



PRODUCT MANUAL FOR ROOM AIR CONDITIONERS - PART 2 SPLIT AIR CONDITIONERS ACCORDING TO IS 1391 (PART 2): 2018

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification license/certificate.

1.	Product	:	IS 1391 (Part 2): 2018
	Title	:	Room Air Conditioners - Part 2 - Split Air Conditioners
	No. of Amendments	:	Three
2.	Sampling Guidelines:		
a)	Raw material	:	Material- as per Cl. 5.2 Electrical Cables- IS 694 or IS 9968(Part 1), as per Cl. 5.3.6 Temperature Sensing Controls- IS/IEC 60730-2-9 Hermetic Compressors- IS 10617 Motors- as per Cl. 5.8 Heat Exchangers- IS 11329
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	One assembled Air Conditioner plus other suitable number of components if required.
3.	List of Test Equipment	:	Please refer ANNEX – B
4.	Scheme of Inspection and Testing	:	Please refer ANNEX – C
5.	Possible tests in a day	:	Please refer ANNEX – D
6.	Scope of the Licence	:	Please refer ANNEX – E
7.	Any other product specific guidelines	:	Please refer ANNEX – F

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ANNEX--A**GROUPING GUIDELINES**

1. The following parameters are taken into consideration for evolving the grouping guidelines for certification of Split Air Conditioners as per IS 1391 (Part 2): 2018

Classifications based upon function: (i) Cooling only and (ii) Cooling and heating.

2. Considering the above, following Group has been formed for GoL/CSoL:

Group	Cooling capacity in Watt (W)	Sample to be tested
I	Upto and including 5 200	From each group, sample of highest cooling capacity among the capacities intended to be covered in the license for each function, shall be tested for all requirements.
II	Above 5 200	

3. When samples are tested to cover both the groups and functions, at least one sample from each function shall be tested to cover the entire range of Air Conditioners.
4. The manufacturer shall declare the function and cooling capacities of Air Conditioners they intend to cover in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.
5. During the operation of Licence, it shall be ensured that all the varieties covered in the Licence are tested in rotation, to the extent possible.
6. A typical example for drawal of sample to cover the entire varieties under the scope of the License is given for the purpose of general guidance:

Sample 1	Split Air Conditioner, Rated Cooling Capacity 5 200 W, 'Cooling only'
Sample 2	Split Air Conditioner, Rated Cooling Capacity 18 000 W, 'Cooling and heating'

Or

Sample 1	Split Air Conditioner, Rated Cooling Capacity 5 200 W, 'Cooling and heating'
Sample 2	Split Air Conditioner, Rated Cooling Capacity 18 000 W, 'Cooling only'

ANNEX--B**List of Test Equipment***Major test equipment required to test as per the Indian Standard*

Sr No	Tests used in with clause reference	Test equipment
1.	Vacuum test , Cl.5.2.5	Vacuum test apparatus
2.	Pressure test, Cl. 15.2.2	Pressure gauge
3.	High Voltage Test, Cl. 15.2.3	High Voltage tester
4.	Leakage Current Test, Cl. 15.2.4	Power Multimeter
5.	Earth Resistance test, Cl. 15.2.5	Voltage Source, Milli-ohmmeter
6.	Cooling Capacity test, Cl. 9.9, Annex G, H	Calorimeter as per Cl. 12 Temperature instruments as per Cl. 11.1 Pressure measuring instruments as per Cl. 11.2 Electrical instruments as per Cl. 11.3 Water flow measuring instruments as per Cl. 11.4 Nozzles as per Cl. 13.2 Air flow apparatus as per Cl. 13.3, 13.4, 13.5
7.	Power factor test, Cl. 9.3	PF Meter
8.	Maximum Operating Condition test, Cl. 9.4	Test bench as per Cl. 9.4
9.	Freeze up test Cl. 9.5	Test bench as per Cl. 9.5
10.	Enclosure sweat test, Cl. 9.6	Test bench as per Cl. 9.6
11.	Power consumption test, Cl. 9.7	Power meter
12.	Sound test, Cl. 9.10	Noise measuring room as per Fig.7
13.	Heat Pump heating capacity test, Cl. 9.11	Test set up as per Cl. 9.11
14.	Maximum Heating Performance Test, Cl. 9.13	Test set up as per Cl. 9.13

The above list is indicative only and may not be treated as exhaustive.

ANNEX- C
Scheme of Inspection and Testing

1. LABORATORY - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare a calibration plan for the test equipments.

2. TEST RECORDS – The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. LABELLING AND MARKING – As per the requirement of IS 1391 (Part 2): 2018. Both the Units (IDU and ODU), whether manufactured in-house or outsourced, shall be marked with Standard Mark at the licensed premises (Please refer to Annex F for details).

4. CONTROL UNIT –All Room Air Conditioners of one type (based on function) and rating manufactured in a day shall constitute a control unit.

5. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

6. REJECTIONS – Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

TABLE 1

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub contracting permitted	Levels of Control		
Cl.	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
5	CONSTRUCTION						
5.2	Material	5.2.1	IS 1391 (Part 2)	S	Raw material/Components which are covered under mandatory certification of BIS shall be ISI marked and received along with manufacturers test certificate. For other materials, conformity shall be established as per Internal Quality Assurance Plan of the licensee and no further testing is required if received with a test certificate or is ISI Marked.		
5.3.5	Electric Cables	5.3.5, 5.3.6	IS 1391 (Part 2)	S			
5.4	Refrigerant Circuit	5.4	IS 1391 (Part 2)	S			
5.7	Air Filter	5.7	IS 1391 (Part 2)	S			
5.8	Temperature sensing Controls	5.8	IS 1391 (Part 2) IS/IEC 60730- 2-9	S			
5.9	Hermetic Compressors	5.9	IS 1391 (Part 2) IS 10617	S			
5.11	Heat Exchanger	5.11	IS 1391 (Part 2) IS 11329	S			
5.6	Grounding Terminal and Grounding Lead Wire	5.6	IS 1391 (Part 2) IS 302(Part 1)	R	Adequate random Inspection as per Internal Quality Assurance Plan of the Licensee.		
9, 15.2, 15.3	PERFORMANCE REQUIREMENTS, TYPE TESTS						
9.2	Safety						

15.3.3	Protection against access to the live part	8	IS 302 (Part 1)	R	One	Each Control Unit	—
	Electric strength test	13.3	IS 302 (Part 1)	S	One	Once in a year for each type and rating.	—
	Provision for earthing	27	IS 302 (Part 1)	R	One	Each Control Unit	—
	Electrical leakage current at operating temperature	13.2	IS 302 (Part 1)	R	One	Each Control Unit	—
9.2	Safety Conditions for units using A ₃ refrigerants	-	IS 16678(part 2)/ ISO 5149(Part 2)	R	One	Once in a month	—
9.3 15.3.1(c)	Power Factor Test	9.3	IS 1391 (Part 2)	S	One	Once in two years for each type and rating.	—
9.4 15.3.1(d)	Maximum Operating Conditions Test	9.4	IS 1391 (Part 2)	S	One	Once in two years for each type and rating.	—
9.5 15.3.1(e)	Freeze Up Test	9.5	IS 1391 (Part 2)	S	One	Once in a year or whenever there is a change in design, whichever is earlier.	—
9.6 15.3.1(f)	Enclosure Sweat Test	9.6	IS 1391 (Part 2)				
9.7 15.3.1(g)	Power Consumption Test for Cooling	9.7	IS 1391 (Part 2)	S	One	Once in two years for each rating.	—
9.8 15.3.1(g)	Power Consumption Test for Heat Pump	9.8	IS 1391 (Part 2)	S	One	Once in two years for each rating.	
9.9	Cooling Capacity Test	9.9	IS 1391 (Part 2)	S	One	Once in two years for each rating.	
9.10	Sound Test	9.10, 14	IS 1391 (Part 2)	S	One	Once in two years for each type.	—
9.11	Heating Capacity Test	9.11	IS 1391 (Part 2)	S	One	Once in two years for each type and rating.	—

9.13	Maximum Heating Performance Test	9.13	IS 1391 (Part 2)	S	One	Once in two years for each type and rating.	—
5.2.5, 15.2	<i>Production Routine Test</i>						
5.2.5	Vacuum Test	5.2.5	IS 1391 (Part 2)	R	Each Air Conditioner		—
15.2.1	General Running Test	15.2.1	IS 1391 (Part 2)	R			—
15.2.2	Pressure Test or Leakage Test	15.2.2	IS 1391 (Part 2)	R	Each Air Conditioner		—
15.2.3	High Voltage Test	15.2.3 Annex A	IS 1391 (Part 2) IS 302 (Part 1)	R	Each Air Conditioner		—
15.2.4	Leakage Current Test	15.2.4 13.2	IS 1391 (Part 2) IS 302 (Part 1)	R	Each Air Conditioner		—
15.2.5	Earth Resistance Test (Provision for Earthing)	15.2.5 27	IS 1391 (Part 2) IS 302 (Part 1)	R	Each Air Conditioner		—
15.4	<i>Acceptance Tests</i>	15.4	IS 1391 (Part 2)	As agreed to between manufacturer and purchaser.			

Note- 1: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-2: The control unit and levels of control as decided by the Bureau are obligatory to which the licensee shall comply with.

ANNEX – D

Possible tests in a day

- i) Vacuum Test (Cl. 5.2.5)
- ii) General Running (Cl. 15.2.1)
- iii) Pressure Test (Cl. 15.2.2)
- iv) High Voltage Test (Cl. 15.2.3)
- v) Leakage Current Test (Cl. 15.2.4)
- vi) Earth resistance (Cl. 15.2.5)
- vii) Power factor Test (Cl. 9.3)
- viii) Maximum Operating Conditions test (Cl. 9.4)
- ix) Enclosure Sweat test (Cl. 9.6)

Note: During each visit, IO shall check that all the components used in manufacturing (either bought out or manufactured in-house) which are covered under various QCOs [e.g: Cables as per IS 694/IS 9968-1, Capacitors as per IS 2993/IS 13340/ IS 13585-1, Motors as per IS 12615, Finned Type Heat Exchangers as per IS 11329, Hermetic Compressors as per IS 10617, Temperature Sensing Controls as per IS 60730-2-9 etc.), as applicable, are ISI Marked under a valid BIS licence.

ANNEX E

Scope of Licence

“Licence is granted to use Standard Mark as per IS 1391 (Part 2): 2018 with the following scope:

Name of the product	Room Air Conditioners - Part 2 - Split Air Conditioners
Classification based on function	
Cooling Capacity (up to and including)	

ANNEX F

Guidelines for Certification of ACs having Indoor Unit (IDU) and Outdoor Unit (ODU)

1. As per Para 1 (i) of Scheme-I of Schedule- II of the BIS (Conformity Assessment) Regulations, 2018, a license can be granted by Bureau for products manufactured in a manufacturing premises. Further, as per Para 3 (1) (a) (ii) of Scheme-I of Schedule- II of these Regulations, a part of the manufacturing activity may be outsourced.
2. Accordingly, the guidelines given below shall be followed for Certification of ACs as per IS 1391 (Part 2):
 - a) The manufacturer who intends to obtain BIS licence for ACs shall normally have complete in-house manufacturing facility. However, outsourcing of part of the manufacturing activity shall be permitted only to the extent of one of the Units (IDU or ODU) subject to proper justification by the manufacturer regarding exercise of control of outsourced activity for ensuring compliance to the relevant Indian Standard.
 - b) Upon obtaining BIS licence, the outsourced Unit (IDU/ODU) shall be brought to the licensed premises and the Standard Mark shall be applied on both Units (IDU and ODU) in the licensed premises, only after due testing of the product (AC) as per the SIT.
 - c) The firm shall ensure that all the components used in manufacturing (either bought out or manufactured in-house) that are covered under various QCOs [e.g: Cables as per IS 694/ IS 9968-1, Capacitors as per IS 2993/IS 13340/ IS 13585-1, Motors as per IS 12615, Finned Type Heat Exchangers as per IS 11329, Hermetic Compressors as per IS 10617, Temperature Sensing Controls as per IS 60730-2-9 etc.), as applicable, are ISI Marked under a valid BIS licence.
 - d) Even if any of the Units (IDU or ODU) is procured from outside (either from domestic or foreign manufacturer), the compliance of components w.r.t the provisions of the respective QCOs shall be ensured by the licensee firm for ACs.