Vertiv™ Liebert® APM2 UPS UL 300 to 600 kVA 480 V

Quick Installation Guide

IMPORTANT: *Before installing, connecting to supply or operating your Vertiv™ Liebert® APM2 UPS, refer the Safety and Regulatory Statements sheet. For detailed installation, operation, maintenance, and troubleshooting information, visit the Liebert® APM2 UPS product page for the SL-71948 Vertiv™ Liebert® APM2 60 to 600 kVA User Manual available at www.Vertiv.com or use the QR code below.*

Mechanical Installation

Inspecting the UPS

Inspect the UPS for damage. If you find any damage, document and photograph all damage and notify your local Vertiv representative.

Choosing the Location

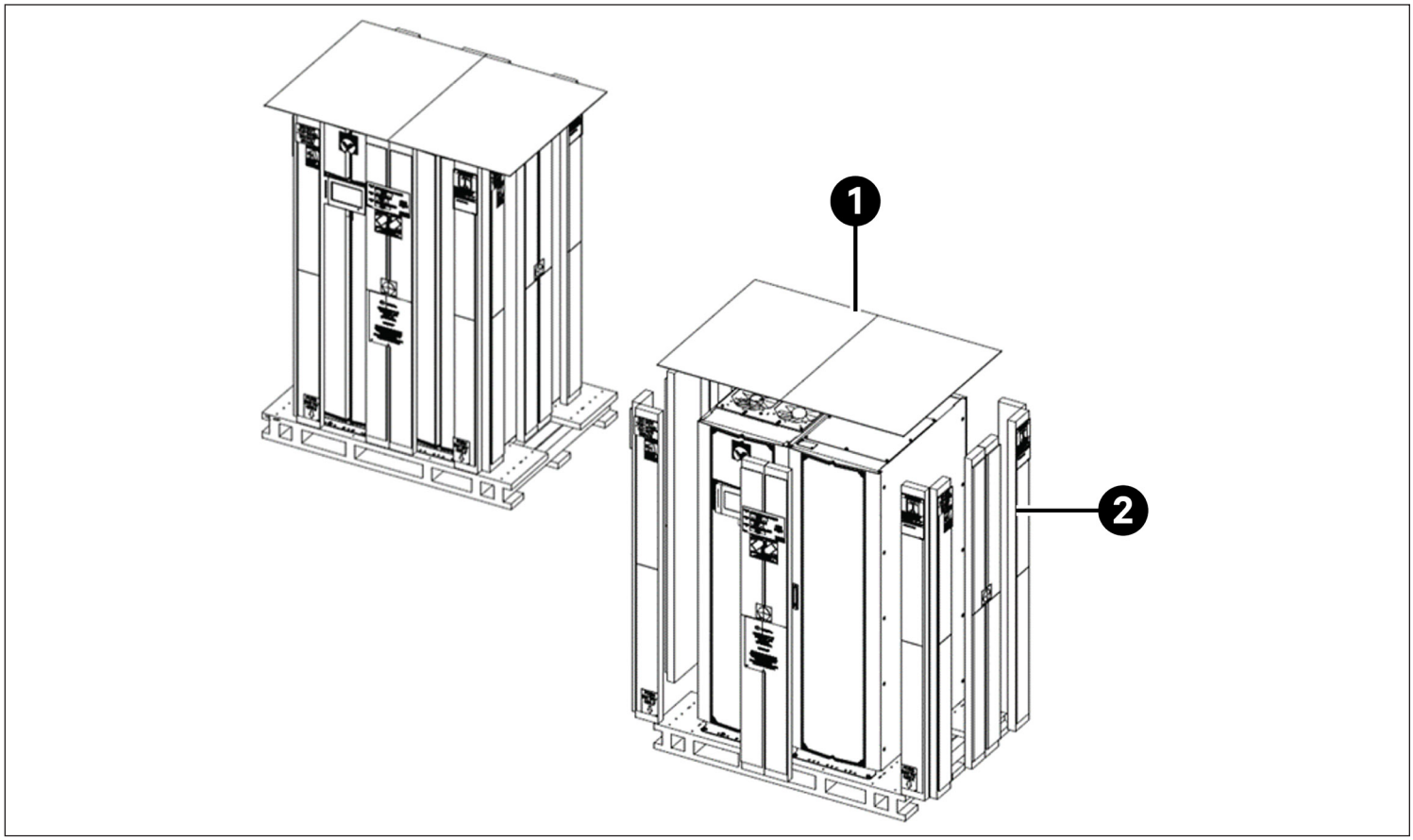
The UPS measures 47.2 in. x 40.5 in. x 78.7 in. (1200 mm x 1030 mm x 2000 mm). Install the UPS in a clean, well-ventilated environment with an ambient temperature range of 32 °F to 104 °F (0 °C to 40 °C). For installation and maintenance, minimum 3 ft. (914 mm) clearance is required in the front of the unit. For standard unit configuration with top fans, rear clearance is not required.

If the following options are selected, the rear clearance is modified by the higher the two values.

- **Seismic anchor selection:** Up to 5 in. (127 mm) may be required in the rear of the UPS.
- **UPS front to rear airflow option configuration selection:** At least 20 in. (500 mm) in the rear.

NOTE: *For UPS front to rear airflow configuration, to permit proper air flow and prevent overheating, do not block or cover the ventilation openings (perforated panels) or blow air down onto the unit.*

Figure 1. Removing the Packaging Material



Item	Description	Item	Description
1	Top cover	2	Honeycomb board

Handling and Unpacking the Unit

The unit weighs up to 1984.16 lbs (900 kg), depending on the options selected. The UPS is shipped on a pallet and is equipped with casters that permit two or more people to roll it off the pallet for installation. Use a forklift or pallet jack to move the palleted UPS as close as possible to the installation location before removing packing material or loosening shipping brackets.

For removing packaging materials, follow the below procedure:

1. Remove the protective packaging, shown in Figure 1.

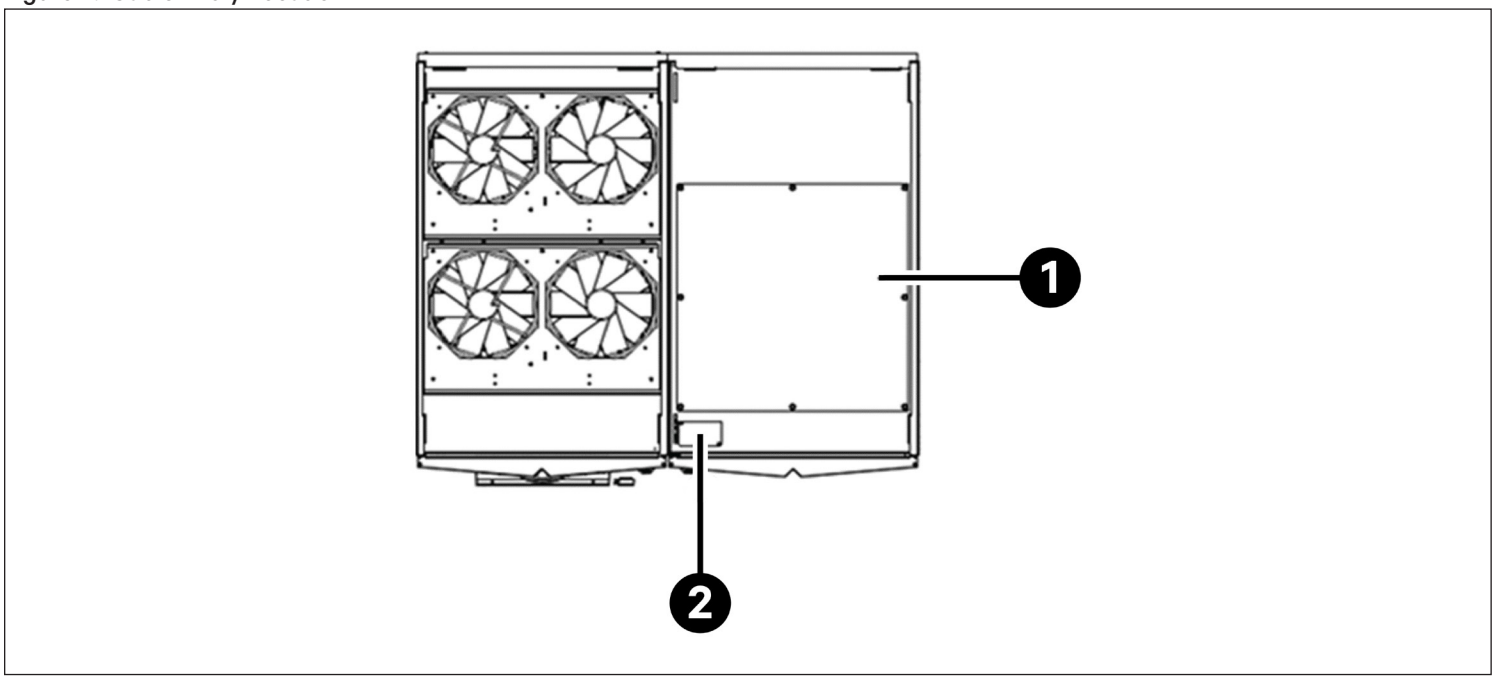
Locate the accessories package on top of the UPS and set aside.

2. Use a 5/8 in. (16 mm) wrench or socket to remove the shipping brackets from the pallet.
3. Remove the shipping brackets from the front and rear of the UPS.
4. Ensure that the leveling feet are raised to prevent interference when rolling the unit on the casters.
5. Roll the unit down the ramp to the installation location then lower the leveling feet to fix the UPS at the installation location.

Power Cable Wiring

Cables must enter the Liebert® APM2 from the top.

Figure 2. Cable Entry Location



Item	Description	Item	Description
1	Signal wire knockout plate	2	Power cable knockout plate

Power Wiring and Conduit

When connecting wiring, follow the local wiring regulations, and take the environment situation into account.

NOTE: *The conduit size and wiring method must be in accordance with all local, regional, and national codes and regulations, including NEC ANSI/NFPA 70.*

The maximum current for operating modes, the recommended wire sizes, and the recommended power cables and plugs are listed in Table 1. These values are based upon 77 °F (25 °C) an ambient temperature.

Check for Lockout and Tagout on the Breaker

Make sure that the feeder breakers are open, locked out or tagged out to prevent inadvertent operation by unauthorized personnel.

Hardware Input/Output Connection

Connecting a Single-input Configuration

1. On the top panel of the UPS, remove the upper conduit entry panel. Punch the holes for the cable conduit. Connect the conduit to the panel, and reinstall the conduit entry panel.
2. Remove the lower cover plate to access the busbar, as shown in Figure 2.
3. Do not remove the factory installed single-input jumpers from rectifier input and BIB for single-input configured UPS.

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Make the input connections between the upstream feeder panel and the input terminal as mentioned below:

- Phase A to mA
- Phase B to mB
- Phase C to mC
- Neutral bus to N (for 4-wire installation)
- Ground cable to PE

Make the output connections from the UPS output busbar to the downstream distribution panel main lug breaker:

- oA to Phase A
- oB to Phase B
- oC to Phase C
- oN to neutral bus (for 4-wire installation)
- PE to ground bus

Torque phase conductor connections is up to 50 lbs-in (5.7 Nm). Neutral and ground conductor connections are up to 126 lbs-in. (14.4 Nm).

4. Reinstall the busbar cover plate.

Connecting a Dual-input Configuration

1. On the rear panel of the UPS, remove the upper conduit entry panel. Punch the holes for the cable conduit. Connect the conduit to the panel, and reinstall the conduit entry panel.
2. Remove the lower cover plate to access busbar, as shown in Figure 3.
3. If present, remove the factory installed single-input jumpers from rectifier input and bypass input busbars for dual-input configured UPS.

Make the connections between the upstream feeder panel and the main/rectifier input busbar as mentioned below:

- Phase A to mA
- Phase B to mB
- Phase C to mC
- Neutral to mN
- Ground cable PE

Make the connections between the upstream feeder panel and the bypass input busbar as mentioned below:

- Phase A to bA
- Phase B to bB
- Phase C to bC
- Neutral to mN
- Ground cable to PE

Make the following output connections from the UPS output terminal to the downstream distribution panel main lug breaker as mentioned below:

- oA to Phase A
- oB to Phase B
- oC to Phase C
- oN to neutral bus
- PE to ground bus

Torque the phase conductor connections to 177 lbs-in (20 Nm). Neutral and ground conductor connections to 177 lbs-in (20 Nm).

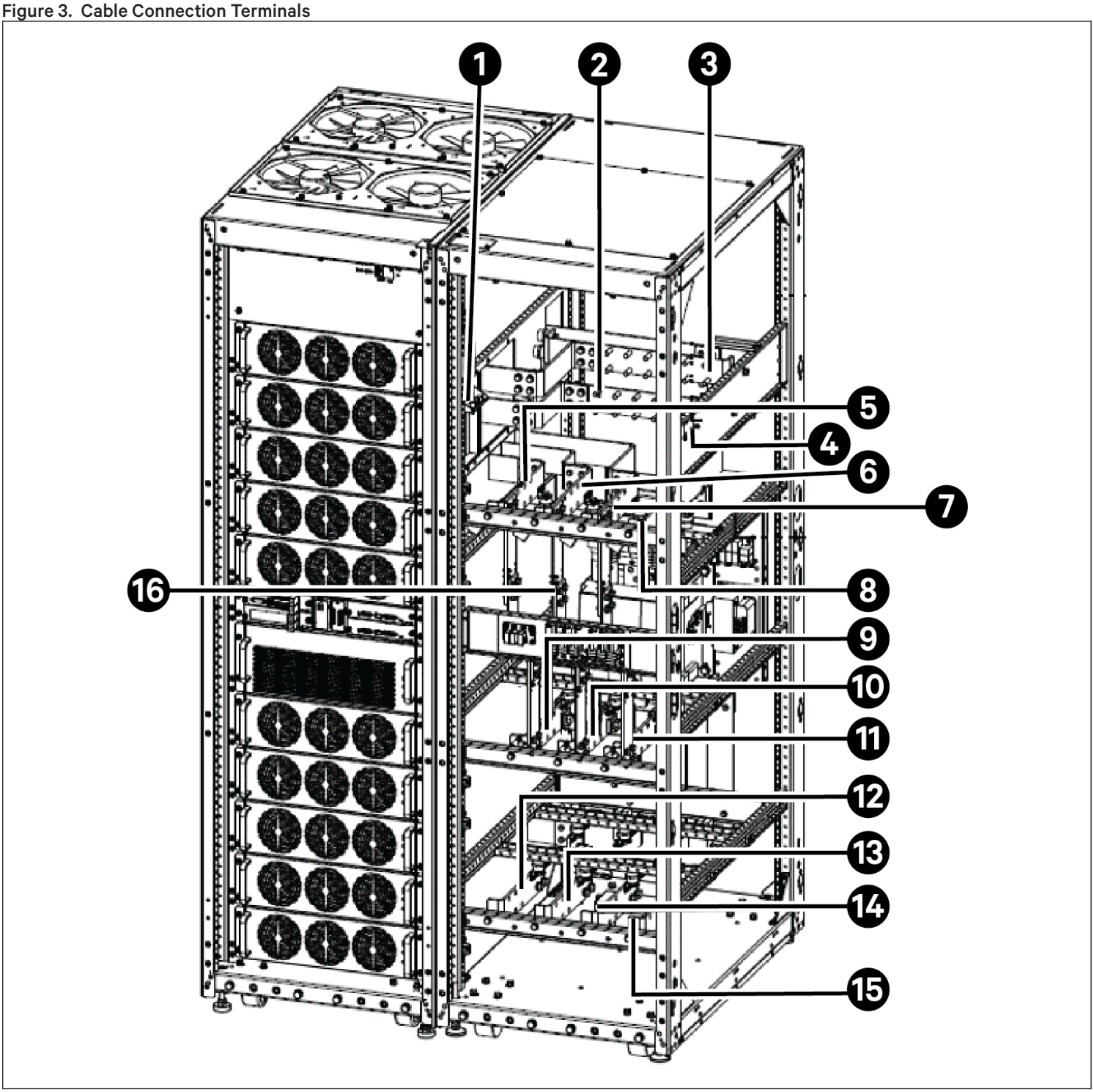
4. Reinstall the busbar cover plate.

NOTE: *Neutral line is not required in 3-wire system.*

Table 1. Recommended Cross-sectional Area (CSA) for Vertiv™ Liebert® APM2 300 to 600 kVA 480 V 4-Wire/3-Wire System

Model (kVA)	Voltage (V)	Input		Output		Bypass		Neutral/Ground		Battery	
		Qty.	Size (AWG)	Qty.	Size (AWG)	Qty.	Size (AWG)	Qty.	Size (AWG)	Qty.	Size (AWG)
300	480	5	2/0	44	1	5	1	1	3/0	2	10
360	480	5	2/0	4	1/0	5	1	1	3/0	2	6
400	480	5	3/0	4	1/0	5	1/0	1	3/0	2	4
420	480	5	3/0	4	2/0	5	1/0	1	3/0	2	3
480	480	5	4/0	4	3/0	5	2/0	1	3/0	2	2
500	480	5	4/0	4	3/0	5	2/0	1	3/0	2	1/0
540	480	5	250	4	3/0	5	3/0	1	3/0	2	2/0
600	480	5	350	4	4/0	5	3/0	1	3/0	2	3/0

Figure 3. Cable Connection Terminals



Item	Description	Item	Description	Item	Description	Item	Description	Item	Description
1	PE	4	PE	7	mC	10	bB	13	oA
2	BAT +	5	mA	8	mN	11	bC	14	oB
3	BAT -	6	mB	9	bA	12	oN	15	oC
16	Single-input busbar installed for single-input configured UPS								

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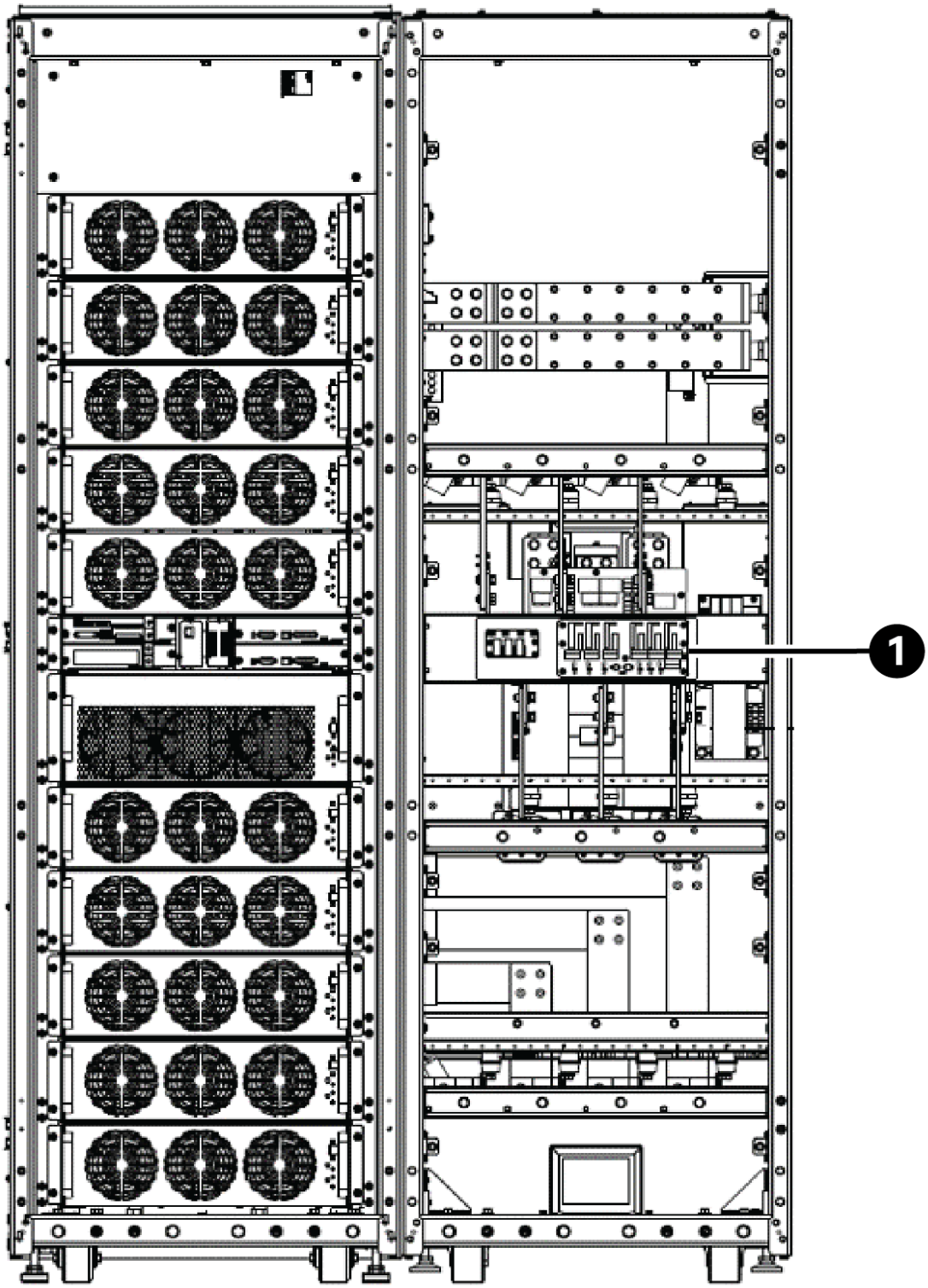
Figure 5. UPS Power Switches



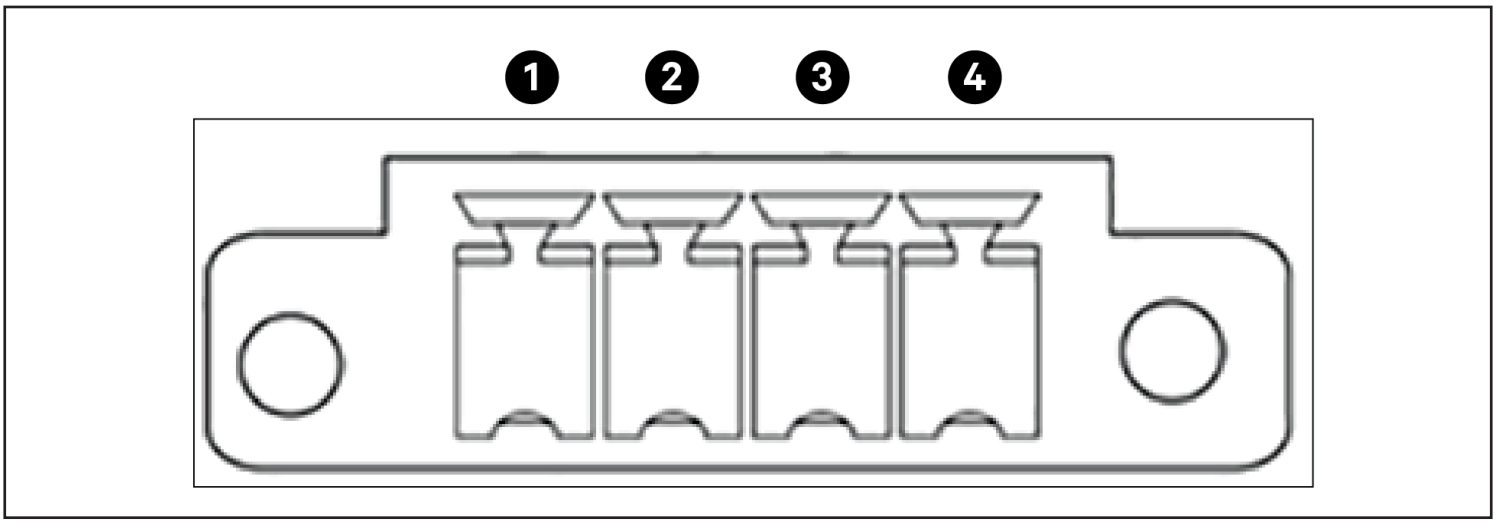
Item	Description
1	Position of lightning protection board.

Remote Emergency Power Off Port

If a remote emergency power off (REPO) connection is not required, leave the factory installed jumper between pins 1 and 2 on the REPO busbar.

If using a REPO connection, refer to the detailed installation steps in the SL-71948 Vertiv™ Liebert® APM2 60 to 600 kVA User Manual available at www.Vertiv.com.

Figure 6. REPO Port



Pin	Name	Description
1	EPO-NC	EPO activated when opened to Pin 2
2	+12 V	EPO activated when opened to Pin 1
3	+12 V	EPO activated when shorted to Pin 4
4	EPO-NO	EPO activated when shorted to Pin 3

UPS Startup

The audible alarm sounds at various points during operation. The alarm canceled at any time by pressing the silence On/Off key.

The Vertiv™ Liebert® APM2 UPS must be completely installed and commissioned before startup by an authorized engineer.

After an external power supply switch closed, the UPS can be started.

To start the UPS from a fully powered down condition, follow the below procedure:

1. Open the front panel of the UPS.
2. Verify that the maintenance bypass breaker (MBB) is open.
3. Close the external feeder breaker to the UPS.
4. Ensure that the input voltage, frequency, and phase rotation are normal.
5. In the following order, close these switches maintenance isolation breaker (MIB), byapass input breaker (BIB), rectifier input breaker (RIB), and all external breakers of the UPS.
6. Wait for 25 seconds, touch the LOG IN icon to enter the system by entering the correct password.

NOTE: *Default password is 1234.*

7. When the rectifier start process is finished, close the battery circuit breaker (BCB).

Now, the system is powered On, and system in bypass mode.

To transfer the UPS from bypass mode to normal mode on inverter, follow the below procedure:

1. Touch the operate tab on the global human machine interface, the unit operations screen will open.
2. Touch the On next to the Inverter On as shown in Figure 7. The inverter start a self-test and synchronize. See Figure 8.

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3. The UPS will transfer from bypass mode to normal node on inverter. See Figure 7.
4. Startup is finished.

Figure 7. Log In Screen Overview

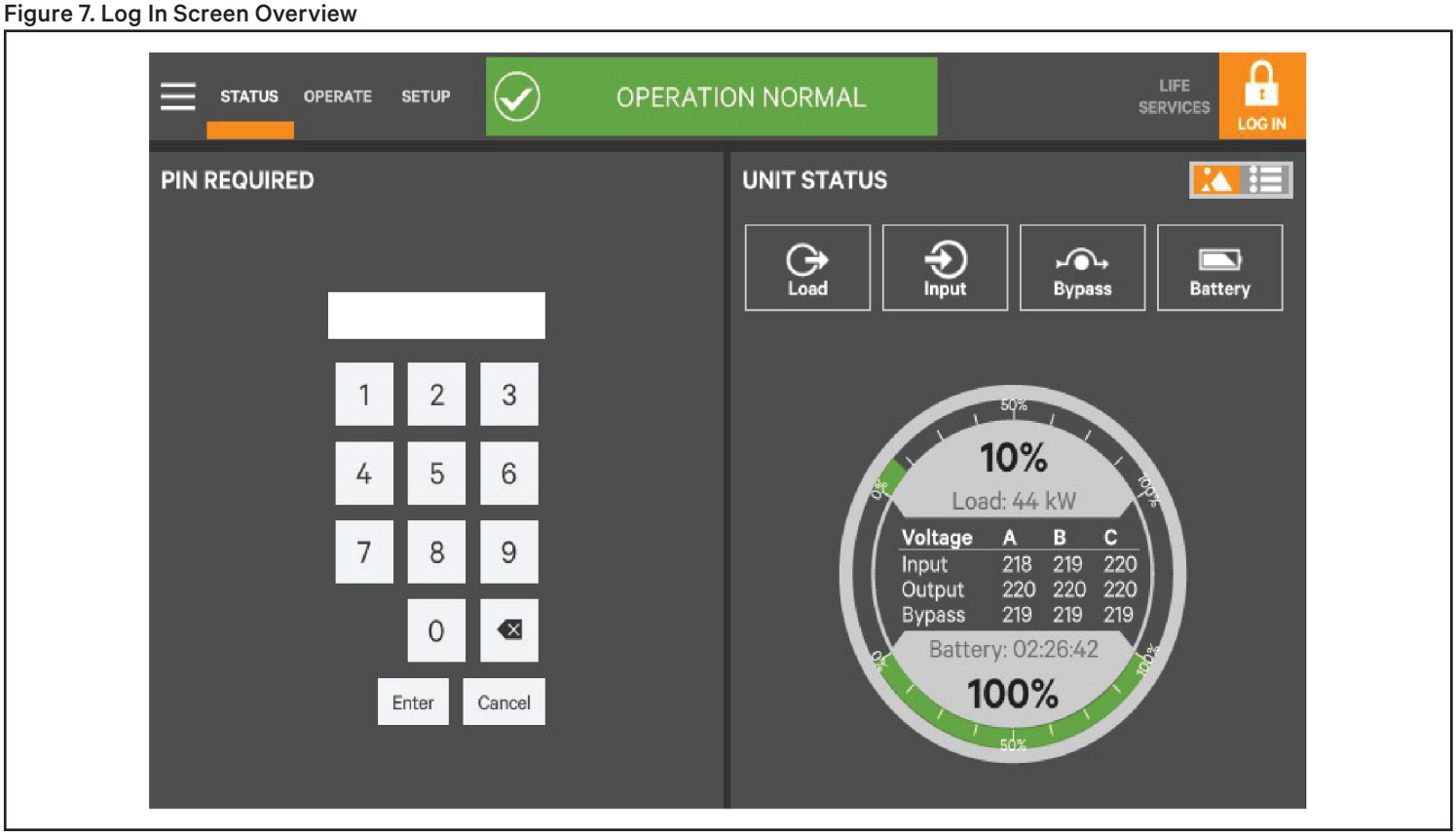


Figure 8. Unit Operations Screen

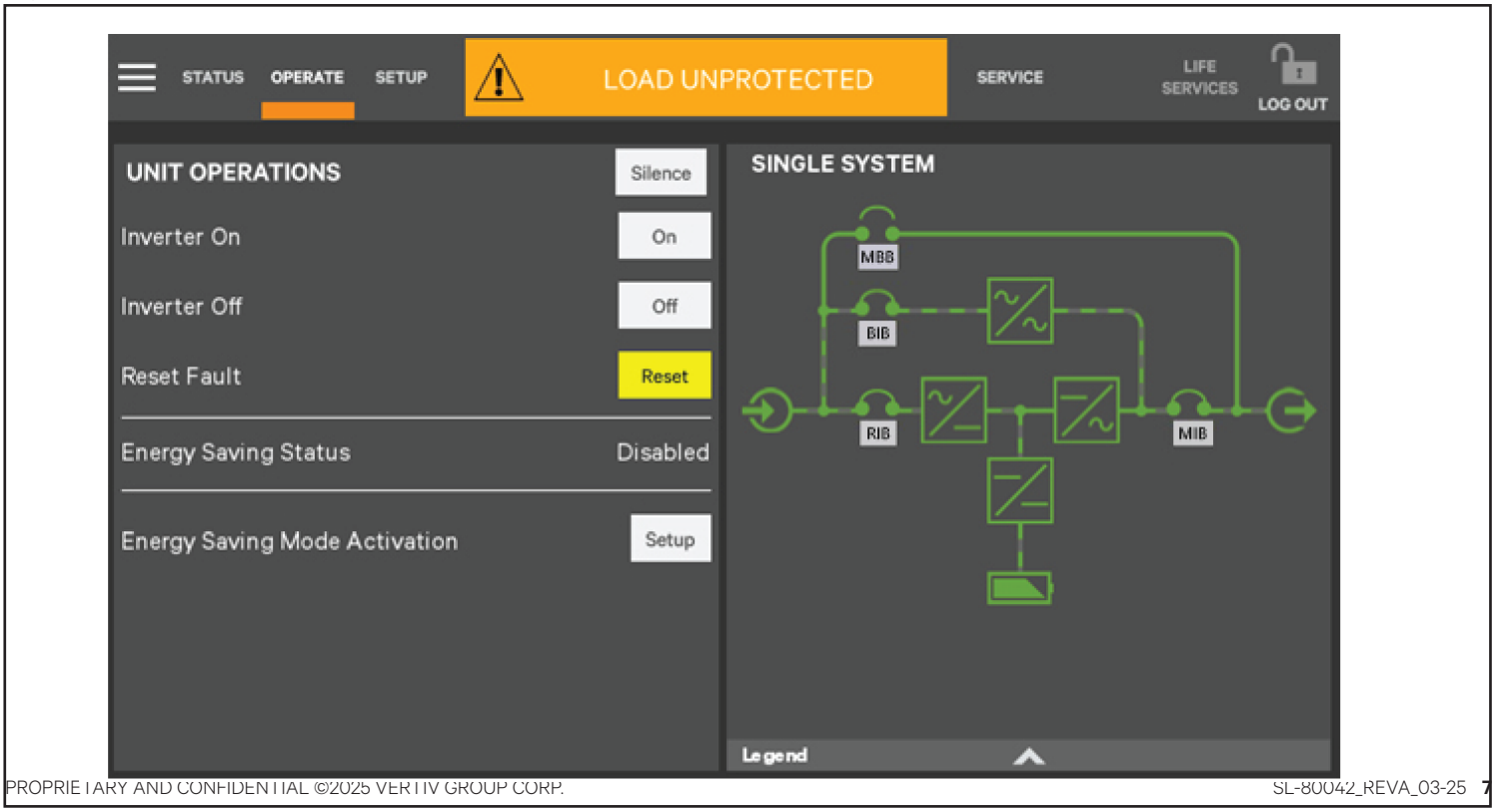
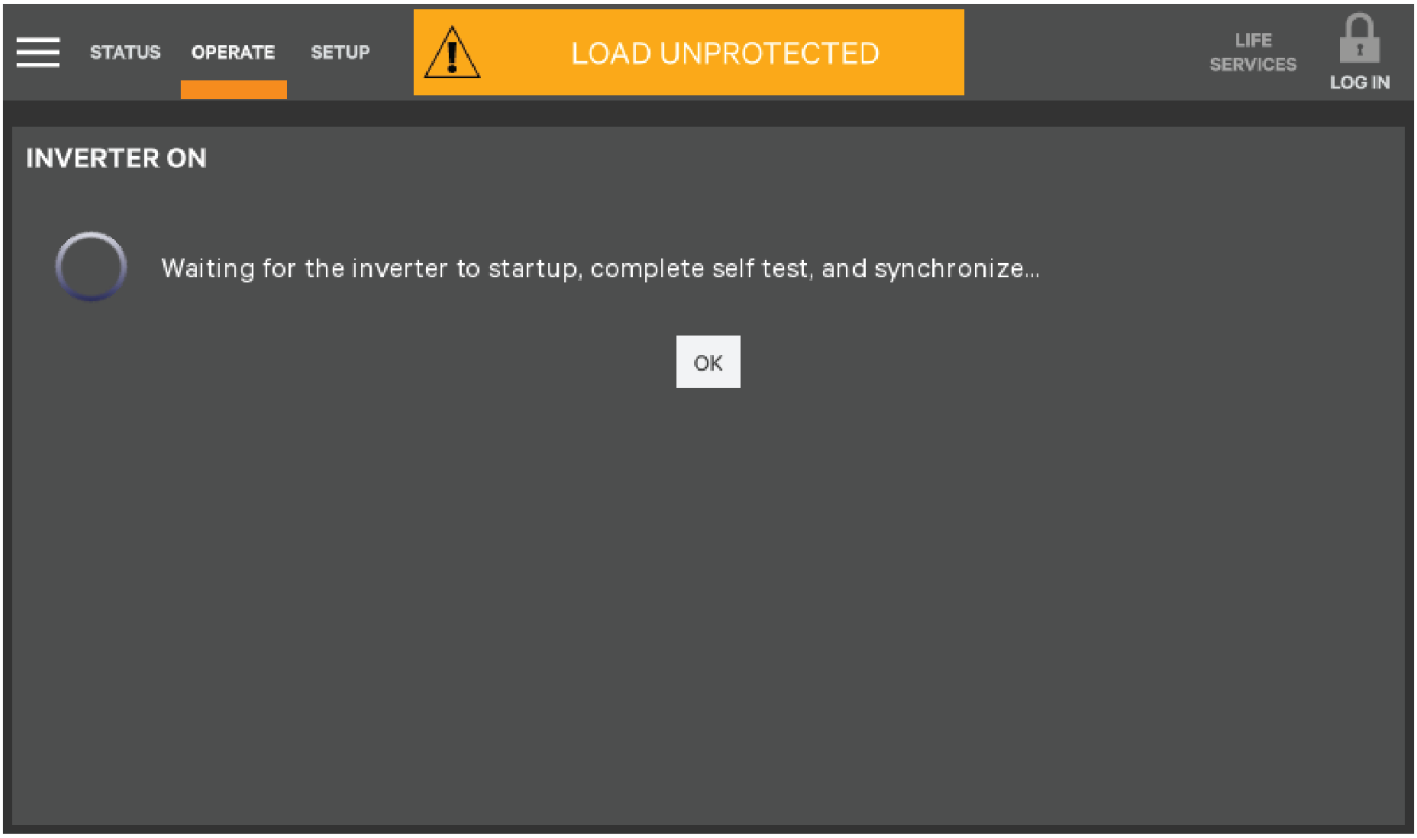


Figure 9. Inverter Self-Test and Synchronization



To contact Vertiv Technical Support: visit www.Vertiv.com

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