

1. Introduction:

Electronics B.P Machine is a compact, fully automatic blood pressure monitor, operating on the Oscillometric principle for precise measurements and accurate results. It measures blood pressure and pulse rate with easy one touch operation.

Along with Blood Pressure Monitoring, this product detects irregular heartbeat also.

Blood pressure is the pressure that the blood exerts against the walls of the arteries as it passes through them. The high and low points of this pressure waves are measured with the sphygmomanometer or blood pressure monitor and are expressed numerically in millimeter of mercury.

Pulse refers to the periodic ejection of blood from the heart left ventricle into the aorta, the left ventricle or chamber receives blood from the left atrium, another of the heart chambers. By contracting the left ventricle drives the blood into the aorta, a central artery through which blood is relayed into the arteries of all limbs and organs except lungs. Pulse transmitted through the arteries as a repeated pressure wave is the mechanism that moves blood through the body.

The high and low points of this pressure waves are measured with the sphygmomanometer or blood pressure monitor and are expressed numerically in millimeter of mercury. The higher number systolic pressure measures the maximum pressure exerted on arteries and the heart muscles the lower figure diastolic pressure measure the minimum pressure exerted.

2. Market Potential

The global blood pressure monitoring devices market size was estimated at USD 1.25

billion in 2018 and is projected to expand further at a CAGR of 10.1% from 2019 to 2026. Increasing incidences of hypertension due to changing lifestyle are the key factor attributing towards the growth of the market over the forecast period. According to the estimates published by the World Health Organization (WHO) in 2019, around 1.15 billion people around the globe have hypertension, it is a major cause behind premature death worldwide. The demand for BP monitors is very high on account of the growing geriatric population base and increasing the risk of lifestyle associated disorders among a wide population base due to rising incidences of obesity & sedentary lifestyle.

Basis & Presumptions

- i) The basis for calculation of production capacity has been taken on single shift basis on 75% efficiency.
- ii) The maximum capacity utilization on single shift basis for 300 days a year. During the first year and second year of operations the capacity utilization 60% and 80% respectively. The unit is expected to achieve full capacity utilization from the third year onward.
- iii) The salary and wages, cost of raw materials, utilization, rent etc are based on prevailing rate in and around Karnal. These cost factors are likely to vary with time and location.
- iv) Interest on term loan and working capital loan must be preferably current rate. Otherwise the rate of interest on an average may be taken as 10.50%. This rate may vary depending upon the policy of 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 breakeven point percentage indicated is of full capacity utilization.

vii) The project preparation cost etc wherever required could be considered under preoperative expenses.

viii) The essential production machinery and test equipments required for the project have been indicated. The unit may utilize common test facilities available at electronic test & development center (ETDC) and electronic regional test laboratories and regional testing center (RTC).

IMPLEMENTATION SCHEDULE

The major activities in the implementation of the project have been listed and the average time for implementation of the project is estimated at 06 months:

Sl. No.	Name of Activity	Period In months (Estimated)
1	Preparation of project report	01 Month
2.	Registration and other formalities	01 month
3.	Sanction of loan by financial institutions	2-3 Month
4	Plant and Machinery: ,Placement of orders	One Week
5.	Procurement	01 Month
6.	Power connection/ Electrification	01Month
7.	Installation / Erection of machinery/ Test	02 week

	Equipment	
8	Procurement of raw materials	01 Month
9	Recruitment of Technical Staff	01Month
10	Trial	5th Month
11	Commercial Service	6th Month

Notes-:

1. Many of the above activities shall be initiated concurrently.
2. All the plants and machinery required are available in ready stock.,
3. The implementation period of project may vary.

5. Technical Aspects of Manufacturing

The device is consisted of three main parts: external hardware's (such as cuff, motor, valve, and LCD), circuit, and microcontroller. The analog circuit converts the pressure value inside the cuff into readable and usable analog waveforms. The MCU samples the waveforms and performs A/D conversion so that further calculations can be made. In addition, the MCU also controls the operation of the devices such as the button and LCD display. Since we have the word 'portable' in our title, for sure all of the components are put together in one package which allows a user to take it anywhere and perform a measurement whenever and wherever he/she wants.

All the parts of electronic BP machine are assembled to form a complete BP Monitoring machine. The digital blood pressure machine has several parts including the display unit, the arm cuff and the air hose.

Main unit

The main unit shows the digital information. It also has a setting button for the date and time. It has off and on button. This button is used to start the measuring process too. The unit has LCD display, which displays the blood pressure in digits, and also the pulse rate is displayed.

The component also includes the air plug and air tube. The air plug must be plugged into the unit to air up the blood pressure cuff. This air tube and plug are made from a black or gray durable piece of rubber tubing. The air tube is connected to air pressure cuff.

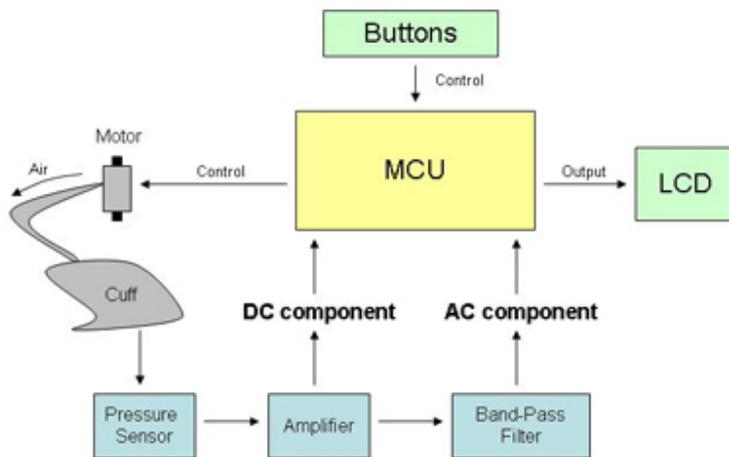
Blood pressure cuff

The blood pressure cuff is the part that does the actual measurement of blood pressure. The cuff has arrows showing how it should be aligned to the arm. The blood pressure cuff also has Velcro to tighten it to the arm. It must not be tightened too tight because it could cause a misread on the unit. These measurements are displayed on the display unit.

Other components

Most units have AC adapter and backup batteries, which keep the stored info from being lost.

Hardware Interconnection:



The diagram above shows how device is operated. The user will use buttons to control the operations of the whole system. The MCU is the main component that controls all the operations such as motor and valve control, A/D conversion, and calculation, until the measurement is completed. The results then are output through and LCD screen for the user to see.

Parts Listing

Components	Quantity
Mega32 Microcontroller	1
Custom PC board	1
Hand-cuff	1
Solder board	1
On-Off switch	1
LCD	1
Instrumentation Amplifier	1
LED	1
Motor and Valve	2

Specification of product:

Measurement System :	Oscillometric method
Measurement Range :	Pressure:0-280mm Pulse: 40-180pulse/min
Accuracy :	Pressure:3mmHg. Pulse; 5%
Power source :	AA Size x 4
Battery Life :	Alkaline battery; Approx. 1000 times
Rated Voltage :	DC6V =3W(=:Direct Current)
Outside dimensions :	129mm(W) x 55mm(H) x 119mm(D)
Weight :	Unit : Approx. 240g (without batteries) Cuff : Approx. 130g

Specification may vary , these are standard specification.

6. 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 Govt. of India since 1980s. The Energy Conservation Act, 2001 has been enacted on 18th August 2001, 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:

1. Adoption of energy conserving technologies, production aids and testing facilities.

2. Efficient management of process / manufacturing machineries and systems, QC and testing equipments for Yielding maximum Energy Conservation.
3. Optimum use of electrical energy for heating during soldering process can be obtained by using efficient
4. Temperature controlled soldering and de-soldering stations.
5. Periodical maintenance of motors compressors etc.
6. 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 .By using efficient temperature controlled soldering and disordering stations can obtain optimum use of electrical energy for heating, during soldering.

4 FINANCIAL ASPECT

A. Fixed Capital

(i) Land and Building

Built up Area	2000-3000 Sqft
Office, stores	1000Sqft
Assembling and Testing	1000-15000 Sqft
Rent Payable per annum	180000 per annum

(ii) Machinery and Equipment-

Sl.	Description	Qty)
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NO.			
1.	<i>Oscilloscope (60Mhz) Dual trace</i>	1 nos.	35000.00
2.	<i>Signal Generator(100 Mhz)</i>	1nos.	10000.00
3.	<i>Power Supplies (0-30 Volts)</i>	02 nos.	10000.00
4..	<i>Digital Multimeter (4 ½ digit)</i>	04 nos	20000.00
5.	<i>Soldering/ Desoldering Station</i>	02 nos.	20000.00
6.	<i>Grinder</i>	02 nos.	12000.00
7.	<i>Dimmer state</i>	04 nos.	10000.00
8.	<i>Drill Machine</i>	04 nos.	20000.00
9.	<i>H.V tester</i>	02 nos.	15000.00
10.	<i>Megger</i>	02 nos.	12000.00
11.	<i>Welding Machine</i>	02 nos.	20000.00
12.	<i>Dip Soldering Machine</i>	02 nos.	22000.00
13	<i>Oven for Drying (0-300 degree centigrade)</i>	01nos.	12000.00
14	<i>Testing Stations</i>	02nos.	20000.00
15	<i>Winding Machine</i>	02	15000.00
16	<i>Oven (0-300 degree)</i>	02	40000.00
	<i>Total</i>		285000.00

Other fixed asset.

Sl. NO.	Description	Cost in Rs.
1.	Electrification Charges @10%	28500.00
2.	Office Equipment, Furniture and Working Table etc	50000.00
3.	Tool kit/Jigs and fixture etc.	15000.00
4	Pre- operative Expenses	15000.00
	Total	108500.00

Total Fixed Capital: 393500.00

1.Working Capital (per month)

Staff and Labour

Sl. No.	Designation	No.	Salary (Rs.)	Total (Rs.)
1	Accountant	01	20000.00	20000.00
2.	Sales manager	03	20000.00	60000.00
3.	Technicians	04	12000.00	48000.00
4.	Workers	5	9000.00	45000.00
5.	Peon / Helper	2	8000.00	16000.00

			<u>Total</u>	<u>189000.00</u>
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Add perquisites @15%

salary:28350.00

Total: 217350.00

2.Raw Material Requirement Per Month

SN	Description	Indian/Imported	Qty	Rate	Value
1	Electronic Display Unit	Indian	500	450	225000
2	Air Tube & Plug	Indian	500	50	25000
3	Blood Pressure Cuff	Indian	500	95	47500
4	AC Adapter	Indian	500	45	22500
5	Battery and packing material	Indian	500	50	25000.00
				Total	245500.00
			Additional raw material 10%		24550.00
			G.Total		270050

3.Utilities per month

Power	20000.00
Water	2000.00
Total	22000.00

4.Other contingent expenditure per month

SN	Description	Amount
1	Rent	15000.00
2	Postage and stationary	2000.00
3	Telephone/Fax	3000.00
4	Repair and Maintenance	3000.00
5	Transport and Conveyance	10000.00
6	Advt. And Publicity	10000.00
7	Insurance and Taxes	10000.00
8	Miscellaneous expenses	15000.00
	Total	68000.0

Total recurring expenditure per month (i+ii+iii+iv) = 577400.00

B. Total capital Investment

Fixed Capital	393500.00
Working capital on three month basis	1732200.00
Total	2125700.00

C. Financial Analysis

(I) cost of production per annum

Total recurring expenditure	6928800.00
Depreciation on machinery and equipment @10%	39350.00

Depreciation on tools, jigs, fixtures & office equipments @10%	Included
Interest on capital Investment @ 10.5%	223198.00
Total	7191348.00

Turnovers per annum

Item Details	Qty (nos.)	Rate/unit	Total sales (Rs.)
Electronic BP Machine	6000	1650	9900000.00

Profit per annum (Before Taxes)

(Turnover per annum- cost of production per annum)= 9900000- 7191348= 2708652

Profit ratio = profit per annum x 100/sales/Annum
= 27.36%

Rate of Return= Profit per Annumx100/ Total Capital Invest.
= 127%

D. Break even Point

Fixed cost per annum

Rent per annum	180,000.00
Depreciation on machinery and equipment @ 10%	39350.00
Depreciation on tools jigs and fixtures@20%	Included
Depreciation on office equipment furniture @ 20%	Included
Interest on total capital Investment@10.5%	223198.00
40% of salary and wages	1043200.00

40% of other contingent & utilities	326400.00
Total Fixed cost	1812148.00

Break Even Point= fixed Costx100/Fixed Cost+ Profit=

$$1812148 \times 100 / 1812148 + 2708652 = 40.08 \%$$

List of Address of Supplier of Machinery and Raw material

a) Medicare Products Inc.
C-53A, Mansarover Garden
NewDelhi-110015
Tel: 011-25155540,65954347,65954347

b) Hospital Devices
A-33, DSIDC Engg.
Complex Mangolpuri
Industrial Area Phase 1
New Delhi-110083 Tel:
011-27921737

c) Leela Enterprises
Shop No 1 Varsha Building
Datta Pada Road, Opposite SBI, Borivali
east Mumbai, Maharastra
Tel; 022-28700501,32111211

d) Hospital Supply company
111,Chitaranjan Avenue
Kolkatta, west Bengal-
700001 Phone: 033-
22153349,22251141

e) SS Technomed Pvt. Ltd.

A-128, sector A-4, Tronica City, UPSIDC Industrial Area, Loni, Ghaziabad UP

Phones: 0120-2696390

f) HI-TEK Medical Solutions

346, Sultanpur, M.G. Road, New Delhi-

110030 Phones: 9212388713

g) Shri Krishna International

A-85, Flat No 04, Paryavaran

Complex IGNOU Road, New Delhi

Phone: 01129253536