



Liebert[®] RXV Remote Distribution Cabinet

User Manual

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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.vertiv.com/en-us/support/> for additional assistance.

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1 Important Safety Instructions

Save These Instructions

This manual contains important instructions that should be followed during installation of the Vertiv™ Liebert® RXV. Read this manual thoroughly, paying special attention to the sections that apply to your installation, before installing or operating the Liebert® RXV. Retain this manual for use by installing personnel.

Only properly trained and qualified personnel wearing appropriate safety headgear, gloves, shoes and glasses should be involved in installing the Liebert® RXV or preparing the unit for installation.

In case of fire involving electrical equipment, use only carbon dioxide fire extinguishers or those approved for use in fighting electrical fires.

Extreme caution is required when performing installation and maintenance.

Special safety precautions are required for procedures involving handling, installation and maintenance of the Liebert® RXV. Observe all safety precautions in this manual before handling or installing the unit. Observe all precautions in this manual before as well as during performance of all maintenance procedures.



WARNING! Risk of electric shock. May cause personal injury or death. Verify that all incoming line voltage (power) circuits are de-energized and locked out before installing cables or making connections in the unit. Equipment inspection and startup should be performed only by properly trained and qualified personnel wearing appropriate safety headgear, gloves and shoes. Lethal voltages are present during startup procedures. Electrical safety precautions must be followed throughout inspection and startup. Only properly trained and qualified service personnel wearing appropriate safety headgear, gloves, shoes and glasses should perform maintenance on the Liebert® RXV. All voltage sources to the unit must be disconnected before inspecting or cleaning within the cabinet.



WARNING! Risk of electric shock. May cause personal injury or death. Lethal voltages exist within the equipment during operation. Observe all warnings and cautions in this manual. Failure to comply may result in serious injury or death. Obtain qualified service for this equipment as instructed. All power wiring should be installed by licensed electricians and must comply with the NEC and applicable codes.



WARNING! Risk of heavy unit falling or tipping over. Improper handling can cause equipment damage, injury or death. The unit should NOT be loosened from the shipping pallet until after all handling by forklift or pallet jack is completed. Exercise extreme care when handling Liebert® RXV cabinets to avoid equipment damage or injury to personnel.

Electromagnetic Compatibility- The Liebert® RXV complies with the limits for a Class A Digital Device, pursuant to Part 15 of FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Operating this device in a residential area is likely to cause harmful interference that users must correct at their own expense.

The Vertiv™ Liebert® RXV complies with the requirements of EMC Directive EN55032:2015 and the published technical standards. Continued compliance requires installation in accordance with these instructions and use of accessories approved by Vertiv.

2 Vertiv™ Liebert® RXV Remote Distribution Cabinet

The Liebert® RXV is a compact Remote Power Panel (RPP) designed to deliver power to critical space server rack equipment and Vertiv™ Liebert® Rack-PDU loads. Liebert® RXV will provide users the flexibility and convenience of a packaged / integrated distribution solution, broad power oversight with Vertiv™ Liebert® DPM intelligent power monitoring, and superior lifecycle support.

The Liebert® RXV cabinet is 23.75 in. (600 cm) wide by 12 in. (305 cm) deep by 78.75 in. (200 cm) high.

Figure 2.1 Liebert® RXV Cabinet



2.1 Cabinet Options

The Liebert® RXV can be installed in any of five configurations. Installation will vary depending on the chosen configuration.

- Configuration 1—Single unit
- Configuration 2—Two units attached back-to-back
- Configuration 3—Two units attached side-by-side
- Configuration 4—Three units: two attached back-to-back with the third attached to one side
- Configuration 5—Four units: two units attached back-to-back with one unit attached to each side



WARNING! Risk of heavy unit falling or tipping over. Can cause property damage, personal injury or death. The Liebert® RXV is not designed to be a free-standing unit and may present a tipping hazard. The Liebert® RXV must be properly supported and braced until it is securely attached to a supporting structure.

2.1.1 Configuration 1—Single Unit

This single-unit configuration is 23.75" (600mm) wide and 12" (305mm) deep. It must be secured to a wall, rack or other structure. The required front service access is:

- 36" (914 mm) for units up to 150V to ground per NEC 110.26
- 42" (1067 mm) for units over 150V to ground per NEC 110.26

2.1.2 Configuration 2—Back-to-Back

This two-unit configuration is attached back-to-back and is 23.75" (600mm) wide and 24" (610mm) deep. The two units can be installed in place of a floor tile. Remove one 24" x 24" (610 x 610mm) floor tile and position the Vertiv™ Liebert® RXV over the opening, the unit will rest on top of the raised floor cross members on all four sides

2.1.3 Configuration 3—Side-By-Side

This two-unit configuration is attached side-by-side and is 47.5" (1200mm) wide and 12" (305mm) deep. The units must be secured to a wall, rack or other structure.

2.1.4 Configuration 4—Three Units

This three-unit configuration has two units attached back-to-back with a third unit attached to the side. It is 35.75" wide and 24" (610mm) deep. These units are free-standing and can be set on a raised floor.

2.1.5 Configuration 5—Four Units

This four-unit configuration has two units attached back-to-back with one unit attached to each side. It is 47.5" wide and 24" (610mm) deep. These units are free-standing and can be set on a raised floor.

2.2 Vertiv™ Liebert® Distribution Power Monitoring (DPM)

Your Liebert® RXV system may include the Liebert® Distribution Power Monitoring (DPM) system. The Liebert® DPM is a color touchscreen system that monitors the panelboard mains and individual panelboard branches. It offers a local Emergency Power-off (EPO), local and remote firmware upgrade, event-log download, billing-grade accuracy and waveform capture.

The Liebert® DPM uses the monitored data to report voltage, current, power, energy, and alarm conditions for the Liebert® RXV system. The Liebert® DPM may be installed for Mains-only monitoring or Mains plus Branch monitoring. Branch monitoring provides load and alarm information for each configured branch circuit. For details on using the Liebert® DPM, see the Liebert® DPM Installer/User Guide SL-11326 available at www.Vertiv.com.

3 Equipment Handling and Pre-Installation Preparation

NOTE: Read the entire manual before installing or operating the system. Upon receipt of a Vertiv™ Liebert® RXV, perform all of the following procedures to ensure a quality installation.



WARNING! Risk of improper handling. Can cause equipment damage, injury or death. The Liebert® RXV equipment is heavy. The unit should not be loosened from the shipping pallet until after all handling by forklift or pallet jack is completed. See [Unit Weights](#) on page 7, for the unit weights.

3.1 Environmental Conditions

Standard Operating Environment

The unit operates at ambient temperatures of 32°F to 104°F (0°C to 40°C) with a relative humidity of 0% to 90% (non-condensing). Maximum operating altitude is 3300 ft (1000 m).

Table 3.1 Ambient Temperature De-rate Table

Temperature	Unit Rating Factor (Normalized to 1000m Elevation)
0 - 40°C	1.000
45°C	0.975
50°C	0.950
55°C	0.925

Table 3.2 Altitude De-rate Table

Altitude (m) at 40°C	Altitude (ft) at 40°C	Unit Rating Factor (Normalized to 1000m Elevation at 40°C)
0	0	1.030
152	500	1.025
268	880	1.022
305	1000	1.021
610	2000	1.012
914	3000	1.003
1000	3300	1.000
1200	4000	0.994
1500	5000	0.985
2000	6600	0.970

3.2 Location Considerations

Consider the following when planning and installing the unit:

- Install the unit only on concrete or other non-combustible flooring.
- The unit may be installed on concrete floors or raised floors.

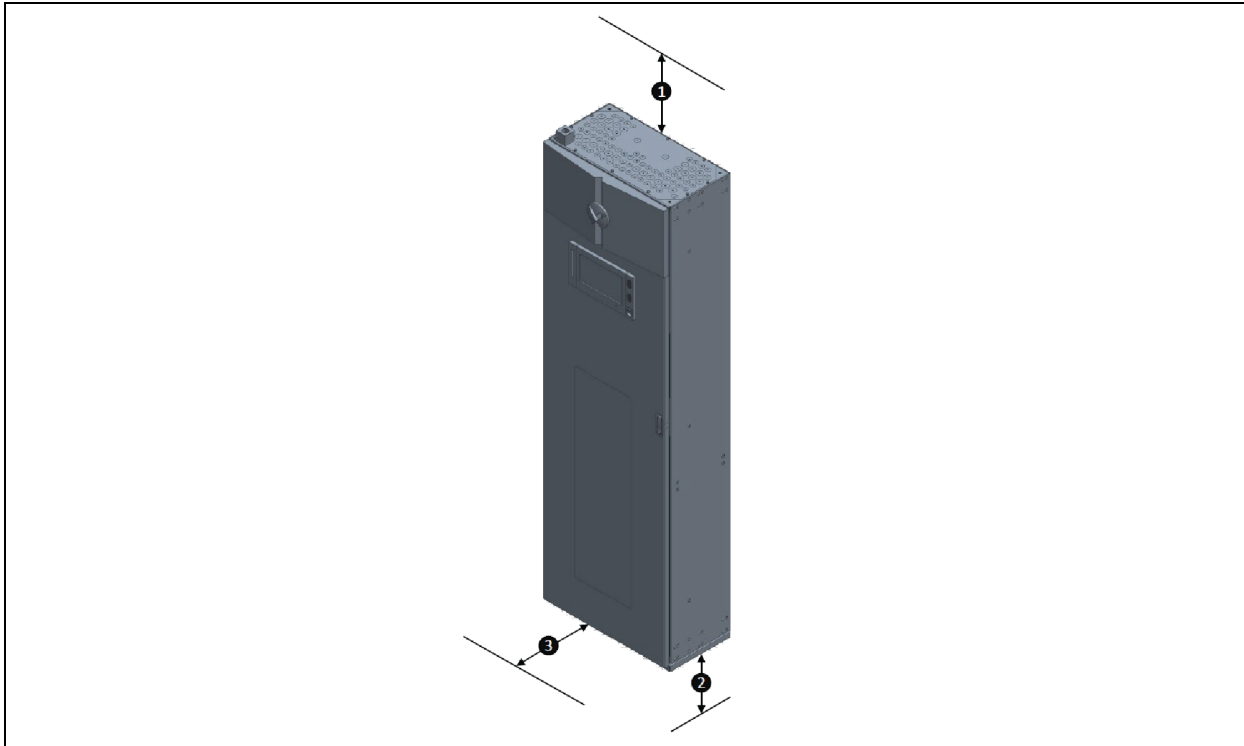
- The unit may be installed with or without a floor stand.
- Raised-floor systems must support the full weight of the Vertiv™ Liebert® RXV.
- For best performance, the Liebert® RXV should be located as close to the load(s) as possible.

3.2.1 Clearance Requirements

NOTE: If required service clearances are not met, the system cannot be started-up or certified.

- The Liebert® RXV cabinet is front-access for operation and maintenance.
- In raised-floor applications, there must be a 6 in. (153 mm) minimum at bottom for cable exit.

Figure 3.1 Clearance Requirements



Item	Description
1	18 in. (457 mm) above the system.
2	12 in. (305 mm) for units installed on raised floors.
3	Units up to 150V to ground: 36 in. (914 mm) minimum in front per NEC 110.26. Units over 150V to ground: 42 in. (1067 mm) minimum in front per NEC 110.26.

The following clearances are required around the system for cooling air-flow.

- 18 in. (457 mm) minimum above
- 6 in. (153 mm) minimum in front

3.2.2 Unit Weights

A single RXV unit weighs approximately 420 lbs (191 kg).

3.3 Preliminary Inspection and Unpacking

Upon receipt of the equipment:

- Inspect the shipping crate(s) for damage or signs of mishandling before unpacking the unit(s). Do not attempt to install if damage is apparent.
- Locate the bag containing the keys for the front door, which is attached-to or inside the cabinet.
- Compare the contents of the shipment with the bill of lading. Report any missing items to the carrier and to Vertiv immediately.
- Check the nameplate on the cabinets to verify that the model numbers correspond with those specified and record the model number and serial number on the inspection and start-up checklist in [Equipment Inspection and Startup Checklist](#) on page 29 and in a secure location according to your company requirements. The equipment models and serial numbers are required for service.
- If storing the unit before installation, observe the following requirements:
 - Store in a dry, indoor environment in the temperature range –4°F to 131°F (–20°C to 55°C).
 - Use original packing materials or other suitable means to keep the unit clean.
- When removing the shipping material, use care not to puncture the equipment with sharp objects.

NOTE: Do not loosen or remove the unit(s) from the shipping pallet until after all handling by fork lift or pallet jack is completed. Perform a complete internal inspection only after equipment is positioned in the installation location and prior to electrical hook-up.

If you observe any damage as a result of shipping, immediately file a damage claim with the shipping agency and forward a copy to:

Vertiv
 1050 Dearborn Drive
 P.O. Box 29186
 Columbus, Ohio 43229 USA

3.4 Internal Inspection

After unpacking the Vertiv™ Liebert® RXV, conduct an internal inspection, before moving to the installation location:

1. Verify all items have been received.
2. Check for shipping damage to the components:
 - a. Inspect exterior panels and doors.
 - b. Inspect all breaker terminals and lugs for any loose connections.
3. Check for and remove components in the cabinet such as manuals, keys and connection hardware.
4. Check for any un-safe condition that may be a potential safety hazard.

3.5 Equipment Handling and Moving



CAUTION: Risk of shock loading during relocation. Can cause unit damage. Exercise caution while moving the unit to avoid equipment damage. Handle the unit so that it is not subjected to shock loading, such as being dropped or severely jarred.

The Liebert® RXV system is bolted to a wooden pallet for handling with forklift, pallet jack, or similar equipment.

When moving the Liebert® RXV system, consider the following:

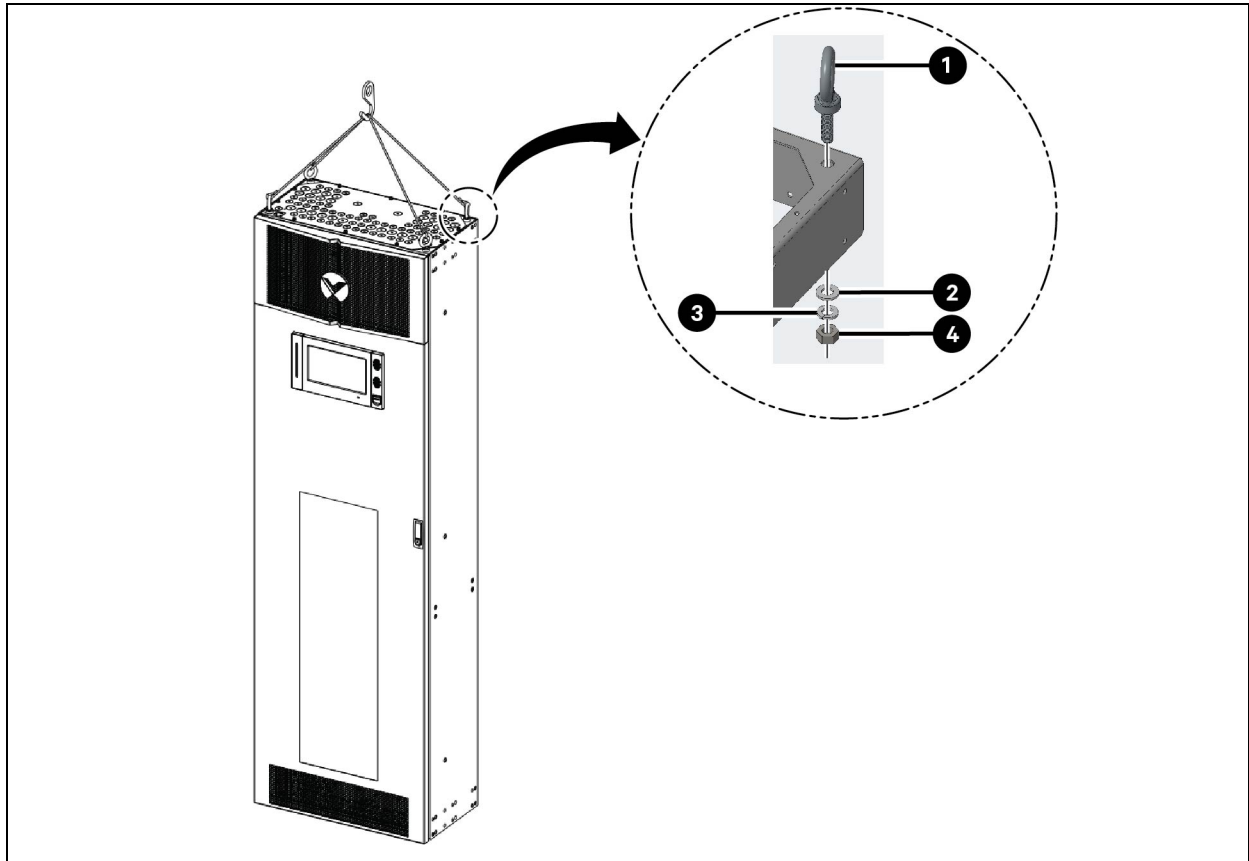
- Check size and weight - refer to [Unit Weights](#) on the previous page and the drawings furnished with the unit for size and weight information. The unit is heavy. Verify any surfaces can support the full weight of the unit.
- Ensure that the route to the installation area is planned so that all passages are large enough to accommodate the unit and that the floors are strong enough to support the weight. Check all doorways, hallways, elevators, ramps and other portions of the route to determine if there are any obstructions and to ensure each is large enough and strong enough to allow easy passage.
- Do not tilt the unit more than 15 degrees to prevent tipping and equipment damage.

3.6 Removing the Unit from the Shipping Pallet

1. Set the palletized unit on an open, level surface.
2. Remove the bolts that connect the unit to the shipping brackets.
3. Remove the lag screws that connect the shipping brackets to the pallet, then remove the brackets.
4. Manually lift the unit from the pallet. Use the optional lifting handles, if available.

NOTE: Optionally, install the lifting lug kit as shown in [Figure 3.2](#) on the facing page and lift the unit using a bridge crane or equivalent equipment.

Figure 3.2 Lifting the Unit with Lifting Lugs Installed



Item	Description
1	Eye Bolt
2	Flat Washer
3	Split Washer
4	Nut

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4 Installation



WARNING! Risk of electric shock. Can cause injury or death. Equipment installation, inspection and start-up should be performed only by properly trained personnel wearing appropriate, OSHA-approved PPE. Lethal voltages are present during start-up procedures. Electrical safety precautions must be followed throughout inspection and start-up.

NOTICE

Do not walk, stand, or sit on top of the unit. Remove conduit plates / top hats from unit prior to any cutting, drilling, or punching. Clean and remove all metallic shavings, burrs and debris before reinstallation of conduit plates / top hats to the unit.

4.1 Installation Mounting Options

This unit may be installed directly to the floor, or to the floor with the addition of optional leveling feet, or by mounting to a wall. For seismic-rated floor mounting, refer to submittal drawing RXV-17-S001 "Mounting Drawing Seismic Floor Mount, Liebert RXV System". For seismic-rated wall mounting, refer to submittal drawing RXV-17-S002 "Mounting Drawing Seismic Wall Mount, Liebert RXV System".

4.2 Installing with Leveling Feet

The unit may be installed using optional leveling feet.

4.3 Installing with Floor Stands

Optional floor stands provide clearance for bottom cable entry and eliminate the need to rely on a raised floor to support the unit. Floor-stand heights are between 10 in. (254 mm) and 42 in. (1067 mm). Refer to the installation instructions included with the floor stand kit for details.

4.4 Power Wiring Installation

Power wiring should be installed by licensed electricians. All power wiring must comply with the NEC and applicable local codes.

4.4.1 System Grounding

Proper system ground is critical to protect the equipment and user and to enhance operation by preventing electrical noise. All grounding must be in accordance with the NEC and any local building codes.

Refer to the appropriate submittal drawing for your system for the power-wiring termination points and recommended wire routing. Contact your Vertiv sales representative for the submittal documents.

The Vertiv™ Liebert® RXV provides a single ground location for the input feeder. System grounding must meet the following requirements:

The minimum grounding conductor must be sized in accordance with NEC Section 250.66, larger sizes are permitted to be used.

- If the input power feeder conduit is used as a grounding conductor, adequate electrical continuity must be maintained at all conduit connections.
- A local grounding electrode is recommended in addition to the equipment safety ground, which is normally run with the input power conductors. The grounding electrode conductor must be run to the nearest available grounding electrode in accordance with the NEC and local codes. The recommended methods for running the local grounding electrode conductor are (arranged by preference; as permissible by NEC/local codes):
 - a. Outside of conduit (where not subject to damage).
 - b. Inside non-metallic conduit.
 - c. Inside non-ferrous conduit.
 - d. Inside ferrous conduit, bonded to the conduit at both ends, as acceptable by local and other applicable codes.

4.4.2 High-frequency Computer-room Grounding

If the unit supplies power to a computer room or area with a signal-reference grid or grounded, raised floor stringer system, connect a grounding conductor from the system ground bus to the grid or floor system. This conductor should be stranded or braided #8 AWG or larger and as short as practical.

4.4.3 Input-power Connections

The power conductors run directly through the top or bottom conduit plate, through the center of the unit. The phase conductors terminate to the main input busbars, the ground and neutral terminate to the distribution buses located in the middle of the unit.

For all input-power connection dimensions and connection details, refer to the submittal drawings included with your system. If needed, call or e-mail your Vertiv Sales Representative for the submittal documentation.

Observe the following requirements for input-power connections:

- For main input-power feeders, size cables according to the NEC and applicable local codes.
- Sizing must take into account the system's rated full-load current and any voltage drop associated with the feeder run.
- Size Input feeder conductors for no more than 2% voltage drop. If you want operation at undervoltage conditions for extended periods of time, the input feeders must be oversized.
- The maximum input feeder size is 2X 500MCM copper cable per phase.

Table 4.1 on the facing page, describes the recommended connections for the various input-power options available.

Table 4.1 Input Connection Options

Input Power Connection	Description
Input Junction Box	For units with a main input junction box, input power feeder connections are made to the junction box busbars. Junction boxes are supplied with power cables for connection to the unit in the field. Junction boxes are intended to be placed under a raised floor. Junction box connections must be installed in accordance with the NEC and all other applicable codes.
No input circuit breaker	For units without a main input circuit breaker (MICB), input feeder connections are made directly to the input busbars. For top fed units, it is recommended the input feed enter the top conduit plate in the front left of the unit to allow for adequate bending space. Over current protection must be provided upstream of the RXV (field-supplied).
Single-input circuit breaker	For units with a single MICB, input feeder connections are made to input busbars connected to the line side of the MICB. For top fed units, it is recommended the input feed enter the top conduit plate in the front left of the unit to allow for adequate bending space.

4.4.4 Output Power Connections

An output panelboard with ground and neutral provisions is provided inside the unit for connecting load(s) as required. The Vertiv™ Liebert® RXV system offers numerous branch panelboard output options with ground and neutral provisions inside the unit.

Balancing of loads is good design practice on any 3-phase system. Each branch panelboard is load-balanced at the factory based on the output-branch circuit-breaker sizes, or laid out per your custom requirements. Please keep in mind to arrange all system additions to preserve this balance.

For all output-power connection dimensions and connection details, refer to the submittal drawings included with your system. If needed, call or e-mail your Vertiv Sales Representative for the submittal documentation.

Flexible output distribution cables are used in data processing areas under a raised floor. Cable lengths and layout should be well planned:

- Cable routes should follow aisles between equipment. This will facilitate access to cables for installation, routine inspection and future changes.
- Determine the required cable length by measuring the distance to the load equipment following right-angle paths, rather than diagonally or directly. Always measure to the extreme far side of the equipment with respect to the unit to insure adequate cable length.
- Prevent restriction of airflow under the raised floor by running the flexible conduits flat on the sub-floor, in parallel paths.
- Initial system output loading should be between 50% and 75% of rated capacity. This allows the addition of future loads without immediately investing in another Vertiv™ Liebert® RXV.
- Balancing of loads is good design practice on any 3-phase system.



WARNING! Risk of electric shock. Can cause personal injury or death.

Verify that all incoming line voltage (power) circuits are de-energized and locked out before installing cables or making connections in the unit.

Before proceeding with installation, read all instructions, verify that all the parts are included and check the nameplate to be sure the voltage matches available utility power. Follow all local codes.

- All output cables and connections must comply with the NEC and all other applicable codes.

- All output cables without receptacles that are hard-wired to the load equipment must be equipped with a padlock-off accessory for the output circuit breaker. The padlock-off accessory is used to lock out and tag the circuit breaker while service is performed on the hard-wired load equipment in accordance with OSHA safety rules.

4.5 Control Wiring Installation and Settings

Connections are provided for communication cards, external EPO loop, alarm inputs and alarm-output contacts. All control wiring terminates in the top of the unit to the communication-card in slots 1 and 2, or to the External Interface Board.

Refer to the appropriate submittal drawing for your system for the power-wiring termination points and recommended wire routing. Contact your Vertiv sales representative for the submittal documents.

To route control wiring in top-entry units:

1. Remove the control-wiring conduit plate, by removing the seven (7) 8mm screws that hold it to the unit.
2. Punch the plate as needed and reinstall.
3. Run the wiring directly into the control-wiring section on top of the unit to the appropriate card connection or board connection.

To route control wiring in bottom-entry units:

1. Remove and punch the control-conduit plate located in the front-right bottom of the unit.
2. Route the control cables up the channel in the front-right frame and into the control-wiring section on top of the unit to the appropriate card connection.

4.5.1 Emergency Power-off (EPO) Loop

All standard Vertiv™ Liebert® RXV units include connections for external shutdown from Remote Emergency Power-off (REPO) stations. The EPO control and logic resides on the External Interface Board.

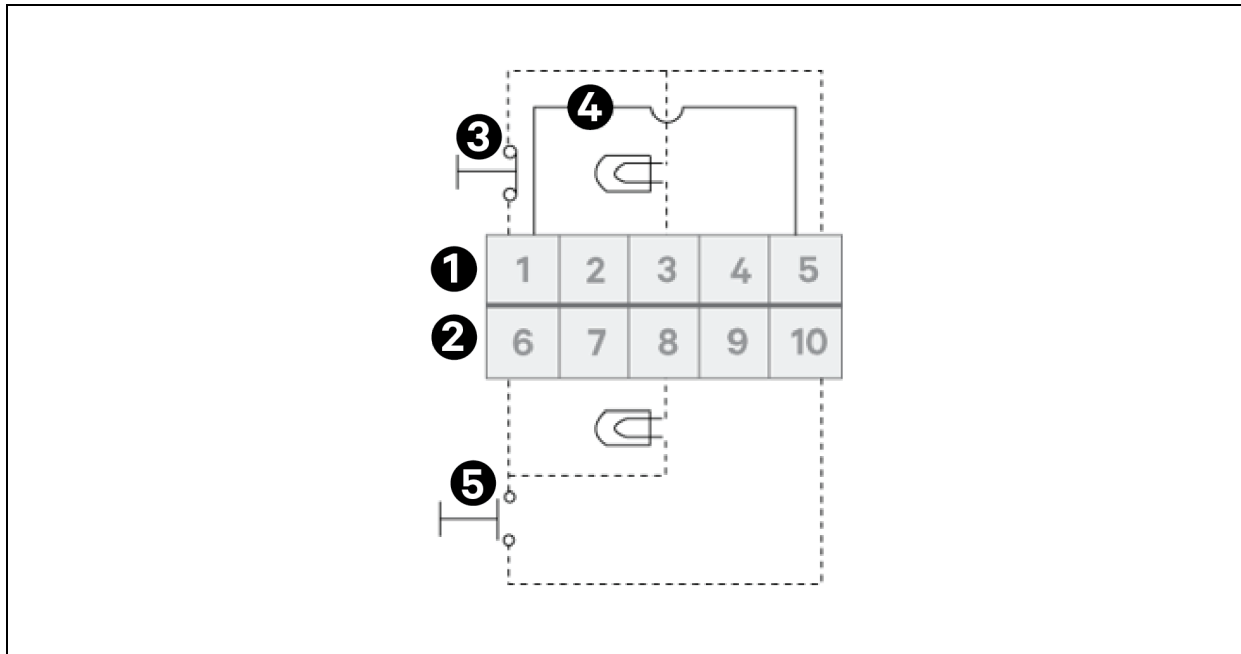
There are multiple methods of triggering the EPO circuit (shunt trip the MICB):

- Pressing the optional local EPO button next to the touchscreen display on the front of the Liebert® RXV, which sends a CAN message to the monitor board requesting unit shutdown.
- Pressing the optional remote EPO button (field-provided and field-connected to the EPO contacts on the external-interface board EPO), which sends a CAN message to the breaker monitor control board requesting unit shutdown.

The contact inputs for the remote Normally-open (NO) and remote Normally-closed (NC) wire-loop connections are on TB1 on the external-interface board. See **Figure 4.1** on the facing page, for the NO and NC loop connections.

- A jumper is factory-installed between TB1-1 and TB1-5 to close the NC loop. Remove the jumper to use the NC EPO loop.
- NO REPO devices may be wired in parallel to the NO REPO Contacts.
- NC REPO devices, such as lamps, may be wired in series to the NC REPO contacts.
- Multiple REPO lamps and other 24 VDC loads may be wired in parallel to the REPO lamps.
- The loop provides 24 VDC (nominal) up to 200 mA.

Figure 4.1 EPO Connections to TB1 on External interface Board



Item	Description
1	TB1 top row
2	TB1 bottom row
3	Normally closed (NC) contact
4	Factory installed jumper, Remove the use Normally closed (NC) EPO loop
5	Normally open (NO) contact

4.5.2 Auto or Manual Restart Selection

Auto/Manual restart controls unit function after loss of input power.

- Auto restart automatically powers the unit back up when input power is restored.
- Manual restart trips the main input circuit breaker (if equipped) and prevents multiple restarts with unstable voltage to allow an orderly system restart.

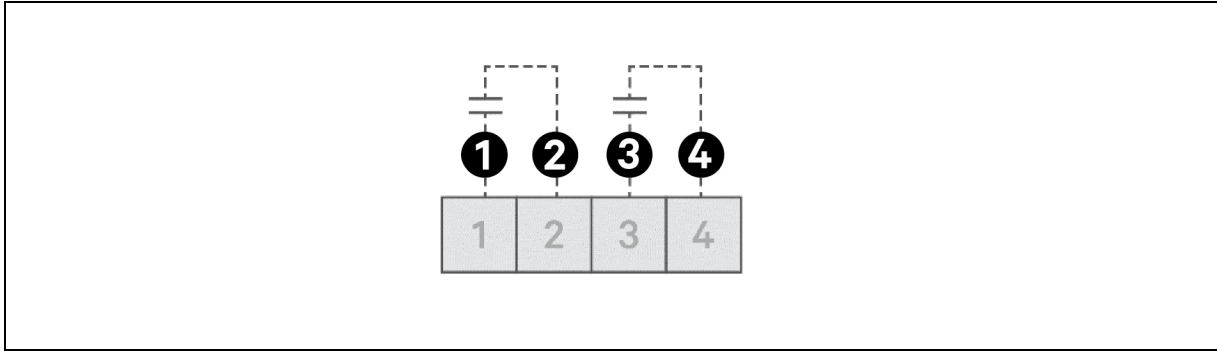
NOTE: To manually restart the system, See [Normal Startup](#) on page 23 on page 37.

To select the restart function, set switch S3 on the External Interface Board to the desired AUTO or MANUAL position.

4.5.3 Input Alarm Connections

When the Vertiv™ Liebert® RXV includes Vertiv™ Liebert® DPM monitoring, two contacts on the external-interface board (TB4, provide alarm inputs with 12 VDC wetting voltage. [Figure 4.2](#) on the next page shows the wiring for the input alarm contacts.

Figure 4.2 Input Contact Wiring on TB4



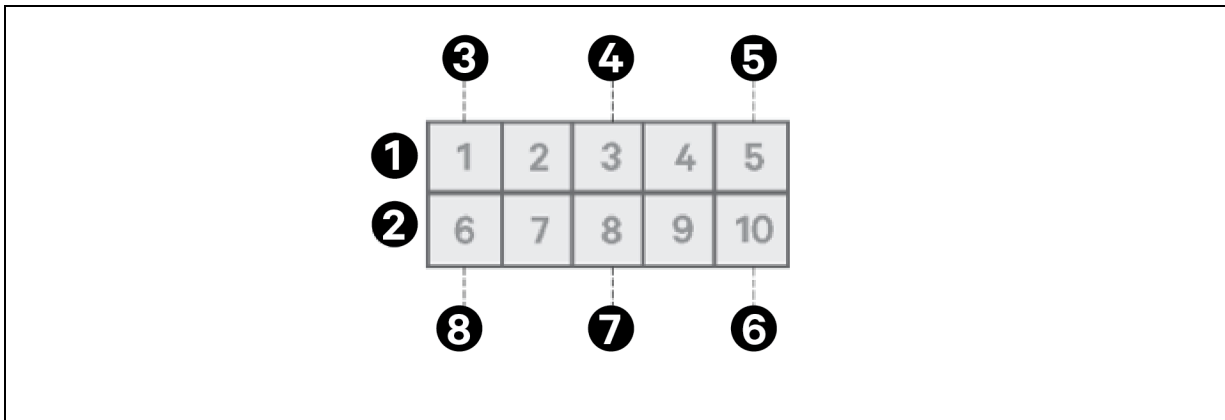
Item	Description
1	Input Alarm 1
2	Input 1 Common
3	Input Alarm 2
4	Input 2 Common

4.5.4 Output Alarm Connections

When the Liebert® RXV includes Liebert® DPM monitoring, two programmable, Form-C contacts on the External Interface Board (TB3) provide output contacts that may be triggered by system events.

Output contacts are rated for 30 VDC 1 A (30 W maximum resistive) or 125 Vac 0.5 A (62.5 V A maximum resistive). **Figure 4.3** below, shows the wiring for the output alarm contacts.

Figure 4.3 Output Contact Wiring on TB3



Item	Description
1	TB3 top row
2	TB3 bottom row
3	Customer Alarm 1 Common

Item	Description
4	Customer Alarm 1 Normally closed
5	Customer Alarm 1 Normally open
6	Customer Alarm 2 Normally closed
7	Customer Alarm 2 Normally open
8	Customer Alarm 2 Common

4.5.5 Communication Cards

The Liebert® RXV has two slots for communication cards, which accept the Vertiv™ Liebert® IntelliSlot RDU101 card.

The Liebert® IntelliSlot RDU101 card provides SNMP monitoring of the Liebert® RXV across the network and/or building management system and lets you monitor external temperature, humidity and contact-closure inputs using external sensors.

To install a card:

1. Open the front exterior door of the unit and locate the card slots.
2. Remove the cover from the slot, slide the card into the slot and secure it with two screws.
3. Run the cable through control conduit plate, See [Control Wiring Installation and Settings](#) on page 14 for cable routing and connect to the card.

Follow instructions provided with the Liebert® IntelliSlot card to configure the card for the power distribution system or any additional equipment for the Liebert® RXV. The installation/user guides for the cards are available at www.Vertiv.com.

4.5.6 Control Power Fuses

The Liebert® RXV has two control power fuses to protect the monitoring equipment. Fuses F7 and F8 are installed at the AC input of the 24VDC power supply. To remove high voltage from the monitoring power supply, F7 and F8 must be opened.

NOTE: If manual restart is enabled, opening F1 and F2 while the unit is operating will cause the system to shunt trip the MICB and drop the load.

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5 Equipment Inspection and Start-Up

Perform the inspection and start-up checks at initial system start-up, each time maintenance/service is performed and any time the unit is de-energized for an extended period.

Print the checklist, [Equipment Inspection and Startup Checklist](#) on page 29 . Complete the checklist while performing the inspection and start-up procedures.

5.1 Equipment Inspection



WARNING! Risk of electric shock. Can cause injury or death. Equipment installation, inspection and start-up should be performed only by properly trained personnel wearing appropriate, OSHA-approved PPE. Lethal voltages are present during start-up procedures. Electrical safety precautions must be followed throughout inspection and start-up.

1. When starting-up initially or after maintenance, use a printed copy of [Equipment Inspection and Startup Checklist](#) on page 29 , to check off each item and record data as you perform the following steps.
2. Verify all upstream power to the unit is off and locked out in accordance with local site procedures.
3. Confirm that the exterior of the unit is undamaged.
4. Confirm sufficient service and air-flow clearance for the unit, See [Clearance Requirements](#) on page 6 .
5. Open/Remove the accessible exterior panels.

NOTE: When removing exterior panels, disconnect panel ground wires by separating the easy disconnect terminals on the frame. When replacing exterior panels, reconnect all panel ground wires.

6. Inspect all wire and conductor insulation for damage. Replace any damaged conductors.
7. Check all breaker connections for tightness and re-torque if needed, see the breaker manufacturer's documentation for torque values.
8. Check the trip settings of adjustable breakers and verify against [Breaker Maintenance](#) on page 26 , or site-planning documentation.
9. Check all control wiring connections for tightness.
10. Remove any foreign objects from the components and the interior of the unit.
11. Verify that all intake and exhaust screens are clean and free of obstructions.
12. Replace the removed panels, making sure to reconnect the panel ground wires. Leave access to the circuit breakers if performing the start-up procedure.

5.2 Pre-Start System Checks



WARNING! Risk of electric shock. Can cause injury or death. Equipment installation, inspection and start-up should be performed only by properly trained personnel wearing appropriate, OSHA-approved PPE. Lethal voltages are present during start-up procedures. Electrical safety precautions must be followed throughout inspection and start-up.

1. When starting up initially or after maintenance, use a printed copy of [Equipment Inspection and Startup Checklist](#) on page 29 , to check-off each item and record data as you perform the following steps.
2. Verify all upstream power to the unit is off and locked out in accordance with local site procedures.

3. Verify all circuit breakers are in the off position.
4. Verify proper input power connections to the unit, including equipment grounding conductor and local grounding electrode conductor.
5. Turn on external source power to the unit.
6. Check the phase rotation at the main input breaker: A-B-C.
7. Check and record the input voltage at the main input breaker. Verify that the measured voltages correspond to the input voltage on the unit nameplate.
 - a. Input Volts, A-B
 - b. Input Volts, B-C
 - c. Input Volts, C-A
8. Turn On the main input circuit breaker. If the breaker trips off, check for wiring errors and the trip settings. If necessary, contact Vertiv Technical Support for assistance.
9. Press the local Emergency Power-off (EPO) button and verify that the system shuts down, then turn the unit back on.
10. If applicable, press each remote Emergency Power-off button for the unit and verify system shutdown. Reset the unit between each remote EPO test.

NOTE: Activating a remote EPO button may shut down equipment or systems other than the Vertiv™ Liebert® RXV. Verify with local site operators before performing remote EPO procedure.

11. Replace/Close all exterior doors and panels making sure to reconnect the panel ground wires.
12. If the Liebert® RXV includes the Vertiv™ Liebert® DPM monitoring system, proceed with the following start-up checks.
13. Turn on the Liebert® RXV and confirm that the touchscreen controller powers on.
14. Verify that the input voltage displayed matches the voltage measured in Step 7 above.
15. Verify auto/manual restart operation:
 - a. Turn off external power source to the unit at the feeder breaker.
 - b. For manual-restart units, verify that the main input circuit breaker trips open. For auto-restart units, verify that the main input circuit breaker does not trip open.
 - c. Restore external power to the unit.
16. Verify input alarm operation (if applicable):
 - a. With the unit on, simulate an alarm by jumpering the appropriate connections on TB4 of the External Interface Board.
 - b. Verify that the correct alarm message displays on the touchscreen controller.
17. Verify Building Management System (BMS) monitoring, (if applicable):
 - With the unit on, coordinate with local site operators to verify communication with the site BMS.

5.3 Initial Startup

Perform the following steps to put the Liebert® RXV into service after installation and pre-start inspections are complete.

1. Apply external source power to the unit.
2. Turn on the main input circuit breaker.
3. Verify voltage and phase rotation on the main input breaker load side.
4. Individually turn on each panelboard branch circuit breaker and verify the voltage and phase rotation (where applicable) at the load input.

5. Power up load equipment per the equipment manufacturer's recommendations.
6. Verify that all load equipment operates correctly.

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6 Operating the Vertiv™ Liebert® RXV

After installation at initial start-up, each time maintenance/service is performed and any time the unit is de-energized for an extended period, perform the procedures in [Equipment Inspection and Startup Checklist](#) on page 29 .

The following procedures apply to standard, day-to-day operation. Review the procedures for any special equipment modifications, special site considerations, or for company policies which may require changes to the standard equipment operation.

6.1 Normal Startup

To power on the unit:

1. Verify all circuit breakers are in the off position.
2. Turn on External Source Power to the unit.
3. Turn on the Main Input Circuit Breaker.
4. If the unit has Vertiv™ Liebert® DPM display, verify correct input and output voltages before proceeding.
5. Individually turn on Branch Panelboard Breakers, following load-equipment manufacturer's start-up procedures.

6.2 Normal Shutdown

To shut down the unit:

1. Perform an orderly, load-equipment shutdown according to the load equipment manufacturer's recommendations.
2. Turn off the Main Input Circuit Breaker.
3. To remove all power from the unit, turn off and lock out external source power to the main input circuit breaker.

6.3 EPO Shutdown

To perform immediate system shutdown during emergency conditions for systems configured with EPO, lift the clear cover and push the EPO button, See [Figure 6.1](#) on the next page .

NOTE: If the site has remote EPO buttons wired to the Liebert® RXV, press one of the remote buttons.

Figure 6.1 Optional EPO Button on the Front Side of the Liebert® RXV



7 Maintenance



WARNING! Risk of electric shock. Can cause injury or death. Verify that all incoming line voltage (power) and low-voltage (control) circuits are de-energized and locked out before performing any inspection, cleaning or maintenance. Only properly trained and qualified service personnel wearing appropriate, OSHA-approved PPE should perform maintenance on the equipment.

The Vertiv™ Liebert® RXV system requires minimal periodic maintenance. Inspect all electrical-distribution components regularly for electrical-connection integrity, signs of excessive temperatures, dirt accumulation and proper system operation.

Use standard electrical troubleshooting procedures to isolate problems in the unit. If you have questions about maintenance, repairs, or operation of the Liebert® RXV equipment, contact Vertiv Technical Support, visit <http://www.Vertiv.com/en-us/support/>.

For repair/replacement of standard items, contact a qualified electrician or Vertiv Technical support. For repairs to the Distribution Monitoring System, contact Vertiv Technical Support.

Vertiv offers a complete range of preventive maintenance services including thorough equipment performance checks and calibration of electronics. Call 1-800-543-2378 or visit www.Vertiv.com.

7.1 Inspection Schedule

Because conditions vary from site to site, it is difficult to prescribe a standard schedule for periodic cleanings. We recommend performing inspections after the first 24 hours, 30 days and 6 months of operation to help determine a pattern for the inspection schedule.

- Inspect electrical connections and component mountings after the first 24 hours, 30 days and 6 months of operation. Then conduct inspections per local-site procedure or annually at minimum thereafter.
- Inspect and clean ventilation openings and grilles every 6 months to annually at minimum.
- Perform a complete inspection and operational check annually. We recommend performing the procedures outlined in [Equipment Inspection and Startup Checklist](#) on page 29.

7.2 Inspection and Cleaning

Air circulation through the cabinet may cause dust to accumulate on internal components. Clean as necessary during electrical inspections.

We recommend at least annual general system inspections, cleaning and operation checks to ensure system performance and long service life, See [Equipment Inspection and Startup Checklist](#) on page 29.

7.2.1 Surge Protective Devices

Liebert® RXV units equipped with a Transient Voltage Surge Suppressor (TVSS) have 3 or 4 indicator LEDs for the TVSS status. Each phase has an LED indicator, which illuminates when the TVSS is energized and operating correctly.

TVSSs equipped with Neutral-Ground protection include a N-G LED at one end of the translucent white label window. TVSSs without N-G protection such as those for Delta power systems do not include this feature.

Each suppression element is monitored and connected by logic to the LED. Should any suppression element fail, the Green LED will extinguish. LEDs may be viewed through the ventilation on the top left of the RXV unit.

The RXV unit must be de-energized before repairing or replacing the TVSS device.

7.3 Breaker Maintenance

Exercise breakers once a year at minimum; although we recommend 3 times per year. To exercise the breakers, cycle the breaker from “ON” or “Closed” to “OFF” or “Trip” then back to “ON” or “Closed”. During regular inspections/maintenance, remove soot build-up that results from the out-gas of a breaker trip event. If the trip is caused by a bolted fault, replace the breaker.

Appendices

Appendix A: Technical Support and Contacts

A.1 Technical Support/Service in the United States

Vertiv™ Group Corporation

24x7 dispatch of technicians for all products.

1-800-543-2378

Liebert® Thermal Management Products

1-800-543-2778

Liebert® Channel Products

1-800-222-5877

Liebert® AC and DC Power Products

1-800-543-2378

A.2 Locations

United States

Vertiv Headquarters

1050 Dearborn Drive

Columbus, OH, 43085, USA

Europe

Via Leonardo Da Vinci 8 Zona Industriale Tognana

35028 Piove Di Sacco (PD) Italy

Asia

7/F, Dah Sing Financial Centre

3108 Gloucester Road

Wanchai, Hong Kong

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Appendix B: Equipment Inspection and Startup Checklist

Place a check mark next to each item as you complete the steps and record the information as noted in the inspection and start-up procedures.

Record the unit information and the date the inspection is performed.

Unit Serial Number	
Unit Model Number	
Inspection Data	

Equipment Inspection

CHECKED

- _____ 1. Upstream power to unit is off and locked-out.
- _____ 2. Unit exterior is undamaged.
- _____ 3. Service and Ventilation clearance is sufficient.
- _____ 4. Wire and Conductor insulation is damage free.
- _____ 5. Breaker connections are properly tightened.
- _____ 6. Trip settings for adjustable breaker are correct.
- _____ 7. Control wiring connections are properly tightened.
- _____ 8. Foreign objects are removed from unit interior.
- _____ 9. Intake/Exhaust screens are clean and obstruction free.

System Startup

CHECKED

- _____ 1. Upstream power to unit is off and locked-out.
- _____ 2. All circuit breakers in "OFF" position.
- _____ 3. Connections to input power, equipment-grounding conductor and local grounding electrode conductor are correct.
- _____ 4. Phase rotation at the main breaker is correct: A-B-C.

CHECKED

- _____ 5. Measured input voltages at the main breaker match the unit nameplate input voltage.
 - a) Input Volts, A-B: _____ VAC
 - b) Input Volts, B-C: _____ VAC
 - c) Input Volts, C-A: _____ VAC
- _____ 6. Main input circuit breaker does not trip after turned "ON."
- _____ 7. If installed, Local EPO button shuts down the system.
- _____ 8. If installed, Remote EPO button shuts down the system.

Monitoring System (if applicable)

CHECKED

- _____ 1. Touchscreen display powers on.
- _____ 2. Auto/Manual restart function is correct.
- _____ 3. Input alarm operation is correct, (if applicable).
- _____ 4. BMS communication is correct, (if applicable).

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SL-70896_REVB_11-22