

Profile No.: 17

NIC Code: 28132

MANUFACTURING OF PUMP SETS FOR AGRICULTURAL (SUBMERSIBLE)

1. INTRODUCTION:

Submersible Pump sets are the ones which are submerged in water to pump up – lift the water from deep bore wells and wells. Since these pumps are submerged in water it does not have priming problem. Submersible pump is used for continuous discharge of water in large quantity as well as for high heads.

It is widely used devices to lift and supply water from deep bore wells to distant locations.

2. PRODUCT & ITS APPLICATION:

These pump sets have electric prime mover mounted integrally on same shaft. The shape and construction of pump and motor is very compact and it is made cylindrical to fit the bore diameter so that it can be lowered down drilled bore hole easily inside a bore casing pipe. The pump is mostly multistage centrifugal type due to depth from which it lifts water. This pump set offers advantage viz better efficiency, less maintenance as and very compact size.

Normally the pumps used in large quantities are offered in capacity of power range of 5 Hp to 75 HP range submersible design. These products are available in different sizes from 1/2" to 6" outlet size and operating range of head 30 mtrs to 500 mtrs head and with discharge capacity of discharge 50 LPM to 3000 LPM.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Graduate with mechanical engineering background and experience.

4. MARKET POTENTIAL AND MARKETING ISSUES. IF ANY:

The submersible pump is used by local governments and Irrigation departments mostly for domestic potable water supply. Also the residential societies and commercial buildings to augment the water needs. Most of the potable water and irrigation requirement are fulfilled by bore water as this water is of good quality and it is safe for such purpose compared to surface water that requires filtration and treatment plant.

In view of ever growing need for potable and irrigation water, submersible pumps have good market potential in Govt. sector as well as in for urban housing sector. Our country is embarking on massive housing and irrigation expansion, which will lead to growing demand for the product.

If a good design, quality and competitive price is offered, the project will have good success. Also there is regular demand for new and replacement of pumps. The pump sets up to 50 HP for clear water service will have steady demand growth in our country. These pumps also have very export potential in developing countries of Asia and Africa. It is suggested to take up 5 hp to 30 HP as product range with axial and mixed flow design of pumps. These are having mass requirement.

5. RAW MATERIAL REQUIREMENTS:

The submersible pump set construction demands almost 70% material of cast iron castings for motor and pump body. The pump impellers are cast from bronze. The shaft is made of EN 8 and requires steel bars. The motor construction requires electrical grade stamping. The winding wire is usually insulated with PVC or PE copper wire as motor is submerged. Other parts "O" rings seals of Vinyl, Viton etc., mechanical seal and bearings.

6. MANUFACTURING PROCESS:

The process of manufacture involves getting the castings from foundry as per design and machining. The shaft and pump impeller casting are machined. The Stator Lamination

stamping are Staked in motor body and the Stator Winding is carried out. The rotor is assembled from machined Shaft followed by assembly of Rotor Core Staking; Brazing of rotor core with copper conductors and end rings, pressing of rotor core with shaft and coating Insulation in Rotor followed by assembly of Motor and testing is carried out.

The pump impeller bearings/ bushes etc. are then mounted on motor shaft to get the final submersible pump – motor assembly. The pump set is tested on the testing station for pump head, flow rate and motor power rating. Pump sets are then painted and name plate is fixed with pump specifications. It is advised to follow Inspection & testing of the submersible pump as per IS: 8034.

7. MANPOWER REQUIREMENT:

The unit shall require highly skilled service persons. The unit can start from 11 employees initially and increase to 22 or more depending on business volume.

Sr. No	Type of Employees	Monthly Salary	No of Employees				
			Year 1	Year 2	Year 3	Year 4	Year 5
1	Skilled Operators	18000	2	3	4	5	6
2	Semi-Skilled/ Helpers	8000	6	8	10	12	12
3	Supervisor/ Manager	25000	1	1	1	1	1
4	Accounts/ Marketing	16000	1	1	2	2	2
5	Other Staff	8000	1	1	1	1	1
	TOTAL		11	14	18	21	22

8. IMPLEMENTATION SCHEDULE:

The unit can be implemented within 6 months from the serious initiation of project work.

Sr. No	Activities	Time Required in Months
1	Acquisition of Premises	2
2	Construction (if Applicable)	2
3	Procurement and Installation of Plant and Machinery	2
4	Arrangement of Finance	2
5	Manpower Recruitment and start up	2
	Total Time Required (Some Activities run concurrently)	6

9. COST OF PROJECT:

The unit will require total project cost of Rs 86.31 lakhs as shown below:

Sr No	Particulars	In Lakhs
1	Land	20.00
2	Building	30.00
3	Plant and Machinery	22.75
4	Fixtures and Electrical Installation	2.60
5	Other Assets/ Preliminary and Preoperative Expenses	1.50
6	Margin for working Capital	9.46
	TOTAL PROJECT COST	86.31

10. MEANS OF FINANCE:

The project will require promoter to invest about Rs 28.67 lakhs and seek bank loans of Rs 57.64 lakhs based on 70% loan on fixed assets.

Sr No	Particulars	In Lakhs
1	Promoters Contribution	28.67
2	Loan Finance	57.64
	TOTAL	86.31

11. WORKING CAPITAL REQUIREMENTS:

Working capital requirements are calculated as below:

Sr. No	Particulars	Gross Amount	Margin %	Margin Amount	Bank Finance
1	Inventories	4.39	40	1.75	2.63
2	Receivables	7.74	50	3.87	3.87
3	Overheads	2.08	100	2.08	0.00
4	Creditors	4.39	40	1.75	2.63
	TOTAL	18.59		9.46	9.13

12. LIST OF MACHINERY REQUIRED:

Sr No	Particulars	UOM	Quantity	Rate	Total Value
	Main Machines/ Equipment				
1	Hacksaw machine	Nos	1	75000	75000
2	CNC Lathe machine	Nos	1	450000	450000
3	Milling machine	Nos	1	300000	300000
4	Lamination Press	Nos	1	35000	35000
5	Slotting machine	Nos	1	35000	35000
6	Lathe Machine	Nos	1	75000	75000
7	Drilling Machine	Nos	2	40000	80000
8	Dynamic Balancing Machine	Nos	1	600000	600000
9	Motor Varnishing & baking Oven	Nos	1	175000	175000
10	Motor Testing Equipment	LS	1	60000	60000
11	Pump Test system as per BIS	Nos	1	230000	230000
	subtotal :				2115000
	Tools and Ancillaries				
1	Tools and gauges	LS	1	100000	100000
2	Misc. tools etc.	LS	1	60000	60000
	subtotal :				160000
	Fixtures and Elect Installation				
	Storage racks and trolleys	LS	1	25000	25000
	Other Furniture	LS	1	25000	25000
	Telephones/ Computer	LS	1	40000	40000
	Electrical Installation	LS	1	170000	170000
	subtotal :				260000
	Other Assets/ Preliminary and Preoperative Expenses	LS	1	150000	150000
	TOTAL PLANT MACHINERY COST				2685000

13. PROFITABILITY CALCULATIONS:

Sr. No	Particulars	UOM	Year Wise estimates				
			Year 1	Year 2	Year 3	Year 4	Year 5
1	Capacity Utilization	%	40	50	60	70	80
2	Sales	Rs Lakhs	46.42	58.02	69.62	81.23	92.83
3	Raw Materials & Other Direct Inputs	Rs Lakhs	26.32	32.90	39.48	46.06	52.64
4	Gross Margin	Rs Lakhs	20.09	25.12	30.14	35.17	40.19
5	Overheads Except Interest	Rs Lakhs	8.58	8.58	8.58	8.58	8.58
6	Interest	Rs Lakhs	8.07	8.07	8.07	8.07	8.07
7	Depreciation	Rs Lakhs	5.69	5.69	5.69	5.69	5.69
8	Net Profit Before Tax	Rs Lakhs	-2.24	2.78	7.80	12.83	17.85

14. BREAK EVEN ANALYSIS

The project is can reach break-even capacity at 40.16 % of the installed capacity as depicted here below:

Sr. No	Particulars	UOM	Value
1	Sales at Full Capacity	Rs Lakhs	116.04
2	Variable Costs	Rs Lakhs	65.80
3	Fixed Cost incl. Interest	Rs Lakhs	22.34
4	Break Even Capacity	% of Inst Capacity	44.46