



PRODUCT MANUAL FOR SOLAR PHOTOVOLTAIC WATER PUMPING SYSTEMS - PART 1 CENTRIFUGAL PUMPS AS PER IS 17018(PART 1):2022

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 17018(PART 1):2022
	Title	:	Solar photovoltaic water pumping systems- Centrifugal Pumps.
	No. of Amendments	:	Nil
2	Sampling Guidelines		
a)	Raw material		- Material of Pump and all external parts of motor used in submersible pump which are in contact with water- Grade 304 or higher as per IS 6911 and IS 3444 - Suction/Delivery pipe- As per Cl. 4.4.4 - Module Mounting Structures and Tracking system- As per Cl. 4.5 - SPV Pump Controller- As per Cl. 4.6 - Solar Photo Voltaic (SPV) array- BIS Certified (Registered under Scheme-II of BIS (Conformity Assessment) Regulations)
b)	Grouping guidelines	:	Please refer ANNEX-A
c)	Sample size	:	One complete unit of solar PV water pumping system
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		Constructional requirements/features (for a.c. induction pump sets), General requirements (for a.c. induction pump sets), Design features (for a.c. induction pump sets), Insulation resistance test, High Voltage test, Leakage Current test, as per Cl. 6.1
6	Scope of Licence:		Please refer ANNEX- D

ANNEX - A

Grouping Guidelines

1. The following guidelines shall be followed for grouping of Solar Photovoltaic Water Pumping Systems as per IS 17018(Part1):2022 for GoL/CSoL:
 - a) A 'series' may be defined as a group of pump sets of the same type having the same Head, Discharge and Delivery Size. Any change in these parameters will be treated as a different series.
 - b) Sample from each series shall be tested to cover entire variety in that particular series.
 - c) Alternate models of a controller used with a particular variety of pumpset and PV array already covered in the scope of licence may be permitted provided the alternate models have the same efficiency, voltage range, Power range and current rating.
 - d) Similarly alternate models of a PV array used with a particular variety of pumpset and controller already covered in the scope of licence may be permitted provided the alternate models have the same rating in Watts peak (W_p).
2. The Firm shall declare the varieties of Solar Photovoltaic Water Pumping Systems intended to be covered in the Licence. The Scope of Licence may be restricted based on the manufacturing and testing capabilities of the Manufacturer.
3. 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	Performance requirements, Cl. 5.1, Cl. 7.1	Automatic testing panel, Sun simulator as per IS 17429, Pyranometer, Electromagnetic flow meter of adequate size etc.
2	Insulation Resistance test, Cl. 6.1	Megger or any such suitable arrangement to measure resistance
3	High Voltage test, Cl. 6.1	HV Test pannel
4	Leakage current test, Cl. 6.1	Mili Ampere meter with test set up
5	Salt mist corrosion test, Cl. 4.3.6	Test set up as per IS/IEC 61701

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 17018 (Part 1) : 2022. The Standard Mark, as given in the Schedule of the licence, shall be marked on each Pump provided always that the Pump thus marked conforms to all the requirement of the specification.. In addition, the licence no. CM/L-_____ and details of BIS website shall be marked at an appropriate place as follows: “For details of BIS certification please visit www.bis.gov.in”

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.

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

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

Table 1

(1)				(2)	(3)		
Test Details				Test equipment requirement	Levels of Control		
Cl.	Requirement	Test Methods		R: required (or) S: Sub-contracting permitted	No. of Sample	Frequency	Remarks
		Clause	Reference				
4	CONSTRUCTIONAL FEATURES						
4.2.3	Provision for remote monitoring	4.2.3	IS 17018 (Part 1)	R	Each Pump controller		Only visual examination
4.3	Solar Photo Voltaic (SPV) Array	4.3.1, 4.3.2, 4.3.3	IS 17018 (Part 1) , IS14286 /IEC 61215	S	One	Each consignment	Only BIS Certified SPV array shall be used.
		4.3.4, 4.3.5, 4.3.6, 4.3.7, 4.3.8, 4.3.9	IS 17018 (Part 1) IS 17210 (Part 1), IS14286 /IEC 61215	S	One	Each consignment	Only BIS Certified SPV array shall be used. For other materials, No further testing is required, if accompanied with test certificate

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4.4	Motor- Pump set	4.4.1, 4.4.2	IS 17018 (Part 1)	S	One	Each consignment	Type of motor pump set and its rating shall be declared and record maintained.
4.4	Motor- Pump set Material	4.4.3, 4.4.4	IS 17018-1 IS 6911 IS 3444 IS 10804	S	One	Each consignment	Product as per IS 6911 is under mandatory BIS Certification and only BIS Certified raw material shall be used in manufacturing of components as required in IS 17018 (Part 1). For other materials, no further testing is required if accompanied with test certificate or ISI Marked
4.5	Module Mounting Structures and Tracking system Material and foundation	4.5.1	IS 17018 (Part 1) IS 822 IS 4759	R	One from a batch of MMS manufactured and hot dip galvanized together		
		4.5.2	IS 17018 (Part 1)	R	Each MMS and Tracking system		Only visual examination
		4.5.3	IS 17018 (Part 1) IS 6911 IS 5624 IS 6403/ IS 456/ IS 4091/ IS 875	R	Each MMS and Tracking system		Material and foundation shall be declared and record maintained

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	Design of MMS	4.5.4 Annex B	IS 17018 (Part 1)	R	Each MMS and Tracking system		
4.6	SPV Pump Controller	4.6.1, 4.6.2, 4.6.3	IS 17018 (Part 1)	S	One	Each Consignment	No testing is required if accompanied with test certificate or ISI Marked.
		4.6.4, 4.6.5	IS 17018 (Part 1) IS/IEC 60947-2 IS/IEC 60947-3 IS 694 IS 9968-1	S	D.C. Switch or D.C circuit breaker covered under compulsory BIS Certification scheme shall be BIS certified. Cables shall be ISI Marked.		
4.7	Earthling arrangement	4.7.1, 4.7.2, 4.7.3, 4.7.4	IS 17018 (Part 1) IS 9283 and IS 3043	R	Each SPV Water Pumping system		
5, 6	TESTS FOR HYDRAULIC AND ELECTRICAL PERFORMANCE OF PUMPSET						
5, 6.1	Performance (with Sun simulator)	6.2	IS 17018 (Part 1) IS 17429	S	One pump-set of each motor rating (Out of every 1000 or once in 6 months whichever is earlier)		—

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	Performance (real condition testing)	6.2	IS 17018 (Part 1) IS 17429	S	One pump-set of each motor rating (Out of every 2500 or once in 6 months, whichever is earlier)	—
	Insulation resistance test	6.1 (d)	IS 17018 (Part 1)	R	Each motor-pump set	
	High Voltage test	6.1 (e)	IS 17018 (Part 1)	R	Each motor-pump set	
	Leakage Current test	6.1 (f)	IS 17018 (Part 1)	R	Each motor-pump set	

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

SCOPE OF LICENCE

“Licence is granted to use Standard Mark as per IS 17018 (Part 1) with the following scope:

[illegible]