

PRODUCT MANUAL FOR SINGLE PHASE A.C. INDUCTION MOTORS FOR GENERAL PURPOSE ACCORDING TO IS 996: 2009

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 996: 2009
	Title	:	SINGLE PHASE A.C. INDUCTION MOTORS FOR GENERAL PURPOSE
	No. of Amendments	:	1
2.	Sampling Guidelines:		
a)	Raw material	:	Insulating Material - IS 1271 Enclosure – IS/IEC 60034-5 Capacitors- IS 2993
b)	Grouping guidelines	:	Please refer ANNEX – A
c)	Sample Size	:	1
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 :		
	All tests except Moisture Proofness (Cl. 13.2)		
6.	Scope of the Licence :	Please refer ANNEX – D	

ANNEX A

Grouping Guidelines

1. The parameters as given below shall be considered for grouping of ‘Single Phase a.c. Induction Motors for general purpose’ as per IS 996: 2009 for GOL/Inclusion :
 - i. Rated Output: 2.5 W to 2200 W (preferred ratings or others)
 - ii. Rated Voltage: 230 V preferred or others upto and including 250V.
 - iii. Number of Poles: 2, 4, 6
 - iv. Starting method: Capacitor- start Induction- run, Capacitor start- and- run, Capacitor- start capacitor- run , Split-phase, Shaded pole
 - v. Insulation Class: A, E, B, F, H
 - vi. Duty: Continuously rated, Short time rated for preferred periods
 - vii. Type of enclosures: Based on different degrees of protection, as given in the Standard.
2. Motors with rated output from 2.5 W to 2200 W shall be considered as one group, provided the rated voltage and number of poles remain the same. Motors with the lowest and the highest rated output in a group shall be tested for covering the entire range of the motors in that group.
3. If motors with superior degree of protection is tested, motors with lower degree of protection shall also be covered.
4. To cover all varieties in the scope of the Licence with respect to Starting method, Insulation Class and Duty above, at least one variety of a motor of each Starting method, Insulation Class and Duty shall be tested
5. Fan duty motors, if intended to be covered, shall be tested independently for all applicable requirements.
6. The Firm shall declare the varieties of various Single Phase a.c. Induction Motors they intend to cover in the Licence. The Scope of Licence shall be restricted based on the Manufacturing capability and Testing facilities of the Manufacturer.
7. 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.	Tests used in with Clause Reference	Test Equipment
1.	Switching operation of centrifugal switch at no load as per Cl. 9.4.6.1	a) Test bench with Ammeter
2.	No-load current, power input and speed at rated voltage and frequency as per Cl. 17.3(a)	a) Voltmeter b) Ammeter c) Wattmeter d) Tachometer e) Dynamometer/ Rope and Pulley arrangement
3.	Test for torques at rated voltage and frequency as per Cl. 17.3(b)	
4.	Test for breakaway starting current at rated voltage and frequency as per Cl. 17.3(c)	
5.	Test for Full load performance at rated voltage and frequency as per Cl. 17.3(d)	a) Voltmeter b) Ammeter c) Wattmeter d) Tachometer e) Power factor meter
6.	Temperature rise test as per Cl. 17.3(e)	a) Milliohm meter b) Temperature indicator
7.	Momentary overload test as per Cl. 17.3(f)	a) Dynamometer/ Rope and Pulley arrangement
8.	Insulation resistance as per Cl. 17.3(g)	a) Megohm Meter
9.	High voltage Test as per Cl. 17.3 (h)	a) High Voltage Tester b) Voltmeter c) Stopwatch
10.	Moisture Proofness test as per Cl. 17.3 (j)	a) Humidity chamber with Temperature and Humidity controller
11.	Leakage current test as per Cl. 17.3 (k)	a) Milli ammeter
12.	Vibration as per Cl. 17.3 (m)	a) Vibration Tester
13.	Dimensions as per Cl. 17.3(n)	a) Vernier Callipers b) Micrometer c) Measuring tape

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 996: 2009.

4. CONTROL UNIT –Motors of the same rating and 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.

5.1 All the production which conforms to the Indian Standard and covered by the licence should be marked with Standard Mark.

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				
9	General Construction	9	IS 996	R	Each Motor		#
17.4	Switching operation of centrifugal switch at no load	9.4.6	IS 996	R	Each Motor		
17.3(a)	No-load current, power input and speed at rated voltage and frequency		IS 996	R	Each Motor		
17.3(c)	Breakaway starting current at rated voltage and frequency	12.5.1	IS 996	R	Each Motor		
17.3(g)	Insulation resistance	12.7	IS 996	R	Each Motor		
17.3(h)	High voltage	13.1	IS 996	R	Each Motor		
17.3(b)	Break away (starting), pull-up and pull-out torques at rated voltage and frequency	12.1.1	IS 996	S	1 motor	Once a month for each type and rating	
17.3(e)	Temperature rise	12.2	IS 996	S	1 motor	Once a month for each type and rating	
17.3(f)	Momentary overload	12.1.2	IS 996	S	1 motor	Once a month for each type and rating	

(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				
17.3(d)	Full-load performance at rated voltage and frequency	12.5.1	IS 996	S	1 motor	Once a month for each type and rating	
17.3(k)	Leakage current	13.3	IS 996	S	1 motor		
17.3(j)	Moisture proofness	13.2	IS 996	S	1 motor	Once in a month from identical type and design	
17.3(m)	Vibration	12.6	IS 996	S	1 motor	Once in three months from identical type and design	
17.3(n)	Dimensions	7	IS 996	R	1 motor	Every 50 motors of identical type and design produced	
10.1	Enclosure	10.1	IS 996	S	1 motor	Once in three years from each type of enclosure	Enclosures shall meet the requirements of IS/IEC 60034-5 as applicable

No further testing is required if accompanied with test certificate or ISI marked.

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 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

“Licence is granted to use Standard Mark as per IS 996: 2009 with the following scope:	
Name of the product	Single Phase A.C. Induction Motors For General Purpose
Ratings	Rated VoltageV, 50Hz,W,
Type	2/4/6 pole, Capacitor-start Induction-run/ Capacitor start-and-run/ Capacitor-start capacitor-run /Split-phase /Shaded pole type, Continuously rated/ Short time rated for minutes,
Insulation Class	A/E/B/F/H
Degree of Protection against Moisture	IPXX (and lower)
Any other aspect required as per the Standard	Declared Values as given below to be obtained from the manufacturer

Declared Values of Single Phase A.C. Induction Motors for General Purpose as per IS: 996:2009.

Type of Motor :

Rated Output (Watts) :

Pull Out Torque (Min.) :

Pull Up Torque (Min.) :

Breakaway Torque (Min.) :

Full Load Current (Max.) :

Breakaway Starting Current (Min.) :

Speed on Load (Min.) :

PF or $PF \times \eta$ (Min.) :

Value of capacitor(s) and voltage rating of capacitor(s) :

Type of duty rating :

Type of Enclosure :