

WATER METERS

1. INTRODUCTION:

Flow measurement is an important aspect of many operations in the water industry and a good understanding of the metering process remains central to the efficient provision of clean water.

In many developed countries water meters are used to measure the volume of water used by residential and commercial buildings that are supplied with water by a public water supply system. Water meters measure flow in cubic meters (m³) or liters, cubic feet (ft.³) or US gallons on a mechanical or electronic register. Some electronic meter registers can display rate-of-flow in addition to total usage.

2. PRODUCT & ITS APPLICATION:

Most meters in a typical water distribution system are designed to measure cold potable water only. Common designs include oscillating piston and rotating disc meters. Velocity-based designs include single and multi-jet meters and turbine meters.

There are also non-mechanical designs, for example electromagnetic and ultrasonic meters, and meters designed for special uses. Floating Ball Technology is a variant on turbine metering having ball-shaped, turbine impeller that floats between axial bearings in the measuring chamber of the meter. This significantly reduces pressure loss and virtually eliminates component wear while improving accuracy across an extended flow range. The thermoplastic ball is virtually weightless in water, therefore even the smallest changes in flow cause the impeller to rise and fall accordingly. As a result, this type of meter can accurately record very low flows as well as support extended high flow rates – all with practically no friction or wear.

Water utilities are met with more challenges than ever, but they are also faced with more opportunities. New generations of water meters will, when conjoined with intelligent water management systems, enable utilities to improve their operations while meeting increasing customer expectations and conservation initiatives for decades to come.

Typical clean water flow applications include: correct billing and accurate water consumption monitoring; optimization of water usage; monitoring of water flow between reservoirs; irrigation water measurement; reverse osmosis water treatment; high purity water plant.

3. DESIRED QUALIFICATIONS FOR PROMOTER:

Any Graduate in Engineering and some experience in manufacturing.

4. INDUSTRY OUTLOOK/ TREND

In view of alarming rise in water scarcity level all over the world, increasing focus towards reducing cost and consumption of water, retrofitting of aging water infrastructure and the need for accurate billing for water supply are driving the market worldwide. The water metering market consists of end user segments viz. Water utilities, Industries using water in their processes and the residential housing.

A complex water tariff structure involving multiple instruments like water connection fee, annual water tax and water charges, all based on the area of land instead of the actual consumption, is a severe deterrent for water conservation. This in turn has a negative impact on the need for water meters. There is a lack of proper regulations for periodic inspection and calibration that will also act as a restraining factor.

The industries have traditionally been charged based on their metered water consumption and so this market is relatively well developed. The awareness of water conservation and water management is quite high among larger companies

and this has aided the requirement of point of consumption metering initiatives within various departments of an organization.

Domestic players like Capston, Kaycee and Dasmesh dominate the market for residential water meters. Foreign players generally find it very difficult to operate in this highly price sensitive market. Sales are done through a network of distributors and construction hardware dealers. The residential consumers are highly price conscious. In addition there is no real customer incentive for adoption of water metering. Despite the requirement of certification as per BIS, Indian Standards Organization issuing guidelines, there exists a gray area in the market for these products. Spurious players thus hinder the growth of the genuine market.

The development trend in the domestic water meter is introduction of new technologies like remote meter reading (RMR) or automated meter reading (AMR) to facilitate operation of billing by utilities.

5. MARKET POTENTIAL AND MARKETING ISSUES. IF ANY:

Water has traditionally been treated as a free commodity rather than as an economic good. The depleting water bodies both surface and underground sources and growing population is leading to charge for water on consumption basis.

The issue of metering is the most debated topics in the Indian water supply industry. Though some cities like Bangalore claim to have achieved hundred percent metering, the majority of the urban residential water supply is not metered. Privatization of the water supply, distribution and collection system will boost demand for domestic water meters. For instance, to enforce water metering, the Bangalore Water Supply and Sewerage Board is roping in two French companies to manage two pilot areas comprising a population of one million each.

The spurt in middle-class residential colonies, combined with the acute water shortage in cities is encouraging the installation of domestic water meters by the consumers themselves. Certain other cities and towns are also taking initiatives in

this direction. This is the beginning of the trend in enforcing water metering in urban centers. There is now substantial thrust among water supply agencies to install water metering for industries and growing awareness to charge for potable water to residential based on quantity consumed by residents.

The Government of India's budget initiatives giving tax sops for housing construction is expected to boost the demand for residential water meters. However this would still form a small fraction of the market, considering the proportion of those existing households that are not metered. Thus the potential market for water meters is clearly huge in India. However the complex nature of the water supply system and scarcity of funds with the Government bodies hamper market development. The municipalities are expected to be the prime customers until or unless water supply management is privatized. Again it is privatization that is expected to boost the demand for water meters. In view of these factors there will be good scope for the water meters in our country.

6. RAW MATERIAL REQUIREMENTS:

Main raw materials are cast components and machined parts from steel/ brass/ bronze or moulded plastic. The meter and recorder unit consists of special metering assembly with either mechanical or electronic system. Also the turbines impeller and other components are made of injection molded plastic parts.

7. MANUFACTURING PROCESS:

Depending upon the water meter design components are made from materials like Cast Iron, brass/ bronze, Injection molding for impellers etc. and the metering chronometer is either assembled or procured from market.

Cast Iron body /Cast brass/ bronze or steel body

En-8 rod for Shaft

C.I. /Gun Metal or NORYL - Plastic Impeller or notating disc

Chronometer assembly

Seals and gaskets

Precision ball bearings

The cast components and shaft/ pins are machined to size and assembled with the body by placing gaskets and seals to prevent leakage to chronometer chamber. The chronometer is attached with specially calibrated link / gear system. The assembled product is then tested and calibrated for the accuracy of flow/quantity measurements.

8. MANPOWER REQUIREMENT:

The unit shall require highly skilled service persons. The unit can start from 7 employees initially and increase to 18 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	1	2	3	3	3
2	Semi-Skilled/ Helpers	8000	3	6	9	12	12
3	Supervisor/ Manager	25000	1	1	1	1	1
4	Accounts/ Marketing	16000	1	1	1	1	1
5	Other Staff	8000	1	1	1	1	1
	TOTAL		7	11	15	18	18

9. IMPLEMENTATION SCHEDULE:

The unit can be implemented within 4 months from the serious initiation of project work.

Sr. No	Activities	Time Required in Months
1	Acquisition of Premises	-
2	Construction (if Applicable)	-
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)	4

10. COST OF PROJECT:

The unit will require total project cost of Rs 22.36 lakhs as shown below:

Sr. No	Particulars	In Lakhs
1	Land	0.00
2	Building	0.00
3	Plant and Machinery	12.90
4	Fixtures and Electrical Installation	1.95
5	Other Assets/ Preliminary and Preoperative Expenses	1.20
6	Margin for working Capital	6.31
	TOTAL PROJECT COST	22.36

11. MEANS OF FINANCE:

The project will require promoter to invest about Rs 10.32 lakhs and seek bank loans of Rs 12.04 lakhs based on 70% loan on fixed assets.

Sr. No	Particulars	In Lakhs
1	Promoters Contribution	10.32
2	Loan Finance	12.04
	TOTAL:	22.36

12. WORKING CAPITAL REQUIREMENTS:

Working capital requirements are calculated as below:

Sr. No	Particulars	Gross Amount	Margin %	Margin Amount	Bank Finance
1	Inventories	3.88	40	1.55	2.33
2	Receivables	3.61	50	1.81	1.81
3	Overheads	1.40	100	1.40	0.00
4	Creditors	3.88	40	1.55	2.33
	TOTAL	12.78		6.31	6.47

13. LIST OF MACHINERY REQUIRED:

Sr. No	Particulars	UOM	Quantity	Rate	Total Value
	Main Machines/ Equipment				
1	Hacksaw machine	Nos	1	25000	25000
2	CNC Lathe machine	Nos	1	350000	350000
3	Milling machine	Nos	1	250000	250000
4	Injection Molding machine	Nos	1	200000	200000
5	Lathe Machine	Nos	2	70000	140000
6	Drilling Machine	Nos	1	40000	40000
7	Flow Testing Equipment	LS	1	35000	35000
8	Flow Test set up as per BIS	Nos	1	150000	150000
	Subtotal:				1190000
	Tools and Ancillaries				
1	Tools and gauges	LS	1	70000	70000
2	Misc. tools etc.	LS	1	30000	30000
	Subtotal:				100000
	Fixtures and Elect Installation				
	Storage racks and trolleys	LS	1	25000	25000
	Other Furniture	LS	1	20000	20000
	Telephones/ Computer	LS	1	30000	30000
	Electrical Installation	LS	1	120000	120000

	Subtotal:				195000
	Other Assets/ Preliminary and Preoperative Expenses	LS	1	120000	120000
	TOTAL PLANT MACHINERY COST				1605000

All the machines and equipment are available from local manufacturers. The entrepreneur needs to ensure proper selection of product mix and proper type of machines and tooling to have modern and flexible designs. It may be worthwhile to look at reconditioned imported machines, dies and tooling. Some of the machinery and dies and tooling suppliers are listed here below:

1. Techno Machines
Chikkanahalli Road, Opp. Shahi Exports (Unit No 6),
Near Annapoorneshwari Temple, Bommanahalli,
BENGALURU-560 068, INDIA
2. S. S. Engineering Works
Plot No. 100, Sector 6 IMT Manesar, Gurgaon - 122050, Haryana, India
3. Taurus Private Ltd Co
No. 24, D 2 / E 3, Kiab Industrial, Area At Pivele
Kiab Industrial Area, Bengaluru - 560100 Karnataka, India
4. Micro Engineering Works;
No. 6/140, Gandhi Nagar, Nallampalayam Road Nanjai Gounden, Pudur, G. N. Mills Post, Coimbatore - 641029, Tamil Nadu, India
5. S. G. Profile
Plot No. 201/1, Gala No. 56, Morya Industrial Estate, MIDC, Bhosari, Bhosari Midc,
Pune-411026, Maharashtra, India

14. 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	43.37	54.21	65.05	75.90	86.74
3	Raw Materials & Other Direct Inputs	Rs Lakhs	31.06	38.83	46.59	54.36	62.12
4	Gross Margin	Rs Lakhs	12.31	15.38	18.46	21.54	24.62
5	Overheads Except Interest	Rs Lakhs	9.49	9.49	9.49	9.49	9.49
6	Interest	Rs Lakhs	1.69	1.69	1.69	1.69	1.69
7	Depreciation	Rs Lakhs	1.61	1.61	1.61	1.61	1.61
8	Net Profit Before Tax	Rs Lakhs	-0.47	2.61	5.69	8.76	11.84

The basis of profitability calculation:

Unit will have capacity of 8000 nos per year of water meters of various types and ratings taken. Depending on the type/ size/ ratings the price range is taken from Rs. 1500 per unit to Rs 15000 or more per unit. The material requirements are cast parts, MS rod, bars, sheets, Carbon alloy steel, etc. They cost in range of Rs 25 per Kg to Rs 200 per kg. Other items like chronometer/ counter, electrical sensors, and other components, electrical control /display panels etc. are bought out and its cost depend on system ratings. The unit may generate scrap which is to be sold at @ Rs 20 ~ 80 per Kg depending on type. The income of same is added. Consumables costs also considered based on prevailing rate. Energy Costs are considered at Rs 7 per Kwh. The depreciation of plant is taken at 10 % and Interest costs are taken at 14 -15 % depending on type of industry.

15. BREAK EVEN ANALYSIS

The project is can reach break-even capacity at 41.52 % of the installed capacity as depicted here below:

Sr. No	Particulars	UOM	Value
1	Sales at Full Capacity	Rs Lakhs	108.42
2	Variable Costs	Rs Lakhs	77.65
3	Fixed Cost incl. Interest	Rs Lakhs	12.78
4	Break Even Capacity	% of Inst Capacity	41.52

16. STATUTORY/ GOVERNMENT APPROVALS

The unit will require state industry unit registration with District Industry center. No other procedures are involved. For export, IEC Code and local authority clearances. The industry registration and approval for factory plan, safety etc. is required as per factory inspectorate and labor laws. Other registration are as per Labor laws are ESI, PF etc. Before starting, GST registration will be required for procurement of materials as also for sale of goods. As such there is no pollution control registration requirement, however the unit will have to ensure safe environment through installation of chimney etc. as per rules. Solid waste disposal shall have to meet the required norms. Entrepreneur may contact State Pollution Control Board where ever it is applicable.

17. BACKWARD AND FORWARD INTEGRATION

The machines and equipment offer scope for diversification in to producing several industrial parts/ components and parts of hydraulic systems and auto components. The unit can utilize the spare capacities. As such there is not much scope for organic backward or forward integration. The entrepreneur needs to ensure proper selection of product mix and also be careful in maintaining product parameters in terms of dimensions, tolerances and geometric profiles along with final weights of products.

The workshop business needs building up reputation, ensuring reliability and quality of services rendered. Also personal rapport of key persons can generate good business volumes from OEM units and ancillary component unit. The location with good catchment area ensures good market potential to new business units.

18. TRAINING CENTERS/COURSES

There are no specific training centers for product technology. The Prototype Development Centers can provide some assistance for precision machining, Tools development, etc. Other centers of excellence viz Indo German Tool Room at Ahmedabad, Rajkot, Chennai, etc. shall be helpful. The most important scope of learning is in product design and development by study of the new product designs, product range, features and specifications of leading Brands / competitors across the world by scanning the Internet and downloading data from websites.

Udyamimitra portal (link: www.udyamimitra.in) can also be accessed for hand-holding services viz. application filling / project report preparation, EDP, financial Training, Skill Development, mentoring etc.

Entrepreneurship program helps to run business successfully is also available from Institutes like Entrepreneurship Development Institute of India (EDII) and its affiliates.

Disclaimer:

Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not carry any recommendation.

Source:- Udyami Mitra/Sidbi