



8th September, 2021

Schedule 24
Light Commercial Air conditioners
(Cooling Capacity above 10.5 kW up to and including 18 kW)

1. SCOPE

1.1 This schedule specifies the requirement for participating in the star labeling program for single and three phase non ducted single split with, fixed and variable speed air-conditioner with rated capacity above 10.5 kW upto and including 18.0 kW of the vapor compression type covered under the scope of IS 1391 (Part 2):2018 with all amendments being manufactured, imported, commercially purchased or sold in India.

1.2 In particular, this schedule specifies the following:

- a) Standard cooling at full capacity (100%) and half capacity (50%)
- b) Cooling Seasonal Energy Consumption (CSEC)
- c) Cooling Seasonal Total Load (CSTL)
- d) Indian Seasonal Energy Efficiency Ratio (ISEER) for cooling only
- e) Performance requirements and Test Methods.
- f) Star Rating plan
- g) Validity period of the label.
- h) Test report format
- i) Label design and its contents.

1.3 All star labelled room air conditioners manufactured, imported, commercially purchased or sold in India, shall have a default setting of 24 ° C without any manual intervention.



2 REFERENCE

This schedule shall be read in conjunction with the following standards with all amendments, for the purpose of star labeling

Reference Standard	Title of the Standard
IS 1391 (Part 2): 2018 with all amendments	Room Air Conditioners-Specifications - Part 2 Split Air Conditioners



3 TERMINOLOGY

For this schedule the following definitions in addition to those given in IS1391 (Part 2) shall apply:-

- 3.1 Cooling Seasonal Energy Consumption (CSEC)** – Total annual amount of energy consumed by the equipment when it is operated for cooling in active mode.
- 3.2 Cooling Seasonal Total Load (CSTL)** – Total annual amount of heat that is removed from the indoor air when the equipment is operated for cooling in active mode.
- 3.3 Indian Seasonal Energy Efficiency Ratio (ISEER)** – 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
- 3.4 Label:** any written, printed, marked, stamped or graphic matter affixed to, or appearing on the product and the packaging provided always that the product inside the packaging to which the label is thus applied conforms to every requirement of this schedule.
- 3.5 Validity of Label:** the validity period of Indian seasonal energy efficiency ratio level specified in this schedule.



4 TESTING GUIDELINES:

Methods of Tests: All the tests specified in this schedule shall be carried out as per latest version of IS 1391 (Part 2) with all amendments using the indoor air enthalpy test method or calorimeter test method. The methodology and the test protocol for calculating ISEER shall also be in accordance with IS1391 (Part 2).

- a) For the purpose of seeking grant of star label for air conditioner model, a manufacturer shall get two units of the said model tested for cooling capacity, power consumption, maximum operating and power factor.
- b) Methodology of calculating CSTL, CSEC and ISEER shall be in accordance with IS1391 (part 2).
- c) Method of evaluation of CSTL, CSEC and ISEER is based on bin temperature range of 24- 43°C and 1600 operating hours for cooling per annum as given in table 1.
- d) The bin hours against each bin temperature is given in Table 1.

Table 1: Reference outdoor temperature bin distribution

Temperature in °C	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	Total
Average Annual Hours	527	590	639	660	603	543	451	377	309	240	196	165	130	101	79	59	44	31	20	10	5774
Fraction	9.1	10.2	11.1	11.4	10.4	9.4	7.8	6.5	5.4	4.2	3.4	2.9	2.3	1.7	1.4	1.0	0.8	0.5	0.3	0.2	100
Bin Hours	146	163	177	183	167	150	125	104	86	67	54	46	36	28	22	16	12	9	6	3	1600



5 Testing parameters

All the tests such shall be conducted as per IS1391 (Part 2).

5.1 Cooling Capacity Test: The cooling capacity test shall be carried out as per IS 1391 (Part-2).

5.2 Power Consumption Test: The power consumption test shall be carried out as per IS 1391 (Part-2) .

5.3 Power Factor Test: The power factor test shall be carried out as per of IS1391 (Part 2).

5.4 Maximum Operating Condition Test: The maximum operating condition test shall be carried out as per IS 1391 (Part-2).

6 TEST REPORT

The results of test shall be reported in the prescribed format as given in Annexure A of this Schedule.

7 TOLERANCE LIMIT

For each unit tested, the following tolerances shall be applicable:

- a) The measured standard cooling at full capacity shall not be less than 90 % of the rated value;
- b) The measured standard cooling at fifty per cent of full capacity shall not vary by more than $\pm 5\%$ of full capacity.
- c) The measured power consumption for standard cooling at full capacity shall not be more than 10% of the rated value;
- d) The measured power consumption for standard cooling at fifty per cent of full capacity shall not be more than 10% of the rated power consumption at fifty per cent of full capacity;



8 RATING PLAN

The star rating parameters for ISEER shall be as given in Table 1.

Table 2
Star Rating Plan – Voluntary Phase
(Valid from 2nd March 2020 to 31st December 2022)

Indian Seasonal Energy Efficiency Ratio(kWh/kWh)		
Star Rating	Minimum	Maximum
1 Star	2.70	3.09
2 Star	3.10	3.39
3 Star	3.40	3.69
4 Star	3.70	3.99
5 Star	≥ 4.00	



9 FEES

1. For the purposes of obtaining permission, every brand shall be registered with the Bureau. A label security fee of one lakh rupees shall be applicable, payable by only electronic mode in favor of the Bureau of Energy Efficiency, New Delhi
In case of small-scale industry, the label security fee shall be twenty-five thousand rupees only
2. Application fee payable for a new model registration shall be INR2000/- (Rupees Two thousand only), payable by only electronic mode in favor of the Bureau of Energy Efficiency, New Delhi.
3. Application fee payable on application for renewal of authority to affix labels is INR 1000/- (Rupees One Thousand only) as per BEE norms.
4. Labelling fee for affixation of label on each unit of air conditioner is INR 30/- (Rupees Thirty only) as per BEE norms.

10. LABEL DESIGN AND MANNER OF DISPLAY

10.1) Placement

Every manufacturer, seller or trader shall display on every room air-conditioner a label at the time of sale and the label shall be affixed to, or be attached as a swing tag, on it. For units not on display, the label shall be attached to the unit (indoor and outdoor) and also on the exterior of the packaging of the air-conditioner, at the time of sale.

10.2) Material, Dimension and Shape

The label shall be made of durable cardboard, or any other durable material self-adhesive and shall be cut out as per the dimensions, design and Colour scheme as given in figure 1 to 3.

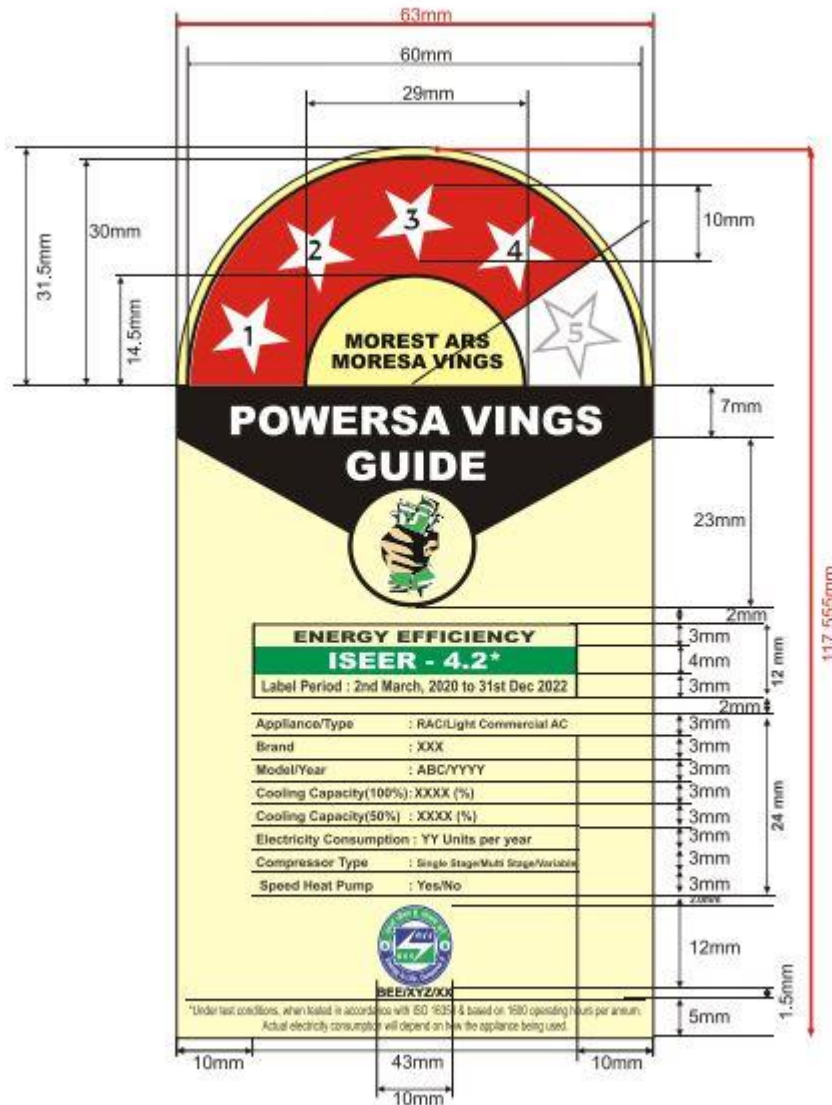


Figure 1 Dimension of the logo

10.3) Color scheme

The label shall be printed as per the color scheme given in Figure 2.

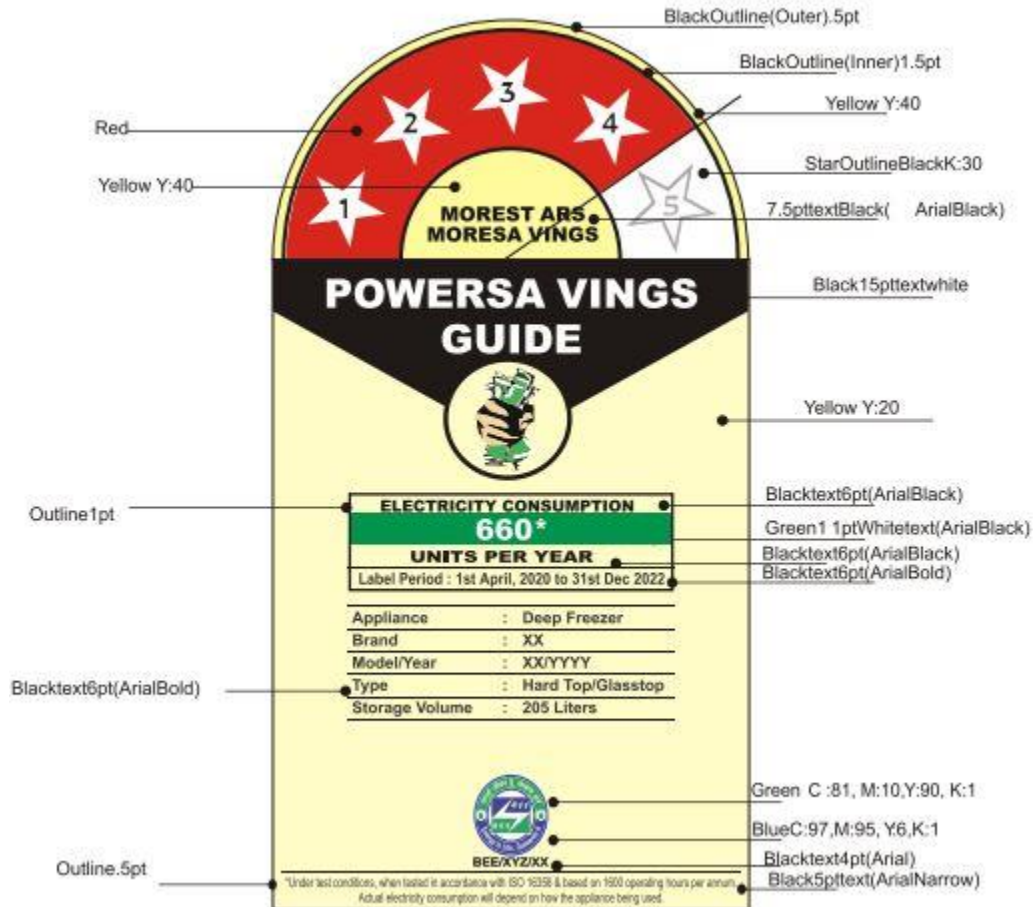


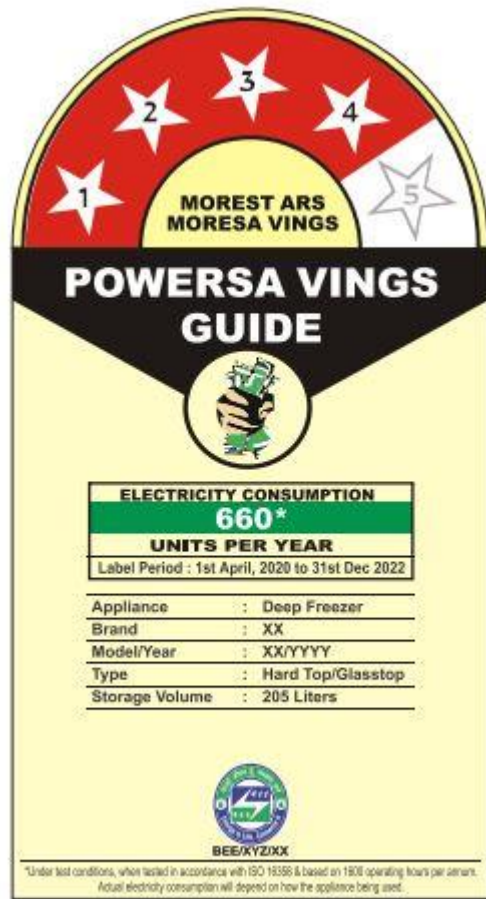
Figure 2 Color Scheme for the Label

Note: CDR File is available on BEE Website (www.beestarlabel.com)

10.4) Sample Label

An example of a printed star label to be affixed on the model is shown in Figure 3.

Figure 3: Sample Label



11 Check Testing

- a) The Bureau shall from time to time carry out verification process to ensure that the room air-conditioner conforms to the star level and other related information displayed on its label and that it complies with the other terms and conditions of permission. All the tests shall be conducted by the Bureau or through its designated agency in balanced ambient calorimeters for the purpose of verification and challenge testing.
- b) For the purpose of verification, the samples will be picked up at random from the open market/authorized dealer/distributor by Bureau and testing will be carried out in an independent laboratory duly accredited by the National Accreditation Board for testing and calibration Laboratories (NABL) in India. If the first sample fails, the Bureau shall draw twice the samples and conduct all the relevant tests specified in this schedule-in another NABL accredited independent test laboratory which is different from the one where the first check testing was conducted, in the presence of authorized representatives from the manufacturer and an officer from the Bureau or its authorized representatives.



- c) Even if one of the second check testing sample fails, the bureau shall direct corrective measures to the concerned manufacturer and shall publish the details of the model for the benefit of the consumers. If those directions are not complied with, the Bureau may initiate adjudication proceedings against the manufacturer.



Annexure A
Form for reporting the result of test

Test report number and date:

1.Details of sample tested

- i. Brand:
- ii. Model name: (if applicable):
- iii. Model number: (indoor unit):
- iv. Model number: (outdoor unit):
- v. Air conditioner type– For cooling only/heating only/cooling and heating:
- vi. Non-ducted split system indoor unit mounting: /under ceiling/floor mounted:
- vii. Serial number of unit tested of indoor unit:
- viii. Serial number of unit tested of outdoor unit:
- ix. Rated voltage of indoor unit (V):
- x. Rated voltage of outdoor unit (V):
- xi. Rated frequency of standard cooling at full capacity: Hz:
- xii. Rated standard cooling at full capacity: W:
- xiii. Rated power consumption of standard cooling at full capacity: W:
- xiv. Rated heating capacity (where applicable):
- xv. Rated effective power input, heating (where applicable):
- xvi. Does this air conditioner use a variable speed compressor : (Yes/No)
- xvii. (If yes, provide details for the following)
- xviii. Rated standard cooling at fifty per cent. of full capacity: W
- xix. Rated power consumption of standard cooling at fifty per cent. of full capacity: W
- xx. Rated frequency of standard cooling at fifty per cent. of full capacity: W

2. Test summary

- i. separate copy Complete a of this page for each test type, as applicable:
- ii. Date of test:
- iii. Test report Number:
- iv. Test officer:
- v. Test mode: Cooling only
- vi. Nature of tests conducted:
- vii. Cooling capacity
- viii. Maximum operating condition
- ix. Power factor
- x. Power consumption and
- xi. ISEER
- xii. Nominal test condition:



- xiii. Test room type indoor equipment: Calorimeter/Enthalpy test room:
- xiv. Test room type outdoor equipment: Calorimeter/Enthalpy test room:
- xv. Test Standard:
- xvi. Supply voltage of indoor unit (V):
- xvii. Supply voltage outdoor unit (V):
- xviii. Supply frequency: Hz
- xix. Average current (amps):
- xx. Stabilization period (minutes):
- xxi. Test period (minutes):
- xxii. Indoor condition – mean dry bulb (°C):
- xxiii. Indoor condition – maximum variation dry bulb (Max – min) (°C):
- xxiv. Indoor condition – mean wet bulb (°C): (where applicable):
- xxv. Indoor condition – maximum variation wet bulb (max – min) (°C): (where applicable):
- xxvi. Fan setting:
- xxvii. Average air flow volume (m/hour):
- xxviii. Indoor external static pressure (Pa): (ducted units only):
- xxix. Outdoor condition – mean dry bulb (°C):
- xxx. Outdoor condition – maximum variation dry bulb (max – min) (°C):
- xxxi. Outdoor condition – mean wet bulb (°C):
- xxxii. Outdoor condition – maximum variation wet bulb (max – min) (°C):
- xxxiii. Reading frequency (minutes):
- xxxiv. Measured Power Factor value:

3. Cooling Capacity Results

	Parameters	Values
Measured parameters	i) Measured sensible cooling capacity (W)	
	ii) Measured latent cooling capacity	
	iii) Measured total cooling at full capacity	
	iv) Measured total cooling (W) at fifty percent of full capacity (if applicable)	
Rated Parameters	i) Declared total cooling (W) at full capacity	
	ii) Declared total cooling (W) at fifty percent of full capacity (if applicable)	



4. Power consumption results

	Parameters	Values
Measured parameters	i) Measured power consumption at full capacity	
	ii) Measured power consumption (W) at fifty percent of full capacity (if applicable)	
Rated Parameters	i) Declared power consumption (W) at full capacity	
	ii) Declared power consumption (W) at fifty percent of full capacity (if applicable)	

5. Declared performance parameters

Parameters	Calculated	Rated
Cooling Seasonal Total Load(kWh)		
Cooling seasonal Energy Consumption (kWh)		
Indian seasonal Energy Efficiency Ratio kWh/kWh		
Star Rating		

6. Test Results

1. Default temperature setting of the room air conditioner at 24-degree Celsius? Yes/No
2. Did the unit pass the maximum operating test? Yes/No