



Liebert®

EXS™

Quick Start Guide

10-kVA, 60-Hz, 208/220-V, Three-phase UPS

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Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures. Visit <https://www.VertivCo.com/en-us/support/> for additional assistance.

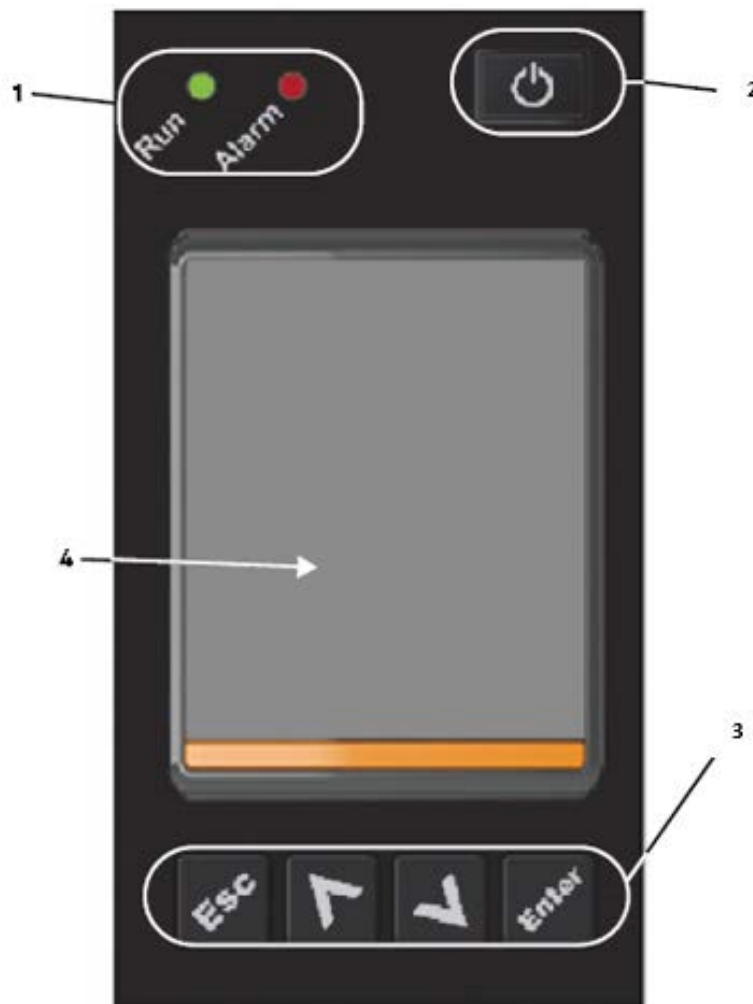
1.0 INTRODUCTION

Thank you for the purchase of the Liebert® EXS™ uninterruptible power system (UPS). The complete user manual is available at Vertiv’s web site, <https://www.vertivco.com/en-us/products-catalog/critical-power/uninterruptible-power-supplies-ups/liebert-exs-ups/> or using the QR code on the right.



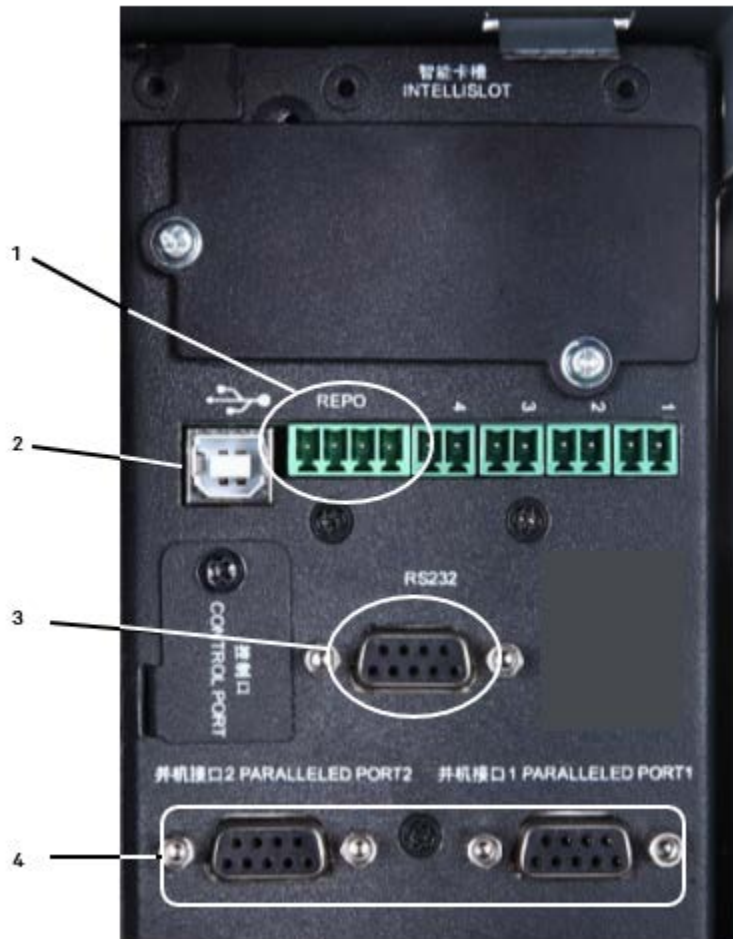
Figure 1 shows the controls and other features on the front of the unit. The rear panel and connections are shown in **Figure 2**.

Figure 1 UPS front panel



1. LED Indicators 2. Power button 3. Function Keys 4. LCD panel

Figure 2 UPS rear panel



1. REPO Port 2. USB Port 3. RS-233 Port 4. Parallel/LBS Port

2.0 UPS INSTALLATION AND COMMISSIONING

2.1 Unpacking and Inspection

The Liebert™ EXS™ is shipped on a pallet. The UPS is equipped with casters that permit two or more people to roll it off the pallet for installation. The Liebert™ EXS™ should be moved as close as practical to its installation location before its packing is removed or the shipping brackets loosened.

Inspect the UPS for damage. If any problem is found, file a damage claim with the carrier immediately and send a copy to Vertiv™ at:

Vertiv™
1050 Dearborn Drive
P.O. Box 29186
Columbus, Ohio 43085 USA

Attn: Traffic Department

Check the accessories and model numbers against the delivery list. If any problem is found, notify your local Vertiv™ representative immediately.

2.2 Installation Tools

The following tools are required to properly install your UPS:

- Pallet jack / Forklift
- Utility Knife
- 19mm (3/4 in.) open wrench or adjustable wrench (Crescent Wrench)
- 16mm (5/8 in.) wrench or socket
- 14mm (9/16 in.) wrench or socket
- 13mm (1/2 in.) wrench or socket
- #1, #2, and #3 Phillips-head screwdrivers
- Torque wrench
- Torque screwdriver

2.3 Removing the UPS from the shipping pallet:

1. Use a forklift, pallet jack, or other lifting device to move the packaged Liebert™ EXS™ as close as practical to its intended installation location.
2. Remove the protective packing; see Figure 9.

3. Locate the included accessories from their packing location on top of the UPS and set them aside.
4. Unbolt the shipping brackets from the pallet with a 14mm (9/16") wrench or socket and then unbolt the shipping brackets from the front and rear of the UPS with a 16mm (5/8") wrench or socket.
5. Retain the brackets to secure the installed UPS to prevent it from tipping; or to secure it to the floor *Note: this step is not required for a Liebert® EXS™ with more than two battery strings (wider UPS).*
6. Raise the leveling feet so that they will not interfere with the ramp.
7. Place the ramp onto the pallet at the front of the UPS and gently roll the UPS down the ramp to the floor; refer to Figure 10.

Figure 9 Remove the protective packing

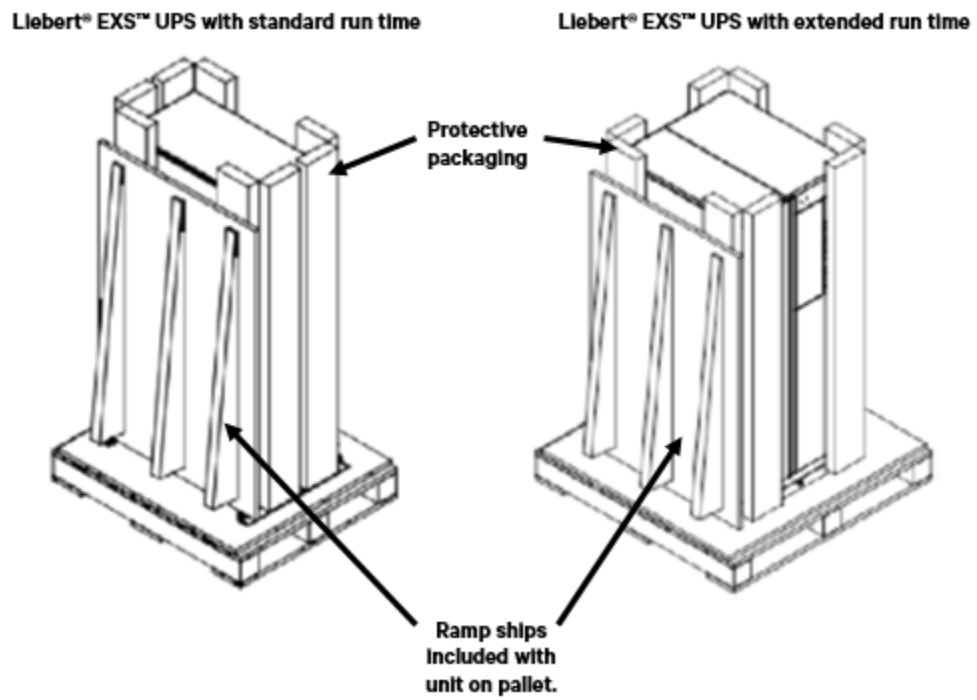
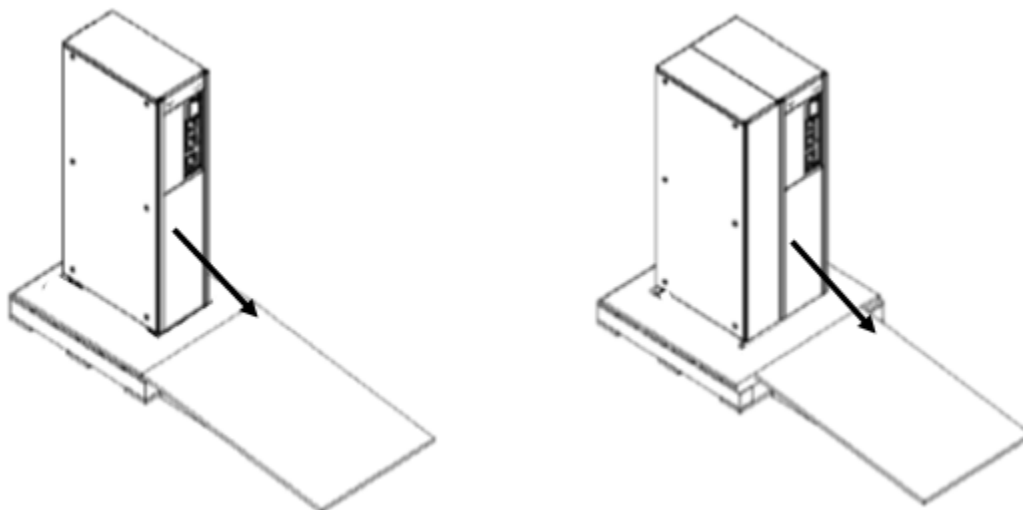


Figure 10 Moving Liebert® EXS™ off shipping pallet



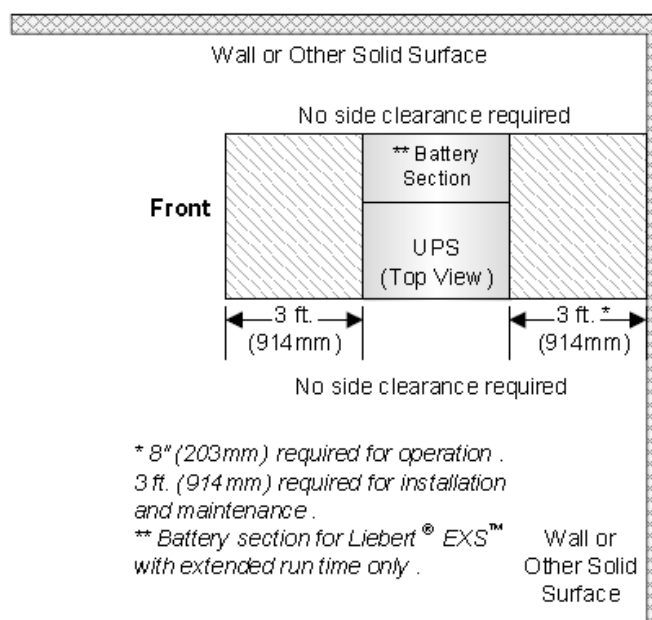
2.4 Installation Preparation

2.4.1 Environmental Requirements

Installation Area

The Liebert® EXS™ is designed for indoor installation in a clean, well-ventilated environment. Internal fans provide forced-air cooling for the UPS. Cooling air enters through the front panel and the hot air is exhausted through the back. Per National Electric Code, at least 3 ft. (914mm) clearance in the front and rear of the Liebert® EXS™ is required for installation and maintenance (see Figure 11). No side clearance is required. Only 8 inches (203mm) rear clearance is required during operation.

Figure 11 Installation clearances



Storage

If the Liebert® EXS™ is not installed immediately, it must be stored indoors and protected from excessive moisture, heat and other harsh conditions. The batteries must be stored in a dry, well-ventilated environment with a temperature range of 68°F ~ 77°F (20°C ~ 25°C).

NOTICE

Risk of failure to properly charge batteries can damage the batteries and void the warranty.

Batteries will lose charge during storage. Batteries must be recharged as recommended by the battery manufacturer every 3 to 6 months, depending on storage temperature.

Approximate times to charge stored batteries are:

- 68-77°F (20-25°C): after 6 months in storage
- 78-86°F (26-30°C): after 3 months in storage
- 87°F or higher (31°C or higher): after 1 month in storage.

2.5 Connecting Power Cables

When connecting input and output cables, follow national and local wiring regulations, take the environment into account and refer to NFPA 70, Table 310-16.

It is recommended to use parity sized ground conductors. Tables 2 and 3 below list the minimum size cables and recommended overcurrent protection device.

Table 2 Currents and wire size — UPS rectifier input

Maximum Input Current, Amps	Recommended OPD, Amp Trip	75°C THW Copper Wire (phase) Number of Cables per Phase: 1	75°C THW Copper Wire (neutral) Number of Cables: 1	75°C THW Copper Wire (Ground) Number of Cables: 1	Recommended Torque
37	50	6AWG	6AWG	10AWG	3nm (2.2ft-lb)

Table 3 AC currents and wire size — UPS bypass input* and output

Maximum Input Current, Amps	Recommended OPD, Amp Trip	75°C THW Copper Wire (phase) Number of Cables per Phase: 1	75°C THW Copper Wire (neutral) Number of Cables: 1	75°C THW Copper Wire (Ground) Number of Cables: 1	Recommended Torque
28	40	8AWG	8AWG	10AWG	3nm (2.2ft-lb)

* Bypass input for dual input configurations only

Table 4 Ring terminal part numbers

	AWG (mm ²)		
	10 (5.26)	8 (8.36)	6 (13.3)
Manf : Part #	McMaster-Carr: 7113K462	McMaster-Carr: 7113K444	McMaster-Carr: 7113K366
	Thomas & Betts: RC10-14	Thomas & Betts: RDV717	Thomas & Betts: RE6-14
	Tyco Electronics: 1577648-1	Tyco Electronics: 132331-1	—

2.5.1 Connecting I/O Cables – Single Input Configuration

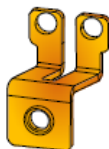
Connect the UPS power cables to the I/O terminal block on the UPS rear panel as shown in Figure 13.

1. Remove the conduit cover plate to gain access to the input and output terminal blocks.
2. Remove the knockouts and attach the conduits to the rear of the conduit plate

Hardwire Connections - UPS Input

3. Leave the factory supplied shorting bus bars in place on the UPS input terminal block.

Shorting bus bar image

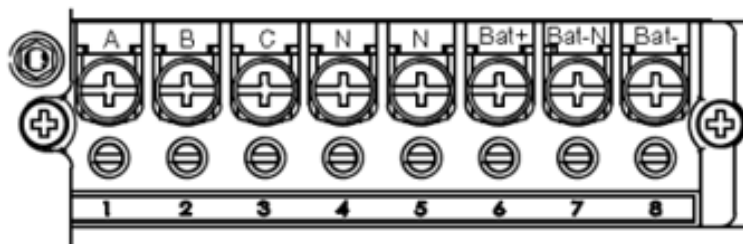
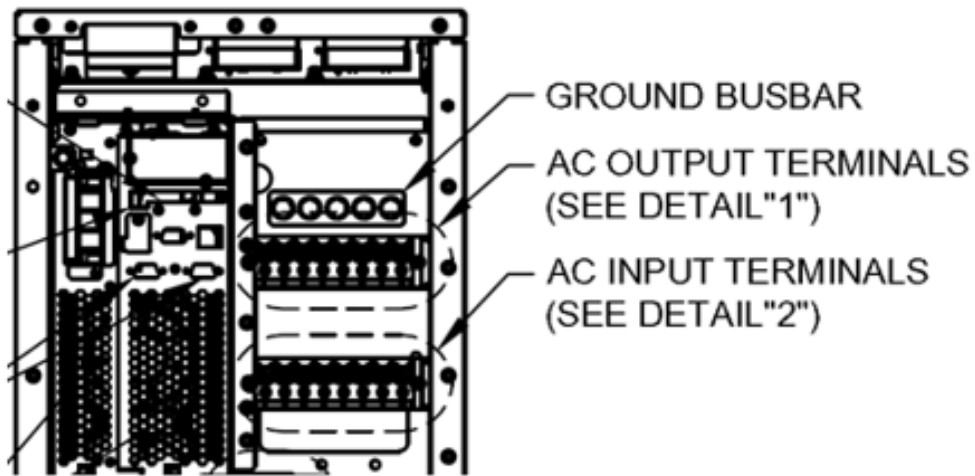


4. Using Figure 13, make these connections:
 - Phase A cable from the upstream feeder panel to UPS Input Terminal Jumper between 1-2 (rA-bA)
 - Phase B cable from the upstream feeder panel to UPS Input Terminal Jumper between 3-4 (rB-bB)
 - Phase C cable from the upstream feeder panel to UPS Input Terminal Jumper between 5-6 (rC-bC)
 - Neutral cable from the upstream feeder panel to UPS Input Terminal Jumper between 7-8 (N-N)
 - The safety equipment ground cable from upstream feeder panel to UPS ground bus bar (PE).

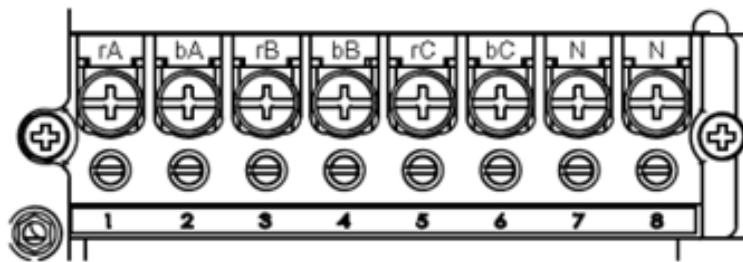
Hardwire Connections - UPS Output

5. Using Figure 13, make these connections:
 - Phase A cable from UPS Output Terminal 1 to the downstream distribution panel Phase A on the panelboard main lug/breaker
 - Phase B cable from UPS Output Terminal 2 to the downstream distribution panel Phase B on the panelboard main lug/breaker
 - Phase C cable from UPS Output Terminal 3 to the downstream distribution panel Phase C on the panelboard main lug/breaker
 - Neutral cable from UPS Output Terminal Jumper between 4-5 to the downstream distribution panel neutral bus
 - The safety equipment ground cable from UPS ground bus bar (PE) to the downstream distribution panel ground bus
6. Replace the conduit plate and secure it.

Figure 13 Wiring diagram—Single and Dual input Configuration



DETAIL "1"
(AC OUTPUT TERMINALS)



DETAIL "2"
(AC INPUT TERMINALS)

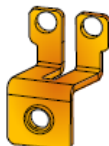
2.5.2 Connecting I/O Cables – Dual-Input Configuration

Dual input configuration for the UPS requires that both input feeds be from the same solid N-G bonded source.

Connect the UPS power cables to the I/O terminal block on the UPS rear panel as shown in Figure 13.

7. Remove the conduit cover plate to gain access to the input and output terminal blocks.
8. Remove the knockouts and attach the conduits to the rear of the conduit plate
9. REMOVE the factory supplied shorting bus bars from the UPS input terminal block.

Shorting bus bar image



Hardware Connections - UPS Rectifier Input

10. Using Figure 13, make these connections:
 - Phase A cable from the upstream feeder panel to UPS Input Terminal 1 (rA)
 - Phase B cable from the upstream feeder panel to UPS Input Terminal 3 (rB)
 - Phase C cable from the upstream feeder panel to UPS Input Terminal 5 (rC)
 - Neutral cable from the upstream feeder panel to UPS Input Terminal 7 (N)
 - The safety equipment ground cable from upstream feeder panel to UPS ground bus bar (PE).

Hardware Connections - UPS Bypass Input

11. Using Figure 13, make these connections:
 - Phase A cable from the upstream feeder panel to UPS Input Terminal 2 (bA)
 - Phase B cable from the upstream feeder panel to UPS Input Terminal 4 (bB)
 - Phase C cable from the upstream feeder panel to UPS Input Terminal 6 (bC)
 - Neutral cable from the upstream feeder panel to UPS Input Terminal 8 (N)
 - The safety equipment ground cable from upstream feeder panel to UPS ground bus bar (PE).

Hardware Connections - UPS Output

12. Using Figure 13, make these connections:
 - Phase A cable from UPS Output Terminal 1 to the downstream distribution panel Phase A on the panelboard main lug/breaker
 - Phase B cable from UPS Output Terminal 2 to the downstream distribution panel Phase B on the panelboard main lug/breaker
 - Phase C cable from UPS Output Terminal 3 to the downstream distribution panel Phase C on the panelboard main lug/breaker
 - Neutral cable from UPS Output Terminal Jumper between 4-5 to the downstream distribution panel neutral bus
 - The safety equipment ground cable from UPS ground bus bar (PE) to the downstream distribution panel ground bus
13. Replace the conduit plate and secure it

3.0 OPERATING INSTRUCTIONS

This section provides the steps to startup and operate the UPS. During operation, the audible alarm may sound, if enabled. To silence the audible alarm, press and hold the “ESC” button for 3 seconds.

Figure 36 Liebert EXS 10kVA Front & Rear View with Covers Removed

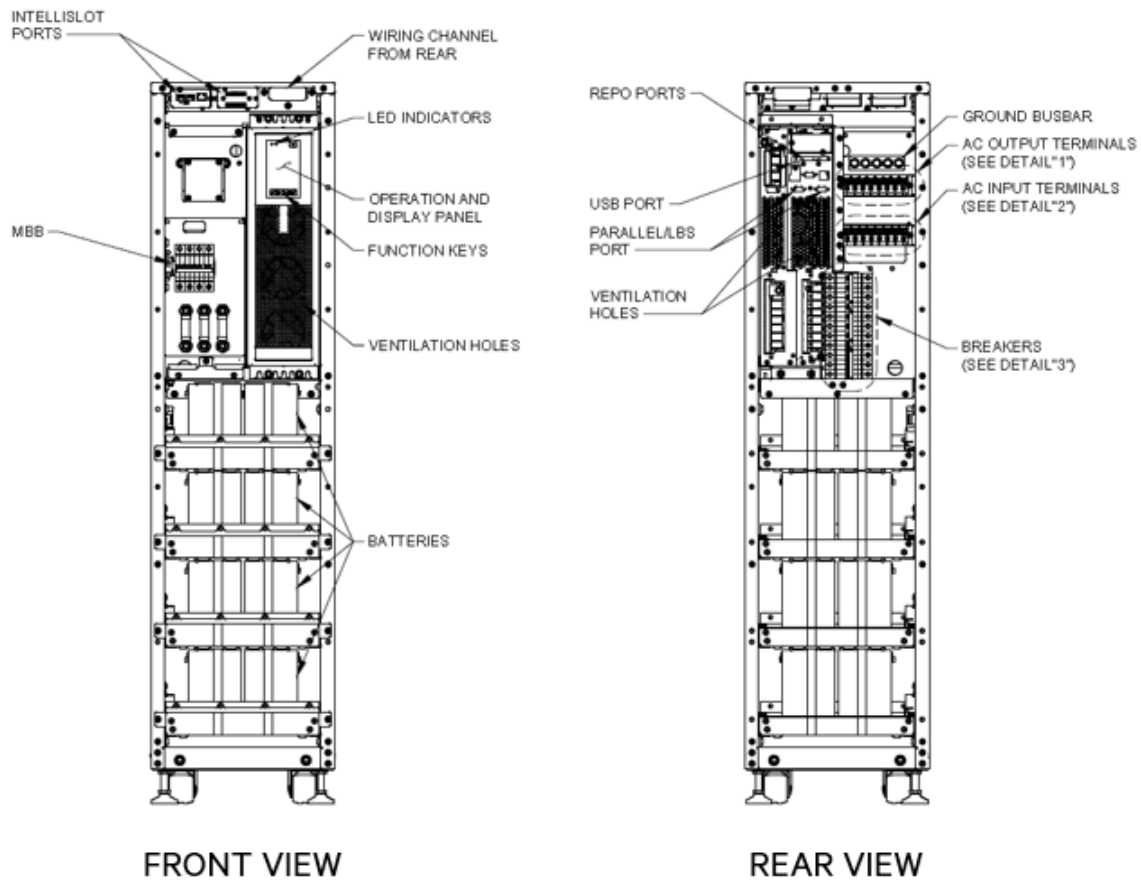
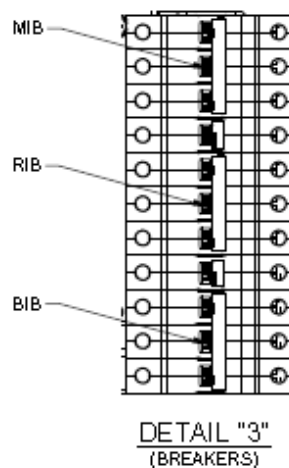


Figure 37 Rear Panel Breaker Layout Detail



3.1 UPS Startup Procedure

The startup procedures can be performed after the UPS installation is complete, all UPS wiring is complete, and all exterior access panels that were removed for installation have been replaced on the UPS.

1. Close the upstream feeder breakers for the UPS rectifier and bypass (if wired as dual input)
2. Close all downstream breakers that might be a distribution panel main breaker and/or branch circuit breakers. If any optional POD's are installed, verify that any distribution breakers on the POD's are closed
3. Ensure that the UPS maintenance bypass breaker (MBB) on the front of the UPS is OPEN and the mechanical interlock is secured in the lower position (near the breaker handle), see Figure 36
4. Close the rectifier input breaker (RIB), bypass input breaker (BIB), and maintenance isolation breaker (MIB) the rear of the UPS, see Figures 36 & 37. The MIB is also the main output breaker of the UPS
5. Once the RIB and BIB breakers are closed, the UPS will automatically begin the startup process and boot up system checks. These checks take approximately 20-30 seconds
6. If any of the UPS operating parameters need to be customized for the installation or application, refer to section 3.6 and make those changes before proceeding to step 7
7. Once the system checks and/or operating parameters are complete, using the display panel, press the "POWER" button and press either the "UP or DOWN" button to confirm "Turn ON UPS"
8. The UPS is operating in Normal Mode providing clean and protected AC power to the connected equipment

3.2 Transfer Between Operation Modes

3.2.1 Transfer from Normal (Inverter) Mode to Bypass Mode or Turn Off the UPS

To transfer to the internal bypass or turn Off the UPS when the UPS is operating in Normal Mode (the inverter is supplying clean and protected power to the connected equipment):

1. Press and hold the "POWER" button for 2 seconds.
 - a. If the bypass power is within normal operating range the screen shown at the top in Figure 38 will appear, permitting the operations of *Turn to Bypass* or *Turn off UPS*
 - i. Use the "UP or DOWN" button to select the desired operation or press the "ESC" button to cancel the operation
 - ii. Press the "ENTER" button to confirm the action
 - iii. Press the "ENTER" button again
 - b. If the bypass power is outside normal operating range, the screen shown in Figure 39 will appear where the only selection is to *Turn off UPS*
 - i. Use the "UP or DOWN" button to select the desired operation or press the "ESC" button to cancel the operation
 - ii. Press the "ENTER" button to confirm the action

NOTE



In Bypass mode, the load is not protected as it is powered directly by utility power.

Figure 38 Bypass normal interface

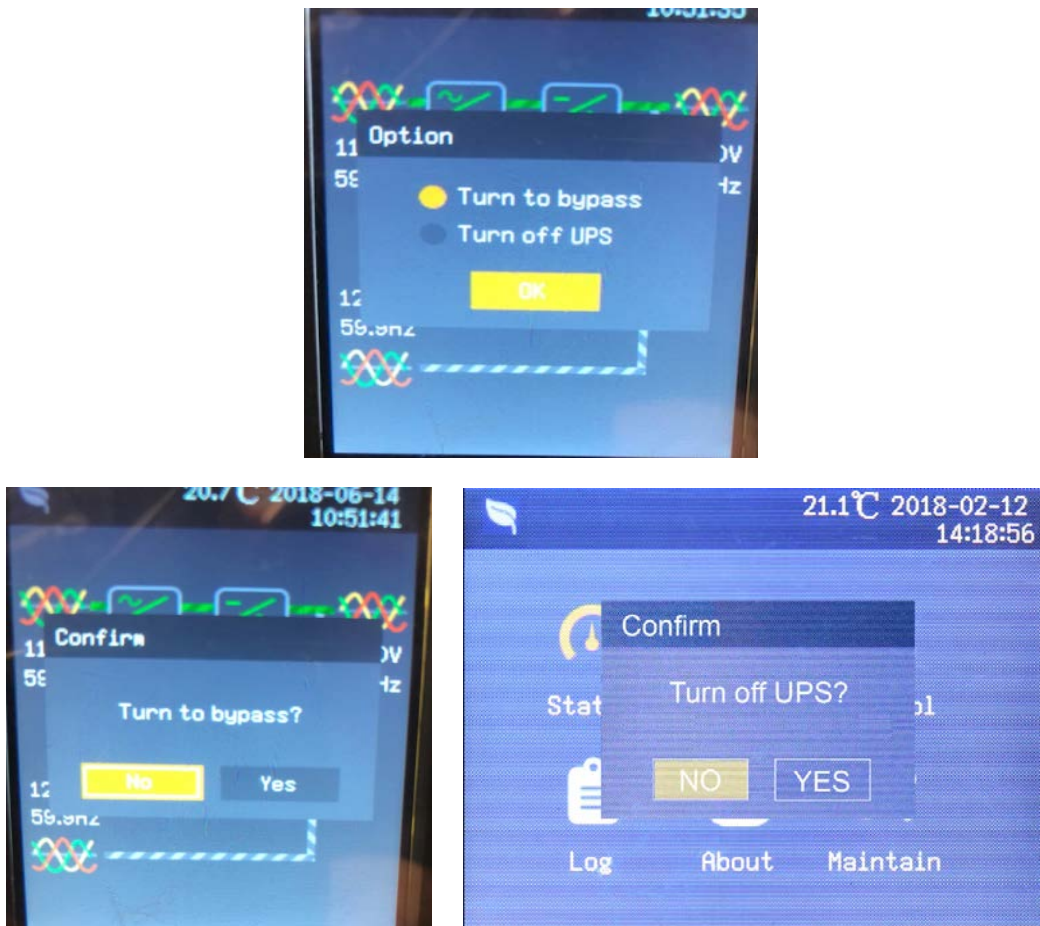
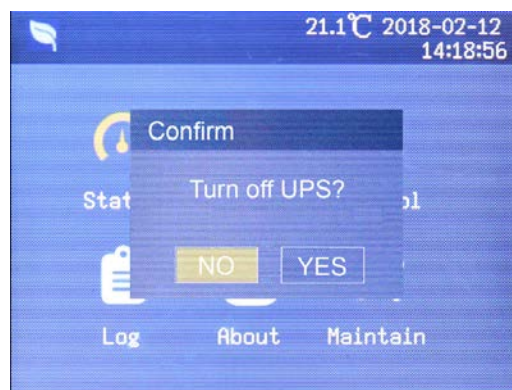


Figure 39 Bypass abnormal interface



3.2.2 Transfer from Bypass Mode to Normal (Inverter) Mode or Turn Off the UPS

To transfer to the inverter (normal operation) or turn Off the UPS when the UPS is on internal bypass mode:

1. Press and hold the “POWER” button for 2 seconds.
 - a. If the UPS is configured for Normal operation, the screen shown at the top in Figure 40 will appear, permitting the operations of *Turn on UPS* or *Turn off UPS*.
 - i. Use the “UP or DOWN” button to select the desired operation or press the “ESC” button to cancel the operation
 - ii. Press the “ENTER” button to confirm the action
 - iii. Press the “ENTER” button again
 - b. If the UPS is configured for or operating in ECO Mode, the screen shown in Figure 41 will appear where the only selection is to *Turn off UPS*
 - i. Use the “UP or DOWN” button to select the desired operation or press the “ESC” button to cancel the operation
 - ii. Press the “ENTER” button to confirm the action

Figure 40 Transfer to Inverter Mode

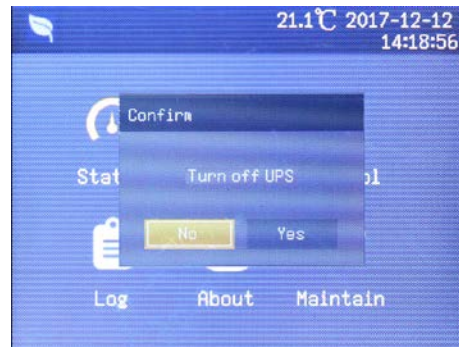
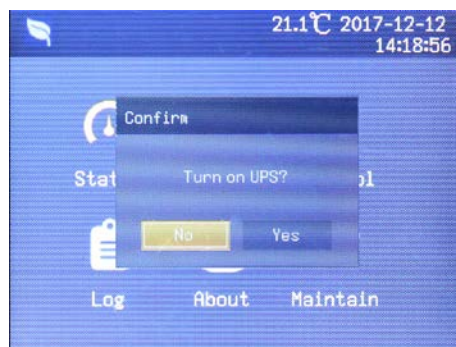
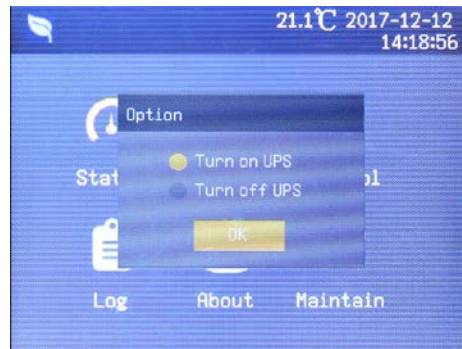
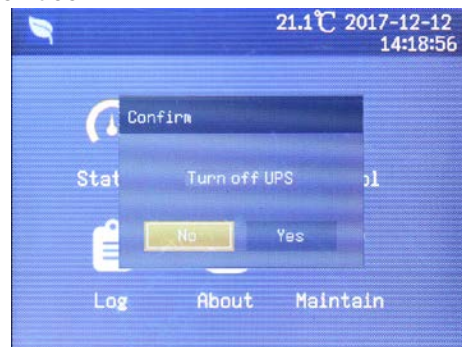


Figure 41 Eco Mode enabled interface



3.2.3 Transfer from Normal (Inverter) Mode to Maintenance Bypass Mode

To transfer from normal operation to maintenance bypass mode:

1. Press and hold the “POWER” button for 2 seconds.
 - a. If the bypass power is within normal operating range the screen shown at the top in Figure 38 will appear, permitting the operations of *To the Bypass* or *Turn off UPS*
 - i. Select the operation *To the Bypass*
 - ii. Press the “ENTER” button to confirm the action
 - iii. Press the “ENTER” button again
 - b. If the bypass power is outside normal operating range, the screen shown in Figure 39 will appear where the only selection is to *Turn off UPS*
2. Pull down on the slide latch on the front left panel of the unit to gain access to the Maintenance Bypass Breaker (MBB), refer to Figures 35 & 36
3. Set this panel aside or lay it gently on top the UPS to avoid scratching the panel or top of the UPS
4. Loosen the thumb screw on the mechanical interlock on the MBB
5. Slide the interlock up and tighten the thumb screw to secure the interlock in place
6. Close the MBB
7. Electrically isolate the UPS module from AC power Input by moving to the rear of the UPS and opening the Rectifier Input Breaker (RIB), Bypass Isolation Breaker (BIB), and Maintenance Isolation Breaker (MIB)

The UPS system is now in maintenance bypass mode, which will allow the UPS module to be safely serviced by Vertiv Service

3.2.4 Transfer from Maintenance Bypass Mode to Normal (Inverter) Mode

To transfer from normal operation to maintenance bypass mode:

1. Ensure that the mechanical interlock is still secured in the unlocked position
2. On the rear of the UPS, close the rectifier input breaker (RIB), bypass input breaker (BIB), and maintenance isolation breaker (MIB) the rear of the UPS, see Figures 36 & 37
3. The UPS will begin its startup procedure and operate in internal bypass mode. Verify that the UPS is operating in internal bypass mode before proceeding



NOTICE

Risk of improper operation. Failure to have the UPS operating on internal bypass and performing the next step will result in loss of all output power to the connected equipment.

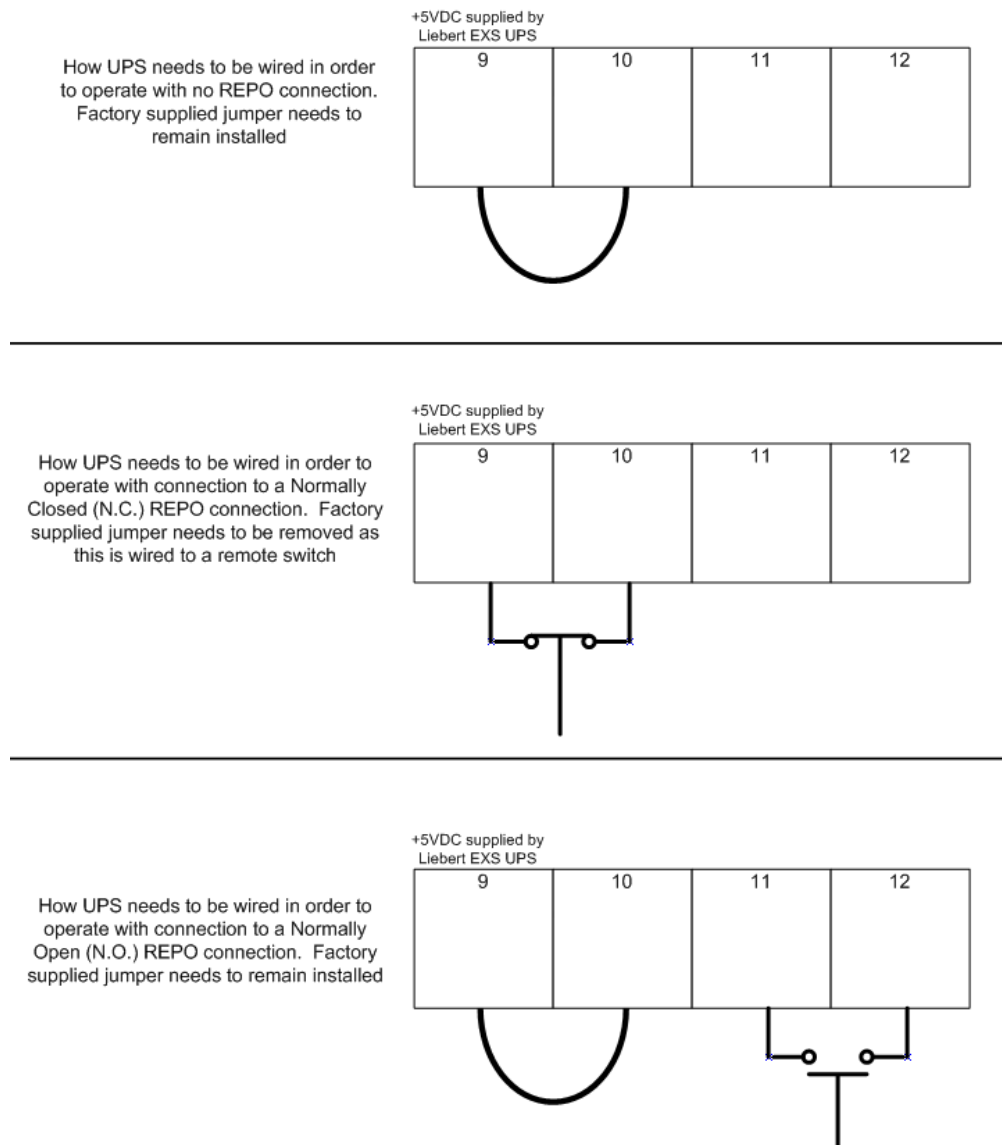
4. On the front of the UPS, open the maintenance bypass breaker (MBB)
5. Loosen the thumb screw on the mechanical interlock on the MBB
6. Slide the interlock down and tighten the thumb screw to secure the interlock in place
7. Press and hold the “POWER” button for 2 seconds.
 - a. Select the operation *Turn on UPS*
 - b. Press the “ENTER” button to confirm the action
 - c. Press the “ENTER” button again
8. Locate the front left panel that was set aside or was laid on top the UPS. Replace this to cover

The UPS system is now in normal operation mode providing clean and protected AC power to the connected equipment

3.3 REPO

The Liebert® EXS™ is equipped with a Remote Emergency Power Off (REPO) connector for either Normally Open (N.O.) or Normally Closed (N.C.) systems. An interface with the external REPO circuit must be field-supplied to allow disconnecting the UPS input feeder breaker to remove all sources of power to the UPS and connected equipment to comply with national and local wiring codes and regulations.

Figure 43 Liebert EXS 10kVA REPO connection



NOTE



Vertiv™ recommends using 0.82mm² ~ 0.33mm² (18AWG ~ 33AWG) copper signal cable. If the REPO has been configured to trip an electronically controlled circuit breaker, after the REPO has been activated it will be necessary to re-arm the switch before restarting the UPS.

Table 13 Physical Specifications

	UPS with 1 Battery String	UPS with 2 Battery Strings	UPS with 3 Battery Strings	UPS with 4 Battery Strings
Dimensions, W x D x H inches (mm)				
Unit	13.2 x 25.6 x 51.2 (335 x 650 x 1300)		22.7 x 25.6 x 51.2 (576 x 650 x 1300)	
Shipping	16 x 30 x 60 (406.4 x 762 x 1524)		36 x 48 x 60 (914.4 x 1219.2 x 1524)	
Weight, lbs (kg)				
Unit	437 (198.2)	627 (284.4)	893 (405.1)	1,093 (495.8)
Shipping	487 (220.9)	677 (307.1)	1,011 (458.6)	1,211 (549.3)
Color	Black-Gray (RAL 7021)			

Table 14 Backup time in minutes—10kVA models

UPS Model	Battery String Qty	Load Level											
		100%	90%	80%	75%	70%	60%	50%	40%	30%	25%	20%	10%
		10kW	9kW	8kW	7.5kW	7kW	6kW	5kW	4kW	3kW	2.5kW	2kW	1kW
10kVA/10kW	1	6	7	9	10	12	15	18	23	34	38	50	106
	2	18	20	23	25	28	34	38	50	73	90	107	189
	3	30	34	36	38	40	50	66	81	107	129	150	306
	4	38	41	50	54	62	73	91	107	140	156	190	328



NOTE

Run times shown in **Table 14** are approximate. They are based on new, fully charged batteries at a temperature of 77°F (25°C) with 100% resistive UPS loading. Different loading will change the actual run times. Run times listed may vary by ±5% due to manufacturing variances of the batteries.



