



PM/ IS 302-2-201/ 1/ December 2018

## PRODUCT MANUAL FOR SAFETY OF HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES - ELECTRIC IMMERSION WATER HEATERS ACCORDING TO IS 302-2-201

*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.	<b>Product</b>	:	IS 302-2-201:2008
	<b>Title</b>	:	Safety of household and similar appliances - Electric Immersion Water Heater.
	<b>No. of Amendments</b>	:	1
2.	<b>Sampling Guidelines:</b>		
a)	<b>Raw material</b>	:	—
b)	<b>Grouping guidelines</b>	:	Please refer <a href="#">ANNEX – A</a>
c)	<b>Sample Size</b>	:	2 nos. of electric immersion water heaters
3.	<b>List of Test Equipment</b>	:	Please refer <a href="#">ANNEX – B</a>
4.	<b>Scheme of Inspection and Testing</b>	:	Please refer <a href="#">ANNEX – C</a>
5.	<b>Possible tests in a day :</b>	:	Please refer <a href="#">ANNEX-D</a>
6.	<b>Scope of the Licence :</b> Licence is granted to use Standard Mark as per IS 302-2-201:2008 with the following scope:		
	Name of the Product	Electric Immersion Water Heater (Safety)	
	Class	Class of Appliance _____, Insulation Class _____	
	Grade	Pollution degree _____, Material group _____	
	Rating	_____ W, _____ V, _____ Hz, _____ Phase _____	

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**ANNEX A**

**Grouping Guidelines**

- 1) For considering GoL/CSoL, following grouping shall be considered:
  - a) **Group I** - up to and including 1000 W
  - b) **Group II** – above 1000 W
- 2) One sample from each group, preferably of the highest wattage, for each voltage rating intended to be covered in the licence may be drawn for testing to cover the entire range of wattages in that group.
- 3) The Firm shall declare the varieties of Electric Immersion Water Heaters they intend to cover in the Licence. The Scope of Licence may be restricted based on the Manufacturing capability and Testing facilities of the Manufacturer.
- 4) 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*

<b>Sl. No.</b>	<b>Test Equipment</b>	<b>Tests used in with Clause Reference</b>
1	Testing Panel consisting of Voltmeter, Ampere meter, Wattmeter, Micro Ampere Meter	Cl. 10, Cl. 13
2	High Voltage Tester, Stop Watch, Micro Ampere Meter	Cl. 16, Cl. 27
3	Humidity Chamber with Digital Thermometer, Hygrometer and Hour Meter	Cl. 15
4	Hot Air Oven, Ball Pressure Apparatus, Travelling Microscope	Cl. 30
5	Digital Temperature Controller, Digital Timer	Cl. 30
6	Suitable size dull black painted wooden test corner with embedded copper disc along with thermocouple & temp. indicator	Cl. 11
7	Impact Test Apparatus	Cl. 21
8	Cord Grip tester	Cl. 25
9	Vernier Calliper, Feeler gauges	Cl. 29
10	Torque Screw Driver	Cl. 28

*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 302 (Part 2/Sec 201): 2008.

**4. CONTROL UNIT** – For the purpose of this Scheme, electric immersion water heaters of each type 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 Methods			No. of Sample	Frequency	Remarks
		Clause	Reference				
5	Earth Continuity test	5.1, A-1	IS 302-1	R	Each Electric Immersion Water Heater	—	—
5	Electric strength test	5.1, A-2	IS 302-1	R			
5	Functional test	5.1, A-3	IS 302-1	R			
8	Protection against access to live parts	8	IS 302-2-201 IS 302-1	R			
27	Provision for Earthing	27		R			
10	Power input and current	10	IS 302-2-201 IS 302-1	R	10% subject to a minimum of three and maximum of thirteen	Every Control Unit	Please see Note 1
13	Leakage current and electric strength at operating temperature	13		R			
11	Heating	11	IS 302-2-201 IS 302-1	R	Two	Every week for each type and rating	Please see Note 2
15	Moisture resistance	15		R			
16	Leakage current and Electric Strength	16		R			
14	Transient Overvoltage	14	IS 302-2-201 IS 302-1	S	One	Every year for each type and rating	
21	Mechanical Strength	21	IS 302-2-201 IS 302-1	R	Two from each type and rating - Every 3 months or 5000 water heaters whichever is earlier		
19	Abnormal Operation	19	IS 302-2-201 IS 302-1	R	Two	Every six months for each type and rating	
20	Stability & Mechanical Hazards	20		R			
22	Construction	22		R			

23	Internal wiring	23	IS 302-2-201 IS 302-1	R	Two	Every six months for each type and rating	Please see Note 2
24	Components	24		R			
25	Supply connection and external flexible cords	25		R			
26	Terminals for external conductors	26		R			
28	Screws and connections	28		R			
29	Clearances, creepage distances and solid insulation	29		R			
30	Resistance to heat, fire and tracking	30		S			
31	Resistance to rusting	31		S			
32	Radiation, toxicity and similar hazards	32		S			

**Note-1:** In case of failure, all water heaters in the control unit shall be tested and those found failing shall be rejected. All water heaters produced subsequently shall be tested for these requirements till 13 consecutive heaters pass. The original frequency may then be restored.

**Note-2:** In case of failure in any type and rating, a thorough investigation of the cause of failure shall be made and defects rectified. Five samples of that type and rating from the improved lot shall be tested for these requirements till samples from five consecutive control units pass. The original frequency may then be restored.

**Note-3:** Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau.

**Note-4:** 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. Protection against access to live parts
5. Power input and current
6. Heating
7. Leakage current and electric strength at operating temperature
8. Leakage current and electric strength
9. Mechanical strength
10. Internal wiring
11. Supply connection and external flexible cord
12. Terminals for external conductors
13. Provision for earthing
14. Screws and connections
15. Stability and Mechanical hazards