



Liebert®

EXM™ Distribution Cabinet

User Manual- 50 kVA-250kVA, 3 Phase, 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.VertivCo.com/en-us/support/> for additional assistance.

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IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation of your Liebert EXM Distribution Cabinet. Read this manual thoroughly, paying special attention to the sections that apply to your installation, before working with the UPS. Retain this manual for use by installing personnel.



WARNING

Risk of electric shock and arc flash. Can cause equipment damage, injury and death.

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

Equipment inspection and startup should be performed only by trained personnel wearing appropriate safety headgear, gloves, shoes and glasses. 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 Distribution Cabinet system. All voltage sources to the unit must be disconnected before inspecting or cleaning within the cabinet.

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.

The monitoring system contains a lithium battery for memory backup. There is a danger of explosion if this battery is incorrectly replaced. Replace only with same or equivalent type. Dispose of used batteries according to the manufacturer's instructions.



NOTE

The unit should not be loosened from the shipping pallet until all handling by fork lift or pallet jack is completed.

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

ELECTROMAGNETIC COMPATIBILITY—The Liebert EXM Distribution Cabinet complies with the limits for a Class A digital device, pursuant to Part 15 of FCC rules.

Operation is subject to the following 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 Liebert EXM Distribution Cabinet complies with the requirements of EMC Directive 2014/30/EU and the published technical standards. Continued compliance requires installation in accordance with these instructions and use of accessories approved by Vertiv.

1.0 INTRODUCTION

The Liebert EXM Distribution Cabinet is designed to operate in UPS normal mode, static bypass mode and maintenance mode. The Liebert EXM Distribution Cabinet offers 50-250kVA capacity to match the associated Liebert EXM frame offerings. Each of the Liebert EXM Distribution Cabinet capacities offers an optional 208/120V output transformer as well as multiple output distribution selections.

2.0 INSTALLATION INSTRUCTIONS

2.1 Unpacking and Installation



NOTE

Read the entire manual before installing and operating the system. Upon receipt of a Liebert EXM Distribution Cabinet, the installer should perform the following steps to ensure a quality installation.

2.1.1 Unpacking and Preliminary Inspection

A quality installation begins on the receiving dock.

1. Inspect the shipment for damage or signs of mishandling before unpacking the unit(s).
2. If the Liebert EXM Distribution Cabinet was shipped in an export crate, open the shipping crate carefully.

Use care to avoid puncturing the container with sharp objects that would damage the contents.

3. Remove the packing and vapor barriers and inspect the equipment for any obvious shipping damages.



NOTE

The units should not be loosened from the shipping pallet until all handling by forklift or pallet jack is completed. Complete internal inspection should be accomplished only after equipment positioning and prior to electrical hookup.

4. If any damage is observed, immediately file a damage claim with the shipping agency and forward a copy to:

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

2.1.2 Handling Considerations

The Liebert EXM Distribution Cabinet is bolted to a wooden pallet to allow handling by forklift equipment.

The Liebert EXM Distribution Cabinet is furnished with casters to allow the unit to be rolled into place after it has been unbolted from the pallet. The unit should be kept on the shipping pallet until it has been moved by forklift as close as practical to its installation location.

Refer to the cabinet drawings furnished with the Liebert EXM Distribution Cabinet for the unit's size and weight. Typical cabinet dimensions and weights are shown in **Figures 1 and 2**.

The route to the Liebert EXM Distribution Cabinet's installation area should be planned to ensure that all passages, including doorways, elevators, ramps and hallways, are large enough to accommodate the unit and that the floors are strong enough to support the weight. Determine whether any corners or offsets would cause problems in maneuvering the unit.

Vertiv recommends removing the exterior side panels, if supplied, before the unit is moved. This will prevent scratches, dents and other damage to the panels.

Figure 1 Typical cabinet and floor planning dimension data, 23.6" (600mm) cabinet

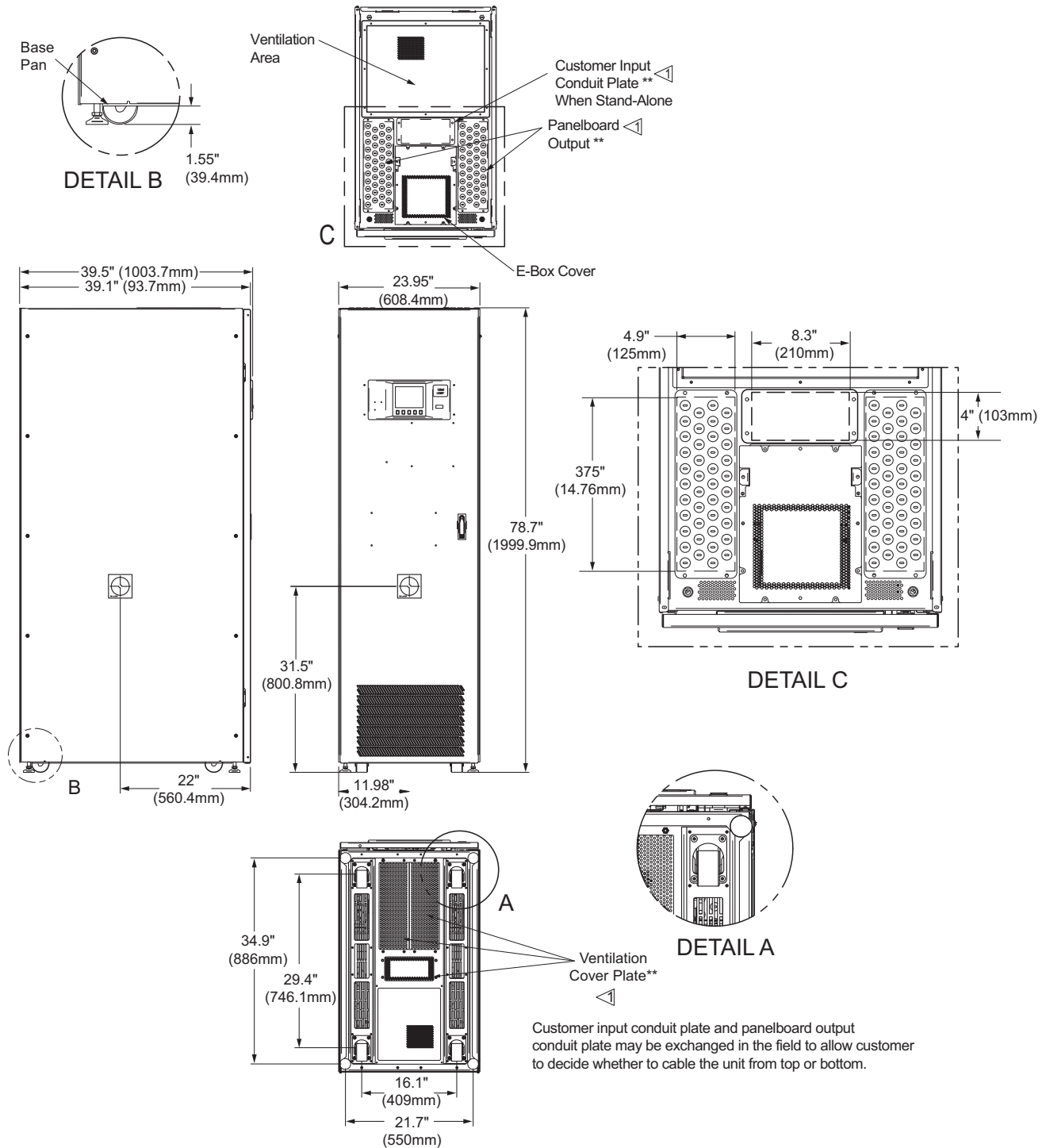


Table 1 23.6-inch (600mm) cabinet weight

Unit kVA	Maximum Weight, lb (kg)
50	1749 (793)
100	
150	

Figure 2 Typical cabinet and floor planning dimension data, 34.6" (880mm) cabinet

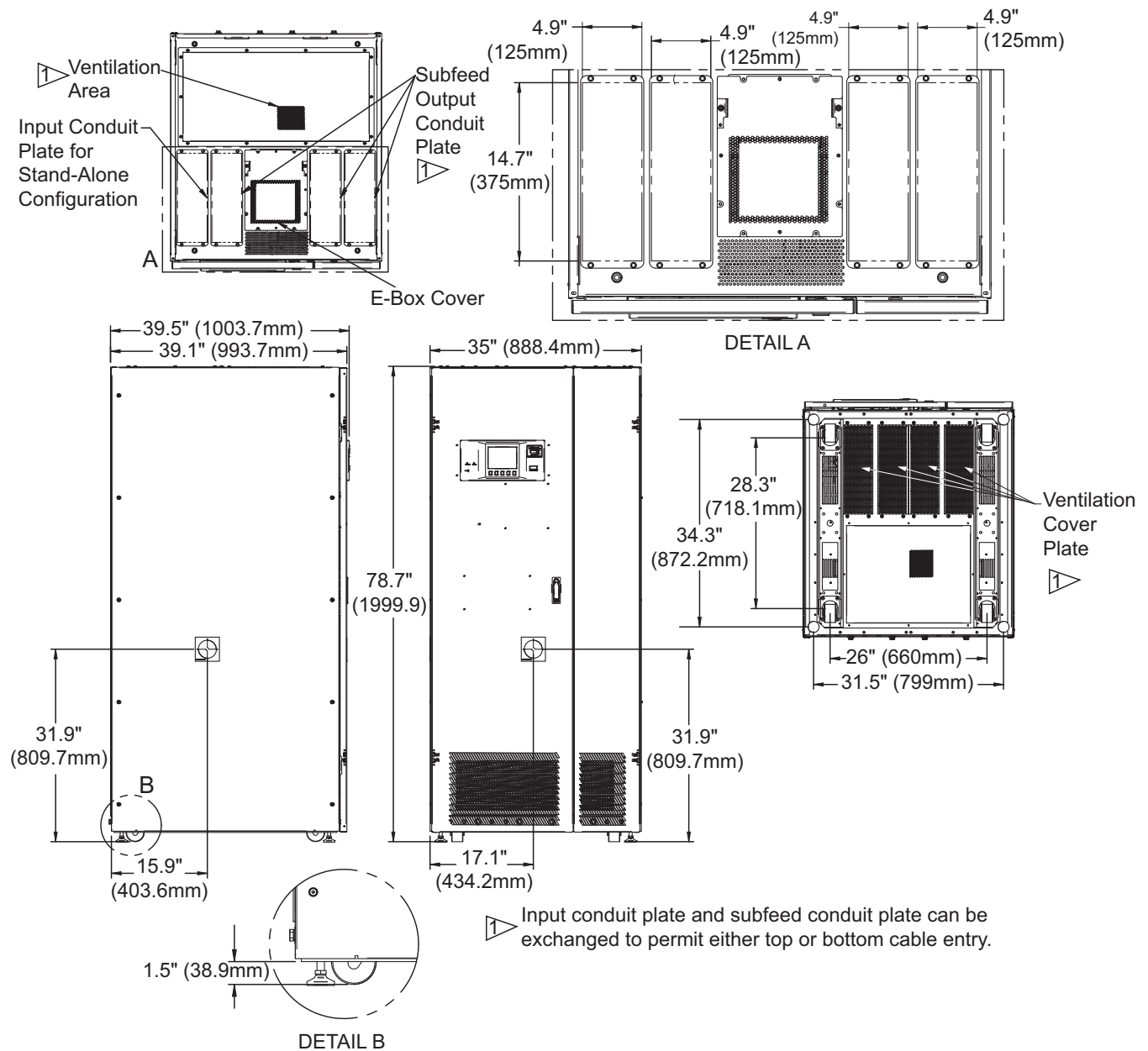


Table 2 34.6-inch (880mm) cabinet weight

Unit kVA	Maximum Weight, lb (kg)
150	2538 (1151)
200	
250	

2.1.3 Unit Preparation

The Liebert EXM Distribution Cabinet may be easily removed from the shipping pallet and installed by customer personnel. A typical procedure is:

1. Set the pallet assembly in a level area where there is enough room to move the Liebert EXM Distribution Cabinet off the pallet onto the floor.
2. Remove side panels from the Liebert EXM Distribution Cabinet, if supplied. An Allen wrench for the side panels is furnished in the installation packet.
3. Remove the bolts and two mounting brackets holding the unit to the shipping pallet. Mounting brackets are located on either side of the unit.
4. Use a forklift to move the unit off the pallet. If a ramp is available from the pallet, it can be used to roll the distribution cabinet off the pallet onto the floor.
5. Roll the Liebert EXM Distribution Cabinet to the installation area. For units to be placed on a raised floor, use care when positioning unit over the floor cutout to prevent the casters from falling through the cutout.



NOTE

*Before maneuvering the unit into its final position, read and follow all advisories in **2.1.4 - Location Considerations**.*

2.1.4 Location Considerations

The Liebert EXM Distribution Cabinet should be placed near the load(s) it will supply, preferably within the data center.

Equipment location should employ the shortest output distribution cable runs consistent with logical equipment arrangement and allowance for expansion.

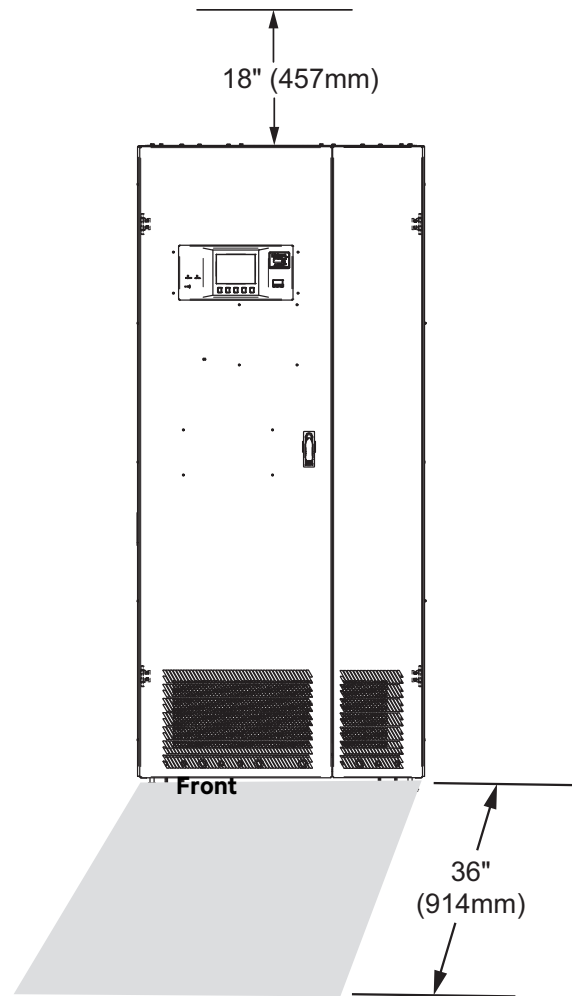
The Liebert EXM Distribution Cabinet is intended for indoor installation in an area with ambient temperatures of 32°F to 104°F (0°C to 40°C) with a relative humidity of 0% to 95% (non-condensing).

Bottom clearance is required for units with bottom entry/exit of cables. This clearance may be provided by a raised floor at least 6" (150mm) high. **Figures 1 and 2** show the typical raised-floor cutout dimensions for cables and cooling airflow.

Recommended minimum service clearances are shown in **Figure 3**. The National Electrical Code (NEC) requires the indicated front and rear clearances for service access. Clearance above the unit is required for cooling airflow (exhaust).

As do all electrical devices, the Liebert EXM Distribution Cabinet produces heat under normal operation (see **Table 3**). This heat must be accounted for when calculating the environmental conditions of the room.

Figure 3 Recommended minimum front and top clearances



NOTE

Service access is required at the front.

Table 3 Liebert EXM Distribution Cabinet heat output

Unit kVA	Full Load Heat Output BTU/Hr (kW)
50	4700 (1.37)
100	8300 (2.43)
150	11,600 (3.39)
200	15,500 (4.45)
250	18,400 (5.39)

2.2 Power and Control Wiring

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

Input power connections are always to be fed from the Liebert EXM UPS. Either attached using factory-provided cables or remotely using cables provided by others.

Figure 4 Wiring diagram, 480V Liebert EXM 600mm Distribution Cabinet with transformer for panelboard

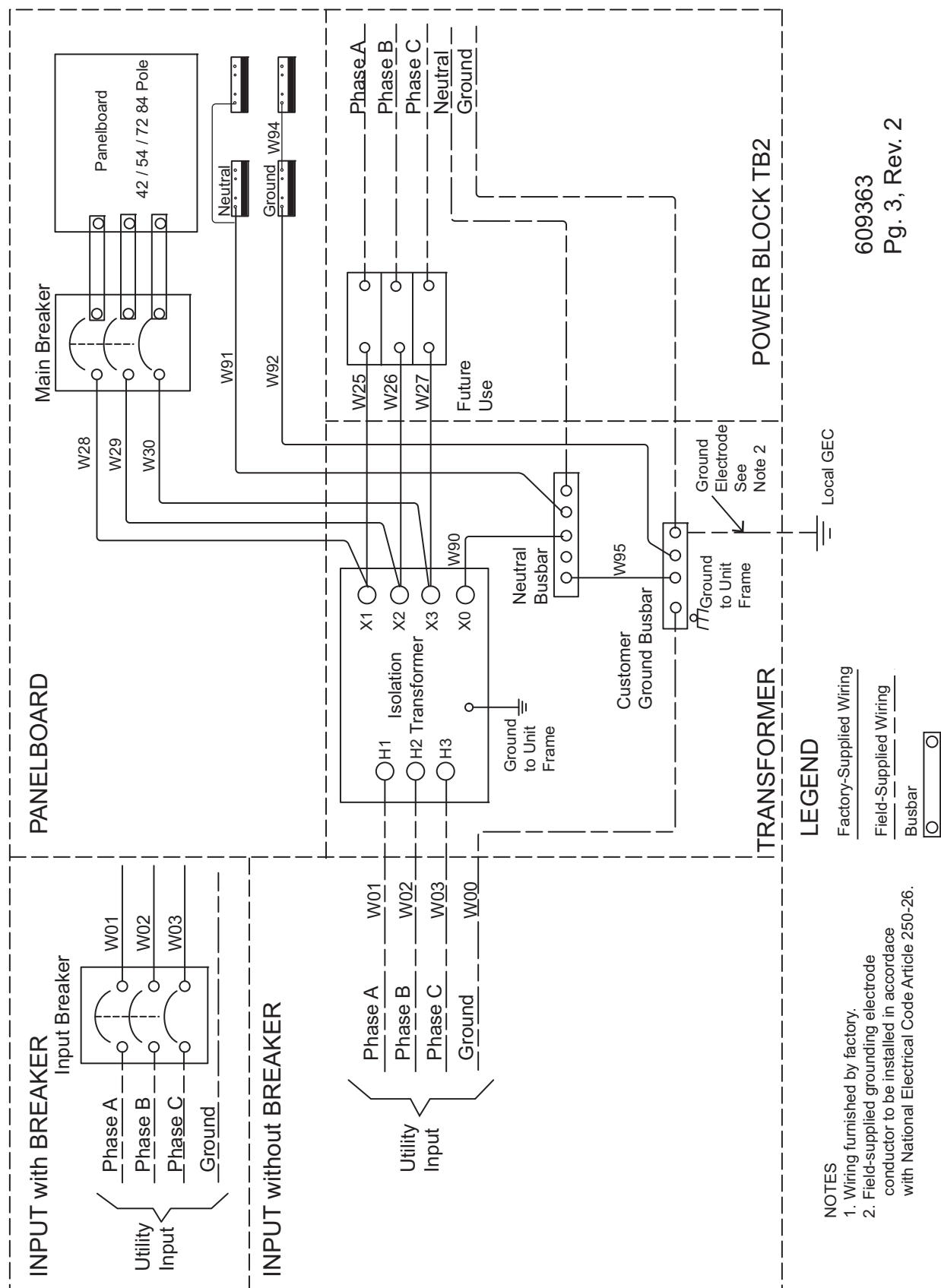
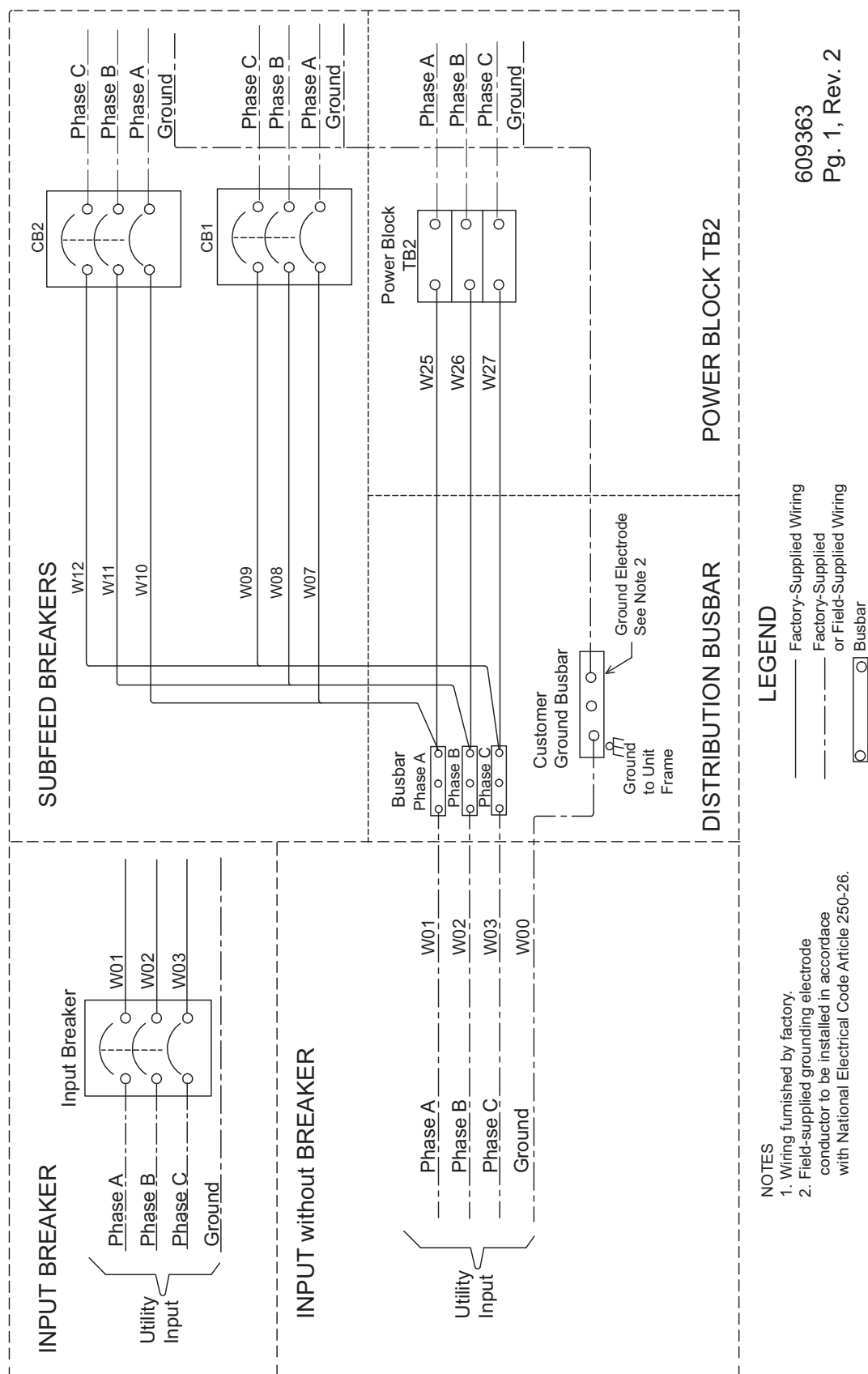
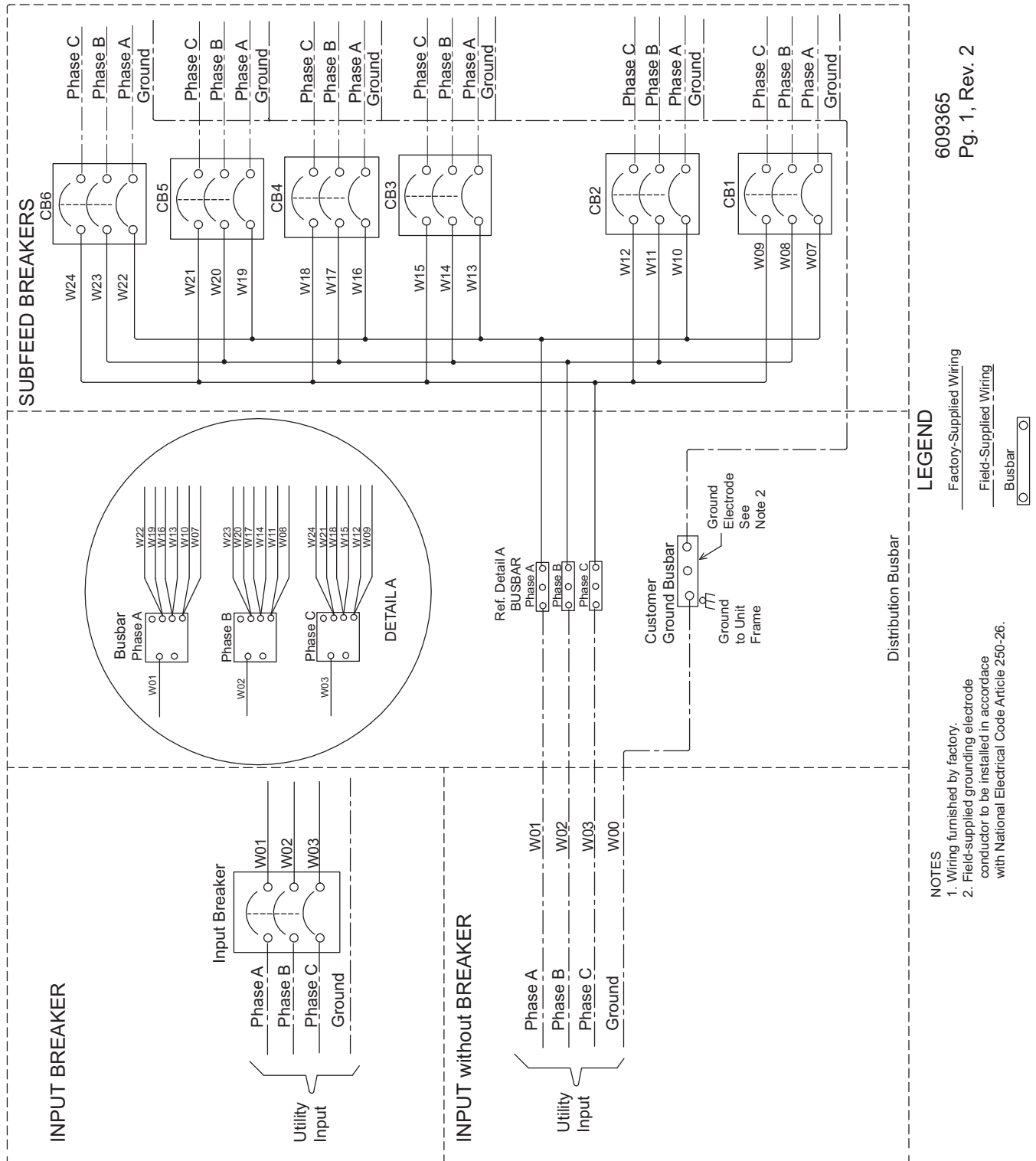


Figure 5 Wiring Diagram, 480V Liebert EXM 600mm Distribution Cabinet with subfeed breakers



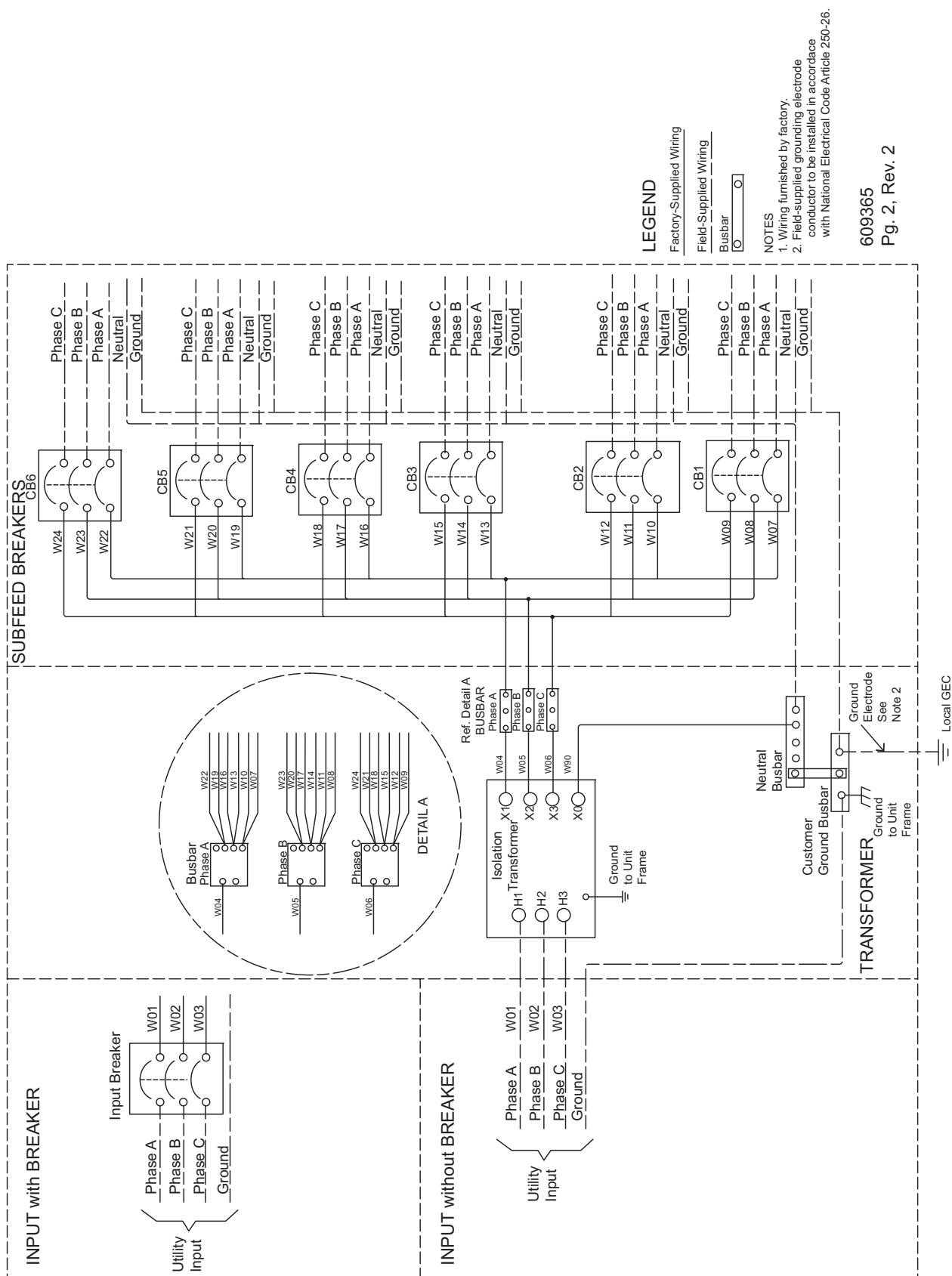
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Figure 6 Wiring Diagram, 480V Liebert EXM 880mm Distribution Cabinet with subfeed breakers



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Figure 7 Wiring diagram, 480V Liebert EXM 880mm Distribution Cabinet with transformer for subfeed



2.2.1 Input Power Connections



WARNING

Risk of electric shock and arc flash. Can cause injury and death.

Verify that all incoming line voltage (power) and low-voltage (control) circuits are de-energized and locked out before installing cables or making connections, whether in the junction box or in the Liebert EXM Distribution Cabinet.

The 3-phase power input to the Liebert EXM Distribution Cabinet is supplied directly from the Liebert EXM UPS.

The input feeder circuit should be sized in accordance with the NEC and any local building codes to ensure the feeder's ability to safely carry the system's full load current, including losses.

Typical conductor size data is shown in **Table 5**. All connections must comply with the NEC and all other applicable codes.

The main input feeder should consist of 3-phase conductors and one (safety) ground conductor (3W + G).

Stand-alone distribution cabinets have an input circuit breaker; attached distribution cabinets do not have an input circuit breaker.

Figure 8 Electrical connection locations for 23.6" (600mm) cabinet

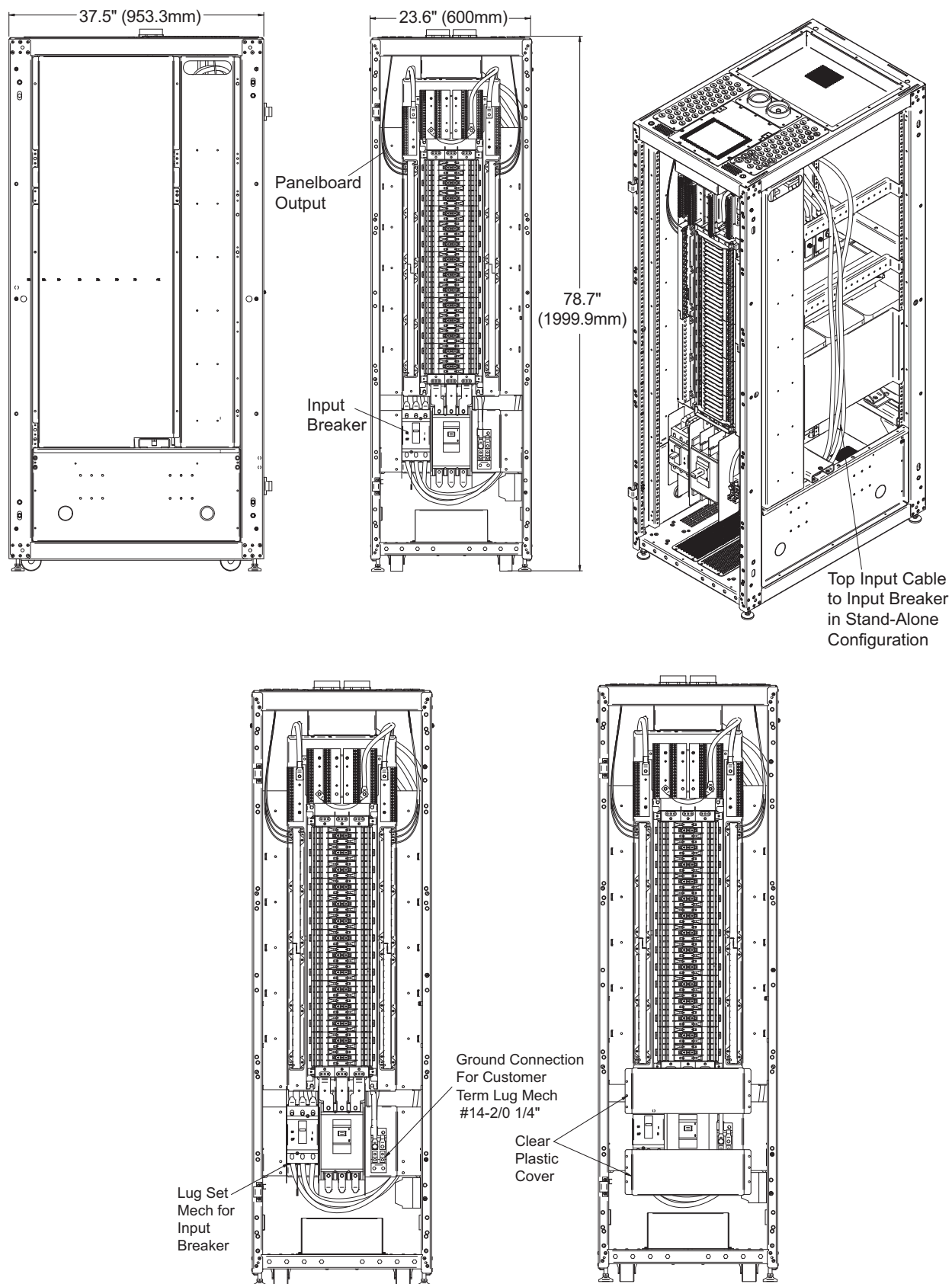


Figure 9 Subfeed SF2 electrical connection location for 23.6" (600mm) cabinet

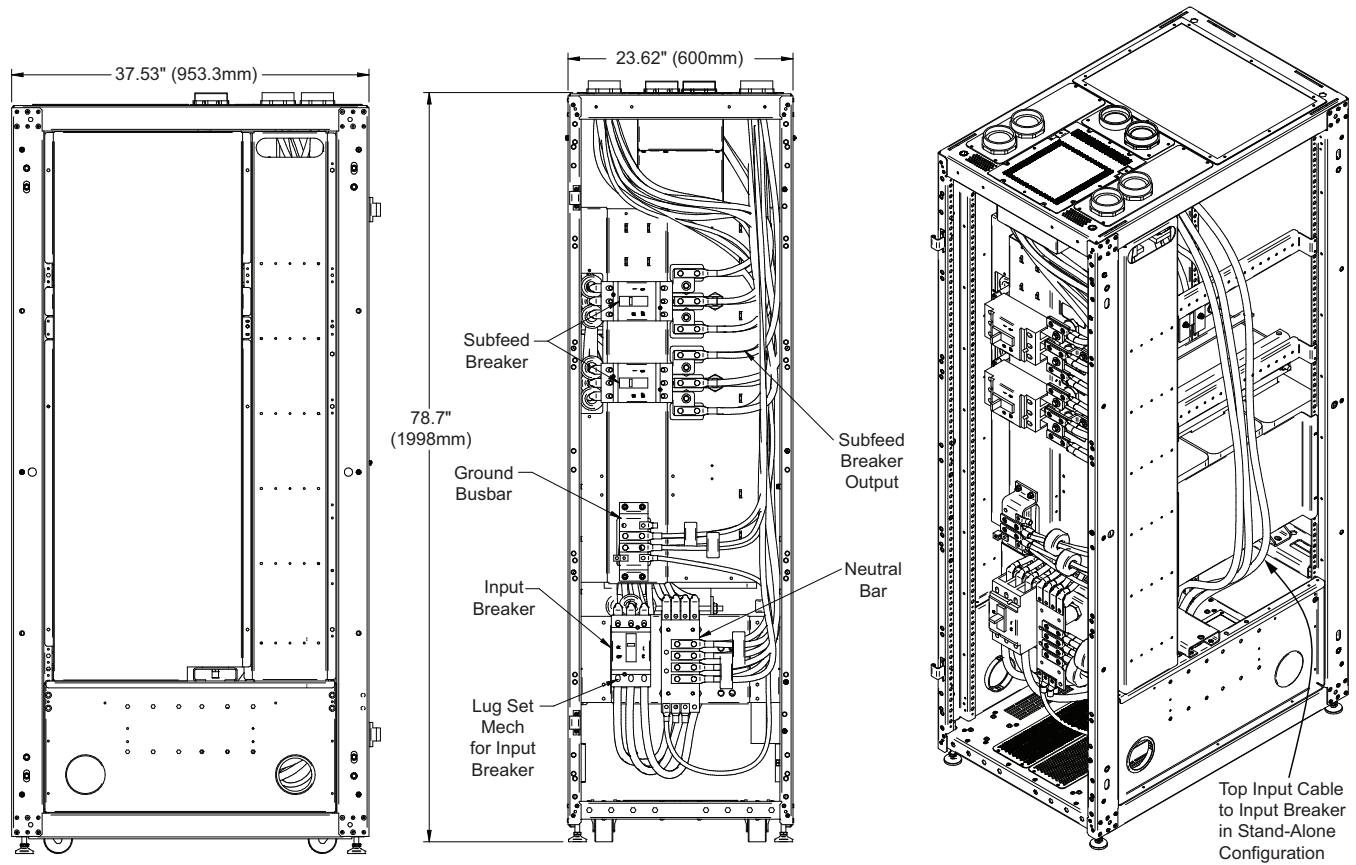


Figure 10 Ground lug detail for 23.6" (600mm) cabinet

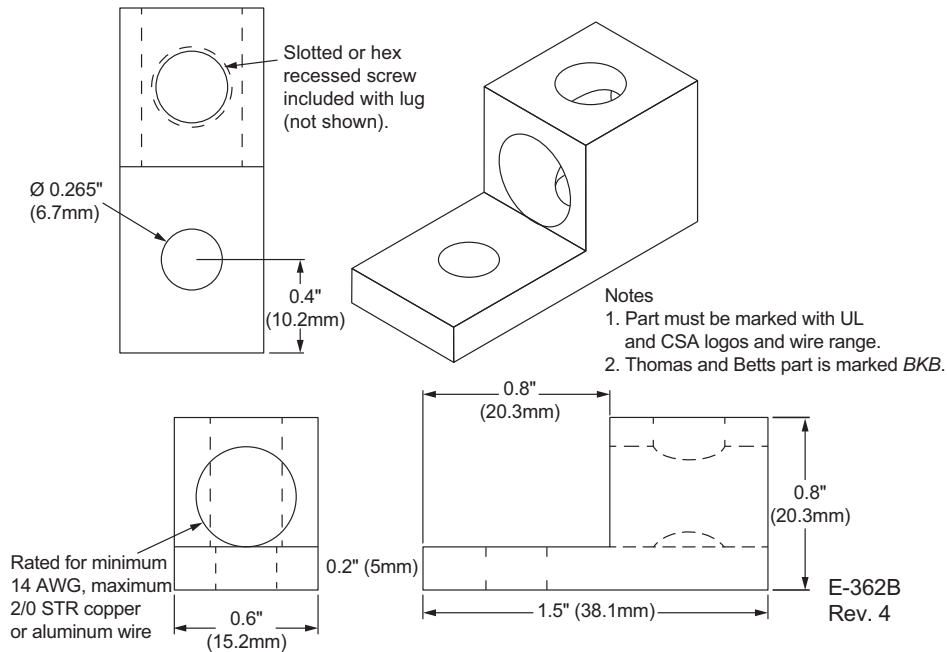


Figure 11 Electrical connection location for 34.6" (880mm) cabinet

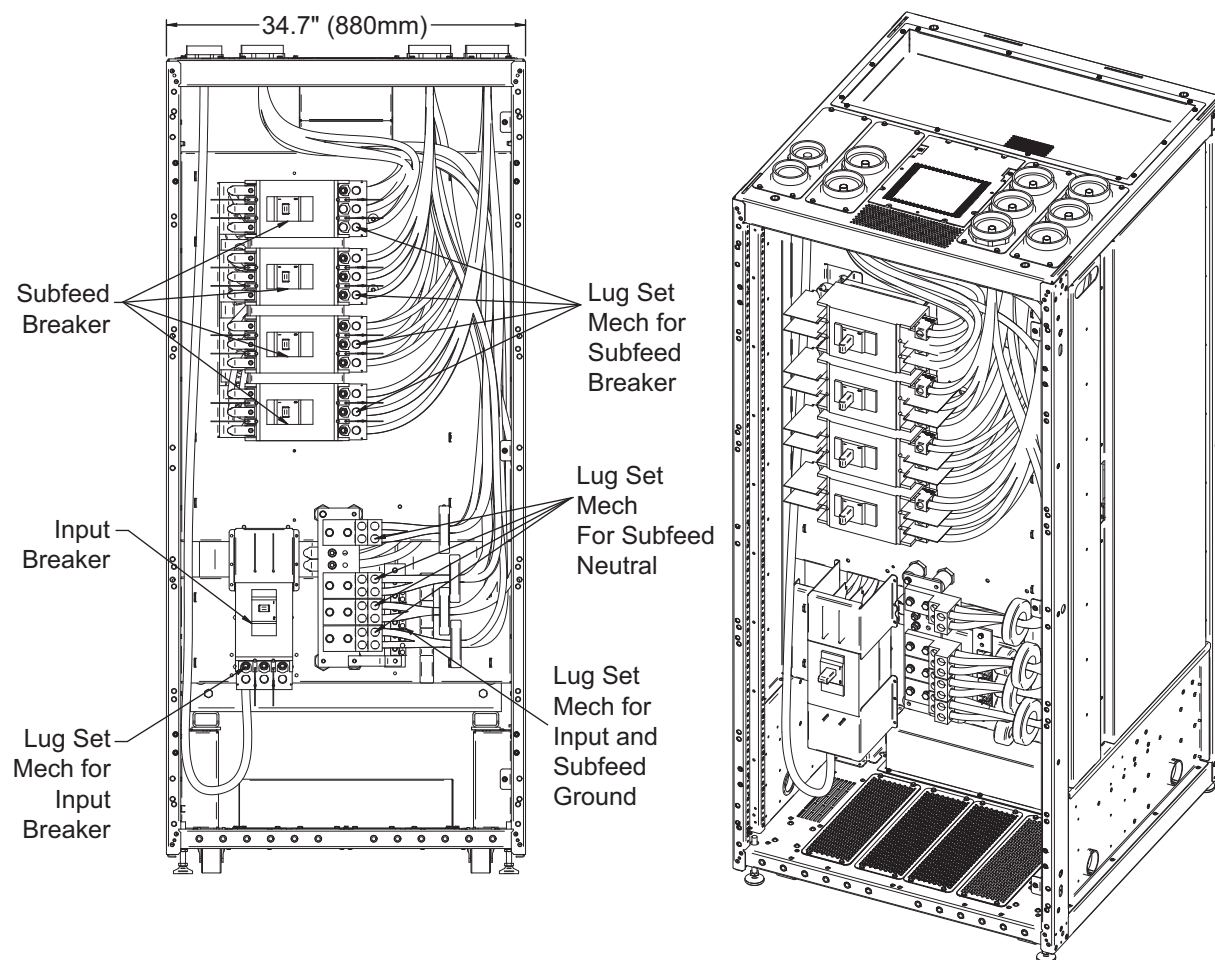


Figure 12 Subfeed SF6 electrical connection location for 34.6" (880mm) cabinet

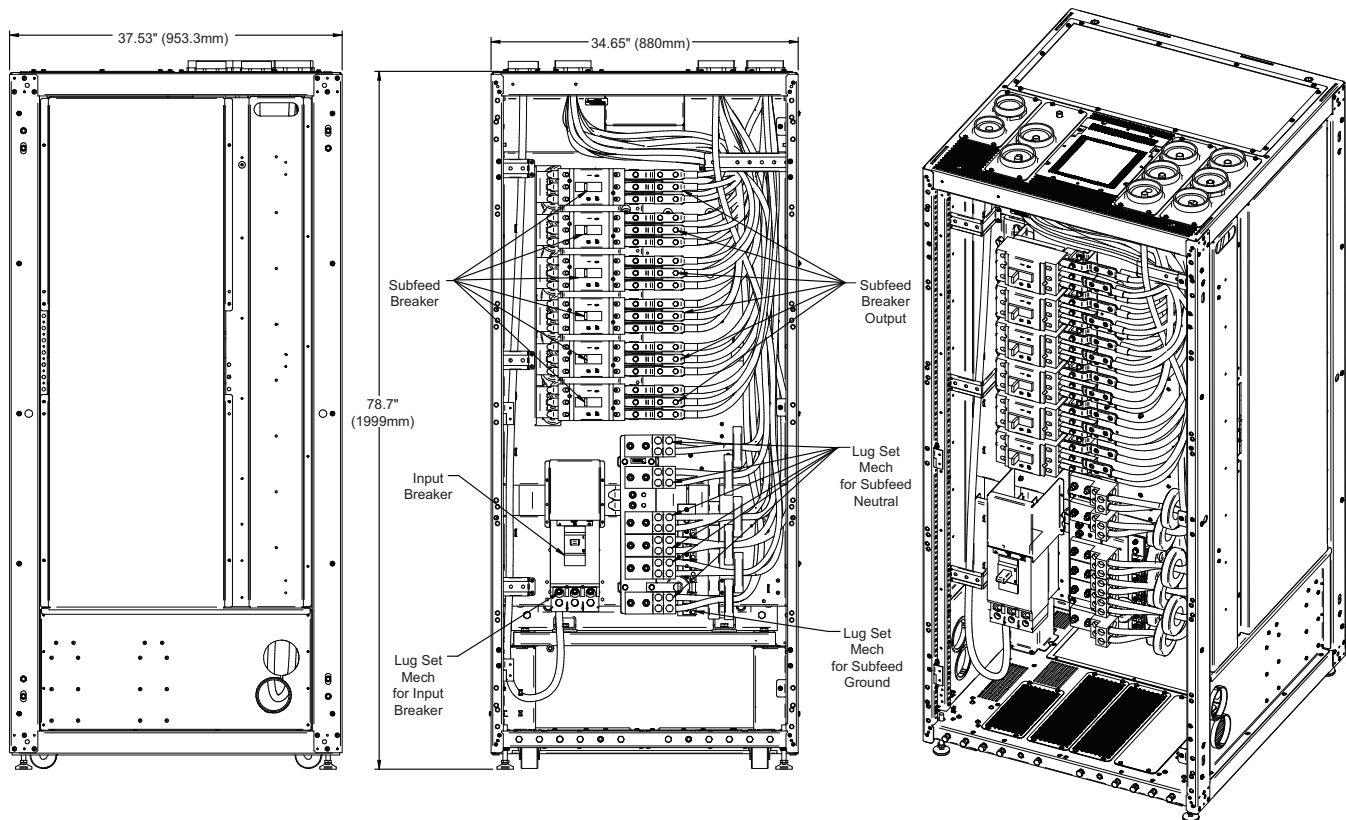
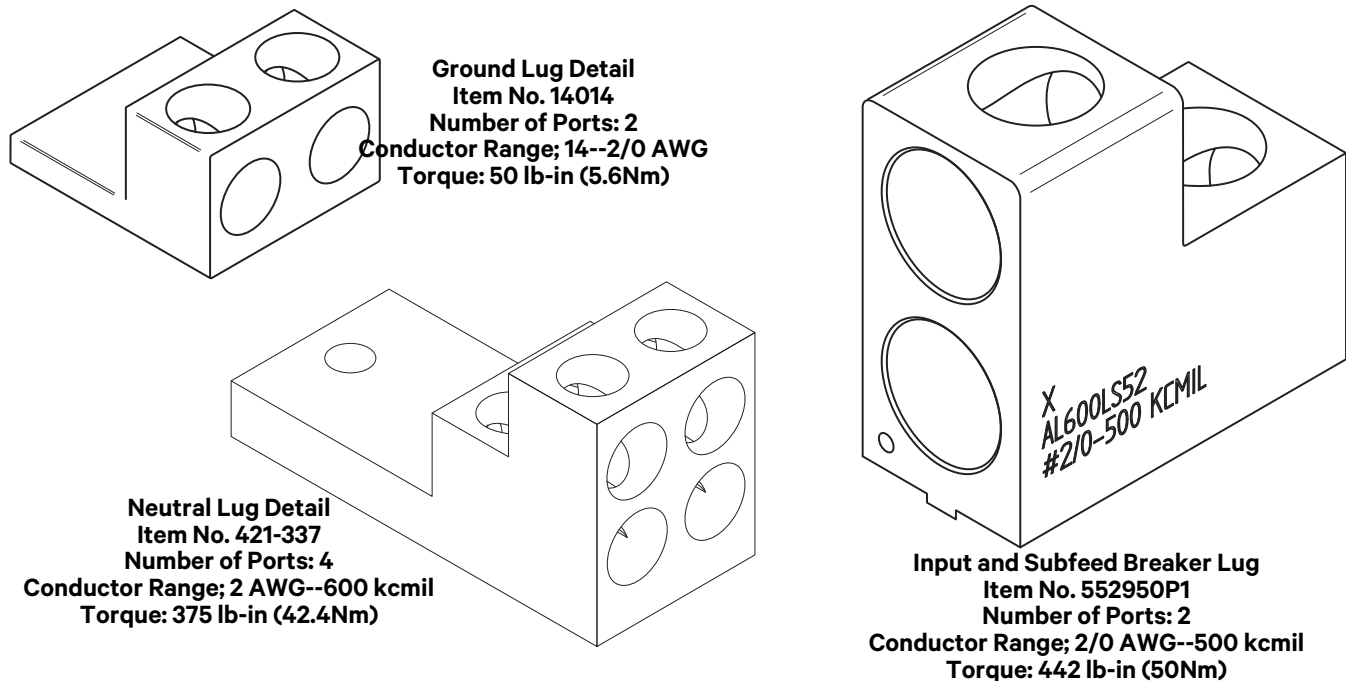


Figure 13 Lug details for 34.6" (880mm) cabinet



2.2.2 Equipment Grounding

Equipment grounding is primarily for safety. Correct implementation of grounding also enhances equipment performance. All power feeders must include equipment grounding means as required by the NEC and local codes.

An insulated ground conductor is recommended to be run in each feeder conduit. Ground conductors must be at least the minimum size per NEC Table 250-66. Larger wire sizes may be used for increased system performance.

If the input power feeder conduit is used as a grounding conductor, adequate electrical continuity must be maintained at all conduit connections.



WARNING

Risk of electric shock. Can cause equipment damage, improper operation, injury and death. Isolating bushings must not be used in a metal conduit run. These bushings might prevent the system from being properly grounded.

2.2.3 Grounding Electrode Conductor for Liebert EXM Distribution Cabinets with Transformer

Required by code - The Liebert EXM Distribution Cabinet with transformer must be grounded according to the safety practices of NEC 250-26. A local grounding electrode conductor is recommended in addition to the equipment safety ground which is normally run with the input power conductors. (See **Figures 8** through **13**.)

2.2.4 Output Power Connections

Output circuit breaker(s) and/or panelboards with ground and neutral provisions are provided inside the unit for connecting load(s) as required. (See **Figures 8** through **13**.)



WARNING

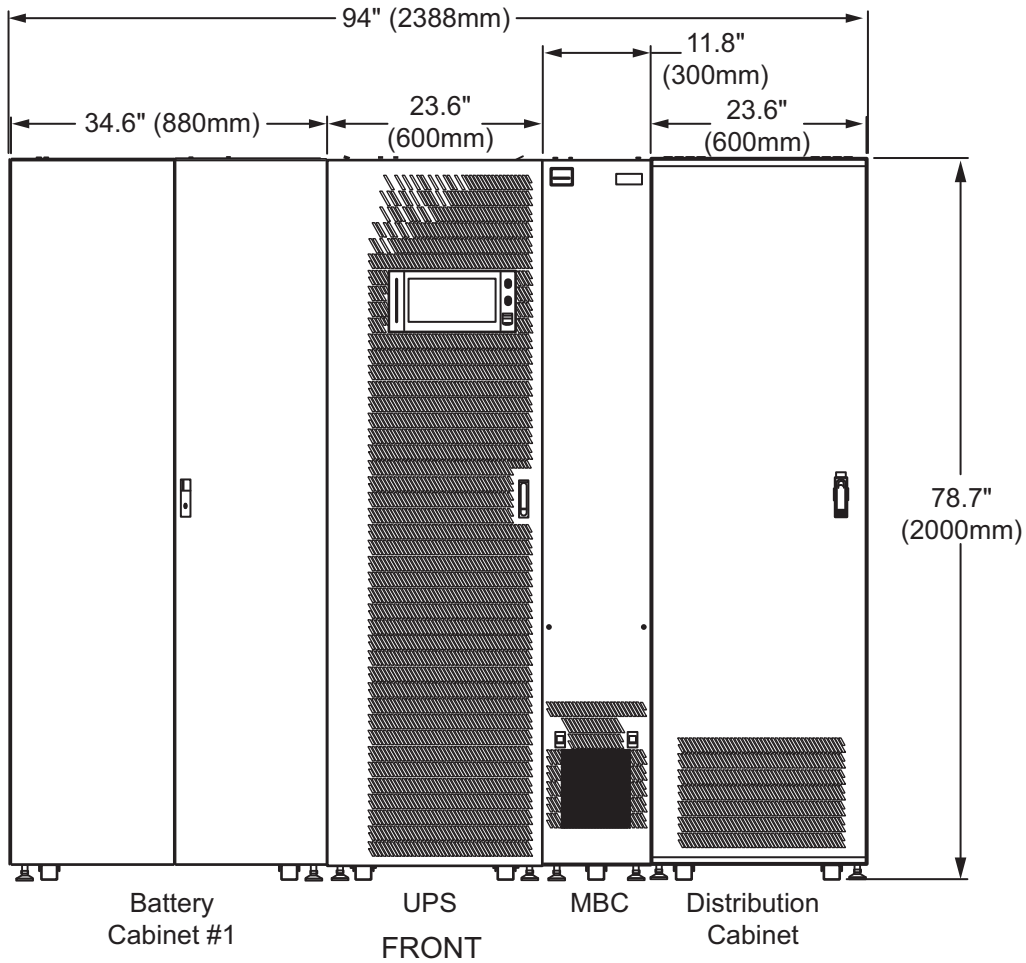
Risk of electric shock and arc flash. Can cause injury and death.

Verify that all incoming line voltage (power) and low-voltage (control) circuits are de-energized and locked out before installing cables or output breakers or making connections, whether in the junction box or in the unit.

Verify that incoming line voltage circuits are de-energized and locked out before installing output breakers and cables.

Code Compliance—All output cables and connections must comply with the NEC and all other applicable codes.

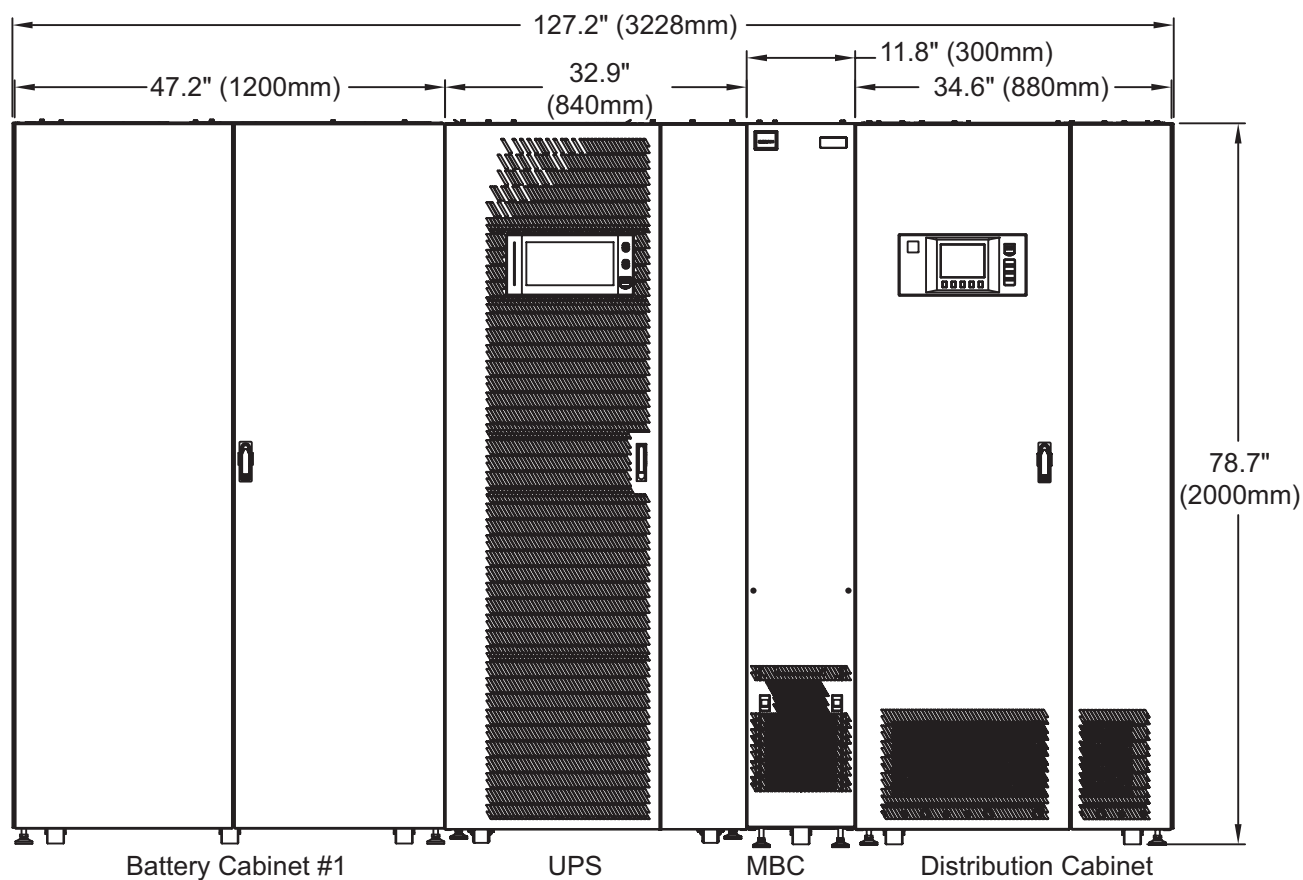
Figure 14 Typical Liebert EXM 600mm Distribution Cabinet equipment arrangement



NOTES

1. 18" (457mm) minimum clearance above unit for ventilation.
2. Keep cabinet within 15 degrees of vertical.
3. Cable Entry
 - UPS:** Bottom cable entry through removable plates
 - MBC:** Top and bottom entry through removable plates
 - Remove, punch to suit conduit size and replace.
4. Unit bottom is structurally adequate for forklift handling.
5. Control wiring and power wiring must be run in separate conduits.
6. All wiring is to be in accordance with national and local electrical codes.
7. All battery cabinets must be positioned on the left side of the UPS.

Figure 15 Typical Liebert EXM 880mm Distribution Cabinet equipment arrangement



FRONT VIEW

NOTES

1. All dimensions are in inches (mm).
2. 24" (610mm) minimum clearance above the unit for ventilation.
3. Keep cabinet within 15 degrees of vertical.
4. Top and bottom cable entry available through removable access plates.
Remove, punch to suit conduit and replace.
5. Unit bottom is structurally adequate for forklift handling.
6. Control wiring and power wiring must be run in separate conduits.
7. All wiring must be in accordance with national and local electrical codes.
8. All battery cabinets must be positioned on the left side of the UPS.

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3.0 EQUIPMENT INSPECTION AND STARTUP

3.1 Internal Inspection

A detailed internal inspection should be performed after the unit is in place and before it is energized, to ensure trouble-free startup. The same internal inspection should be carried out when performing preventive maintenance.



WARNING

Risk of electric shock and arc flash. Can cause injury and death.
Verify that all incoming line voltage (power) and low-voltage (control) circuits are de-energized and locked out before performing the internal inspection.

Open the unit - Gain access to the internal components of the Liebert EXM Distribution Cabinet unit by removing the exterior panels and internal accent panels.

Visually inspect - Be sure wiring and components are not damaged.

Check power connections - Check all power connections for tightness. Refer to **Tables 8** through **11** for torque requirements of all electrical connections.

Perform formal detailed inspection - Follow the procedures described in **5.0 - Inspection and Startup Checklist** when performing detailed inspection.

3.2 Startup

Checklists

Follow the detailed step-by-step checklist (**5.0 - Inspection and Startup Checklist**) when installing and starting up the Liebert EXM Distribution Cabinet.

Initial System Startup

A qualified electrician must be employed to perform the equipment inspection and startup. Liebert system startup may be arranged by calling your local Vertiv sales representative or Vertiv. In the United States, call 1-800-543-2378.

Warranty

A copy of the appropriate checklist (furnished with the equipment) must be completed, signed, dated and returned to Vertiv. Warranty coverage of the equipment is not effective unless the checklist has been received by the factory.



WARNING

Risk of improper startup. Can cause equipment damage, personal injury and death.
Hazardous voltages are present during startup procedures. Electrical safety precautions must be followed throughout inspection and startup.
Equipment inspection and startup should be performed only by properly trained and qualified personnel wearing appropriate safety headgear, gloves and shoes.

4.0 OPERATING INSTRUCTIONS

4.1 Startup Procedures

Before the unit is placed into service after initial installation, after equipment relocation, or after equipment has been de-energized for an extended period of time, perform equipment inspection and startup procedures as detailed in **3.0 - Equipment Inspection and Startup** and **5.0 - Inspection and Startup Checklist**.

After initial system startup, the following guidelines can be used for standard equipment operation. These guidelines should be reviewed for any special equipment modifications, special site considerations or company policies that may require changes to the standard equipment operation.

4.1.1 Normal System Shutdown

To perform a normal system shutdown, perform an orderly load equipment shutdown according to the load equipment manufacturer's recommended shutdown sequence. The load equipment can be turned Off at each piece of load equipment or at the Liebert EXM Distribution Cabinet's output distribution (circuit breaker) panels located behind the Liebert EXM Distribution Cabinet's front door. Turn Off all unit output breakers, then turn Off the unit's main input circuit breaker. To remove all power from the Liebert EXM Distribution Cabinet, turn Off the building power to the Liebert EXM Distribution Cabinet's input breaker or junction box.

4.1.2 Normal System Turn On

Make certain all of the Liebert EXM Distribution Cabinet's circuit breakers are in the Off position. All unit circuit breakers are located behind the front doors. Turn On building power to the Liebert EXM Distribution Cabinet. Turn On the Liebert EXM Distribution Cabinet's main input circuit breaker. If the circuit breaker has been tripped Off (instead of being turned Off), the circuit breaker handle must be moved to the Off position before being turned On. If the Liebert EXM Distribution Cabinet has a voltage monitoring panel, verify proper output voltages before turning On output circuit breakers. Turn On the panelboard main breakers. Turn On each output circuit breaker following the load equipment manufacturer's startup sequence.

5.0 INSPECTION AND STARTUP CHECKLIST

5.1 Exterior Inspection

Exterior Inspection Checklist

- ___ 1. Confirm that the exterior of the unit is undamaged.
- ___ 2. Confirm that service and ventilation clearances are adequate. (See **Figure 3**).

5.2 Internal Inspection

A detailed internal inspection should be performed after the unit is in place and before it is energized to insure trouble-free startup. The same internal inspection should be carried out when performing preventive maintenance.



WARNING

Risk of electric shock. Can cause injury and death. Verify that all incoming power circuits are de-energized and locked out before performing the internal inspection.

Gain access to the internal components of the Liebert EXM Distribution Cabinet™ unit by removing the external and interior side panels.

5.2.1 Interior Inspection Checklist

- ___ 1. Inspect all wire and conductor insulation for damage.
- ___ 2. Check all breaker connections for tightness. Retorque if necessary. Unless otherwise labeled, use the recommended tightening torque as shown in **Table 10**.
- ___ 3. Check all terminal block connections for tightness. Retorque if necessary. Unless otherwise labeled, use the recommended tightening torque as shown in **Table 11**.
- ___ 4. Verify that input phase cables A, B and C are properly connected to the input breaker (standalone units) with the correct phase rotation. Refer to **Figures 4 and 7** for additional details. When the Liebert EXM Distribution Cabinets are attached, the input power connects to a busbar or transformer.
- ___ 5. Verify that the input ground cable connects to the internal customer ground busbar.
- ___ 6. Verify that the internal customer ground busbar is connected to the Liebert EXM Distribution Cabinet frame.
- ___ 7. Verify that the output neutral cable is connected to the internal customer ground busbar.
- ___ 8. Verify that the output ground cable is connected to the internal customer ground busbar.
- ___ 9. Remove any foreign objects from the components or the interior area of the unit.

5.3 Startup

A qualified electrician should be employed to perform the equipment inspection and startup. Liebert system startup may be arranged by calling your local Vertiv sales representative or Vertiv. In the United States, call 1-800-543-2378.

A copy of the appropriate checklist (furnished with the equipment) must be completed, signed, dated and returned to Vertiv. Warranty coverage of the equipment is not effective unless the checklist is received by the factory.



WARNING

Equipment inspection and startup should be performed only by qualified trained personnel. Electrical safety precautions must be followed throughout inspection and startup. Hazardous voltages are present in the equipment throughout the majority of the startup procedure. Use proper safety equipment. Proceed with caution.

5.3.1 Startup Checklist

- ___ 1. Make certain that all circuit breakers are in the Off position and that power to the unit is locked out.
- ___ 2. Verify proper input power connections to unit, including the equipment grounding conductor.
- ___ 3. Turn On the building power to the unit.
- ___ 4. Check the phase rotation at the input busbars. Phase rotation should be A, B, C, left-to-right.
- ___ 5. Check and record the input voltage. Measured voltages should correspond to the unit's nameplate input voltage.

Input	
Volts, Phase A to Phase B =	_____
Volts, Phase B to Phase C =	_____
Volts, Phase C to Phase A =	_____

- ___ 6. Check the phase rotation at the panelboard main breakers. Phase rotation should be A, B, C, left-to-right.
- ___ 7. Check the phase rotation at the transformer output. Phase rotation should be A, B, C, left-to-right.
- ___ 8. Check and record the input voltage at each of the panelboard main breakers. Measured voltages should correspond to the unit's nameplate input voltage.

	Panelboard 1	Panelboard 2	Panelboard 3	Panelboard 4
Volts, Phase A to Phase B =				
Volts, Phase B to Phase C =				
Volts, Phase C to Phase A =				

If output voltage or phase rotation is incorrect, check for wiring errors or incorrect input voltage, Contact Vertiv at 1-800-543-2378) in the USA or the local factory representative for assistance.

- ___ 9. Turn On the panelboard main breakers.
- ___ 10. Replace internal and external panels, if supplied.

6.0 MAINTENANCE

6.1 Repair

Even the most reliable equipment may fail. Vertiv is at your service to ensure fast repair of your unit and minimum downtime of your installation.



WARNING

Risk of electric shock and arc flash. Can cause equipment damage, injury and death. Only properly trained and qualified service personnel wearing appropriate safety headgear, gloves, shoes and glasses should perform maintenance on the Liebert EXM Distribution Cabinet system.

Standard electrical troubleshooting procedures should be used to isolate problems in the unit. If there are questions, don't hesitate to contact Vertiv.

Repair or replacement of standard items, such as circuit breakers, fuses, transformers, capacitors and indicator lights can either be handled by qualified electricians or referred to Vertiv.

Repairs related to the monitoring system should be referred to Vertiv. To contact Vertiv for information or repair service in the United States, call 1-800-543-2378.

6.2 Inspection and Cleaning

Air circulation through the cabinet may cause dust to accumulate on internal components. Cleaning should be done as necessary during electrical inspections.

Annual general system inspections, cleaning, and operation checks are recommended to ensure system performance and long service life.



WARNING

Risk of electric shock and arc flash. Can cause equipment damage, injury and death. Only properly trained and qualified service personnel wearing appropriate safety headgear, gloves, shoes and glasses should perform maintenance on the Liebert EXM Distribution Cabinet system. All voltage sources to the unit must be disconnected before inspecting or cleaning within the cabinet.

6.2.1 Inspection Schedule

- It is difficult to establish a schedule for periodic cleanings because conditions vary from site to site. Inspections after the first 24 hours, 30 days and 6 months of operation should help determine a pattern for the inspection schedule.
- Electrical connections and component mountings should be inspected after the first 24 hours, 30 days, and 6 months of operation. Inspections should be conducted annually thereafter.
- Ventilation openings and grilles should be inspected and cleaned every 6 months to one year.
- A complete inspection and operational checkout should be performed annually. This is best done by performing the inspection and startup procedure as detailed in **5.0 - Inspection and Startup Checklist**.
- Vertiv offers a complete range of preventive maintenance services. These include thorough equipment performance checks and calibration of electronics. Contact Vertiv in the United States by calling 1-800-543-2378 for details.

7.0 SPECIFICATIONS

Table 4 Physical standards and parameters

Distribution Cabinet Parameters	Values
Standard Color	Black (ZP-7021)
Front Door Opening (for serviceability)	More than 180°
Degree of Protection	IP 20 (with and without front door open)
Minimum Clearance, Top	18" (457mm)
Minimum Clearance, Back	0"
Minimum Clearance, Sides	0"
Cable Entrance	Top or Bottom
Standards & Conformities	UL 60950-1-01 2nd Ed.; CSA C22.2 No. 60950-1-07 FCC Part 15, Class A; ISTA Procedure 1H; WEEE;
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 to 40°C)
Relative Humidity	up to 95% Non-Condensing (Operating and Non-Operating)

Table 5 Suggested minimum input wire size data—208V Units

Input data with Transformer (3-Phase + Ground)							
Rating (kVA)	Input Voltage	Input Current Amps	Recommended Breaker, Amps	Recommended Wire Size 75°C (Copper at 30°C Ambient)	Recommended Wire Size 75°C (Aluminum at 30°C Ambient)	Recommended Wire Size 90°C (Copper at 40°C Ambient)	Recommended Wire Size 90°C (Aluminum at 40°C Ambient)
50	480	62	80	4	2	4	2
100	480	123	175	2/0	4/0	2/0	4/0
150	480	184	250	250	350	250	350
200	480	246	350	(2) # 2/0	(2) # 4/0	(2) # 2/0	(2) # 4/0
250	480	307	400	(2) # 3/0	(2) # 250	(2) # 3/0	(2) # 250
Subfeed (3-Phase + 2 Neutral + Ground)							
Output Voltage	Subfeed Rating	Recommended Wire Size 75°C (Copper at 30°C Ambient)	Recommended Wire Size 75°C (Aluminum at 30°C Ambient)	Recommended Wire Size 90°C (Copper at 40°C Ambient)	Recommended Wire Size 90°C (Aluminum at 40°C Ambient)		
208	250	(2) # 2/0	(2) # 4/0	(2) # 2/0	(2) # 3/0		
208	400	(2) # 250	(2) # 350	(2) # 250	(2) # 350		

Table 6 Suggested minimum input wire size data—480V Units, No Transformer

Input data without Transformer (3-Phase + Ground)							
Rating kVA	Input Voltage	Input Current Amps	Recommended Breaker, Amps	Recommend ed Wire Size 75°C (Copper at 30°C Ambient)	Recommended Wire Size 75°C (Aluminum at 30°C Ambient)	Recommend ed Wire Size 90°C (Copper at 40°C Ambient)	Recommend ed Wire Size 90°C (Aluminum at 40°C Ambient)
50	480	60	80	4	2	4	2
100	480	120	150	1/0	1/0	3/0	3/0
150	480	180	225	4/0	4/0	300	300
200	480	241	300	2/0	2/0	3/0	3/0
250	480	301	400	3/0	3/0	250	250
Subfeed (3-Phase + Ground)							
Output Voltage	Subfeed Rating	Recommend ed Wire Size 75°C (Copper at 30°C Ambient)	Recommended Wire Size 75°C (Aluminum at 30°C Ambient)	Recommend ed Wire Size 90°C (Copper at 40°C Ambient)	Recommended Wire Size 90°C (Aluminum at 40°C Ambient)		
480	60	6	4	6	4		
480	70	4	3	4	3		
480	80	4	2	4	2		
480	125	1	2/0	1	2/0		
480	150	1/0	3/0	1/0	3/0		
480	175	2/0	4/0	2/0	4/0		
480	200	3/0	250	3/0	250		

Table 7 Main input circuit breaker interrupt rating

Standard Interrupt Rating*
480V
65 kAIC

* Refer to unit specification sheet for units equipped with non-standard main input breakers.

Table 8 Torque specifications, general

	Electrical Connections with 1 Belleville Washer		Electrical Connections with 2 Belleville Washers	
	Torque		Torque	
	lb-in	N-m	lb-in	N-m
Bolt Shaft Size, in./mm				
1/4 / M6	40	4.5	80	9.0
5/16 / M8	80	9.0	160	18.0

Table 8 Torque specifications, general

	Electrical Connections with 1 Belleville Washer		Electrical Connections with 2 Belleville Washers	
	Torque		Torque	
	lb-in	N-m	lb-in	N-m
3/8 / M10	120	13.6	240	27.1
1/2 / M12	240	27.1	480	54.2
Input and Output Breakers				
Up to 150 amp	80	9.0	160	18.0
175 - 500A	120	13.6	240	27.1

Table 9 Panelboard main circuit breaker torque specifications

	Torque	
	lb-in	N-m
Busbar-to-Breaker	240	27.1

Table 10 Branch circuit breaker torque specifications

Breaker Size	lb-in	N-m
Up to 30 amp	35	4.0
40 to 100 amp	45	5.1

Table 11 Terminal block compression lug torque specifications

AWG Wire Size or Range	Torque	
	lb-in	N-m
#14 - #10	35	4.0
#8	40	4.5

NOTES



