SASO 2663 :2014

(SASO 2663/2012 including the modifications approved in Saudi Council Board No. …./2014)

ENERGY LABELLING AND MINIMUM ENERGY PERFORMANCE REQUIREMENTS FOR AIR-CONDITIONERS

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Saudi Standard No. 2663/2014

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Contents

Introduction

Saudi Standards, Metrology and Quality Organization (SASO) has modified the Saudi standard No. 2663/2012 " Energy Labeling and Minimum Energy Performance Requirements for Air-Conditioners ", by adding the national modifications that have been approved in SASO Council Board No. …./2014.

ENERGY LABELLING AND MINIMUM ENERGY PERFORMANCE REQUIREMENTS FOR AIR-CONDITIONERS

1. SCOPE AND OBJECTIVE

1.1 Scope

This standard specifies the energy labelling requirements and the Minimum Energy Performance Standard (MEPS) requirements for single-package of window type, split-system non-ducted air conditioners using air-cooled condensers, split-system ducted air-conditioners using air-cooled condensers, and heat pumps using air-cooled condensers for residential, commercial and industrial sector as applicable in accordance with SASO standards. It is applied to units designed to operate in AC single phase circuits of 220 V or 230 V, or designed for dual voltage or voltage range including these values, and three phase circuits of 380 V or 400 V with a frequency of 60 Hz. It covers units with capacities up to and including 70000 Btu/h (20 KW).

1.2 Objective

The objective of this standard is to:

a) Provide detailed information on the performance and energy labelling requirements which an airconditioning 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 SASO 2681/2007 “Non-ducted air conditioners and heat Pumps -Testing and rating for Performance”.

2.2 SASO 2682/2013 “Ducted air-conditioners and air-to-air heat Pumps - Testing and rating for Performance”.

2.3 Latest available version of SASO 2763 " Safety and Performance requirements for Room Air-Conditioners and their Methods of test.”.

3. TERMS AND DEFINITIONS

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

3.1 Ducted airconditioners

An airconditioner 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 airconditioner

An airconditioner 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 airconditioner 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 temperature condition H1. (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 airconditioner 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 airconditioner 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 ten. 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 tested EER .

3.7 Estimated annual energy consumption

Rated power expected within 2700 working hour with a full load annually.

4. REGISTRATION REQUIREMENTS

4.1 The information about registration requirement for energy labelling and MEPS will be available in information center of Saudi Standards, Metrology and Quality Organization (SASO).

4.2 For registration of an airconditioner for energy labelling and MEPS with a test report in accordance with recent edition of SASO 2681/2007 or SASO 2682/2013 , as applicable. An application shall be provided for each model, in accordance with Appendix A, and submitted to the registration body .

Application should be submitted through the registration system electronically via SASO website (www.saso.gov.sa). The applicant should fulfill all updated requirements of the electronic registration system and any new requirements, procedures, and regulations required by SASO.

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) Test voltage .....Refer to SASO 2681/2007 and SAS 2682/2013.
Note:
- The test voltage on dual-rated voltage equipment shall be performed at both voltages, or at the lower of the two voltages if only a single rating is published.
- For voltage range appliances (ex: 220-240V), the tested voltage shall be the average value (i.e. 230V).
f) Tested frequency ……. 60 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 standard shall be greater than or equal to the value of Energy Effeicency Ratio (EER), When calculating the cooling capacity at test conditions (T1) and test condition (T3) as follows:

Air conditioner appliance type	Rated Cooling Capacity (CC) (Btu/h) at test condition (T1)	(EER) Value (Btu/h)/watt To be applied mandatory starting from the beginning of DHUAL-QADAH' 1434H		(EER) Value (Btu/h)/watt To be applied mandatory starting from the beginning of RABI'II 1436 H	
		T1	T3	T1	T3
Single package of Window type	18000 ≥ CC	8.5	6.12	9.8	7.06
	18000 < CC ≤ 24000	8.5	6.12	9.7	6.98
	24000 < CC ≤ 70000	8.5	6.12	8.5	6.12
Split type ducted and non-ducted using air-cooled condensers, heat pumps using air cooled condensers	CC ≤ 70000	9.5	6.84	11.5	8.28

A review of the MEPS will, in principle, take place every 3 to 5 years to ensure alignment with international standards.

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 information related energy performance added showed in any part of the air-conditioner unit or packaging shall not have any ambiguity or lead to miss understand of the performance of the unit.

6.1 The information on the name plate in Arabic or English or both shall include at least:

- 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).
- For each of cooling test conditions T1 and T3 according to the standard stated in clauses 2.1 and 2.2, as applicable:
  - Rated current in Amperes.
  - Rated power input in watts or kilowatts.
  - Net total room cooling capacity in Btu/h (and any units of kW or Kcal/h) when tested according to conditions stated in clauses 2.1

and 2.2.

- Rated Energy Efficiency Ratio (EER) in (Btu/hr)/Watt.

– For heating test conditions according to the standard stated in clauses 2.1 and 2.2, as applicable.

- Current rating (Amperes).
- Input power rating (watts or kilowatts).
- Heating capacity in W when tested according to conditions stated in clauses 2.1 and 2.2, as applicable.
- Coefficient of Performance (COP) (watt/watt).

– 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 for calculating the expected rated power within 2700 working hour with full load annually.

7. ENERGY RATING CLASSIFICATION

7.1 The energy efficiency class rating is used for the comparative label for products within the scope of this standard (as defined in subclause 1.1) 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 standards referred to in Article 2 at condition T_1 ‘moderate’.

EER limits (tested value) (Btu/h)/w at T_1	Star Rating
EER ≥ 18.1	10
18.1 > EER ≥ 16.8	9.5
16.8 > EER ≥ 15.6	9
15.6 > EER ≥ 14.5	8.5
14.5 > EER ≥ 13.4	8
13.4 > EER ≥ 12.4	7.5
12.4 > EER ≥ 11.5	7
11.5 > EER ≥ 10	6
10 > EER ≥ 9.7	5
9.7 > EER ≥ 9	4
9 > EER ≥ 8.5	3
8.5 > EER > 7.5	2
EER ≤ 7.5	1

Note:

Star Rating has to be applied starting from 3 stars and above only.

8. ENERGY LABELLING REQUIREMENTS

8.1 Information and Values Contained in the Energy Labels

The font should be written "Simplified Arabic" for Arabic and "Times New Roman" for English as illustrated in the Figures 2,3 .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 highest 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 area allowed. 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, based on the rated input power at T1condition.

(d) *Field d* This panel shall contain the rated total heating capacity (if any), 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 panel for heating.

(e) *Field* e This band shall include the tested value of energy efficiency ratio (EER) for the appliance.

(f) *Field f* This band shall include the issue date of the label, and application registration number.

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 as well as shown in the nameplate for condition T1 for cooling capacity in accordance with the standard mentioned in clause 2.1 and 2.2.

8.2 Sample Labels

Example of printed energy label for air-conditioning appliances are shown in Figures 1 to 4.

8.3 Dimensions of Labels

Figure 6 shows the dimensions of label.

8.4 Placement of Energy Labels

The label shall be adhered, or attached as a swing tag, on the front of the unit. Additional label may be attached to the exterior of the packaging. The label shall be existed 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 swing tag, or be self-adhesive, and shall be cut to the outline shown in Figure 5. A trim or die cut margin of up to 5 mm around the label is acceptable.

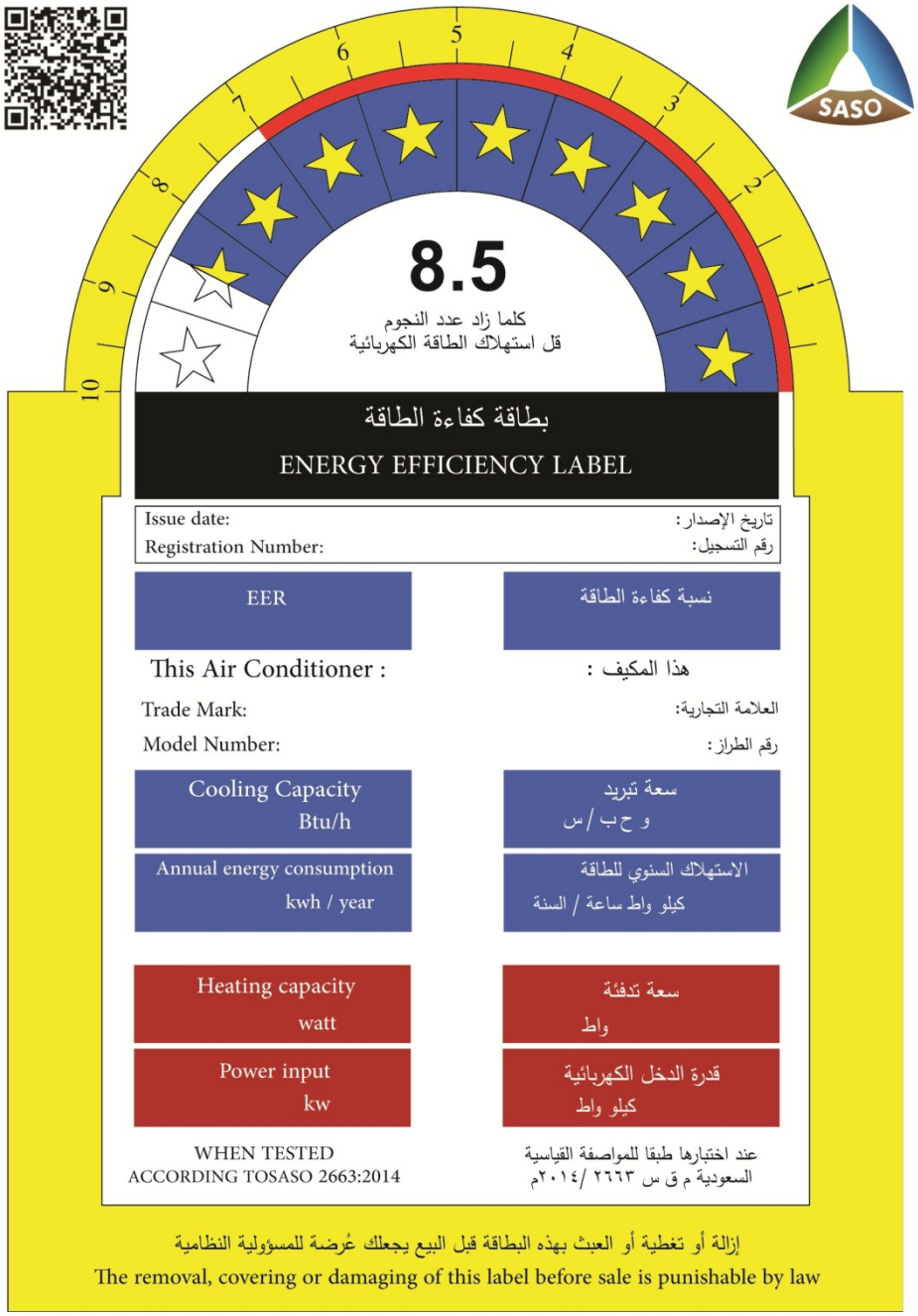

Figure 1

Example of an 8.5 Star energy efficiency label for a split type (CC≤70000 BTU/hr) air-conditioner – Heating and cooling

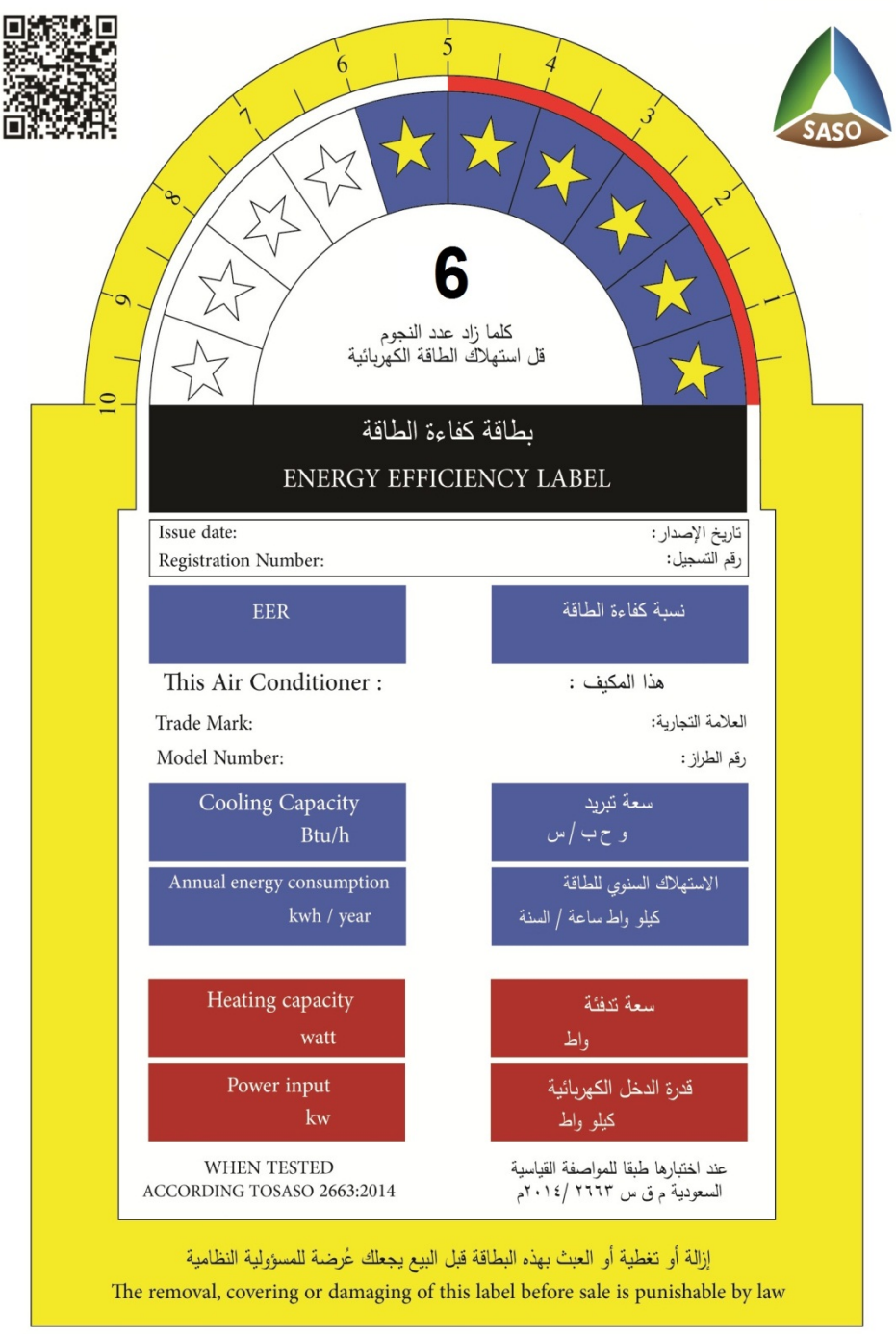

Figure 2

Example of a 6 Star energy efficiency label for a single package of window type air-conditioner(CC≤24000 BTU/hr) – Heating and cooling

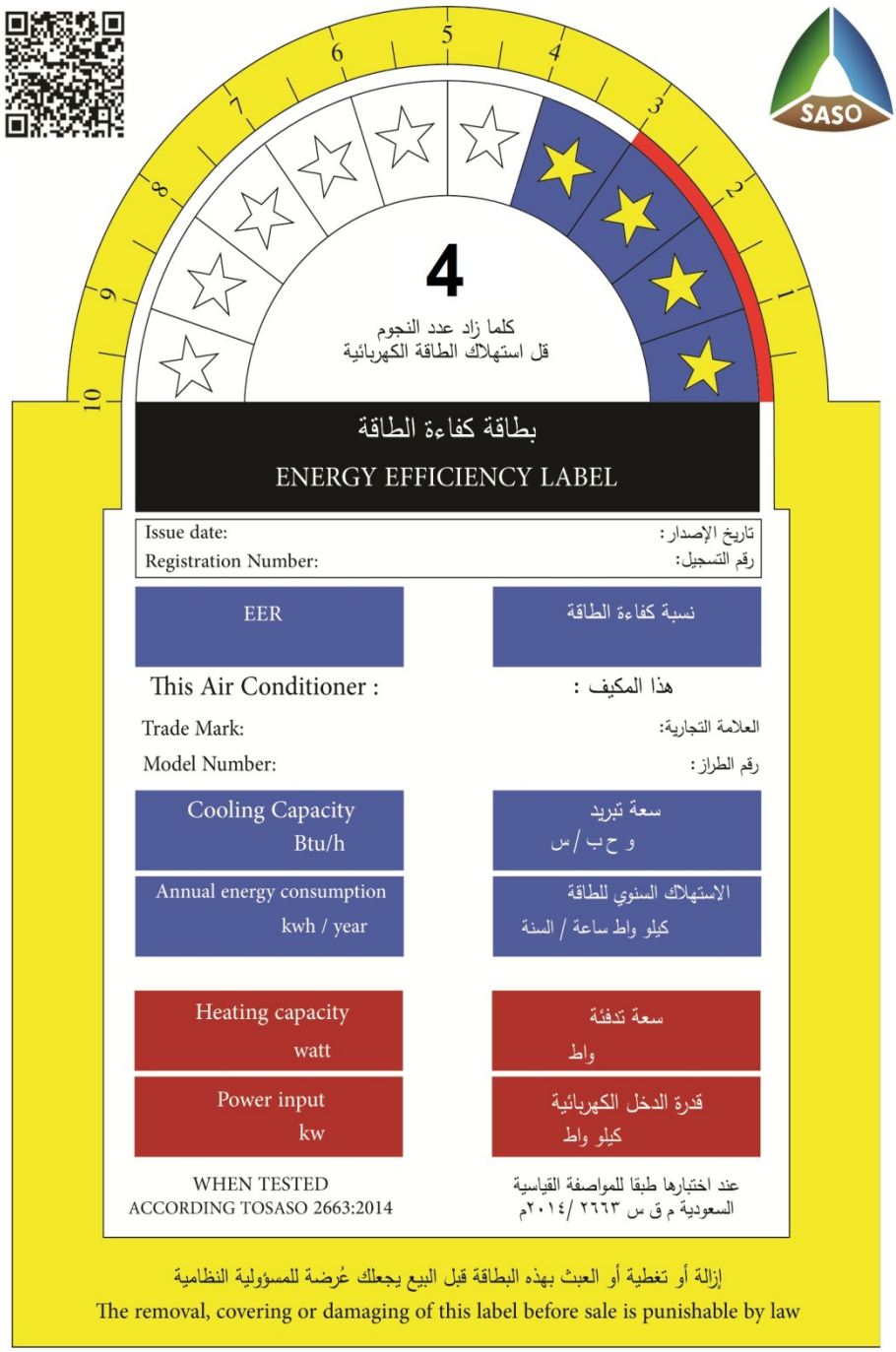

Figure 3

Example of a 4 Star energy efficiency label for a single package of window type air-conditioner (24000< CC ≤70000 BTU/hr) – Heating and cooling

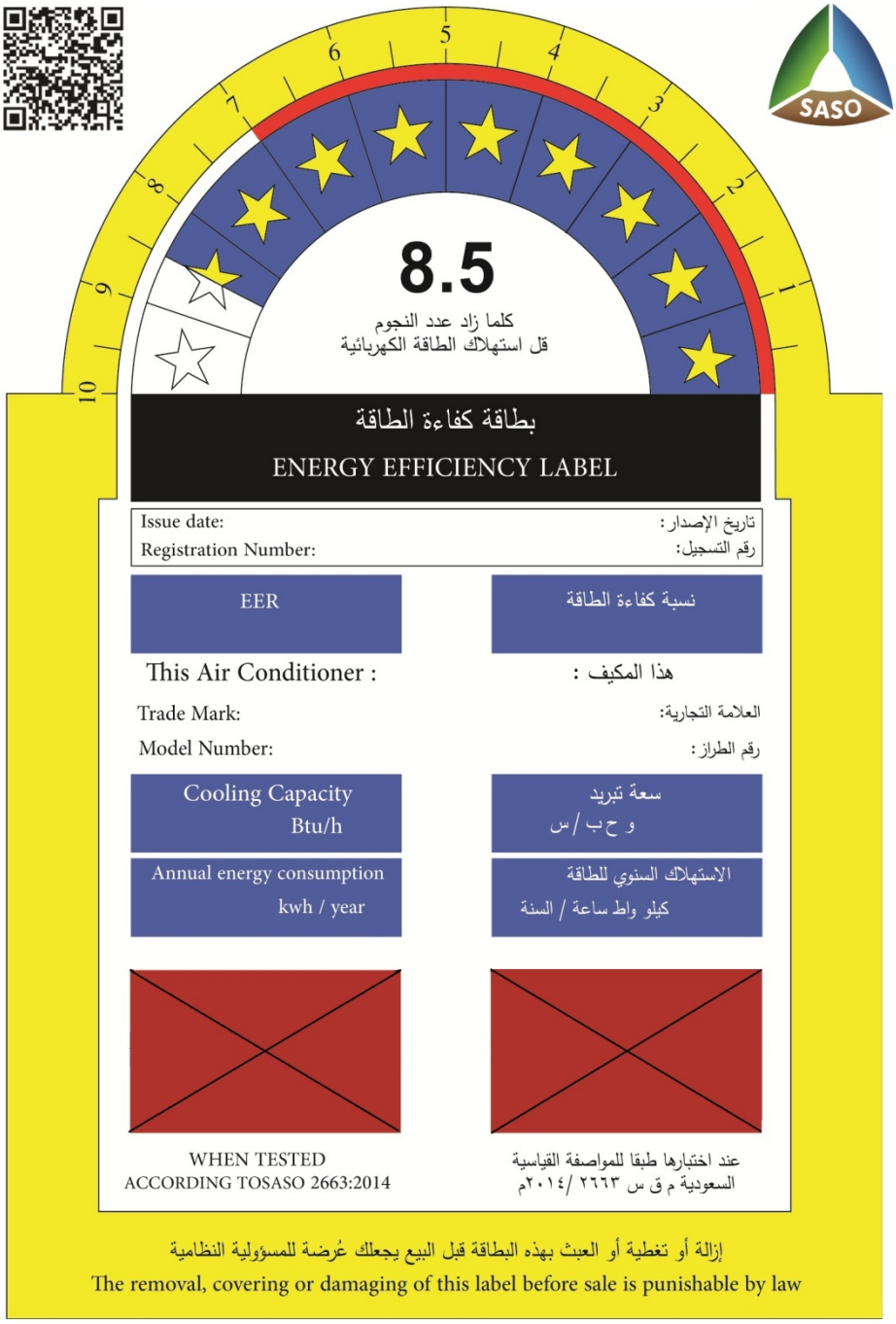

Figure 4

Example of an 8.5 Star energy efficiency label for a split type (CC≤70000 BTU/hr) air-conditioner – Cooling only

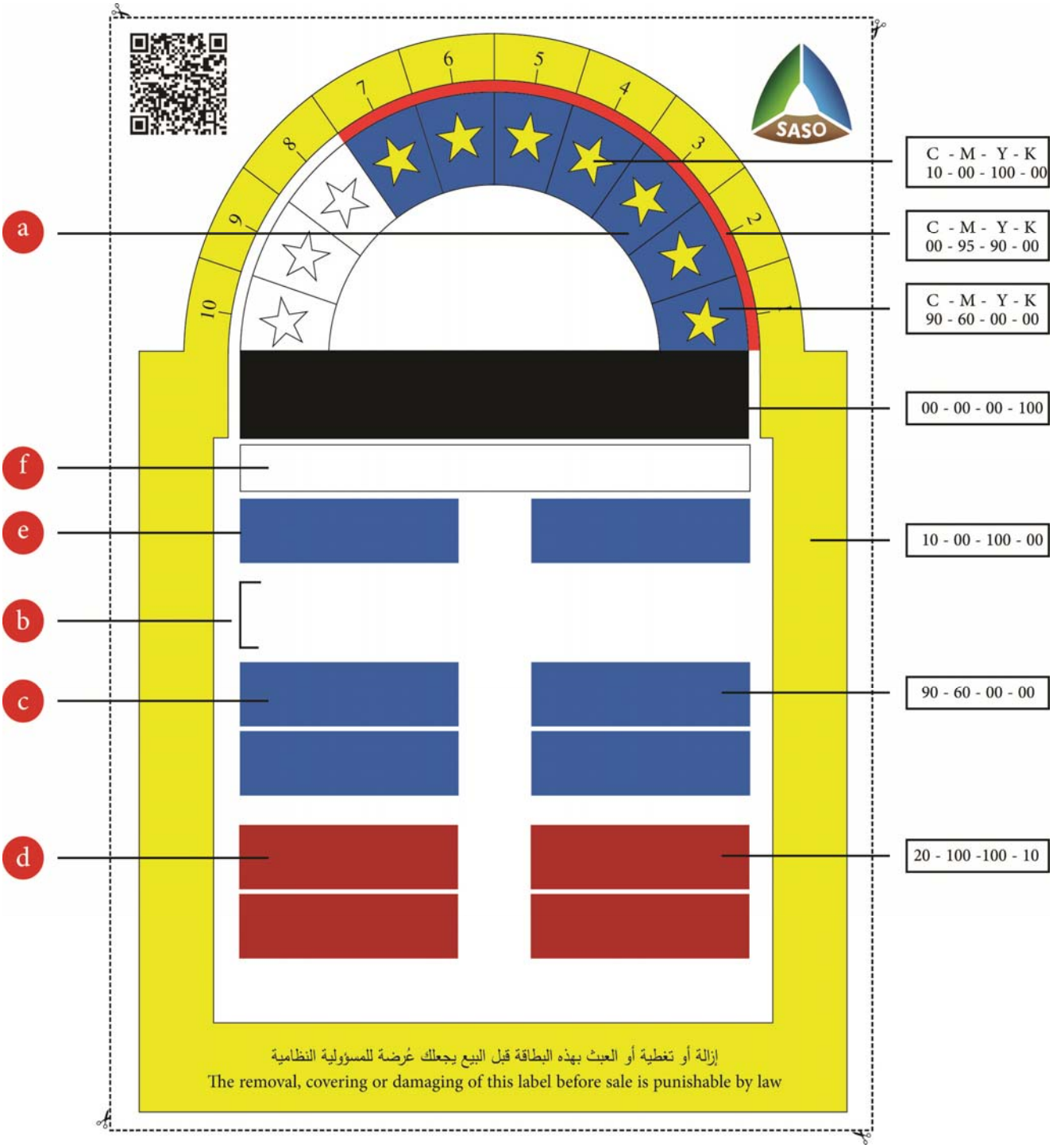

Figure 5

Information and value fields of the energy efficiency label
(Stars represented in this figure are indicative and only to show the color scheme)

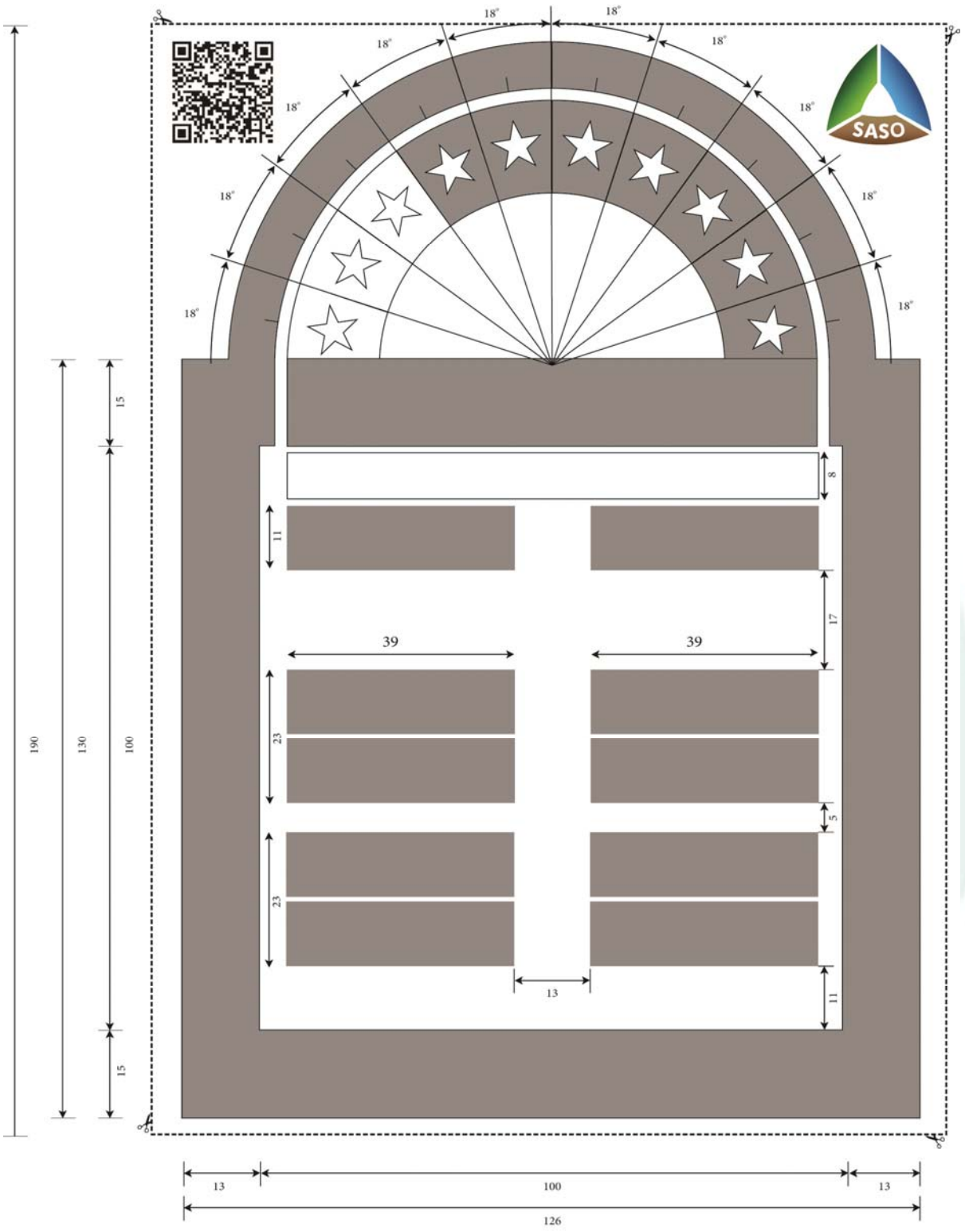

Figure 6

Dimensions in millimeters of the energy efficiency 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 labelling.

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 Adrees and workplace in each sales country)

Jop Title : ……

Phone : …… Fax : ……. Electronic Mail : .....

Supplier or Vendor in Kingdom of Saudi Arabia :

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 *(if available)*			
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:	Saudi Arabia Other-please specify		
Year in which model first available in Saudi Arabia:			
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? *(indicate correct answer)*	Yes	No	
If yes, indicate relevant details:	Model name	Model number	Registration number
Informtion about the components used in the manfucturing:	1- Compressor Country of origin:…….. Name of Manufacturer or his trading mark: ……		

There must be submited complemantry documents for the materials used in the Manufacturing including drawings and figures and technical specifications and product model accreditation (if any) for each of the components mentioned here.	Compressor model number: …… Compressor type: …….…… 2- Fan Country of origin:…….. Name of Manufacturer or his trading mark: ……. Fan Model number: …….. Fan type: …… 3- Heat Exchanger Volume and description of the heat exchanger:….

Part 3 TESTING AND TEST REPORT			
Test Laboratory Type: (put (√) inside the appropriate box)	□ Own 'in-house' laboratory: □ Independent laboratory:		
Test Laboratory Name:			
Test Laboratory Address:			
Test Laboratory Location:	□ Saudi Arabia □ Other—*(please specify):*		
Test Laboratory Accreditation:	□ Saudi Accreditation Committee (SAC) □ Other (Accredited from a body member in (ILAC))		
Test Standard Used:	□ SASO 2681/2007 (the standard mentioned in 2.1) □ SASO 2682/2013 (the standard mentioned in 2.2) Other— (please specify)		
Does this airconditioner have separate indoor and outdoor units	□ Yes □ 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 APPLICANCE DETAILS			
Air-conditioner dimensions (Advisory only): *(for split systems note only dimensions of the internal unit)*	Width (mm):	Height (mm):	Depth (mm):
Air-conditioner type:	☐ Cooling only ☐ Reverse cycle ☐ Heating only ☐ Other *(please specify)*		
Power supply:	☐ Single-phase ☐ Three-phase		
Rated Voltage (V):			
Rated Frequencu (Hz):			
Refrigerant Number :	*Please specify:* Note: Refrigerants should comply with the mandatory requirements of the Presidency of Metrology and Environment (for example, any air-conditioners using R22 refrigerant will not be registered by SASO)		
A/C Configuration 1—Air Distribution	☐ Ducted ☐ Non ducted		
A/C Configuration 2—Type	*Please specify:*		
Does this air-conditioner use a variable speed drive (inverter) or a multi-speed compressor?	☐ Yes ☐ 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 class rating number according to clause 7 of SASO 2663/2014 (This standard)		□ Yes □ No

* 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 number according to clause 7 of SASO 2663/2014 (This standard)		□ Yes □ No

* to 2 decimal places

** to 3 decimal places

TEST RESULTS—HEATING—		
Does this model incorporate electric resistance heating?		□ Yes □ 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: .....