



User Manual

Vega® Series

1RU POWER SYSTEM

VSYS-1RU-203-C



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A. Introduction

This manual provides a comprehensive overview of the installation, interconnection, and expedited initiation procedures for the Domestic Power Technology (DPT) Vega series DC power systems, specifically model number VSY-1RU-203-C.

This document contains crucial installation, servicing, and maintenance safety guidelines. Store it safely. Review the diagrams before proceeding.

Please contact the Domestic Power technical support team if you have any questions about this equipment's safe installation or operation.

B. Safety

B.1. Convention

The following symbols are utilized throughout this manual to minimize the risk of injury or fatality and to ensure the ongoing safe operation of this product.

NOTE: Notes offer supplementary information intended to facilitate the completion of specific tasks or procedures.

CAUTION: Cautions signify safety information designed to PREVENT DAMAGE to materials or equipment.

WARNING: Warnings convey safety information aimed at PREVENTING INJURY OR FATALITY to personnel.

B.2. Electrical Safety

WARNING: Hazardous voltages are present at the input of power systems. The direct current output from rectifiers and batteries can exhibit high energy levels and the capacity for high short-circuit currents, which may result in severe burns and electrical arcing.

Individuals engaged in installing, commissioning, and operating this equipment must possess the necessary qualifications, training, and licensure to execute their responsibilities effectively.

B.3. Battery Safety

WARNING: The service and connection of batteries must be conducted by or under the direct supervision of personnel with comprehensive knowledge of battery systems and the requisite safety protocols.

B.4. Physical Safety

WARNING: Please adhere to OSHA guidelines when unpacking, lifting, and positioning this equipment in its designated applications, such as cabinets and racks. Ensure that there is sufficient spacing for proper ventilation and follow the cable routing guidelines provided in this manual.

Certain system components may become excessively hot under specific operating conditions. Therefore, it is imperative to exercise caution to prevent burns and other physical injuries.

The Vega VSYS-1RU-203-C 48V DC power and distribution systems are equipped with the following components:

- V1000A rectifier module x 3
- VCNT100 system controller x 1
- 19" horizontal mounting power system shelf with DC distribution x 1

C. Product Overview

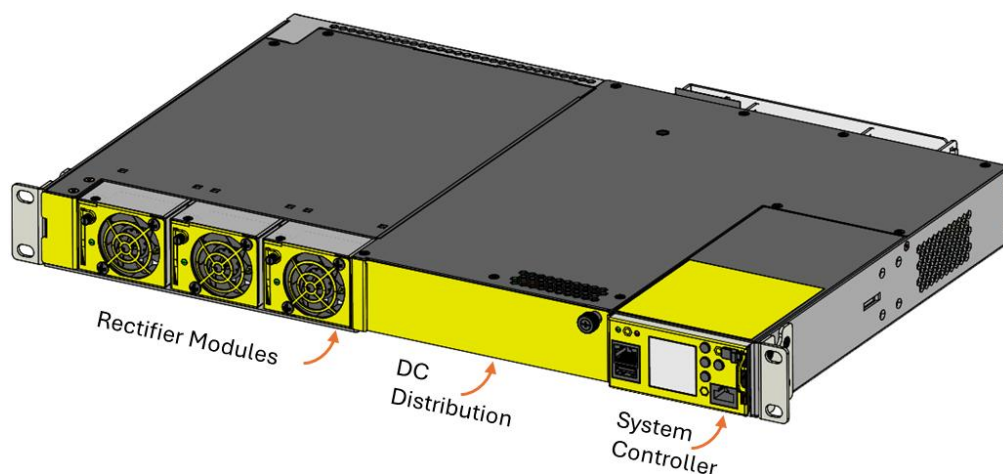


Figure 1: System front view with rectifiers, controller, and distribution

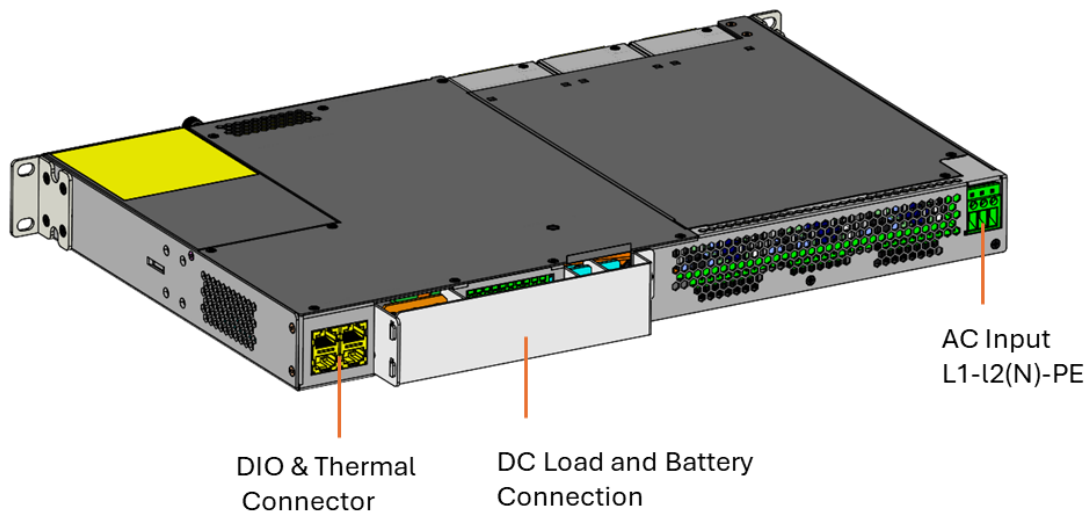


Figure 2: System back view

C.1. Rectifier Module

The Vega series of 48V 1.0kW rectifier modules utilize advanced high-frequency switch mode technology, which offers exceptional power conversion efficiency.

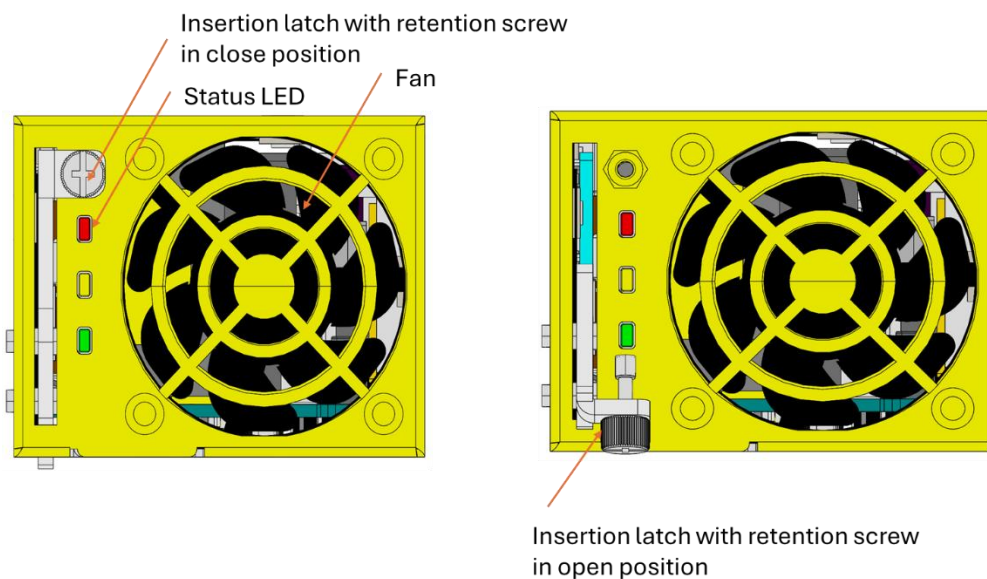


Figure 3 Rectifier module front panel

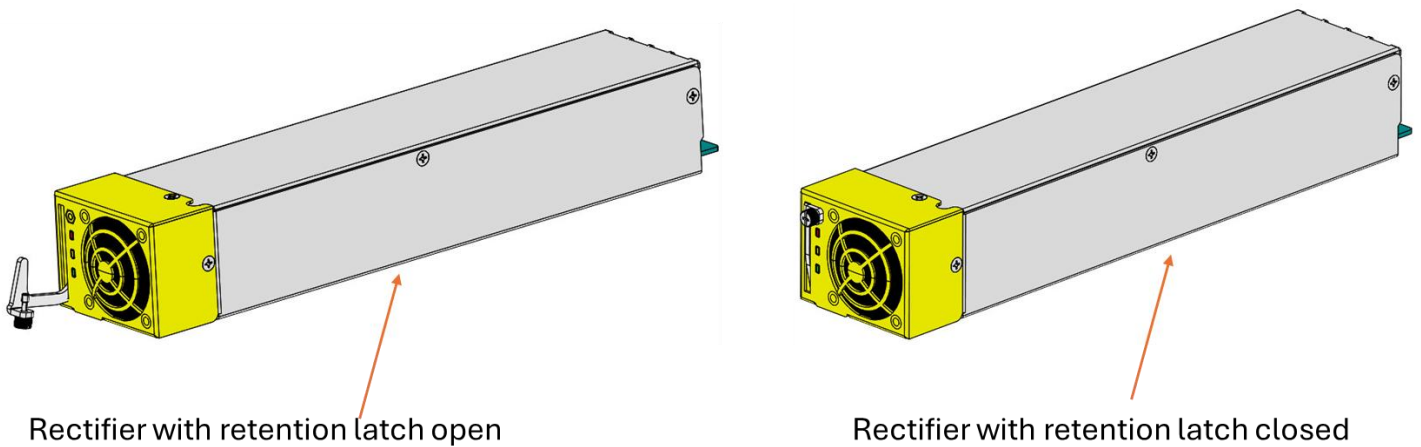


Figure 4: Rectifier module isometric view

C.1.1.1. LED

The front panel LED as shown in Figure 1, has four distinct modes of display:

1. **Continuously On - GREEN:** This mode signifies that the module is powered and operating normally.
2. **Blinking - GREEN:** This indicates that the module is powered; however, it is not communicating with the system controller. It is advisable to ensure that the system controller is present and powered within the shelf. Reseating the module(s) and/or system controller frequently resolves this issue.
3. **Continuously On-Red:** This mode denotes that the module is powered but non-operational. This situation may arise from an internal fault within the module, an external overload on the DC output, or improper AC wiring to the shelf. If external conditions, such as improper incoming AC wiring or system overload, are not identified as the root cause, please contact the Domestic Power technical support line for further assistance.
4. **LED is Off:** This indicates that the module is without power, which may result from an internal fault or improper incoming AC wiring. If the incoming AC wiring is correctly connected to a live AC source and the module(s) still do not display any LED light, please contact the appropriate support for professional assistance.

C.1.2. Retention Latch and Screw

As illustrated in Figures 1 and 2, the retention latch is specifically engineered to facilitate the insertion, securement, and removal of rectifiers from the power system shelf.

C.2. System Controller

The VSY-1RU-203-C system is equipped with an advanced and versatile controller. This controller manages system configuration, monitoring, alarm functionalities, and reporting capabilities, ensuring optimal performance and reliability.

C.2.1. Front Access

Figure 4 illustrates the front view of the SC505 controller, displaying its various features, including the screens, connectors, and the push button designed for local menu navigation.

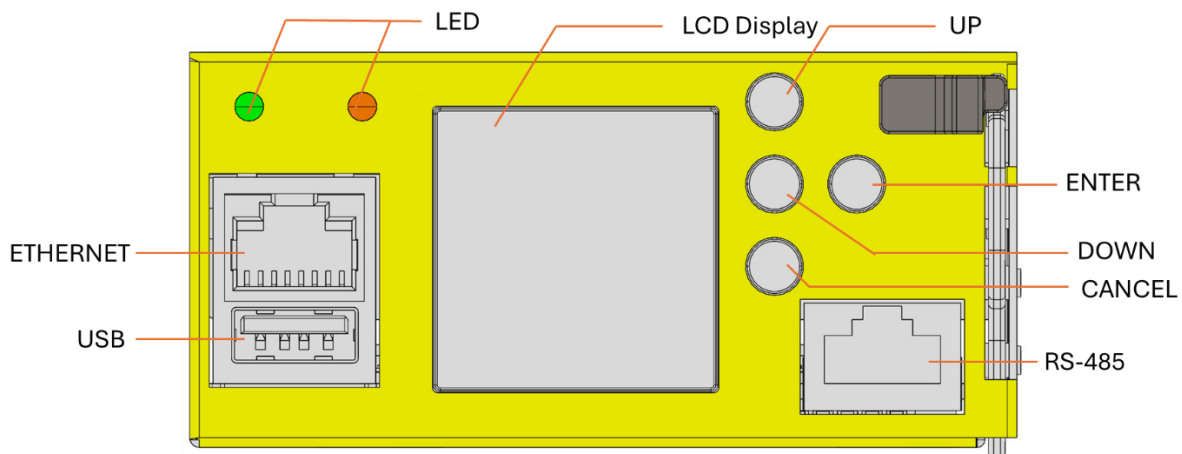


Figure 5 : SC505 Front View

C.2.2. Retention Latch and Screw

The retention latch, shown in Figure 5, has been thoughtfully designed to facilitate seamless insertion, secure fastening, and effortless removal of the controller from the power system shelf.

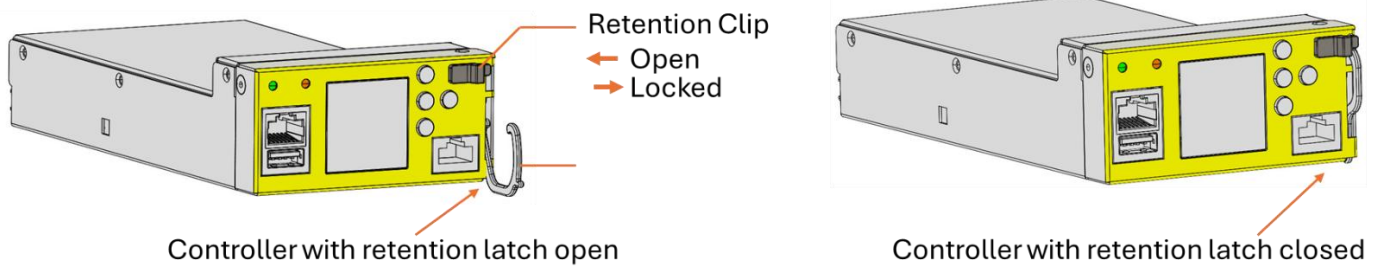


Figure 6 : Controller Isometric View

C.2.3. Controller Operation

The controller can be operated for configuration and monitoring via the front LCD, LEDs, and push buttons, as illustrated in Figure 4. A user-friendly interface is also accessible through a built-in web server, and web pages are available via the Ethernet connection. Additionally, the controller supports SNMP protocols for integration with any Network Management System (NMS). For quick start instructions, please refer to section F of this document. For full details on software features and access steps, consult the controller user manual, VCNT-1RU-100.

C.3. Distribution

C.3.1. DC Distribution

The distribution component can accommodate up to two bullet-type breakers and up to ten GMT fuse positions. It also allows for the termination of two battery strings, including an 85A battery shunt and a 60A low-voltage battery disconnect. Figure 7 shows the details of the front accessible breakers and GMT fuses

This module features connection points for dual-hole lug terminations for two battery strings at the back of the shelf. A ten-position terminal block, protected by the GMT fuses, is also available for load wiring.

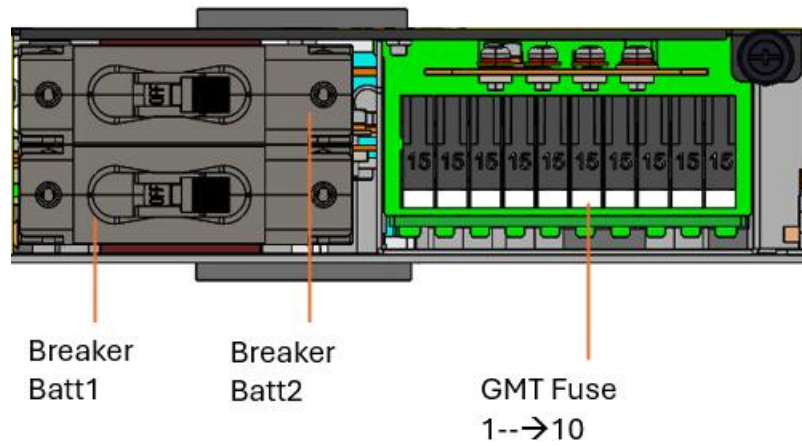


Figure 7: DC Distribution Front (Cover Removed)

Figure 10 shows the details of the system's AC, DC, and signal connection options

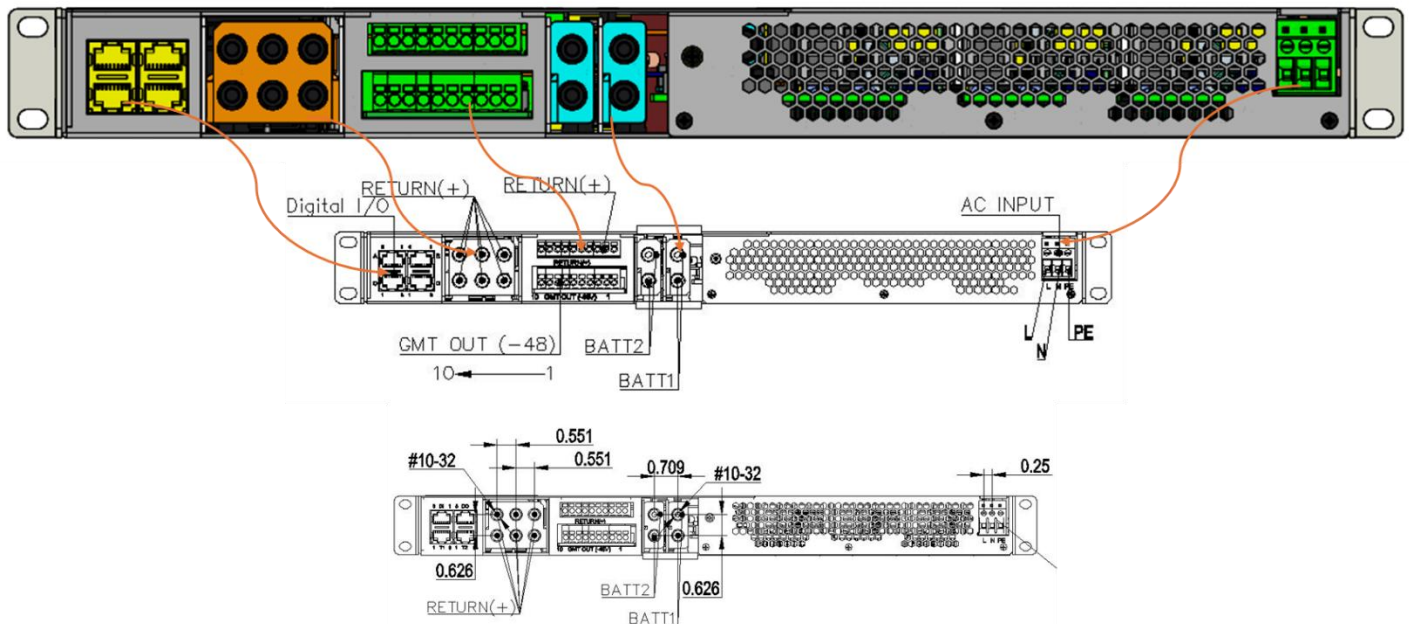


Figure 8: Details of AC, DC, and Signal connection

C.3.1.1. GMT Fuse usage guideline

Figure 9 is a guideline for the best utilization of GMT fuses. Following this guideline is essential to avoid excessive thermal stress on the GMT fuse block and the corresponding load connection on the terminal blocks



Fuse Block Position	Fuse Configuration for Load Current Up To ...		
	6A per Fuse	10A per Fuse	12A per Fuse
1	FUSE	FUSE	FUSE
2	FUSE		
3	FUSE	FUSE	
4	FUSE		FUSE
5	FUSE	FUSE	
6	FUSE		
7	FUSE	FUSE	FUSE
8	FUSE		
9	FUSE	FUSE	
10	FUSE		FUSE

Figure 9 : GMT Fuse allocation based on load distribution

C.3.1.2. DC Terminal block wire size

Please refer to Figure 10 for the acceptable wire size for the DC terminal block used to connect the load and the corresponding RTN wire. Wires should have a strip length of approximately .4 inches. Wiring ferrule crimps is helpful.

- Voltage rating: 300 V
- Current rating:
- Current rating(Sol): 13A
- Current rating(Str): 16 A
- Wire range:
- Solid wire(AWG): 14-24
- Stranded wire(AWG): 12-24
- Wire strip length: 9-10mm

Figure 10 : DC Wire size and rating

Adhering to the relevant industry standards is important when selecting a cable. The cross-sectional area of a direct current (DC) cable is determined by several factors, including the amount of current flowing through it, the allowable voltage drop, the peak load current, and the ambient conditions. Additionally, the cable should have a temperature rating exceeding 90°C. Please follow the standards and the manufacturer's recommendations for sizing fuses and circuit breakers.

C.4. Input AC terminal and cable

As illustrated in Figure 8, the shelf's AC input is connected through the terminal block. DPT includes a standard AC cable with each system. Figure 11 provides detailed information about this cable.

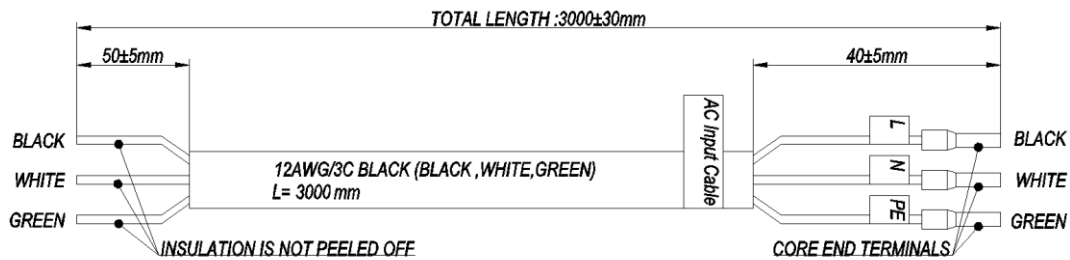


Figure 11 : AC cable

In case a customer-supplied cable is used, Figure 12 is a guideline to be used.

Electrical

- Voltage rating: 300VAC
- Current rating: 30A
- Wire range:
- Solid wire(AWG): 10-24
- Stranded wire(AWG): 10-24
- Torque(Lb-In): 4.3
- Screw: M3
- Wire strip length: 15-16mm

Figure 12 : AC Wire size and rating

Cable selection must comply with local and national electrical codes.

C.5. Signal connectors and cables

The Vega 1RU shelf provides multiple Digital Input / Output (DIO) and temperature sense inputs through four RJ-45 connectors located in the back of the shelf as shown in Figure 8.

Figures 13 and 14 provide the details of the signals available on these connectors. The included Vega smart controller can utilize these signals for various system monitoring and control functions. Please refer to the Vega SC505 controller user's manual for the full details for configuration and application assistance.

CONNECTOR A (4) digital input			CONNECTOR B (4) digital output		
1	DI1	Digital In 1	1	N1	Relay Output 1
2	DI1_RTN	Digital In 1_RTN	2	N1_RTN	Relay Output 1RTN
3	DI2	Digital In 2	3	N2	Relay Output 2
4	DI2_RTN	Digital In 2_RTN	4	N2_RTN	Relay Output 2RTN
5	DI3	Digital In 3	5	N3	Relay Output 3
6	DI3_RTN	Digital In 3_RTN	6	N3_RTN	Relay Output 3RTN
7	DI4	Digital In 4	7	N4	Relay Output 4
8	DI4_RTN	Digital In 4_RTN	8	N4_RTN	Relay Output 4RTN

Figure 13: DIO Connector pin configuration

CONNECTOR C (1) battery temperature			CONNECTOR D (1) battery temperature		
1	Temp 1	Temperature Probe 1	1	Temp 2	Temperature Probe 2
2	Temp1_RTN	Temperature Probe 1_RTN	2	Temp2_RTN	Temperature Probe 2_RTN

Figure 14: Temperature Connector pin configuration

DPT offers two cables, each serving as a digital input/output (DIO) and a temperature probe within the system. If additional DIO and temperature probe cables are needed based on application requirements, they can be ordered as necessary. For more details, please refer to Figures 15 and 16, which provide specifications for these cable assemblies.

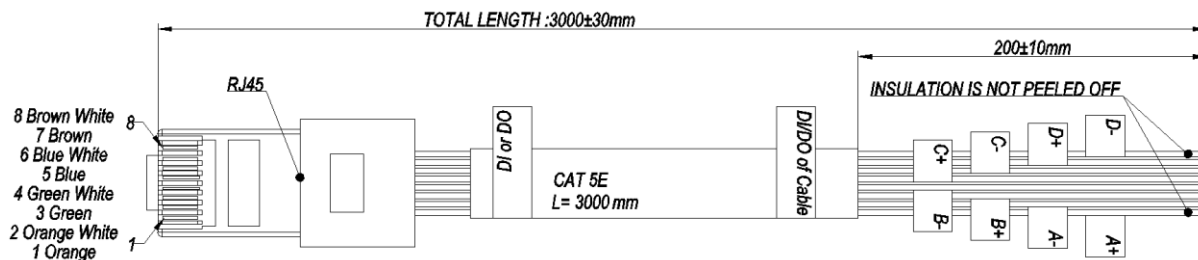


Figure 15 : DIO Cable

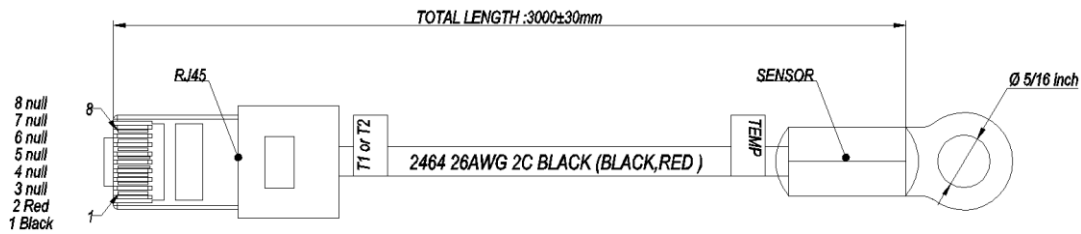


Figure 16 : Temperature Cable

The inventory included in your shipment will vary based on the options you have selected. The available options are clearly indicated on both the shipping container labels and the bill of materials (BOM).

D. Inspection

D.1. Check for Damage

Before unpacking the product, thoroughly examine the shipping container for any signs of damage. Upon unpacking, inspect the product's exterior closely for any defects or damage. If you find any damage, contact the carrier immediately. Afterward, conduct a detailed inspection for internal damage. If you discover any internal issues, promptly inform the carrier and contact Domestic Power for guidance on addressing the situation.

D.2. Returns for Service

Please retain the original shipping container for any product that may require a return for service. To ensure the safe handling of returned items, it is essential that they are packaged in their original shipping container. Domestic Power will not be held responsible for any damage resulting from improper packaging of returned products. Thank you for your understanding.

E. Installation

E.1.Safety First

Certain components within this system carry hazardous voltage and current. It is important to adhere to the safety precautions outlined in the user manual. Please follow the instructions below prior to conducting any operations or installations:

1. Personnel should be adequately trained and thoroughly understand the power system to access the system and installation activities. During the installation process, it is essential to comply with the latest revisions of these safety rules and relevant local safety regulations.
2. All external circuits connected to the power system, operating at voltages below -48V, must meet the requirements specified in IEC 62368-1.
3. Please ensure that the power supply (both mains and battery) has been completely disconnected before undertaking any operations within the system cabinet.
4. The installation and maintenance personnel must be equipped with the necessary tools required for safety and proper installation of typical DC power systems

E.2.Mechanical Installation

E.2.1. Install the power shelf in the rack or cabinet

1. Install brackets on the shelf based on the site preference. The shelf can be flush mount (default) or mid-mount, depending on the location of the two side brackets, as shown in Figure 11

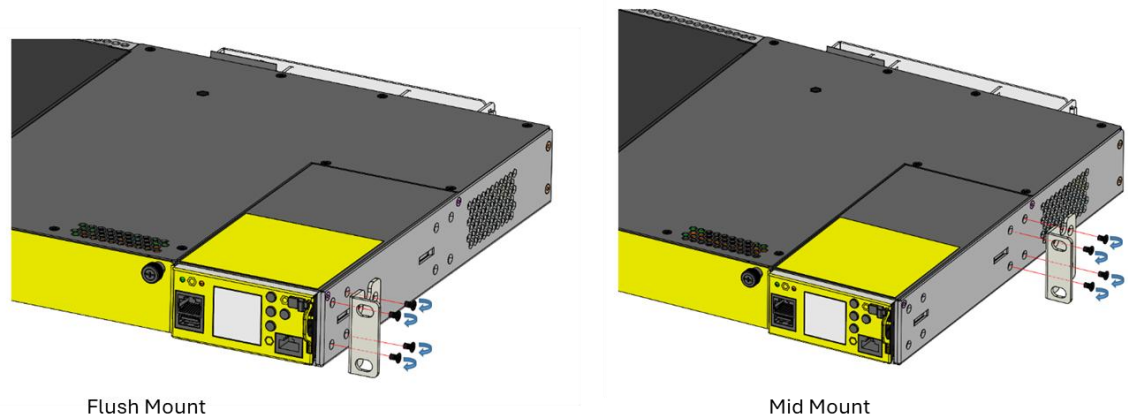


Figure 17 : Shelf bracket mounting options

2. Install the power supply shelf in the rack or cabinet, securing it firmly with the appropriate sizes and types of hardware. It is critical to ensure that the shelf's location does not create



a top-heavy structure, as this poses a significant risk of tipping over and can lead to serious injury or death. Additionally, always install a rack tray under the shelf when necessary to effectively support the weight of a fully populated shelf and to manage any torque from the installed load and battery cables. Prioritize safety and stability in your installation.

3. Insert one rectifier module and controller into the power shelf. Ensure that the modules are securely pushed into their respective slots. Use the retention latch and screw or slider to attach them to the shelf firmly.
4. To ensure proper ventilation of the power system, the front and back of the system must be free of obstructions. This will ensure room-temperature air is forced to the rectifier modules by the built-in fan assembly.

E.3. Electrical Installation

E.3.1. AC Wiring

AC wiring must be performed according to local and national electrical codes. To prevent injury or death, the AC cable should be disconnected from any live power source.

AC cables must be connected according to the marking on the back of the shelf and as indicated in this manual. Turn the screw located on the terminal block counterclockwise to open the respective wire terminals.

1. Insert the wire in the respective slot, ensuring a secure placement.
2. Turn the screw clockwise to provide a satisfactory retention of the wire in the connector.
3. Always test with a reasonable pull test

E.3.2. DC Wiring

1. Handle the batteries carefully, as they can generate very high currents. It is imperative that you switch off the battery fuses or circuit breakers on both the battery side and the system side before connecting any battery cables. If no fuses are present on the battery side, you must disconnect one of the connectors between the battery cells to ensure the system remains safe and not energized during installation.
2. Under no circumstances should you connect the battery in reverse; this will result in damage to both the battery and the system!
3. Always connect the DC cables with the positive cables first, followed by the negative cables. After making the connections, secure and bundle the cables properly to protect the connection point from any external interference.



4. For load connection, use the ten-position terminal block at the back of the shelf
 - i. Use the required wire size and rating to match each location's load and GMT fuse.
 - ii. Wire the RTN wire as a pair with each load cable. Do not insert multiple RTN wires in a single terminal.
 - iii. Secure the wire (s) to the connector using the guidelines indicated in the AC wiring section.
 - iv. For the GMT fuse-protected load connections, use the ten-position terminal block at the back of the shelf
 - v. Use the required wire size and rating to match each location's load and GMT fuse.
 - vi. Wire the RTN wire as a pair with each load cable. Do not insert multiple RTN wires in a single terminal.
 - vii. The terminal block used for AC and DC power connection utilizes a push-in style connector
 - viii. Insert the wire in the respective slot
 - ix. With a small flat screwdriver, push the clamp located in the slot above each terminal to open fully
 - x. Once the wire is fully inserted, release the clamp by removing the screwdriver
 - xi. Always test with a reasonable pull test

E.3.3. Signal Cable wiring

Install the Digital IO and Temperature cables supplied with the system in the corresponding RJ-45 connector according to the system's needs

F. System Startup and Commissioning

F.1. Check System Connections

1. Ensure the AC is off, the battery is disconnected, and all power modules are removed from the shelf.
2. Verify the polarity of all connections.

F.2. Verify AC and Power the Shelf

1. Install one power module.
2. Verify AC input voltage is correct and turn on the corresponding AC input feeder breaker.
3. The rectifier module OK LED should illuminate after a preset start delay.



4. The controller should power up with the boot-up screen shown.
5. Insert and power up the remaining rectifier modules

F.3.Controller Wizard

The system controller SC505 is factory-configured to boot up in wizard mode to walk through the basic system setup. The following steps describe the steps that should be followed.

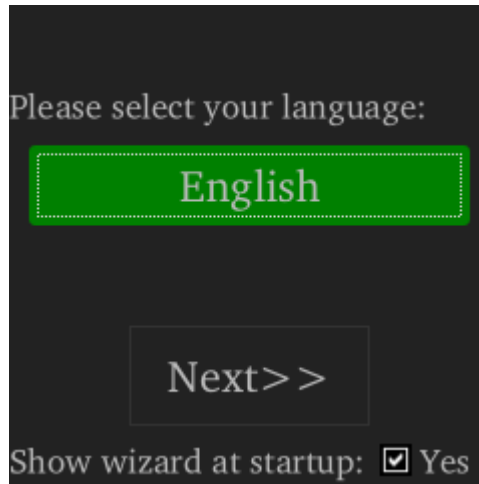
1. Please choose to select the setup wizard (Factory default deselects the walking through the setup steps)



Press: **Down > Enter (YES)**



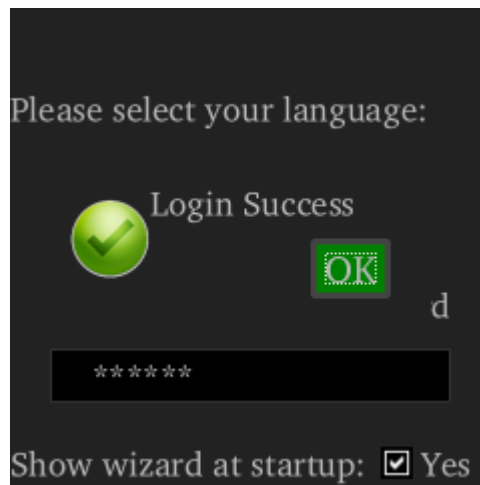
2. Press: **Down > Enter (Next)**



3. You will be prompted to select the access level, and the default is “Admin”
Press: **Enter (Admin)**

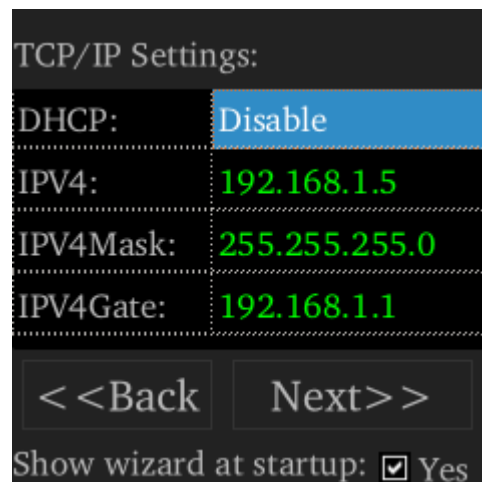


4. Enter the Admin password. The factory default value is 1111 and applies to web portal access.
An admin can change it later from the web or front LCD menu.



Steps:

- a. Enter the most significant digit (1) by pressing the **Up** and **Down** keys, followed by **Enter**
 - b. Continue with the next digit(s)
 - c. When complete (1111), press Enter twice
5. The wizard will guide you in setting up the IPV4 configurations. This step is crucial as it enables the web interface, which is preferable for fully configuring the system as needed.



Once completed, select **Next** and press **Enter**.

6. In the next screen, there are options to set certain parameters such as Float Voltage, Boost Voltage, and Battery Charge rate (C Rate)



Battery Configuration:

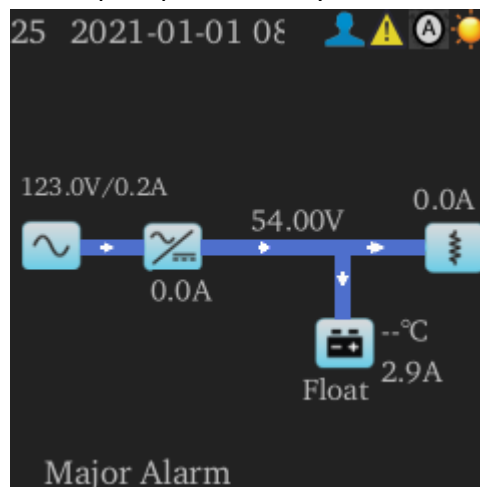
FloatVolt:	53.50	V
BoostVolt:	56.40	V
Chg-Limit:	0.10	C10

<<Back Finish>>

Show wizard at startup: ☒ Yes

After completing any needed changes, select **Finish** and press **Enter**

7. That will complete the wizard setup steps and take you to the LCD home screen



F.4. Check Battery Polarity and Connect

1. Verify correct battery polarity using a voltmeter (ensuring no cells or batteries are reversed).
2. Connect the battery as required to the system's output or turn on the battery breaker.
3. Install the remaining power modules.
4. On the controller, set the Float and Equalize voltage to the levels specified by the battery manufacturer.



5. Using the controller, test the functionality of various module alarms and controls. In addition, perform a load test with the system using a resistive load box as needed.



G. Warranty and Service Information

G.1. Technical Support

Please contact DPT for your support needs via email (support@domesticpower.us)

G.2. Product Warranty

DPT warrants that for two (2) years from the date of shipment, its products shall be free from defects when utilized under normal and authorized conditions per the product specifications and DPT's guidelines. In cases where discrepancies arise, the terms outlined in the manual shall take precedence. This warranty encompasses repairing, replacing, or issuing credit— at DPT's discretion—for any equipment manufactured by DPT and returned by the customer to the factory or to another authorized location within the warranty period.

It is important to note that there are limitations to this warranty coverage. The warranty does not extend to provide the customer or any other parties with remedies beyond those explicitly stated. It does not cover losses incurred, including loss of profits, loss of use, or costs associated with the removal or installation of defective equipment, nor does it account for damages or consequential damages resulting from equipment failure during or after the warranty period. No additional obligations, whether expressed or implied, are acknowledged.

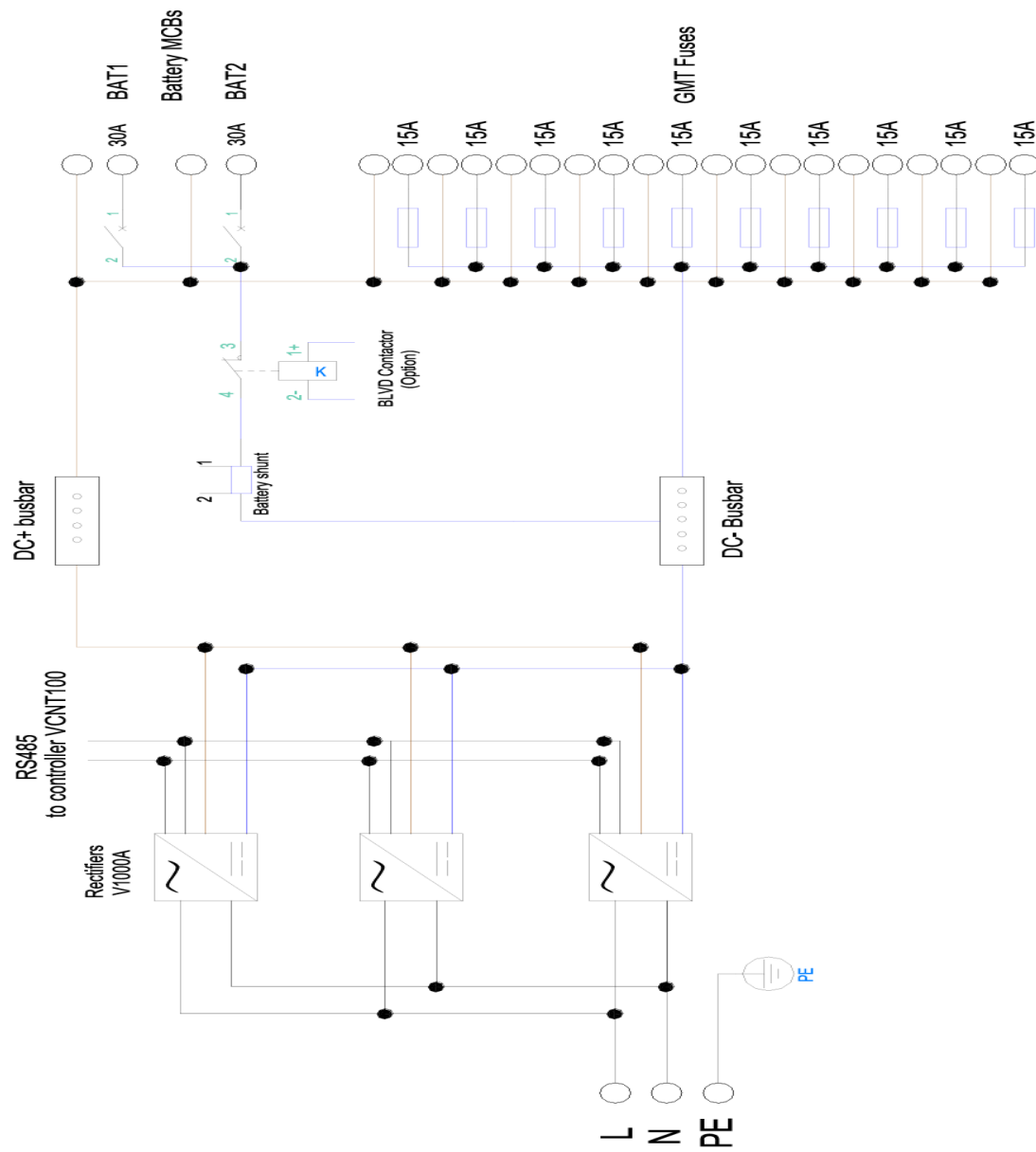
Additionally, the warranty excludes damages or equipment failures arising from external causes to the unit, including but not limited to environmental conditions, water damage, power surges, or any other external influences. The customer shall be responsible for all shipping and handling charges. For products that are covered under warranty, DPT will assume the costs associated with shipping the repaired or replacement unit back to the customer.

G.3. Warranty Claims

To initiate a claim under this Limited Warranty, please submit your request in writing to DPT before returning any materials. Upon approval of your return request, DPT will provide comprehensive instructions for the return process. A Service Repair Order (SRO) and/or Return Authorization (RA) number will be issued to ensure that your service needs are managed promptly and efficiently. Thank you for your attention to this matter.



H.Appendix A: System One-line Diagram





 DomesticPower