

## **Control Panel (for Single Phase Submersible Pump set)**

PRODUCT CODE (ASICC)	: 77503
QUALITY AND STANDARDS	: IS 6875 (Part 1):1973
PRODUCTION CAPACITY	: Quantity : 12000 Nos. (per annum) Value : Rs. 87,00,000
YEAR OF PREPARATION	: 2002 _ 2003
PREPARED BY	: Small Industries Service Institute 386, Patel Road, Ram Nagar, Coimbatore - 641009 and Office of the Development Commissioner (Small Scale Industries), Electrical and Electronics Division 7th Floor, Nirman Bhavan, New Delhi - 110 011.

### **Introduction**

Single phase submersible pump control panels are widely used for domestic and industrial sectors. All the pump parts are immersed in the water, so it is necessary to provide the separate starting and control device on the outside of bore or well. Single phase submersible control panels are available from 1/2 HP to 2 HP range. This control panel has the starting device and having safety feature of overload and short circuit protection.

### **Market Potential**

Now the ground water level is considerably going down and need of water sources is increasing, the public wants to provide borewell for their use. Generally all the pumps manufacturers are included in single phase submersible pump manufacturing also. Keeping in view of increasing the production of single phase submersible pumps this control panel is having good demand.

### **Basis and Presumptions**

- i) The basis for calculation of production capacity has been taken on single shift basis on 75% efficiency. Second year of operations the capacity utilization is 60% and 80% respectively. The unit is expected to achieve full capacity utilization from the third year onwards.
- iii) The salaries and wages, cost of raw materials, utilities, rents, etc. are based on the prevailing rates in and around Coimbatore. These cost factors are likely to vary with time and location.
- iv) Interest on term loan and working capital loan has been taken at the rate of 14% on an average. This rate may vary depending upon the policy of the financial institutions/agencies from time to time.
- v) The cost of machinery and equipments refer to a particular make/model and prices are approximate.
- vi) The break-even point percentage indicated is of full capacity utilization.
- vii) The project preparation cost etc. whenever required could be considered under pre-operative expenses.
- viii) The essential production machinery and test equipment required for the project have been indicated. The unit may also utilize common test facilities available at Electronics Test and Development Centres (ETDCs) and Electronic Regional Test Laboratories (ERTLs) and Regional Testing Centres (RTCs).

### **Implementation Schedule**

The major activities in the implementation of the project has been listed and the average time for implementation of the project is estimated at 12 months:

<i>Sl. No.</i>	<i>Activity</i>	<i>Period (In Months)</i>
1.	Preparation of project report	1
2.	Registration and other formalities	1
3.	Sanction of loan by financial institutions	3
4.	Plant and Machinery:	
	a) Placement of orders	1
	b) Procurement	2

	c) Power connection/ Electrification	2
	d) Installation/Erection of machinery/Test Equipment	2
5	Procurement of raw materials	2
6.	Recruitment of Technical Personnel etc.	2
7.	Trial production	11
8.	Commercial production	12

#### *Notes*

1. Many of the above activities shall be initiated concurrently.
2. Procurement of raw materials commences from the 8th month onwards.
3. When imported plant and machinery are required, the implementation period of project may vary from 12 months to 15 months.

### **Technical Aspects**

#### **Process of Manufacture**

This control panel serves the purpose of starting a single phase submersible motor up to 2 HP with over load production and short circuit protection.

Overload may happens due to change in output load or reduced AC input voltage. Short circuit may happen due to terminals shorted or winding damaged. There will be sudden surge in load current in both cases. Single phase power supply first given to overload relay and not to volt coil unit. The output of overload device given to starting capacitor and running capacitors through on-off Push Button stations. The suitable voltmeter and ammeter connection also made. The wiring leads are suitably arranged by

multi colour wires with the provision of proper connectors with "RYBPN" marking. The detail sticker is pasted on the cabinet and the product is tested as per specification and standard.

### **Quality Control and Standards**

IS 6875 (Part 1) :1973 is to be followed while manufacturing.

### **Production Capacity (per annum)**

1/2 HP to 2 HP capacity single phase submersible pumpset control panel :

Qty. : 12000 Nos.

Value : Rs. 87,00,000 @ Rs. 725

**Motive Power** 10 kW.

### **Pollution Control**

The Government accords utmost importance to control environmental pollution. The small-scale entrepreneurs should have an environmental friendly attitude and adopt pollution control measures by process modification and technology substitution.

India having acceded to the Montreal Protocol in September 1992, the production and use of Ozone Depleting

Substances (ODS) like Chlorofluore Carbon (CFCs), Carbon Tetrachloride, Halons and methyl Chloroform etc. need to be phased out immediately with alternative chemicals/solvents. A notification for detailed Rules to regulate ODS phase out under the Environment Protection Act, 1986 have been put in place with effect from 19th July 2000.

### **Energy Conservation**

With the growing energy needs and shortage coupled with rising energy cost, a greater thrust in energy efficiency in industrial sector has been given by the Government of India since 1980s. The Energy Conservation Act, 2001 has been enacted on 18th August 2001, which provides for efficient use of energy, its conservation and capacity building of Bureau of Energy Efficiency created under the Act.

The following steps may help for conservation of electrical energy:

- i) Adoption of energy conserving technologies, production aids and testing facilities.
- ii) Efficient management of process/manufacturing machineries and systems, QC and testing equipments for yielding maximum Energy Conservation.

iii) Optimum use of electrical energy for heating during soldering process can be obtained by using efficient temperature controlled soldering and de-soldering stations.

iv) Periodical maintenance of motors compressors etc.

v) Use of power factor correction capacitors. Proper selection and layout of lighting system; timely switching on-off of the lights; use of compact fluorescent lamps wherever possible etc.

## Financial Aspects

### A. Fixed Capital

<b>(i) Land and Building</b>	<b>(Rs.)</b>
Rented Area 200 sq. mtr @ Rs. 25	5,000
<b>Total</b>	<b>5,000</b>

### (ii) Machinery and Equipments

Sl. No	Description	Qty.	Rate (Rs.)	Amount (Rs.)
1.	Bench Drilling Machine (1/2" Cap)	1	10,000	10,000
2.	Bench Grinder (200 mm cap)	1	5,000	5,000
3.	Bending Machine	1	10,000	10,000
4.	Cost of Dies and fixtures			25,000
5.	Cost of office equipments and working table			25,000
6.	Electrification and			44,250

Installation charges @ 10% cost of machinery and equipment

7.	H.V. Tester (5 kV)	1	5,000	5,000
8.	Hydraulic Power Press (30 Tonne)	1	80,000	80,000
9.	Megger (500 V, D.C.)	1	3,000	3,000
10.	Powder Coating Plant (3' x 3')	1	300,000	300,000
11.	Pre-operative Expenses			18,250
12.	Spot Welding (5 kVA)	1	15,000	15,000
13.	Test Panel	1	7,000	7,000
14.	Treadle Shearing Machine (1200 mm)	1	15,000	15,000
15.	Welding Set (200 A)	1	7,500	7,500
			<b>Total</b>	<b>570,000</b>

**B. Working Capital (per month)**

**(i) Raw Material (per month)**

Sl. No.	Description	Qty.	Rate (Rs.)	Amount (Rs.)
1.	5 way connectors (30 A Baklite)	1000	5	5,000
2.	Ammeter (0 to 30 A Panel Mount)	1000	50	50,000
3.	Capacitor	1000	50	50,000

	(100/120/230 V)			
4.	Capacitor	1000	90	90,000
	(36 Farad/440 V)			
5.	CRC steel sheet	1.5	20,000	30,000
	(18 guage)			
6.	Fuse unit (15 A)	1000	10	10,000
7.	Hinges	2000	3	6,000
	(1/2" x 1" size)			
8.	Indication Lamp Set	1000	10	10,000
9.	Metal coating powder	50	450	22,500
10.	Overload Relay unit	1000	200	200,000
11.	Packing Material	1000	10	10,000
12.	Push Button			
	Station (on-off)	1000	15	15,000
13.	Screws, Nut and Bolt, Bottom Bush and sticker			10,000
14.	Voltmeter (0 to 300 V Panel Mount)	1000	50	50,000
15.	Wires (2.5 sq. mm copper of 5 different colours)	3000	2	4,500
			<b>Total</b>	<b>562,000</b>

**(ii) Salaries and Wages (per month)**

<b>Sl. No.</b>	<b>Designation</b>	<b>No.</b>	<b>Salary (Rs.)</b>	<b>Total (Rs.)</b>
1.	Clerk and Typist	1	1,500	1,500
2.	Manager	1	4,000	4,000
3.	Peon/Chowkidar	2	1,250	2,500
4.	Semi-skilled Worker	4	2,000	8,000
5.	Skilled Worker	4	2,500	10,000
6.	Store Keeper	1	1,500	1,500
7.	Supervisor	1	3,000	3,000
			<b>Total</b>	<b>30,500</b>

**(iii) Utilities (per month)**

1. Power 2500 kwh @ Rs. 3.50	8,750
2. Water 1,250	

**Total 10,000**

**(iv) Other Contingent Expenses (per month) (Rs.)**

1. Advertisement	1,000
2. Consumable Stores	1,500
3. Miscellaneous Expenditure	1,500
4. Postage and Stationery	1,500
5. Rent	5,000
6. Repairs and Maintenance	1,500
7. Telephone	1,500



8. Transport charges 1,500

**Total 15,000**

**(v) Working Capital (per month) (Rs.)**

562,000 + 30,500 +

10,000 + 15,000 = **617,500**

**(vi) Working Capital (for 3 Months) (Rs.)**

617,500 × 3 = **1,852,500**

### **C. Total Capital Investment**

Fixed Capital 570,000

Working Capital (for 3 Months) 1,852,500

**Total 2,422,500**

### **Financial Analysis**

**(1) Cost of Production (per annum) (Rs.)**

1. Depreciation on Dies and Fixtures 6,250
2. Depreciation on Office Furniture 5,000
3. Depreciation on Plant and Machinery 52,000
4. Recurring expenditure 7,410,000
5. Interest on capital investment @ 14% 339,150

**Total 7,812,400**

**(2) Sales (per annum) (Rs.)**

1/2 HP to 2 HP capacity single phase 87,00,000

submersible pumpset control, panel : 12000 Nos. @ Rs 725

**(3) Profit (per annum) (Rs.)** Sales 8,700,000 Cost of Production 7,812,400 **Total 887,600**

**(4) Profitability Analysis**

**(a) Profit on Sales**

$$= \frac{\text{Profit (per annum)} \times 100}{\text{Sales (per annum)}}$$

$$= \frac{887,600 \times 100}{8,700,000}$$

$$= 10.2\%$$

**(b) Profit on Investment**

$$= \frac{\text{Profit (per annum)} \times 100}{\text{Total Capital investment}}$$

$$= \frac{887,600 \times 100}{2422500} = 36.64\%$$

**(5) Break-even Point**

<b>(i) Fixed Cost (per annum)</b>	<b>(Rs.)</b>
Depreciation	63,250
Rent	60,000
Interest on investment	339,150
40% of salary and wages	146,400
40% of other contingent expenses	96,000
and Utilities excluding rent	
<b>Total</b>	<b>704,800</b>

**(ii) Profit (per annum) = Rs. 887600**

$$\text{B.E.P.} = \frac{\text{Fixed Cost per annum} \times 100}{\text{Fixed Cost per annum} + \text{profit per annum}}$$

$$= \frac{704,800 \times 100}{704,800 + 887,600}$$

$$= 44.26\%$$

### **Additional Information**

- a. The Project Profile may be modified/tailored to suit the individual entrepreneurship qualities/capacity, production programme and also to suit the locational characteristics, wherever applicable.
- b. The Electrical Technology is undergoing rapid strides of change and there is need for regular monitoring of the national and international technology scenario. The unit may, therefore, keep abreast with the new technologies in order to keep them in pace with the developments for global competition.
- c. Quality today is not only confined to the product or service alone. It also extends to the process and environment in which they are generated. The ISO 9000 defines standards for Quality Management Systems and ISO 14001 defines standards for Environmental Management System for acceptability at international level. The unit may therefore adopt these standards for global competition.
- d. The margin money recommended is 25% of the working capital requirement at an average. However, the percentage of margin money may vary as per bank's discretion.

### **Addresses of Machinery Suppliers**

1. M/s. Globe Machine Tools  
811, Avinashi Road, Coimbatore - 641 018
2. M/s. Sri Vishnu Machinery Manufacturers  
100, Jayaprakash Nagar, Ganapathy, Coimbatore - 641 006
3. M/s. Grinder Engineering Co.  
308, Dr. Nanjappa Road, Coimbatore - 641 018
4. M/s. R. R. Steels and Alloys 63, Rangakonar Street, Kattoor, Coimbatore - 641 009
5. M/s. Geekay Electricals  
28, Rajiv Gandhi Nagar, Coimbatore - 641 009
6. M/s. Sunrise Electronics  
721/1, Oppanakara Street, Coimbatore - 641 001