



**PRODUCT MANUAL FOR
ALTERNATING CURRENT DIRECT CONNECTED STATIC
PREPAYMENT METERS FOR ACTIVE ENERGY
(CLASS 1 AND 2)
ACCORDING TO IS 15884:2010**

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 15884:2010
	Title	:	Alternating Current Direct Connected Static Prepayment Meters For Active Energy (Class 1 and 2)
	No. of Amendments	:	—
2.	Sampling Guidelines:		
a)	Raw material	:	—
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	Three Meters
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 15884:2010 with the following scope:		
	Name of the Product	Alternating Current Direct Connected Static Prepayment Meters For Active Energy	
	Class 1 / Class 2, Type, Single phase 2-wire/ Three phase 4-wire, Voltage.....V, Basic current (I _b)A, Maximum current (I _{max})A, Frequency ...Hz, Load Switching Utilization Category UC1/ UC2/ UC3, Insulating Encased Meter of Protective Class I/ Insulating Encased Meter of Protective Class II, with Token Carrier Interface.		

ANNEX A**Grouping Guidelines**

1. Samples of each variety of meters shall be tested considering the following:
 - i. Accuracy Class – 1 and 2
 - ii. Number of phases and wires - Single phase 2-wire, Three phase 4-wire
 - iii. Insulating Encased Meter of Protective Class I and Insulating Encased Meter of Protective Class II
 - iv. Load Switching Utilization Category – UC1, UC2, UC3
 - v. Type of Token Carrier Interface

2. The following relaxation may be given when a variety is tested for all the requirements:
 - i. Same basic current (I_b) and different current ratio (I_{max}/I_b) – One sample with highest current ratio (I_{max}/I_b) and another sample with lowest current ratio (I_{max}/I_b) out of the range offered be subjected to all tests.
 - ii. Different basic current (I_b) but same (I_{max}/I_b) – One sample with highest (I_b) and another sample with the lowest (I_b) be subjected to all tests.
 - iii. Different basic current (I_b) and different (I_{max}/I_b) – One sample with lowest (I_b) and lowest (I_{max}/I_b) and another sample with highest (I_b) and highest (I_{max}/I_b) be subjected to all tests.
 - iv. For CSoL – If same (I_b) with different (I_{max}/I_b) is to be included in the licence, the varieties offered be subjected to tests applicable at I_{max} only.

3. For the electronic display, manufacturer's certificate shall be obtained for compliance to the requirement of Clause 4.2.10.2 of IS 15884:2010.

4. If the license covers only 'Insulating Encased Meter of Protective Class II' and CSoL for 'Insulating Encased Meter of Protective Class I' is to be considered, then any one sample of 'Insulating Encased Meter of Protective Class I' from any one variety already covered in the license or any new variety intended to be covered in the licence be subjected to all tests or vice-versa.

5. The Firm shall declare the varieties of ac direct connected static prepayment meters intended to be covered in the Licence. An undertaking shall also be taken from the applicant/ licensee in respect of construction and design similarity for the range of varieties which they intend to cover in the licence. One set of drawings representing each of these varieties be sealed and kept in the factory for reference whenever required. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.

6. 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
1	Vernier Caliper, Micrometer	Cl. 4.1, 4.2
2	Gauss Meter	Cl. 4.6.2
3	Short Time Over Current Tester	Cl. 5.4.3
4	Voltage Dips and Interruption Tester	Cl. 5.4.2, Cl. 4.4.2
5	a.c. High Voltage Tester	Cl. 5.4.6.1, Cl. 5.4.6.3
6	Insulation Tester	Cl. 5.4.6.1, 5.4.6.4
7	Digital Multi meter	Cl. 5.4.1
8	High Voltage Tester	Cl. 5.4.6.3
9	Digital Temperature Measurement Equipment	Cl. 5.4.4
10	Shock Test Device	Cl. 5.2.2
11	Vibration Test Device	Cl. 5.2.3
12	Spring Hammer Test Device	Cl. 5.2.1
13	Impulse Voltage Tester	Cl. 5.4.6.2
14	Glow Wire Test Apparatus	Cl. 5.2.4
15	Short time overcurrent tester	Cl. 4.4.3, Cl. 5.4.3

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 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 15884:2010.

4. CONTROL UNIT – Meters of the same design 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				
4.2.1 to 4.2.3, 4.2.7	General & Mechanical requirement	4.2.1 to 4.2.3, 4.2.7	IS 15884	R	Each Meter		In case of failure of any meter, cause of failure shall be identified and corrective action shall be taken to remove the non-conformity.
4.2.4, 4.2.5	Terminal Blocks and Terminal Cover	4.2.4, 4.2.5		S	Three	Every consignment of insulating material received	No further testing is required if accompanied with Test Certificate.
4.2.8	Resistance to Heat and Fire	4.2.8, 5.2.4		S		Once in six months for each type and rating	In case of failure of any sample, double the number of samples shall be tested and no failure in those samples shall be permitted. After corrective actions samples from two consecutive control units shall be tested and the original frequency may be restored if all the samples pass. For Cl. 4.2.10.2 non-volatile memory supplier's test certificate may also be accepted.
4.2.6	Clearances & Creepage Distances	4.2.6,		S		Once in a year for each type and rating	
4.2.9	Protection against penetration of dust and water	4.2.9, 5.2.5		R	Three	Once in six months for each type and rating	
4.2.10	Display of Measured Values	4.2.10		R	Each Meter		In case of failure of any meter, cause of failure shall be identified and corrective action shall be taken to remove the non-conformity.
4.4.6, 5.4.6.3	a.c high voltage test	5.4.6.1, 5.4.6.3		R			
5.4.6.4	Insulation Resistance Test	5.4.6.1, 5.4.6.4		R			
4.6.1	Limits of Error due to variation of current	4.6.1, 5.6.1, 5.6.6		R			
4.6.4	Starting and running with no load	4.6.4, 5.6.3, 5.6.4		R			

4.4.1, 5.4.1	Power Consumption	5.4.1, 4.4.1.1, 4.4.1.2		R			
4.2.12	Token Carrier Interface	4.2.12		S			
4.4.2, 5.4.2	Influence of Supply Voltage	4.4.2, 5.4.2		S			
4.4.3, 5.4.3	Short time over current test	4.4.3, 5.4.3		S			
4.4.4, 5.4.4	Influence of Self Heating	5.4.4, 4.4.4		S			
4.4.5, 5.4.5	Influence of Heating	5.4.5, 4.4.5		S			
4.6.5, 5.6.5	Meter Constant	5.6.5		R			
5.6.7	Repeatability of Error Test	5.6.7		S			
4.6.6, 5.7	Test of Keeping Time	4.6.6, 5.7		S			
5.9	Test of consumption based charging	5.9		S			
5.10	Test of time-based charging functions	5.10		S			
5.8	Test of Load Switch	5.8		S	One -for UCI and As per G-9 of IS 15884 for UC2/UC3	Once in a year for each rating and load switching Utilization Category	In case of failure of any sample, double the number of samples shall be tested and no failure in those samples shall be permitted. After corrective actions samples from two consecutive control units shall be tested and the original frequency may be restored if all the samples pass.

4.5, 5.5	Electromagnetic Compatibility	4.5, 5.5		S	Three	Once in a year for each type and rating	
4.6.2	Limits of Error due to other Influence Quantities	5.6.2, 4.6.2		S			
4.6.3	Limits of Error due to Ambient Temperature variation	4.6.3		S			
5.2.2	Shock Test	5.2.2		S			
5.2.3	Vibration Test	5.2.3		S			
5.2.1	Spring Hammer Test	5.2.1		S			
4.3, 5.3	Test for climatic influences	4.3, 5.3		S			
4.4.6, 5.4.6.2	Impulse Voltage Test	5.4.6.2		S			

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 obligatory 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. General and Constructional Requirements
2. a.c. High Voltage Test
3. Insulation Test
4. Accuracy Requirements (Limits of Error)
5. Test of starting condition
6. Test of no-load condition
7. Power Consumption