



# Liebert® Power6000 Industrial UPS

**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

## 1.1 Conformity and standards

This cabinet complies with the following reference standards for low-voltage switchgear cabinet:

- IEC 61439-1: 2011 Low-voltage switchgear and control-gear assemblies – Part 1: Type-tested and partially type-tested assemblies



**WARNING!** Before connecting the input power supply, make sure to ground the cabinet reliably in compliance with local electrical codes.



**WARNING!** The selection of the power distribution protection cabinet must comply with local electrical codes.



**WARNING!** If internal fuses are damaged, they must be replaced with fuses of the same electrical specifications and by qualified personnel.



**WARNING!** All cabinet service and care involve contact with internal components and must therefore be performed by trained personnel.

**Table 1.1 UPS Models**

Product	Model
80 kVA main input transformer cabinet	IDT 0080kMTC01
120 kVA main input transformer cabinet	IDT 0120kMTC01
200 kVA main input transformer cabinet	IDT 0200kMTC01

## 1.2 Disclaimer

Vertiv disclaims all responsibility and/or liability for any defects or malfunction caused by the following actions:

- Any use or operation outside of the product specifications, including application ranges or operating environments.
- Any unauthorized product operations, modifications or improper installation.
- Any forceful measures used when operating the product.
- Any other product related actions not in compliance with the instructions in this document.

If you need product assistance or have additional product questions, contact your Vertiv Technical Support representative.

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## 2 Overview

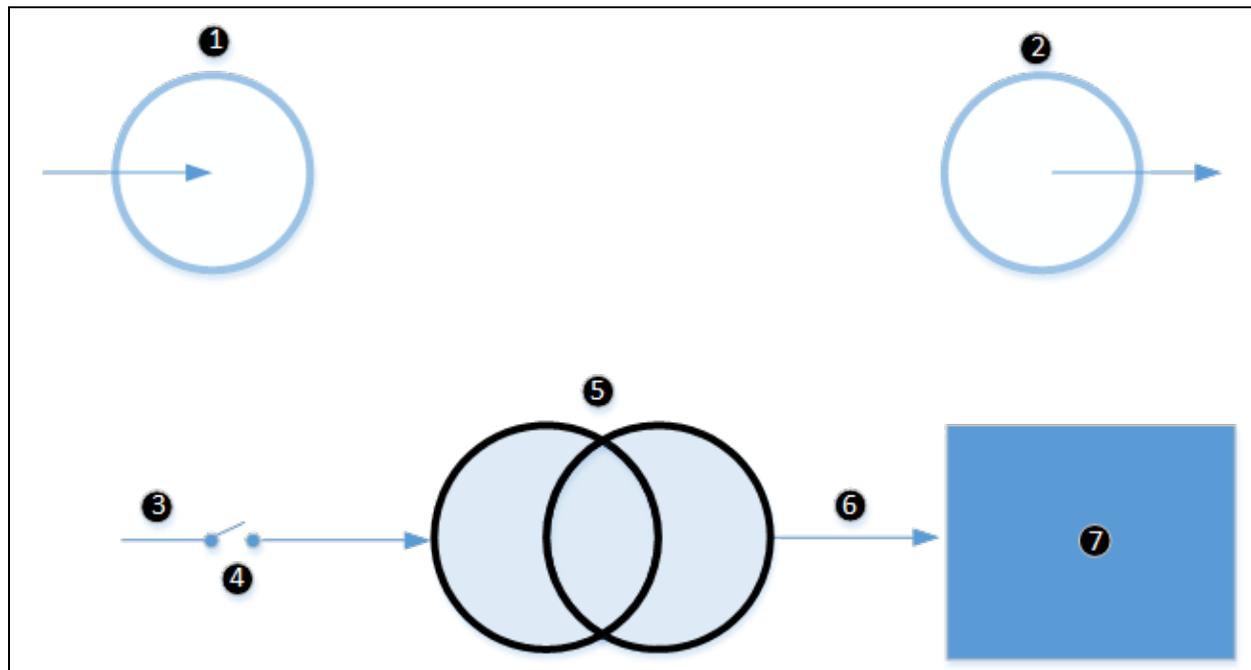
This chapter provides an overview of general technical specifications of the cabinet.

### 2.1 Working Principle

The input transformer cabinet provides input isolation protection for the UPS. Electrical isolation is implemented through the transformation between the primary and secondary sides of the transformer.

Figure 2.1 below illustrates the specific operating mode.

Figure 2.1 Block diagram of input transformer cabinet working principle



Items	Name
1	Input
2	Output
3	Input
4	Input circuit breaker Q11
5	Input transformer
6	Output
7	UPS

### 2.2 Operating and Environmental Conditions

- Indoor operating temperature

Maximum short-term temperature: +40°C

Maximum average temperature over 24 hours: +35°C

Minimum temperature: -5°C

- **Storage and transportation temperature range:**

-25°C to +55°C, short-term (no more than 24 hours) up to +70°C

- **Relative humidity range:**

Operating: ≤90% (at 40°C ± 2°C)

Storage and transportation: ≤95% (at 40°C ± 2°C)

- **Atmospheric pressure range:** 70 kPa to 106 kPa

- **Altitude:** ≤ 3000 m; for higher altitudes, the cabinet must be derated.



**CAUTION:** In environments prone to condensation, ventilation or heating measures must be taken inside the UPS isolation transformer cabinet to prevent moisture buildup. This requirement should be clearly indicated.



**CAUTION:** At the maximum temperature of +40°C, the relative humidity must not exceed 50%. At lower temperatures, higher relative humidity is acceptable. For example, at +20°C, 90% RH is acceptable. However, occasional light condensation may occur due to temperature fluctuations.



**CAUTION:** The air should be clean and meet Pollution Grade 3 requirements.

## 3 Mechanical Installation

This chapter briefly introduces the mechanical installation of the cabinet, including precautions, environmental requirements, mechanical requirements, pre-installation inspection, and installation diagrams.

This chapter provides general installation steps and guidance. Installation personnel should adapt the process based on the specific site conditions.

### 3.1 Notice



**WARNING! Do not power on the cabinet before the arrival of authorized engineers.**



**WARNING! Cabinet installation must be carried out by qualified engineers according to the instructions in this chapter. Please read this manual carefully before installation.**



**WARNING! The ground system is TN-S. For other types of ground systems, contact Vertiv technical service engineers.**

### 3.2 Environment Requirements

#### 3.2.1 Operating and Usage Environment

The cabinet should be installed in a cool, dry, clean, and well-ventilated environment. The environment must be free from electrically conductive dust (such as metal particles, sulfides, sulfur dioxide, graphite, carbon fibers, and conductive fibers), acidic fumes, or other conductive media (strongly ionized substances).

The cabinet should be installed according to the dimensional drawings. Cable inlet/outlet should be arranged using cable trenches or overhead cable trays.

### 3.3 Cabinet Handling

Ensure that the cabinet's weight is within the load capacity of the lifting equipment. The cabinet can be transported using a forklift. Before moving, ensure that both front and rear doors are securely closed.

If a forklift is not available, use rollers or other appropriate equipment.



**WARNING! The lifting equipment used must have sufficient lifting capacity to safely move the cabinet.**

## 3.4 Pre-installation Inspection

Before installing the cabinet, perform the following inspections:

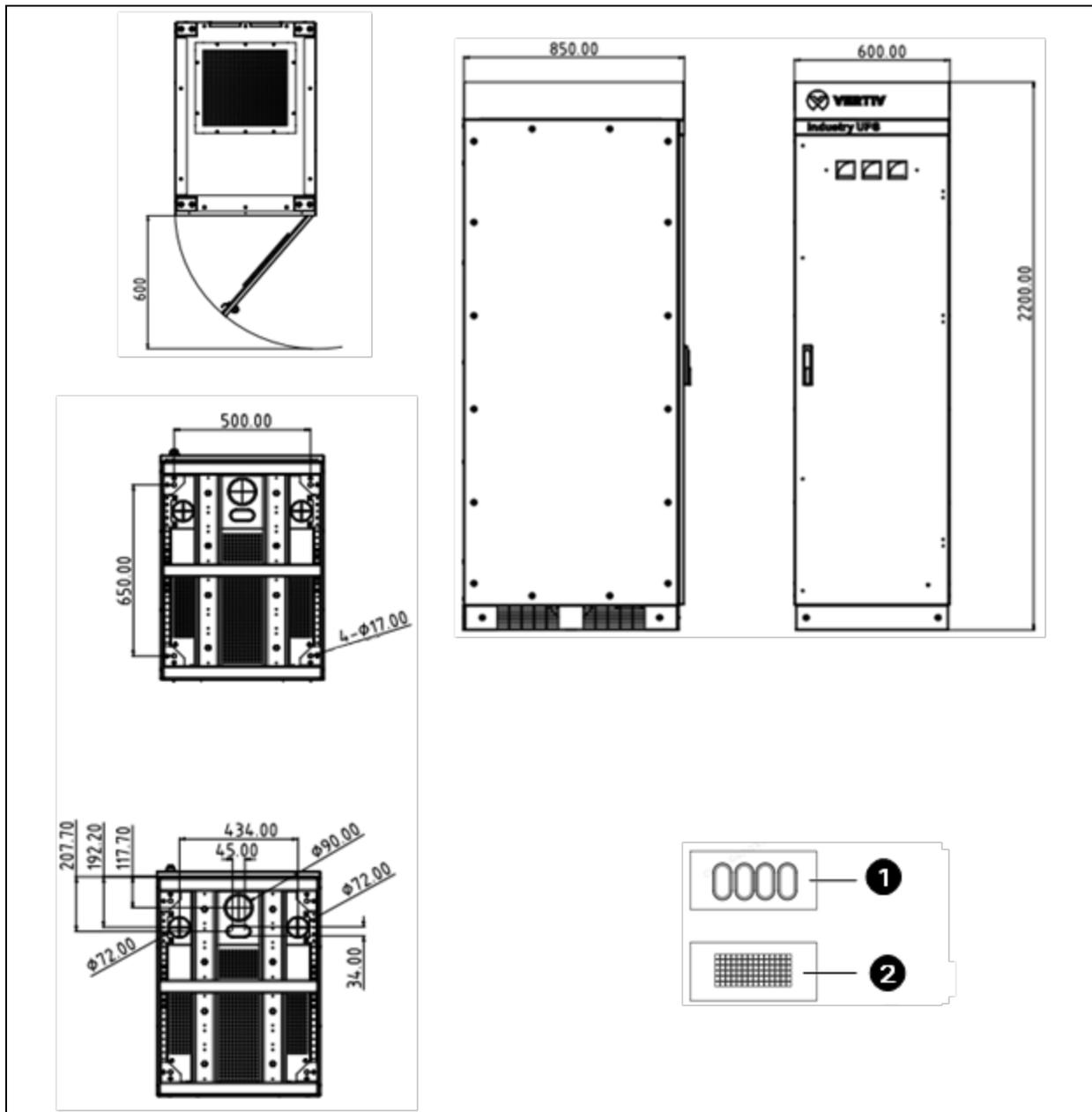
- Ensure that the surrounding environment meets the environmental requirements specified in the technical specifications, especially regarding ambient temperature, ventilation, and dust conditions.
- Ensure that the installation base is level.
- Unpack and visually inspect the cabinet internally and externally for any transportation damage. If there is any damage, notify the shipping carrier immediately.

## 3.5 Procedures

This section outlines the general installation procedure:

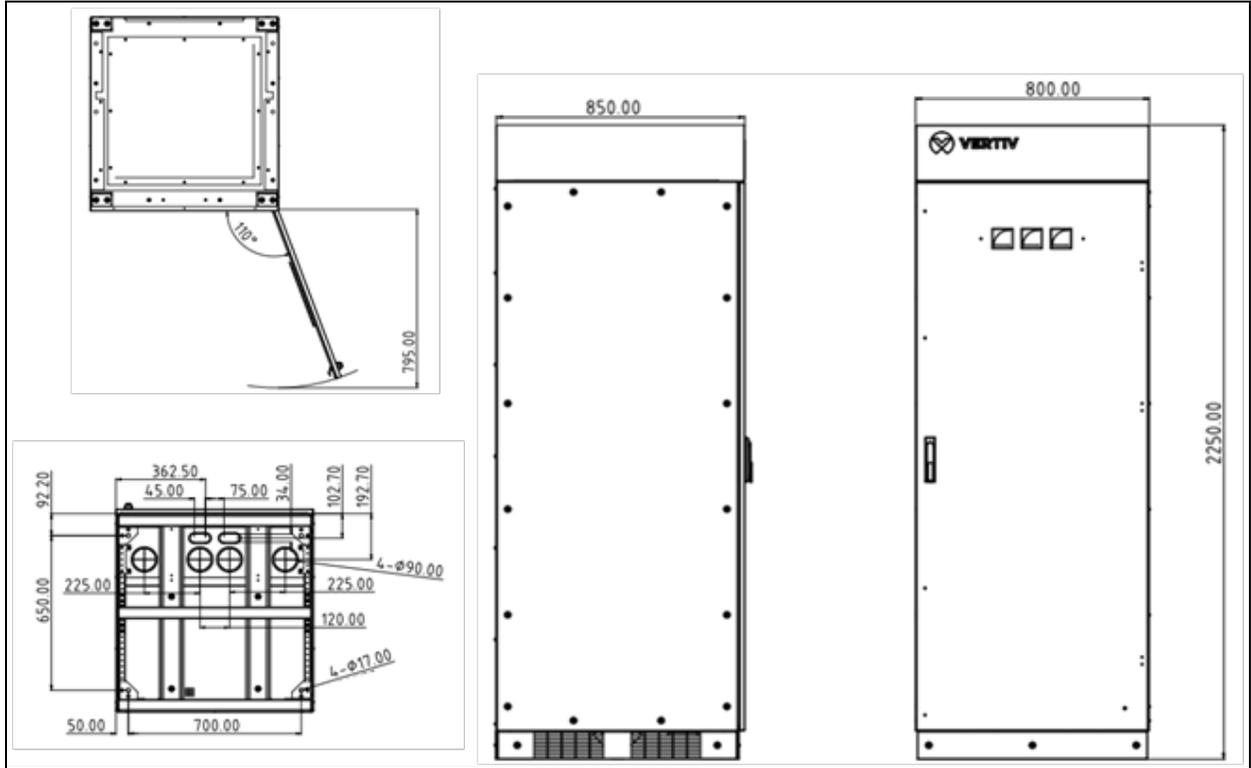
1. Prepare the planned installation site. The floor or mounting base must be flat and free of debris. Ensure that the fixing facilities have been pre-set according to the mounting hole dimensions at the bottom of the cabinet, in compliance with the ground-mounting requirements. The hole spacing must be accurate enough to avoid gaps between cabinets when placed side-by-side. **Figure 3.1** on the facing page and **Figure 3.2** on page 8 show the hole spacing and mounting dimensions.
2. After completing the pre-installation inspection and confirming no issues, transport the cabinet to the designated location. Once positioned, secure the cabinet to the mounting base using bolts through the four mounting holes at the bottom of the cabinet.
3. Tighten the fixing bolts and check the vertical alignment of the cabinet. When the cabinet is arranged with other cabinets closely side by side, there should be no visible gaps between the cabinets.
4. Clean the site and prepare for electrical installation.

Figure 3.1 Matching input transformer cabinet for 60~120 kVA UPS models



Item	Description
1	Cable inlet/outlet holes
2	Bottom ventilation

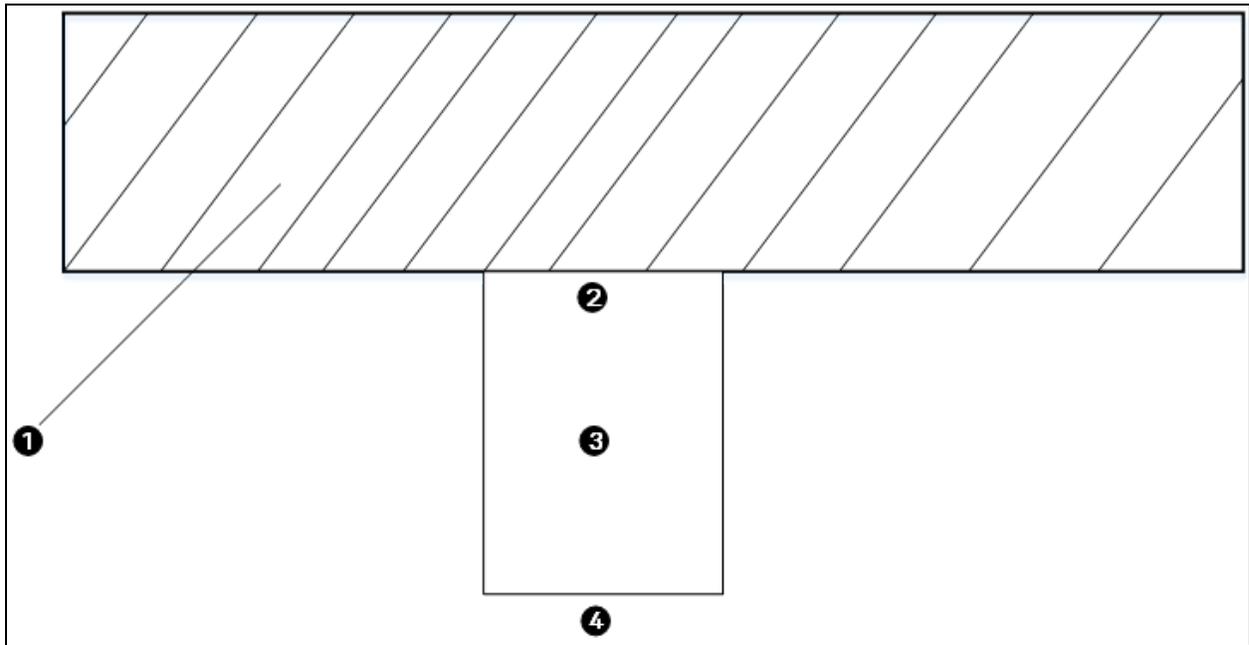
Figure 3.2 Matching input transformer cabinet for 160~200 kVA UPS models



### 3.5.1 Installation Environment

The cabinet must be installed in a clean and well-ventilated environment to ensure that the ambient temperature meets the product specifications.

Figure 3.3 Schematic diagram of the operation space



Item	Description
1	Wall
2	Rear
3	Cabinet
4	Front

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## 4 Electrical Installation

This chapter describes the electrical installation of the cabinet, including procedures for wiring power and control cables.

After mechanical installation, proceed with power cable wiring.



**WARNING!** Cabinet installation must be carried out by qualified engineers according to the instructions in this chapter. Please read this manual carefully before installation.



**WARNING!** Before wiring the cabinet, ensure that the upstream circuit breaker for the input cable is turned off, labeled, and locked to prevent accidental power-on.

### 4.1 Power Cable Wiring

#### 4.1.1 System Configuration

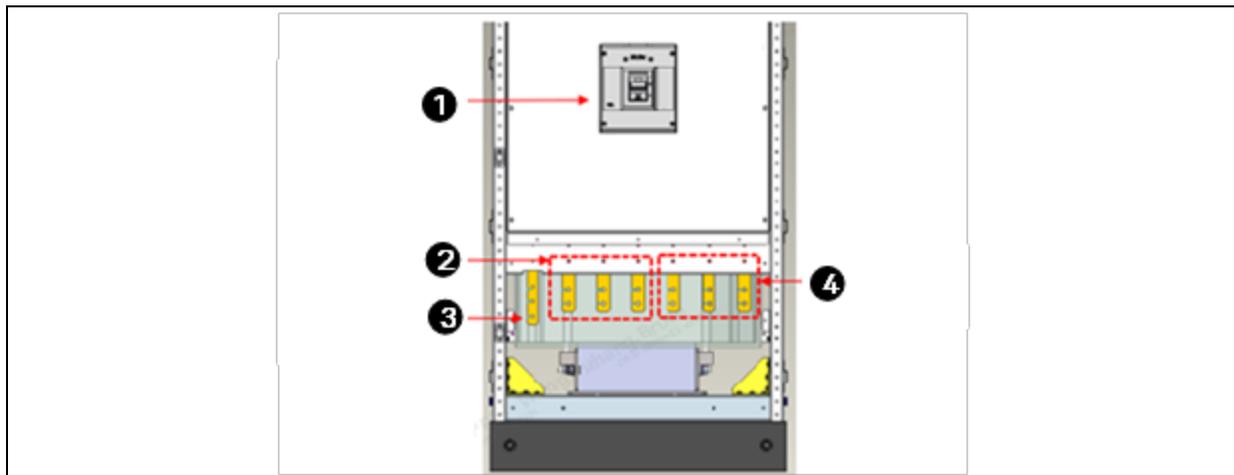
The wire diameter of the power cable should meet applicable standards. Key requirements include but are not limited to:

- Voltage drop must allow for normal cabinet operation and start-up.
- The conductor's current-carrying capacity (based on installation method and environment conditions) must be equal to or greater than the rated current of the circuit breaker in the corresponding switch circuit, to ensure the safety of the power distribution line.
- The conductor should meet the requirements for both dynamic stability and thermal stability.

#### 4.1.2 Wiring

For details about the terminal diagram and panel silk-screen instructions, see **Figure 4.1** below.

**Figure 4.1** Terminal diagram of three-phase input transformer cabinet



Item	Description
1	Input switch
2	Input copper busbar
3	PE
4	Output copper busbar

### 4.1.3 Protective Ground

The cabinet must be safely grounded. The external PE cable should be connected to the PE terminal. For safety, grounding must be completed before any power cables are connected.



**WARNING!** Failure to perform grounding as required may result in electric shock and fire.

### 4.1.4 Power Cable Connection Steps

Route input and output power cables through the bottom of the cabinet. After positioning the cabinet, follow these steps:

1. Open the front door and confirm that the input switch is in the OFF position.
2. Connect the input cables to the appropriate terminal blocks according to the on-site power distribution requirements.
3. Locate the PE ground bar inside the cabinet, and secure the PE cable to the PE ground bar to ensure a safe connection to earth.
4. Connect the output terminals of the cabinet to the corresponding input terminals of the matching UPS.
5. Clean and tidy up the inside of the cabinet. After confirming that all cables are securely connected, re-lock the cabinet door.



**CAUTION:** Terminal blocks must not bear the mechanical load of cable connections. Cables should be properly secured.



**CAUTION:** If there are too many or too large inlet/outlet cables causing insufficient cable holes, the entire cover plate can be removed.

## 4.2 Wiring Channel

A cable channel is reserved at the bottom of the cabinet. The rubber grommet can be cut as needed for wiring, based on actual project requirements.

## 5 Commissioning and Operation

This chapter mainly introduces the general steps or methods for on-site cabinet commissioning.

**IMPORTANT!** The initial power-on and commissioning must be performed by authorized engineers before the user is allowed to operate the system.

**IMPORTANT!** Components located behind protective covers that require tools to remove are not user-serviceable. Only qualified service personnel are allowed to open the protective covers.

**IMPORTANT!** AC input and output terminals may carry hazardous voltage at any time.



**WARNING!** Please read this manual carefully before installation. Improper operation may damage the cabinet and endanger personal safety.

**IMPORTANT!** Commissioning must be performed without any load. The full power-on trial operation of the entire power distribution system must only be carried out after commissioning is complete. Otherwise, it may pose a threat to personal safety and damage the load cabinets.

### 5.1 Routine Inspection

Before the cabinet is officially put into use after installation, the following items must be checked:

1. Check whether the interior and exterior of the cabinet are clean and free of debris.
2. Check whether all cables are correctly and securely connected.
3. Operate the switches (ON/OFF) to check whether their mechanical performance is normal.
4. Measure the voltage and frequency of the AC input power supply to check whether they meet system requirements.
5. Ensure that no load is connected to the output. If a load is connected, disconnect it.
6. Only after all the above inspection items meet the requirements can the power-on operations be performed.

### 5.2 Trial Operation

1. Ensure that no load is connected to the cabinet output.
2. Turn on the input power supply.
3. Connect the input switch and check whether the output voltage on the transformer side is as expected.
4. Disconnect the input power supply and complete the inspection.

## 6 Service and Care

During long-term operation, the cabinet requires periodic service and care. This chapter outlines recommendations for periodic inspections and service replacements. Proper service and care can extend the service life and reduce failure risk.

### 6.1 Safety



**WARNING! Routine inspections may be performed by personnel who have received relevant training. Inspections involving live electrical components must be carried out by qualified professionals. Component inspection and replacement must only be performed by authorized personnel.**

### 6.2 Routine Inspections

It is recommended to conduct a daily walkthrough of the equipment room to observe any abnormal operation of the cabinet.

### 6.3 General Inspections

General inspections do not require a power shutdown. While the cabinet is operating, professional personnel should perform a comprehensive inspection and assessment and check the monitoring status to ensure the system safety. It is recommended to perform general inspections once a month, including but not limited to the following:

1. Inspect the switches for any abnormal appearance.
2. Check all cable connections for signs of oxidation, surface damage, or burning.
3. Ensure that the cabinet structure is free of deformation, rust, or coating peeling.
4. Verify that the cabinet's floor mounting bolts and inter-cabinet connection bolts are secure.
5. Check that all indicator labels are intact and not detached.

### 6.4 Comprehensive Inspections

A comprehensive inspection requires a power shutdown. All switches must be turned off, and professional personnel should conduct a full inspection and assessment of the cabinet.

It is recommended to perform a comprehensive inspection once a year, in addition to general inspections, including but not limited to the following:

1. Perform insulation resistance testing.
2. Manually check all cables for looseness.



**WARNING! Before performing a comprehensive inspection, power must be completely cut off. All inspection and replacement of components must be carried out by authorized professional personnel.**

### 6.5 General Troubleshooting

If the system encounters any anomalies, contact Vertiv service center for technical support.

## 7 Specifications

This chapter includes all the required specifications.

### 7.1 Technical Data

Electrical Specifications		
Product	Input isolation transformer cabinet	
Rated Capacity	80/120 kVA	200 kVA
Rated Input Operating Voltage (L-L)	380/400/415 V AC	
Rated Input Operating Voltage Range	±10%	
Rated Output Operating Voltage (L-L)	380/400/415 V AC	
Rated Frequency	50 Hz/60 Hz	
Mechanical Characteristics		
Width (mm) × Depth (mm) × Height (mm)	600 × 850 × 2,200	800 × 850 × 2,200
Ingress Protection Rating	IP20	
Appearance Color	EG110	

# 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

1-800-543-2378

Liebert® Channel Products

1-800-222-5877

Liebert® AC and DC Power Products

1-800-543-2378

### A.2 Locations

#### United States

Vertiv Headquarters

505 N Cleveland Ave

Westerville, OH 43082

#### 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

## Appendix B: Glossary

Term	Definition
AC	Alternating current
BCB	Battery circuit breaker
CSA	Cross sectional area
DC	Direct current
EIB	External interface board
EMC	Electromagnetic compatibility
EMI	Electromagnetic interference
EOD	End of discharge
EPO	Emergency power off
I/O	Input/output
IGBT	Integrated gate bipolar transistor
LBS	Load bus synchronizer
LCD	Liquid crystal display
LED	Light emitting diode
PC	Personal computer
PE	Protective earth
RCCB	Residual current circuit breaker
RCD	Residual current detector
REPO	Remote emergency power off
SCR	Silicon controlled rectifier
SNMP	Simple network monitoring protocol
STS	Static transfer switch
SVPWM	Space vector pulse width modulation
UPS	Uninterruptible power system
VRLA	Valve regulated lead-acid

## Appendix C: Hazardous Substances and Content

Parts	Hazardous Substances					
	Plumbum	Mercury	Cadmium	Chrome <sup>6+</sup>	Polybrominated Biphenyls	Polybrominated Diphenyl Ethers
	(Pb)	(Hg)	(Cd)	Cr (VI)	(PBB)	(PBDE)
Enclosure/Housing/Copper Bar	x	○	○	○	○	○
Hardware/Fastener	x	○	○	○	○	○
Plastic Parts	x	○	○	○	○	○
Radiator	x	○	○	○	○	○
PCBA	x	○	○	○	○	○
AC Capacitor	x	○	○	○	○	○
DC Capacitor	x	○	○	○	○	○
Fan	x	○	○	○	○	○
Cable	x	○	○	○	○	○
Screen	x	x	○	○	○	○
Detection Component	x	○	○	○	○	○
Medium/High-Power Magnetic Component	x	○	○	○	○	○
Power Distribution Switch (MCB/Contactor)	x	○	○	○	○	○
Fuse	x	○	○	○	○	○
Contactor (if applicable)	x	○	○	○	○	○
Semiconductor device	x	○	○	○	○	○
<p><b>NOTE: This table is prepared based on the regulation of SJ/T 11364.</b></p> <p>Content of the hazardous substances in all the average quality materials of the parts is within:</p> <p>○: The specified limits.</p> <p>x: Outsides specified the limits.</p>						
The Hazardous Substances and Content mentioned are applicable to Vertiv Integrated Power Distribution Cabinets.						

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