

**REGULATION ON ENERGY LABELLING AND MINIMUM
ENERGY PERFORMANCE REQUIREMENTS
FOR AIR-CONDITIONERS**

Introduction

This regulation is based on the Saudi standard No. 2663:2012 & 2663:2014 "Energy Labeling and Minimum Energy Performance Requirements for Air – Conditioners", with slight modifications to meet National needs.

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REGULATION ON ENERGY LABELLING AND MINIMUM ENERGY PERFORMANCE REQUIREMENTS FOR AIR-CONDITIONERS

1. SCOPE AND OBJECTIVE

1.1 Scope

This regulation specifies the energy labelling requirements and the Minimum Energy Performance Standard (MEPS) requirements for single-package (such as window type) and split-system non-ducted air conditioners using air- and water-cooled condensers and heat pumps employing air-cooled condensers and ducted air-conditioners using air-to-air heat pumps for residential, commercial and industrial sector as applicable in accordance with Bahrain standards.

1.2 Objective

The objective of this regulation is to:

- a) Provide detailed information on the performance and energy labeling requirements which an air-conditioning appliance has to meet in order to carry a valid energy efficiency label; and
- b) Provide detailed information on the performance requirements which an air-conditioning appliance has to meet in order to meet minimum energy performance standard requirements.

2. NORMATIVE REFERENCES

Updated editions of the following normative references are applied (Including any changes on these normative references).

- 2.1 GSO ISO 5151 “Non-ducted air conditioners and heat Pumps -Testing and rating for Performance”.
- 2.2 GSO ISO 13253 “Ducted air-conditioners and air-to-air heat Pumps - Testing and rating for Performance”.

3. TERMS AND DEFINITIONS

For the purposes of this regulation, the terms and definitions given in standards mentioned in sub-clauses 2.1 and 2.2 and those below are considered.

3.1 Ducted air conditioners

An air conditioner model configuration where the indoor side is situated remote to the space to the conditioned. The conditioned air is supplied or extracted via a duct.

3.2 Non-ducted air conditioner

An air conditioner model configuration where the indoor side is situated partly or wholly within the space to be conditioned. The conditioned air is supplied and extracted directly to and from the conditioned space.

3.3 Rated capacity

The nominal rated capacity claimed by the manufacturer of an air conditioner model determined as follows, as applicable:

- (a) Rated total cooling capacity as claimed by the manufacturer for temperature condition T1 and T3. (Units: Btu/h).
- (b) Rated heating capacity as claimed by the manufacturer for indicated heating capacity test conditions specified in the normative references in clause (2). (Units Btu/h).

The rated capacity appears on the energy label as ‘Capacity Output’ (heating and/or cooling as applicable). (Units: Btu/h).

3.4 Rated power

Effective power input of the air conditioner model as claimed by the manufacturer during the determination of rated cooling capacity and rated heating capacity, as applicable. (Units: W or kW.)

3.5 Split system

An air conditioner with separate indoor and outdoor components that are connected with refrigerant piping. The indoor unit usually lies within the conditioned space and may be installed or portable/mobile.

3.6 Star rating

The number of stars displayed on the energy label. Available stars are between a minimum of one and a maximum of six. It is considered as an indication of the claimed energy efficiency of a model at rated conditions. A higher star rating indicates a higher energy efficiency. It is derived from the measured EER .

3.7 Estimated annual energy consumption

Estimated annual energy consumption at rated power will be kWh consumed in 2700 hours at full load.

4. REGISTRATION REQUIREMENTS

4.1 The registration requirement and information about energy labeling and MEPS will be available at Electricity & Water Authority (EWA).

4.2 For registration of an air conditioner for energy labeling and MEPS with a test report in accordance with recent edition of GSO ISO 1515 or GSO ISO 13253, as applicable. An application shall be provided for each model, in accordance with Appendix A, and submitted to the Electricity & Water Conservation Directorate, Electricity & Water Authority, and (EWA).

4.3 Energy Label Validity (Check Testing)

The energy label shall be accepted as valid when a single sample of an appliance or unit model, tested for an initial screening test, meets the following criteria for cooling and heating, as applicable:

- a) Tested effective power input ≤ 1.05 x rated power.
- b) Tested cooling and heating capacity ≥ 0.95 x rated capacity.
- c) Tested EER ≥ 0.95 x rated EER.
- d) Tested COP ≥ 0.95 x rated COP.
- e) Tested voltage230 volt single phase or 400 volt three phase.
- f) Tested frequency 50 Hz.
- g) Testing conditions (T1).... (Refer to the standards mentioned in clause 2).

5. MEPS

The minimum energy performance standard MEPS value for the air conditioner in the scope of this regulation shall be greater than or equal to the value of Energy Efficiency Ratio (EER), when calculating the cooling capacity at test conditions (T1) and test condition (T3) as follows:

Air Conditioner appliance type	Cooling Capacity limit (CC) (Btu/h) At test condition (T1)	(EER) Value (Btu/h)/watt To be applied mandatory starting from the beginning of July 2016		(EER) Value (Btu/h)/watt To be applied mandatory starting from the beginning of July 2017	
		T1	T3	T1	T3
Window Type	18000 > CC	8.5	6.12	9.8	7.06
	18000 \leq CC < 24000	8.5	6.12	9.7	6.98
	CC \geq 24000	8.5	6.12	8.5	6.12
Split Type and the other types	All Capacities	9.5	6.84	11.5	8.28

6. NAME PLATE AND INSTRUCTION SHEET OR MANUAL

In addition to any information needed to be displayed on the air-conditioner unit, the following information shall be marked on the name plate of the air-conditioner, in Arabic or English or both. The marking shall not be on a detachable part of the unit and shall be indelible, durable and easily legible.

Any energy / performance related information that is attached or displayed on any part of the air-conditioner unit or packaging must be justified and free from misstatements and according to the normative reference standards mentioned in the clause (2).

6.1 The information on the name plate shall include at minimum, the following:

- Manufacturer's name and/or trademark.
- Country of origin.
- Manufacturer's model or type reference and serial number of the unit.
- Rated voltage or rated voltage range (Volts).
- Rated frequency (Hz).
- Rated current in Amperes.
- Rated power input in watts or kilowatts.
- Net total room cooling capacity in Btu/h.
- Energy Efficiency Ratio (EER) in (BTU/h)/Watt.
- Heating capacity in W (Applicable to heating units only).
- Coefficient of Performance (COP) (watt/watt). (Applicable to heating units only).
- Refrigerant used and mass of refrigerant charge in kg.

6.2 An instruction sheet or manual in both Arabic and English shall be delivered with each air-conditioner, including the following information:

- The information specified in clause 6.1.
- Dimensions of the unit and its method of mounting.
- Minimum clearances between the various parts of the unit and the surrounding framework.

- Instructions necessary for the correct operation of the unit and any special precautions to be observed to ensure its safe use and maintenance.
- Instruction for packing and unpacking the unit.
- Weight of the unit.
- Any other additional information.
- Annual energy consumption as stated in clause 3.7.

7. ENERGY RATING CLASSIFICATION

- 7.1 The energy efficiency class rating is used for the comparative label used with window type and split type air-cooled air-conditioner with cooling capacity less than and including 70000 Btu/h (20000 W).
- 7.2 The energy efficiency class is then determined in accordance with the following table, where the EER (energy efficiency ratio) is determined in accordance with the test procedures of the harmonized regulation referred to in clause 2 at condition T₁.

EER limits (Btu/h)/w at T₁	Star Rating
EER > 10	6
10 ≥ EER > 9.5	5
9.5 ≥ EER > 9	4
9 ≥ EER ≥ 8.5	3
8.5 > EER > 7.5	2
EER ≤ 7.5	1

8. ENERGY LABELLING REQUIREMENTS

8.1 Information and Values Contained in the Energy Labels

The required fonts are “Simplified Arabic” for Arabic and “Times New Roman” for English as illustrated in the Figures 2 and 3. The fields (a), (b), (c), (d) of Figure 1 shall comply with the following requirements:

- (a) *Field a* This band shall terminate according to the appliance’s star rating for a rating of only full stars, bisecting the gap between the relevant star and the next higher on the scale.

- (b) *Field b* The brand and the model designation shall be inserted here. The wording should be complete and concise. They should have normal spacing of letter, line and word in the specified area. In the case of split systems, where the indoor and outdoor components have different model numbers, model numbers for both shall appear on the label.
- (c) *Field c* This band shall include the total rated cooling capacity (output capacity) and the annual energy consumption.
- (d) *Field d* This area shall contain the rated total heating capacity (if applicable), and the power input for heating. The Figures that apply to the particular appliance shall be of the font indicated and shall be centered in the red area for heating.
- (e) *Field e* This band shall include the energy efficiency ratio (EER) for the appliance.

Note: The cooling capacity and power input values shown on the energy label are based on the rated cooling capacity and the rated power, as declared by the manufacturer and shown in the nameplate for condition T1 for cooling capacity in accordance with the standards mentioned in clause 2.

8.2 Sample Labels

Examples of printed energy label for air-conditioning appliances are shown in Figures 2 and 3.

8.3 Dimensions of Labels

Figure 4 shows the dimensions of label.

8.4 Placement of Energy Labels

The label shall be fixed, or attached as a tag, on the front of the unit. Additional label may be attached to the exterior of the packaging. The label shall remain on the unit when the unit is removed from its packaging for display purposes.

8.5 Material and Shape of Energy Labels

The label shall be of durable cardboard, if it is to be attached as a tag, or be self-adhesive, and shall be cut to the outline shown in Figure 1. A trim or die cut margin of up to 5 mm around the label is acceptable.

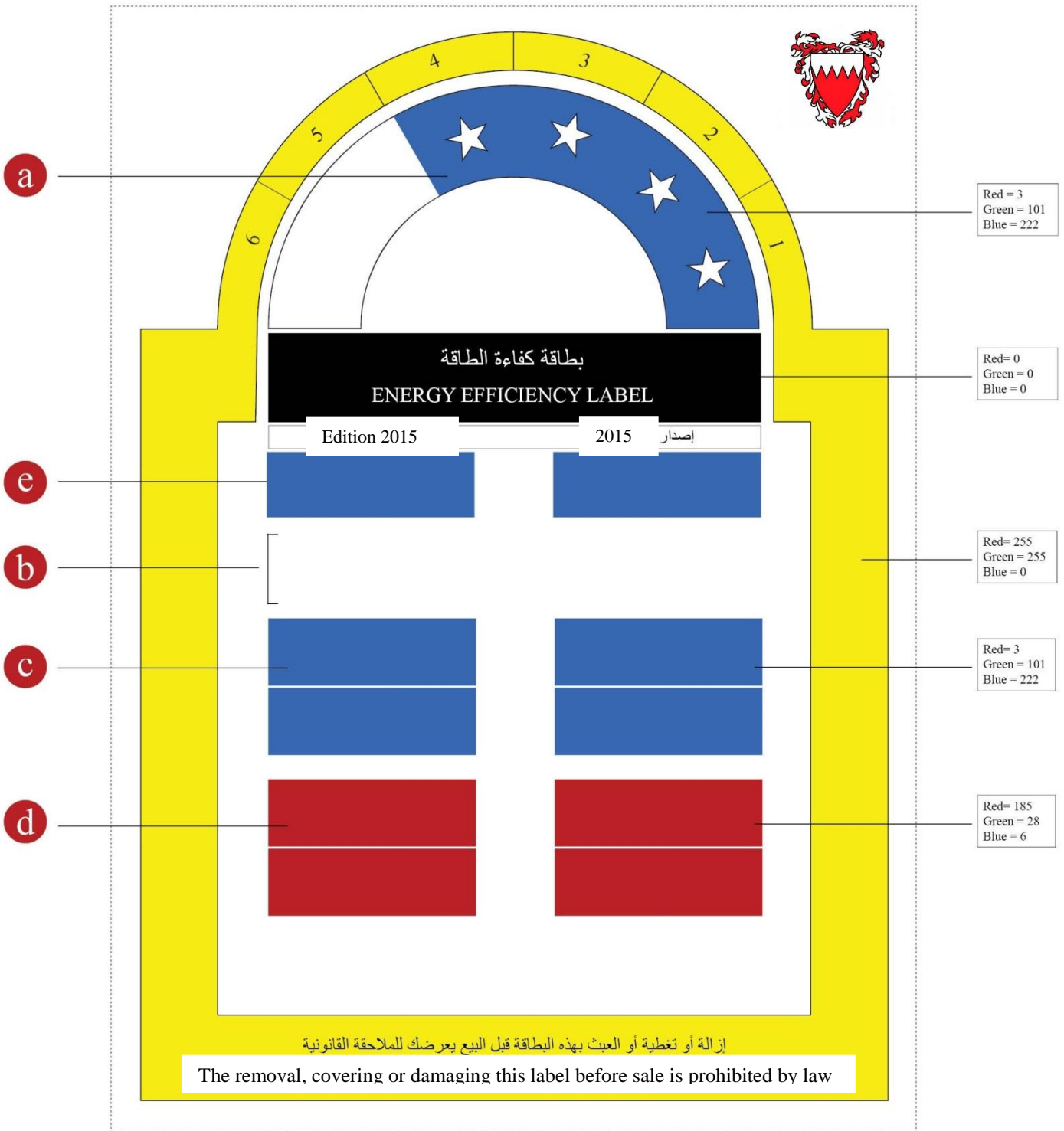




FIGURE 2: Example of label - Heating & Cooling Unit

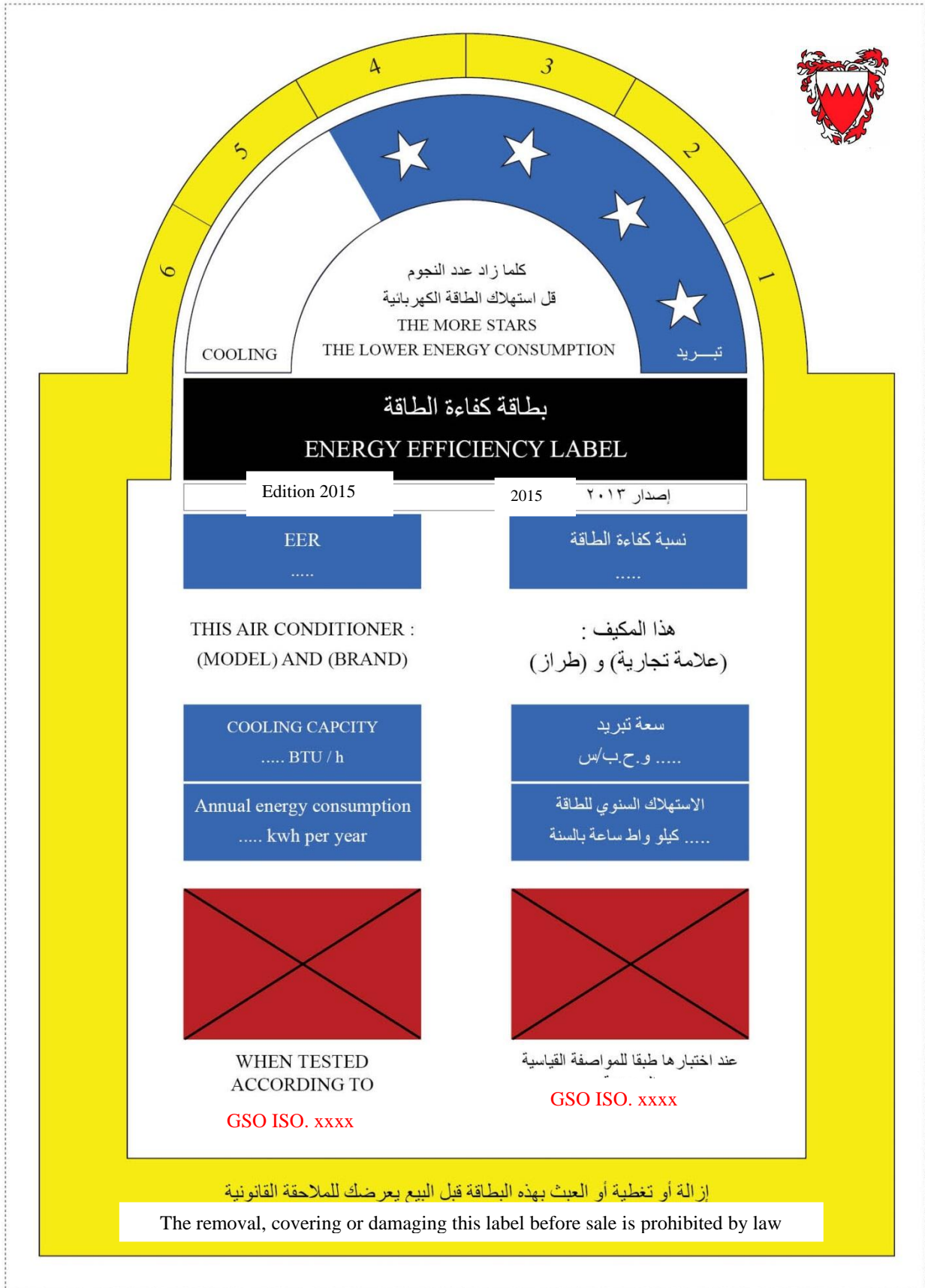
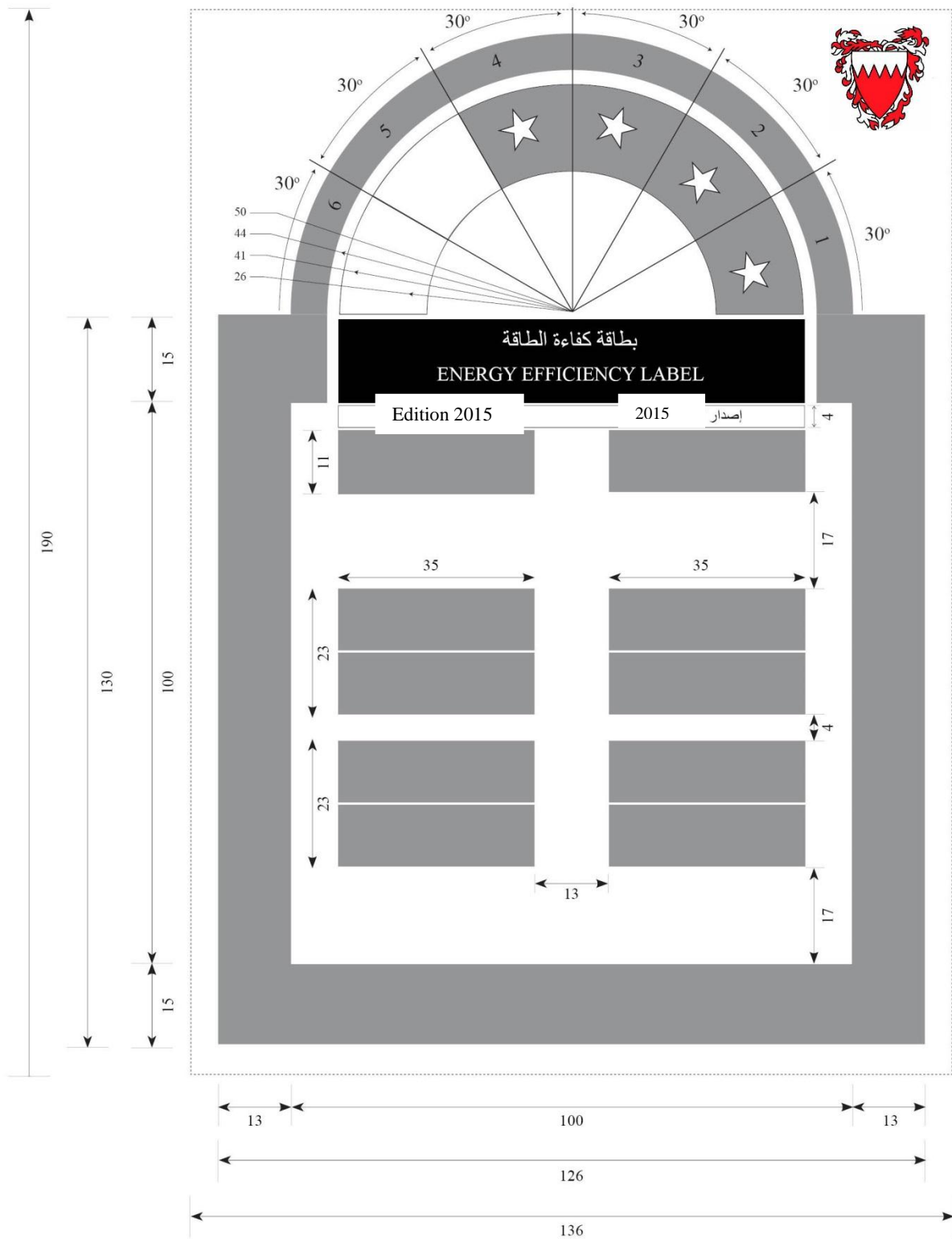


FIGURE 3: Example of Label - Cooling Only



Dimensions in Millimeters

FIGURE 4: Dimensions of Label

APPENDIX A
APPLICATION FOR REGISTRATION OF
AIR-CONDITIONERS FOR ENERGY LABELLING AND MEPS
(Please type or print)

This Appendix sets out the required format for submitting an application for registration.

Application for registration of an air-conditioner for energy efficiency.

I hereby apply for registration of an electrical appliance/s for the purpose of energy labeling.

In the Country of.....
(Specify the country in which this application is made)

PART 1 APPLICANT INFORMATION

Applicant Name :

Company Name :

Company Address :

P.O.Box : Post Code:

Contact Person: (Name and Address in Kingdom of Bahrain)

Job Title:

Phone : Fax : Electronic Mail :

Supplier or Vendor in Kingdom of Bahrain:

No.	Supplier or Vendor Name	Contact Address (Mail Address, Phone, Fax, Electronic Mail)	License Number or Commercial Licenses (related to import and sale of goods in the Kingdom.

Part 2 DESCRIPTION OF THE APPLIANCE			
Model Name <i>(if available)</i>			
Model Number or Family Number:			
Model Number: (on indoor unit for split systems)			
Model Number on Outdoor Unit: (split systems only)			
Other Model Numbers to be included under this registration:			
Country of Manufacture:			
Year in which model first available in Kingdom of Bahrain:			
Model Number(s) to appear on the Energy Label:			
Date of manufacture traceability (of package unit or indoor unit if split system): Is the date of manufacture permanently marked on the rating plate in a non-encrypted format? If yes, provide an example of the date format. If no, provide details on how to determine (from the serial number or other permanent markings for this model)	Yes Date format:	No Provide details:	
'Date of manufacture traceability (of outdoor unit if split system): Is the date of manufacture permanently marked on the rating plate in a non-encrypted format? If yes, provide an example of the date format. If no, provide details on how to be determined (from the serial number or other permanent markings for this model)	Yes Date format:	No Provide details:	
Does this model or family replace or supplement another model or family with identical energy consumption and energy efficiency rating? <i>(indicate correct answer)</i>	Yes	No	
If yes, indicate relevant details:	Model name	Model number	Registration number
Information about the components used in the manufacturing: There must be complementary documents for the materials used in the Manufacturing including	1- Compressor Country of origin:..... Name of Manufacturer or trading mark: Compressor model number: Compressor type:		

drawings and figures and technical specifications and product model accreditation (if any) for each of the components mentioned here.	2- Fan Country of origin:..... Name of Manufacturer or trading mark: Fan Model number: Fan type: 3- Heat Exchanger Volume and description of the heat exchanger:....
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Part 3 TESTING AND TEST REPORT			
Test Laboratory Type: (put (√) inside the appropriate box)	<input type="checkbox"/> Own 'in-house' laboratory: <input type="checkbox"/> Independent laboratory:		
Test Laboratory Name:			
Test Laboratory Address:			
Test Laboratory Accreditation:			
Test Standard Used:	<input type="checkbox"/> The standard mentioned in 2.1 <input type="checkbox"/> The standard mentioned in 2.2 Other— (please specify)		
Does this air conditioner have separate indoor and outdoor units	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Serial number of test units/s and date tested:	SERIAL NUMBER Unitary unit or indoor unit if split system	SERIAL NUMBER Outdoor unit if split system	Test date
Rated voltage and frequency of tested unit	Package unit	Unitary unit or indoor unit if split system	Outdoor unit if split system
	Rated voltage or Rated voltage range (V)		
	Rated frequency (Hz)		
Tested voltage and frequency of tested unit		Unitary unit or indoor unit if split system	Outdoor unit if split system
	Tested voltage (V)		
	Test frequency (Hz)		

Part 4 SPECIFIC APPLIANCE DETAILS			
Air-conditioner dimensions (Advisory only): <i>(for split systems note only dimensions of the internal unit)</i>	Width (mm):	Height (mm):	Depth (mm):
Air-conditioner type:	<input type="checkbox"/> Cooling only <input type="checkbox"/> Reverse cycle <input type="checkbox"/> Heating only <input type="checkbox"/> Other <i>(please specify)</i>		
Power supply:	<input type="checkbox"/> Single-phase <input type="checkbox"/> Three-phase		
Rated Voltage (V):			
Rated Frequency (Hz):			
Refrigerant Type:	<input type="checkbox"/> R22, <input type="checkbox"/> Other <i>(please specify)</i>		
A/C Configuration 1—Air Distribution	<input type="checkbox"/> Ducted <input type="checkbox"/> Non ducted		
A/C Configuration 2—Type	<input type="checkbox"/> Window/Wall, <input type="checkbox"/> Spot cooler, <input type="checkbox"/> Portable cooler, <input type="checkbox"/> Single split system <input type="checkbox"/> Double/triple split system, <input type="checkbox"/> Multiple split system, <input type="checkbox"/> Packaged		
Does this air-conditioner use a variable speed drive?	<input type="checkbox"/> Yes <input type="checkbox"/> No		

Part 5 TEST RESULTS		
TEST RESULTS—COOLING—CONDITION T1		
COOLING POWER	Rated Effective Power Input (kW)*	
	Tested Cooling Power Input (kW)**	
COOLING CAPACITY	Rated Total Cooling Capacity (Btu)*	
	Tested Total Cooling Capacity (Btu)**	
EER (Btu/h)/W	Rated EER **	
	Tested EER **	
The star rating according to clause 7 of this regulation.		

* To 2 decimal places

** To 3 decimal places

TEST RESULTS—COOLING—CONDITION T3		
COOLING POWER	Rated Effective Power Input (kW)*	
	Tested Cooling Power Input (kW)**	
COOLING CAPACITY	Rated Total Cooling Capacity (kW)*	
	Tested Total Cooling Capacity (kW)**	
EER (Btu/h)/W	Rated EER **	
	Tested EER **	
The class rating according to clause 7 of this regulation.		

* To 2 decimal places

** To 3 decimal places

TEST RESULTS - HEATING		
Does this model incorporate electric resistance heating?		<input type="checkbox"/> Yes <input type="checkbox"/> No
HEATING POWER	Rated Effective Power Input (kW)*	
	Tested Heating Power Input (kW)**	
HEATING CAPACITY	Rated Total Heating Capacity (kW)*	
	Tested Heating Capacity (kW)**	
COP (w/w)	Rated COP **	
	Tested COP **	

* To 2 decimal places

** To 3 decimal places

DECLARATION

I declare that the details stated above are correct.

Signature of Applicant: Date:

Office use only

Date received: Registration number: