# PROJECT PROFILE ON REGULATED DC POWER SUPPLIES

| | | |
|---|---|---|
| PRODUCT CODE (ASICC) | : | 77207 |
| QUALITY AND STANDARDS | : | IS 7204 :1981<br>IS7204:1980Stabilized power supplies<br>(Part 1) Terms and definition<br>(Part 2) Rating and performance<br>(Part 3) Radio Interference tests<br>(Part 4) Tests other than radio frequency interference |
| PRODUCTION CAPACITY | : | 1. Qty.:3000Nos. (perannum) of PSUs 5V,5A.<br>Value : Rs.30,00000/-<br>2. Qty.:3000Nos.(perannum) PSUs 30V,2A<br>Value : Rs.42,00,000 |
| YEAR OF PREPARATION | : | 2020-2021 |
| PREPAREDANDUPDATEDBY | : | ELECTRICAL DIVISION<br>MSME - Development Institute,<br>Shaheed Capt. Gaur MargOppt.<br>Okhla Industrial Area, Estate Okhla,<br>New Delhi:- 110020.<br>Tele. (91) 011-26838269, 26838068, 6838118.<br>Tele/Fax No.: (91) 011-23838016. |

## INTRODUCTION

Regulated DC power supplies provide accurate DC voltage, which are derived from AC mains. These DC supplies are cheaper in nature than the DC sources from battery. Such supplies provide constant voltage irrespective of load variations for which they are designed. DC power supplies are used extensively in various electronics laboratories, industries and communication departments to feed DC voltage to the electronic modules, R and D sections, institutions and colleges to impart practical training etc. Present range of electronic equipment produced in the country makes use of transistors and integrated circuits. These IC's are designed to work on fixed regulated DC voltages. Therefore, such supplies have become the part and parcel of such equipment and are:

1. Preset Power supplies (single or dual supply type)
2. Variable power supplies

Preset Power Supplies (Single or Dual supply type)

These power supplies are generally customs made and preset for fixed voltages like 5V/10V/15 Volts etc. These supply units are normally mounted on/ integrated into the electronic equipment.

As such these power supplies are not fitted with any cabinets. These power supplies are used in computers.

### Variable Power Supplies

Variable power supplies are supplies in which the voltage can be varied continuously with the knob as per requirement. They are generally available in the range of 5 to 30 volts in 0.5 to 10 amps capacities. These supplies are generally used in research institutions, colleges, practical training centers and electronic industries, etc.

## MARKET POTENTIAL

There are hundreds of small-scale units engaged in the manufacture of regulated DC power supplies in the country. The production of computers, control and instruments sector, aerospace, defence and telecommunication equipment is steadily increasing and the demand for such supplies is also proportionately increasing. Some of the units have been exporting these power supplies to the Middle East countries.

## BASIS AND 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 first year and 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 Chennai. 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 16% 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) set up by the State Governments and STQC, Directorate of the Department of Information Technology, Ministry of Communication and Information Technology, to manufacture products conforming to Bureau of Indian Standards.

## 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:

| Sl.No | Name of Activity | Period in Months (Estimated) |
|---|---|---|
| 1. | Preparation of project report | 1 |
| 2. | Registration and other formalities | 1 |
| 3. | Sanction of loan by financial institutions | 3 |
| 4. | Plant and Machinery:<br>a) Placement of orders<br>b) Procurement<br>c) Power connection/ Electrification<br>d) Installation/Erection of machinery/Test Equipment | <br>1<br>2<br>2<br>2 |
| 5. | Procurement of raw materials | 2 |

| | | |
|---|---|---|
| 6. | Recruitment of Technical | 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

The manufacture of DC power supplies involves design assembly andtesting. The printed circuit boards (PCBs) are to be procured as per design and drawings prepared. The chassis and front panel are obtained as per order placed on supplier. The components are soldered on to the PCBs as per circuit diagram. Such PCBs and other large/ heavy components like power transformers are wired on to the main chasis. The necessary switches and sockets are fitted and wired. The assembled power supply is checked for performance and necessary adjustments are made, so as to conform to specifications already laid down. Latest technique of on card regulators is being utilized extensively for easy maintenance and quick fault findings.

### Quality Control and Standards

IS 7204: 1980 Stabilisedpower supplies DC output

(Part1) Terms anddefinition

(Part2) Rating andperformance

(Part3) RadioInterferencetests

(Part4) Tests other than radio frequencyinterference

**Production Capacity (per annum)**

3000 Nos. of PSUs 5V, 5A at Rs. 1000 each = Rs.3000×1000= Rs 30,00,000
And
3000 Nos.of variable power supplies 30V 2A @ Rs.1400=3000× 1400 = Rs. 42,00,000

Total Rs.72,00,000

**TOTAL= (Rs.30,00,000 +Rs 4200000)=Rs 7200000**

**Motive Power** **5 KVA.**

**Pollution Control**

The Govt. 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 Sept. 1992, the production and use of Ozone Depleting Substances (ODS) like Chlorofluoro Carbon (CFC), Carbon Tetrachloride, Halos 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.

The following steps are suggested which may help to control pollution in electronics industry wherever applicable:

i) In electronic industry fumes and gases are released during hand soldering/wave soldering/Dip soldering, which are harmful to people as well as environment and the end products. Alternate technologies may be used to phase out the existing polluting technologies. Numerous new fluxes have been developed containing 2-10% solids as opposed to the traditional 15-35% solids.

ii) Electronic industry uses CFC, Carbon Tetrachloride and Methyl Chloroform for cleaning of printed circuit boards after assembly to remove flux residues left after soldering, and various kinds of foams for packaging.

Many alternative solvents could replace CFC-113 and Methyl Chloroform in

electronics cleaning. Other Chlorinated solvents such as Trichloroethylene, Perchloroethylene and Methylene Chloride have been used as effective cleaners in electronicsindustry for many years. Other organic solvents such as Ketones and Alcohols are effective in removing both solder fluxes and many polar contaminants.

**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, 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 desoldering 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**

**(i) Land and Building**

| | |
|---|---|
| Built up area | 250 sq. mtrs. |
| Office/Stores | 50 Sq. mtrs. |
| Factory | 200 sq. mtrs. |

## (ii) Machinery and Equipments

| Sl. No. | Description | Qty. | Rate | Amount (Rs.) |
|---|---|---|---|---|
| 1. | Bench Grinder | 1 | 6,000 | 6,000 |
| 2. | Digital millimeter (4½ digit) | 1 | 10000 | 10000 |
| 3. | Dimmer stats (4 and 8 amps) | 4 | 3,000 | 12000 |
| 4. | Drilling machine (1/2') | 1 | 6,000 | 6,000 |
| 5. | H V tester | 1 | 6,000 | 6,000 |
| 6. | Megger. | 1 | 5000 | 5000 |
| 7. | Multimeter Analog | 3 | 1,000 | 3,000 |
| 8. | Oscilloscope dual trace (20 MHz) | 2 | 20,000 | 40,000 |
| 9. | Digital Panel meters | 2 | 5,000 | 10,000 |
| 10. | True RMS meter (4 digit | 1 | 8,000 | 8,000 |
| 11. | Installation and electrification @ 10% of machinery and equipments | | | 10,000 |
| 12. | Office furniture and equipments | | | 30,000 |
| 13. | Tools Dies and equipments | | | 20,000 |
| | | | **(iii) Pre-operative Expenses** | **10,000** |
| | | | **Total** | **1,70,000** |
| | | | **Or Say** | **1,70,000** |

## B. Working Capital (per month)

(i) Salaries and Wages (per month)

| Sl. No. | Description | Qty. | Rate (Rs.) | Amount (Rs.) |
|---|---|---|---|---|
| 1. | Accountant | 1 | 25,000 | 25,000 |
| 2. | Design Engineer-cum Production in | 1 | 25,000 | 25,000 |

| | | | | |
|---|---|---|---|---|
| | charge | | | |
| 3. | R and D Design Engineer | 1 | 25,000 | 25,000 |
| 4. | Sales manager | 1 | 30,000 | 30,000 |
| 5. | Un-skilled workers | 1 | 19,000 | 19,000 |
| 6. | Skilled workers | 2 | 20,000 | 40,000 |
| 7. | Typist / clerk | 1 | 21,000 | 21,000 |
| | | | **Total** | **1,85,000** |
| | | | Perquisites @ 15% | 27,750 |
| | | | **Total** | **2,12,750** |

(ii) RawMaterial(permonth)

| Sl. No. | Description | Qty. (sets) | Rate (Rs.) | Total (Rs.) |
|---|---|---|---|---|
| (a) For PSUs (5V, 5A) (100 sets) | | | | |
| 1. | Transformer | 100 | 200 | 20,000 |
| 2. | Semiconductor devices (ICs, SCR, rectifier, diodes, transistors, LEDs etc.) | 100 | 200 | 20,000 |
| 3. | Chasis/cabinet with heat sink | 100 | 100 | 15,000 |
| 4. | Printed circuit boards | 100 | 20 | 20,000 |
| 5. | Resistors and capacitors including filter capacitors and trim pot. | 100 | 200 | 20,000 |
| 6. | Termination, switches fuse assembly potentiometer, hook up wire, mains, cards and misc. hardware etc. | 100 | 200 | 20,000 |
| 7. | | | **Total** | **1,15,000/-** |
| **(b) For Variable Power Supply (30V, 2A) (100 sets)** | | | | |
| 1. | Transformer | 100 | 300 | 30,000 |
| 2. | Semiconductor devices (ICs, SCR, rectifier, diodes, | 100 | 120 | 12,000 |

| | | | | |
|---|---|---|---|---|
| | transistors, LEDs etc.) | | | |
| 3. | Chasis/cabinet with heat sink | 100 | 100 | 11500 |
| 4. | Printed circuit boards | 100 | 20 | 2,000 |
| 5. | Resistors and capacitors including filter capacitors and trim pot | 100 | 200 | 20,000 |
| 6. | Termination, switches fuse assembly potentiometer, hook up wire, mains, cards and misc. hardware etc. | 100 | 200 | 20,000 |
| 7. | Current/ Volts meters | 100 | 350 | 35,000 |
| | | | **Total** | **1,29,000/-** |
| | | | **Total Cost of Raw Materials/ Components (per month) (a+b)** | **2,44,000/-** |

(iii) Utilities (per month)

| Sl. No. | Description | Amount (Rs.) |
|---|---|---|
| 1. | Power | 5000 |
| 2. | Water | 1000 |
| | **Total** | **6000** |

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

| Sl. No. | Description | Amount (Rs.) |
|---|---|---|
| 1. | Advertisement and Publicity | 5000/- |
| 2. | Consumable stores | 5000/- |
| 3. | Insurance | 2000/- |
| 4. | Misc. Expenditure | 2000/- |
| 5. | Postage and stationery | 2000/- |
| 6. | Rent | 20,000/- |

| | | |
|---|---|---|
| 7. | Repairs and maintenance | 3000/- |
| 8. | Telephone/fax | 3000/- |
| 9. | Transport charges | 5000/- |
| | **Total** | **47,000/-** |

**(v) WorkingCapital**
**Rs. 5,04,000**
**(i+ii+iii+iv)**
**(vi) Working Capital for 3 Months (Rs. 5,04,000 x 3)=Rs. 15,12,000**

**C. Total Capital Investment**

**Fixed capital = Rs.1,70,000**

**Working capital for 3 months= Rs.15,12,000**

**Total = Rs. 16,82,000**

**FINANCIAL ANALYSIS**

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

| Sl.No | Description | Amount(Rs.) |
|---|---|---|
| 1. | Depreciation on machinery and equipment @ 10% | 17,000/- |
| 2. | Depreciation on office furniture @20% | 6,000/- |
| 3. | Depreciation on tools @ 25% | 5,000/- |
| 4. | Recurring expenditure | 60,48,000/- |
| 5. | Interest on capital investment @13% | 2,18,660/- |
| | **Total** | **62,94,660/-** |
| | **Or Say** | **62,95,000/-** |

**(2) Sales (per annum)**

| |
|---|
| 3000 Nos. of PSUs 5V, 5A at Rs. 1000 each = Rs. 3000 x 1000 = Rs30,00,000<br>and<br>3000 Nos. of variable power supply 30V 2A @ Rs.3000 x 1400 = Rs. 42,00,000<br><br>**Total Rs. 72,00,000** |

| | |
|---|---|
| Sales | Rs.72,00,000 |
| Cost of production | -Rs.62,95,000(Minus) |
| **Total** | **Rs.9,05,000** |

**(3) Profit (per annum) (Before Taxes)** = **Rs. 9,05,000**

**(4) Net Profit Ratio =** $\frac{\text{Profit (per annum)} \times 100}{\text{Sales (per annum)}}$

$= \frac{905000 \times 100}{7200000}$

= **12.6%**

**(6)Rate of Return** = $\frac{\text{Profit (per annum)} \times 100}{\text{Total capital investment}}$

$= \frac{905000 \times 100}{1682000}$

= **53.8%**

**(7)Break-even Point**

| **Fixed Cost (per annum)** | **(Rs.)** |
|---|---|
| Rent | 2,40,000 |
| Depreciation on machinery andequipment @ 10 % | 17,000 |
| Depreciation on tools, jigs and fixtures @ 25% | 5000 |
| Depreciation on office furniture @ 20% | 6000 |
| Interest on total capitalinvestment @ 16% | 2,18,600 |
| Insurance and Taxes | 24000 |
| 40% Salaries and wages | 9,43,600 |
| 40% other contingent expenses andutilities (excluding rent and insurance) | 3,00,000 |
| **Total** | **17,54,200** |
| **or Say** | **17,54,000** |

**B.E.P.**

$$= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}}$$

$$= \frac{17,54,000 \times 100}{17,54,000 + 9,05000}$$

= **65.9%**

**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 Electronics 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 and Equipment Suppliers**

1. M/s. British Physical Laboratories 93, Nehru Place,
   New Delhi – 110019
2. Rama Electric And Machinery Store676-77, G.B. Rd Delhi 110006
3. M/s. Bharat Electronic Ltd. Jallahalli,
   Bangalore.
4. M/s. Chaudhary Trading Co. 1681/11, Bhagirat Place, ChandniChowk,
   New Delhi - 110006
5. M/s. E C I L Cherapalli, Hyderabad.
6. M/s. Integral Systems and Components (P) Ltd.
   45/7-A, Gubbana Industrial Estate, VI–Block, Rajaji Nagar, Bangalore
7. M/s. Kiber India Mahal Industrial Area, Andheri East, Mumbai - 93
8. M/s. M R Electronics Components Limited
   Mount Road, Chennai – 2
9. M/s. Noble Electronics 354, Lajpat Raj Market, Delhi - 110006
10. M/s. Nippen Electrical Instruments 12A, MarolMaroshi Road, Andheri East, Mumbai -400 059.

**Raw Material Suppliers**

1. M/s. Transtronix India Pvt. Ltd. 80A, DDA Sheds,
   Okhla, Phase–II, New Delhi -1100 20.
2. Link Electrical( India)Shop No.1853/1 Hari Ram Market, Bhagirath Palace, Delhi 110006
3. M/s. Leader Electronics Corpn.
   2-6-33, TsunashimaHijiashiKahoku Ku, Yokohoma,Japan
4. M/s. Pieco Electronics and Electricals Limited
   Ramon House,169, Bakbay Reclamation, Mumbai - 400020.
5. M/s. Uptron India Ltd. 10 AdhokMarg, Lucknow–226 001.
6. M/s. Applied Electronics Ltd. A-5, Wagle Industrial Estate,
   Thane, Mumbai-40000 4