participants' obligation to allow the inspecting officers to gain access to their premises to carry out inspection.

Mode of Inspection

13.7 Inspections will be carried out on registered room air conditioners on random basis. Based on the record of the registration, random inspection programmes will be developed.

13.8 In addition to the random inspections, the inspecting officers will carry out ad-hoc inspections in response to complaints. The items to be inspected in such a case will depend upon the nature of complaint and may include all types of inspection as stated in clause 13.2.

13.9 Inspections will normally be carried at the retail outlets and room air conditioners showrooms. Where necessary, inspection will also be done at warehouses.

13.10 The inspection results will be properly recorded for future analysis as well as on evaluation of the effectiveness of the Scheme.

Compliance Monitoring

13.11 During the compliance monitoring testing carried out by the Director, a registered model of room air conditioner will be accepted as conformance if the test results of a single sample of the registered model meet the following criteria:

(a) The tested cooling capacity ϕful (35) from cooling full capacity test at standard cooling condition (T1 climate) being not less than 90% of the rated cooling capacity. The tested heating capacity ϕful (7) from heating full capacity test at standard heating condition (H1 climate) being not less than 90% of the rated heating capacity;

(b) The tested power consumption Pful (35) from cooling full capacity test at standard cooling condition (T1 climate) being not greater than 110% of the rated power consumption. The tested power consumption Pful (7) from heating full capacity test at standard heating condition (H1 climate) being not greater than 110% of the rated power consumption;

(c) The calculated cooling seasonal performance factor being not less than 92% of the rated cooling seasonal performance factor. The calculated heating seasonal performance factor being not less than 92% of the rated heating seasonal performance factor;

(d) The cooling only type and reverse cycle type room air conditioner (with a Grade 1, 2, 3 or 4 energy label) passing the maximum cooling performance test. The reverse cycle type room air conditioner (with a Grade 1, 2, 3 or 4 energy label) passing the maximum heating performance test; and

(e) The tested energy efficiency grade meeting either one of the following:

(i) The cooling energy efficiency grade calculated in the compliance monitoring testing being equal to or better than the cooling energy efficiency grade determined by the test results submitted to the Director

by the specified person. The heating energy efficiency grade calculated in the compliance monitoring testing being equal to or better than the heating energy efficiency grade determined by the test results submitted to the Director by the specified person; or

(ii) If the cooling energy efficiency grade calculated in the compliance monitoring testing being not equal to nor better than the cooling energy efficiency grade determined by the test results submitted to the Director, the cooling seasonal performance factor calculated in the compliance monitoring testing being not less than 92% of the cooling seasonal performance factor calculated by the test results submitted to the Director, and in any cases not less than the lowest cooling seasonal performance factor allowed in the next lower cooling energy efficiency grade. If the heating energy efficiency grade calculated in the compliance monitoring testing being not equal to nor better than the heating energy efficiency grade determined by the test results submitted to the Director, the heating seasonal performance factor calculated in the compliance monitoring testing being not less than 92% of the heating seasonal performance factor calculated by the test results submitted to the Director, and in any cases not less than the lowest heating seasonal performance factor allowed in the next lower heating energy efficiency grade.

13.12 The Director may remove from the registered record of room air conditioner, if he has reasonable grounds to believe that the room air conditioner does not conform to the specified information or a specified document, or their updates if any, submitted to the Director. The specified person may provide explanation on the failure of a product to pass the compliance monitoring testing stipulated in clause 13.11 above and apply for further testing of the concerned model for the Director's consideration.

13.13 If further testing is approved to be carried out, three samples of the same model shall be tested at the specified person's own costs. A registered model of room air conditioner will be accepted as conformance if the results of further testing meet the following criteria:

(a) The average of the tested cooling capacities ϕful (35) from cooling full capacity tests at standard cooling condition (T1 climate) of all the samples being not less than 90% of the rated cooling capacity. The average of the tested heating capacities ϕful (7) from heating full capacity tests at standard heating condition (H1 climate) of all the samples being not less than 90% of the rated heating capacity;

(b) The average of the tested power consumptions P_{ful} (35) from cooling full capacity tests at standard cooling condition (T1 climate) of all the samples being not greater than 110% of the rated power consumption. The average of the tested power consumption P ful(7) from heating full capacity tests at standard heating condition (H1 climate) of all the samples being not greater than 110% of the rated power consumption;

(c) The average of the calculated cooling seasonal performance factors of all the samples being not less than 92% of the rated cooling seasonal performance factor. The average of the calculated heating seasonal performance factors of all the samples being not less than 92% of the rated heating seasonal performance factor;

(d) Each sample passing the maximum cooling and Heating performance test for Grade 1 to 4; and

(e) The tested energy efficiency grade meeting either one of the following:

(i) The cooling energy efficiency grade determined by the average of the calculated cooling seasonal performance factors of all the samples calculated in the further testing being equal to or better than the cooling energy efficiency grade determined by the test results submitted to the Director by the specified person. The heating energy efficiency grade determined by the average of the calculated heating seasonal performance factors of all the samples calculated in the further testing being equal to or better than the heating energy efficiency grade determined by the test results submitted to the Director by the specified person; or

(ii) If the cooling energy efficiency grade determined by the average of the calculated cooling seasonal performance factors of all the samples calculated in the further testing being not equal to nor better than the cooling energy efficiency grade determined by the test results submitted to the Director, the average of the cooling seasonal performance factors of all the samples calculated in the further testing being not less than 92% of the cooling seasonal performance factor calculated by the test results submitted to the Director, and in any cases not less than the lowest cooling seasonal performance factor allowed in the next lower energy efficiency grade. If the heating energy efficiency grade determined by the average of the calculated heating seasonal performance factors of all the samples calculated in the further testing being not equal to nor better than the heating energy efficiency grade determined by the test results submitted to the Director, the average of the heating seasonal performance factors of all the samples calculated in

the further testing being not less than 92% of the heating seasonal performance factor calculated by the test results submitted to the Director, and in any cases not less than the lowest heating seasonal performance factor allowed in the next lower energy efficiency grade.

(Remark : The specified person can choose to accept the results of further testing undertaken on fewer than three samples if the results of each sample subsequently tested also do not meet the acceptance criteria as stated above.)

14. Complaints and Appeal

14.1 The Authority will be responsible for dealing with the complaints from participant and other parties against matters related to the Scheme.

Complaints Handling Procedure

14.2 The Director shall ensure that complaints are properly recorded and handled without undue delay.

14.3 The Authority shall carry out preliminary investigation on complaints and reply to the complainants within a reasonable time. For complaints that require site inspection and laboratory test, the complainant shall be notified through an interim reply.

14.4 The Authority shall inform the complainant of the results or decisions made on the complaint.

Appeal Procedure

14.5 A participant who feels aggrieved by the decision or action taken by the Authority according to Section 13 may appeal to the Director in writing stating the reason for the appeal.

14.6 The Director may decide to suspend the decision or action given by the Authority from the day on which the appeal is filed until such appeal is disposed of, withdrawn or abandoned unless such suspension would, in the opinion of the Director, be contrary to public interest.

14.7 The Director may by notice to the appellant require that appellant to attend before him or his representative with documents and evidence relevant to the appeal.

14.8 The Director shall notify the appellant of his decision and the reasons for it. The decision will be final and binding.

15. Maintenance of the Scheme

15.1 To ensure that the scheme can continue to operate effectively and efficiently after its introduction, a proper system of maintenance is needed.

15.2 The maintenance system consists essentially of :

(a) Continuous updating of the lists of participants in the Scheme as follows :

i. details of the registered room air conditioners such as registration number, date of registration or de-registration if it occurs, energy consumption data, performance data, make, model, category and other related information ; and

ii. details of the registered importers, manufacturers, local agents etc. in the distribution network with details such as address, date of registration or de-registration if it occurs, etc.

(b) Periodic review of the test methodology, and procedures for application registration and compliance monitoring, etc., to bring them in line with the latest needs of the manufacturers, importers and retailers, etc.;

(c) Continuous evaluation of the effectiveness of the Scheme and assessment of what changes are necessary.

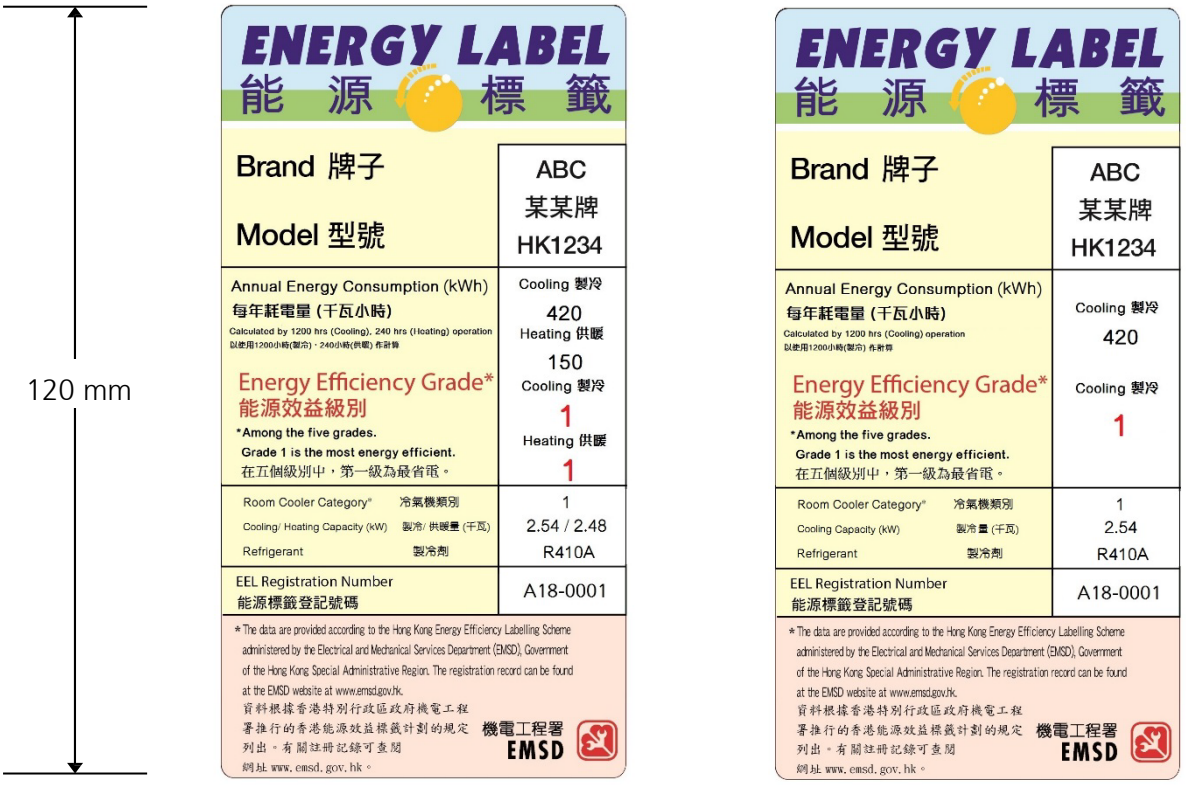
16. Future Development

16.1 It is hoped that following the implementation of the Scheme, the market will phase out models of low efficiency appliances and public awareness of using energy efficient products will be much improved.

16.2 To further facilitate the public in choosing energy efficient appliances and raise public awareness on energy saving, the Government has introduced a mandatory Energy Efficiency Labelling Scheme (EELS) through the Energy Efficiency (Labelling of Products) Ordinance.

16.3 Under the mandatory EELS, energy labels are required to be shown on prescribed products for supply in Hong Kong to inform consumers of their energy efficiency performance. Eight types of prescribed products covered in the mandatory EELS are room air conditioners, refrigerating appliances, compact fluorescent lamps, washing machines, dehumidifiers, televisions, storage type electric water heaters and induction cookers.

The Hong Kong Voluntary Energy Efficiency Labelling Scheme for Room Air Conditioners
Energy Label Format



Reverse Cycle Type Room Air Conditioners

Cooling Type Room Air Conditioners

(Not in Scale)

The figure of the energy label is shown not to scale.

Soft copy of this label can be obtained from Energy Efficiency Office, Electrical and Mechanical Services Department.

Proforma Letter of Invitation

Our ref. ( ) in EMSD/EEO/LB/04
Your ref.

Tel:
Fax.
Date

「 Name and Address of
Manufacturers/Importers/Agents 」

Dear Sir/Madam,

Invitation of application for registration to participate in
Voluntary Energy Efficiency Labelling Scheme for Room Air Conditioners

Having gone through the necessary consultations and duly considered the views from various concerned parties, the government has decided to introduce a voluntary energy efficiency labelling scheme for room air conditioners to Hong Kong with effect from (_____). The details of the Scheme❶ have been finalized and I enclose herewith a guide of the Scheme* for your reference.

Being one of the major room cooler manufacturers / importers / agents❷ in Hong Kong, you are invited to participate in the scheme so as to take part in promoting public awareness in energy conservation and environmental improvement to Hong Kong. If you are interested to participate in the Scheme, please apply in accordance with the proforma letter of application (Annex 3) and submit details including technical information in accordance with the attached Annex 4 to the 'Chief Engineer/Energy Efficiency A' at the following address.

Energy Efficiency Office
Electrical and Mechanical Services Department
3 Kai Shing Street,
Kowloon Hong Kong

Please be reminded to submit accurate test data to support your application. Under this Scheme, routine compliance monitoring and checking will be performed and if a registered room cooler is found to be non-compliant, we may consider deregistering the room air conditioners from the Scheme.

Should you need further clarification or information, you are most welcome to contact the undersigned or Mr._____, at the telephone number_____.

Yours faithfully,

for Director of Electrical & Mechanical Services

(Note : ❶ 'Scheme' means 'The Voluntary Energy Efficiency Labelling Scheme for Room Air Conditioners'

❷ *delete as appropriate)*

Proforma Letter of Application

Your ref. ( ) in EMSD/EEO/LB/04
Our ref.

Tel.
Fax
Date

Chief Engineer/Energy Efficiency A
Electrical & Mechanical Services Department
3 Kai Shing Street, Kowloon
Hong Kong

Dear Sir/Madam,

Application for Registration to Participate in
Voluntary Energy Efficiency Labelling Scheme for Room Air Conditioners

Our company is the (manufacturer/importer/agent*) of _____ in Hong Kong. We support the introduction the labelling scheme to Hong Kong and would like to be one of the participants in the scheme to promote energy efficiency.

I understand fully the obligations and duties stated in the scheme and will comply with all relevant requirements, in particular those specified below:

i) conduct tests via recognized laboratories and to comply with the specified test standards;

ii) produce and affix specified energy labels at my own costs;

iii) allow random/ad-hoc inspection to be conducted by persons authorized by the issuing Authority on registered appliance at my premises;

iv) conduct re-test(s) at my own costs at some recognized laboratories, if the results of inspection suggest inaccurate energy label information being displayed. The result of re-test(s) shall reach the Authority within the prescribed period of time specified by the Authority;

v) inform the Authority of any change in the technical information and data that were previously submitted to the Authority together with the application letter; and

vi) accept the fact that if appliance fails to perform in accordance with the required energy efficiency standards and performance as given in Section 8 and this cannot be readily rectified, the Authority may order it be de-registered from the scheme.

The details of information of those appliances which we intend to register with the Authority are shown in the attached document, Annex 4, and are submitted herewith for your vetting.

Yours faithfully,

(Manufacturer/Importer/Agent's Name and Company Chop)

* *delete as appropriate*

Information to be submitted to Energy Efficiency Office

1. Information on the company

   Name, Address, Telephone number, Fax number, Email address, Contact person, Importer, Distributor etc.

2. Product to apply for participating in the scheme:

   Name of products, types, makes, models, countries of origin

3. Which parties will be responsible for making and fixing the Energy Label

4. Commencement date to affix energy label on appliance

   Year_____, Month_____

5. Completion of the Information stated in the Energy Label for each product including the following:

   Brand (English & Chinese)

   Model

   Countries of origin

   Room Air Conditioner category

   Cooling capacity and Heating Capacity

   Annual energy consumption

   Energy efficiency grading

   Refrigerant

6. Supporting Technical Information and Calculations :

   Test reports : -

   Cooling capacity test and Heating Capacity Test,

   Energy Consumption Test (Effective Power Input)*,

   Maximum Cooling Performance and Heating performance Tests

   Enclosure sweat test and condensate disposal test, if applicable

Calculations :-

Cooling Seasonal Performance Factor (CSPF) and Heating Seasonal Performance Factor (HSPF)

Cooling Seasonal Total LOAD (CSTL) and Heating seasonal total load (HSTL)

Cooling Seasonal Energy Consumption (CSEC) and Heating seasonal energy consumption (HSEC)

Energy Efficiency Grading

7. Miscellaneous Technical Information :

Product information catalogue

Information on compressor

Others

8. Certificate of Safety Compliance prescribed by the Electrical Products (Safety) Regulation of HKSAR for the concerned refrigerating appliances in the application.

.

Note: Company's name and chop should be stamped on the all documents provided.
All test reports submitted to the office should be certified true copy by appropriate organization.

Proforma Letter of Acceptance

Our ref. ( ) in EMSD/EEO/LB/04
Your ref.

Tel:
Fax:
Date

⌜
Manufacturers/Importers/Agents
⌟

Dear Sir/Madam,

Acceptance of Application for Registration to Participate in
Voluntary Energy Efficiency Labelling Scheme for Room Air Conditioners

With reference to your letter of ref._____ dated_____, I am pleased to inform you that your application to participate in the captioned scheme has been accepted.

I enclose herewith the registration certificates of appliances registered. The registered appliances are as follows:

Brand / Make / Model	Registration No.	Effective date
(_____)	(_____)	(_____)

You are allowed to affix a specified energy label onto each and every appliance registered under the scheme. The contents of the energy label should be based on the information that you have provided in your application ref._____and dated_____.

Should you have any queries regarding the scheme, please contact this office.

Yours faithfully,

for Director of Electrical & Mechanical Services

Proforma letter of Rejection

Our ref. ( ) in EMSD/EEO/LB/04
Your ref.

Tel:
Fax:
Date

⌜
Manufacturers/Importers/Agents
⌟

Dear Sir/Madam,

Rejection of Application for Registration to Participate in
Voluntary Energy Efficiency Labelling Scheme for Room Air Conditioners

With reference to your letter of application ref._____dated_____, I regret to inform you that your application for registration to participate in the scheme has not been accepted for the following reasons:-

1._____, etc.

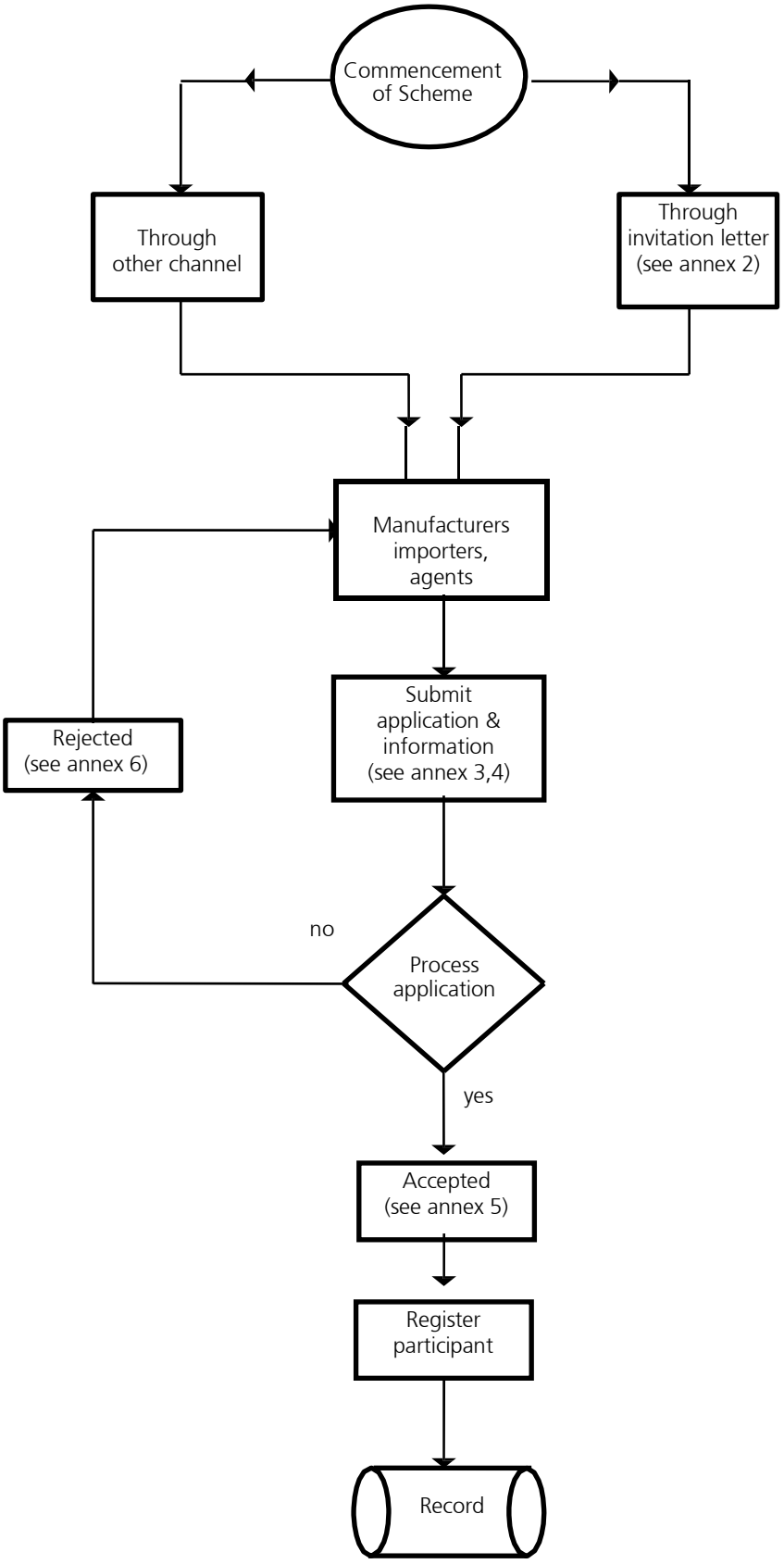
You are most welcome to submit new application again in future, when you have the necessary documents / information to support your application.

Yours faithfully,

for Director of Electrical & Mechanical Services

The Hong Kong Voluntary Energy Efficiency Labelling Scheme for Room Air Conditioners

Flow Chart for Registration



Example for Calculating the Energy Efficiency Grade for Room Air Conditioner

(Cooling - Fixed Capacity Single Package Type)

Step (1)

Rated cooling capacity	6.000 kW
Rated power input	1.850 kW

Measured cooling capacity at 35℃, $\Phi_{ful}(\mathbf{35})$	5.899 kW
Measured power input at 35℃, $\boldsymbol{P_{ful}}(\mathbf{35})$	1.855 kW

Step (2)

Calculated cooling capacity at 29℃, $\Phi_{ful}(\mathbf{29})$ $=1.077 \times \Phi_{ful}(35)$	6.353 kW
Calculated cooling power input at 29℃, $\boldsymbol{P_{ful}}(\mathbf{29})$ $=0.914 \times P_{ful}(35)$	1.695 kW

The defined cooling load is assumed linearly changing depending on the change in outdoor temperature as shown below:

Parameter	Load zero (0)	Load 100%
Cooling load (W)	0	6000
Outdoor Temperature (°C)	23	35

Degradation Coefficient, C_D = 0.25

Step (3)

A	B	C	D	E	F	G	H	I	J
Bin no. j	Out-door temp	Ref. bin hours	$\Phi_{ful}(t_j)$	$P_{ful}(t_j)$	$L_c(t_j)$	$X(t_j)$	$F_{PL}(t_j)$	$L_{CST}(t_j)$	$C_{STE}(t_j)$
1	24	67	6.7317422	1.56253	0.5	0.0743	0.768568744	33.5	10.117
2	25	117	6.6560383	1.58912	1	0.1502	0.78755988	117	35.468
3	26	147	6.5803345	1.61571	1.5	0.228	0.806987984	220.5	67.09
4	27	177	6.5046307	1.64229	2	0.3075	0.826868315	354	108.09
5	28	210	6.4289268	1.66888	2.5	0.3889	0.847216848	525	160.86
6	29	183	6.353223	1.69547	3	0.4722	0.868050319	549	168.78
7	30	114	6.2775192	1.72206	3.5	0.5575	0.889386273	399	123.07
8	31	75	6.2018153	1.74865	4	0.645	0.911243111	300	92.826
9	32	56	6.1261115	1.77524	4.5	0.7346	0.933640144	252	78.215
10	33	33	6.0504077	1.80182	5	0.8264	0.956597649	165	51.367
11	34	15	5.9747038	1.82841	5.5	0.9205	0.98013693	82.5	25.759
12	35	5	5.8990000	1.855	6	1	1	29.495	9.275
13	36	1	5.8232962	1.88159	6.5	1	1	5.8233	1.8816
		1200					Σ	3032.8	932.8
							CSPF	3.2513	

For details of the abbreviations and formulae, please refer to ISO 16358-1:2013.

Step (4)

The cooling seasonal performance factor (CSPF), F_{CSP}, of the room air conditioner is 3.2513.

According to Table 8 in clause 7 of the Scheme, the single package type room air conditioner is rated as a **Grade 1** room air conditioner for cooling.

Example for Calculating the Energy Efficiency Grade for Room Air Conditioner

(Cooling - Variable Capacity Split Type)

Step (1)

Rated cooling full capacity	6.000 kW
Rated cooling full power input	1.850 kW
Rated cooling half capacity	3.000 kW
Rated cooling half power input	0.650 kW

Measured cooling full capacity at 35℃, $\boldsymbol{\Phi_{ful}(35)}$	5.899 kW
Measured cooling full power input at 35℃, $\boldsymbol{P_{ful}(35)}$	1.855 kW
Measured cooling half capacity at 35℃, $\boldsymbol{\Phi_{haf}(35)}$	3.086 kW
Measured cooling half power input at 35℃, $\boldsymbol{P_{haf}(35)}$	0.663 kW

Step (2)

Calculated cooling full capacity at 29℃, $\boldsymbol{\Phi_{ful}(29)}$ $=1.077 \times \Phi_{ful}(35)$	6.353 kW
Calculated cooling full power input at 29℃, $\boldsymbol{P_{ful}(29)}$ $=0.914 \times P_{ful}(35)$	1.695 kW
Calculated cooling half capacity at 29℃, $\boldsymbol{\Phi_{haf}(29)}$ $=1.077 \times \Phi_{haf}(35)$	3.324 kW
Calculated cooling half power input at 29℃, $\boldsymbol{P_{haf}(29)}$ $=0.914 \times P_{haf}(35)$	0.606 kW

The defined cooling load is assumed linearly changing depending on the change in outdoor temperature as shown below:

Parameter	Load zero (0)	Load 100%
Cooling load (W)	0	6000
Outdoor Temperature (°C)	23	35

Degradation Coefficient, C_D = 0.25

Calculated outdoor temperature when cooling load is equal to cooling half capacity, $\boldsymbol{t_c}$ $=\frac{6\Phi_{ful}(35)\times 23+6\Phi_{haf}(35)\times(35-23)+0.077\times 35\Phi_{haf}(35)\times(35-23)}{6\Phi_{ful}(35)+0.077\Phi_{haf}(35)\times(35-23)}$	29.7℃
Outdoor temperature when cooling load is equal to cooling full capacity, $\boldsymbol{t_b}$	*35℃

*In the calculation, $\boldsymbol{t_b}$ would be set as 35℃

Step (3)

Bin no. j	Outdoor temp. (℃)	*Ref. Bin hours, n_j	$\Phi_{ful}(t_j)$ (kW)	$P_{ful}(t_j)$ (kW)	$L_c(t_j)$ (kW)	Cooling load at t_j (kWh)	Energy consumption at t_j (kWh)
1	24	67	6.7317	1.5625	0.5	33.5000	6.7632
2	25	117	6.6560	1.5891	1	117.0000	23.2227
3	26	147	6.5803	1.6157	1.5	220.5000	43.0640
4	27	177	6.5046	1.6423	2	354.0000	68.0803
5	28	210	6.4289	1.6689	2.5	525.0000	99.4947
6	29	183	6.3532	1.6955	3	549.0000	102.5943
7	30	114	6.2775	1.7221	3.5	399.0000	75.9067
8	31	75	6.2018	1.7486	4	300.0000	61.9685
9	32	56	6.1261	1.7752	4.5	252.0000	56.9377
10	33	33	6.0504	1.8018	5	165.0000	41.1408
11	34	15	5.9747	1.8284	5.5	82.5000	22.9464
12	35	5	5.8990	1.8550	6	29.4950	9.2750
13	36	1	5.8233	1.8816	6.5	5.8233	1.8816
					Σ	L_{CST} =3032.8183	C_{CSE} =613.2760
					CSPF	4.9453	

For details of the abbreviations and formulae, please refer to ISO 16358-1:2013.

Step (4)

The cooling seasonal performance factor (CSPF), F_{CSP}, of the room air conditioner is 4.9453.

According to Table 8 in clause 7 of the Scheme, the split type room air conditioner is rated as a **Grade 1** room air conditioner for cooling.

Example for Calculating the Energy Efficiency Grade for Room Air Conditioner

(Heating - Fixed Capacity Single Package Type)

Step (1)

Rated heating capacity at 7℃, $\Phi_{ful}(7)$	6.000 kW
Rated power input at 7℃, $P_{ful}(7)$	1.500 kW
Measured heating capacity at 7℃, $\Phi_{ful}(7)$	6.200 kW
Measured power input at 7℃, $P_{ful}(7)$	1.400 kW

Step (2)

Calculated heating capacity at 0℃, $\Phi_{ful}(0)$ = $0.82 \times \Phi_{ful}(7)$	5.084 kW
Calculated heating power input at 0℃, $P_{ful}(0)$ = $0.91 \times P_{ful}(7)$	1.274 kW

The defined heating load is assumed linearly changing depending on the change in outdoor temperature as shown below:

Parameter	Load zero (0)	Load 100%
Heating load (kW)	0	5.084
Outdoor Temperature (°C)	17	0

Degradation Coefficient, C_D = 0.25

Step (3)

A	B	C	D	E	F	G	H	I	J	K
Bin no. j	Out-door temp	Ref. bin hours	$\Phi_{ful}(t_j)$	$P_{ful}(t_j)$	$L_h(t_j)$	$X(t_j)$	$F_{PL}(t_j)$	$P_{RH}(t_j)$	$L_{HST}(t_j)$	$C_{HSE}(t_j)$
1	0	0	5.084000	1.274	5.084	1.000	1.00000000	0.450	0.000	0.000
2	1	0	5.2434286	1.292	4.785	1.000	1.00000000	0.056	0.000	0.000
3	2	0	5.4028571	1.310	4.486	1.000	1.00000000	0.000	0.000	0.000
4	3	0	5.5622857	1.328	4.187	1.000	1.00000000	0.000	0.000	0.000
5	4	0	5.7217143	1.346	3.888	1.000	1.00000000	0.000	0.000	0.000
6	5	0	5.8811429	1.364	3.589	1.000	1.00000000	0.000	0.000	0.000
7	6	1	6.0405714	1.382	3.290	1.000	1.00000000	0.000	3.29	0.849
8	7	3	6.200000	1.400	2.991	0.969	0.99227060	0.000	8.972	2.327
9	8	5	6.3594286	1.418	2.692	0.850	0.96257726	0.000	13.458	3.506
10	9	9	6.5188571	1.436	2.392	0.737	0.93433632	0.000	21.532	5.635
11	10	12	6.6782857	1.454	2.093	0.630	0.90744376	0.000	25.121	6.603
12	11	16	6.8377143	1.472	1.794	0.527	0.88180525	0.000	28.71	7.578
13	12	20	6.9971429	1.490	1.495	0.429	0.85733507	0.000	29.906	7.926
14	13	24	7.1565714	1.508	1.196	0.336	0.83395516	0.000	28.71	7.640
15	14	31	7.3160000	1.526	0.897	0.246	0.81159422	0.000	27.812	7.431
16	15	36	7.4754286	1.544	0.598	0.161	0.79018707	0.000	21.532	5.776
17	16	40	7.6348571	1.562	0.299	0.079	0.76967395	0.000	11.962	3.221
18	17	43	7.7942857	1.580	0.000	0.000	0.75000000	0.000	0.000	0.000
		240						Σ	221	58.493
								HSPF	3.7783	

For details of the abbreviations and formulae, please refer to ISO 16358-2:2013.

Step (4)

The heating seasonal performance factor (HSPF), F_{HSP}, of the reverse cycle type room air conditioner is 3.7783

According to Table 9 in clause 7 of the Scheme, the single package type room air conditioner is rated as a **Grade 1** room air conditioner for heating.

Example for Calculating the Energy Efficiency Grade for Room Air Conditioner

(Heating - Variable Capacity Split Type)

Step (1)

Rated heating full capacity at 7℃, $\Phi_{ful}(7)$	6.400kW
Rated heating full power input at 7℃, $P_{ful}(7)$	1.600 kW
Rated heating half capacity at 7℃, $\Phi_{haf}(7)$	3.100 kW
Rated heating half power input at 7℃, $P_{haf}(7)$	0.600kW
Measured heating full capacity at 7℃, $\Phi_{ful}(7)$	6.200kW
Measured heating full power input at 7℃, $P_{ful}(7)$	1.500 kW
Measured heating half capacity at 7℃, $\Phi_{haf}(7)$	3.086 kW
Measured heating half power input at 7℃, $P_{haf}(7)$	0.590 kW

Step (2)

Calculated heating full capacity at 0℃ =0.82 x $\Phi_{ful}(7)$	5.084kW
Calculated heating full power input at 0℃ =0.91 x $P_{ful}(7)$	1.365 kW

The defined heating load is assumed linearly changing depending on the change in outdoor temperature as shown below:

Parameter	Load zero (0)	Load 100%
Heating load (kW)	0	5.084
Outdoor Temperature (°C)	17	0

Degradation Coefficient, C_D = 0.25

Step (3)

A	B	C	D	E	F	G	H	I	J	K
Bin no. j	Outdoor temp	Ref. bin hours	$\Phi_{ful}(t_j)$	$P_{ful}(t_j)$	$L_h(t_j)$	$X(t_j)$	$F_{PL}(t_j)$	$P_{RH}(t_j)$	$L_{HST}(t_j)$	$C_{HSE}(t_j)$
1	0	0	5.084000	1.365	5.084	1.000	1.00000000	0.000	0.000	0.000
2	1	0	5.2434286	1.384	4.7	0.913	0.97813990	0.000	0.000	0.000
3	2	0	5.4028571	1.404	4.486	0.958	0.95756991	0.000	0.000	0.000
4	3	0	5.5622857	1.423	4.187	0.938	0.93817909	0.000	0.000	0.000
5	4	0	5.7217143	1.442	3.888	0.920	0.91986888	0.000	0.000	0.000
6	5	0	5.8811429	1.461	3.589	0.903	0.9255138	0.000	0.000	0.000
7	6	1	6.0405714	1.481	3.290	0.886	0.88614801	0.000	3.29	0.652
8	7	3	6.200000	1.500	2.991	0.871	0.87058824	0.000	8.972	1.729
9	8	5	6.3594286	1.519	2.692	0.856	0.85580862	0.000	13.458	2.639
10	9	9	6.5188571	1.539	2.392	0.842	0.84175192	0.000	21.532	4.298
11	10	12	6.6782857	1.558	2.093	0.828	0.82836636	0.000	25.121	50103
12	11	16	6.8377143	1.577	1.794	0.816	0.81560500	0.000	28.71	5.934
13	12	20	6.9971429	1.596	1.495	0.803	0.80342517	0.000	29.906	6.289
14	13	24	7.1565714	1.616	1.196	0.792	0.79178800	0.000	28.71	6.142
15	14	31	7.3160000	1.635	0.897	0.781	0.78065803	0.000	27.812	6.052
16	15	36	7.4754286	1.654	0.598	0.770	0.77000279	0.000	21.532	4.765
17	16	40	7.6348571	1.674	0.299	0.760	0.75979255	0.000	11.962	2.692
18	17	43	7.7942857	1.693	0.000	0.750	0.75000000	0.000	0.000	0.000
		240						Σ	221	46.296
								HSPF	4.7737	

For details of the abbreviations and formulae, please refer to ISO 16358-2:2013.

Step (4)

The heating seasonal performance factor (HSPF), F_{HSP}, of the reverse cycle type room air conditioner is 4.7737.

According to Table 9 in clause 7 of the Scheme, the split type room air conditioner is rated as a **Grade 1** room air conditioner for heating.