PRODUCT MANUAL FOR ELECTRIC INSTANTANEOUS WATER HEATERS ACCORDING TO IS 8978:1992

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 8978:1992
	Title	:	Electric Instantaneous Water Heaters
	No. of Amendments	:	2
2.	**Sampling Guidelines:**		
a)	**Raw material**	:	• Copper - IS 191 • Stainless steel - IS 1570 (Part 5) • The vitreous enameled inner tank - IS 13273 • Components - Cl. 24 of IS 302-2-35
b)	**Grouping guidelines**	:	Please refer ANNEX – A
c)	**Sample Size**	:	2 nos.
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 :** Licence is granted to use Standard Mark as per IS 8978:1992 with the following scope:		

	Name of the Product	Electric Instantaneous Water Heaters
	Class	Class of Appliance I/II/III
	Type	Closed / Open-Outlet
	Grade	Pollution degree _____, Material group _____
	Material of Inner Tank	Stainless Steel/ Copper Tank/ Vitreous Enamelled Tank
	Rating	_____ W, _____V, _____Hz, _____ Phase, _____ Pa
	Capacity	_____ L
	Degree of Protection	_____

ANNEX A

Grouping Guidelines

1) For considering GoL/CSoL, Electric Instantaneous Water Heaters of capacities upto 3L having same type, class, ratings, degree of protection, material of inner tank, degree of pollution and material group shall be considered as a group.

2) One sample of Electric Instantaneous Water Heaters, with the highest capacity in the group shall be tested for covering the entire range of capacities of water heaters of that particular variety in that group.

3) The Firm shall declare the varieties of Electric Instantaneous Water Heaters they intend to cover in the Licence.

4) The Scope of Licence may be restricted based on the Manufacturing capability and Testing facilities of the Manufacturer.

5) During the operation of the Licence, BO shall ensure that all the Varieties covered in the Licence are tested in rotation to the extent possible.

ANNEX B

List Of Test Equipment

Major test equipment required to test as per the Indian Standard

Sl. No.	Test Equipment	Tests used in with Clause Reference as per IS 8978 and IS 302-2-35
1	Voltmeter, Ammeter, Wattmeter, Micro ammeter, Mega Ohm Meter, Frequency Meter, Test Finger, Mili Ammeter, ECR Tester	Cl. 8, Cl. 10, Cl. 13, Cl. 16, Cl. 27
2	High Voltage Tester, Voltmeter, mili Ammeter	Cl. 13, Cl. 16
3	Glow Wire Test Apparatus – Temperature Indicator, Timer	Cl. 30
4	Temperature Indicator	Cl. 11, Cl. 19, Cl. 22
5	Humidity Chamber (Temperature Indicator, Temperature Controller, Thermo hygrometer, Hour Meter), Test setup for degree of protection against moisture	Cl. 15
6	Torque Screw Driver, Micrometer, Vernier Caliper, Gauges	Cl. 28, Cl. 29
7	Pressure Gauge, Vacuum Gauge	Cl. 22
8	Hot Air Oven, Ball Pressure Test Apparatus	Cl. 30
9	Cord Grip Test Apparatus	Cl. 25
10	Test set up for degree of protection against moisture	Cl. 15
11	Impact Tester	Cl. 21

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 equipment.

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

3. LABELLING AND MARKING – As per the requirements of IS 8978:1992. In addition, the water heaters shall also be marked with an identification in code or otherwise for traceability. Each water heater shall be provided with the instruction manual for installation, operation and use, routine maintenance and safety precautions. This shall also include values declared by the manufacturer in respect of relevant test requirements. The manual shall also specify the critical components and supply the circuit diagram to ensure proper replacement of components for each class (Cl. 7 of IS 8978:1992) at the time of servicing.

4. CONTROL UNIT – All Electric Instantaneous Water Heaters of the same class, design, rated capacity and rated voltage 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 Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
101.3	Earth Continuity Test	A-1	IS 302-1	R	Each water heater		*
101.3	Electric Strength Test	A-2	IS 302-1	R			
101.3	Functional Test	A-3	IS 302-1	R			
8	Protection against access to live parts	8	IS 302-2-35	R			
10	Finish	10	IS 8978	R			
8	Power Input & Current	10	IS 302-2-35	R	Five water heaters	Every Control Unit	
	Leakage current & electric strength at operating temperature	13	IS 302-2-35	R			
	Construction	22	IS 302-2-35	R			
	Provision for Earthing	27	IS 302-2-35	R			
12	Endurance	12	IS 8978	R			
8	Heating	11	IS 302-2-35	S	One water heater	Every month for each type & design	**
	Moisture Resistance	15	IS 302-2-35	S			
	Transient Overvoltage	14	IS 302-2-35	S			
	Leakage Current & Electric Strength	16	IS 302-2-35	S			
	Overload Protection of Transformers and associated circuits	17	IS 302-2-35	S			

8	Abnormal Operation	19	IS 302-2-35	S	One water heater	Every six months for each type & design	
11	Operation of Flow Switch	11	IS 8978	S			
8	Stability & Mechanical Hazards	20	IS 302-2-35	S			
8	Mechanical Strength	21	IS 302-2-35	S			
8	Internal Wiring	23	IS 302-2-35	S			
8	Components	24	IS 302-2-35	S			
8	Supply Connections & external flexible cords	25	IS 302-2-35	S			
8	Terminals for external conductors	26	IS 302-2-35	S			
8	Screws & Connections	28	IS 302-2-35	S			
8	Clearances, creepage distances & solid insulation	29	IS 302-2-35	S			
8	Resistance to heat & fire	30	IS 302-2-35	S			
8	Resistance to rusting	31	IS 302-2-35	S			

* In case of failure, all the water heaters in the control unit shall be tested and those found failing shall be rejected. Twice the number of samples shall be tested from the subsequent control units for these requirements till samples from 5 consecutive control units pass. Thereafter, the original frequency may be restored.

** In case of failure, the marking of that type & design shall be stopped and after a thorough investigation the defect shall be rectified. The marking shall be resumed when samples of that type & design tested from the improved lot show conformity to the requirements.

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

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.

ANNEX D

Possible Tests in a day

1. Earth Continuity Test
2. Electric Strength Test
3. Functional Test
4. Finish
5. Protection against access to live parts
6. Power Input and Current
7. Heating
8. Leakage Current & Electric Strength at operating temperature
9. Leakage Current & Electric Strength
10. Mechanical Strength
11. Internal Wiring
12. Supply connections & external flexible cords
13. Terminals for external conductors
14. Provision for Earthing
15. Screws and Connections
16. Stability and Mechanical Hazards