



उत्पाद मैनुअल
निमंज्जन पंपसेटों के लिए लाइन संचालित ए.सी. मोटर
आईएस 9283: 2024 के अनुसार

PRODUCT MANUAL
LINE OPERATED a.c. MOTORS FOR SUBMERSIBLE PUMPSETS
according to IS 9283: 2024

यह उत्पाद नियमावली सभी क्षेत्रीय/शाखा कार्यालयों और लाइसेंसधारियों द्वारा विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना-1 के अंतर्गत प्रमाणन के संचालन में एकरूपता और पारदर्शिता सुनिश्चित करने के लिए संदर्भ सामग्री के रूप में उपयोग की जाएगी। बीआईएस प्रमाणन प्राप्त करने के इच्छुक भावी आवेदक भी इस दस्तावेज़ का उपयोग कर सकते हैं।

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 9283: 2024
	शीर्षक / Title	:	LINE OPERATED a.c. MOTORS FOR SUBMERSIBLE PUMPSETS
	संशोधनों की संख्या No. of amendments	:	1
2.	नमूनाकरण दिशानिर्देश / Sampling Guidelines		
a)	कच्चा माल Raw material	:	Table 1 of IS 9283:2024. <i>Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance.</i>
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer ANNEX – A
c)	नमूने का परिमाण / Sample Quantity	:	1 number
d)	परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर Parameters to be Declared in Test Request	:	Parameters as given in scope of licence, Declared performance values (if applicable as per cl.11.1) <i>Note: Apart from the above, any other requirements/ parameters may also be declared as per the standard, as applicable.</i>
3.	परीक्षण उपकरण की सूची List of Test Equipment	:	Please refer ANNEX – B

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4.	निरीक्षण एवं परीक्षण योजना Scheme of Inspection and Testing	:	Please refer ANNEX – C
5.	एक दिन में संभावित परीक्षण Possible tests in a day	:	All tests as per IS 9283: 2024. <i>Note: This section is for the guidance of BIS Certification Officers/ Technical Auditors of BIS Authorized Outside Surveillance Agencies(OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/ auditor.</i>
6.	लाइसेंस का दायरा /Scope of the Licence:		

“License is granted to use Standard Mark as per **IS 9283: 2024** with the following scope:

Name of the product	Line Operated a.c. Motors for Submersible Pumpsets
Rating	____kW, ____V, ____Hz, ____Phase
Bore Size	____mm
No. of poles	2/ 4
Efficiency class	EL1/EL2/ EL3/ EL4/ EL5
Type	Water filled/ Oil filled/ Resin filled
Type of Motor (cl.12.1)	
Type of bearing	Anti-friction/ Journal

ANNEX -A

Grouping Guidelines

1. The following parameters are taken into consideration for the purpose of grouping:
 - i. Dimensions: *Maximum overall diameter of submersible motor for borewell applications: 98mm/120 mm/ 146 mm/ 196 mm/ Other applications including openwell submersible pumpset*
 - ii. Type of bearing: *Anti friction/Journal*
 - iii. Number of poles: *2/ 4*
 - iv. Type of motor (Cl.12.1)
 - v. Efficiency class: *EL 1, EL 2, EL 3, EL 4, EL 5*
 - vi. Type: *Water filled/ Oil filled/ resin filled*
 - vii. No. of phases: *Single phase/ Three phase*
 - viii. Rated Output: *0.37 to 2.2 kW (Single phase) and 0.75 kW to 75 kW (Three phase)*

Submersible motors with rated outputs as given above, having same other classifications are considered as one group. Motors with lowest and highest rated output in the group shall be tested for covering the entire range of the motors in that group. If the range consists of more than 10 motors, one intermediate rating of motor shall also be tested.

2. The following relaxation may be given when a group of motors is tested for all the requirements:
 - i. If a motor with superior efficiency class is tested, then motors with lower efficiency class shall also be covered. *For example, if motor of EL 5 is tested, EL 4, EL 3, EL 2, EL 1 shall also be covered or if EL4 is tested EL 3, EL2, EL1 shall also be covered.*
 - ii. By testing motors of any one rated voltage, motors with other rated voltages can also be covered.
3. If the licensee applies for covering the output ratings for which performance values are not given in the standard, the highest rating applied shall be tested and their performance values shall not be lower than the values of highest rating mentioned for that size & type in the standard. *For example, if a licensee applies to cover in 7.5 kW three phase in 98 mm size, the performance values shall not be lower than that of 5.5 kW mentioned in the respective table.*
4. The Firm shall submit the declaration for each of the parameters as specified in scope of the licence for each model of 'Submersible motor' they intend to cover in the scope of licence. The Scope of Licence may be restricted based on the Manufacturing and Testing capabilities of the Manufacturer.
5. During the operation of the Licence, BO shall ensure all the varieties covered in the Licence are tested in rotation to the extent possible.

ANNEX- B
List of Test Equipments
(Indicative List, For Guidance Only)

Sl. No.	Test Equipment	Clause Reference of tests used for
1.	Surface Comparator	Cl. 5.5
2.	Dynamic Balancing Machine	Cl. 5.6
3.	Vernier Caliper	Cl. 7
4.	Micrometer	
5.	Steel ruler	
6.	Magnetic Stand with dial indicator for Shaft Extension Runout, Concentricity, Perpendicularity.	
7.	Insulation Tester	Cl. 16.1 a, 16.2 a
8.	High voltage tester	Cl. 16.1 b, 16.2 b
9.	Auto transformer	Cl. 16.2 c, 16.2 d, 16.1 f, 16.1 g, 16.1 h, 16.1 j, 16.1 k.
10.	Current transformer	Cl. 16.2 c, 16.2 d, 16.1 f, 16.1 g, 16.1 h, 16.1 j, 16.1 k.
11.	Frequency Meter	Cl. 16.2 c, 16.2 d, 16.1 f, 16.1 g, 16.1 h, 16.1 j, 16.1 k, 18.1
12.	Voltmeter	Cl. 16.2 c, 16.2 d, 16.1 f, 16.1 g, 16.1 h, 16.1 j, 16.1 k, 18.1
13.	Ammeter	Cl. 16.2 c, 16.2 d, 16.1 f, 16.1 g, 16.1 h, 16.1 j, 16.1 k, 18.1
14.	Wattmeter	Cl. 16.2 c, 16.2 d, 16.1 d, 16.1 f, 16.1 g, 16.1 h., 18.1
15.	Tacho meter	Cl. 16.1 d, 16.1 g, 16.2 c
16.	Digital Slip speed Meter with Slip coil	Cl. 16.2 c, 16.1 g, 16.1 h
17.	Milli Ohm meter	Cl. 16.1 c, 16.1 j, 16.1 k.
18.	Thermo meter	Cl. 16.1 c, 16.1 j, 16.1 k
19.	Motor load testing bed & Spring balance/ Torque bench brake drum	Cl. 16.1 g, 16.1 h, 16.2 d, 18.1
20.	Sump	Cl. 16.1 & 16.2
21.	Milli Ammeter	Cl. 22

The above list is indicative only and may not be treated as exhaustive.

ANNEX C

Scheme of Inspection and Testing

1. QUALITY ASSURANCE PLAN

1.1 It is expected that during operation of BIS licence manufacturers will implement a Quality Assurance Plan (QAP) 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 Assurance Plan (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or sub-contracting/ sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

1.3 Recommended Levels of Control/ Control Unit:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: *All motors of same model manufactured in a day* shall constitute a control unit.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in Table 1. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan.

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

2. ENSURING COMPLIANCE THROUGH TESTING

The manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred:

- i) Shared testing resources like common facility,
- ii) Cluster based testing facility,
- iii) Sub-contracting to outside laboratories which may either be:
 - a) BIS recognised/ empanelled laboratories, or
 - b) Any accredited laboratory as per ISO/IEC 17025

2.1 Test Records- The manufacturers shall maintain test records for the tests carried out (either in-house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted at a shared test facility, test results issued by the laboratories or test facilities, shall be made available for inspection by BIS.

3. PACKING AND MARKING

The Standard Mark as given in the Schedule of the licence shall be incorporated legibly and indelibly on each Motor and also on its packaging provided always that the motor so marked conforms to each requirement of the specification.

3.1 Marking on each Motor shall be done as per Cl. 15 of IS 9283: 2024.

3.2 **Additional Marking requirements:** The motor shall also be marked with the following additional requirement on each packing:

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

4. REJECTION

The production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. 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
(Recommended Levels of Control by BIS- for Guidance Only)

(1)				(2)		
Test Details				Levels of Control		
Cl.	Requirement	Test Methods		No. of Sample	Frequency	Remarks
		Clause	Reference			
5.1.2	Material	Cl. 5.1.2 Table 1	IS 9283	No further testing is required, if accompanied with Test Certificate or ISI Marked.		
5.2	Earthing	5.2	IS 9283			
5.3	Foreign Matter	5.3	IS 9283	Manufacturer shall exercise adequate levels of control to ensure that entire production should conform to the Standard. Appropriate records of testing indicating conformity shall be maintained.		
5.4	Construction a) Type of cable b) Size of conductor of cable c) Length of cable d) Joint in Cable	5.4 5.4.1 5.4.1 5.4.2 5.4.3	IS 9283			
5.5	Finish of Bearings	5.5	IS 9283& IS 3073			
5.6	Balancing of Rotor	5.6	IS/ISO 21940-11			
7	Dimensions and Tolerances					
7.1	Dimensions	7.1	IS 9283			
7.2	Tolerances a) For motors with anti-friction bearing	7.2.1, Table 6,7	IS 9283, IS 2223			
	b) For motors with journal bearing	7.2.2	IS 9283			
13	Terminal Marking	13	IS 9283			
12	Efficiency	12.1	IS 9283			
16.2(a)	Insulation resistance before HV test	21	IS 9283			
16.2(b)	High Voltage Test	20	IS 9283			
16.2(c)	No-load running of Motor and reading of Current, Voltage, Power & Speed	8.1	IS 4029			
		8.1	IS 7572			
16.2(d)	Locked rotor reading of voltage, current and power input	8.3	IS 4029			
		8.2	IS 7572			
16.2(e)	Reduced voltage running up test at no-load	16.2(e)	IS 9283	5 Motor Each Control Unit		
16.1(a)	Insulation resistance Test after HV Test	21	IS 9283			
16.1(c)	Measurement of Stator Resistance	7	IS 4029			
		7	IS 7572			
16.1(f)	Locked rotor torque	8.3	IS 4029			
		8.2	IS 7572			
16.1(g)	Full Load Reading of voltage, current, power input, speed and frequency	8.8	IS 4029			
		8.4	IS 7572			
16.1(h)	Performance characteristics	11.1	IS 9283			
16.1(j)	Temperature rise test at rated voltage	19	IS 9283			
16.1(k)	Temperature rise test at reduced voltage	19	IS 9283			
16.1(m)	Momentary Overload Test	18	IS 9283			
16.1(n)	Leakage Current Test at rated voltage at no load	22	IS 9283			