



PRODUCT MANUAL FOR DUCTED AND PACKAGE AIR- CONDITIONERS ACCORDING TO IS 8148: 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 8148: 2018
	Title	:	Ducted and Package Air- Conditioners
	No. of Amendments	:	NIL
2.	Sampling Guidelines:		
a)	Raw material	:	As per Cl. 4
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	One assembled Air Conditioner
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 Ducted and Packaged Air Conditioner as per IS 8148: 2018

Classifications based upon function and construction:

- (i) Ducted/Packaged heat pump units for both Cooling and Heating with Air-cooled condenser
 - (ii) Ducted/Packaged Air Conditioner units for Cooling only with Air-cooled condenser
 - (iii) Ducted/packaged Air Conditioner units for cooling only with water-cooled condenser
2. Further, the maximum cooling capacity is not limited by the Standard.
 3. Considering the above, separate sample of units with air cooled condenser and water-cooled condenser will required to be tested. However, if heat pump units with air-cooled condenser for both cooling and heating are tested then units with air-cooled condenser for cooling only may also be covered. Further, sample of units of maximum cooling capacity will be tested for covering the entire range of air-conditioners.
 4. Samples of either of Ducted or of Package units will be tested to cover both Ducted and Package units as they vary mainly in installation method only.
 5. 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.
 6. 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.
 7. A typical example for drawl of sample to cover the entire varieties under the scope of the License is given for the purpose of general guidance:

Sample 1	Ducted/ Package Heat pump units for both Cooling and Heating with Air-cooled condenser, Maximum Rated Cooling Capacity (in Watts)
Sample 2	Ducted/Packaged Air-conditioner units for cooling only with water cooled condenser, Maximum Rated Cooling Capacity (in Watts)

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.	Corrosion resistance test , Cl. 4	Salt spray chamber
2.	Pressure test, Cl. 12.2.2	Pressure gauge
3.	Insulation resistance test, Cl. 12.2.3	Megger
4.	High Voltage Test, Cl. 12.2.4	High Voltage tester
5.	Leakage Current Test, Cl. 12.2.5	Power Multimeter
6.	Earth Resistance test, Cl. 12.2.6	Voltage Source, Milli-ohmmeter
7.	Capacity rating test, Cl. 8.1 and Heating Capacity test , Cl. 9.1	Apparatus as per either Annex D or Annex E
8.	Maximum Cooling Conditions test, Cl. 8.3	Test bench as per Cl. 8.3
9.	Freeze up test Cl. 8.4	Test bench as per Cl. 8.4
10.	Drip test, Cl. 8.5	Test bench as per Cl. 8.5
11.	Enclosure sweat test, Cl. 8.6	Test bench as per Cl. 10.6
12.	Condensate disposal test, Cl. 8.7	Test bench as per Cl. 8.7
13.	Power consumption test, Cl. 8.8	Power meter
14.	Maximum Heating Performance test, Cl. 9.2	Test bench as per Cl. 9.2
15.	Automatic Defrost Performance test, Cl. 9.3	Test bench as per Cl. 9.3
16.	Sound test, Cl. 11	Noise measuring room as per Fig.7, Noise measuring instrument as per Cl. 11.4
17.	Safety test, Cl. 12.3.3	Test set up as per Cl. 12.3.3

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 8148: 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 Air Conditioners of one type (based on function and construction) 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: Subcontracting permitted	Levels of Control		
Cl.	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
4	CONSTRUCTION						
4.2, 4.5	Material	4.2, 4.5 3	IS 8148 IS 101 (Part6/Sec 1)	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.		
4.11	Air Filter	4.11	IS 8148	S			
5, 8, 9, 11, 12.2, 12.3	PERFORMANCE REQUIREMENTS, TYPE TESTS						
10.2	Safety						
12.3.3	Protection against access to the live part	8	IS 302 (Part 1)	R	One	At the time of design approval or whenever there is change in design	
	Earth continuity test	Type test as per IS 302-1		R	One		
	Electric strength test	13.3	IS 302 (Part 1)	S	One		

	Functional test	Type test as per IS 302-1		R	One	At the time of design approval or whenever there is change in design	
	Provision for earthing	27	IS 302 (Part 1)	R	One		
	Electrical insulation and leakage current at operating temperature	13.2	IS 302 (Part 1)	R	One		
8.1 12.3.1	Capacity rating test	8.1	IS 8148	S	One	Once in two years for each type and rating.	—
8.3	Maximum cooling conditions test	8.3	IS 8148	S	One	Once in two years for each type and rating.	—
8.4 12.3.1	Freeze Up Test	8.4	IS 8148	S	One	Once in a year or whenever there is a change in design, whichever is earlier.	—
8.5 12.3.1	Drip test	8.5	IS 8148	S	One		—
8.6 12.3.1	Enclosure Sweat Test	8.6	IS 8148	S	One		—
8.7 12.3.1	Condensate Disposal Test	8.7	IS 8148	S	One	Once in two years for each rating.	—
8.8 12.3.1	Power Consumption Test	8.8	IS 8148	S	One	Once in two years for each rating.	—
11	Sound Test	11	IS 8148	S	One	Once in two years for each type.	—
9.1	Heating Capacity Test	10.12	IS 8148	S	One	Once in two years for each type and rating.	—

9.2	Maximum Heating Performance Test	9.2	IS 8148	S	One	Once in two years for each type and rating.	—
9.3	Automatic Defrost Performance test	9.3	IS 8148	S	One	Once in two years for each type and rating.	—
12.3.1	Room discharge airflow rating test	Annex C	IS 8148	S	One	Once in two years for each type and rating.	—
12.2	<i>Production Routine Test</i>						
12.2.1	Running Test	12.2.1	IS 8148	R	Each unit	—	
12.2.2	Pressure Test or Leakage Test	12.2.2	IS 8148	R	Each unit		
12.2.3	Insulation resistance test	12.2.3	IS 8148	R	Each unit		
12.2.3	High Voltage Test	12.2.3	IS 8148 IS 302 (Part 1)	R	Each unit		
12.2.4	Leakage Current Test	12.2.4	IS 8148 IS 302 (Part 1)	R	Each unit		
12.2.5	Earth Resistance Test	12.2.5	IS 8148 IS 302 (Part 1)	R	Each unit		
12.4	<i>Acceptance Tests</i>	12.4	IS 8148	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) General Running (Cl. 12.2.1)
- ii) Pressure Test (Cl. 12.2.2)
- iii) Insulation Resistance test (Cl. 12.2.3)
- iv) High Voltage Test (Cl. 12.2.4)
- v) Leakage Current Test (Cl. 12.2.5)
- vi) Earth resistance (Cl. 16.2.6)
- vii) Maximum Operating Conditions test (Cl. 8.3)
- viii) Enclosure Sweat test (Cl. 8.6)

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 8148: 2018 with the following scope:

Name of the product	Ducted/ Package 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 8148:
 - 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.