Revision : 1

Date : 21/08/15

Schedule – 3(A)

Room Air Conditioners

1. Scope

1.1 This Standard specifies the energy labeling requirements for single-phase split air conditioners of the vapour compression type for household/ commercial use up to a rated cooling capacity of **11 kW** and that fall within the scope of IS1391 Part 2, being manufactured, imported, or sold in India **including different type of Air conditioners up to 3 ton capacity and single phase shown in Annexure-I.**

1.2 This Standard shall be read in conjunction with IS1391 Part 2 with all amendments[1], as applicable

In particular, this voluntary scheme specifies the following:

1. Rated power (input).
2. Rated capacity (output).
3. Energy Efficiency Ratio (EER) for cooling.
4. Star rating.
5. Label validity.
6. The performance criteria for energy labeling .
7. Test report format.
8. Color scheme, Dimensions and manner of display .

Exclusions:

1. Air conditioners which are not included within the scope of IS 1391 Part 1 and Part 2, pending the development of a suitable test method.
2. Multi-split systems (i.e., those having more than one indoor unit with an independent control for each indoor unit)
3. Evaporative coolers or any other cooling systems that are not of the vapour compression type.

1.3 **Definition**

Air conditioners that are covered in this schedule are encased assembly or assemblies designed as a unit, primarily for mounting in a window, or through a wall, as a console. It is designed primarily for mounting in window, or through a wall, or as a console. It is designed primarily to provide free delivery of air conditioned air to an enclosed space, room or zone (conditioned space). It includes a prime source of refrigeration for cooling

[1] Including amendments made during May 2006 meeting of BIS committee on the subject.

and dehumidification and may also include means for ventilating or exhausting air. Where such equipment is provided in more than one assembly, the separated assemblies (split-systems) are to be designed to be used together, and the requirements of rating outlined in this schedule are based on the use of matched assemblies.

2. Schedule of tests

2.1 Method of tests

The testing code and procedure for air conditioners shall be as per IS1391 Part 2 with all amendments.

Exception to IS 1391 part 2: All tests, including the Energy Consumption and Capacity tests, shall be conducted in Balanced Ambient Calorimeters for the purpose of check and challenge testing.

2.2 Parameters to be tested

2.2.1 Energy Consumption

The Energy Consumption test of the air conditioner shall be conducted as per IS 1391 Part 2 with all amendments.

2.2.2 Cooling Capacity

The Capacity Rating test of the air conditioner shall be conducted as per IS 1391 Part 2 with all amendments.

Note : All standard ratings for equipment in which the condenser and the evaporator are two separate assemblies shall be determined with the maximum length of refrigerant tubing on each line of length specified by the manufacturer or 7.5m, whichever is shorter. Such equipment in which the interconnecting tubing is furnished as an integral part of the unit and not recommended for cutting to length should be tested with the complete length of the tubing furnished. Unless constrained by the design, at least half of the interconnecting tubing shall be exposed to the outdoor conditions. The line diameters, insulation, details of insulation, evacuation and charging shall be in accordance with the manufacturer's published recommendations.

2.3 Test Report

The results of tests shall be reported as per Annexure II – Section 4 of this Schedule.

3. Tolerance Limit

For each unit tested, the measured capacity shall be > 0.95 of the rated value

For each unit tested, the measured energy consumption shall be < 1.05 of the rated value

For each unit tested, the EER shall be > 0.95 of the tested EER

There is no tolerance for Star Rating Band, the average of products tested must be at par or better than the Label threshold

4. Rating Plan

Rating plan will be as per Annexure II – Section 2 (CALCULATIONS FOR THE ENERGY LABEL) of this schedule.

5. Sampling

The samples for the check testing will be picked up by Bureau of Energy Efficiency (BEE) or its designated agency for testing at NABL accredited independent laboratory.

Three units of each type shall be picked up for each test. The tests shall be conducted on two of the three units, the third shall be kept as an alternative in case one of the units is damaged or can not be tested properly for any other reason.

6. Qualification

Maximum Operating Conditions Test

The Maximum Operating Conditions Test shall be conducted as per IS 1391 Part 2 with all amendments.

7. Label Design, manner of display

The label design and manner of display will be as per Annexure II - Section 3 (LABEL DESIGN AND MANNER OF DISPLAY) of this schedule.

8. Fees

a) Security deposit of INR1,00,000 is required to be paid against the labeling fee for the appliances mentioned in the schedule.
b) Registration fee is payable on application for assignment of authority is Rs.1000/- (One thousand only).
c) Registration fee is payable on application for renewal of authority to affix labels is Rs. 500/- (Five hundred only).
d) Labelling fee for affixation of label on each piece of air conditioners is Rs. 30/- (Thirty only).

Annexure – I to Schedule 3(A)

Different Types of Air Conditioner – Group-2

Various Cassette Air Conditioners

Floor Standing Tower Air Conditioner

Ceiling / floor Air Conditioner

Corner AC

All above Air Conditioners up to 3 Ton capacity – Single Phase are included in Group -2

Annexure – II to Schedule 3(A)

SECTION 1

DEFINITIONS

1 Definitions

For the purposes of this schedule, the definitions given in IS 1391 Part 2 with all amendments and those below apply. The definitions below take preference over the ones in the above mentioned standards.

1.1. Star Rating

The number of stars displayed on the energy label. The available stars are between a minimum of one and a maximum of five shown in one star interval. The star rating is calculated from the Star Rating Band (refer 2.2 of this Annexure)

1.2. Star Rating Band

The Star Rating Band is a range of energy efficiency ratio (W/W) which is arrived by calculations (refer 2.2 of this annexure), and is used for determining the number of stars displayed on the energy label.

1.3. Family of models

Family of models is the range of models of one particular brand, to which a single set of test reports is applicable and where each of the models has the same relevant physical characteristics, comparative energy consumption, and energy efficiency rating and performance characteristics. The term ‘model’ is synonymous with ‘family of models’.

SECTION 2

CALCULATIONS FOR THE ENERGY LABEL

2.1 NUMBER OF TEST AND PROCESSING OF DATA

2.1.1 Number of units required

For the purpose of determining the Energy Efficiency Ratio (EER) of a model for labeling, two separate units of the nominated model shall be tested for capacity and energy consumption

2.1.2 Number of tests per unit

Each unit shall be tested with sufficient test runs to enable a valid EER to be determined for that unit. This determination shall be documented in a test report containing the test result for all test runs used to derive EER.

2.1.3 Rounding

- Unless otherwise stated, number shall be rounded and recorded to five significant figures. The values of Capacity (kW), shall be rounded and recorded to three significant figures.
- The values of Energy Consumption (W) shall be rounded of (< 0.5 to lower whole number and ≥ 0.5 to higher whole number) to the nearest whole number.
- The values of EER (W/W) shall be rounded and recorded to two significant figures.

2.2 STAR RATING

The star rating parameters **EER** shall be obtained from TABLE 2.1 / 2.2 / 2.3/2.4, depending on the year of manufacturing/import/assembling

SL. No.	Product Manufactured/Imported/Assembled	Table to be used
1	From 07 January 2010 to 31 December 2011	2.1
2	From 01 January 2012 to 31 December 2013	2.2
3	From 01 January 2014 to 31 December 2015	2.3
4	From 01 January 2016 to 31 December 2017	2.4

TABLE 2.1: Star Rating Band valid from 01 May 2011 to 31 December 2011.

	EER (W/W)	
Star Rating	**Min**	**Max**
1 Star *	2.30	2.49
2 Star **	2.50	2.69
3 Star ***	2.70	2.89
4 Star ****	2.90	3.09
5 Star *****	3.10	

TABLE 2.2: Star Rating Band valid from 01 January 2012 to 31 December 2013.

	EER (W/W)	
Star Rating	**Min**	**Max**
1 Star *	2.50	2.69
2 Star **	2.70	2.89
3 Star ***	2.90	3.09
4 Star ****	3.10	3.29
5 Star *****	3.30	

TABLE 2.3: Star Rating Band valid from 01 January 2014 to 31 December 2015.

	EER (W/W)	
Star Rating	**Min**	**Max**
1 Star *	2.70	2.89
2 Star **	2.90	3.09
3 Star ***	3.10	3.29
4 Star ****	3.30	3.49
5 Star *****	3.50	

TABLE 2.4: Star Rating Band valid from 01 January 2016 to 31 December 2017.

	EER (W/W)	
Star Rating	**Min**	**Max**
1 Star *	2.70	2.89
2 Star **	2.90	3.09
3 Star ***	3.10	3.29
4 Star ****	3.30	3.49
5 Star *****	3.50	

The above equation provides for the value of the various Star Rating Bands for a particular model. The Star Rating chosen for the model will be based on the lower and the upper limits of each Star Rating Band.

There is **no tolerance** for the Star Rating Bands. All tested products must meet the minimum threshold for each Star Rating Band. The scope for manufacturing tolerance and other variations shall be accounted for when determining the Star Rating.

SECTION 3
LABEL DESIGN AND MANNER OF DISPLAY

3.1 PLACEMENT

All air conditioners must display the label at the point of sale. The label shall be adhered, or attached as a swing tag, on the front of the unit or display front.

For units not on display, the label may be attached to the exterior of the packaging. The label may be attached to the unit when the unit is removed from its packaging or the label may be included as a part of the documentation given to the customer/user.

3.2 MATERIAL AND SHAPE

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 one of the outlines shown in Figure 3.1 as applicable

3.3 COLOURS

The label shall be printed as per the specification given in Figure 3.2

3.4 SAMPLE LABEL

An example of a printed energy label for air conditioner is shown in Figure 3.3.

The label shall display declared values for the following:

1. Appliance/Type:
2. Brand/Model Name/Number/Year of Manufacturing
3. Rated Capacity (kW)
4. Rated Power (Watts)
5. Rated EER (W/W)
6. Variable Output Compressor (Yes/No)
7. Heat Pump (Yes/No)

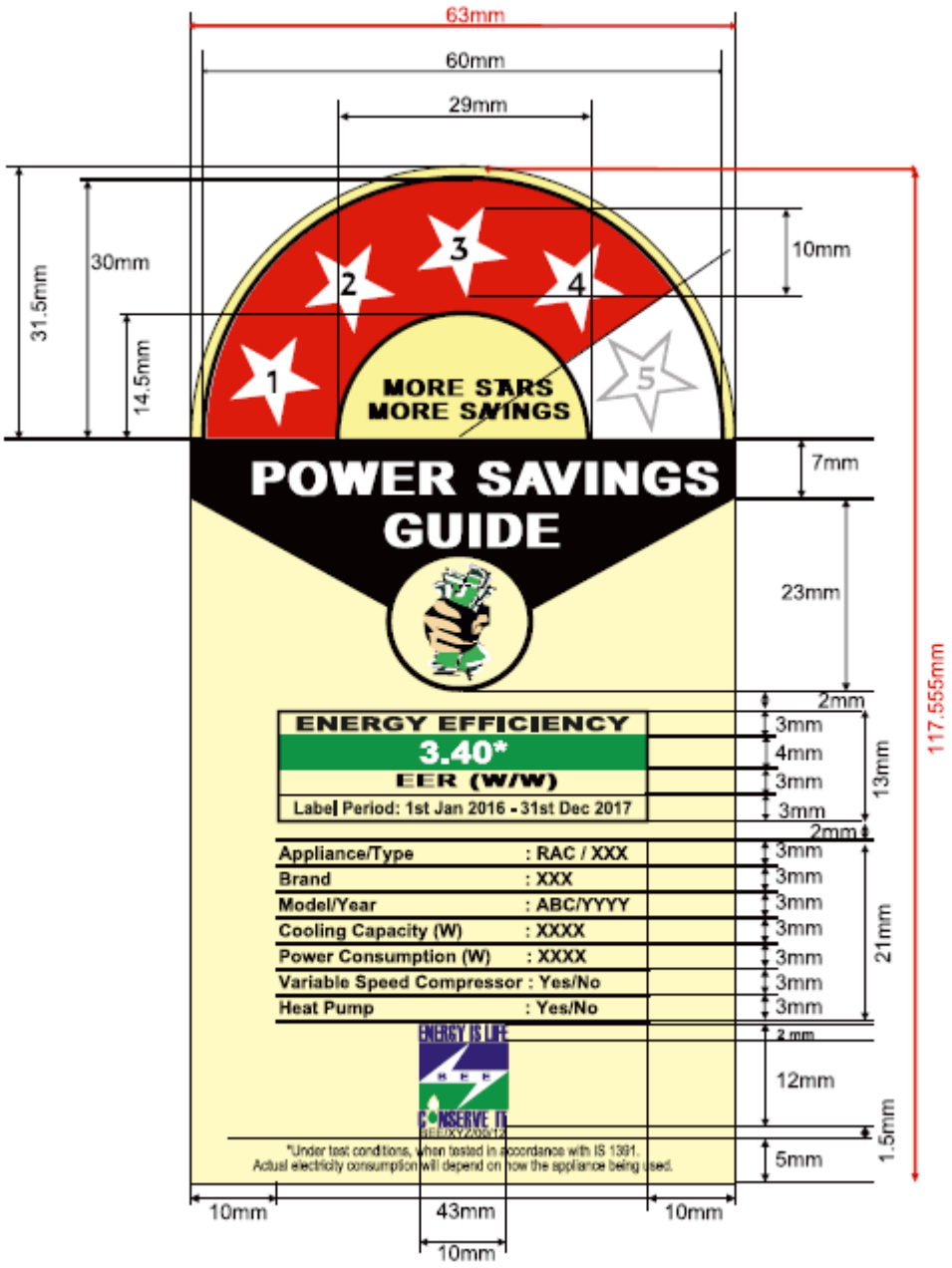


Figure 3.1: Design Scheme for the Label (Sample).

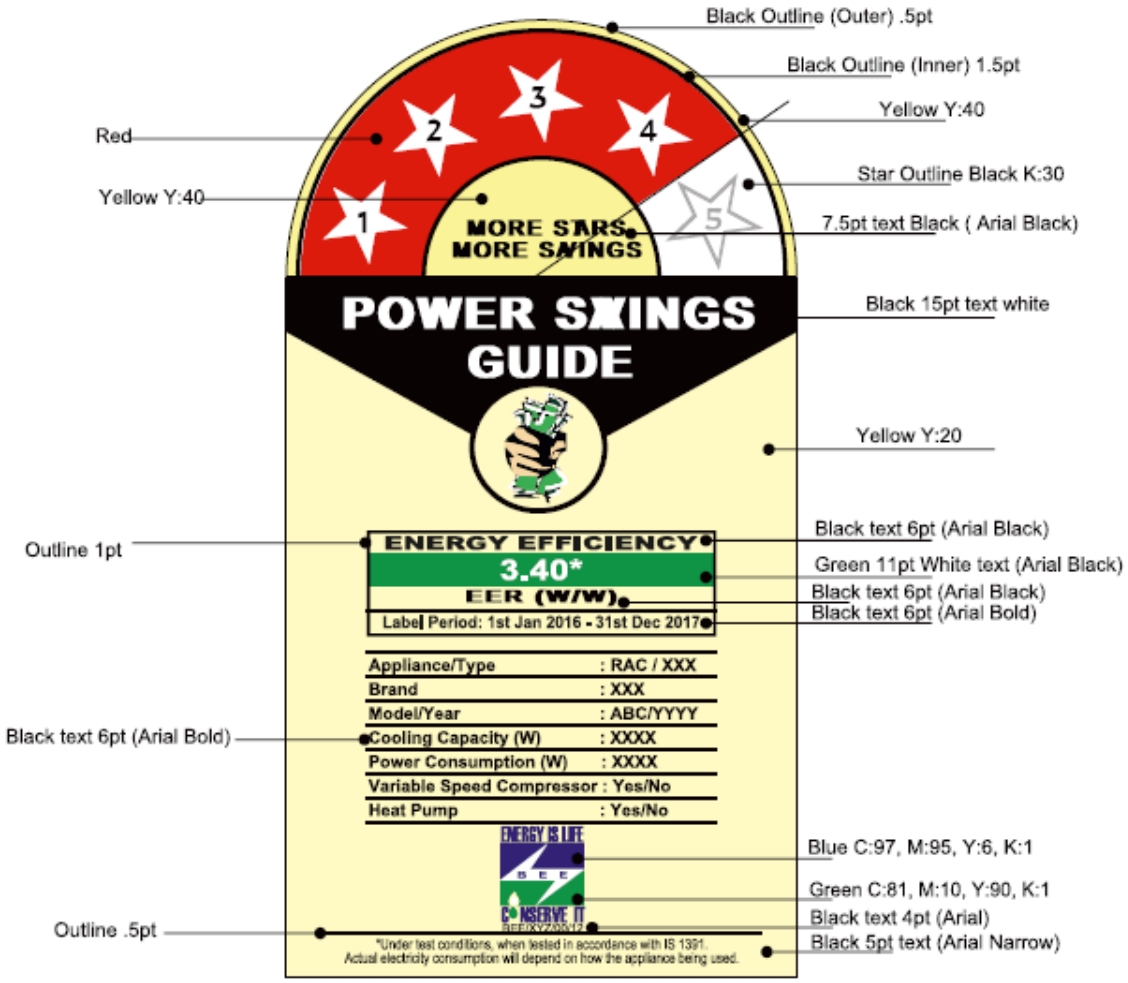


Figure 3.2: Colour Scheme for the Label (Sample).

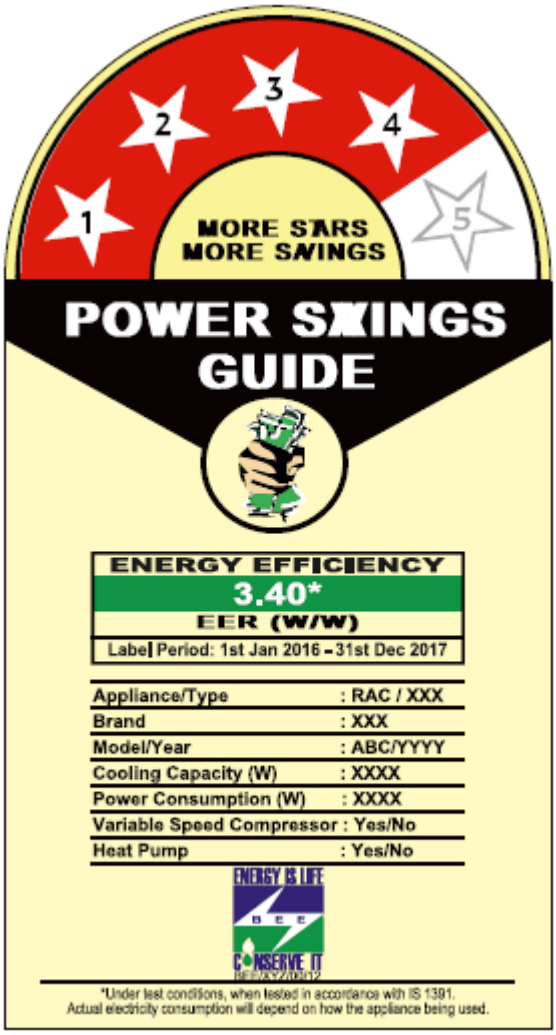
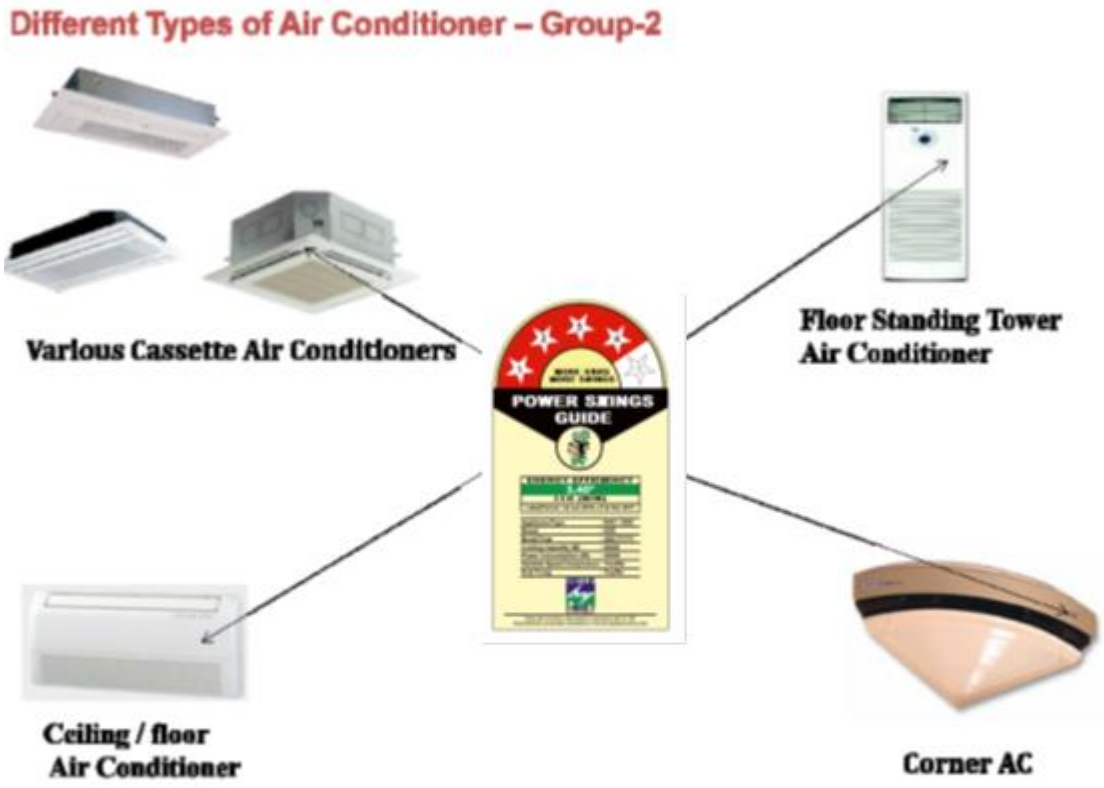


Figure 3.3: Sample Label

Sample Picture of manner of Label Diaplay:



Note: The label shall be applied to the front base of air conditioner preferably near the name plate, so as to be prominently visible.

SECTION 4
FORMAT OF TEST RESULTS

NOTE: A separate form should be prepared for each unit tested.

Airconditioner details

Brand:

Model name: (if applicable)

Model number: (of package unit or indoor unit if split system)

Model number: (of outdoor unit if split system)

A/C Configuration 1—Air distribution non-ducted

A/C Configuration 2—Type Cooling only/heating only/cooling and heating

Non-ducted split system indoor unit mounting: Wall-hung/Under ceiling/Floor mounted/Cassette/Floor/Ceiling

Serial number(s) of unit tested: (of package unit or indoor unit if split system)

Serial number(s) of unit tested: (of outdoor unit if split system)

Rated voltage: V (of package unit or indoor unit if split system)

Rated voltage: V (of outdoor unit if split system)

Rated frequency:

Rated cooling capacity:

Rated effective power input, cooling:

Length of the Tubing

Test summary

Complete a separate copy of this page for each test type, as applicable

Date of test:

Test officer:

Test mode: Cooling only

Test type: Cooling capacity/maximum operating condition test/all applicable tests

Nominal test condition:,

Test room type indoor equipment: Calorimeter/Enthalpy test room

Test room type outdoor equipment: Calorimeter/Enthalpy test room/Water loop

Test Standard: IS 1391 Part 2

Test mode: Cooling/

Supply voltage: V (of package unit or indoor unit if split system)

Supply voltage: V (of outdoor unit if split system)

Supply frequency: Hz

Average current (amps): (Single-phase)

Stabilization period (minutes):

Test period (minutes):

Indoor condition — mean dry bulb (°C):

Indoor condition — maximum variation dry bulb (max − min) (°C):

Indoor condition — mean wet bulb (°C): (where applicable)

Indoor condition — maximum variation wet bulb (max − min) (°C): (where applicable)

Indoor Fan speed setting:

Average air flow volume (m^3/hour): (if test by air enthalpy method):

Outdoor condition — mean dry bulb (°C):

Outdoor condition — maximum variation dry bulb (max − min) (°C):

Outdoor condition — mean wet bulb (°C):

Outdoor condition — maximum variation wet bulb (max − min) (°C): Reading frequency (minutes):

Cooling capacity results

Measured sensible cooling capacity (W):

Measured latent cooling capacity (W):

Measured total cooling capacity (W):

Measured effective power input (W):

Measured EER cooling (W/W):

Maximum Operating Conditions Test results

Did the unit pass the Maximum Operating Test – 110% of rated Voltage? Yes/No

Did the unit pass the Maximum Operating Test – 90% of rated Voltage? Yes/No