CS150U48V3

Installation & Operation Manual

K01-1504801-00

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

TABLE OF APPENDICES

1 PRODUCT INTRODUCTION

1.1 General Description

The CS150U48V3 battery backup unit is designed to serve up to two MDU ONTs (Optical Network Terminal for Multi-Dwelling Use) and can be installed indoors or outdoors. Generally, the product includes the following features:

- Universal input voltage 100 - 240V
- Up to 150W power output (48VDC)
- Microprocessor-based intelligent control
- Two battery strings (4 or 8 batteries) plus two sets of outputs provide four backup options to meet customers' different needs
- Communication interface to provide status updates to the ONT and customer
- PFC (Power Factor Correction) Functionality
- Optional pole mount kit
- Optional battery heater to provide wider temperature range for UPS operation

2 IMPORTANT SAFETY NOTES

- ONLY qualified installation and repair personnel should service this power supply.
- SAVE THESE INSTRUCTIONS - This manual contains important instructions for the CS150U48V3 units that should be followed during installation and maintenance.
- Verify the supplied AC line voltage prior to installation using an AC voltage meter.
- Verify branch circuit breaker or fuse on the service feed is correct for the equipment being installed.
- Batteries may produce hazardous currents and may present a burn hazard if damaged or shorted.
- The following precautions should be observed when working on the unit:
  - Remove watches, rings, or other metal objects.
  - Wear protective clothing and eye protection when working with batteries and installing this equipment.
  - Always carry a water supply to wash eyes and/or skin if exposed to battery electrolyte. Use tools with insulated handles.
  - Examine the packing container for damage. Notify the carrier immediately if damage is present.
  - Do not disassemble the unit.
  - Do not operate near water or excessive humidity.
  - Keep liquid and foreign objects from getting inside the unit.
  - Do not operate close to gas or fire.
  - Do not operate unit near leaking liquid or if any liquid residue is present.
  - Immediately unplug Power Supply from AC if you see liquid leaking.

2.1 Electrical Warnings

- Servicing this equipment may require working with protective covers removed and utility power connected. Use extreme caution during these procedures.
- Check that the power cord(s), plug(s), and outlets are in good condition.

2.2 Battery Warnings

- Danger of explosion if battery is incorrectly connected or replaced.
- Worn-out or damaged batteries are considered environmentally unsafe. Always recycle used batteries or dispose of the batteries in accordance with all federal, state and local regulations.
- Do not open or mutilate batteries. Any gel or liquid emissions from the sealed lead-acid (SLA) battery contain sulfuric acid, which is harmful to the skin and eyes. Emissions are electrically conductive and corrosive.
- Batteries may produce explosive gases. Keep all open flames and sparks away from batteries.
- Batteries contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Battery post terminals and related accessories contain lead and lead compounds. Wash hands after handling (California Proposition 65).
- Risk of Energy Hazard -12V max. / 7.2 (7) Ampere-Hour battery. Before replacing batteries, remove conductive jewelry such as chains, wrist watches, and rings. High energy through conductive materials could cause severe burns.
- Wear protective clothing and eye protection whenever installing, maintaining, servicing, or replacing batteries.
- If any battery emission contacts the skin, immediately and thoroughly wash with water. Follow approved chemical exposure procedures.
- Neutralize any spilled battery emission with the special solution contained in an approved spill kit or with a solution of one pound Bicarbonate of soda to one gallon of water. Report chemical spills and seek medical attention if necessary.
- Never use un-insulated tools or other conductive materials when installing, maintaining, servicing or replacing batteries.
- A battery showing signs of cracking, leaking, or swelling should be replaced immediately with a battery of identical type and rating.
- The battery can energize hazardous live parts inside even when the AC input power is disconnected.

2.3 Limited Warranty

CyberPower warrants to you, the Initial Purchaser, that the Product will be free from defects in material and workmanship for three years from the date of original purchase, subject to the terms of this Limited Warranty. This Limited Warranty gives you specific rights, and you may have other rights, which vary from State to State or Province to Province.

Any Implied Warranty of Merchantability or for Fitness for a Particular Purpose, if applicable to the Product, is limited in duration to three years. This provision shall NOT create any Implied Warranty or Merchantability or of Fitness for a Particular Purpose that would not otherwise apply to the Product. NOTE: Some States and Provinces do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

To be covered you must still be the owner of the Product at the time of the failure that results in the claim made under this Limited Warranty. Your sole and exclusive remedies are those provided by this Limited Warranty. This exclusion of other express warranties applies to written and oral express warranties. CyberPower excludes any liability for personal injury. CyberPower excludes any liability for direct, indirect, special, incidental, or consequential damages, whether for damage to or loss of property, loss of profits, business interruption, information or data. This exclusion applies even though damage or loss is caused by negligence or other fault. NOTE: Some States or Provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

DO NOT USE FOR MEDICAL OR LIFE SUPPORT EQUIPMENT OR OTHER HIGH RISK ACTIVITIES.

CyberPower does not sell the PRODUCT for use in high-risk activities. The PRODUCT is not designed or intended for use in hazardous environments requiring fail-safe performance, including the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, weapons systems, life support or medical applications or for use in any circumstance in which the failure of the PRODUCT could lead directly to death, personal injury, or severe physical or property damage, or that would affect operation or safety of any medical or life support device (collectively, "High Risk Activities"). CyberPower expressly disclaims any express or implied warranty of fitness for High Risk Activities. CyberPower does not authorize use of any PRODUCT in any High Risk activities.

ANY SUCH USE IS IMPROPER AND IS A MISUSE OF A CYBERPOWER PRODUCT.

The Limited Warranty is governed by the laws of the United States and the State of Minnesota, without reference to conflict of law principles. The application of the United Nations Convention of Contracts for the International Sale of Goods is expressly excluded.

2.4 FCC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with these instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: (1)Reorient or relocate the receiving antenna. (2) Increase the separation between the equipment and receiver. (3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. (4) Consult the dealer or an experienced radio/TV technician for help.

CAUTION: Any changes or modifications not expressly approved by Cyber Power could void the authority granted by the FCC to operate this equipment.

3 DIMENSIONS

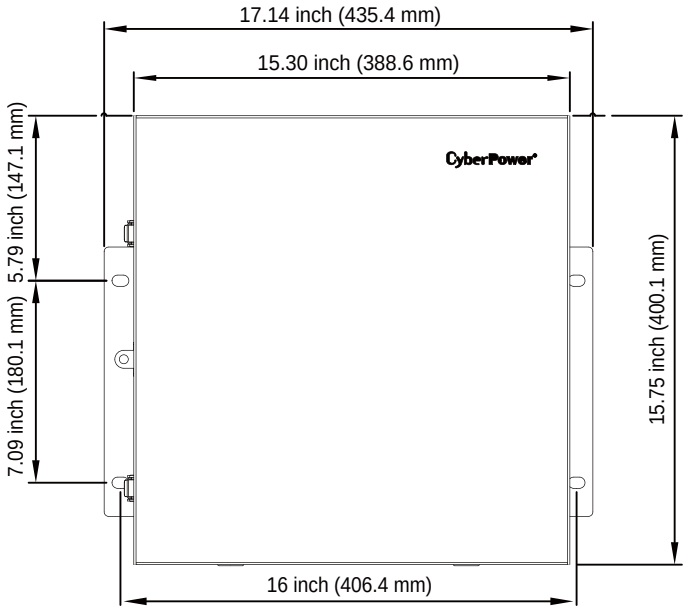


Figure 1: Dimensions (Front View)

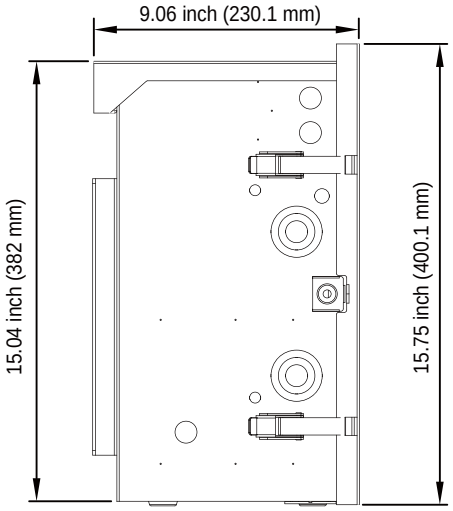


Figure 2: Dimensions (Side View)

4 INSTALLATION

4.1 Overview

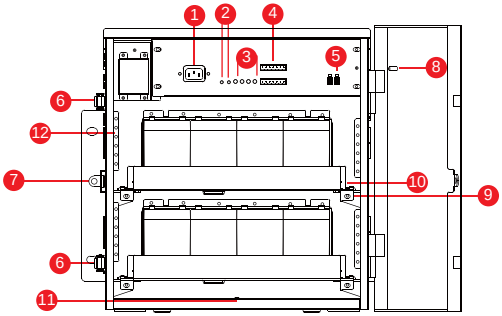


Figure 3: Unit Overview (Front)

1. Internal AC power wiring inlet
2. Alarm Silence and Cold Start button
3. LED Indicators (AC/DC MODE, BATTERY MISSING 1, BATTERY MISSING 2, DC OUTPUT)
4. DC Output and Telemetry receptacles
5. Battery wiring harness plug-in
6. Door clasp
7. Door padlock hasp
8. Door ground and bonding stud
9. Battery tray mounting screw
10. Battery tray
11. Customer option ground stud
12. Wire management bracket
13. Wall-mount bracket

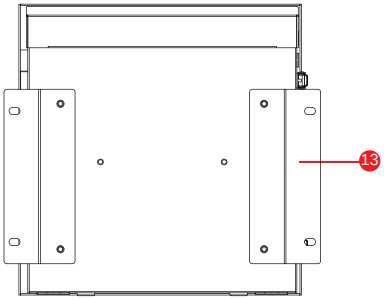


Figure 4: Unit Overview (Rear)

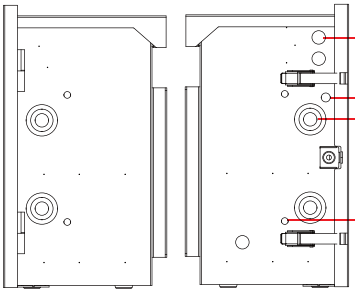


Figure 5: Unit Overview (Side)

3/4" knock-out

1/2" knock-out

3/4", 1 1/4", 1 3/4" concentric knock-out

3/8" knock-out (for recessed mounting)

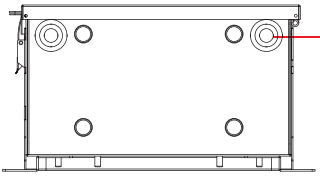


Figure 6: Unit Overview (Bottom)

3/4", 1 1/4", 1 3/4" concentric knock-out

4.2 Unpacking

Inspect the Battery Backup Unit upon receipt. The box should contain the following:

- Battery Backup Power Supply Unit x 1
- Battery Shelves x 2
  - – Battery Tray x 2
  - – Battery Tray Clamp x 2
  - – M4 x 8 Truss head Screws x 8 (secure clamp to shelf)
  - – M4 x 8 Truss head Screws x 4 (secure shelf to enclosure)
- Accessory Pack
  - – Terminal Connectors x 2
  - – Cable Ties x 6
  - – Battery Terminal Jumper x 6
  - – Battery Wire Harness Assemblies x 2
  - – User's Manual x 1
- Wall Mount Kit
  - – Wall Mount Bracket x 2
  - – M8 Flange Nut x 4
- (OPTIONAL) Pole Mount Kit
  - – Pole Mount Bracket x 3
  - – M8 Flange Nut x 6
  - – M8 x 25L Hex Head Screws (clamp center bracket to side brackets) x 4
  - – M8 Lock Washers x 4
  - – M8 Flat Washers x 4
- (OPTIONAL) Battery Heater
  - – Battery Heater Sheet x 1
  - – Circuit Breaker with Outlet x 1

4.3 Prior to Installation

Installation of the unit must be performed by skilled technicians and electricians familiar with electrical equipment. Do not allow unqualified personnel to handle, install, or operate the equipment. The installation must comply with both the requirements of the National Electrical Code (ANSI/NFPA 70, latest issue), and local codes.

CAUTION: When batteries are installed in the UPS, the total weight will exceed 50 pounds. Make sure the fasteners used to attach to the wall are of sufficient strength to securely hold the UPS.

4.4 Installation

4.4.1 Wall Mounting the UPS

1. Remove the UPS from the carton.
2. Get the wall mount kit.
3. Use the nuts included in the kit. Attach both wall mount brackets to the threaded posts on the back side of the UPS enclosure as shown on the right.
4. Reference the Wall Mount Chart (scaled-down) in Appendix I to mark the four mounting hole locations.
5. Pre-drill the marked hole locations to a suitable size (M8 is recommended) for the fasteners being used.
6. Install the fasteners and mount the UPS to the wall.

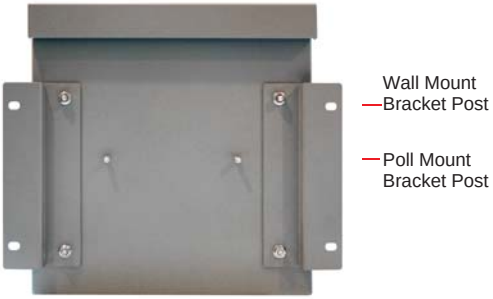


Figure 7: Wall Mount Kit

4.4.2 Pole Mounting the UPS (Optional)

1. Remove the UPS from the carton.
2. Get the pole mount kit (ordered separately)
3. Using the nuts included in the kit, attach the left and right pole mount brackets to the threaded posts on the back side of the UPS enclosures as shown.
4. Thread the (4) M8 x 25L hex head screws with a lock washer and flat head washer onto the center pole mount bracket.
5. Using pole mount straps (not provided), attach the center bracket to the pole.
6. Hang the UPS (batteries not installed) onto the center poll mount bracket which is already on the poll.
7. Tighten the 4 screws.

Note: Using stainless or galvanized steel straps with a width of 1-inch is recommended.

"Warning: Risk of Electric Shock. Mount the unit at a height greater than 25cm from the ground surface.**"**

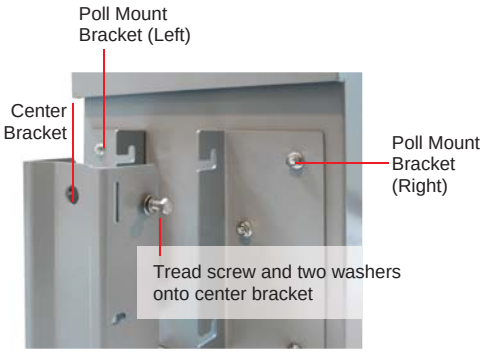


Figure 8: Pole Mount Kit

Figure 9: Pole Mounting Diagram

4.5 Installing the Battery Trays (Battery Replacement)

The batteries must be installed and wired to the battery tray prior to installing inside the UPS enclosure.

1. Slide the battery tray out of the UPS.
2. Get the new batteries and install batteries onto the battery tray as shown below.

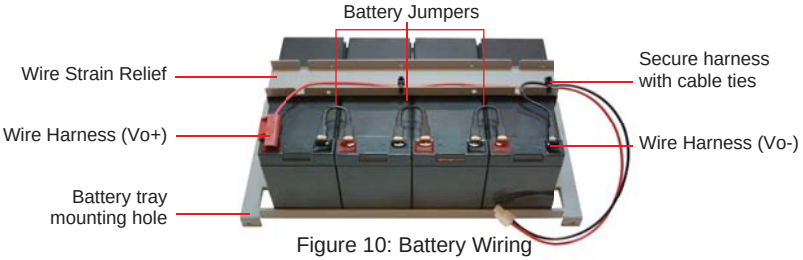


Figure 10: Battery Wiring

3. Install the battery clamp using the (4) screws provided. Tighten the screws.
4. Wire the batteries:
   a. Add wire jumpers (spade lugs) to interconnect the batteries.
   b. Attach the red wire on the wiring harness to the positive terminal (red) of battery.
   c. Attach the black wire on the wiring harness to the negative terminal (black) of battery.
   d. Secure the harness assembly to the battery clamp with cable ties.
5. Carefully slide the battery tray into the enclosure and secure with the M4 x 8 Truss head screws provided.

Note: The UPS should be secured on the wall/pole before sliding the battery trays into the UPS.

6. Plug the connectorized end of each wiring harness into the receptacle on the front face of the UPS.

Note: For customers who initially ordered one-battery-string configured cabinet, please contact CyberPower if upgrading to two-battery-string configuration is needed.

Note: The door must be locked with padlock after installation is complete.

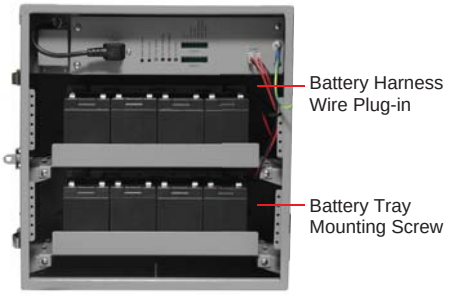
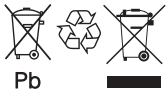


Figure 11: Battery Installation

Battery Type

The battery is a standard sealed lead acid battery rated at 12Vdc / 7.2 (7) Ah. When required, the battery may be replaced with an approved 12Vdc / 7.2 (7) Ah battery.



Batteries are considered HAZARDOUS WASTE and must be disposed of properly. Most retailers that sell batteries collect used batteries for recycling.

4.6 Battery Heater - BTH-150-8X (Optional)

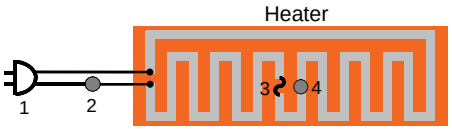


Figure 12: Block Diagram of Battery Heater

Input Voltage	(AC) 110V/60Hz
Wattage	120W
Line Cord Thermostat	OPEN：15˚C CLOSE：5˚C
Thermal Fuse	84˚C
Mat Mounted Thermostat	OPEN：50˚C CLOSE：35˚C

Table 1: Battery Heater Specifications

Note: Make sure that the input voltage for the battery heater is 110V.

DESCRIPTION:

Location	Device	Function
1	Power Connector	AC Input
2	Line Cord Thermostat	In low temperature conditions the thermostat will allow power to flow to the heater mat coil
3	Thermal Fuse	Final protection allows safe failure
4	Mat Mounted Thermostat	The thermostat is to keep the temperature of the battery heater within a pre-set range.

Table 2: Block Diagram Descriptions

DIMENSIONS:

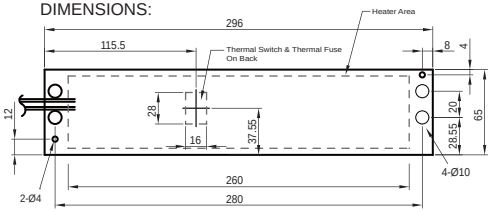


Figure 13: Battery Heater Dimensions

4.7 Connecting to Power Source

4.7.1 Installing the Power Cord

1. Remove the 4 terminal strip cover screws (upper left hand corner)
2. Remove any convenient 3/4” knock-out of the UPS enclosure.
3. Install a Heyco Liquid Tight Cordgrip (LTF-11) or equivalent, if not using conduit.
4. With the power cord disconnected from any supply source, route the power cord through the strain relief and attach it to the terminal strip.
5. Tighten the strain relief around the power cord to secure.
6. Re-install the terminal strip cover.
7. Plug-in the molded power plug on the front of the UPS control panel.

Note: Be certain to utilize environmentally sealed strain-reliefs, cordgrips, or conduit at the AC Power entry point.

Note: Be sure to connect the power cord to each terminal (L/N/G) correctly and securely.

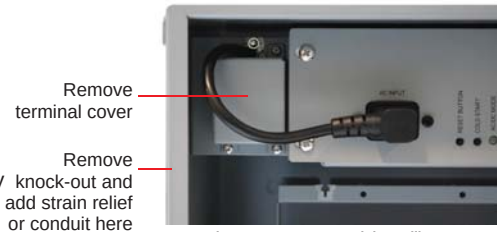


Figure 14: AC Wiring (i)

Figure 15: AC Wiring (ii)

4.7.2 Outdoor Power Cord Selection

1. If an outdoor AC Line cord is selected to connect the unit to AC wall outlet, be sure that the selection criterion in the following table are fully complied.

Cord Rating	Wire (AWG)	Outdoor Use	Attachment Plug	Flexible Cord Type
Three conductors, current rating 10A, VW-1, 105℃, 125/250V	Check specifications of liquid tight cable gland to determine the outside diameter of the wire. (O.D. > 6.8mm; 18AWG min. for each inner wire)	Use cord type with the suffix "W", "W-A" or the words "Water resistant" or "Outdoor" marked on the flexible cord	15A, 125V (NEMA 5-15P) or 15A, 250V (NEMA 6-15P)	SP-2, SPE-2, SPT-2, NISP-2, NISPE-2, NISPT-2, SP-3, SPE-3, SPT-3 SV, SVE, SVO, SVOO, SVT, SVTO, SVTOO SJ, SJE, SJO, SJOO, SJT, SJTO, SJTOO S, SE, SO, SOO, ST, STO, STOO

Table 3: AC Line Cord

2. The connection of the power cord should also be in accordance with Article 110.14 of ANSI/NEPA 70.
3. Using pin terminals (as shown in the Figure 14) for the power cord at the end connected to terminal strip is recommended.

"Warning - Risk of Electric Shock. Connect plug of outdoor power cord only to a covered Class A GFCI receptacle that has an enclosure that is weatherproof with the attachment plug cap inserted or removed.**"**

4. If conduit is used, be sure to choose wires in accordance with the following criterion.

Wire Gauge (AWG)	Wire Type	Tightening Torque (lb-in)	Minimum temperature rating of conductors
10-18 AWG Copper Conductors	Copper conductors	7	75°C

Table 4: Conduit Wires

"Warning - Risk of Electric Shock. Install wires going through conduit only on a circuit protected by a Class A GFCI.**"**

"Warning: Power supply cord must not be attached to the building surface, nor run through walls, ceilings, floors and similar openings in the building structure.**"**

"Warning: The socket outlet shall be installed near the equipment and shall be easily accessible.**"**

"Warning: To reduce the risk of fire, connect the unit only to a circuit provided with Listed 20 Amperes circuit breaker in accordance with the National Electrical Code, ANSI/NFPA.**"**

Note: Wiring, liquid tight fittings, conduit and cable glands shall be selected in accordance with Article 300 of ANSI/NFPA 70.

Note: Before installing the unit, confirm that there is listed IEC 61643-12 or UL1449 low surge protective device with surge protection level less than 2.5KV being connected between the unit and the power source.

Note: Surge Arrestors or Transient Voltage Surge Suppressor external to the equipment to reduce overvoltages or to bypass surge current shall be installed per Article 280 or 285 of ANSI/NFPA 70.

Note: Be certain to keep coolant or oil away from the unit.

4.8 ONT Alarm Connections

1. Route the 7-wire cable back from the ONT enclosure to the UPS.
2. Remove any convenient 3/4” knock-out of the UPS enclosure.
3. Install a strain relief in the knock-out hole.
4. Route the power cable up through the strain relief.
5. Trim the cable to the desired length and strip back approximately 2” of the jacket.
6. Using a jeweler’s standard blade screwdriver, attach the wires to the connector referencing the ONT pin-out information.
7. Tighten the strain relief around the power cord.

Note: Be certain to utilize environmentally sealed strain-reliefs, cordgrips, or conduit at the cable exit point.

Note: Output wires should be installed in accordance with Article 800 of ANSI/NFPA 70.

Figure 16: LED’s and ONT Alarm Connections

5 OPERATION

5.1 Start-Up

1. Supply AC power.
2. During initial start-up, observe the following:
   a. The AC/DC Mode LED illuminates (Green). The UPS is running on AC (utility) power and the batteries are charging.
   b. The DC Output LED illuminates (Green). The UPS is outputting DC power to the ONT.
3. Route and secure the cables to the wire management brackets.
4. Close and latch the front cover of the UPS.

5.2 Controls and Operational LEDs

Four status LEDs are displayed on the front panel of the UPS. The operation of the UPS can be assessed using these LEDs.

Indicator	Color	Condition
Alarm Silence Button	Black	Press and hold the button for 1 second to silence the audible alarm for 24 hours. Press and hold the button for 10 seconds to shut down the output voltage. The UPS will restart after 15 seconds. **Note:** The second function can be utilized to reset an output if it has been shut-down due to an over-current or short condition, and the fault has been removed.
Cold Start Button	Black	The cold start allows a start-up of the system after a power outage and the batteries have been replaced. **Note:** Before using the Cold Start feature, make sure the batteries are fully charged.
AC/DC Mode LED	Green/ Orange	When the LED is green, the UPS is running on AC power. When the LED is orange, the UPS is running on battery power.
Battery Missing LED 1&2	Red	The appropriate battery string is not connected or needs replacing.
DC Output LED	Green	When lit, the UPS is outputting DC power whether in utility or battery power mode.

Table 5: Controls and LED Indicators

5.3 Alarms

There are audible and visual alarm signals to alert the customer to abnormal and/or service affecting conditions present in the UPS.

Condition	Status LED	Alarm	Interface	Description
Normal	AC/DC Mode LED is GREEN	No Audible Alarm	“ON Batt” signal in low state	Condition normal
On Battery	AC/DC Mode LED is ORANGE	Beeps twice every 5 seconds	“ON Batt” signal in open state	AC input failure; Battery is supplying the power
Low Battery	N/A	Beeps twice every second	“Low Batt” signal in open state	When the battery is nearly depleted, the audible alarm will beep twice every one second.
Battery Missing	Missing Battery LED On	No Audible Alarm	“Missing Batt” signal in open state	The Missing Battery LED will be illuminated due to a missing battery.
Replace Battery	Missing Battery LED On (RED)	No Audible Alarm	“Replace Batt” signal in open state	The unit will perform a periodic battery test automatically without disrupting operation. If the battery needs to be replaced, the Missing Battery LED will be illuminated.

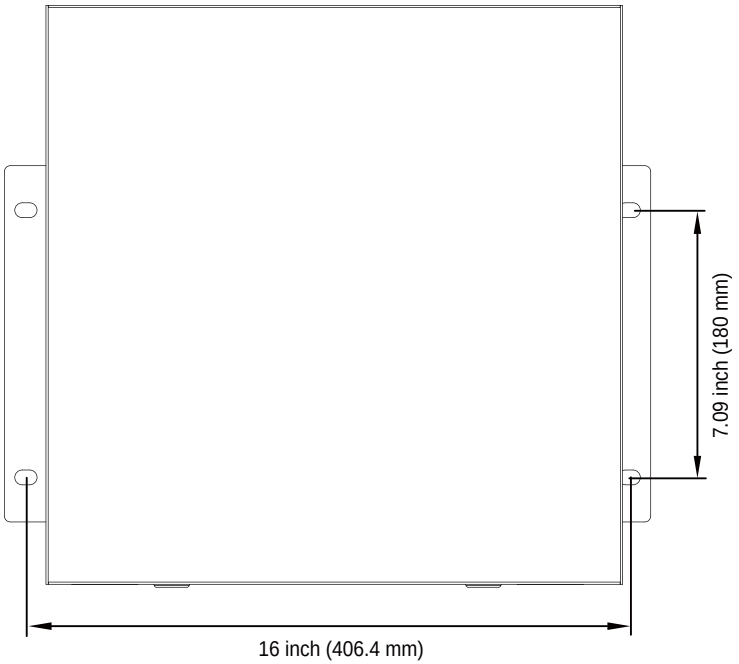
Table 6: Alarms

6 SPECIFICATIONS

Model Number	CS150U48V3
Input:	
Rating Voltage/Frequency	100 - 240V / 50 - 60Hz
Input Voltage Range	90 - 264Vac
Frequency Range	47 - 63Hz
P.F.	> 0.9 at Rating Voltage and Max Load
Output:	
Output Power Continuous	150W
Output Power Max	170W, 10sec Max.
Output Voltage Range	42V - 58Vdc
Output Current (max Load)	3.1A Nominal
Ripple	< 30mVrms
Noise	< 120mVp-p
Efficiency	> 85% at Rating Voltage and Max Load
Output Connection	7-Pin communication signals connector (DECA ME030-5007), Max 12AWG
Battery	
Battery Type	Sealed, Maintenance Free Lead-Acid Battery
Numbers of Battery	7.2 (7) AH/12V (8-standard, 4-factory orderable option)
Replaceable	Yes
Surge Protection and Filtering	
Lightning / Surge Protection	GR-1089-CORE Sect 4
Warning Diagnostics	
Indicators	AC (AC/Battery Mode Indicator), Output (Output On/Off Indicator), Battery (Battery Missing/Replacement Indicator)
Management	
Auto-Charge	Yes
Communication Interface	On Battery, Replace Battery, Battery Missing, Low Battery
Physical	
Maximum Dimensions (W*D*H)	389mm x 230mm x 400mm
Weight	28kg (with 8pcs battery)
Environmental Specifications	
Operating Temperature	-4°F to 131°F (-20°C to 55°C)
Operating Humidity	0 to 95% non-condensing within enclosure
Max Operating Elevation	10,000ft (3,000m)
Max Storage Elevation	50,000ft (15,000m)
Storage Temperature	-4°F to 131°F (-20°C to 55°C)
Compliance	CSA/UL 60950, EN 60950, EN 55022 Class B, FCC Part 15 Class B, GR-63 Sect 4.2 Fire Resistance, GR-1089 Sect 3 Emissions, Sect 4 Lightning and AC Power Fault, Sect 7 Electrical Safety.

Table 7: Specifications

APPENDIX I - Wall Mount Chart



Recommended Screw Dimensions

M8 x 25L or 3/8” x 1”L