

BCPS 2440

Battery Charger-cum-Power Supply

State-of-the-art equipment with Switching Mode technology for round-the-clock applications



Installation and User Manual

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Chapter 1: Safety Instructions

This Section Contains...

- ✓ *Important Safety Instructions*
- ✓ *Receiving and Unpacking*
- ✓ *Returns*
- ✓ *General Information*
- ✓ *Limited Warranty*

1.1. Important Safety Instructions

This manual contains important instructions that should be followed during installation and operation of the **BCPS 2440** Battery- Charger cum-Power supply.

The following symbols used in this manual stand for the purpose detailed against each:



This symbol warns you of the presence of dangerous voltages and the risk of electrical shock.



This symbol provides important information to take notice of.

It is advised that the BCPS 2440 Battery- Charger cum-Power supply should only be installed by an authorized electrician in accordance with local electrical codes and instructions contained in this manual.

Read this manual thoroughly before using the product and ensure to read through this safety information completely. Keep this manual safely for future reference.

Always follow the instructions contained in this manual, while operating the product.



Before cleaning the product please unplug the power.

Carry the product to the installation site with care. Components inside the unit may get damaged on dropping the product, resulting in short-circuit or severe consequences when connected.

Power: Please follow the labeled specifications provided on the unit before connecting the power source. Contact the manufacturer in case of any doubt.

Power Cable: The power cables must be properly secured, as improper connections may cause short-circuits, fire hazards or similar dangerous consequences.

Foreign Objects or fluids: Do not allow any foreign objects or fluids into the unit, to avoid any fatal consequences.

Maintenance



Only qualified maintenance personnel are authorized to service the unit.

Switch OFF the equipment immediately and call the maintenance personnel for assistance in case of the following:

- Damaged Power Cables or Power Sockets;
- Insertion of foreign objects or fluids;
- Inoperability of the unit, in spite of correct operations;
- Dropped or damaged unit;
- Any other hazards.

Replacements: Unauthorized replacement of the internal components is restricted to avoid electric shock, short-circuits and similar hazards. Contact the maintenance personnel or the Manufacturer before attempting any replacements.

1.2. Receiving and Unpacking

Please unpack the contents carefully and compare the packing list. Any discrepancy in this regard must be immediately brought to the notice of M/S Kernex Microsystems (India) Limited (KMIL). Please check and inspect for any damage of the equipment during the shipment and in case of any damage, file immediately a complaint with the carrier consignee for the damage.

1.3. Returns

If equipment is to be returned to the factory for any reason, please call M/S Kernex Microsystems (India) limited between 9.00 a.m. and 5.45 p.m. Indian Standard Time (IST) to request a Return Authorization Number (RA.No) and include this number with the returning equipment along with a description of the problem and the name, address and the contact number of the sender. Carefully pack the equipment to prevent damage during shipment. In case of need contact M/S Kernex Microsystems (India) limited for packaging instructions.



Remember to write the RA.No on the outer case of the package prominently.

1.4. General Information



Changes or modifications to this product by other than an authorized service facility could make the product warranty void.

- This booklet includes the latest information available at the time of printing. M/S Kernex Microsystems (India) Limited (KMIL) reserves the right to make changes to this product without further notices.
- If you have questions about the use of this product, contact your KMIL's Sales and Service Representative or at the address given in section 1.5 below.

1.5. Warranty

KERNEX MICROSYSTEMS (INDIA) LIMITED

Plot No 7 “THRUSHNA”, Software Units Layout, Infocity, Madhapur,
HYDERABAD INDIA 500 081

Phone: 91 40 23113193

Fax: 91 40 23113191

Email: support@kernex.in

Kernex Microsystems (India) Limited (KMIL) warrants that the product mentioned below will be free from defects in materials and workmanship for a period of 24 months from the date of commissioning or 28 months from the date of supply, whichever ends earlier. If any such product proves defective during this warranty period, KMIL, at its option, either will repair the defective product without charge for parts and labour, or will provide a replacement in exchange for the defective product. Batteries used inside and breakage of glass or any other fragile items are excluded from this warranty. In case of replacement of a defective product with another one, the warranty shall expire on date corresponding to the original product.

The Customer shall be responsible for identification of the defective unit, packing, to and fro transportation to the nominated central maintenance facility and transit insurance.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. KMIL shall not be obligated, to repair damages resulting from:

- a) Attempts by personnel other than KMIL maintenance personnel, to install, repair or service the product,
- b) Improper use or connection to incompatible equipment, or input voltage supply beyond specified range,
- c) Natural calamities, fire hazards, accidents, vandalism, theft or burglary.

This warranty is given by KMIL with respect to the product mentioned below in lieu of any other warranties, expressed or implied. KMIL's responsibility to repair or replace defective products is the sole and exclusive remedy provided to the customer in case of any faults identified. KMIL will not be liable for any indirect, special, incidental, or consequential damages irrespective of whether KMIL has advance notice of the possibility of such damages.

* Proof of purchase of the product and the purchase date shall be provided before any warranty service can be performed.

Chapter 2: Installation

This Section Contains...

- ✓ *Required Installation Tools & Materials*
- ✓ *Inventory*
- ✓ *Site Preparation*
- ✓ *Installation Requirements*
- ✓ *Installation*
- ✓ *Mounting figures with dimensions*

2.1. Required Installation Tools and Materials

2.1.1. Tools

- Common Hand Tools
 - Set Spanner M6
 - Screwdriver Set
 - Wire Stripper
 - Cutting Pliers, 6"
- Power Drill
- M6 Wall Drill Bits
- Multi-meter



Please do not replace any of the screws or other fasteners on the equipment, which may result in loss of warranty. If replacement is needed, please contact M/S Kernex Microsystems (India) Limited.

2.2. Inventory

- BCPS 2440 Battery Charger-cum-Power Supply Manual
- Warranty / Registration Card
- BCPS 2440 Battery-cum-Power Supply Unit
- Installation Kit containing:
 1. 25 mm Steel Glands—3 Nos.
 2. M6 X 75 mm Anchor Bolts with drums—4 sets
 3. M6 Plane Washers—4
 4. M6 Spring Washers—4
 5. Fuse 10A—2
 6. Fuse 25A—2
 7. MCBs (2pole 10A) with mounting box – 1No

2.3. Site Preparation

Please follow the below instructions for site preparation before installing the unit.

2.3.1. Input Power Specifications

- Voltage : 190 - 270V AC, 50 Hz, ± 2 Hz
- Current : 10 Amp

2.3.2. Dimensions

- Height : 350 mm
- Width : 123 mm
- Weight of unit : 10 Kg (approx.)

2.4. Installation Requirements

- Be sure to read all the installation requirements and instructions before beginning the actual installation.



This equipment requires a dedicated branch circuit rated at 220 V (Single Phase) with minimum circuit capacity of 10 Amps and over current protection of 15 Amps.

- Position the power junction box such that the conduit and input wiring can be connected.
- The unit must be mounted at least 4 - 5 Feet above the floor.
- The unit must be mounted at a location that allows an unobstructed clearance all around for ease of maintenance.
- The unit must be mounted and an electric point (MCB) of suitable rating shall be provided near to this unit.

2.5. Installation

2.5.1. Inspection

1. Remove the charger from its shipping container.



Please read the manual carefully before installation.

2. Please find the following on the Unit:
 - i. Find and locate two top mounting holes.
 - ii. Find and locate two bottom mounting holes

2.5.2. Installation

3. Place the Charger Template on the wall (approx. 4' - 5' above the floor) and mark the four holes with a marker.
4. Drill the holes on wall to suit M6 Anchor bolt with power drill machine. Please refer figure at section 2.6.2.
5. Insert the Anchor Bolts drums into the drilled slots.
6. Lift the charger on to the wall and align it exactly with the drilled holes on the wall and insert the Anchor bolts.
7. Hold the charger in place and tighten the anchor bolts (diagonally opposite bolts) to full extent possible and repeat the same for the bolts on the opposite side.
8. Check and ensure that the Charger is firmly fixed in its position.
9. Connect the Earth point of the charger with suitable copper wire to the MCB box.
10. Open the charger Front Door and connect the charger I/P supply to I/P terminals, Phase to L, Neutral to N and ground to G.
11. Connect the Load to the Load terminals on the charger (marked as Load Terminals +Ve and -Ve).
12. Connect the Battery Terminals to the Battery terminals of the charger (marked as Battery Terminals +Ve and -Ve).
13. All the wires into the charger and from the charger to be routed through the PVC conduit and through the Cable glands.



Turn Off the circuit breaker at the service or distribution panel supplying the electricity to the MCB box and verify that high voltage is not present before performing the following steps.

2.5.3. System Test

1. Turn ON the MCB for the charger unit.

2. Switch on the unit by using ON/OFF switch located on the front panel.
3. Observe the output voltage on the meter located on the front panel, it should be $28.5V \pm 1V$ DC.
4. Observe the battery current on the meter located on the front panel by selecting the battery/load current switch in battery current mode. The reading depends on the battery condition.
5. By using Multi-meter, measure the battery voltage at battery terminals and voltage depends on the battery condition.

2.5.4. Commissioning

1. Connect the load.
2. Switch on the unit by using ON/OFF switch located on the front panel.
3. After power 'ON,' the BCPS performs self diagnostics continuously. During self diagnostics, the following functions/parameters are checked by a microprocessor.
 - a. Oscillator – working or not
 - b. Output Voltage – within tolerance or not
 - c. Battery Charge level
 - d. Mode of operation (Float / Boost)
 - e. AC Power status
 - f. Load on Battery
 - g. Overall Charger Functioning



On detection of any of the above failures the "Charger Failed" LED will be lit ON. The microprocessor also monitors the charging and discharging current of the battery. The battery charging level is continuously computed and the battery low condition is decided based on charge – discharge cycles.

4. Keep the Auto / Equalizer switch in Auto mode.
5. Observe the output voltage on the charger.
6. Measure the load current on the meter located on the front panel by selecting the battery/load current switch in load current mode. The reading depends on the load condition.
7. Change the mode switch to Equalize mode and measure the Output voltage on the charger by varying the potentiometer located on the front panel (26V to 30V DC).
8. Switch OFF the unit and connect the battery to the Battery terminals.

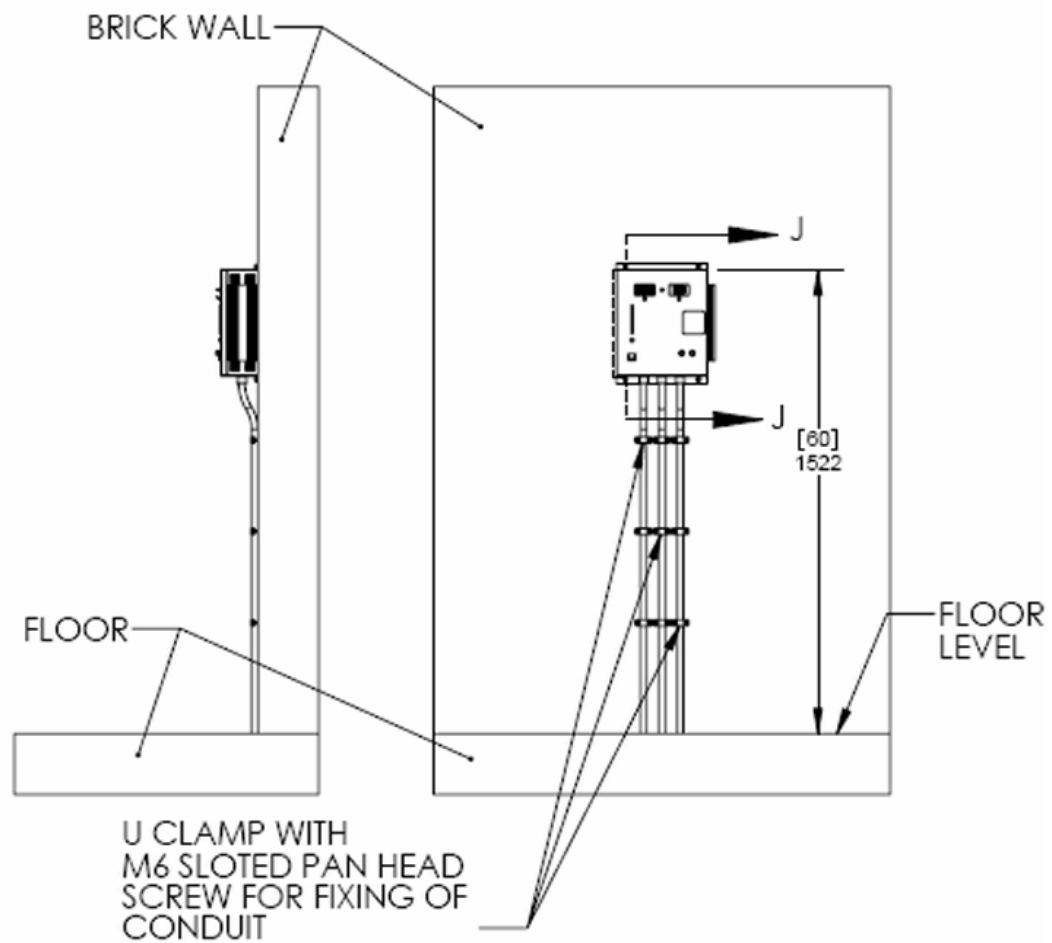
9. Switch ON the unit and measure the charging current in the Ammeter by selecting the selector switch to battery current mode. The charging current depends on the battery condition.
10. Switch OFF the line input to the unit by switching OFF the MCB in MCB box.
11. Observe the indication on the unit front panel “Mains Fail”.
12. Observe there is no power disturbance to load and also observe the load current on the charger.
13. Observe the indication on the unit front panel “Load ON Battery”.

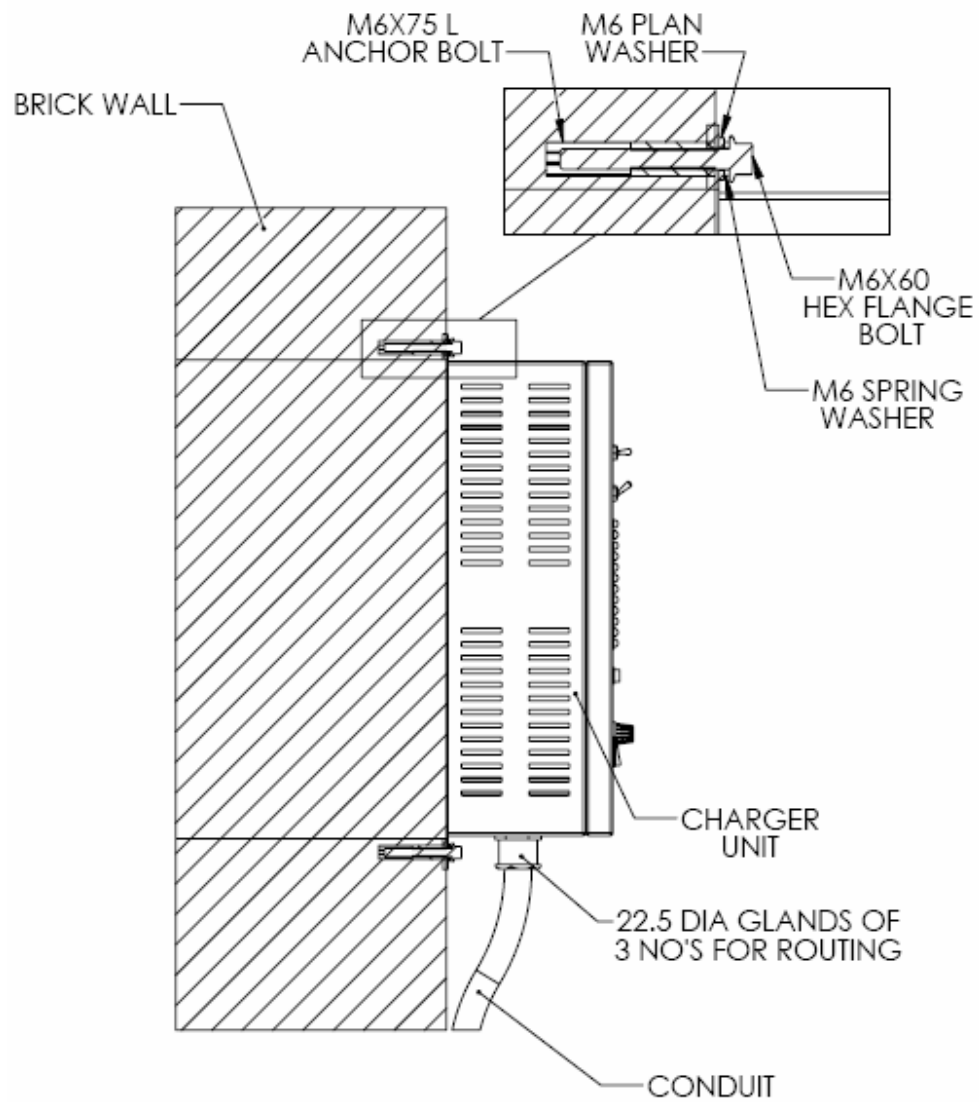
2.5.5. Site Cleaning

1. Recover all packaging materials and clear all the debris at the site area.
2. Present this booklet to the owner.

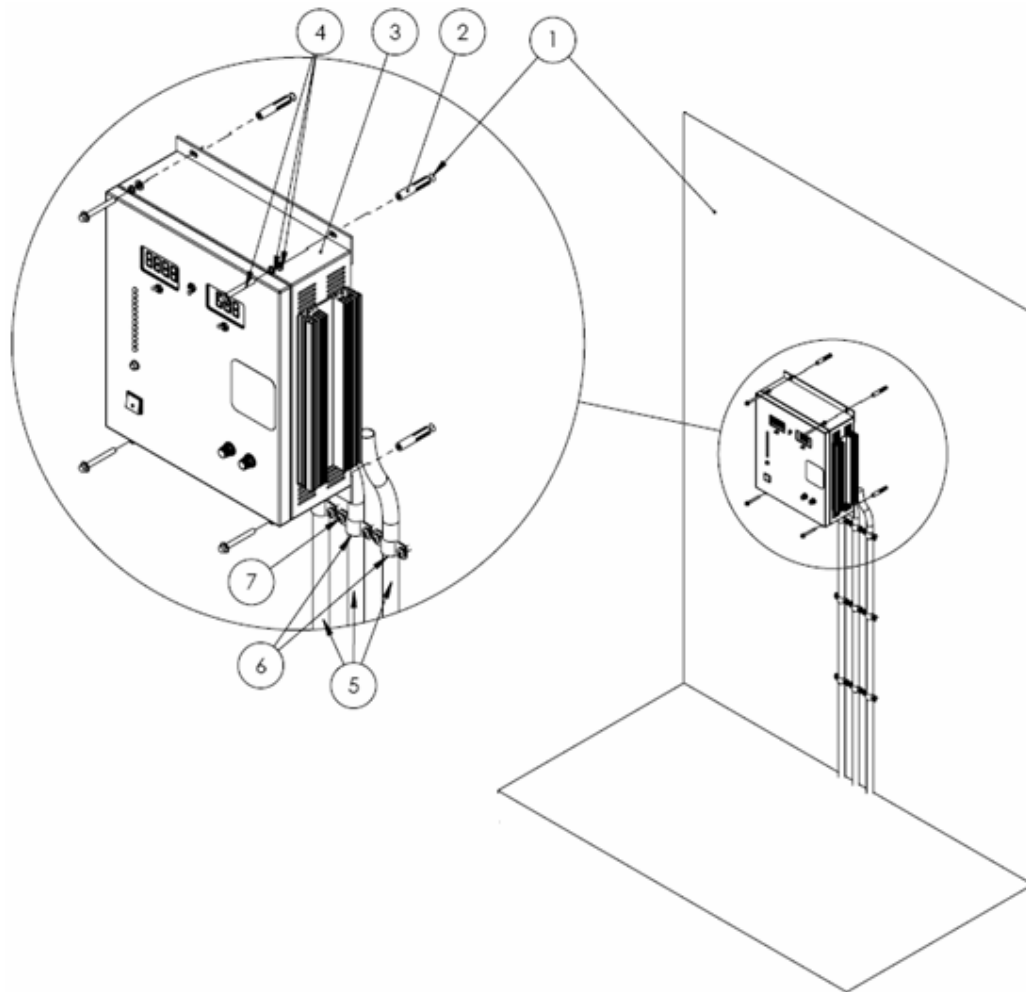
2.6. Wall Mount Figures with Dimensions

2.6.1. Figure Depicting the Placement of BCPS on the wall



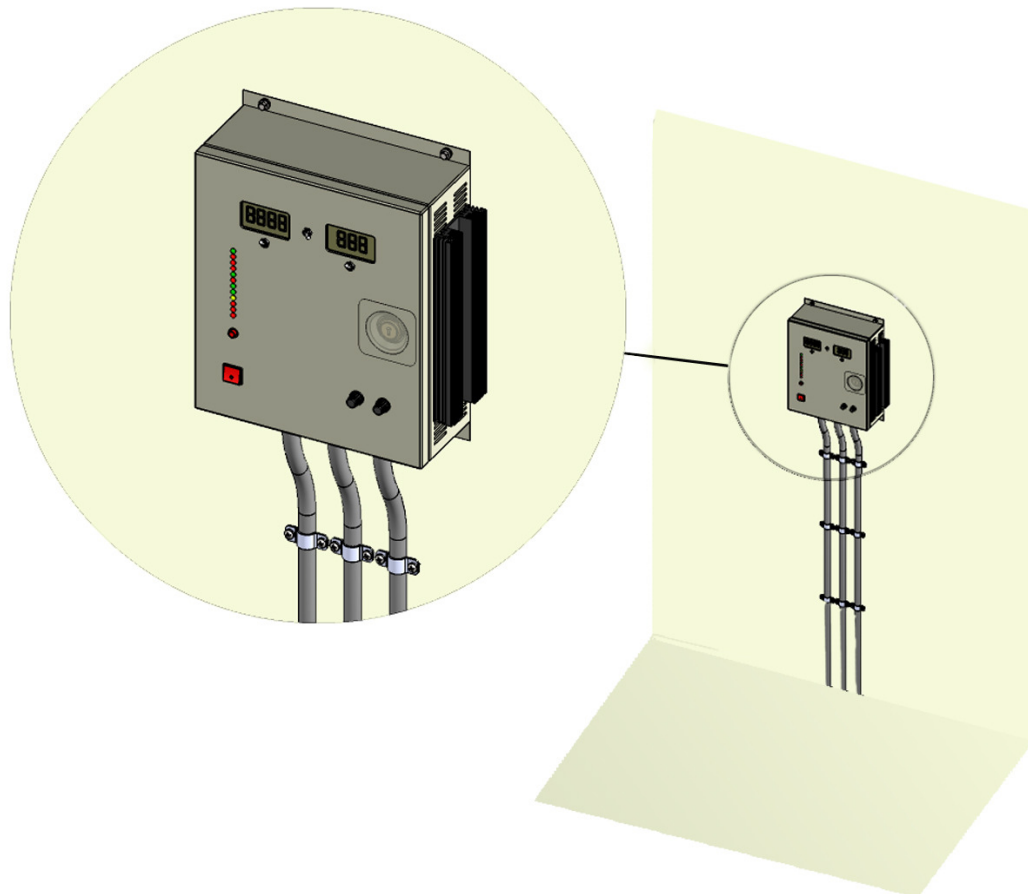
2.6.2. Figure Depicting the fixing of BCPS to the wall

2.6.3. Fixing Procedure



Item No	Part No	Description	Quantity
1	Wall	Wall with predrilled holes to suit M6 Anchor Bolt	4
2	Anchor Bolt	Standard M6x75 L Anchor Bolt	4
3	Battery Charging Unit	Battery Charger-cum-Power Supply Unit	1
4	Fasteners	M6 Flange Head Bolts with Spring & Plain Washers	4
5	Rounding Conduit	Suitable Conduit for Routing	3
6	U-Clamp for Routing	Fixing of Routing Conduit	9
7	IS 7483-M6-x40-Z-40 N	M6 Slotted Pan Head Screws	18

2.6.4. View of the BCPS after Complete Installation



Chapter 3: System Description

This Section Contains...

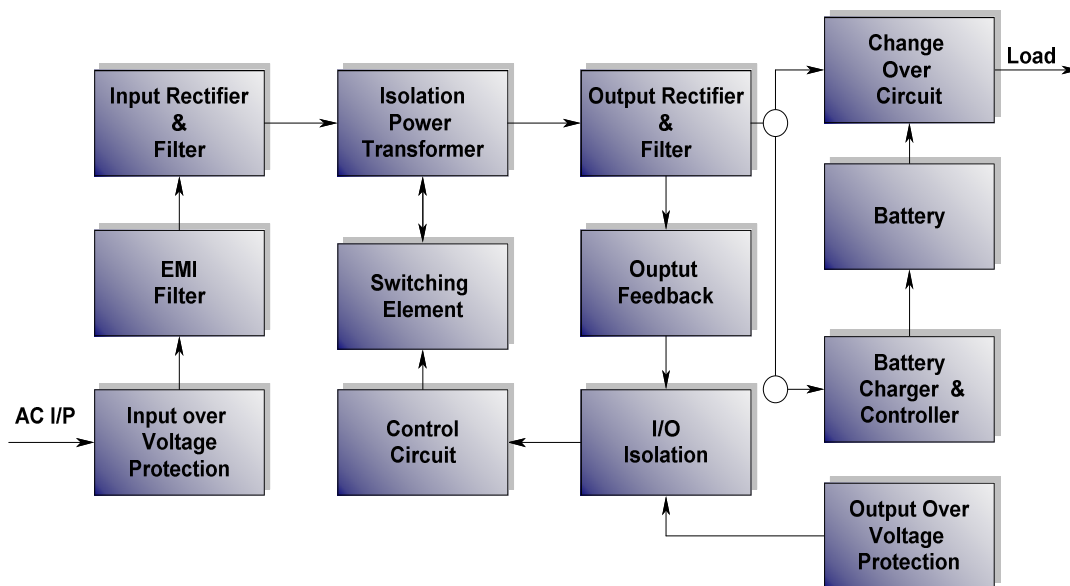
- ✓ *General System Description*
- ✓ *Parts Description, Physical Dimensions*
- ✓ *Functional Modules & Description*
- ✓ *Operating Principle with Block Diagram*
- ✓ *LED Indicators & Alarms*
- ✓ *Auxiliary Contacts*
- ✓ *Technical Specifications*
- ✓ *Protection & Safety*

3.1. General System Description

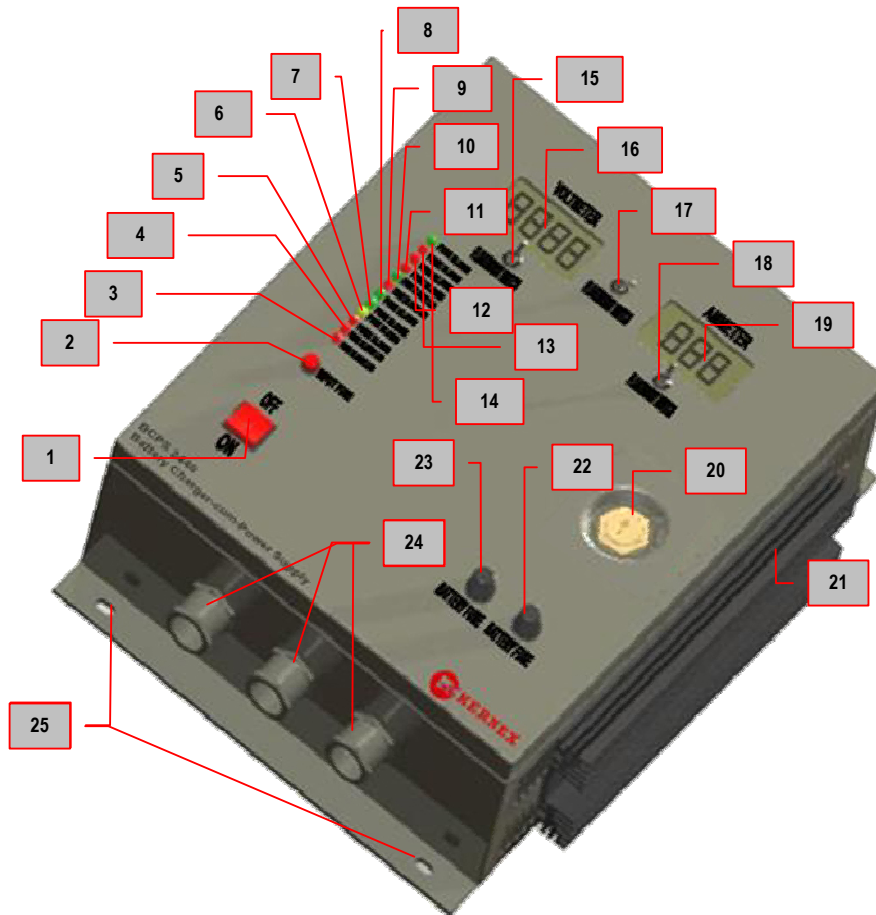
Kernex Microsystems (India) Limited's BCPS 2440 Battery Charger-cum-Power Supply (BCPS) unit is an Industrial Grade Equipment suitable for highly demanding round-the-clock applications. BCPS 24/40 employs state-of-the-art Switching Mode Technology to achieve high efficiency, low power dissipation and small in size. High reliability of the unit is achieved through vigorous quality checks, testing and environmental stress screening during the manufacturing process. KMIL's BCPS delivers load to the equipment and simultaneously charges a battery in 'Float Charge' mode.

The BCPS operates on 190-270 V, 50Hz single phase AC supply and delivers 28.5V output. The total current delivered by the BCPS will be 40A. The Block diagram of Battery charger cum power supply is shown at figure given below.

System Block Diagram



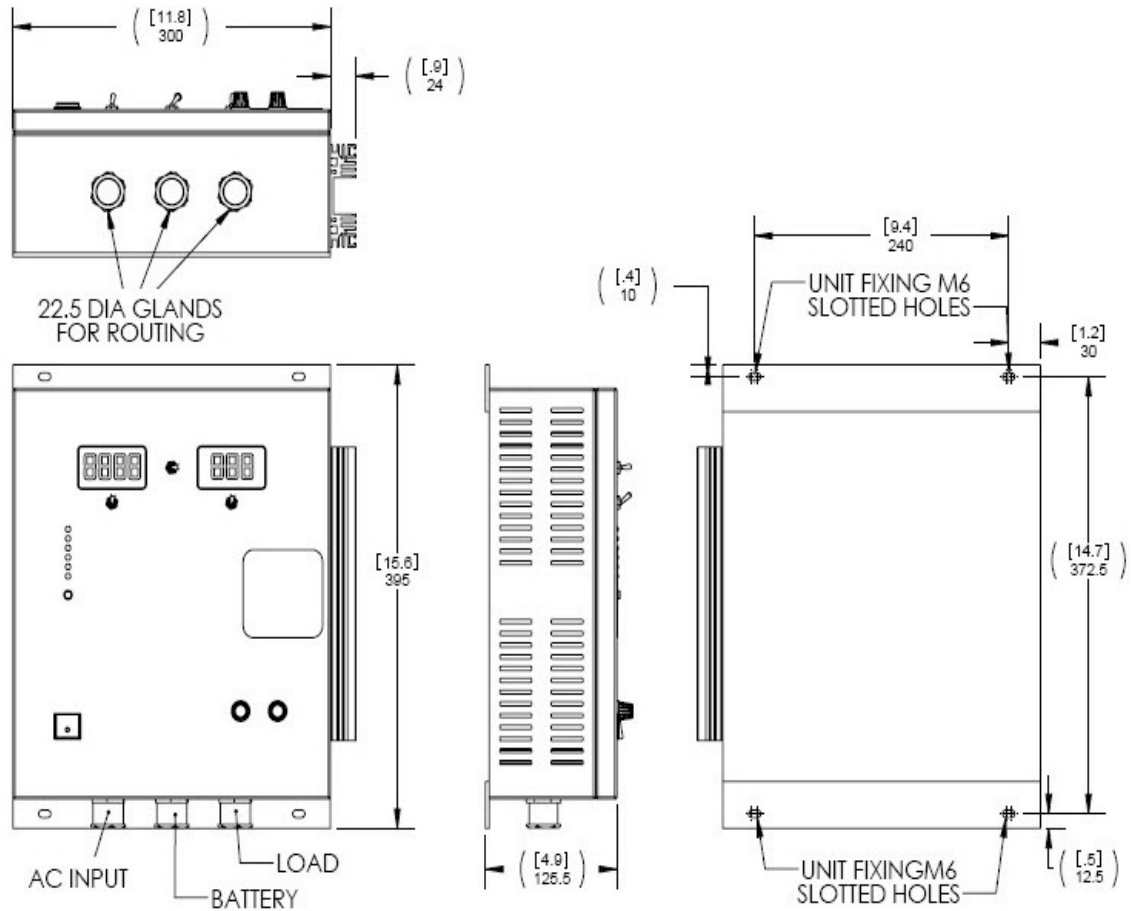
3.2. Parts Description



Legend

Label no	Description	Label no	Description
1	Power ON/OFF switch	14	Mains ON
2	Buzzer ACK switch	15	Voltmeter Selection Switch
3	Fuse blown	16	Digital Voltmeter
4	BATT Reverse	17	Auto/ Equalize Selection Switch
5	Equalizer Mode	18	Ammeter Selection
6	Float	19	Ammeter
7	Boost	20	Door Lock
8	Charger OK	21	Heat Sink
9	Load Disconnect	22	Output Fuse
10	Load On Battery	23	Input Fuse
11	Over Voltage	24	Cable Glands
12	Battery Low	25	Unit Fixing Holes
13	Mains Fail		

3.3. Physical Dimensions



Please note that all the measurements are in millimeters (mm)

3.4. Functional Modules

The Battery Charger-Cum Power Supply (BCPS) comprises of the following modules:

Sl.No	Name of the Functional Module
1	Input Over Voltage Protection Circuit
2	Line filter
3	Inrush current limit, Input Rectifier and Filter
4	Switching mode regulator
5	Output over voltage protection circuit
6	Battery charger with protection
7	Indications, meters and manual controls

3.5. Description of Functional Modules

3.5.1. Input over Voltage Protection Circuit

When Input voltage (AC) exceeds $270V \pm 2V$, the input to the unit is disconnected automatically; however, the output power to the load is provided from the battery. When the input voltage falls below $245V \pm 2V$, the normal operation is resumed automatically.

3.5.2. Line Filter

The line filters EMI/RFI noise prevalent on the input lines to enter into the charger output; similarly, it prevents the switching noise of the charger unit entering into the AC power lines.

3.5.3. Inrush Current limiting circuit, Input Rectifier and Filter

This section limits the power ON inrush current and also rectifies AC voltage into DC voltage and filters the ripple. The output of this section will be unregulated DC voltage.

3.5.4. Switching Mode Regulator

The input DC voltage is converted into high frequency AC voltage by a MOSFET switching element. This AC voltage is passed through a step down isolation transformer with 1KV isolation and the output is rectified and filtered. Pulse Width Modulation (PWM) technique is used for the purpose of regulation.

The output feedback is obtained through isolation and given to the PWM control circuitry.

3.5.5. Output over Voltage Protection Circuit

When the output reaches to over voltage, due to any reason, a rare occurrence, Power supply unit trips on over voltage condition (above 30V DC) and resumes to normal operation on removal of the fault condition. The power supply folds back and resumes to normal operation at the AC recycle.

3.5.6. Battery charger with protection

The Battery Sense Circuitry senses the presence of battery and analyses the health of the battery. The Battery Sense Circuitry also senses the load connected to the battery during mains failure and provides an indication. Battery charge condition is sensed by state-of-art sensing circuitry, which works based on charge-discharge cycle. Two levels of battery low conditions are realized, one for providing an alarm to the load control circuitry for taking preventive action and second limit to disconnect the battery from the load, to save the battery from deep discharge condition. Both the battery low limits are adjustable.

The main advantages are:

- High efficiency
- Smaller Dimensions
- Short Charge Times
- Charge independent of the changes in the Mains Supply
- Electronic Control that provides the desired Charge Curve

3.6. LED Indicators, Alarms, Meters & Switches

3.6.1. LED Indicators

Indicator	Description
Mains ON - Green	Will be lit ON when AC voltage is available
Mains Fail - Red	Will be lit ON along with buzzer when AC voltage is not available
Battery Low - Red	Will be lit ON along with buzzer when the Battery voltage is below $22.6 \pm 0.1V$
Over Voltage - Red	Will be lit ON when the output voltage is above 30V DC
Load ON Battery - Green	Will be lit ON when the load is on battery.
Load Disconnect – Red	Will be lit ON when the Battery voltage is below $21.6 \pm 0.1V$ and load will be disconnect.
Charger ON - Green	Will be lit ON when Charger is in OK.
Boost - Green	Will be lit ON when charger is in Boost mode
Float - Amber	Will be lit ON when charger is in Float mode
Equalizer Mode - Red	Will be lit ON when charger is in Equalizer mode
Battery Reverse - Red	Will be lit ON when Battery is connected in reverse polarity
Fuse Blown –Red	Will be lit ON when fuse is blown (i.e. the fuse connected in series with the battery)

3.6.2. Alarms

Condition	Alarm Type	Action
Audible Alarm	Battery Low	When Battery voltage falls down to under voltage (22.5V)
Audible Alarm Acknowledgement Push Button	Mains Failure	I/P AC supply is OFF To be pressed to reset the audio alarm

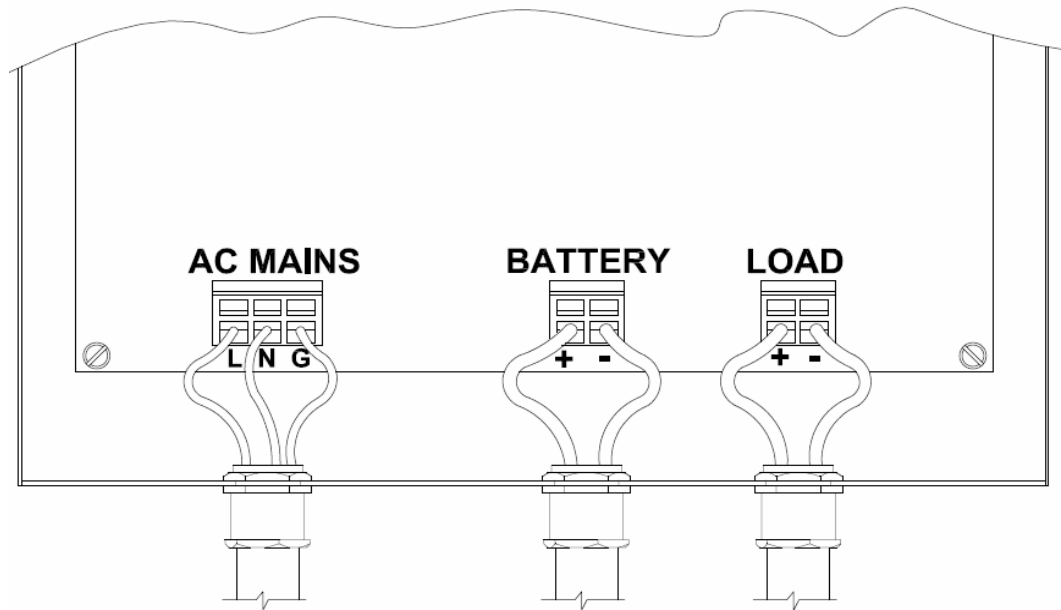
3.6.3. Meters

Meters	Type	Description
Voltmeter	Digital Meter	Display the BCPS Output / Battery Voltage
Ammeter	Digital Meter	Display the LOAD current/ Battery charge, discharge Currents.

3.6.4. Switches

Manual Controls	Type	Position	Description
Voltmeter Selection	Switch	1	To select the BCPS voltage
		2	To select the Battery Voltage
Ammeter Selection	Switch	1	This switch selects the Load current
		2	To selects the Battery charge/ discharge current
Auto/ Equalize Selection Switch	Switch	1	To select the battery to Auto mode
		2	To select the battery to Equalize mode

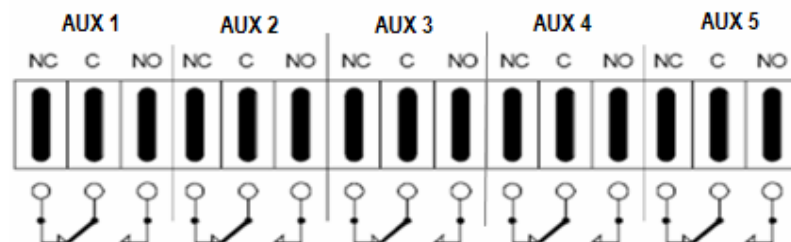
3.7. Main terminals



3.8. Auxiliary Contacts

The auxiliary contacts of the BCPS are as follows. Please refer figure and table below for more details.

- Mains ON Relay
- Battery Low Relay
- Charger Fail
- Load Disconnect
- Over voltage



Section	Function	Description
Aux1	Mains ON	Charger is working on Mains supply, then the contacts will be given (NO, NC & Pole)
Aux2	Battery Low	When battery voltage is discharged to 22.5V, then the contacts will be given (NO, NC & Pole)
Aux3	Charger Fail	When Charger is failed, then the contacts will be given (NO, NC & Pole)

Section	Function	Description
Aux4	Load disconnect	When battery voltage is discharged to 21.5V, then the contacts will be given (NO, NC & Pole)
Aux5	Over voltage (Output)	When output voltage is above 55V, then the contacts will be given (NO, NC & Pole)

3.9. Technical Specifications

3.9.1. Mains Side

Description	Symbol	Test condition	Value and / or range	Unit
Supply Voltage	V _{in}	--	190 - 270	V AC
Frequency	f	--	50 ±2	Hz
Maximum Current	I _{in} Max	--	10	A

3.9.2. Battery Side

Description	Symbol	Test condition	Value and / or range	Unit
Maximum Charging Current	I	--	20	A
Output Voltage	V	--	28.5	V

3.10. Other Specifications

3.10.1. General

Description	Symbol	Test condition	Value and / or range	Unit
Switching Frequency	F _c	--	85 ± 5	KHz
Efficiency		At 230V AC and fully loaded	>75%	
Maximum Power	P _{in} Max	P = P max	1200	W

3.10.2. Performance

Description	Test condition
Power Input	Nominal 230 V AC (range 190V to 270V single phase AC)
Line Frequency	50Hz – 60Hz ±2Hz
Output	28.5V at 40Amps max. Battery charging current 20 Amps Max.
Regulation	Within ±2% when operating from Inverter; will follow the Battery Voltage when operating from battery.
Ripple & Noise	Ripple on output load terminal < 100mV, Noise < 300mV Pk-Pk

3.10.3. Protection and Safety

Description	Test condition
Output over Voltage	Power supply unit trips on over voltage condition (above 30V DC) and resumes to normal operation on removal of fault condition
Output over load/Short Circuit	Fold back current limit. It resumes to normal operation on removal of the short
Battery Reverse Polarity	Protected on reverse polarity connection (fuse blown), the LED indication is provided
Battery Deep Discharge	Limit 1: When the battery voltage falls to 22.50 V, Indication with audio alarm and Potential free contact as advance warning Limit 2: When the battery voltage falls below 21.5±0.2V load disconnect indication and potential free contact. The battery will cut-off from the load and only charging takes place. When the battery voltage reaches 22.50±0.2V, the battery will get connected to equipment output.
Fuse Protection	Provided for the mains supply and the Battery Reverse

3.10.4. Environmental

Description	Test condition
Operating Temperature	Range from -10°C to +60°C
Humidity	95% RH

3.10.5. Physical Dimensions

Description	Test condition
Dimensions	Width: 350mm; Height: 300mm; Depth: 120 mm
Weight	10 Kgs approx.
Mounting	Wall Mounting

Chapter 4: Operation

This Section Contains...

- ✓ *Operating Procedures*
- ✓ *Normal Operation Indications*
- ✓ *Fault Condition Indications*

4.1. Instructions to operate BCPS

- Switch ON the Power to the unit.
 - The Mains ON LED indication will be glowing Green to indicate the availability of I/P supply.
 - The Charger ON LED indication will be glowing Green to indicate the proper working status of the unit.
- The charger can be operated in 'Auto' mode or Equalizer' mode. Periodically, equalizer mode can be selected manually for dissolving any solidified sulphate deposits on the battery plates. In this mode, charging voltage can be adjusted manually (maximum Voltage of 30 V). After 1 hour, the charger can be put back in 'Auto' mode.
 - If Auto mode is selected the Boost (Green LED) or Float (Amber LED) will be glowing depending on the battery charging condition.
 - If Equalizer mode is selected the LED indication will be glowing Red.
- To decrease the charging time, change the Auto/Equalizer mode switch to equalizer mode.
- For Normal charging, keep the mode selector switch in Auto mode.

Chapter 5: Maintenance & Troubleshooting

This Section Contains...

- ✓ *Maintenance Procedures*
- ✓ *Troubleshooting Procedures*

5.1. Maintenance



Turn OFF your Charger unit at the circuit breaker before cleaning. To reduce the risk of electrical shock or equipment damage, do not allow any liquid to enter the unit while cleaning it.



Clean the charger unit with a clean, soft and dry cloth.



Do not use any abrasive pad, Scouring powder or flammable or non-flammable solvents such as alcohol or benzene.



Take care not to break the Seal covering the Panel Lock. Refer to No.14 of figure given at section 4.2. Do not break the seal on the front panel lock to open the BCPS panel door during the warranty period. Warranty is liable for termination in such a case.



Do not try to replace any parts of the BCPS during troubleshooting. Contact the BCPS service representative in case of any unresolved problem immediately.

5.2. Trouble Shooting

5.2.1. Symptom 1: NO Output Power and NO Mains, Charger ON LED Indications

Check Point	Solution
Check the input fuse F1	Open the fuse and check the continuity with multi-meter. If the fuse fails, replace it with a new fuse.
Check AC input ON/OFF switch	Disconnect the wires to the ON/OFF switch on the Unit. Keep the switch to ON position and check the continuity of the pole and way connections with multi-meter.
Check the AC Input Voltage and Check the Over Voltage Protection Circuit	If it is above 270V AC, there is no output. Input voltage is below 270V AC then only the charger will be ON.
Charger OK LED lit OFF	One of the functions tested by diagnostics has failed if AC mains ON is OK.

5.2.2. Symptom 2: Mains OFF LED lit ON

Check Point	Solution
Check the input fuse F1	Open the fuse and check the continuity with multi-meter. If the fuse fails, replace it with a new fuse.
Check AC input ON/OFF switch	Disconnect the wires to the ON/OFF switch on the Unit. Keep the switch to ON position and check the continuity of the pole and way connections with multi-meter.
Check wiring from MCB to Unit	If wires are cut, damaged or shorted, then replace the wires with the same specifications.
Check MCB in MCB box	If MCB is in tripped condition, then switch on the MCB
Check the Mains	Check the Main Supply at power distribution panel.

5.2.3. Symptom 3: Battery Reverse LED lit ON

Check Point	Solution
Check the Battery Connections	Check the wire coming from Battery to the unit for any reverse, then connect properly.

5.2.4. Symptom 4: Fuse Blown LED lit ON

Check Point	Solution
Check the Battery side fuse	Open the fuse and check the continuity with multi-meter. If the fuse fails, replace it with a new fuse.
Check the Battery Connections	Check the wire coming from Battery to the unit for any reverse, then connect properly.

5.2.5. Symptom 5: Low Output Voltage and Battery Low Indication lit ON

Check Point	Solution
Check the Load Current	Charger is overloaded therefore reduce the load on the charger.
Check the Load terminals	The Load terminals are shorted for any reason, then remove the short

5.2.6. Symptom 6: Over Voltage LED lit ON

Check Point	Solution
Check the Output Voltage	Disconnect the Load and Check the output voltage. If fault persists, change the unit.

5.2.7. Symptom 7: Load ON Battery LED lit ON/OFF

Check Point	Solution
Load ON Battery LED lit ON always	<ul style="list-style-type: none"> Open the fuse and check the continuity with multi-meter. If the fuse fails, replace it with a new fuse. Disconnect the wires to the ON/OFF switch on the Unit. Keep the switch to ON position and check the continuity of the pole and way connections with multi-meter. If wires are cut, damaged or shorted, then replace the wires with the same specifications. If MCB is in tripped condition, then switch on the MCB Check the Main Supply at power

Check Point	Solution
	distribution panel.
Check the Charger Output Voltage	If output voltage not available, replace the unit.
Load ON Battery LED lit OFF always	<ul style="list-style-type: none"> • Switch OFF the MCB and check the LED. • In case of fuse failure, check the battery terminal connection for reverse polarity, replace with same type and rating fuse and connect the battery terminals properly. • If the battery terminals are loosely connected or totally disconnected, then tighten / reconnect the terminals.

5.2.8. Symptom 8: Load Disconnect LED lit ON when Mains fail

Check Point	Solution
Load disconnect LED lit ON always	<ul style="list-style-type: none"> • In case of fuse failure, check the battery terminal connection for reverse polarity, replace with same type and rating fuse and connect the battery terminals properly. • If the battery terminals are loosely connected or totally disconnected, then tighten / reconnect the terminals.

5.2.9. Symptom 9: No Charger Output at battery terminals and NO Float/Boost or Equalize ON LED Indications

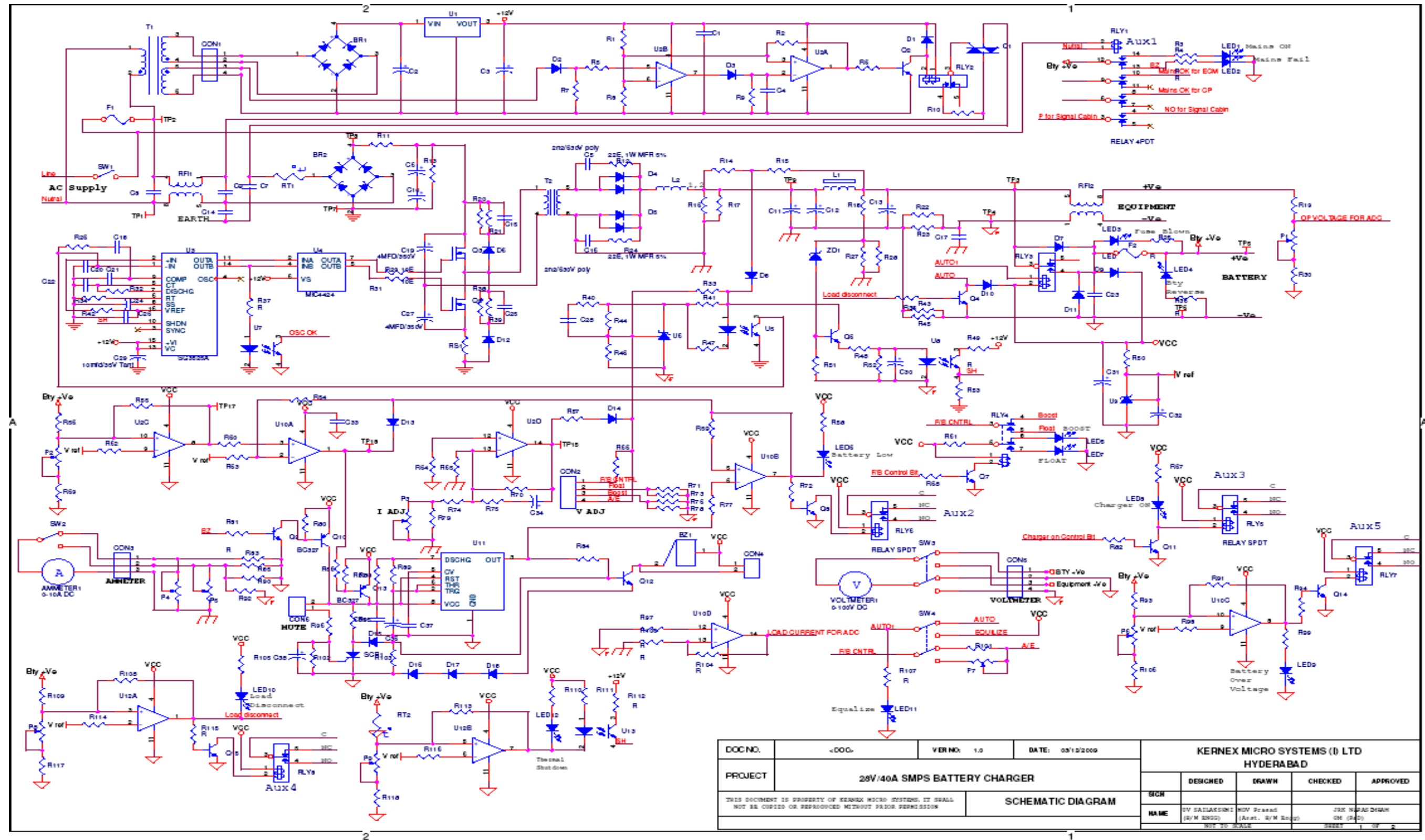
Check Point	Solution
Check the Battery Charger output fuse (25A)	In case of fuse failure, check the battery terminal connection for reverse polarity, replace with same type and rating fuse and connect the battery terminals properly.
Check the battery terminals for tightness	If the battery terminals are loosely connected then tighten the terminals.

Chapter 6: Circuit Diagrams

This Section Contains...

- ✓ *Main Circuit Diagram*
- ✓ *Circuit Diagram of Controller*

6.1. Main Circuit Diagram of the BCPS



6.2. Circuit Diagram of the Controller

