



**PRODUCT MANUAL FOR
SHUNT POWER CAPACITORS OF THE SELF-HEALING TYPE
FOR AC SYSTEMS HAVING A RATED
VOLTAGE UPTO AND INCLUDING 1000V
ACCORDING TO IS 13340(Part 1):2012/IEC 60831-1:2002**

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 licence/certificate.

1.	Product	:	IS 13340(Part 1):2012/IEC 60831-1:2002
	Title	:	Shunt Power Capacitors of the self-healing type for AC systems having a rated voltage upto and including 1000V
	No. of amendments	:	Nil
2.	Sampling Guidelines		
a)	Raw material	:	NA
b)	Grouping Guidelines	:	Please refer Annex - A
c)	Sample Size	:	1 Capacitor + 2 dummy capacitors
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 13340(Part 1):2012/IEC 60831-1:2002 with the following scope:		
	Name of the product	Shunt power capacitors of the self-healing type for AC systems	
	Type	Ratings _____ kVAR, _____ V, _____ Hz, _____ phase, with _____ connection, temperature categories _____, Insulation levels _____.	

ANNEX A

Grouping Guidelines

1. The parameters as given below shall be considered for grouping of ‘Shunt power capacitors of the self-healing type for AC systems having a rated voltage up to and including 1000 V’ as per IS 13340 (Part 1) : 2012/ IEC 60831-1 : 2002 for GOL/CSoL:
 - i. Rated Output
 - ii. Rated Voltage
 - iii. Rated frequency
 - iv. Temperature category
 - v. No. of phases
 - vi. Type of connection
2. Capacitors with different rated outputs shall be considered as one group, provided the parameters stated at 1(ii), 1(iii) & 1(iv) remain the same. Capacitors with the highest rated output in a group shall be tested for covering the entire range of capacitors in that group.
3. If capacitors with wider temperature category are tested, capacitors with a narrower operating temperature range shall also be covered. For e.g., if temperature category -5/B is tested, temperature categories -5/A, +5/A and +5/B shall also be covered.
4. Capacitors with lower insulation levels shall be covered if capacitors with higher insulation levels are tested. For e.g, Capacitor with insulation level 3/- kV shall be covered if capacitor with insulation level 3/8 kV is tested.
5. To cover all varieties in the scope of the Licence with respect to number of phases and type of connection, at least one three phase capacitor of each connection type and one single phase capacitor shall be tested.
6. The Firm shall declare the varieties of Capacitors they intend to cover in the Licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.
7. Power Filter Capacitors, if intended to be covered, shall be tested independently for all applicable requirements.
8. 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	Capacitance Bridge	Capacitance Measurement - Cl. No. 7
2	Loss Factor Meter	Tan delta measurement - Cl. No. 8, 13, 14
3	High Voltage tester	Voltage Test between terminals - Cl. No. 9.1, 9.2 Voltage test between terminals and container - Cl. No. 10.1,10.2
4	Heating Oven and temperature recorder	Sealing test - Cl. No. 12
5	Servo Stabilizer, Reactors, Heating Oven and temperature recorder	Thermal stability test - Cl. No. 13
6	Break Down Tester	Discharge Test - Cl. No. 16
7	Thermal stability unit, Charge discharge unit, Temperature recorder	Ageing test - Cl. No. 17
8	Multimeter	Test of internal discharge device – Clause 11

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 requirements of IS 13340 (Part 1):2012/ IEC 60831-1:2002

4. 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.

5. 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
		Clause	Reference			
7	Capacitance measurement and output calculation	7	IS 13340 (Part 1)	R	Every capacitor unit/ bank	
8	Measurement of the tangent of the loss angle ($\tan \delta$) of the capacitor	8	IS 13340 (Part 1)	R		
9.1	Voltage tests between terminals	9.1	IS 13340 (Part 1)	R		
10.1	Voltage tests between terminals and container	10.1	IS 13340 (Part 1)	R		
11	Test of the internal discharge device	11	IS 13340 (Part 1)	R		
12	Sealing test	12	IS 13340 (Part 1)	R		
22 -25	Safety requirements	22 - 25	IS 13340 (Part 1)	R		
9.2	Voltage tests between terminals	9.2	IS 13340 (Part 1)	S	One	Once in six months from each type and design of capacitor unit/ capacitor bank
10.2	Voltage tests between terminals and container	10.2	IS 13340 (Part 1)	S		
13	Thermal stability test	13	IS 13340 (Part 1)	S		
14	Measurement of the tangent of the loss angle ($\tan \delta$) of the capacitor at elevated temperature	14	IS 13340 (Part 1)	S		
16	Discharge Test	16	IS 13340 (Part 1)	S		
18	Self-healing test	18	IS 13340 (Part 2)	S		
15	Lightning impulse voltage test between terminals and container	15	IS 13340 (Part 1)	S	One	Once in three years from each type and design of capacitor unit/ capacitor bank
17	Ageing test	17	IS 13340 (Part 2)	S		
19	Destruction test	19	IS 13340 (Part 2)	S		

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

Note-2: Levels of control given in column 3 are obligatory in nature.

ANNEX D

Possible Tests in a day

- (a) Capacitance Measurement and output calculation
- (b) Measurement of the tangent of the loss angle($\tan \delta$) of the capacitor
- (c) Voltage tests between terminals
- (d) Voltage tests between terminals and container
- (e) Test of the Internal Discharge Device
- (f) Sealing test