SIEMA DRAFT

Schedule 7 – Pump Sets

Technical Specifications - Agricultural Pump Sets

1. Scope

1.1 This standard specifies the requirements for participating in the energy labeling scheme for pump sets for Agricultural and Domestic applications covering mono block pump sets, submersible pump sets and open well submersible pump sets.

1.2 The referred Indian standard are IS 9079 : 2002 Electric Mono set pumps for clear, cold water for agricultural and water supply purposes, IS 8034 : 2002 Submersible pump sets, IS 14220 : 1994 open well submersible pump sets.

Sr No.	Product Detail Electrical Pumps	Range kW	No. Of pole	Applicable IS
1	Single phase Open well Submersible pump sets	0.37, 0.5, 0.75, 1.1, 1.5, 2.2	2	IS 14220 : 1994
2	Three phase Open well submersible pump sets	1.1, 1.5, 2.2, 3.0, 3.7, 4.5, 5.5, 7.5, 9.3, 11, 13, 15	2	IS 14220 : 1994
3	Single phase submersible pump sets	0.37, 0.5, 0.75, 1.1, 1.5, 2.2	2	IS 8034 : 2002
4	Three phase submersible pump sets	1.1, 1.5, 2.2, 3.0, 3.7, 4.5, 5.5, 7.5, 9.3, 11, 13, 15, 18.5, 22, 26, 30, 37, 45, 55, 63, 67, 75	2	IS 8034 : 2002
5	Single phase mono set pumps	0.37, 0.5, 0.75, 1.1, 1.5, 2.2	2	IS 9079 : 2002
6	Three phase mono set pumps	1.1, 1.5, 2.2, 3.7, 5.5, 7.5, 9.3, 11, 15, 18.5, 22	2	IS 9079 : 2002

1.3 The standard ratings covered under the energy labeling scheme are as follows:

Table : 1

Schedule of Tests:

1.1 Method of Tests:

The testing code and procedure for Electric Mono set pumps, Submersible pumps sets and Open well submersible pumps sets would be as per IS 11346 : 2002 with all amendments as of date.

1.2 Parameters to be tested:

Parameters for initial verification and challenge testing are guaranteed performance of nominal volume rate of flow, nominal head and overall efficiency of the pump set at the duty point.

The Open well submersible pump sets shall meet the requirements of performance in clause 10.2 (10.2.1 through 10.2.3) of IS 14220 : 1994.

The submersible pump sets shall meet the requirements of performance in Clause 15.2 (15.2.1 and 15.2.2) of IS 8034 : 2002.

The Electric Mono set pump shall meet the requirements of performance in Clause 13.2 (13.2.1 and 13.2.2) of IS9079 : 2002.

1.3. Test Report:

The test reports shall be reported as per the format in Annexure C & D of IS 11346 : 2002

2. Tolerances:

The tolerance shall be as specified in IS 11346: 2002. However, there shall be no negative tolerance on overall efficiency declared for star rating band, the average products tested must be at par or better than the label threshold.

3. Rating Plan:

Rating plan will as below

TABLE : 2

Star Rating	Overall Efficiency of the Pump Set*(multiplying factor – times the BIS value)
1 Star	**>=1.00 & <1.05**
2 Star	**>=1.05 & <1.10**
3 Star	**>=1.10 & <1.15**
4 Star	**>=1.15 & <1.20**
5 Star	**>=1.20**

a. To derive the overall efficiency, for the Three Phase open well and submersible pump sets from 1.1kW. to 15kW the pump efficiency value shall be taken from IS 14220:1994 (Fig 5) . The TABLE: 2 shall be applicable to derive at the appropriate star rating.

b. For the Single Phase openwell pump sets, following motor efficiency factors shall be considered to arrive the minimum overall efficiency with the pump efficiency value obtained from the Fig. 5 of IS 14220:1994. The TABLE: 2 shall be applicable to derive at the appropriate star rating.

c. For the single Phase and three phase Borewell submersible pump sets the following motor efficiency factors shall be used to derive the overall Efficiency, while the pump efficiency with flow upto 7 lps, will be derived from the Fig 4 and Fig 5 of IS 8034:2002, after multiplying the both the minimum overall efficiency will be derived,

d. For arriving the overall efficiency of the Borewell submersible pumpsets having flow rate above 7 lps, the pump efficiency values from Fig.6 and the motor efficiency factor values from table 4 shall be taken.

TABLE : 3 Motor efficiency factor for Single Phase open well submersible pump sets of 2 Pole 50Hz – IS 14220.

Motor Rating (kW)	Motor Efficiency Factor for 2 Pole (Single Phase)
0.37	45
0.55	47
0.75	50
1.1	56
1.5	58
2.2	60

TABLE : 4 Motor Efficiency factor for Submersible Pump sets of 2 Pole 50Hz - IS 8034

kW	Single Phase	Three Phase		
	100mm	100 mm	150 mm	200 mm
0.37	40	-	-	-
0.55	42	-	-	-
0.75	46	-	-	-
1.1	49	56	57	-
1.5	52	60	66	-
2.2	56	63	67	69
3.0	-	63	67	69
3.7	-	64	68	70
4.5	-	-	70	72
5.5	-	-	73	75
7.5	-	-	74	76
9.3	-	-	75	77
11.0	-	-	76	78
13	-	-	77	79
15	-	-	78	80
18.5	-	-	-	80
22.0	-	-	-	80
26.0	-	-	-	81
30.0	-	-	-	81
37	-	-	-	82
45	-	-	-	82
55	-	-	-	83
63	-	-	-	83
67	-	-	-	84
75	-	-	-	84

4. Qualifications:

a. The products should conform to minimum requirements of corresponding Indian Standards to participate in BEE high efficiency labeling program. The product must carry BIS certification on the plate.

b. Quality Certification such as ISO : 9000 shall be preferred.

5. Sampling plan:

The samples will be picked up by Bureau of Energy Efficiency or its designated agency for testing from either manufacturing facility or warehouse or the dealer. Sample size would be 2 per rating.

6. Label design, manner of display:

6.1. The rating plate details will be as per the requirements of relevant Indian Standards with all its latest amendments.

6.2. The detailed label specifications (size, colour scheme, font size, security features, if any, etc), content of the label (parameters displayed on the label) is in the annexure

6.3. Manner of display of label:

The label shall be applied on the front base of the equipment near the name plate, so as to be prominently visible on the equipment.

Labelling Fees:

1. Registration fee is payable on application for authority to affix labels is Rs. 1000/-
   (Rupees one thousand only)

2. Registration fee is payable on application for renewal of authority to affix labels is
   Rs. 500/- (Rupees five hundred only)

3. Labelling fee for affixation of label on each pump set is Rs. 20/- (Twenty rupees only) for submersible pumpsets, Rs.10/- (Ten rupees only) for openwell & mono set pumpsets.