Liebert® Ancillary Medium BDC

Installer/User Manual

10 kVA to 250 kVA, 60 Hz

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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 Save These Instructions

This manual contains important instructions that should be followed during installation of the Vertiv™ Liebert® Ancillary Medium Bypass Distribution Cabinet (BDC) Installer/User Manual.

Read this manual thoroughly, paying special attention to the sections that apply to installation, before working with the uninterrupted power supply (UPS). Retain this manual for use by installing personnel.

A properly trained and qualified electrical contractor should oversee the installation of the equipment.

The Liebert® Ancillary Medium BDC can not be put into operation until it is commissioned by the manufacturer or authorized engineer. Otherwise, human safety may be endangered and damage to the UPS will not be covered by the warranty.

The Liebert® Ancillary Medium BDC is designed for commercial and industrial uses and can not be used as life support equipment.

WARNING! Risk of moving heavy equipment and electric shock. Can cause damage to the equipment, injury, or death. Exercise extreme care when handling UPS cabinets to avoid damage to the equipment or injury to the personnel. The weight of the Liebert® Ancillary Medium BDC ranges from 660 lbs to 1752 lbs (300 kg to 795 kg). Determine the weight of the unit's and locate the center of gravity symbols before handling the Liebert® Ancillary Medium BDC. Test lift and balance the cabinet before transporting it. Never tilt the equipment more than 15 degrees from vertical. In the 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 maintenance. Be constantly aware that the UPS system contains high DC as well as AC voltages. Check for the voltage with both the AC and DC voltmeters prior to making contact.

AVERTISSEMENT! Risque lors du déplacement de l'équipement lourd et de décharge électrique pouvant entraîner des dommages matériels, des blessures et même la mort. Faites preuve d'une extrême prudence lors de la manutention des armoires ASC afin d'éviter de les endommager ou de blesser le personnel. Les armoires Liebert® Ancillary Medium BDC pèsent de 660 lb à 1752 lb (de 300 kg à 795 kg). Déterminez le poids de l'unité et trouvez les symboles de centre de gravité avant de déplacer l'armoire Liebert® Ancillary Medium BDC. Faites des essais de levage et d'équilibre avant de transporter l'armoire. N'inclinez jamais l'équipement à plus de 15 degrés à la verticale. En cas d'incendie associé à du matériel électrique, n'utilisez que des extincteurs à dioxyde de carbone ou homologués pour la lutte contre les incendies d'origine électrique. Les opérations d'entretien requièrent une extrême prudence. Soyez toujours conscient du fait que le système ASC contient des tensions c.c. et c.a. élevées. Vérifiez les tensions avec des voltmètres c.a. et c.c. avant d'établir tout contact.

WARNING! Risk of electric shock. It can can cause damage to the equipment, injury, or death. As with other types of high power equipment, dangerous voltages are present within the UPS and battery enclosure even after the input power has been disconnected. The risk of contact with these voltages is minimized as the live component parts are housed behind a metal panel. Further internal safety screens make the equipment protected to IP20 standards. Never remove the panels or the covers or open the doors that will expose the internal components to the contact. Read and follow all warnings, cautions, and safety and operating instructions to avoid serious injury or death from electric shock. No risk exists to any personnel when operating the equipment in the normal manner, following the recommended operating procedures. All equipment maintenance and servicing procedures involve internal access and should be carried out only by a trained personnel.

AVERTISSEMENT! Risque de décharge électrique pouvant entraîner des dommages matériels, des blessures et même la mort. À l'instar des autres types d'équipement haute puissance, des tensions dangereuses sont présentes à l'intérieur de l'armoire ASC et du châssis de batteries même après le débranchement de l'alimentation d'entrée. Le risque de contact avec ces tensions est diminué, car les parties de composants sous tension sont abritées derrière un panneau métallique. D'autres écrans de sécurité internes protègent l'équipement en conformité avec les normes IP20. Ne retirez jamais les panneaux ou les couvercles et n'ouvrez pas les portes donnant accès aux composants internes avec lesquels vous pouvez entrer en contact. Veuillez lire et suivre l'ensemble des avertissements, des mises en garde et des instructions de sécurité et de fonctionnement afin d'éviter des blessures graves, voire la mort, pouvant être causées par une décharge électrique. Il n'y a aucun risque pour le personnel lorsque l'équipement est utilisé normalement, en suivant les procédures de fonctionnement recommandées. Toutes les procédures de réparation et d'entretien de l'équipement exigent un accès à l'intérieur de l'armoire et devraient être menées uniquement par du personnel compétent.

1.2 Ground Leakage Currents

WARNING! Risk of electric shock from high leakage current. Can cause injury, damage to the property, or death. EARTH CONNECTION IS ESSENTIAL BEFORE CONNECTING THE INPUT SUPPLY. The earth leakage current exceeds 3.5 mA and is less than 1000 mA. Transient and steady-state earth leakage currents, which may occur when starting the equipment, should be taken into account when selecting the instantaneous residual current circuit breakers (RCCBs) or residual current detector (RCD). RCCBs must be selected sensitive to DC unidirectional pulses (Class A) and insensitive to the transient current pulses. Note also that the earth leakage currents of the load will be carried by this RCCBs or RCD. This equipment must be earthed in accordance with the local electrical code of practice.

AVERTISSEMENT! Risque de décharge électrique due à un courant de fuite élevé pouvant causer des blessures, des dommages matériels et même la mort. IL EST PRIMORDIAL D'ASSURER UNE CONNEXION DE TERRE AVANT DE BRANCHER L'ALIMENTATION D'ENTRÉE. La fuite à la terre est supérieure à 3,5 mA et inférieure à 1 000 mA. Vous devez tenir compte des fuites de courant transitoires et permanentes à la terre, susceptibles de se produire au démarrage de l'équipement, lors de la sélection des dispositifs DDFT instantanés. Vous devez sélectionner des disjoncteurs différentiels de fuite à la terre (DDFT) sensibles aux impulsions unidirectionnelles c.c. (classe A) et insensibles aux impulsions de courant transitoires. Notez également que les courants de fuite à la terre de la charge seront acheminés par ce dispositif DDFT. Cet équipement doit être mis à la terre conformément au code national de l'électricité.

WARNING! Risk of the electric shock. It can cause damage to the property, injury, or death. Under typical operation and with all UPS doors closed, only normal safety precautions are necessary. The area around the UPS system should be kept free of puddles of water, excess moisture, and debris. Special safety precautions are required for procedures involving handling, installation, and maintenance of the UPS system and the internal batteries (internal batteries accommodated by the 10 kVA to 40 kVA frame only). Observe all safety precautions in this manual before handling or installing the UPS system as well as during all the maintenance procedures. Observe all battery safety precautions before working on or near the battery. This equipment contains several circuits that are energized with high voltage. Only test equipment designed for troubleshooting should be used. This is particularly true for the oscilloscopes. Always check with the AC and DC voltmeters to ensure safety before making contact or using the tools. Even when the power is turned Off, dangerously high electric charges may exist within the UPS. All power and control wiring should be installed by a qualified electrician. All the power and control wiring must comply with the NEC and applicable local codes. ONLY qualified service personnel should perform maintenance on the UPS system. When performing maintenance with any part of the equipment under power, the service personnel and test equipment should be standing on rubber mats. The service personnel should wear insulating shoes for isolation from direct contact with the floor (earth ground). Never work alone, even if all the power is removed from the equipment. A second person should be standing by to assist and summon help in the case an accident should occurs.

AVERTISSEMENT! Risque de décharge électrique pouvant causer des blessures, des dommages matériels et même la mort. Les précautions de sécurité habituelles suffisent lorsque le système ASC est en mode de fonctionnement normal et que toutes les portes sont fermées. La zone entourant le système ASC doit être exempte de flaques d'eau, d'humidité excessive et de débris. Des précautions de sécurité spéciales sont requises pour les procédures associées à la manutention, à l'installation et à l'entretien du système ASC. Observez toutes les précautions de sécurité décrites dans le présent manuel avant de manipuler ou d'installer le système ASC, ainsi que pendant toutes les procédures d'entretien. Cet équipement comporte plusieurs circuits à haute tension. Seuls des équipements d'essai conçus pour le dépannage doivent être utilisés. Cette mise en garde couvre notamment les oscilloscopes. Utilisez toujours des voltmètres c.a. et c.c. pour vérifier les tensions avant d'établir un contact ou d'utiliser des outils. Des tensions dangereusement élevées peuvent demeurer dans le système ASC même une fois l'alimentation coupée. Tous les câbles d'alimentation et de contrôle doivent être installés par un électricien qualifié. Tous les câbles d'alimentation et de contrôle doivent être conformes au Code national de l'électricité des États-Unis (NEC) et celui du Canada, ainsi qu'aux codes locaux en vigueur. L'entretien du système ASC ne doit être confié qu'à des professionnels qualifiés. Les responsables de l'entretien et l'équipement d'essai doivent reposer sur des tapis de caoutchouc lors de toute intervention sur une pièce d'équipement sous tension. Les responsables de l'entretien doivent porter des chaussures isolantes pour prévenir tout contact direct avec le plancher. Ne travaillez jamais seul, même si toute l'alimentation d'entrée est coupée de l'équipement. Une seconde personne devrait toujours être présente pour porter assistance ou chercher de l'aide en cas d'accident.

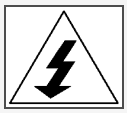
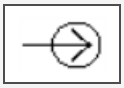
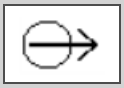
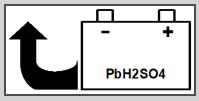
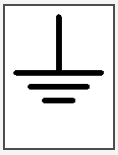
NOTICE

Risk of improper ground connection. It can cause the equipment damage. The ground connection is essential before connecting the input supply. This equipment must be grounded in accordance with the local electrical codes. Maximum load must not exceed that shown on the UPS rating label.

NOTICE

Risk of improper electromagnetic shielding. It can cause radio communication interference. This unit complies with the limits for a Class A digital device, pursuant to Part 15 Subpart J of the FCC rules. These limits provide reasonable protection against harmful interference in a commercial environment. This unit generates, uses, and radiates radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. This unit is not designed for use in a residential area. Operation of this unit in a residential area may cause harmful interference that the user is solely responsible for correcting.

1.3 Glossary of Symbols

	Risk of electrical shock
	Indicates caution followed by important instructions.
	AC input
	DC output
	Requests the user to consult the manual
	Indicates the unit contains a valve-regulated lead acid battery
	Recycle
	DC voltage
	AC voltage
	Equipment grounding conductor
	Bonded to ground

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2 Overview

2.1 Introduction

The Vertiv™ Liebert® Ancillary Medium BDC is designed to operate in UPS normal mode, static bypass mode, and maintenance mode. The Liebert® Ancillary Medium BDC offers 10 kVA to 100 kVA capacity to match the associated Vertiv™ Liebert® Medium UPS frame offerings. Each of the Liebert® Ancillary Medium BDC capacities offer optional input 208 V, 220 V, 480 V, and 600 V internal transformers as well as multiple output distribution selections.

2.1.1 Normal (UPS) Mode

While the Liebert® Ancillary Medium BDC is in normal mode (MBB open. BIB/MIB closed), the UPS is supplying the connected load with continuous, high-quality AC power. In this mode of operation, the load is protected by the UPS.

2.1.2 Static Bypass Mode

While the Liebert® Ancillary Medium BDC is in normal mode (MBB open. BIB/MIB closed) and the UPS is supplying unprotected utility power through its bypass module with static bypass mode active. In this mode if the SKRU option is present the indicator lamp and solenoid will become active for Solenoid key release unit (SKRU) operation to transfer the BDC into maintenance mode. Power is supplied to the UPS and the load is not protected by the UPS.

2.1.3 Maintenance Mode

When the Liebert® Ancillary Medium BDC is in maintenance mode (MBB closed. BIB/MIB open), it provides an alternate path for power to the connected equipment should the UPS need to be taken out of service for limited maintenance or repair. In this mode of operation, no power is supplied to the UPS and the load is not protected by the UPS.

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3 Mechanical Installation

3.1 Introduction

This chapter provides brief instructions for mechanical installation of Vertiv™ Liebert® Ancillary Medium BDC, including environmental requirements, mechanical requirements that must be considered when planning the positioning and cabling of the UPS equipment.

This chapter is a guide to general procedures and practices that must be observed by the commissioning engineer. The conditions of each site will determine the applicability of such procedures.

WARNING! Risk of arc flash and electric shock. Can cause equipment damage, injury, or death. Installation must be performed only by properly trained and qualified personnel wearing appropriate safety clothing. Eye protection must be worn to prevent injury from accidental electrical arcs. Remove rings, watches, and all other metal objects. Only use tools with insulated handles. Wear rubber gloves.

AVERTISSEMENT! Risque d'arc ou de décharge électrique pouvant entraîner des dommages matériels, des blessures et même la mort. L'installation ne doit être confiée qu'à des professionnels qualifiés et dûment formés portant des vêtements de sécurité adéquats. Des lunettes de sécurité doivent être portées afin de prévenir les blessures en cas d'arcs accidentels. Retirez montre, bagues et tout autre objet métallique. Utilisez uniquement des outils dont le manche est isolé. Portez des gants de protection en caoutchouc.

WARNING! Risk of improper installation. Can cause equipment damage and void warranty. The Liebert® Ancillary Medium BDC must be installed by a qualified engineer in accordance with the information contained in this chapter. All equipment not referred to in this manual is shipped with details of its own mechanical and electrical installation. Do not apply electrical power to the UPS equipment before the arrival of the commissioning engineer.

AVERTISSEMENT! Risque de mauvaise installation. Peut causer des dommages à l'équipement et annuler la garantie. Le Liebert® L'Ancillary Medium BDC doit être installé par un ingénieur qualifié conformément aux informations contenues dans ce chapitre. Tout équipement non mentionné dans ce manuel est expédié avec des détails sur ses propres caractéristiques mécaniques et installation électrique. N'appliquez pas d'alimentation électrique à l'équipement UPS avant l'arrivée du ingénieur de mise en service.

3.2 Preliminary Checks

Before installing the Liebert® Ancillary Medium BDC, carry out the following preliminary checks.

- Visually examine the equipment for transit damage, both internally and externally. Report any damage to the shipper immediately.
- Verify that the correct equipment is being installed. The equipment supplied has an identification tag on the back of the main door reporting the type, size, and main calibration parameters of the UPS.
- Verify that the room satisfies the environmental conditions stipulated in the equipment specifications, paying particular attention to the ambient temperature and air exchange system.

3.3 Environmental Considerations

3.3.1 UPS Location Selection

The Vertiv™ Liebert® Ancillary Medium BDC is intended for indoor installation and must be located in a cool, dry, clean air environment with adequate ventilation to keep the ambient temperature within the specified operating range. See Specifications on page 41 for more information.

All models of the Liebert® Ancillary Medium BDC are convection cooled. To permit air to enter and exit and prevent overheating or malfunctioning, do not cover the ventilation openings.

When bottom entry is used, the conduit plate can be removed and punched and replaced. The bottom conduit plate must be replaced for proper airflow. If necessary to cool the room, install a system of room extractor fans.

The Liebert® Ancillary Medium BDC is suitable for mounting only on concrete and other non-combustible surfaces.

3.3.2 Storage

If the equipment will not be installed immediately, it must be stored in a room for protection against excessive humidity or heat sources. See Table 5.1 on page 41 for more information of environmental condition.

3.4 Positioning

The cabinet is structurally designed to handle lifting from the base. Access to the power terminals, auxiliary terminals blocks, and power switches is from the top and sides. The top and side removable panels are secured to the chassis by screws. The side panel can be removed for access to the power connections bars, auxiliary terminal blocks, and power isolators.

3.4.1 Moving the Cabinets

WARNING! Risk of moving heavy units and tipping hazard. Can cause equipment damage, injury, and death. Exercise extreme care when handling cabinets to avoid equipment damage or injury to personnel. The Liebert® Ancillary Medium BDC weight ranges from 660 lbs to 1752 lbs (300 kg to 795 kg). Locate center of gravity symbols and determine unit weight before handling each cabinet. Test lift and balance the cabinets before transporting. Always maintain minimum tilt from vertical.

AVERTISSEMENT! Le centre de gravité élevé des appareils présente un risque de renversement lors des déplacements pouvant entraîner des dommages matériels, des blessures et même la mort. Faites preuve d'une extrême prudence lors de la manutention des armoires afin d'éviter de les endommager ou de blesser le personnel. Les armoires de dérivation d'entretien Liebert® Ancillary Medium BDC de Liebert pèsent de 660 lbs to 1752 lbs (300 kg to 795 kg). Identifiez les symboles de centre de gravité et déterminez le poids de l'appareil avant de manipuler chaque armoire. Testez le levage et l'équilibre des armoires avant de transporter l'appareil. Maintenez en tout temps l'inclinaison verticale minimale.

The route to be traveled between the point of arrival and the unit's position must be planned to make sure that all passages are wide enough for the unit and that floors are capable of supporting its weight. Check that doorways, lifts, ramps, and so on are adequate and that there are no impassable corners or changes in the level of corridors.

Ensure that any lifting equipment used in moving the cabinet has sufficient lifting capacity.

The Liebert® Ancillary Medium BDC can be handled by means of a forklift or similar equipment. For operations with a forklift, see the installation drawings in Installation Drawings on page 21.

Because the weight distribution in the cabinet is uneven, use extreme care during handling and transporting.

When moving the unit by forklift, care must be taken to protect the panels. Do not tilt the cabinet more than 15 degrees from vertical while transportation. Do not handle the unit with straps.

3.4.2 Clearances

Liebert® Ancillary Medium BDC have no perforated panels on the sides or rear. Clearance around the front of the equipment must be sufficient to enable free passage of personnel with the doors fully opened. It is important to leave a distance of 24 in. (610 mm) between the top of the cabinet and any overhead obstacles to permit adequate circulation of air coming out of the unit.

3.4.3 Floor Installation Anchoring

The installation diagrams in Installation Drawings on page 21 identify the location of the holes in the base plate through which the equipment can be bolted to the floor. If the equipment is to be located on a raised floor it must be mounted on a pedestal suitably designed to accept the equipment point loading.

3.5 Cable Installation

3.5.1 Wiring Preparation

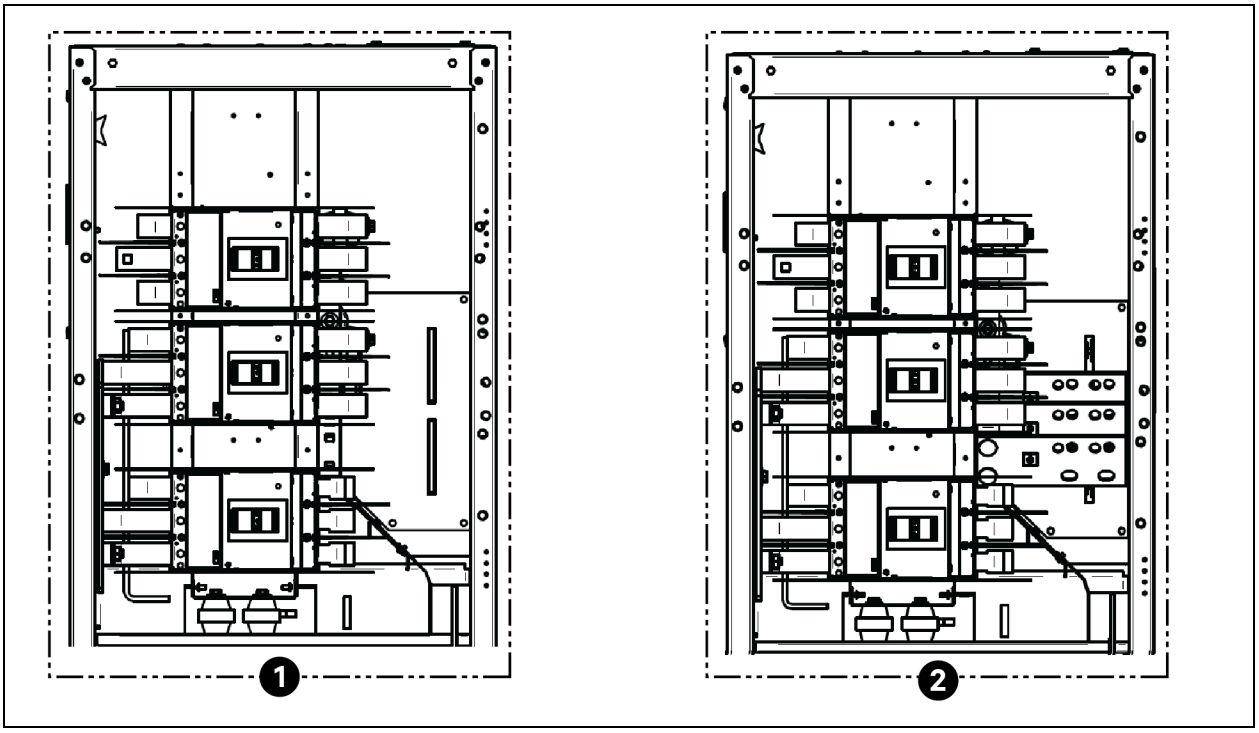
Be sure that the unit is not connected to any AC utility power source or the UPS before installing any wiring to this unit. This Liebert® Ancillary Medium BDC should be installed by a qualified/certified electrician.

WARNING! Risk of electrical shock and arc flash. Can cause damage to the property, injury, or death. Read this section thoroughly before attempting to install wiring to this unit. Read and comply with all the warnings and cautions in this manual.

Removing the cover plates

Cover plates are given to the input and the output terminals on the front of the Liebert® Ancillary Medium BDC.
See Figure 3.1 on the next page for more information. Remove these plates and keep the screws and plates for reinstallation.

Figure 3.1 Vertiv™ Liebert® Ancillary Medium BDC — Access Plate Removed



Item	Description
1	Access panel removed. Liebert® BDC with input transformer
2	Access panel removed. Liebert® BDC with output transformer or with transformer not installed

3.6 Locating the Cabinet

This Liebert® Ancillary Medium BDC must be mounted to the right of the UPS. Ensure that the unit is placed in a well-ventilated area and that there is clearance for access to the switches and the cable connections as required by the national and the local codes.

3.6.1 Power Cable Installation

NOTE: Transient and steady-state earth leakage currents may occur when starting the equipment. This should be taken into account when selecting the ground current detection devices because these will carry the earth leakage currents of both the UPS equipment and the load.

3.6.2 Input/Output Wiring

Follow the steps below to connect the input wiring:

1. Locate the input wiring access (top or bottom access), remove the conduit landing plate and punch the appropriate size hole for the size conduit being used. Pull the three/four input wires through it, allowing some slack for installation.
2. Secure the conduit to the access plate of the Liebert® Ancillary Medium BDC.
3. Input power cables connect to the system input bus. See Figure 4.1 on page 21 for location of power cable and Table 4.2 on page 32 for the torque required to fit the cables.

4. Connect the ground (earth) wire to the earth busbar and tighten it to 428 lb-in (48 Nm) for M12 bolt.
5. Locate the UPS input and output cables and the access panel to the UPS on the upper left side of the BDC.
6. Connect the system ground cable between the Liebert® Ancillary Medium BDC the UPS. Tighten the M12 bolt connections to 428 lb-in (48 Nm).
7. Connect the system input cables between the Liebert® Ancillary Medium BDC UPS input busbars (A-B-C-N terminals) and the UPS input busbars (A-B-C-N terminals). Tighten the M12 bolt connections to 428 lb-in (48 Nm).
8. Connect the system output cables between the Liebert® Ancillary Medium BDC UPS output busbars (A-B-C-N terminals) and the UPS output busbars (A-B-C-N terminals). Tighten the M12 bolt connections to 428 lb-in (48 Nm).
9. See Table 3.1 below for control wiring.

NOTICE

Risk of improper wiring connection. Can cause damage to the equipment. The control wire must be installed to ensure proper operation of the system and fully protect the load when switching between the bypass cabinet and the UPS.

NOTE: All interconnection hardware will be supplied by Vertiv.

NOTE: AC connections must be made to the UPS module before attaching the Liebert® Ancillary Medium BDC to the UPS module.

NOTE: All cabling will be field-supplied when a Liebert® Ancillary Medium BDC is configured as a stand-alone cabinet.

NOTE: Liebert® Ancillary Medium BDC's must attach to only the right side of the Vertiv™ Liebert® Medium UPS.

NOTE: Refer to individual drawing of each piece of the equipment for additional details.

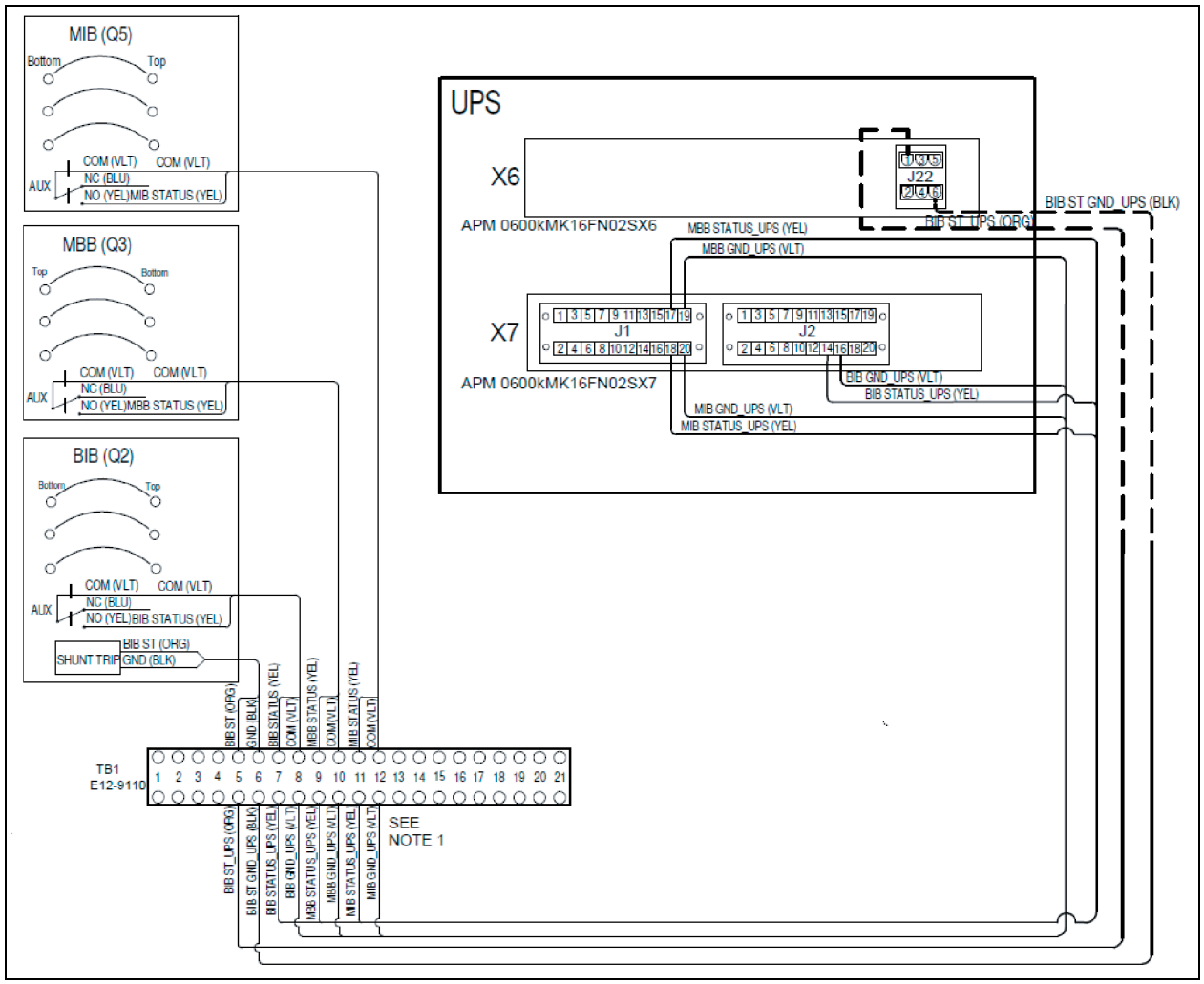
Table 3.1 Control Wiring for Liebert® Medium UPS to Liebert® Ancillary Medium BDC

From	To	From	To
Control Module (X7 J1, J2, and J3)	Liebert® Ancillary Medium BDC Terminal Strip (TB1)	Control module (X6 J22)	Liebert® Ancillary Medium BDC Terminal Strip (TB1)
J2-14	TB1-7	J22-1	TB1-5
J2-16	TB1-8	J22-6	TB1-6
J1-17	TB1-9		
J1-19	TB1-10		
J1-18	TB1-11		
J1-20	TB1-12		
J3-4	TB1-18		
J3-6	TB1-19		
J1-13	TB1-20		
J1-15	TB1-21		

See Control Wiring on the next page for the location of X7 J1, J2, J3, and X6 J22.

3.6.3 Control Wiring

Figure 3.2 Vertiv™ Liebert® Ancillary Medium BDC Connected to Vertiv™ Liebert® APM2 UPS



Notes to Figure:

1. Terminal board shown is for Vertiv supplied maintenance bypass cabinets only.

Figure 3.3 Vertiv™ Liebert® Ancillary Medium BDC 400 VAC and 480 VAC SKRU Wiring

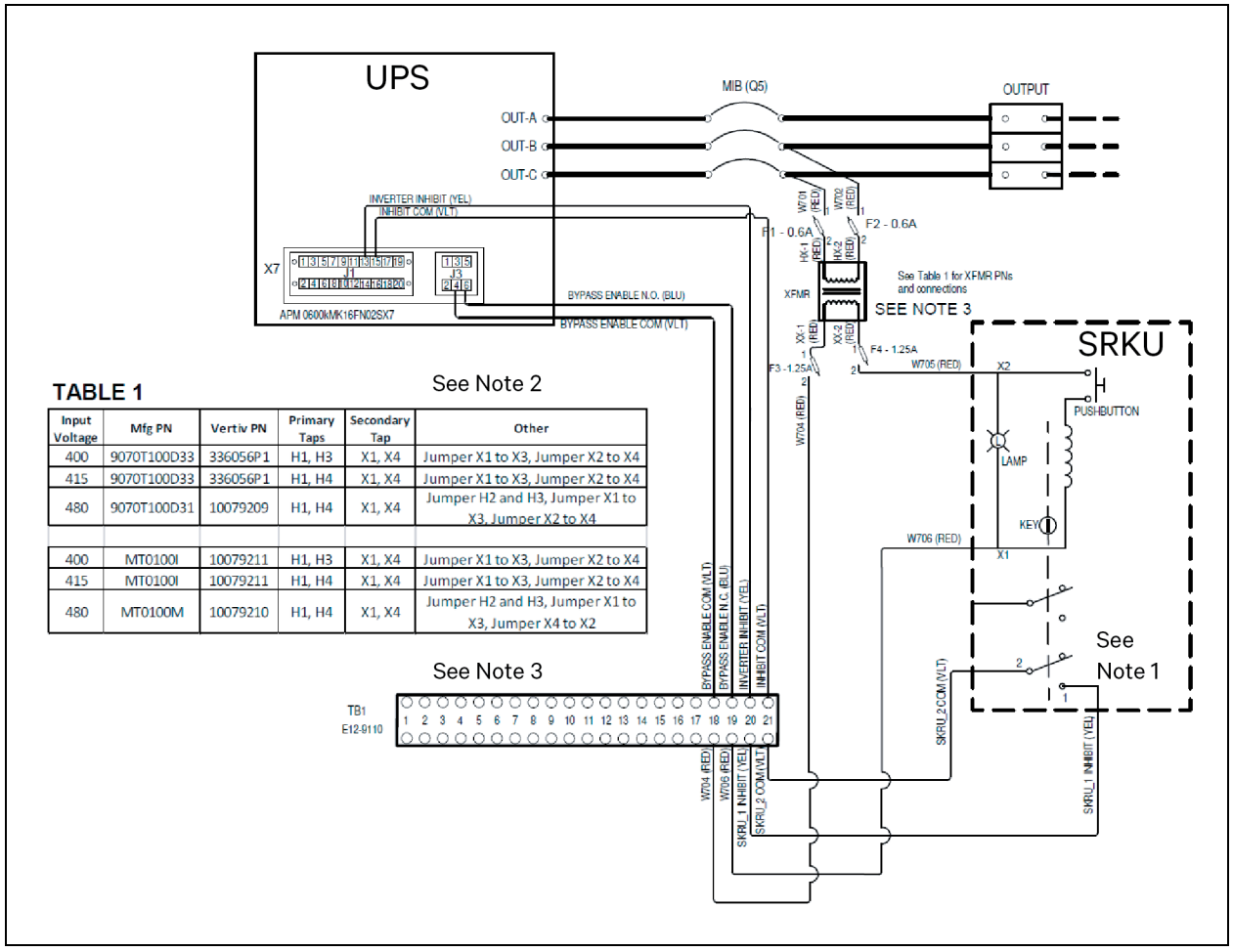


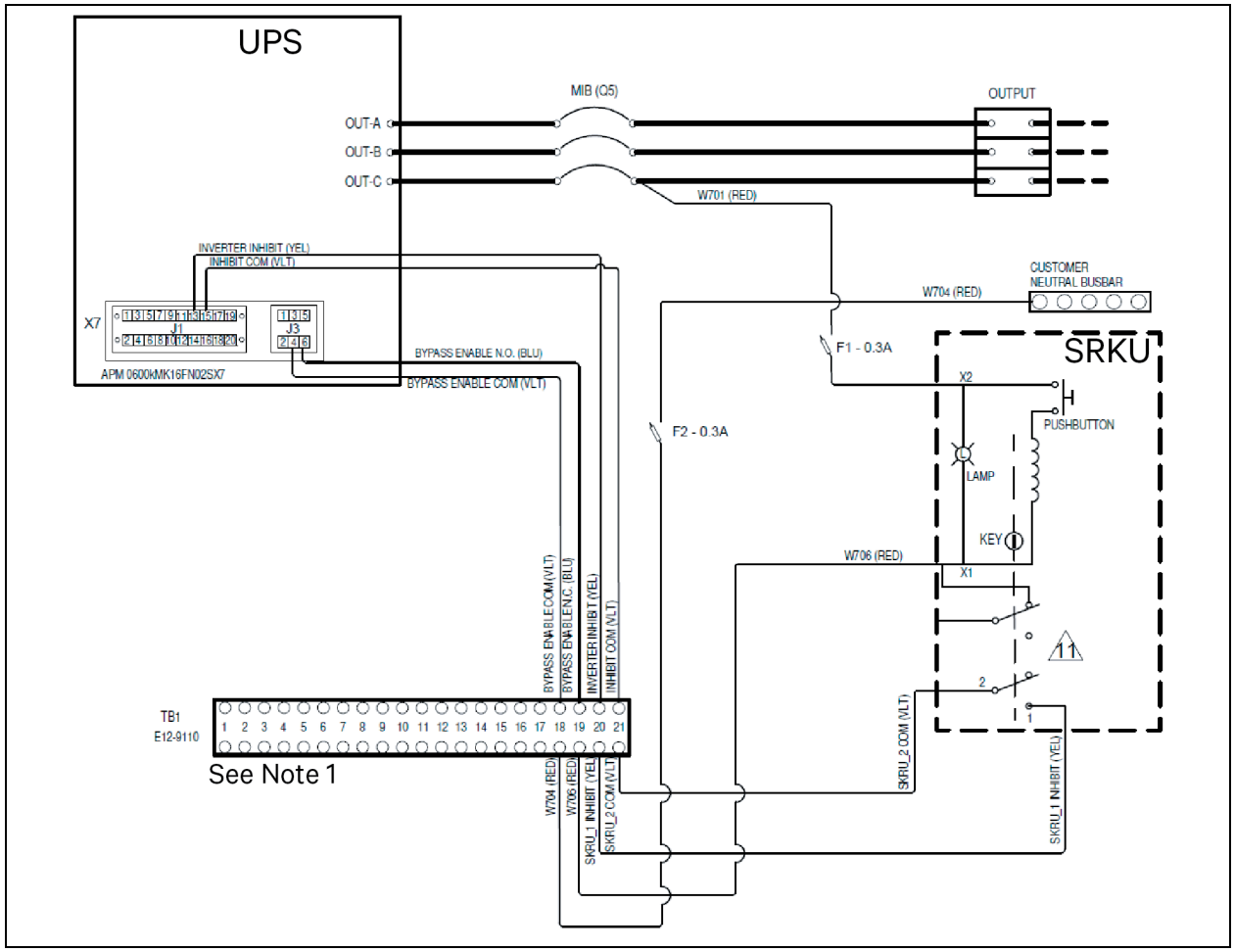
TABLE 1

Input Voltage	Mfg PN	Vertiv PN	Primary Taps	Secondary Tap	Other
400	9070T100D33	336056P1	H1, H3	X1, X4	Jumper X1 to X3, Jumper X2 to X4
415	9070T100D33	336056P1	H1, H4	X1, X4	Jumper X1 to X3, Jumper X2 to X4
480	9070T100D31	10079209	H1, H4	X1, X4	Jumper H2 and H3, Jumper X1 to X3, Jumper X2 to X4
400	MT0100I	10079211	H1, H3	X1, X4	Jumper X1 to X3, Jumper X2 to X4
415	MT0100I	10079211	H1, H4	X1, X4	Jumper X1 to X3, Jumper X2 to X4
480	MT0100M	10079210	H1, H4	X1, X4	Jumper H2 and H3, Jumper X1 to X3, Jumper X4 to X2

Notes to Figure:

1. SKRU contacts shown with key captive.
2. Jumpers are factory supplied.
3. Terminal board and transformer shown are for Vertiv supplied BDC only.

Figure 3.4 Vertiv™ Liebert® Ancillary Medium BDC 208 VAC SKRU Wiring



Notes to Figure:

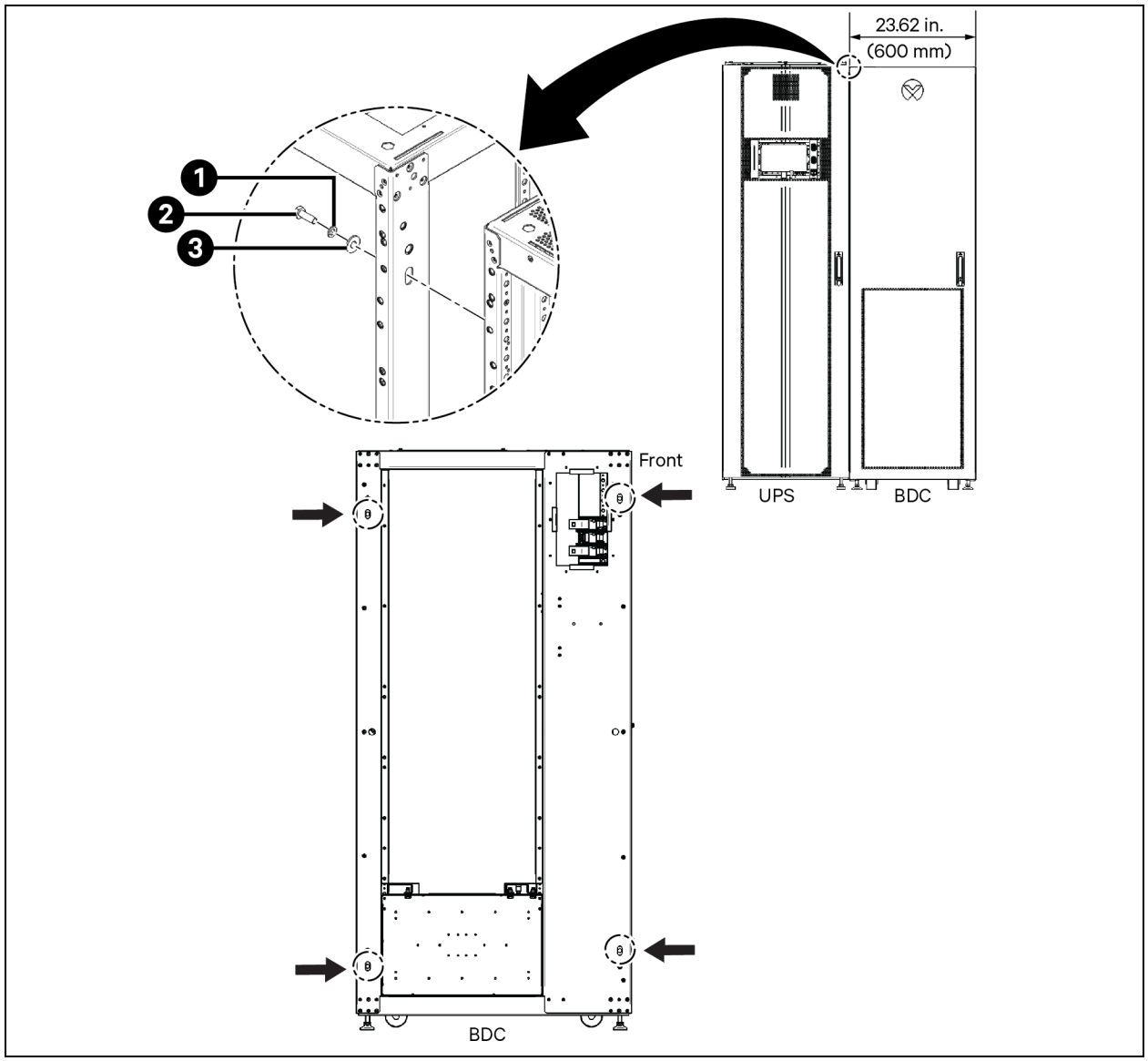
1. Terminal board and transformer shown are for Vertiv supplied BDC only.

3.7 Bolting Cabinets Together

NOTE: The UPS wiring must be completed before the cabinets are bolted together.

Lineup the cabinets so that the mounting holes are aligned.
Using supplied hardware, bolt the cabinets together. The bolts may be inserted from either the UPS side or from the Vertiv™ Liebert® Ancillary Medium BDC side, whichever is more convenient.

Figure 3.5 Bolting of Vertiv™ Liebert® Medium UPS to a Liebert® Ancillary Medium BDC



Item	Description
1	Washer split, M10
2	Hex head bolt, M10 x 30 mm
3	Washer flat, M10

Notes to Figure:

1. Place the cabinets so that the mounting holes are aligned.
2. A bolt from the adjacent cabinet may be screwed into the threaded top hole or a bolt may be inserted through the lower and screwed into the threaded hole in the adjacent cabinet.

WARNING! Risk of heavy units tipping over while being moved. Can cause damage property, injury, or death. The Vertiv™ Liebert® Ancillary Medium BDC and battery cabinets must be properly prepared and secured for lifting. Improper lifting may cause the cabinets to fall, causing the equipment damage, personal injury, or death. Vertiv recommends lifting the units by placing the suitable straps on the Liebert® Ancillary Medium BDC or the battery cabinet. The straps must go under the unit to be lifted.

AVERTISSEMENT! Le centre de gravité élevé des appareils présente un risque de renversement lors des déplacements, pouvant entraîner des dommages matériels, des blessures et même la mort. Les armoires Liebert® Ancillary Medium BDC et de batterie doivent être correctement préparées et sécurisées avant d'être levées. Un mauvais levage peut faire tomber les armoires, causant des dommages à l'équipement, des blessures, voire la mort. Vertiv recommande de soulever les unités en suivant l'une des méthodes suivantes: En installant quatre anneaux de levage dans les ouvertures fabriquées en usine, avec un anneau dans chaque coin de l'appareil, pour ensuite fixer les câbles ou sangles aux anneaux afin d'effectuer le levage à l'aide d'un mécanisme approprié. En plaçant des sangles convenables sur l'armoire Liebert ou de batterie. Les sangles doivent passer sous l'unité à soulever.

3.7.1 Floor Installation

If the Liebert® Ancillary Medium BDC is to be placed on a raised floor, the Vertiv™ Liebert® Medium UPS should be mounted on a pedestal that will support the equipment point loading. Refer to the UPS installer/user manual, supplied with UPS to design this pedestal.

3.7.2 Cable Entry

The cables can enter the Liebert® Ancillary Medium BDC from the top or bottom through the removable metal plates.

Some plates have factory-punched holes and others are designed to allow the personnel to punch the holes for fitting and securing the conduit. Once the conduit holes are punched, these plates should be reattached to the UPS. The conduit size and wiring method must be in accordance with all the local, regional and national codes, and regulations, including the NEC ANSI/NFPA 70.

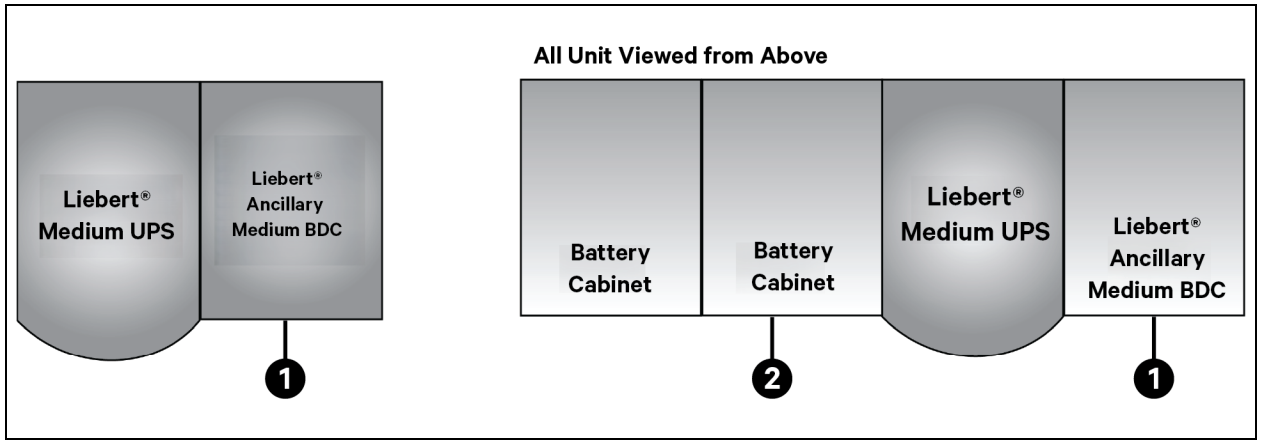
NOTE: When installing the UPS, the customer must provide a disconnect with overcurrent protection at the output of the UPS.

3.7.3 Optional Cabinets

The Vertiv™ Liebert® Ancillary Medium BDC must be bolted to the right side of the Vertiv™ Liebert® Medium UPS. See Figure 3.6 below.

The Liebert® Ancillary Medium BDC must be cabled and bolted to the Liebert® Medium UPS before the UPS and the BDC are moved into their final position. Connect input wiring to the Liebert® Ancillary Medium BDC only after the units are internally cabled and positioned.

Figure 3.6 Cabinet Arrangement



Item	Description
1	Liebert® Ancillary Medium BDC
2	Battery cabinet

Notes to Figure:

1. The Liebert® Medium UPS connected to the Liebert® Ancillary Medium BDC. The Liebert® Ancillary Medium BDC must be on the right side of the Liebert® Medium UPS.
2. The Liebert® Medium UPS connected to the Liebert® Ancillary Medium BDC and the Battery Cabinets. The Liebert® Ancillary Medium BDC must be on the right side of the Liebert® Medium UPS. The battery cabinets must be on the left side of the Liebert® Medium UPS.

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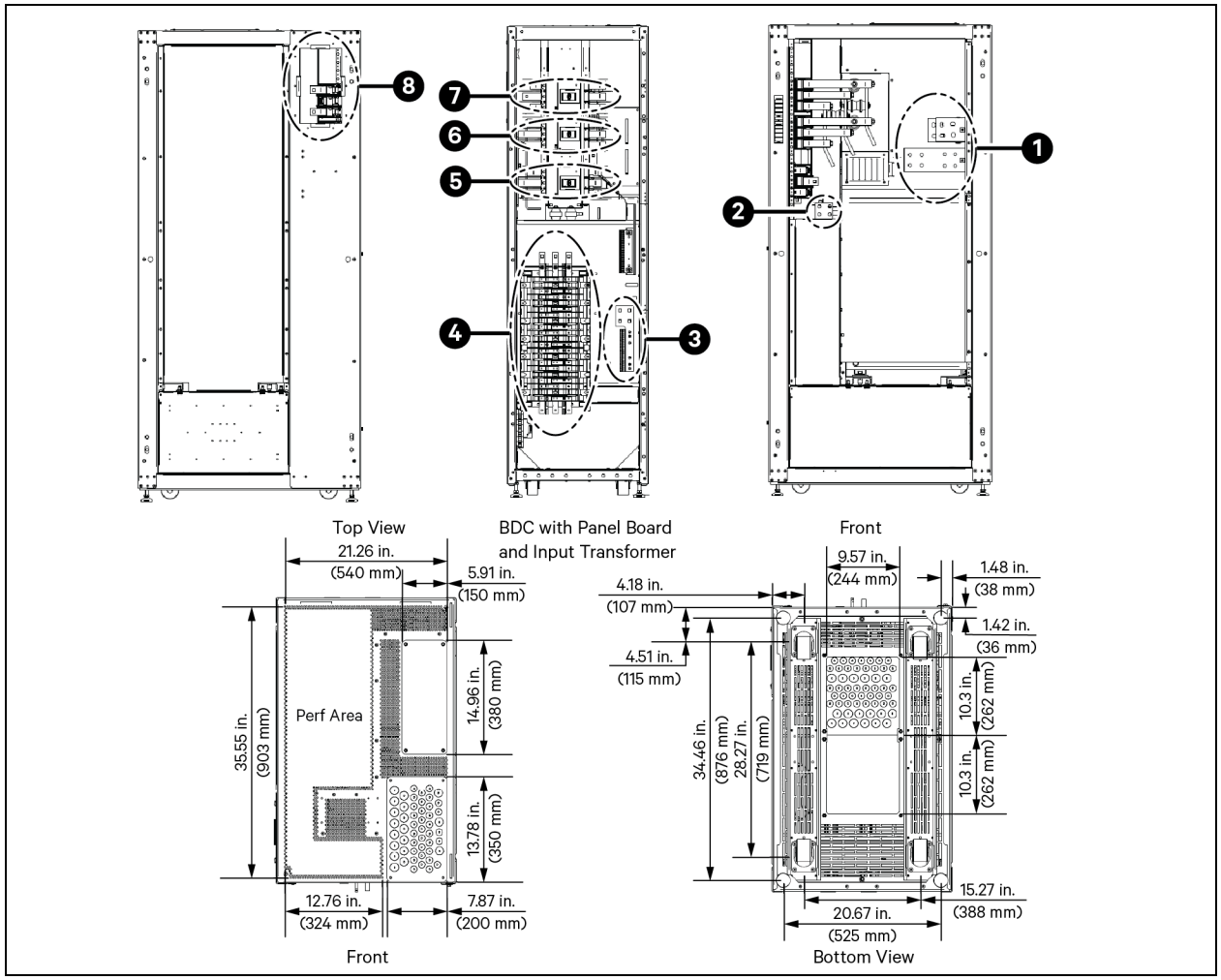
4 Installation Drawings

Figure 4.1 Vertiv™ Liebert® Ancillary Medium BDC with 250 A or 400 A Panelboards with Input Transformer — Main Components

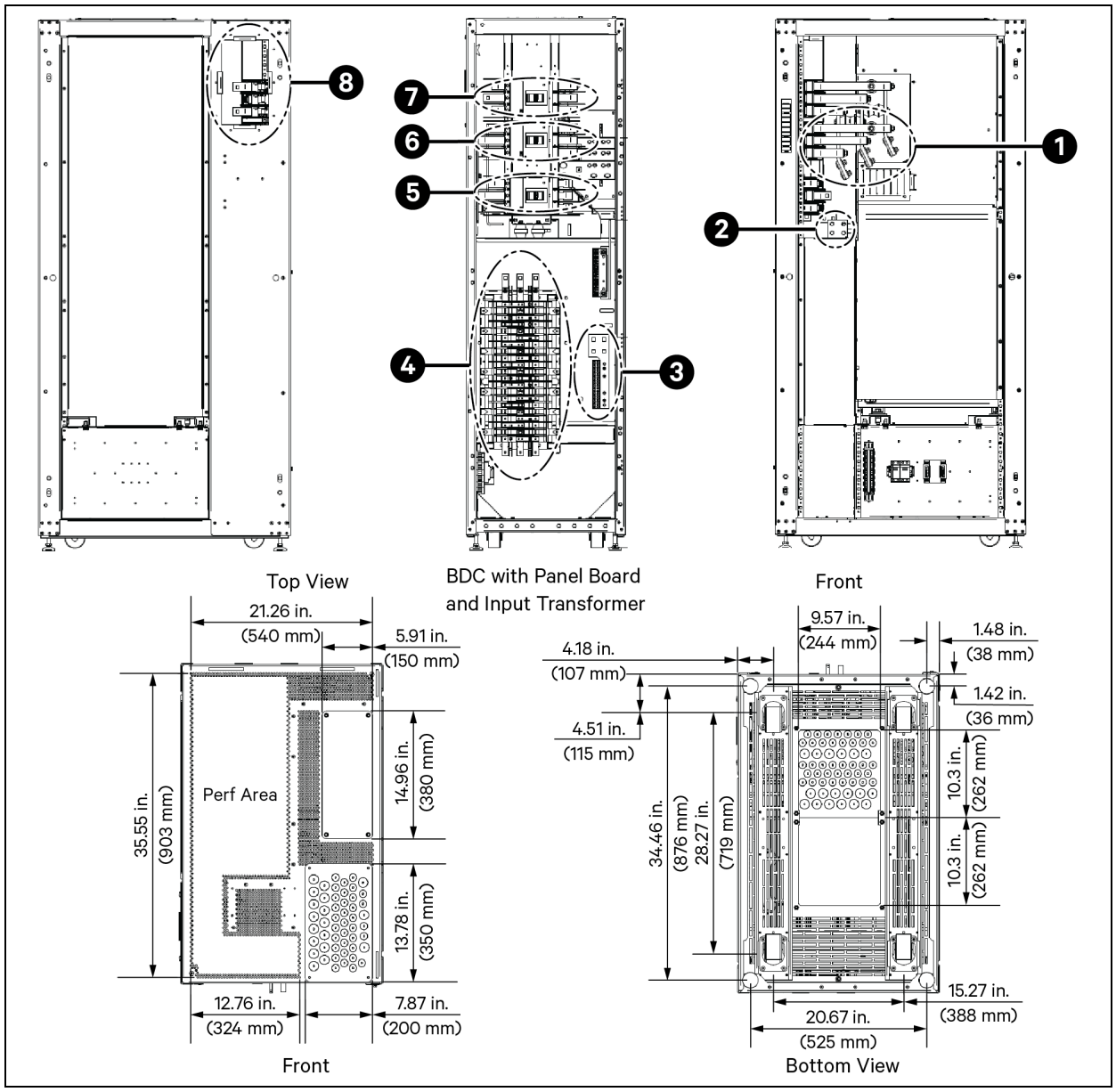


Item	Description	Item	Description
1	System input bus	5	MIB
2	Ground bus	6	MBB
3	Neutral bus	7	BIB
4	Panelboard	8	Cable pass-through to UPS

Notes to Figure:

1. The control wiring and the power wiring must be run in separate conduits.
2. All wiring must be in accordance with the national and the local electrical codes.
3. If the BDC is attached to the right side of the UPS, Vertiv will supply the interconnection cables.

Figure 4.2 Vertiv™ Liebert® Ancillary Medium BDC with 250 A or 400 A Panelboard with Output Transformer or Transformer Not Installed — Main Components

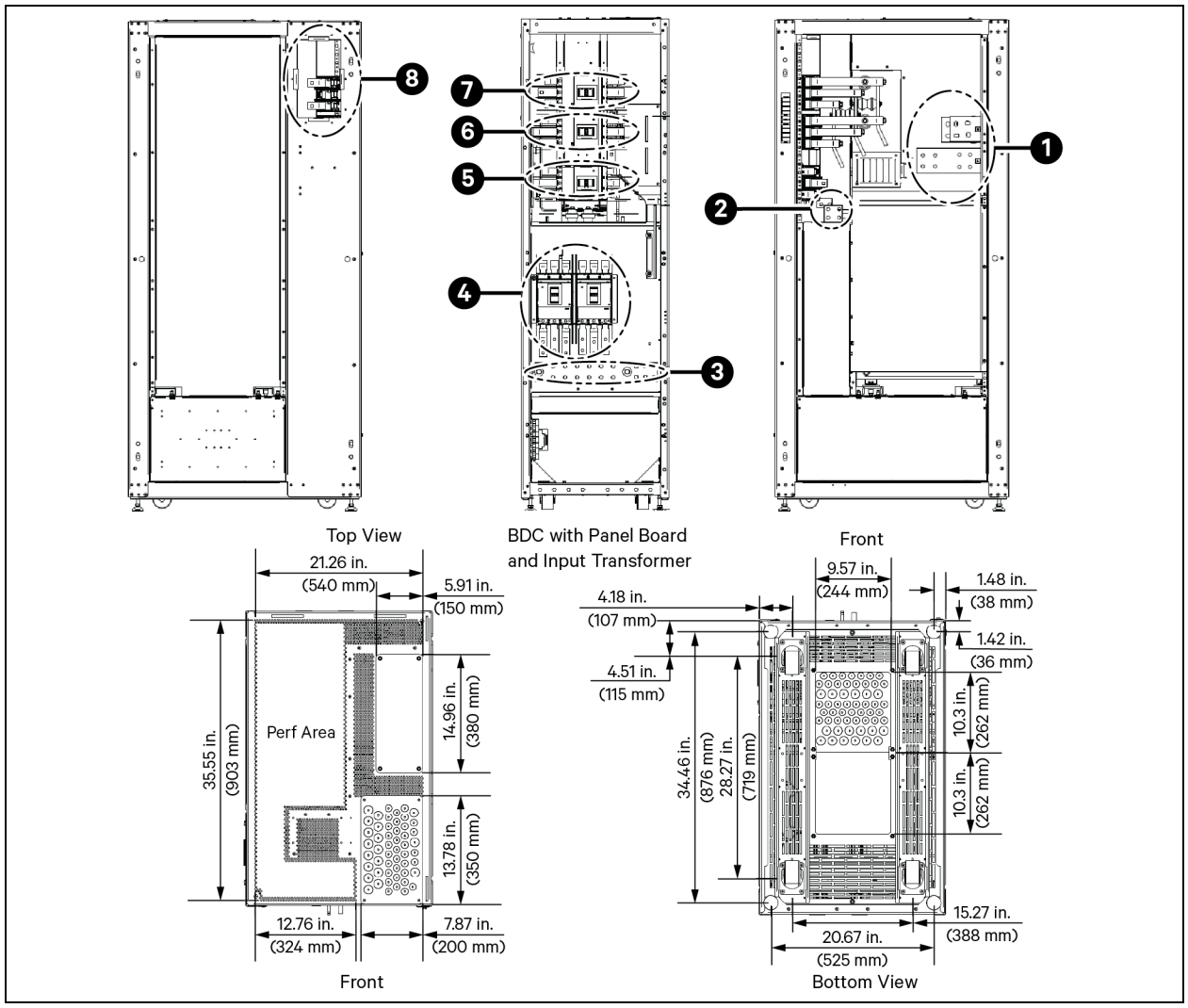


Item	Description	Item	Description
1	System input bus	5	MIB
2	Ground bus	6	MBB
3	Neutral bus	7	BIB
4	Panelboard	8	Cable pass-through to UPS

Notes to Figure:

1. The control wiring and the power wiring must be run in separate conduits.
2. All wiring must be in accordance with the national and the local electrical codes.

Figure 4.3 Vertiv™ Liebert® Ancillary Medium BDC with One to Two 250 A or 400 A Subfeed Breakers and Input Transformer — Main Components

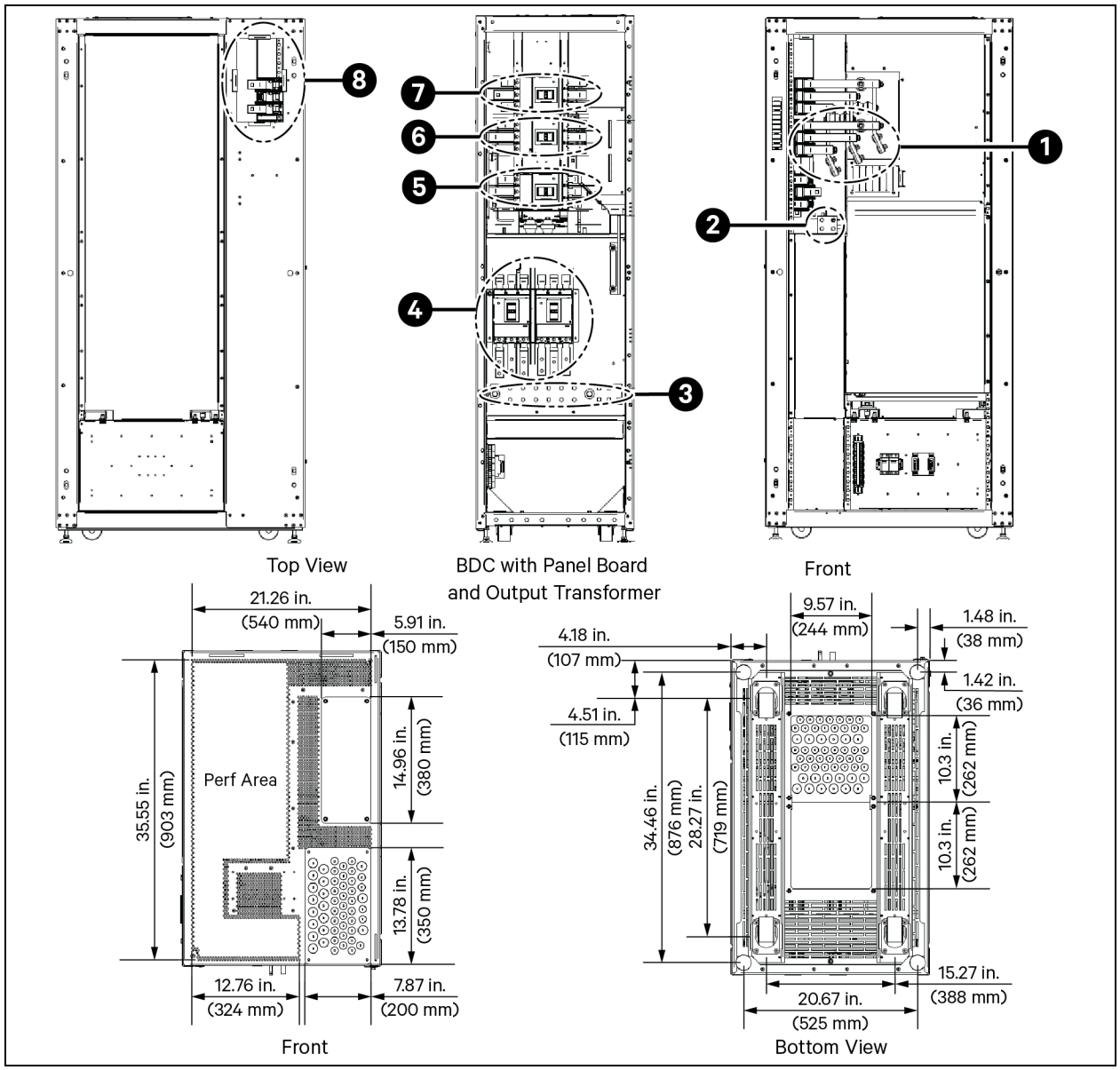


Item	Description	Item	Description
1	System input bus	5	MIB
2	Ground bus	6	MBB
3	Neutral bus	7	BIB
4	Subfeed breakers	8	Cable pass-through to UPS

Notes to Figure:

1. The control wiring and the power wiring must be run in separate conduits.
2. Copper cables only are recommended.
3. All the wiring is to be in accordance with the national and the local electrical codes.
4. When the Liebert® Ancillary Medium BDC is attached to the UPS, Vertiv will supply the interconnection cables.
5. 250 A panelboard for 10 kVA to 60 kVA only. 400 A panelboard for 20 kVA to 100 kVA only.

Figure 4.4 Vertiv™ Liebert® Ancillary Medium BDC with One to Two 250 A or 400 A Subfeed Breakers and Output Transformer or Transformer Not Installed — Main Components

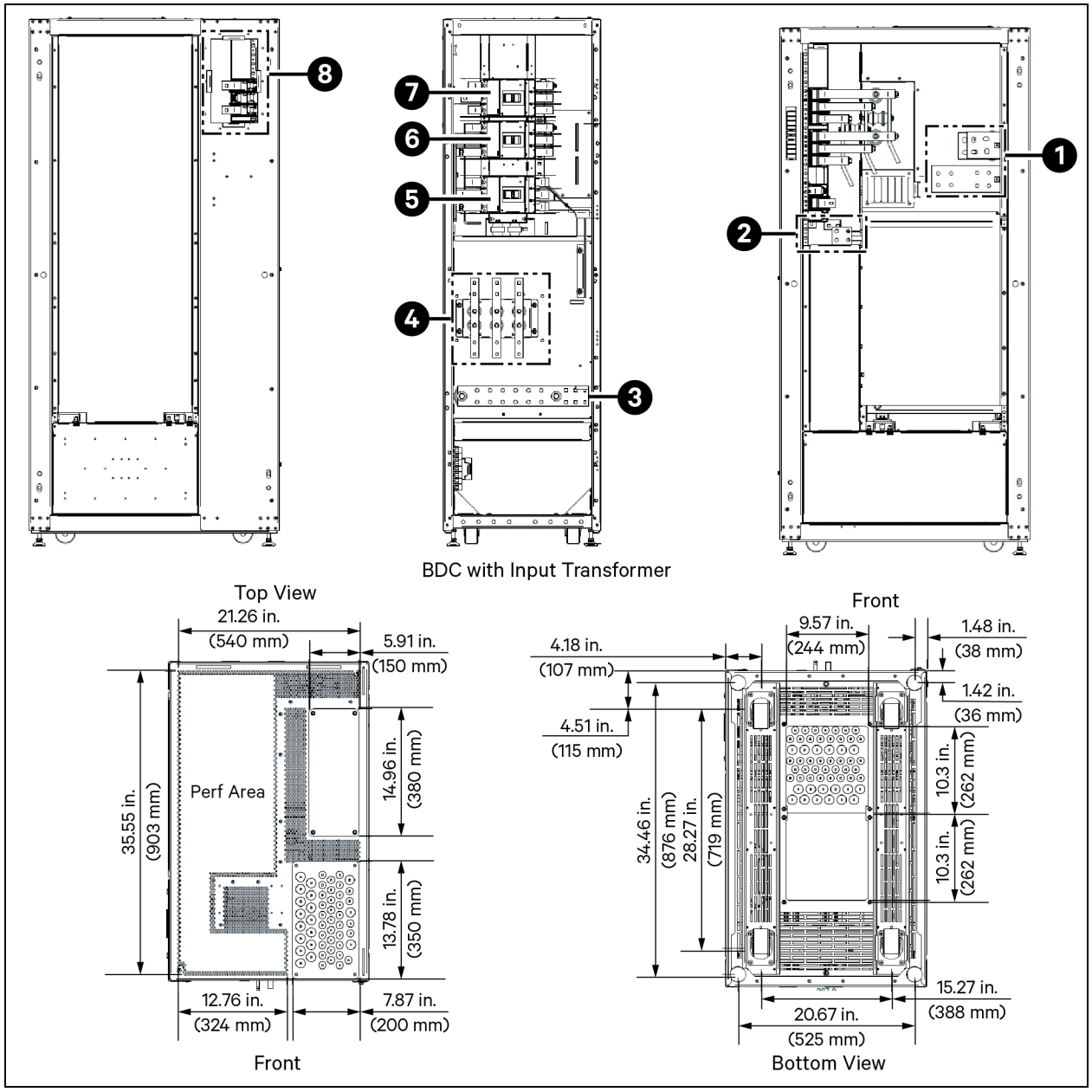


Item	Description	Item	Description
1	System input bus	5	MIB
2	Ground bus	6	MBB
3	Neutral bus	7	BIB
4	Subfeed breakers	8	Cable pass-through to UPS

Notes to Figure:

1. The control wiring and the power wiring must be run in separate conduits.
2. Copper cables only are recommended.

Figure 4.5 Vertiv™ Liebert® Ancillary Medium BDC with Input Transformer — Main Components

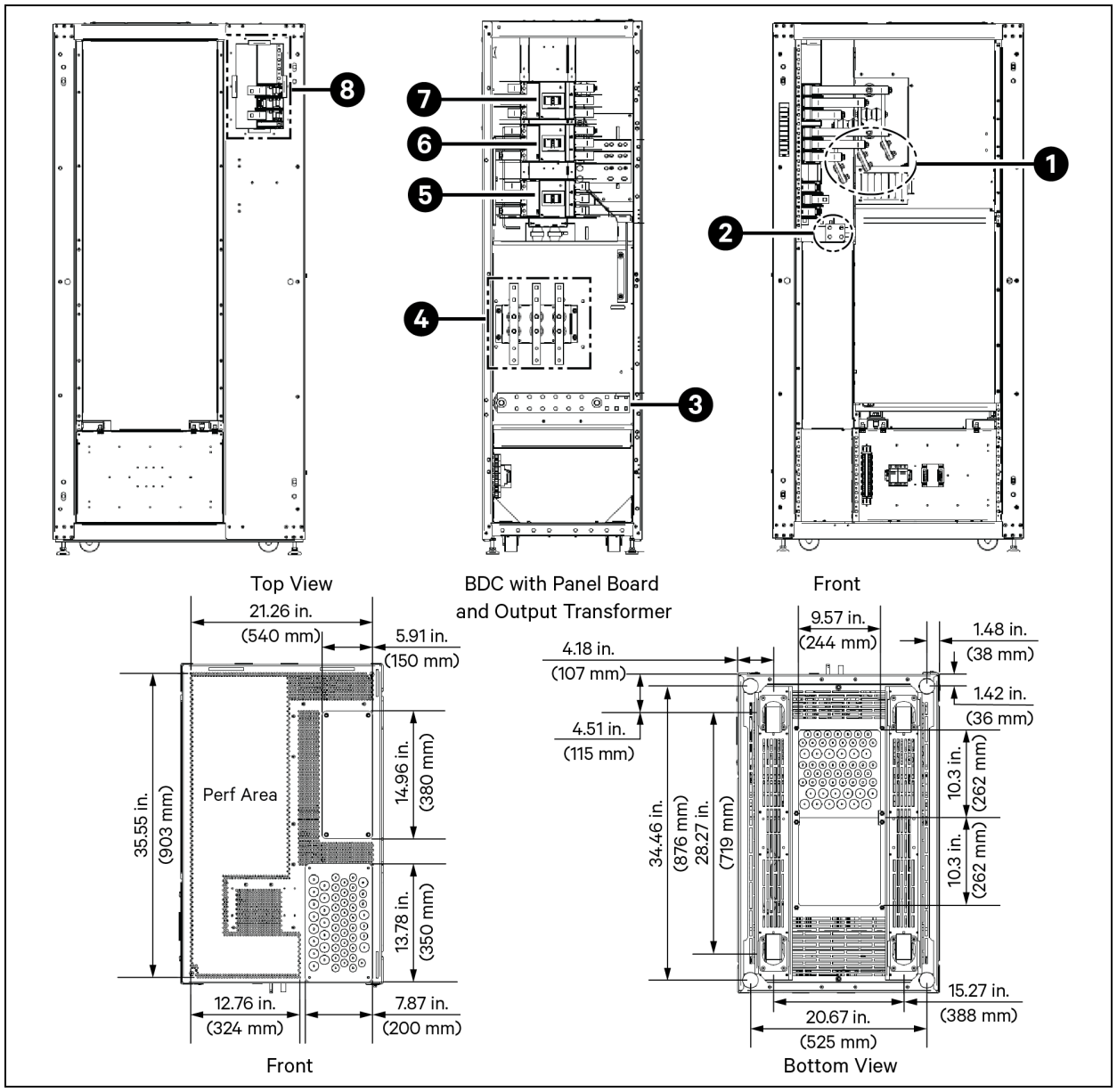


Item	Description	Item	Description
1	System input bus	5	MIB
2	Ground bus	6	MBB
3	Neutral bus	7	BIB
4	Output bus when distribution option are not selected	8	Cable pass-through to UPS

Notes to Figure:

1. The control wiring and the power wiring must be run in separate conduits.
2. All the wiring is to be in accordance with the national and the local electrical codes.

Figure 4.6 Vertiv™ Liebert® Ancillary Medium BDC without Distribution Options and Output Transformer — Main Components

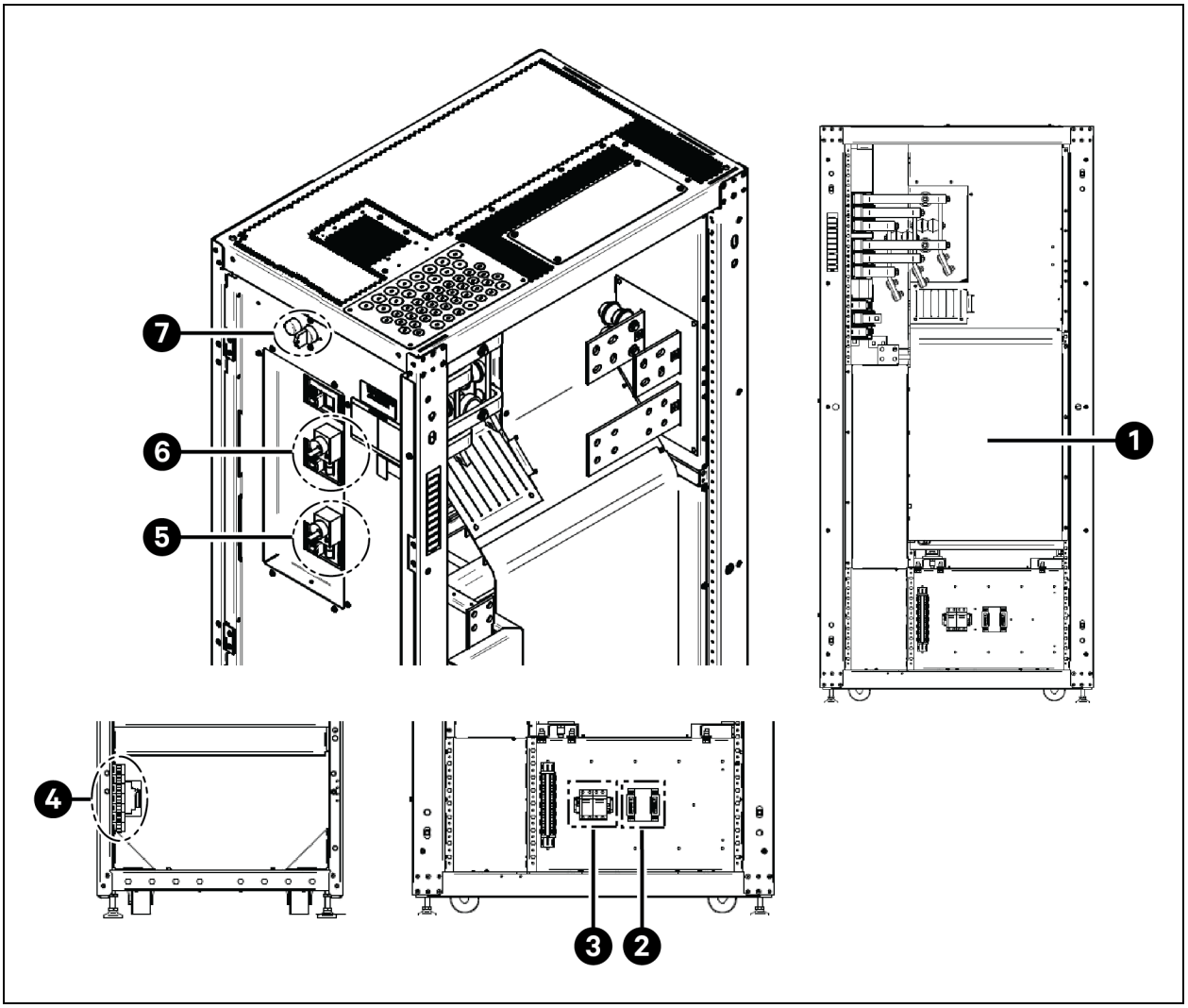


Item	Description	Item	Description
1	System input bus	5	MIB
2	Ground bus	6	MBB
3	Neutral bus	7	BIB
4	Output bus when distribution options are not selected	8	Cable pass-through to UPS

Notes to Figure:

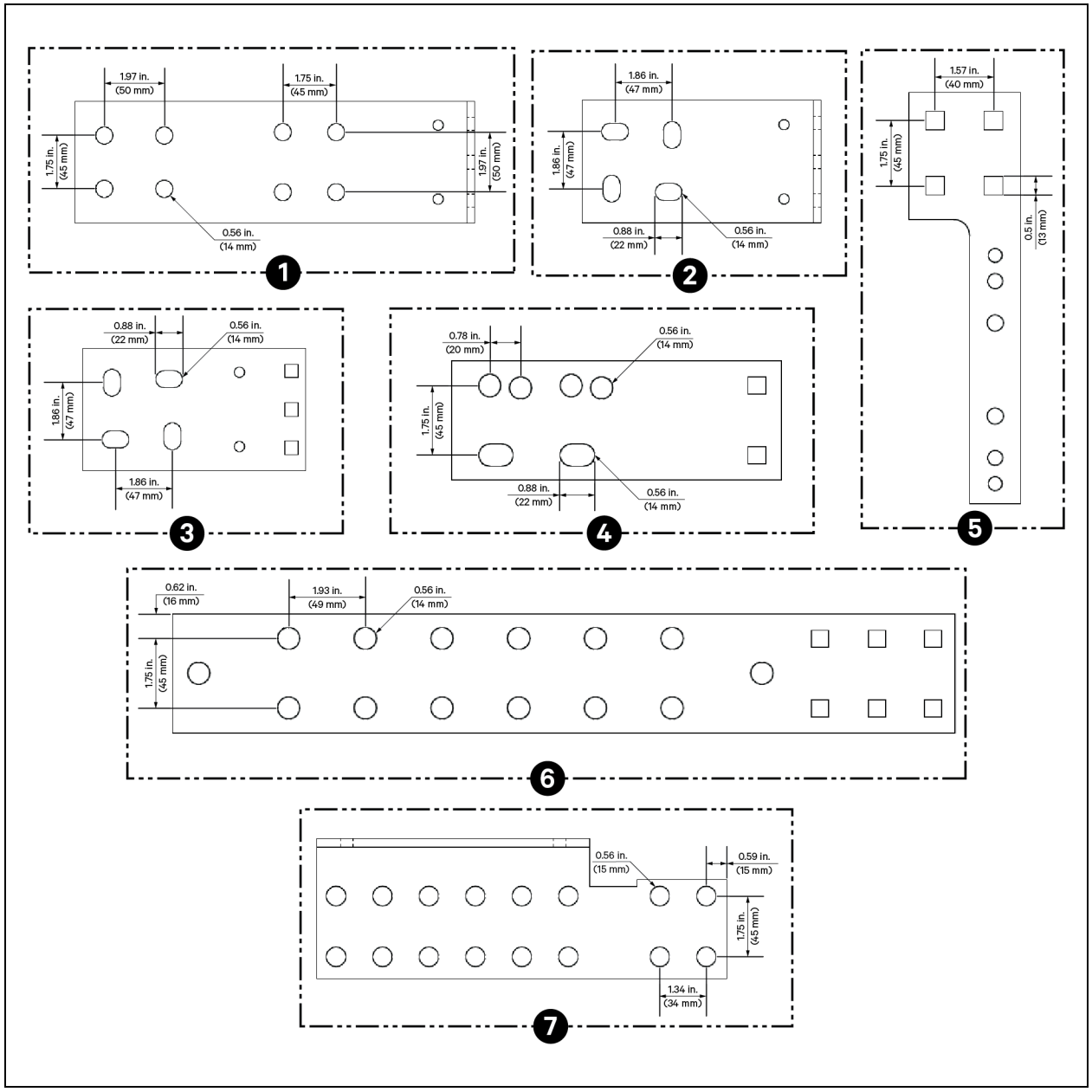
1. The control wiring and the power wiring must be run in separate conduits.
2. All the wiring is to be in accordance with the national and the local electrical codes.

Figure 4.7 Vertiv™ Liebert® Ancillary Medium BDC with Optional SKRU and Transformer



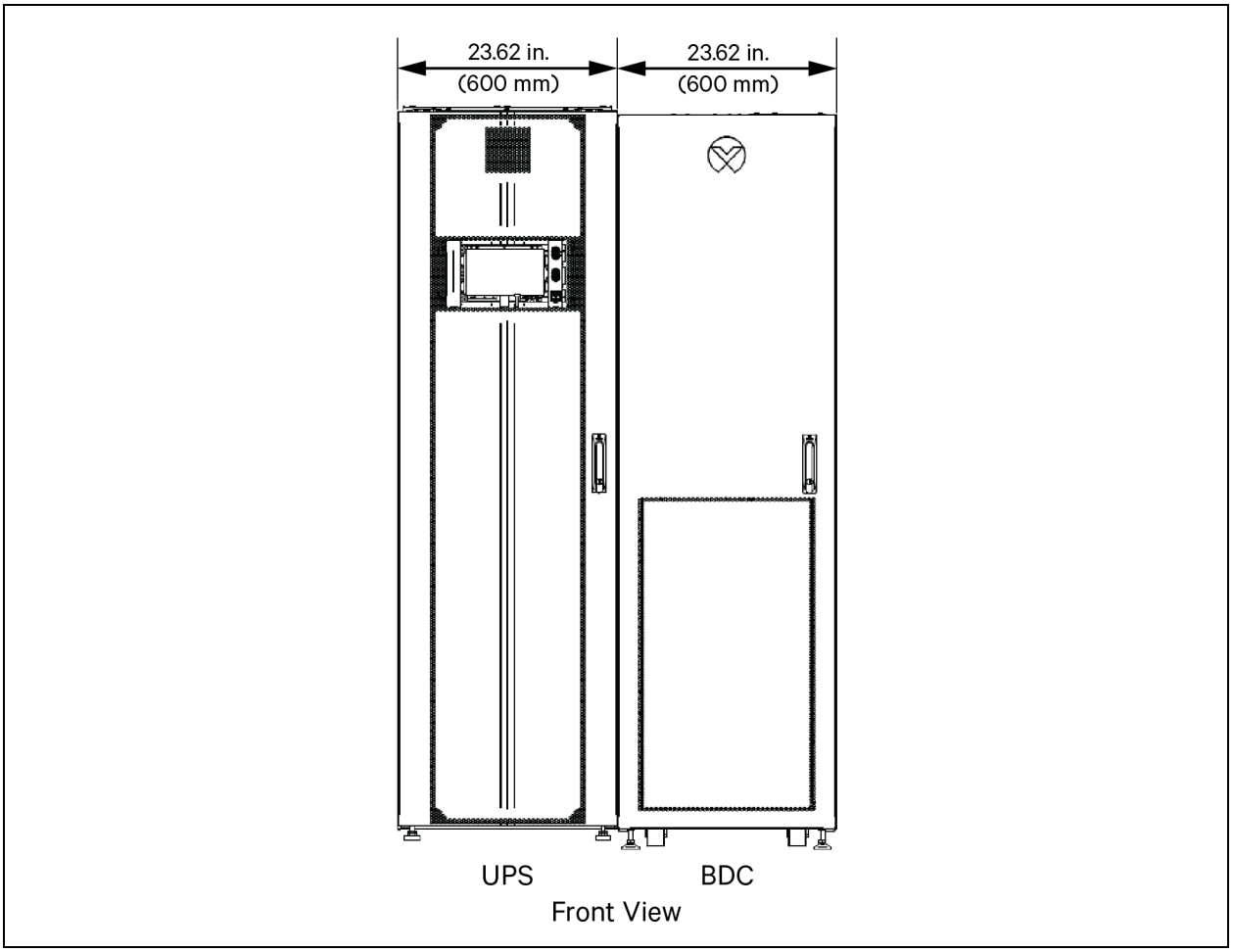
Item	Description	Item	Description
1	Optional transformer (configured as input or output)	5	MIB kirk key tumbler
2	Control wiring transformer	6	MBB kirk key tumbler
3	Control wiring fuses	7	Key operator and lamp
4	TB1 control wiring		

Figure 4.8 Vertiv™ Liebert® Ancillary Medium BDC — Busbars



Item	Description	
1	Input busbar for input transformer option	Phase A
2		Phase B
3		Phase C
4	Input busbar with output transformer and without transformer option	Phase A, Phase B, and Phase C
5	Panelboard neutral busbar	
6	Neutral busbar for subfeed and no distribution option	
7	Ground busbar	

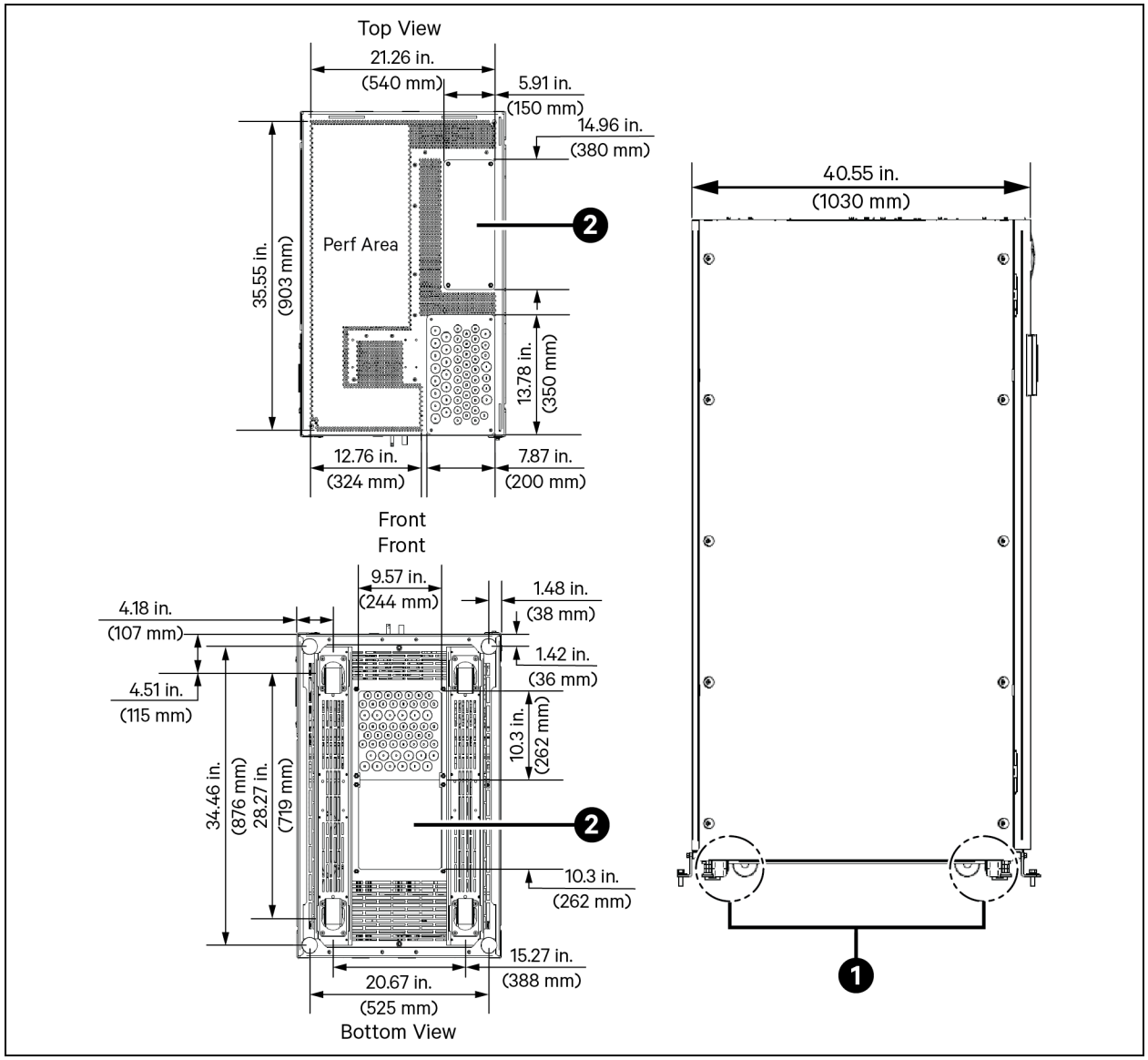
Figure 4.9 Vertiv™ Liebert® Medium UPS with Vertiv™ Liebert® Ancillary Medium BDC — Lineup Arrangement



Notes to Figure:

1. 24 in. (610 mm) minimum clearance above the unit. 36 in. (914 mm) front access required for service. For seismic mounting only, 5 in. (127 mm) in rear for mounting brackets.
2. Keep the cabinet within 15 degrees of vertical.
3. Top and bottom cable entry available through removable access plates. Remove, the punch to suit the conduit size and replace.
4. Unit bottom is structurally adequate for forklift handling.
5. The control wiring and the power wiring must be run in the separate conduits.
6. All the wiring is to be in accordance with national and local electrical codes.
7. BDC must be positioned on the right side of the UPS.

Figure 4.10 Vertiv™ Liebert® Ancillary Medium BDC for Vertiv™ Liebert® Medium UPS — Outline Drawing

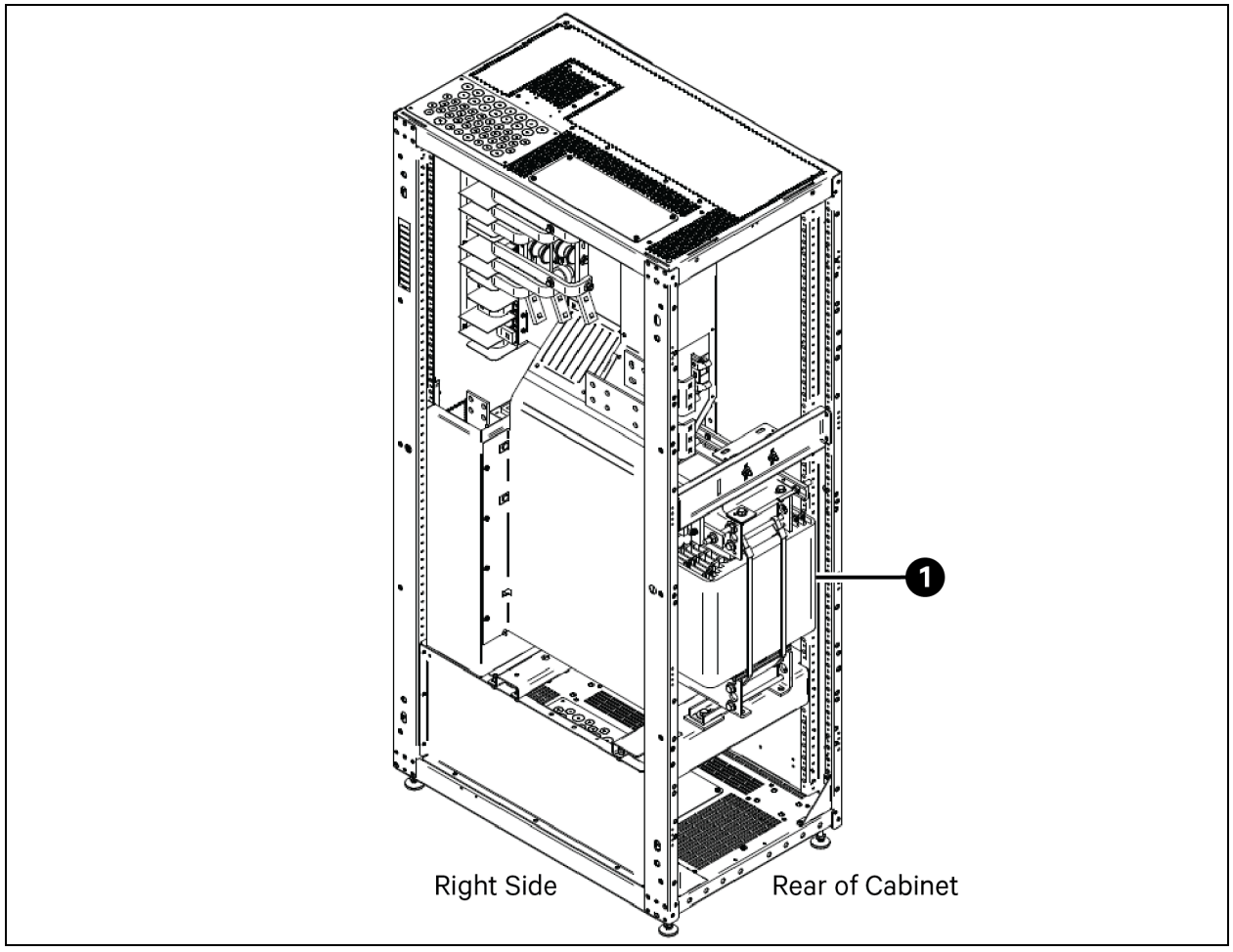


Item	Description
1	Leveling feet
2	Cable entry area

Notes to Figure:

1. 24 in. (610 mm) minimum clearance above unit. 36 in. (914 mm) front access required for service.
2. Keep the cabinet within 15 degrees of vertical.
3. Top and bottom cable entry available through removable access plates. Remove, punch to suit conduit size and replace.
4. The control wiring and the power wiring must be run in separate conduits.
5. All wiring is to be in accordance with national and local electrical codes.

Figure 4.11 Vertiv™ Liebert® Ancillary Medium BDC Transformer Location



Item	Description
1	Transformer

Table 4.1 Wiring for Vertiv™ Liebert® Medium UPS to Vertiv™ Liebert® Ancillary Medium BDC

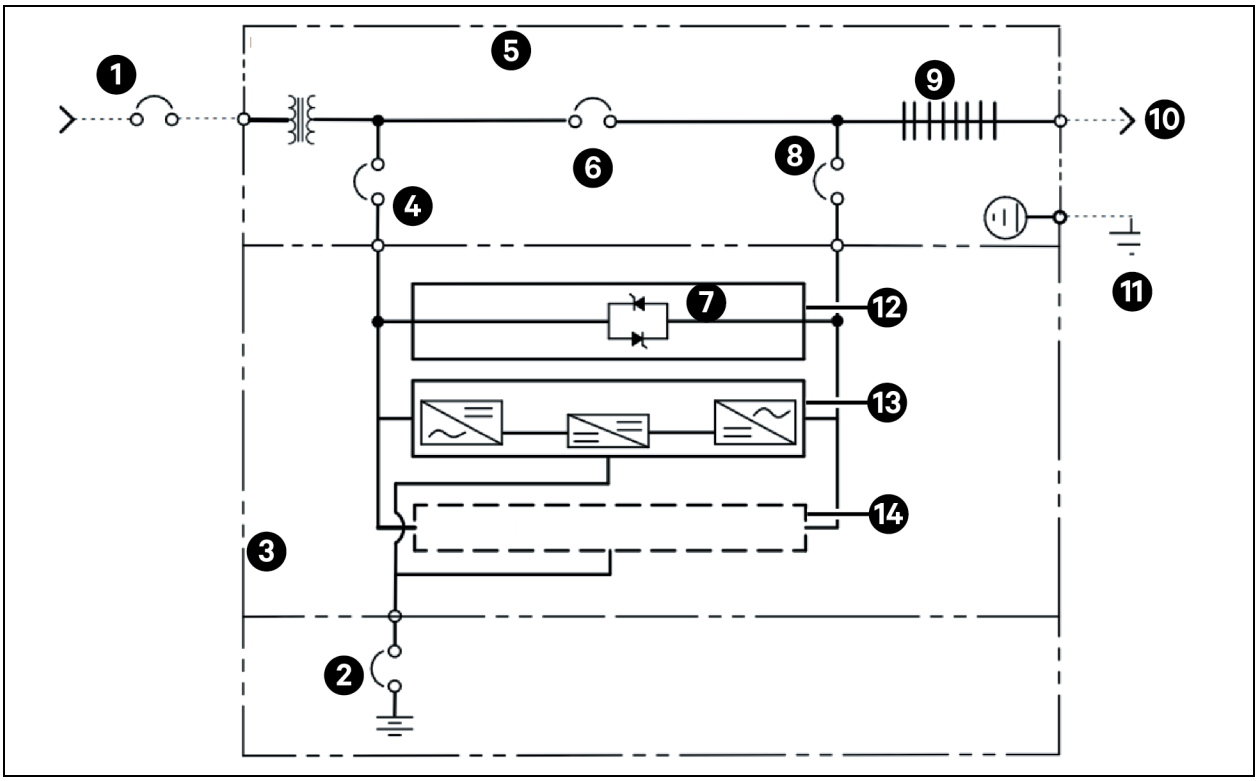
Run	From	To	Conductors
A	Utility AC source	BDC system input bus	Phase A, B, C
B	Utility AC source	BDC system input bus	Neutral
C	BDC BIB	UPS main input	Phase A, B, C
D	BDC BIB	UPS main input	Neutral
E	UPS output	Liebert® Ancillary Medium BDC MIB	Phase A, B, C
F	UPS output	Liebert® Ancillary Medium BDC MIB	Neutral
G	BDC panelboard	Load AC connection	Phase A, B, C
H	BDC panelboard	Load AC connection	Neutral
I	Utility AC source	All ground connections	Ground
J	BDC terminal block TB1	UPS static bypass module J23, J24, and J26	Wiring for KO on Liebert® Ancillary Medium BDC
See Control Wiring on page 14 and Table 3.1 on page 13 for additional details.			

NOTE: Interconnection wiring between the UPS and BDC is supplied by Vertiv when the Liebert® Ancillary Medium BDC and Liebert® Medium UPS are ordered as a system.

Table 4.2 Hardware Torque Values

Hardware in. (mm)	Two Belleville Washers lb-in (Nm)
M10 3/8 (9.5)	240 (27)
M12 1/2 (12.7)	428 (48)

Figure 4.12 Single Input UPS (with External Vertiv™ Liebert® Ancillary Medium BDC and Optional Internal Transformer) — Typical Configuration (Additional Options and Configurations Not Shown Here may be Available)

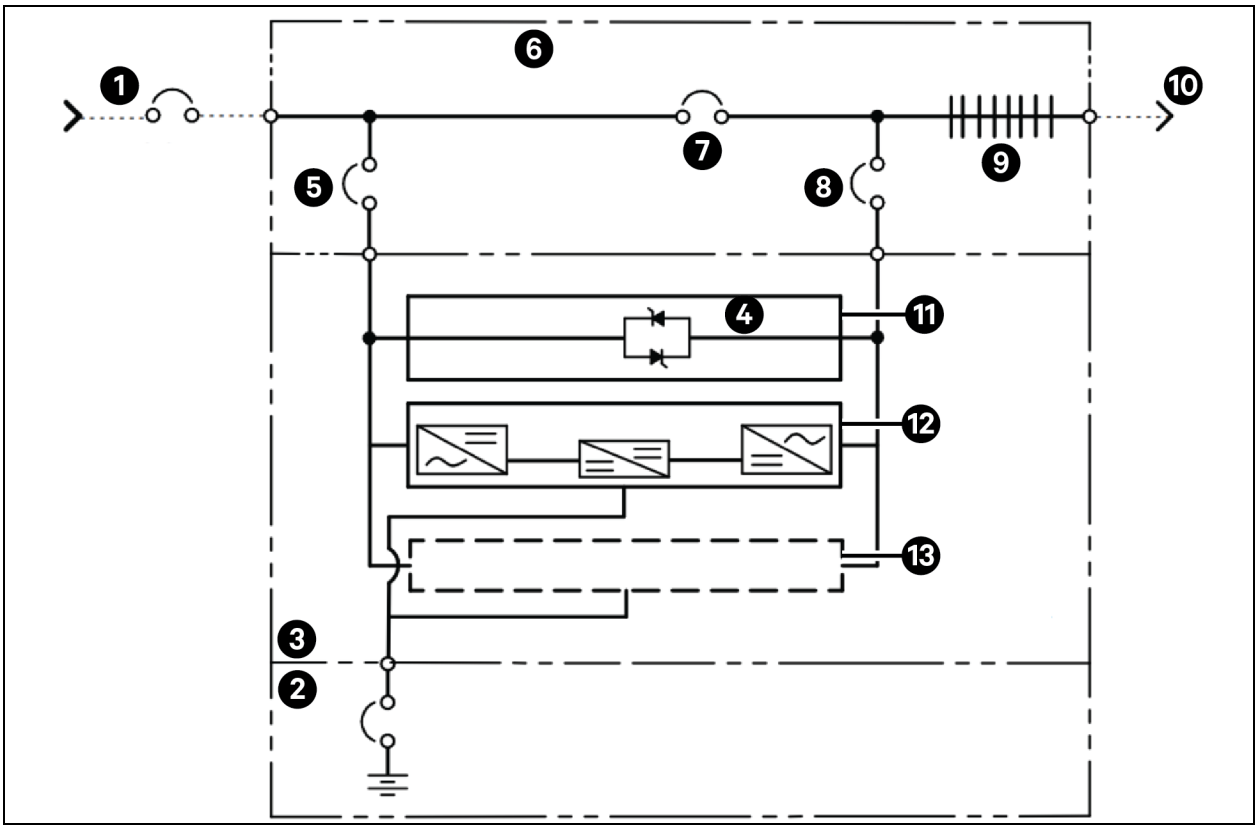


Item	Description	Item	Description
1	*System AC input 3-wire + GND	8	Maintenance isolation breaker (MIB)
2	Battery	9	(Optional) 42 poles, see Note 4
3	UPS cabinet	10	AC output 208 V 4-Wire + GND
4	Bypass isolation breaker (BIB)	11	Local grounding electrode, see Note 1
5	BDC	12	Bypass module
6	Maintenance bypass breaker (MBB)	13	Power module #1
7	Static bypass	14	Power module #N
*External overcurrent protection by others.			

Notes to Figure:

1. Install in accordance with the national and the local electrical codes.
2. UPS system input and output cables must be run in separate conduits.
3. Control wiring must be run in separate conduits.
4. Optional 42 poles, 250 A for 10 kVA to 60 kVA frame only or optional 42 poles 400 A for 20 kVA to 100 kVA frame only.
5. Transformers available are with input voltage of 208 V, 480 V, and 600 V.

Figure 4.13 One-Line Diagram, Single Input 10 kVA to 100 kVA UPS with Three-Breaker Vertiv™ Liebert® Ancillary Medium BDC and Panelboard

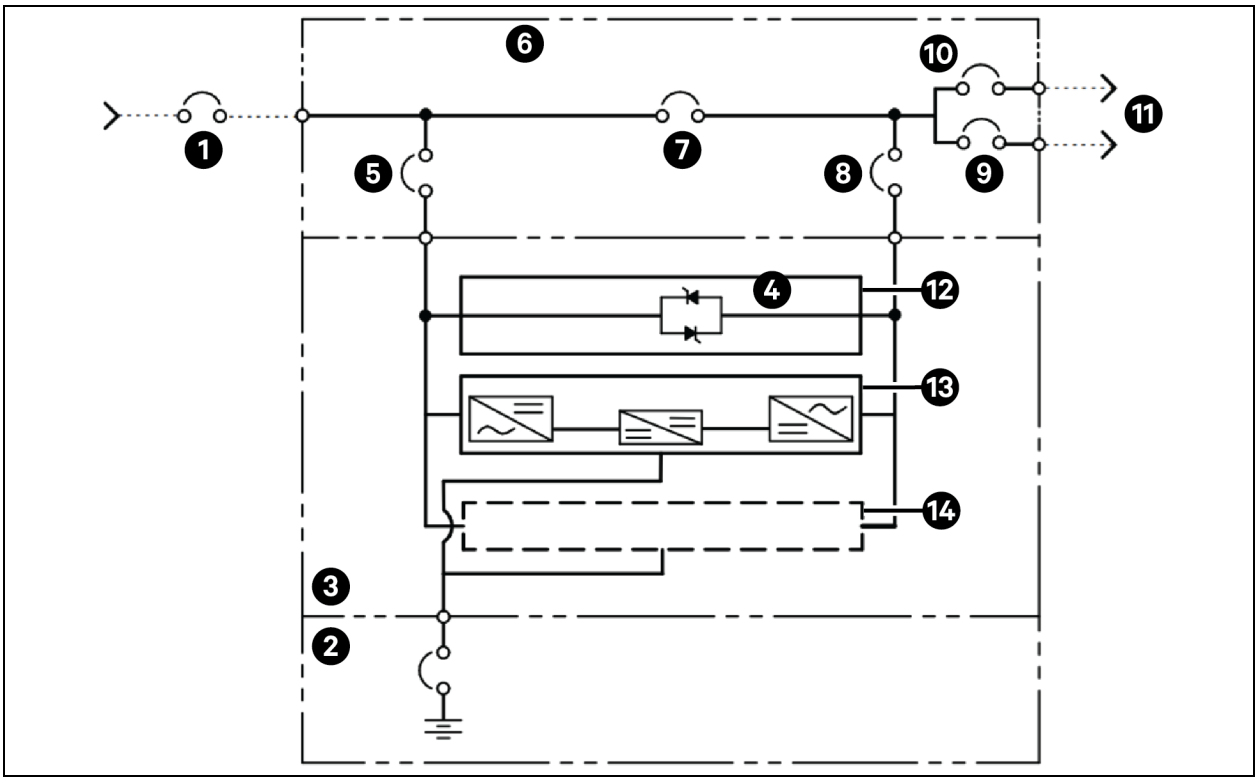


Item	Description	Item	Description
1	*System AC input 4-wire + GND	8	MIB
2	Battery	9	(Optional) 42 poles, see Note 4
3	UPS cabinet	10	AC output 208 V 4-wire + GND
4	Static bypass	11	Bypass module
5	BIB	12	Power module #1
6	BDC	13	Power module #N
7	MBB		
*External overcurrent protection by others.			

Notes to Figure:

1. Install in accordance with the national and the local electrical codes.
2. A neutral is required from the system AC input source.
3. The UPS system input and output cables must be run in separate conduits.
4. The control wiring must be run in separate conduits.
5. Optional 42 poles, 250 A for 10 kVA to 60 kVA frame only or optional 42 poles 400 A for 20 kVA to 100 kVA frame only.

Figure 4.14 One-Line Diagram, Single Input 10 kVA to 100 kVA UPS with Three-Breaker Vertiv™ Liebert® Ancillary Medium BDC and Two Subfeed Breakers

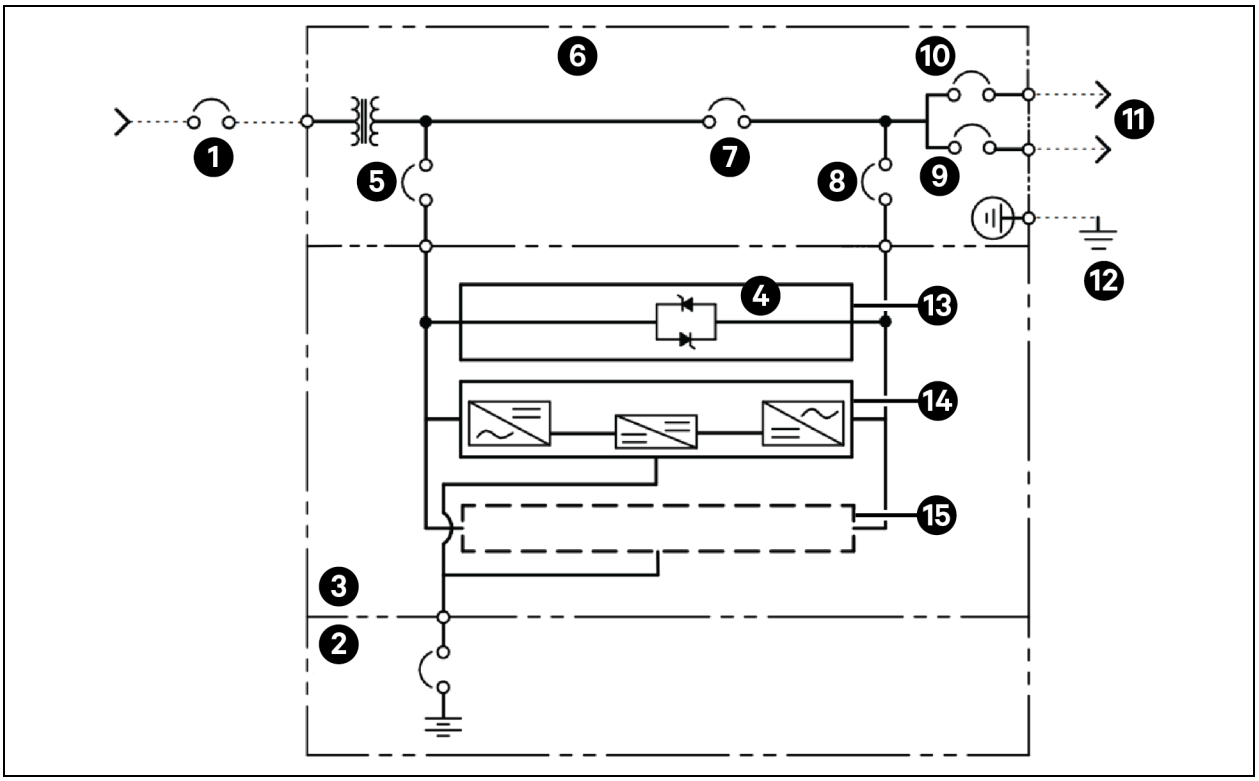


Item	Description	Item	Description
1	*System AC input 4-wire + GND	8	MIB
2	Battery	9	(Optional) 250 A or 400 A, see Note 6
3	UPS cabinet	10	Load distribution breaker (LDB)
4	Static bypass	11	AC output 208 V 4-wire + GND
5	BIB	12	Bypass module
6	BDC	13	Power module #1
7	MBB	14	Power module #N
*External overcurrent protection by others.			

Notes to Figure:

1. Install in accordance with the national and the local electrical codes.
2. The input and the bypass must share the same single source.
3. A neutral is required from the system AC input source. Vertiv recommends a full capacity neutral conductor and grounding conductors.
4. The UPS system input and output cables must be run in separate conduits.
5. The control wiring must be run in separate conduits.
6. Optional one to two 250 A or 400 A subfeed breakers.

Figure 4.15 One-Line Diagram, Single Input 60 kVA to 100 kVA UPS with Three-Breaker Vertiv™ Liebert® Ancillary Medium BDC, Input Isolation Transformer and Two Subfeed Breakers

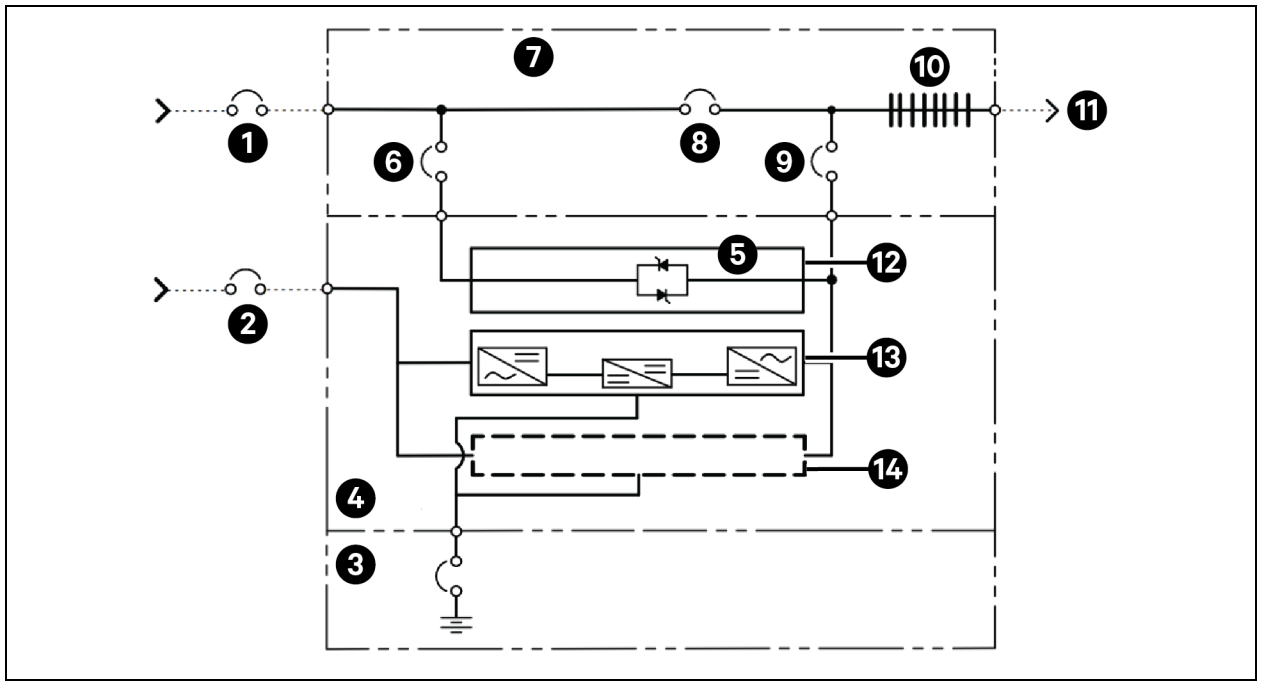


Item	Description	Item	Description
1	*System AC input 3-Wire + GND	9	(Optional) 250 A or 400 A, see Note 5
2	Battery	10	LDB
3	UPS cabinet	11	AC output 208 V 4-Wire + GND
4	Static bypass	12	Local grounding electrode, see Note 1
5	BIB	13	Bypass module
6	BDC	14	Power module #1
7	MBB	15	Power module #N
8	MIB		
*External overcurrent protection by others.			

Notes to Figure:

1. Install in accordance with the national and the local electrical codes.
2. The Input and the bypass must share the same single source.
3. The UPS system input and output cables must be run in separate conduits.
4. The control wiring must be run in separate conduits.
5. Optional one to two 250 A or 400 A subfeed breakers.
6. Optional Transformers are available with input voltage 208V/220V/480V/600V.

Figure 4.16 One-Line Diagram, Dual Input 10 kVA to 100 kVA UPS with Three-Breaker Vertiv™ Liebert® Ancillary Medium BDC and Panelboard

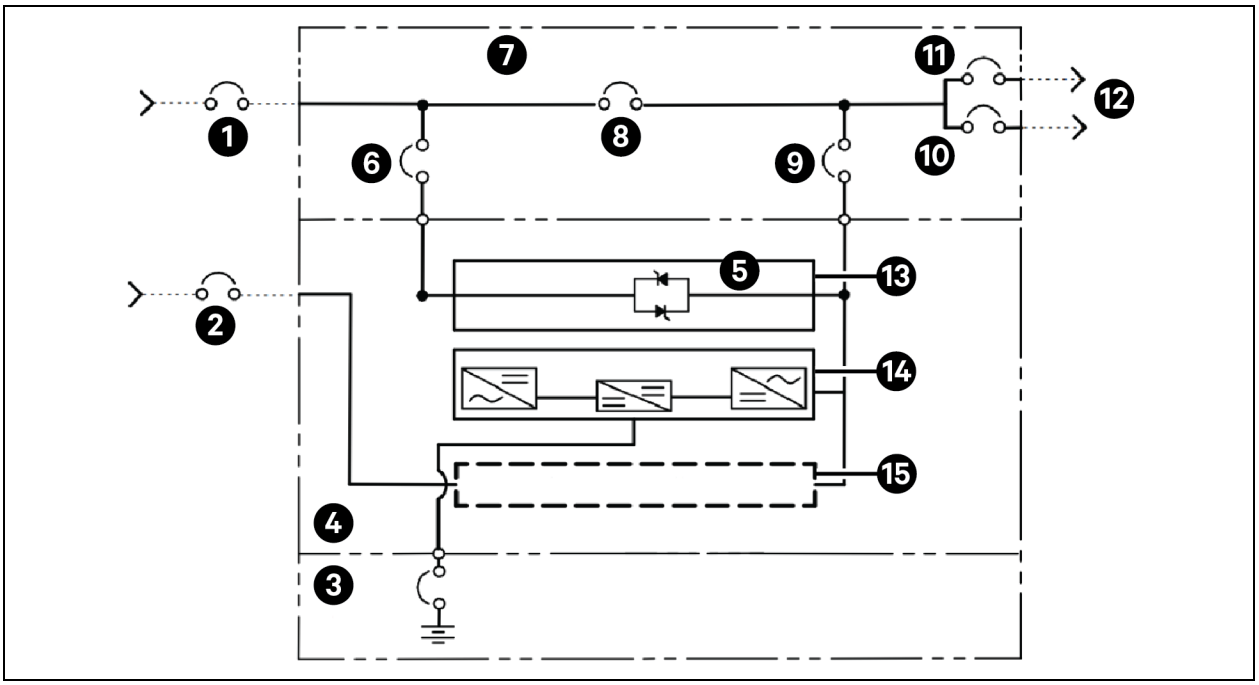


Item	Description	Item	Description
1	*Bypass AC input 4-wire + GND	8	MBB
2	*Rectifier AC input 4-wire + GND, see Note 7	9	MIB
3	Battery	10	(Optional) 42 poles, see Note 6
4	UPS cabinet	11	AC output 208 V 4-wire + GND
5	Static bypass	12	Bypass module
6	BIB	13	Power module #1
7	BDC	14	Power module #N
*External overcurrent protection by others.			

Notes to Figure:

1. Install in accordance with the national and the local electrical codes.
2. The Input and the bypass must share the same single source.
3. A neutral is required from the system AC input source. Vertiv recommends a full capacity neutral conductor.
4. The bypass and the rectifier inputs and output cables must be run in separate conduits.
5. The Control wiring must be run in separate conduits.
6. Optional 42 poles, 250 A for 10 kVA to 60 kVA frame only or optional 42 poles 400 A for 20 kVA to 100 kVA frame only.
7. The customer must supply shunt trip breaker with 24 V coil.
8. Remove the bypass jumper busbars inside the UPS to configure a dual input system.

Figure 4.17 One-Line Diagram, Dual Input 10 kVA to 100 kVA UPS with Three-Breaker Vertiv™ Liebert® Ancillary Medium BDC and Two Subfeed Breakers

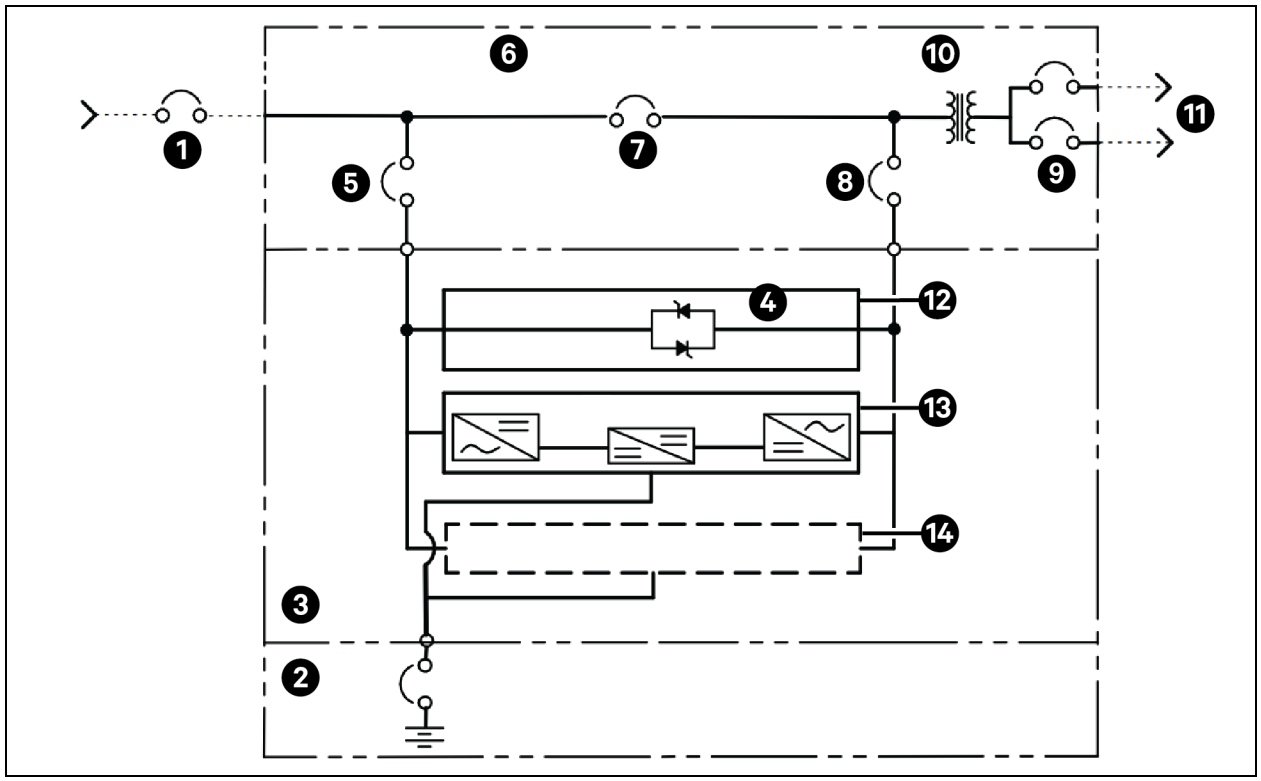


Item	Description	Item	Description
1	*Bypass AC input 4-wire + GND	9	MIB
2	*Rectifier AC input 4-wire + GND, see Note 7	10	(Optional) (2) LDB, see Note 6
3	Battery	11	LDB
4	UPS cabinet	12	AC output 208 V 4-wire + GND
5	Static bypass	13	Bypass module
6	BIB	14	Power module #1
7	BDC	15	Power module #N
8	MBB		
*External overcurrent protection by others.			

Notes to Figure:

1. Install in accordance with the national and the local electrical codes.
2. The Input and the bypass must share the same single source.
3. A neutral is required from the system AC input source. Vertiv recommends a full capacity neutral conductor and grounding conductors.
4. The bypass and the rectifier inputs and output cables must be run in separate conduits.
5. Control wiring must be run in separate conduits.
6. Optional (2) 225 A LDB for 60 kVA to 100 kVA frame only.
7. The Customer must supply shunt trip breaker with 24 V coil.
8. Remove the bypass jumper busbars inside the UPS to configure a dual input system.

Figure 4.18 One-Line Diagram, Single Input 50 kVA to 150 kVA UPS with Three-Breaker Vertiv™ Liebert® Ancillary Medium BDC, Output Transformer and Two Subfeed Breakers

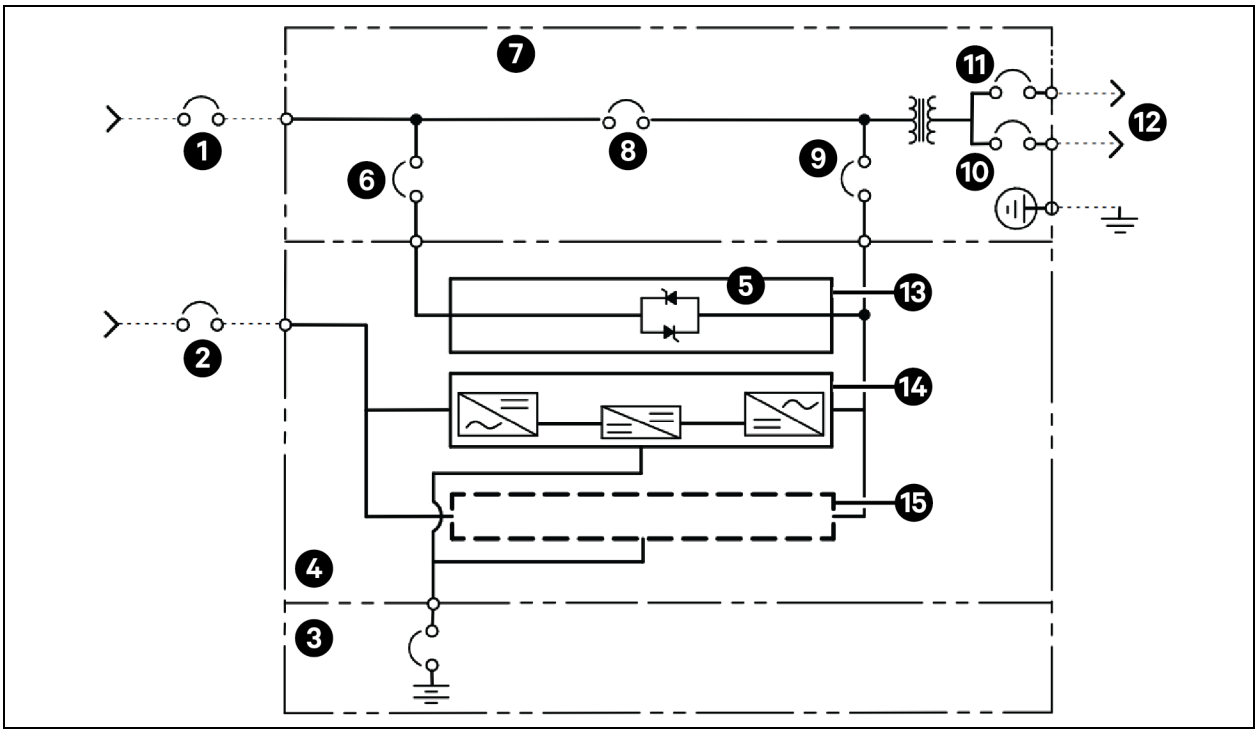


Item	Description	Item	Description
1	*System AC input 4-wire + GND	8	MIB
2	Battery	9	Subfeed breakers, see Note 6
3	UPS cabinet	10	LDB
4	Static bypass	11	AC output 208 V 4-wire + GND
5	BIB	12	Bypass module
6	BDC	13	Power module #1
7	MBB	14	Power module #N
*External overcurrent protection by others.			

Notes to Figure:

1. Install in accordance with the national and the local electrical codes.
2. The input and the bypass must share the same single source.
3. The UPS system input and output cables must be run in separate conduits.
4. The control wiring must be run in separate conduits.
5. Optional one to two 250 A or 400 A subfeed breakers.

Figure 4.19 One-Line Diagram, Dual Input 50 kVA to 150 kVA UPS with Three-Breaker Vertiv™ Liebert® Ancillary Medium BDC and Two Subfeed Breakers



Item	Description	Item	Description
1	*Bypass AC input 4-wire + GND	9	MIB
2	*Rectifier AC input 4-wire + GND, see Note 7	10	Subfeed breakers, see Note 6
3	Battery	11	LDB
4	UPS cabinet	12	AC output 208 V 4-wire + GND
5	Static bypass	13	Bypass module
6	BIB	14	Power module #1
7	BDC	15	Power module #N
8	MBB		
*External overcurrent protection by others.			

Notes to Figure:

1. Install in accordance with the national and the local electrical codes.
2. The Input and the bypass must share the same single source.
3. The bypass and the rectifier inputs and output cables must be run in separate conduits.
4. Control wiring must be run in separate conduits.
5. Optional one to two 250 A or 400 A subfeed breakers.
6. The Customer must supply shunt trip breaker with 24 V coil.
7. Remove the bypass jumper busbars inside the UPS to configure a dual input system.

5 Specifications

Table 5.1 Physical Standards and Parameters

BDC Parameters	Values
Standard color	Black (ZP-7021)
Front door opening (for serviceability)	More than 180 degrees
Degree of protection for UPS enclosure	IP20 (with and without front door open)
Minimum clearance, top	24 in. (610 mm)
Minimum clearance, back	0 in. (5 in. [127 mm] when seismic brackets are used)
Minimum clearance, sides	0 in.
Cable entrance	Top or bottom
Standards and conformity	UL 1778 5th Ed.; CSA 22.2 107.3 -14 FCC Part 15, Class A; ISTA Procedure 1H; WEEE; IBC 2012/CBC 2010
Environmental	
Storage temperature range, °F (°C)	-13 °F to 158 °F (-25 °C to 70 °C)
Operating temperature range, °F (°C)	32 °F to 104 °F (0 °C to 40 °C)
Relative humidity	up to 95% non-condensing (operating and non-operating)
Maximum altitude above MSL, ft. (m)	4920 ft. (1500 m) (as per IEC 62040/3) - 1% maximum kW derate/328.1 ft. (100 m) rise between 4920 ft. to 9840 ft. (1500 m to 3000 m)

Only Siemens Type BL and BLH branch breakers, 100 A max are approved for use in the panel boards used in the Vertiv™ Liebert® Ancillary Medium BDC.

Table 5.2 Vertiv™ Liebert® Ancillary Medium BDC 60 kVA to 100 kVA - Mechanical Characteristics

Rated Power, kVA	10 kVA to 250 kVA						
Dimensions, W x D x H, in. (mm)	23.625 x 39.375 x 78.75 (600 x 1000 x 2000)						
Weight, lbs (kg)							
Transformer Options	Distribution Options						
	1x250 A Panelboard	1x400 A Panelboard	1x250 A Subfeed	2x250 A Subfeed	1x400 A Subfeed	2x400 A Subfeed	No Distribution Selection
208 V to 208 V input XFMR 10 kVA to 20 kVA	916 (415.5)	916 (415.5)	895.5 (406.22)	901 (408.69)	-	-	890 (403.7)
208 V to 208 V input XFMR 25 kVA to 40 kVA	1077 (488.52)	1077 (488.52)	1056.5 (479.22)	1062 (481.72)	1062.2 (481.81)	1084.6 (491.97)	1051 (476.73)
208 V to 208 V input XFMR 45 kVA to 60 kVA	1314.65 (596.32)	1314.65 (596.32)	1294.15 (587.02)	1299.65 (589.52)	1299.85 (589.61)	1322.25 (599.77)	1288.65 (584.53)
208 V to 208 V input XFMR 75 kVA to 100 kVA	-	1602 (726.66)	-	1587 (719.86)	1587.2 (719.95)	1609.6 (730.11)	-
480 V to 208 V input XFMR 10 kVA to 20 kVA	937.6	937.6	917.1	922.6	-	-	911.6

Table 5.2 Vertiv™ Liebert® Ancillary Medium BDC 60 kVA to 100 kVA - Mechanical Characteristics (continued)

Rated Power, kVA	10 kVA to 250 kVA						
	(425.29)	(425.29)	(415.99)	(418.49)			(413.5)
480 V to 208 V input XFMR 25 kVA to 40 kVA	1076.21 (488.17)	1076.21 (488.17)	1055.71 (478.87)	1061.21 (481.36)	1061.41 (481.45)	1083.81 (491.61)	1050.21 (476.37)
480 V to 208 V input XFMR 45 kVA to 60 kVA	1218.32 (552.63)	1218.32 (552.63)	1197.82 (543.33)	1203.32 (545.82)	1203.52 (545.91)	1225.92 (556.07)	1192.32 (540.83)
480 V to 208 V input XFMR 75 kVA to 80 kVA	-	1510.3 (685.06)	-	1495.3 (678.26)	1495.5 (678.35)	1517.9 (688.51)	-
480 V to 208 V input XFMR 90 kVA to 100 kVA	-	1615.6 (732.83)	-	1600.6 (726.02)	1600.8 (726.12)	1623.2 (736.28)	-
600 V to 208 V input XFMR 10 kVA to 20 kVA	951.55 (431.62)	951.55 (431.62)	931.05 (422.32)	936.55 (424.81)	-	-	925.55 (419.82)
600 V to 208 V input XFMR 25 kVA to 40 kVA	1073.96 (487.14)	1073.96 (487.14)	1053.46 (477.85)	1058.96 (480.34)	1059.16 (480.43)	1081.56 (490.59)	1047.96 (475.35)
600 V to 208 V input XFMR 45 kVA to 60 kVA	1306.45 (592.6)	1306.45 (592.6)	1285.95 (583.3)	1291.45 (585.8)	1291.65 (585.89)	1314.05 (596.05)	1280.45 (580.81)
600 V to 208 V input XFMR 75 kVA to 100 kVA	-	1669.1 (757.1)	-	1654.1 (750.29)	1654.3 (750.38)	1676.7 (760.54)	-
480 V to 208 V output XFMR 20 kVA	-	-	917.1 (415.99)	-	-	-	-
480 V to 208 V output XFMR 30 kVA to 50 kVA	-	-	1055.71 (478.87)	1061.21 (481.36)	-	-	-
480 V to 208 V output XFMR 60 kVA	-	-	1197.82 (543.33)	1203.32 (545.82)	-	-	-
480 V to 208 V output XFMR 80 kVA to 100 kVA	-	-	1489.8 (675.77)	1495.3 (678.26)	1495.5 (678.35)	1517.9 (688.51)	-
480 V to 208 V output XFMR 120 kVA	-	-	-	1600.6 (726.02)	-	1623.2 (736.28)	-
480 V to 208 V output XFMR 150 kVA	-	-	-	1679.8 (761.95)	-	1702.4 (772.2)	-
No transformer selection 10 kVA to 250 kVA	652 (295.74)	652 (295.74)	631.5 (286.44)	637 (288.94)	637.2 (289.03)	659.6 (299.19)	-
Color	ZP 7021 (Black)						
Protection Degree IEC (60529)	IP20 (finger-proof with front doors open or closed)						

Table 5.3 Liebert® Ancillary Medium BDC Heat Dissipation

Liebert® Ancillary Medium BDC Rating kVA	Liebert® Ancillary Medium BDC Heat Dissipation 208:208 Input BTU/hr (kW)	Liebert® Ancillary Medium BDC Heat Dissipation 480:208 Input BTU/hr (kW)	Liebert® Ancillary Medium BDC Heat Dissipation 600:208 Input BTU/hr (kW)	Liebert® Ancillary Medium BDC Heat dissipation 480:208 Output BTU/hr (kW)
10	1307 (0.383)	1555 (0.455)	1574 (0.461)	1233 (0.361)
15	1980 (0.58)	2356 (0.69)	2384 (0.698)	1850 (0.542)
20	2615 (0.766)	3111 (0.911)	3148 (0.922)	2467 (0.723)
25	3599 (1.054)	3162 (0.926)	3173 (0.93)	3084 (0.904)
30	4294 (1.258)	3773 (1.105)	3786 (1.109)	2992 (0.876)
40	5726 (1.678)	5030 (1.474)	5049 (1.479)	3989 (1.169)
45	5955 (1.745)	5360 (1.57)	5258 (1.54)	4488 (1.315)
50	6617 (1.939)	5955 (1.745)	5842 (1.712)	4987 (1.461)
60	7941 (2.327)	7147 (2.094)	7010 (2.054)	5659 (1.658)
75	7698 (2.256)	8224 (2.41)	6130 (1.796)	7074 (2.073)
80	8212 (2.406)	8772 (2.57)	6539 (1.916)	6712 (1.967)
90	9238 (2.707)	8316 (2.437)	7356 (2.155)	7552 (2.213)
100	10265 (3.008)	9240 (2.707)	8174 (2.395)	8391 (2.459)
120	-	-	-	9339 (2.737)
150	-	-	-	11674 (3.421)

*Heat dissipation at full load.

5.1 Electrical Characteristics

NOTE: The breakers and cables used must be in accordance with the NEC ANSI/NFPA 70. A disconnect breaker must be provided for the AC input, the bypass, and the AC output. Recommended cable sizes are suitable for operation at a maximum temperature of 104 °F (40 °C).

Input Current with XFMR

Table 5.4 Vertiv™ Liebert® Ancillary Medium BDC, 600 VAC Input, 208 VAC Output, Single Input, with 600V:208V Input Transformer, Input Current

BDC Rating kVA	System Input Current, A, Max	Phase	Recommended Upstream Protection, A	Copper Wire		Aluminum Wire		Bolt Size
				Qty.	Size	Qty.	Size	
10	12	3W+G	15	1	10 AWG	1	10 AWG	M12
15	18	3W+G	25	1	10 AWG	1	10 AWG	M12
20	24	3W+G	30	1	10 AWG	1	10 AWG	M12
25	30	3W+G	40	1	8 AWG	1	8 AWG	M12
30	36	3W+G	45	1	8 AWG	1	6 AWG	M12
40	48	3W+G	60	1	4 AWG	1	3 AWG	M12
45	54	3W+G	70	1	4 AWG	1	3 AWG	M12
50	60	3W+G	80	1	4 AWG	1	2 AWG	M12
60	72	3W+G	90	1	3 AWG	1	1/0	M12
75	89	3W+G	110	1	1 AWG	1	2/0	M12
80	95	3W+G	125	1	1 AWG	1	2/0	M12
90	107	3W+G	150	1	1/0	1	3/0	M12
100	119	3W+G	150	1	2/0	1	4/0	M12

Table 5.5 Liebert® Ancillary Medium BDC, 480 VAC Input, 208 VAC Output, Single Input, with 480V:208V Input Transformer, Input Current

BDC Rating kVA	System Input Current, A, Max	Phase	Recommended Upstream Protection, A	Copper Wire		Aluminum Wire		Bolt Size
				Qty.	Size	Qty.	Size	
10	15	3W+G	20	1	10 AWG	1	10 AWG	M12
15	23	3W+G	30	1	10 AWG	1	10 AWG	M12
20	30	3W+G	40	1	8 AWG	1	8 AWG	M12
25	38	3W+G	50	1	8 AWG	1	6 AWG	M12
30	45	3W+G	60	1	6 AWG	1	4 AWG	M12
40	60	3W+G	80	1	4 AWG	1	2 AWG	M12
45	67	3W+G	90	1	3 AWG	1	2 AWG	M12

Table 5.5 Liebert® Ancillary Medium BDC, 480 VAC Input, 208 VAC Output, Single Input, with 480V:208V Input Transformer, Input Current (continued)

BDC Rating kVA	System Input Current, A, Max	Phase	Recommended Upstream Protection, A	Copper Wire		Aluminum Wire		Bolt Size
				Qty.	Size	Qty.	Size	
50	75	3W+G	100	1	3 AWG	1	1/0	M12
60	89	3W+G	110	1	1 AWG	1	2/0	M12
75	112	3W+G	150	1	1/0	1	3/0	M12
80	119	3W+G	150	1	2/0	1	4/0	M12
90	134	3W+G	175	1	2/0	1	4/0	M12
100	149	3W+G	200	1	4/0	1	250 kcmil	M12

Table 5.6 Vertiv™ Liebert® Ancillary Medium BDC, 208 VAC Input, 208 VAC Output, Single Input, with 208V:208V Input Transformer, Input Current

BDC Rating kVA	System Input Current, A, Max	Phase	Recommended Upstream Protection, A	Copper Wire		Aluminum Wire		Bolt Size
				Qty.	Size	Qty.	Size	
10	36	3W+G	45	1	8 AWG	1	6 AWG	M12
15	53	3W+G	70	1	4 AWG	1	3 AWG	M12
20	71	3W+G	90	1	3 AWG	1	1/0	M12
25	89	3W+G	110	1	1 AWG	1	2/0	M12
30	106	3W+G	150	1	1/0	1	3/0	M12
40	141	3W+G	175	1	4/0	1	250 kcmil	M12
45	158	3W+G	200	1	4/0	1	250 kcmil	M12
50	176	3W+G	225	1	4/0	1	250 kcmil	M12
60	223	3W+G	300	1	350 kcmil	1	500 kcmil	M12
75	278	3W+G	350	1	500 kcmil	2	4/0	M12
80	297	3W+G	400	2	4/0	2	250 kcmil	M12
90	334	3W+G	450	2	4/0	2	300 kcmil	M12
100	371	3W+G	450	2	250 kcmil	2	350 kcmil	M12

Table 5.7 Vertiv™ Liebert® Ancillary Medium BDC, 480 VAC Input, 208 VAC Output, Single Input, with 480V:208V Output Transformer, Input Current

BDC Rating kVA	System Input Current, A, Max	Phase	Recommended Upstream Protection, A	Copper Wire		Aluminum Wire		Bolt Size
				Qty.	Size	Qty.	Size	Qty.
20	30	3W+G	40	1	8 AWG	1	8 AWG	M12
30	45	3W+G	60	1	6 AWG	1	4 AWG	M12
40	60	3W+G	80	1	4 AWG	1	2 AWG	M12
50	75	3W+G	100	1	3 AWG	1	1/0	M12
60	93	3W+G	125	1	1 AWG	1	2/0	M12
80	119	3W+G	150	1	2/0	1	4/0	M12
90	134	3W+G	175	1	2/0	1	4/0	M12
100	155	3W+G	200	1	4/0	1	250 kcmil	M12
120	186	3W+G	225	1	250 kcmil	1	350 kcmil	M12
150	232	3W+G	300	1	350 kcmil	1	500 kcmil	M12

Output Current with Output XFMR

Table 5.8 Liebert® Ancillary Medium BDC, 480 VAC Input, 208 VAC Output, Single Input, with 480V:208V Input Transformer, Output Current

BDC Rating kVA	System Output Current, A, Max	Phase	Copper Wire		Aluminum Wire		Bolt Size
			Qty.	Size	Qty.	Size	
20	56	3W+N+G	1	3 AWG	1	2 AWG	M12
30	83	3W+N+G	1	1 AWG	1	2/0	M12
40	111	3W+N+G	1	2/0	1	4/0	M12
50	139	3W+N+G	1	4/0	1	350 kcmil	M12
60	167	3W+N+G	1	250 kcmil	1	350 kcmil	M12
80	222	3W+N+G	2	2/0	2	4/0	M12
90	250	3W+N+G	2	4/0	2	250 kcmil	M12
100	278	3W+N+G	2	4/0	2	300 kcmil	M12
120	333	3W+N+G	2	350 kcmil	3	4/0	M12
150	416	3W+N+G	2	500 kcmil	3	300 kcmil	M12

Input Current without XFMR

Table 5.9 Vertiv™ Liebert® Ancillary Medium BDC, 208 VAC Input, Single Input, Main, without Transformer, Input Current (208 VAC Input, Dual Input,Rectifier, without Transformer, Input Current)

BDC Rating kVA	System Main Input Current, A, Max	Phase	Recommended Upstream Protection, A	Copper Wire		Aluminum Wire		Bolt Size
				Qty.	Size	Qty.	Size	
10	34	3W+N+G	45	1	6 AWG	1	4 AWG	M12
15	51	3W+N+G	70	1	3 AWG	1	2 AWG	M12
20	69	3W+N+G	90	1	2 AWG	1	1/0	M12
25	86	3W+N+G	110	1	1/0	1	4/0	M12
30	103	3W+N+G	150	1	4/0	1	250 kcmil	M12
40	137	3W+N+G	175	1	250 kcmil	1	350 kcmil	M12
45	154	3W+N+G	200	1	250 kcmil	1	350 kcmil	M12
50	172	3W+N+G	225	1	350 kcmil	1	500 kcmil	M12
60	218	3W+N+G	300	2	4/0	2	250 kcmil	M12
75	272	3W+N+G	350	2	4/0	2	300 kcmil	M12
80	290	3W+N+G	350	2	250 kcmil	3	4/0	M12
90	326	3W+N+G	400	2	350 kcmil	2	500 kcmil	M12
100	363	3W+N+G	450	2	350 kcmil	2	500 kcmil	M12

Table 5.10 Liebert® Ancillary Medium BDC, 400 VAC Input, Single Input, Main, without Transformer, Input Current (400 VAC Input, Dual Input,Rectifier, without Transformer, Input Current)

BDC Rating kVA	System Main Input Current, A, Max	Phase	Recommended Upstream Protection, A	Copper Wire		Aluminum Wire		Bolt Size
				Qty.	Size	Qty.	Size	
20	36	3W+N+G	45	1	6 AWG	1	4 AWG	M12
30	54	3W+N+G	70	1	3 AWG	1	2 AWG	M12
40	72	3W+N+G	90	1	2 AWG	1	1/0	M12
50	90	3W+N+G	110	1	1/0	1	4/0	M12
60	110	3W+N+G	150	1	4/0	1	250 kcmil	M12
80	144	3W+N+G	175	1	4/0	1	350 kcmil	M12
90	162	3W+N+G	200	1	250 kcmil	1	350 kcmil	M12
100	183	3W+N+G	225	1	350 kcmil	1	500 kcmil	M12
120	220	3W+N+G	300	2	4/0	2	250 kcmil	M12
150	274	3W+N+G	350	2	4/0	2	300 kcmil	M12
180	329	3W+N+G	400	2	250 kcmil	3	4/0	M12
200	366	3W+N+G	450	2	350 kcmil	2	500 kcmil	M12

Table 5.11 Vertiv™ Liebert® Ancillary Medium BDC, 480 VAC Input, Single Input, Main, without Transformer, Input Current (480 VAC Input, Dual Input,Rectifier, without Transformer, Input Current)

BDC Rating kVA	System Main Input Current, A, Max	Phase	Recommended Upstream Protection, A	Copper Wire		Aluminum Wire		Bolt Size
				Qty.	Size	Qty.	Size	
20	29	3W+N+G	40	1	8 AWG	1	6 AWG	M12
30	44	3W+N+G	60	1	4 AWG	1	3 AWG	M12
40	58	3W+N+G	80	1	3 AWG	1	1 AWG	M12
50	73	3W+N+G	90	1	1 AWG	1	2/0	M12
60	91	3W+N+G	110	1	2/0	1	4/0	M12
80	116	3W+N+G	150	1	4/0	1	250 kcmil	M12
90	131	3W+N+G	175	1	4/0	1	350 kcmil	M12
100	152	3W+N+G	200	1	250 kcmil	1	350 kcmil	M12
120	182	3W+N+G	225	2	2/0	2	4/0	M12
150	227	3W+N+G	300	2	4/0	2	250 kcmil	M12
180	273	3W+N+G	350	2	4/0	2	300 kcmil	M12
200	303	3W+N+G	400	2	250 kcmil	3	4/0	M12
225	341	3W+N+G	450	2	350 kcmil	2	500 kcmil	M12
240	364	3W+N+G	450	2	500 kcmil	3	300 kcmil	M12
250	379	3W+N+G	500	2	500 kcmil	3	300 kcmil	M12

Table 5.12 Vertiv™ Liebert® Ancillary Medium BDC, 208 VAC Input, Dual Input, Bypass, without Transformer, Input Current

BDC Rating kVA	System Bypass Input Current, A, Max	Phase	Copper Wire		Aluminum Wire		Bolt Size
			Qty.	Size	Qty.	Size	
10	28	3W+N+G	1	8 AWG	1	6 AWG	M12
15	42	3W+N+G	1	6 AWG	1	4 AWG	M12
20	56	3W+N+G	1	3 AWG	1	2 AWG	M12
25	69	3W+N+G	1	3 AWG	1	1 AWG	M12
30	83	3W+N+G	1	1 AWG	1	2/0	M12
40	111	3W+N+G	1	2/0	1	4/0	M12
45	125	3W+N+G	1	4/0	1	250 kcmil	M12
50	139	3W+N+G	1	4/0	1	350 kcmil	M12
60	167	3W+N+G	1	250 kcmil	1	350 kcmil	M12
75	208	3W+N+G	2	2/0	2	4/0	M12
80	222	3W+N+G	2	2/0	2	4/0	M12
90	250	3W+N+G	2	4/0	2	250 kcmil	M12
100	278	3W+N+G	2	4/0	2	300 kcmil	M12

Table 5.13 Liebert® Ancillary Medium BDC, 400 VAC Input, Dual Input, Bypass, without Transformer, Input Current

BDC Rating kVA	System Bypass Input Current, A, Max	Phase	Copper Wire		Aluminum Wire		Bolt Size
			Qty.	Size	Qty.	Size	
20	29	3W+N+G	1	8 AWG	1	6 AWG	M12
30	43	3W+N+G	1	4 AWG	1	3 AWG	M12
40	58	3W+N+G	1	3 AWG	1	1 AWG	M12
50	72	3W+N+G	1	1 AWG	1	2/0	M12
60	87	3W+N+G	1	1/0	1	4/0	M12
80	115	3W+N+G	1	4/0	1	250 kcmil	M12
90	130	3W+N+G	1	4/0	1	350 kcmil	M12
100	144	3W+N+G	1	250 kcmil	1	350 kcmil	M12
120	173	3W+N+G	1	350 kcmil	1	500 kcmil	M12
150	217	3W+N+G	2	4/0	2	250 kcmil	M12
180	260	3W+N+G	2	4/0	2	300 kcmil	M12
200	289	3W+N+G	2	250 kcmil	3	4/0	M12

Table 5.14 Vertiv™ Liebert® Ancillary Medium BDC, 480 VAC Input, Dual Input, Bypass, without Transformer, Input Current

BDC Rating kVA	System Bypass Input Current, A, Max	Phase	Copper Wire		Aluminum Wire		Bolt Size
			Qty.	Size	Qty.	Size	
20	24	3W+N+G	1	8 AWG	1	6 AWG	M12
30	36	3W+N+G	1	6 AWG	1	4 AWG	M12
40	48	3W+N+G	1	3 AWG	1	2 AWG	M12
50	60	3W+N+G	1	2 AWG	1	1/0	M12
60	72	3W+N+G	1	1 AWG	1	2/0	M12
80	96	3W+N+G	1	4/0	1	250 kcmil	M12
90	108	3W+N+G	1	4/0	1	250 kcmil	M12
100	120	3W+N+G	1	4/0	1	350 kcmil	M12
120	144	3W+N+G	1	250 kcmil	1	350 kcmil	M12
150	180	3W+N+G	2	2/0	2	4/0	M12
180	217	3W+N+G	2	4/0	2	250 kcmil	M12
200	241	3W+N+G	2	4/0	2	300 kcmil	M12
225	271	3W+N+G	2	250 kcmil	3	4/0	M12
240	289	3W+N+G	2	250 kcmil	3	4/0	M12
250	301	3W+N+G	2	350 kcmil	2	500 kcmil	M12

Output Current without XFMR

Table 5.15 Liebert® Ancillary Medium BDC 208 VAC Output Currents

BDC Rating kVA	System Output Current, A, Max	Phase	Copper Wire		Aluminum Wire		Bolt Size
			Qty.	Size	Qty.	Size	
10	28	3W+N+G	1	8 AWG	1	6 AWG	M12
15	42	3W+N+G	1	6 AWG	1	4 AWG	M12
20	56	3W+N+G	1	3 AWG	1	2 AWG	M12
25	69	3W+N+G	1	3 AWG	1	1 AWG	M12
30	83	3W+N+G	1	1 AWG	1	2/0	M12
40	111	3W+N+G	1	2/0	1	4/0	M12
45	125	3W+N+G	1	4/0	1	250 kcmil	M12
50	139	3W+N+G	1	4/0	1	350 kcmil	M12
60	167	3W+N+G	1	250 kcmil	1	350 kcmil	M12
75	208	3W+N+G	2	2/0	2	4/0	M12

Table 5.15 Liebert® Ancillary Medium BDC 208 VAC Output Currents (continued)

BDC Rating kVA	System Output Current, A, Max	Phase	Copper Wire		Aluminum Wire		Bolt Size
			Qty.	Size	Qty.	Size	
80	222	3W+N+G	2	2/0	2	4/0	M12
90	250	3W+N+G	2	4/0	2	250 kcmil	M12
100	278	3W+N+G	2	4/0	2	300 kcmil	M12

Table 5.16 Liebert® Ancillary Medium BDC 480 VAC Output Currents

BDC Rating kVA	System Input Current, A, Max	Phase	Copper Wire		Aluminum Wire		Bolt Size
			Qty.	Size	Qty.	Size	
20	24	3W+N+G	1	8 AWG	1	6 AWG	M12
30	36	3W+N+G	1	6 AWG	1	4 AWG	M12
40	48	3W+N+G	1	3 AWG	1	2 AWG	M12
50	60	3W+N+G	1	2 AWG	1	1/0	M12
60	72	3W+N+G	1	1 AWG	1	2/0	M12
80	96	3W+N+G	1	4/0	1	250 kcmil	M12
90	108	3W+N+G	1	4/0	1	250 kcmil	M12
100	120	3W+N+G	1	4/0	1	350 kcmil	M12
120	144	3W+N+G	1	250 kcmil	1	350 kcmil	M12
150	180	3W+N+G	2	2/0	2	4/0	M12
180	217	3W+N+G	2	4/0	2	250 kcmil	M12
200	241	3W+N+G	2	4/0	2	300 kcmil	M12
225	271	3W+N+G	2	250 kcmil	3	4/0	M12
240	289	3W+N+G	2	250 kcmil	3	4/0	M12
250	301	3W+N+G	2	350 kcmil	2	500 kcmil	M12

Table 5.17 Vertiv™ Liebert® Ancillary Medium BDC 400 VAC Output Currents

BDC Rating kVA	System Output Current, A, Max	Phase	Copper Wire		Aluminum Wire		Bolt Size
			Qty.	Size	Qty.	Size	
20	29	3W+N+G	1	8 AWG	1	6 AWG	M12
30	43	3W+N+G	1	4 AWG	1	3 AWG	M12
40	58	3W+N+G	1	3 AWG	1	1 AWG	M12
50	72	3W+N+G	1	1 AWG	1	2/0	M12
60	87	3W+N+G	1	1/0	1	4/0	M12
80	115	3W+N+G	1	4/0	1	250 kcmil	M12
90	130	3W+N+G	1	4/0	1	350 kcmil	M12
100	144	3W+N+G	1	250 kcmil	1	350 kcmil	M12
120	173	3W+N+G	1	350 kcmil	1	500 kcmil	M12
150	217	3W+N+G	2	4/0	2	250 kcmil	M12
180	260	3W+N+G	2	4/0	2	300 kcmil	M12
200	289	3W+N+G	2	250 kcmil	3	4/0	M12

Table 5.18 Liebert® Ancillary Medium BDC 480 VAC Output Currents

BDC Rating kVA	System Input Current, A, Max	Phase	Copper Wire		Aluminum Wire		Bolt Size
			Qty.	Size	Qty.	Size	
20	24	3W+N+G	1	8 AWG	1	6 AWG	M12
30	36	3W+N+G	1	6 AWG	1	4 AWG	M12
40	48	3W+N+G	1	3 AWG	1	2 AWG	M12
50	60	3W+N+G	1	2 AWG	1	1/0	M12
60	72	3W+N+G	1	1 AWG	1	2/0	M12
80	96	3W+N+G	1	4/0	1	250 kcmil	M12
90	108	3W+N+G	1	4/0	1	250 kcmil	M12
100	120	3W+N+G	1	4/0	1	350 kcmil	M12
120	144	3W+N+G	1	250 kcmil	1	350 kcmil	M12
150	180	3W+N+G	2	2/0	2	4/0	M12
180	217	3W+N+G	2	4/0	2	250 kcmil	M12
200	241	3W+N+G	2	4/0	2	300 kcmil	M12
225	271	3W+N+G	2	250 kcmil	3	4/0	M12
240	289	3W+N+G	2	250 kcmil	3	4/0	M12
250	301	3W+N+G	2	350 kcmil	2	500 kcmil	M12

Table 5.19 Recommended Lug Sizes (Compression Type) M12, 1/2 in. (12.7 mm) Bolt

Cable Size	T and B copper Two Hole	T and B Aluminum Two Hole
6 AWG	256-030695-868	—
4 AWG	256-030695-733	—
2-3 AWG	54811BE	—
1 AWG	54857BE	—
1/0 AWG	256-30695-593	—
2/0 AWG	54862BE	60238
3/0 AWG	54864BE	60244
4/0 AWG	54866BE	60250
250 kcmil	54868BE	60256
300 kcmil	54870BE	60262
350 kcmil	54872BE	60267
400 kcmil	54874BE	60269
500 kcmil	54876BE	60273
600 kcmil	54878BE	60275
700 kcmil	54879BE	60277
750 kcmil	54880BE	60278

5.2 Torque Requirements

All electrical connections must be tight.

Table 5.20 below and Table 5.21 below provide the torque values for the connections to the Vertiv™ Liebert® Ancillary Medium BDC. Use these values unless the equipment is labeled otherwise.

Table 5.20 Busbar torque for power wiring

Bolt Shaft Size in. (mm)	Torque lb-in (Nm)
M12 1/2 (12.7)	428 (48)

Table 5.21 Terminal block torque with compression lugs for control wiring

AWG Wire Size or Range	Torque lb-in (Nm)
22-14	3.5 to 5.3 (0.4 to 0.6)

NOTE: Refer to the manufacturer's data for proper torque for circuit breaker power connections.

Table 5.22 Breaker Torque

Manufacturer	Breaker Frame	Torque lb-in (Nm)
ABB	XT2	61.9 (7)
	XT4	70.8 (8)
	XT5	221.3 (25)
	XT1	53.1 (6)
	XT3	70.8 (8)
Siemens	D Frame	48.7 (5.5)
	F Frame	194.7 (22)
	J Frame	274.4 (31)

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

505 N Cleveland Ave

Westerville, OH, 43082, 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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