



उत्पाद मैनुअल
ए०सी० स्टैटिक ट्रांसफॉर्मर ऑपरेटेड वॉटआवर मीटर (वर्ग 0.1 एस, 0.2 एस एवं 0.5 एस)
एवं वारआवर मीटर (वर्ग 0.1 एस, 0.2 एस, 0.5 एस एवं 1 एस) - विशिष्टि
आईएस 14697: 2021

PRODUCT MANUAL FOR
a.c. Static Transformer Operated Watthour Metres (Class 0.1 S, 0.2 S and 0.5 S)
and Var-Hour Metres (Class 0.1 S, 0.2 S, 0.5 S and 1 S) — Specification
ACCORDING TO IS 14697: 2021

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो) अनुरूपता मूल्यांकन (विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity 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.

1.	मानक संख्या IS No.	:	IS 14697: 2021
	शीर्षक Title	:	a.c. Static Transformer Operated Watthour Metres (Class 0.1 S, 0.2 S and 0.5 S) and Var-Hour Metres (Class 0.1 S, 0.2 S, 0.5 S and 1 S) — Specification
	संशोधनों की संख्या No. of amendments	:	02
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	NA
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer ANNEX – A
c)	नमूने का परिमाण Sample Quantity	:	01 Meter alongwith Strips of terminal block material (as per Cl. 6.4)
d)	परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर Parameters to be Declared	:	As per Scope of license defined in Sl. No. 6 of PM below

	in Test Request		
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer ANNEX – B
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer ANNEX – C
5.	एक दिन में संभावित परीक्षण Possible tests in a day	:	• General and Constructional Requirements • a.c. High Voltage Test • Insulation Test • Accuracy Requirements (Limits of Error) • Test of starting condition • Test of no-load condition • Power Consumption
6.	लाइसेंस का दायरा /Scope of the Licence:		
“License is granted to use Standard Mark as per IS 14697: 2021 with the following scope:			
Name of the product		a.c. Static Transformer Operated Watthour Metres (Class 0.1 S, 0.2 S and 0.5 S) and Var-Hour Metres (Class 0.1 S, 0.2 S, 0.5 S and 1 S)	
Accuracy Class		Class 0.1S / Class 0.2S / Class 0.5S – Watthour Class 0.1S / Class 0.2S / Class 0.5S / Class 1– Var-hour	
Type		Single-phase 2-wire / Three-phase 3-wire / Three-phase 4-wire	
Current rating(s)		Basic Current (I _b).....A Max. Current (I _{max}).....A	
Voltage		As applicable to the type of meter	
Connection through		Connection through voltage transformer / Connection through current transformer	
Insulating encased		Insulating encased / Non-insulating encased	
Display		Electromechanical / Electronic	

ANNEX -A**Grouping Guidelines**

1. The variety of a.c. Static Transformer Operated Watthour Metres (Class 0.1 S, 0.2 S and 0.5 S) and Var-Hour Metres (Class 0.1 S, 0.2 S, 0.5 S and 1 S) are classified based on the following:

Accuracy Class	Class 0.1S / Class 0.2S / Class 0.5S – Watthour Class 0.1S / Class 0.2S / Class 0.5S / Class 1– Var-hour
Type	Single-phase 2-wire / Three-phase 3-wire / Three-phase 4-wire
Current rating(s)	Basic Current (I_b).....A Max. Current (I_{max}).....A
Voltage	As applicable to the type of meter
Connection through	Connection through voltage transformer / Connection through current transformer
Insulating encased	Insulating encased / Non-insulating encased
Display	Electromechanical / Electronic

2. For considering GoL / CSOL, sample of each type of a.c. Static Transformer Operated Watthour Metres (Class 0.1 S, 0.2 S and 0.5 S) and Var-Hour Metres (Class 0.1 S, 0.2 S, 0.5 S and 1 S) as specified above shall be tested.
3. However, the following relaxation may be considered for GoL/CSOL:
- Same basic current (I_b) and different current ratio (I_{max}/I_b) – One sample of maximum current ratio (I_{max}/I_b) out of the range offered be subjected to all tests.
 - Different basic current (I_b) but same (I_{max}/I_b) – One sample with highest (I_b) be subjected to all tests.
 - 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.

Note 1: Manufacturer shall submit the compliance to the requirement of Clause 6.10 of IS 14697:2021.

Note 2: Manufacturer shall submit an undertaking w.r.t construction and design similarity as per clause 3.1.9 of IS 14697:2021 for the range of varieties which they intend to cover in the licence.

Note 3: Manufacturer shall submit the set of drawings representing each of the variety of a.c. Static Transformer Operated Watthour Metres (Class 0.1 S, 0.2 S and 0.5 S) and Var-Hour Metres (Class 0.1 S, 0.2 S, 0.5 S and 1 S)

4. The Scope of License may be restricted based on the Manufacturing and testing capabilities of the manufacturer.
5. During the operation of License, it shall be ensured that all the varieties covered in the License are tested in rotation, to the extent possible.

ANNEX- B
LIST OF TEST EQUIPMENTS
(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No.	Tests used in with clause reference	Test equipment
1.	General And Constructional Requirements – Cl. 6	Vernier Caliper, Micrometer
2.	Test of Mechanical Requirements – Cl. 12.3 Shock Test – Cl. 12.3.1 Vibration Test – Cl. 12.3.2 Spring Hammer Test – Cl. 12.3.3	Shock Test Device Vibration Test Device Spring Hammer Test Device
3.	Test of Resistance to Heat and Fire – Cl. 12.4	Glow Wire Test Apparatus
4.	Test of Protection against Penetration of Dust and Water – Cl. 12.5	Dust test equipment, Rain Fall Test Equipment
5.	Test for Climatic Influences – Cl. 12.6 Dry Heat Test – Cl. 12.6.1 Cold Test – Cl. 12.6.2 Damp Heat Cycle Test – Cl. 12.6.3	Conditioning Chamber with timer Deep-freezer with timer Conditioning Chamber with timer, Voltmeter and Ammeter and / or Power meter, IR Tester, Functional tester
6.	Test of Power Consumption – Cl. 12.7.1	Power Meter
7.	Test of Influence of Supply Voltage – Cl. 12.7.2	Voltage drop simulation generator
8.	Test of Influence of Short-Time Over Currents – Cl. 12.7.3	Short time overcurrent tester
9.	Test of Influence of Self-Heating – Cl. 12.7.4	Test bench load with phantom system, Reference Standard Meter, Timer / Stopwatch
10.	Test of Influence of Heating – Cl. 12.7.5	Test bench load with phantom system, Reference Standard Meter, Timer / Stopwatch, Thermocouples
11.	Test of Insulation Properties – Cl. 12.7.6 Impulse voltage test – Cl. 12.7.6.2 a.c. Voltage test – Cl. 12.7.6.3 Insulation resistance test – Cl. 12.7.6.4	Impulse Voltage Tester a.c. High Voltage Tester Insulation Tester
12.	Test of Accuracy Requirements – Cl. 12.9	Test bench load with phantom system, Reference Standard Meter
13.	Test of Influence Quantities – Cl. 12.10	
14.	Test of Ambient Temperature Influence – Cl. 12.11	
15.	Test of No-Load Condition – Cl. 12.12	
16.	Test of Starting Conditions – Cl. 12.13	
17.	Test of Meter Constant/Registration – Cl. 12.14	
18.	Limits of Error and Interpretation of Test Results - Cl. 12.15	
19.	Repeatability of Error Test – Cl. 12.16	

ANNEX C

Scheme of Inspection and Testing

1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Control Assurance Plan i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Control system defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.5.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: *a.c. Static Transformer Operated Watthour Meters (Class 0.1 S, 0.2 S and 0.5 S) and Var-Hour Meters (Class 0.1 S, 0.2 S, 0.5 S and 1 S) of same ratings manufactured in a day from the same consignment of raw materials* shall constitute a control unit.

1.3.2 As mentioned above, recommended levels of control are given in **Table 1 for guidance only**.

1.3.3 The tests as indicated in Table 1 and at the levels of control in column 3 of Table 1 or the Quality Assurance Plan as submitted by the manufacturer to BIS may be carried out on the whole production of the factory which is covered by this plan and records maintained in accordance with para 2.3.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING- It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates where test equipment is required in house i.e “R” or whether it can be subcontracted as “S”. Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

2.3 TEST RECORDS- The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the licence shall be marked legibly and indelibly on each a.c. Static Transformer Operated Watthour Metres (Class 0.1 S, 0.2 S and 0.5 S) and Var-Hour Metres (Class 0.1 S, 0.2 S, 0.5 S and 1 S) provided always that the screws so marked conforms to each requirement of the specification.

3.1 Marking on the meters shall be done as per Cl. 7 of IS 14697: 2021.

3.2 **Additional Marking requirements:** The following additional requirement shall also be marked on the packaging of the meters:

a) “For BIS certification details please visit www.bis.gov.in”

3.3 All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark.

4. HYGIENIC CONDITIONS (if applicable) – NA.

5. REJECTION - 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				
6.4	Terminals, Terminals block(s) and Protective Earth Terminal	6.4	IS 14697	S	One	Each Consignment	No further testing is required, if accompanied with test certificate or ISI marked.
6.5	Terminal Cover(s)	6.5.1 6.5.2	IS 14697				
6.1,6.2, 6.3	General and Constructional Requirements	6.1,6.2, 6.3	IS 14697	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity			
6.7	Insulating Encased Meter	6.7	IS 14697				
6.6	Clearance and Creepage Distance	6.6 12.7.6.2	IS 14697				
6.10	Display of Measured Values	6.10	IS 14697				
6.11	Output Device	6.11	IS 14697				
9.1	Power Consumption	9.1 12.7.1	IS 14697	S	One	Once in three months	For each of the variety manufactured during that period
9.1.1	Power Consumption in Voltage Circuit						
9.1.2	Power Consumption in Current Circuit						
9.2	Influence of Supply Voltage	12.7.2	IS 14697	S	One		
	Voltage Range						
	Voltage Dips and Interruptions						
	Short-Time Over current	12.7.3	IS 14697				
9.4	Influence of Heating	9.4	IS 14697	S	One	Once in six months	For each of the variety manufactured during that period
	Test of Influence of Self-Heating	12.7.4					
	Test of Influence of Heating	12.7.5					

9.5	Insulation	9.5	IS 14697	R	Each meter		
12.7.6.2	Impulse voltage test	12.7.6.2					
12.7.6.3	a.c. Voltage test	12.7.6.3					
12.7.6.4	Insulation resistance test	12.7.6.4					
9.6	Immunity to Earth/Phase Fault	9.6 12.17 Annex - J	IS 14697	S	One	Once in six months	For each of the variety manufactured during that period
11	Accuracy Requirements						
11.1	Limits of Error Due to Variation of the Current	11.1 12.9.1	IS 14697	R	Each meter		
11.2	Limits of Error due to Other Influence Quantities	11.2 12.9.1	IS 14697	S	One	Once in six months	For each of the variety manufactured during that period
11.3	Limits of Error Due to Ambient Temperature Variation	11.3 12.9.1	IS 14697	S	One	Once in six months	
11.4	Starting and Running with No-Load	11.4	IS 14697	R	Each meter		
	Initial Start-up of the Meter	11.4.1					
	Running with No-Load	11.4.2 12.12					
11.5	Starting Current	11.5	IS 14697	R			
11.6	Meter Constant	11.6	IS 14697	R			
11.7	Repeatability of Error Test	11.7 12.16	IS 14697	R			
12.3	Test of Mechanical Requirements						
12.3.1	Shock Test	12.3.1 -	IS 14697 IS 9000 (Part 7/Sec 1)	S	One	Once in six months	For each of the variety manufactured during that period
12.3.2	Vibration Test	12.3.2 -	IS 14697 IS 9000 (Part 8)	S	One	Once in six months	
12.3.3	Spring Hammer Test	12.3.3 -	IS 14697 IEC 60068-2-75	S	One	Once in six months	
12.4	Test of Resistance to Heat and Fire	12.4 -	IS 14697 IS 11000 (Part 2/Sec 1)	S	One	Once in six months	

12.5	Test of Protection against Penetration of Dust and Water	-	IS/IEC 60529	S	One	Once in six months	For each of the variety manufactured during that period
12.5 a)	Protection against penetration of dust	12.7.6.4	IS 14697				
12.5 b)	Protection against penetration of water	12.7.6.4	IS 14697				
12.6	Test for Climatic Influences			S	One	Once in six months	For each of the variety manufactured during that period
12.6.1	Dry Heat Test	12.6.1	IS 14697				
		-	IS 9000 (Part 3/Sec 3)				
12.6.2	Cold Test	12.6.2	IS 14697				
		-	IS 9000 (Part 2/Sec 3)				
12.6.3	Damp Heat Cycle Test	12.6.3	IS 14697				
		-	IS 9000 (Part 5/Sec 2)				
10	ELECTROMAGNETIC COMPATIBILITY (EMC)	10	IS 14697	S	One	Once in every three year	For each of the variety manufactured during that period
10.1	Immunity of Electromagnetic Disturbance	12.8					
	Test for Immunity to Electrostatic Discharge (ESD)	12.8.2					
	Test for Immunity to Electromagnetic HF Fields	12.8.3					
	Fast Transient Burst Test	12.8.4					
	Surge Immunity Test	12.8.5					
	Radio Interference	12.8.6					
10.2	Suppression						