



Liebert®

EXM™ Parallel Cabinet

User Manual—208V, 10-200kVA, 60Hz

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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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IMPORTANT SAFETY INSTRUCTIONS


SAVE THESE INSTRUCTIONS

This manual contains important instructions that should be followed during installation of your Liebert EXM Parallel Cabinet.

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 EXM Parallel Cabinet's weight ranges from 263-714lb. 119.3 to 323.8kg.

Locate center of gravity symbols  and determine unit weight before handling each cabinet. Test lift and balance the cabinets before transporting. Maintain minimum tilt from vertical at all times.

Slots at the base of the cabinets are intended for forklift use. Base slots will support the unit only if the forks are completely beneath the unit.

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

Extreme caution is required when performing maintenance.


Be constantly aware that the system contains high DC as well as AC voltages.

Check for voltage with both AC and DC voltmeters prior to making contact.

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 EXM de Liebert pèsent de 263 à 714 lb (de 119,3 à 323,8 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.

Les fentes situées à la base des armoires sont conçues pour utiliser le chariot élévateur. Les fentes situées à la base peuvent soutenir le système seulement si les fourches se trouvent complètement sous le système.

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 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.

Read this manual thoroughly before working with the Liebert Parallel Cabinet. Retain this manual for use by installing personnel.

WARNING

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

Under typical operation and with all doors closed, only normal safety precautions are necessary. The area around the 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 Liebert Parallel Cabinet. Observe all safety precautions in this manual before handling or installing the Liebert Parallel Cabinet. Observe all precautions in the Operation and Maintenance Manual, before as well as during performance of all maintenance procedures.

This equipment contains circuits that are energized with high voltage. Only test equipment designed for troubleshooting should be used. This is particularly true for oscilloscopes. Always check with an AC and DC voltmeter to ensure safety before making contact or using tools. Even when the power is turned Off, dangerously high potential electric charges may exist.

All power and control wiring should be installed by a qualified electrician. All power and control wiring must comply with the NEC and applicable local codes.

ONLY properly trained and qualified personnel should perform maintenance on the Liebert Parallel Cabinet. When performing maintenance with any part of the equipment under power, 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 ground.

One person should never work alone, even if all power is removed from the equipment. A second person should be standing by to assist and summon help in case of an accident.

AVERTISSEMENT

Risque d'arc ou de décharge électrique pouvant entraîner des dommages matériels, des blessures et même la mort.

Les précautions de sécurité habituelles suffisent lorsque le système est en mode de fonctionnement normal et que toutes les portes sont fermées. La zone entourant le système 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 de l'armoire de dérivation d'entretien. Observez toutes les précautions de sécurité décrites dans le présent manuel avant de manipuler ou d'installer l'armoire de dérivation d'entretien. Observez également toutes les précautions décrites dans le manuel d'utilisation et d'entretien, avant et pendant toutes les procédures d'entretien.

Cet équipement comporte des 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 un voltmètre c.a. et c.c. pour vérifier les tensions avant d'établir un contact ou d'utiliser des appareils. Des tensions dangereusement élevées peuvent demeurer dans le système 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 ainsi qu'aux codes locaux en vigueur.

L'entretien de l'armoire de dérivation d'entretien ne doit être confié qu'à des professionnels qualifiés et dûment formés. 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.

Une personne ne devrait jamais travailler seule, même si toute l'alimentation de l'équipement est coupée. Une deuxième personne devrait toujours être présente pour porter assistance ou chercher de l'aide en cas d'accident.

1.0 MECHANICAL INSTALLATION

1.1 INTRODUCTION

This section describes the requirements that must be taken into account when planning the positioning and cabling of the Liebert EXM Parallel Cabinet.

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

WARNING

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

Installation must be performed only by properly trained and qualified personnel wearing appropriate safety clothing.

Eye protection should 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.

NOTICE

Risk of improper installation. Can cause equipment damage and void warranty.

The Liebert EXM Parallel Cabinet should 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.

1.2 PRELIMINARY CHECKS

Before installing the Liebert EXM Parallel Cabinet, 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.

1.3 ENVIRONMENTAL CONSIDERATIONS

1.3.1 Room

The Liebert EXM Parallel Cabinet is intended for indoor installation and should be located in a cool, dry, clean-air environment with adequate ventilation to keep the ambient temperature within the specified operating range (see **3.0 - Specifications**).

All models of the Liebert EXM Parallel Cabinet 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.



NOTE

The Liebert EXM Parallel Cabinet is suitable for mounting only on concrete and other noncombustible surfaces.

1.3.2 Storage

Should the equipment not be installed immediately, it must be stored in a room for protection against excessive humidity and or heat sources (see **Table 4**).

1.4 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.

1.4.1 Moving the Cabinets

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 (for instance, check that doorways, lifts, ramps, etc. are adequate and that there are no impassable corners or changes in the level of corridors).

Ensure that the cabinet weight is within the designated surface weight loading (kg/cm²) of any handling equipment. See **Table 4** for the weight of the Liebert EXM Parallel Cabinet 300mm, 600mm and 800mm models.

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

The Liebert EXM Parallel Cabinet can be handled with a forklift or similar equipment. For operations with a fork lift, refer to installation drawings in **2.0 - Installation Drawings**.

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 exceed a 15-degree tilt with the forklift.


Handling the unit with straps is not authorized.



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 EXM Parallel Cabinet's weight ranges from 263 to 714 lb. (119.3 to 323.8kg)


Locate center of gravity symbols  and determine unit weight before handling each cabinet. Test lift and balance the cabinets before transporting. Maintain minimum tilt from vertical at all times.



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 EXM de Liebert pèsent de 263 à 714 lb (de 119,3 à 323,8 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.

1.4.2 Clearances

Liebert EXM Parallel Cabinet's have no ventilation grilles at either side or at the rear. Clearance around the front of the equipment should be sufficient to enable free passage of personnel with the doors fully opened. It is important to leave a distance of 24" (610mm) between the top of the cabinet and any overhead obstacles to permit adequate circulation of air coming out of the unit.

1.4.3 Floor Installation/Anchoring

The installation diagrams in **2.0 - Installation Drawings** of this manual 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 should be mounted on a pedestal suitably designed to accept the equipment point loading.

1.5 CABLE ENTRY

Cables can enter the Liebert EXM Parallel Cabinet from the bottom or top.

1.6 POWER CABLES

The Liebert EXM Parallel Cabinet requires both power and control cabling once it has been mechanically installed. All control cables must be separate from the power cables. Run control cables in metal conduits or metal ducts that are electrically bonded to the cabinets they are connected to.

The cable design must comply with the voltages and currents provided in **Tables 5** and **6**, follow local wiring practices and take into consideration the environmental conditions (temperature and physical support media).

For cable entry locations, refer to **Figures 8** and **9**.

WARNING

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

Before cabling up the cabinet, ensure that you are aware of the location and operation of the external isolators that connect the input/bypass supply.

Check that these supplies are electrically isolated, and post any necessary warning signs to prevent their inadvertent operation.

AVERTISSEMENT

Risque de décharge électrique pouvant entraîner des dommages matériels, des blessures et même la mort.

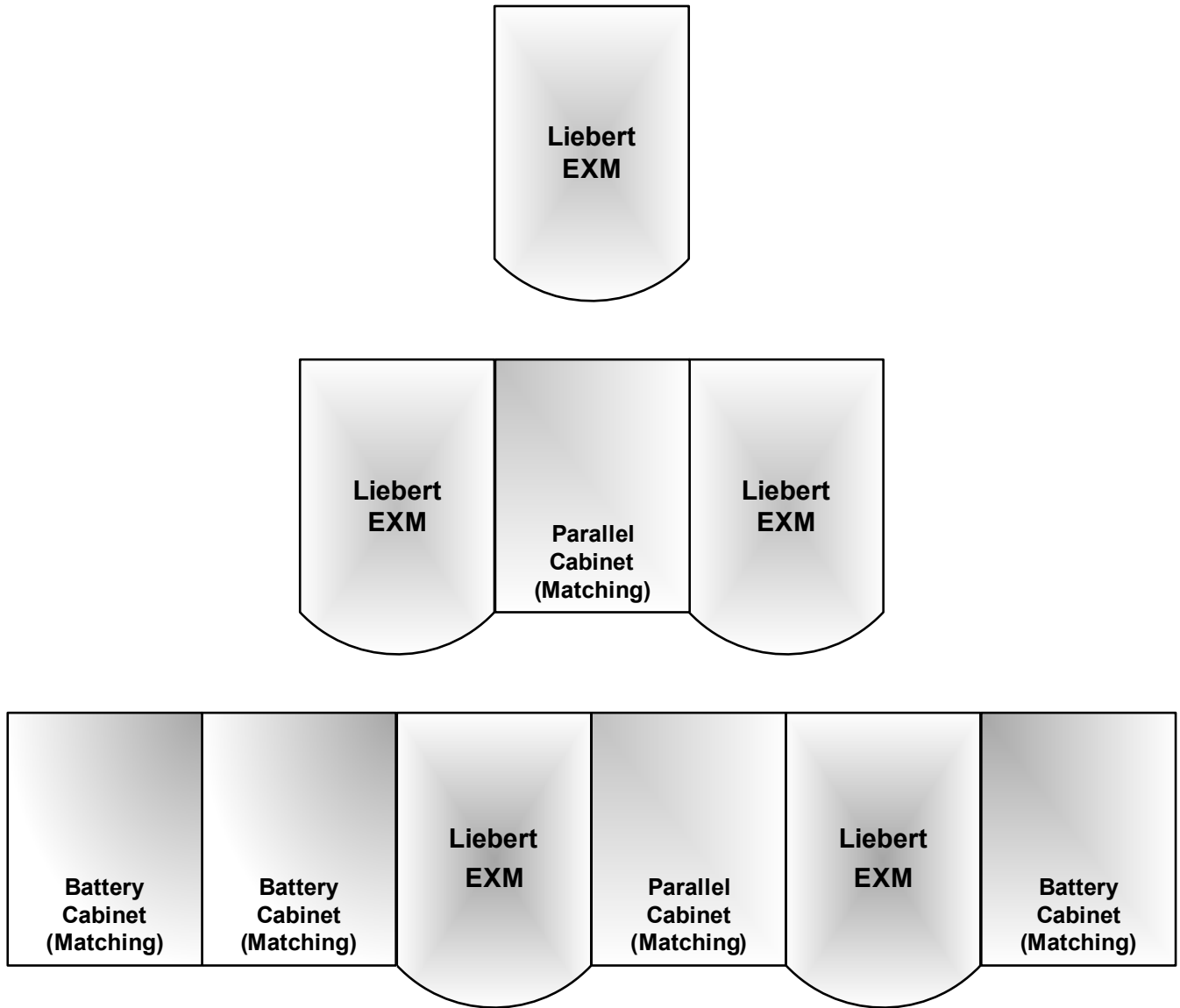
Avant de procéder au câblage de l'armoire, assurez-vous que vous êtes au courant de l'emplacement et du fonctionnement des isolateurs externes qui raccordent l'alimentation d'entrée ou de dérivation.

Vérifiez que ces raccords sont isolés électriquement et installez tous les panneaux d'avertissement nécessaires pour empêcher leur utilisation accidentelle.

The following are guidelines only and are superseded by local regulations and codes of practice where applicable:

- Take special care when determining the size of the neutral cable (grounded conductor), because current circulating on the neutral cable may be greater than nominal current in the case of nonlinear loads.
- The grounding conductor should be sized according to local or NEC codes, cable lengths, type of protection, etc. The grounding cable connecting the UPS to the main ground system must follow the most direct route possible.
- Consider using smaller, paralleled cables for heavy currents as a way of easing installation.

Figure 1 Cabinet arrangement—Liebert EXM UPS, battery cabinets, Liebert Parallel Cabinet



1.6.1 Power Cable Connection Procedure

The system input, UPS bypass, UPS output and system output cables (all require lug type terminations) are connected to power blocks behind the power isolator switches as shown in **2.0 - Installation Drawings**. These are accessible when the side or top panel is removed.

Equipment Ground

The equipment ground busbar is near the input and output power supply connections as shown in **2.0 - Installation Drawings**. The grounding conductor must be connected to the ground busbar.

All cabinets and cable trunking should be grounded in accordance with local regulations.



WARNING

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

Failure to follow adequate grounding procedures can result in electric shock hazard to personnel and the risk of fire, should a ground fault occur.



AVERTISSEMENT

Risque de décharge électrique pouvant entraîner des dommages matériels, des blessures et même la mort.

Le non-respect des procédures de mise à la terre peut entraîner des risques d'électrocution du personnel, ou des risques d'incendie en cas de défaillance de la mise à la terre.



WARNING

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

The operations described in this section must be performed by authorized electricians or properly trained and qualified technical personnel wearing adequate safety clothing, eye protection and gloves.

If you have any difficulties, do not hesitate to contact Vertiv. See the back page of this manual for contact information.



AVERTISSEMENT

Risque de décharge électrique pouvant entraîner des dommages matériels, des blessures et même la mort.

Toutes les opérations décrites dans cette section ne doivent être effectuées que par des électriciens ou des techniciens professionnels dûment formés et qualifiés portant gants, lunettes et vêtements de protection adéquats.

En cas de problème, n'hésitez pas à communiquer avec Vertiv. Pour obtenir les renseignements de contact, consultez la dernière page de ce manuel.



NOTE

Proper grounding considerably reduces problems in systems caused by electromagnetic interference.

Once the equipment has been finally positioned and secured, connect the power cables as described in the following procedure.

Refer to the appropriate cable connection drawing in **2.0 - Installation Drawings**.

1. Verify that the equipment is isolated from its external power source and all the power isolators are open. Check that these supplies are electrically isolated and post any necessary warning signs to prevent their inadvertent operation.
2. Remove the panels.
3. Connect the ground and any necessary main bonding jumper to the equipment ground busbar.



NOTE

The grounding and neutral bonding arrangement must be in accordance with local and national codes of practice.



NOTE

Care must be taken when routing power cables. Ensure that the cables do not touch other busbars.

4. See **Table 1** for all power connections.
5. Tighten the connections to the proper torque (see **Table 8**). **Ensure correct phasing.**
6. Connect the control wiring from the Liebert EXM Parallel Cabinet terminal block TB1 & TB10 to the Liebert EXM UPS Bypass Module (X9 J23 and J26). Tighten the connections to the proper torque (see **Table 8**).
7. Replace the panels. If your system has an SKRU interlock, refer to **Table 3**.

Table 1 Power wiring for Liebert EXM UPS to Liebert EXM Parallel Cabinet

System Configuration	From	To
Liebert EXM 10-20kVA 2+0 Liebert EXM 10-40kVA 1+1	Utility	UPS 1 AC Input
	Utility	UPS 2 AC Input
	Utility	TB4
	UPS 1 AC Output	TB1
	UPS 2 AC Output	TB2
	TB1	MOB1
	TB2	MOB2
Liebert EXM 30-40kVA 2+0	Utility	UPS 1 AC Input
	Utility	UPS 2 AC Input
	Utility	MBB
	UPS 1 AC Output	TB1
	UPS 2 AC Output	TB2
	TB1	MOB1
	TB2	MOB2
Liebert EXM 10-40kVA 2+1	Utility	UPS 1 AC Input
	Utility	UPS 2 AC Input
	Utility	UPS 3 AC Input
	Utility	TB4
	UPS 1 AC Output	TB1
	UPS 2 AC Output	TB2
	UPS 3 AC Output	TB3
	TB1	MOB1
	TB2	MOB2
	TB3	MOB3
	TB5	Critical Load

Table 1 Power wiring for Liebert EXM UPS to Liebert EXM Parallel Cabinet (continued)

System Configuration	From	To
Liebert EXM 60-100kVA 1+1	Utility	UPS 1 AC Input
	Utility	UPS 2 AC Input
	Utility	TB4
	UPS 1 AC Output	TB1
	UPS 2 AC Output	TB2
	TB1	MOB1
	TB2	MOB2
	TB5	Critical Load
Liebert EXM 60-100kVA 2+0	Utility	UPS 1 AC Input
	Utility	UPS 2 AC Input
	Utility	MBB
	UPS 1 AC Output	MOB1
	UPS 2 AC Output	MOB2
	Parallel Cabinet Output	Critical Load
Liebert EXM 60-100kVA 2+1	Utility	UPS 1 AC Input
	Utility	UPS 2 AC Input
	Utility	UPS 3 AC Input
	UPS 1 AC Output	MOB1
	UPS 2 AC Output	MOB2
	UPS 3 AC Output	MOB3
	Parallel Cabinet Output	Critical Load
Liebert EXM 120-200kVA 1+1 Liebert EXM 120-160kVA 2+0	Utility	UPS 1 AC Input
	Utility	UPS 2 AC Input
	Utility	MBB
	UPS 1 AC Output	MOB1
	UPS 2 AC Output	MOB2
Liebert EXM 120-160kVA 2+1	Utility	UPS 1 AC Input
	Utility	UPS 2 AC Input
	Utility	UPS 3 AC Input
	Utility	MBB
	UPS 1 AC Output	MOB1
	UPS 2 AC Output	MOB2
	UPS 3 AC Output	MOB3
	Parallel Cabinet Output	Critical Load

Table 2 Control wiring for Liebert EXM UPS to Liebert EXM Parallel Cabinet

System Configuration		UPS 1	Parallel Cabinet	Signal Name		
2+1	1+1 and 2+0	J26-17	TB10-1	MIB Status (NC)		
		J26-19	TB10-2			
		J26-21	TB1-8	MBB Status (NO)		
		J26-23	TB1-7			
		J26-22	TB1-1	MOB1 Status (NC)		
		J26-24	TB1-2			
				UPS2	Parallel Cabinet	Signal Name
				J26-17	TB10-3	MIB Status (NC)
				J26-19	TB10-4	
				J26-21	TB1-10	MBB Status (NO)
				J26-23	TB1-9	
				J26-22	TB1-3	MOB2 Status (NC)
		J26-24	TB1-4			
		UPS3	Parallel Cabinet	Signal Name		
2+1		J26-17	TB10-5	MIB Status (NC)		
		J26-19	TB10-6			
		J26-21	TB1-12	MBB Status (NO)		
		J26-23	TB1-11			
		J26-22	TB1-5	MOB3 Status (NC)		
		J26-24	TB1-6			

Table 3 Control wiring for Liebert EXM UPS to Liebert EXM Parallel Cabinet with SKRU interlock

System Configuration		From Liebert EXM UPS Bypass Module	TB7	Signal Name
2+1	1+1 & 2+0	UPS1		UPS1 On-UPS
		X9J23-4	TB7-1	
		X9J23-6	TB7-2	
		UPS2		UPS2 On-UPS
		X9J23-4	TB7-3	
		X9J23-6	TB7-4	
2+1		UPS3		UPS3 On-UPS
		X9J23-4	TB7-5	
		X9J23-6	TB7-6	

Notes

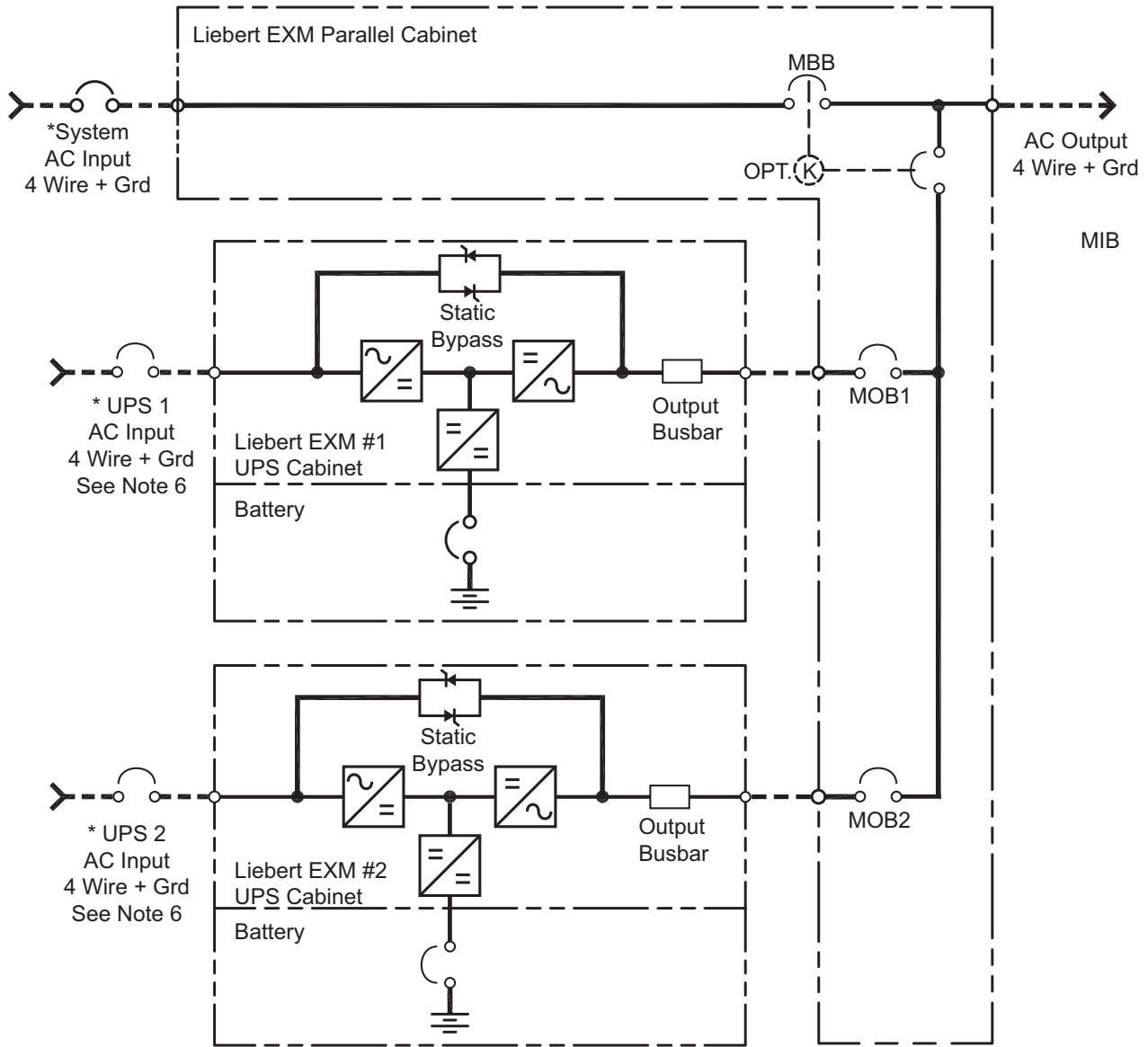
Refer to the Liebert EXM UPS installation manual, SL-25648, SL-25650 or SL-26100 for additional details about the Liebert EXM 10-40kVA, 60-100kVA and 120-200kVA UPS's. The manual is available at the Liebert Web site: www.liebert.com

The following are guidelines only and are superseded by local regulations and codes of practice where applicable.

- Take special care when determining the size of the neutral cable because current circulating on the neutral cable may be greater than nominal current in the case of non-linear loads.
- The ground conductor should be sized according to local or NEC codes, cable lengths, type of protection, etc. The ground cable connecting the UPS to the main ground system must follow the most direct route possible.
- Consideration should be given to the use of smaller, paralleled cables for heavy currents, as a way to ease installation.
- In most installations, the load is connected to a distribution network of individually protected busbars fed by the Liebert EXM Parallel Cabinet output rather than being connected directly to the Liebert EXM Parallel Cabinet itself. Where this is the case, the Liebert EXM Parallel Cabinet output cables can be rated to suit the individual distribution network demands rather than being fully load-rated.
- To avoid increasing formation of electromagnetic interference, do not form coils when laying the power cables.

2.0 INSTALLATION DRAWINGS

Figure 2 Parallel (1+1, 2+0) cabinet, 10-200kVA



NOTES:

1. Install in accordance with national and local electrical codes.
2. Input and bypass must share the same single source.
3. A neutral is required from the system AC input source.
A full capacity neutral conductor is recommended.
Grounding conductors are recommended.
4. Bypass and rectifier inputs and output cables must be run in separate conduits.
5. Control wiring must be run in separate conduits.
6. Customer must supply shunt trip breaker with 120V coil.
7. 2+0 available only from 10-160 kVA; 180 and 200 kVA are 1+1 only.

LEGEND

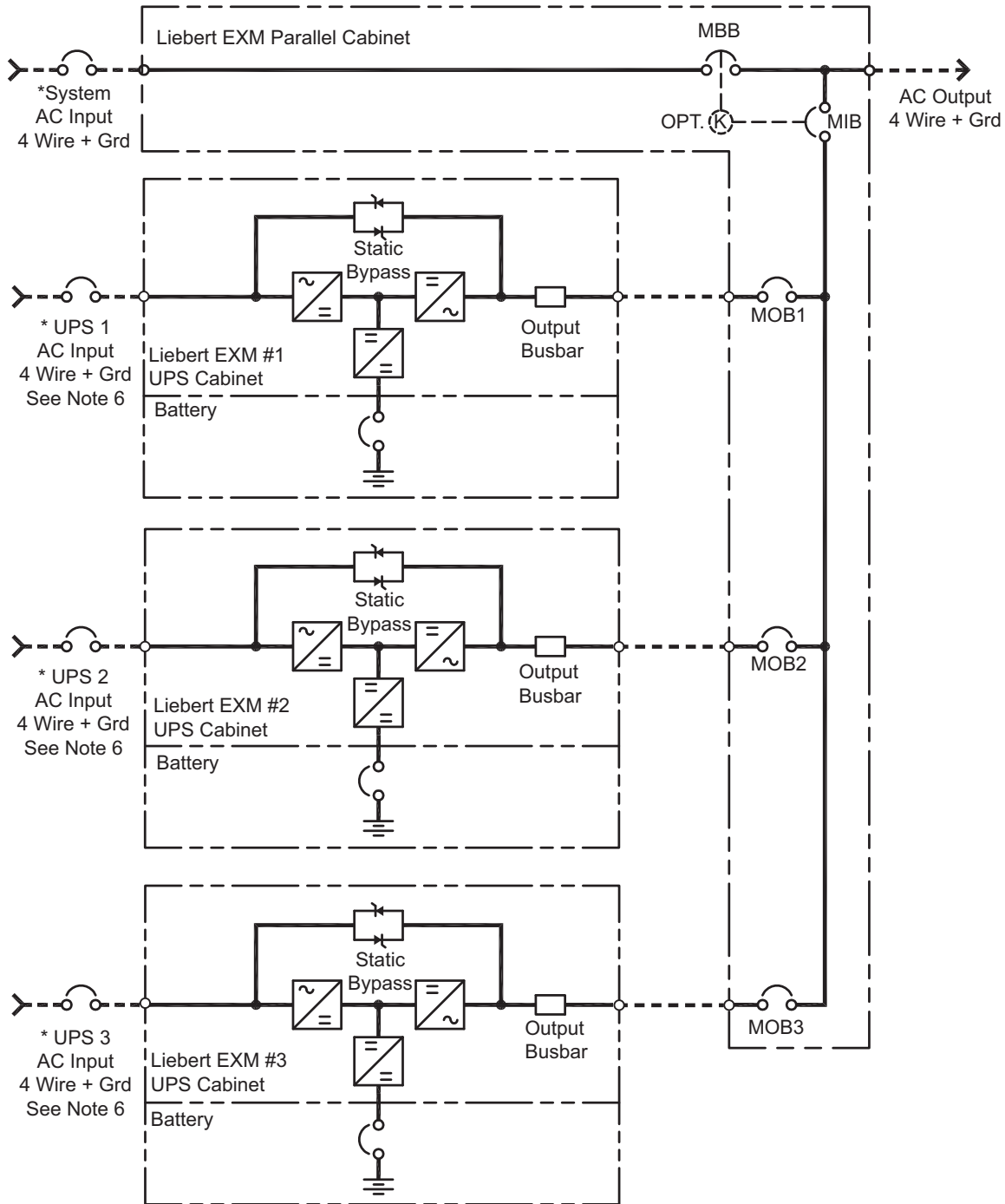
- MOB - Module Output Breaker
- MIB - Maintenance Isolation Breaker
- MBB- Maintenance Bypass Breaker

* External Overcurrent Protection By Others

----- Field-Supplied Wiring

EXM11015
Rev. 2

Figure 3 One-line diagram, Parallel (2+1) Cabinet, 10-160kVA



NOTES:

1. Install in accordance with national and local electrical codes.
2. Input and bypass must share the same single source.
3. A neutral is required from the system AC input source.
A full capacity neutral conductor is recommended.
Grounding conductors are recommended.
4. Bypass and rectifier inputs and output cables must be run in separate conduits.
5. Control wiring must be run in separate conduits.
6. Customer must supply shunt trip breaker with 120V coil.

LEGEND

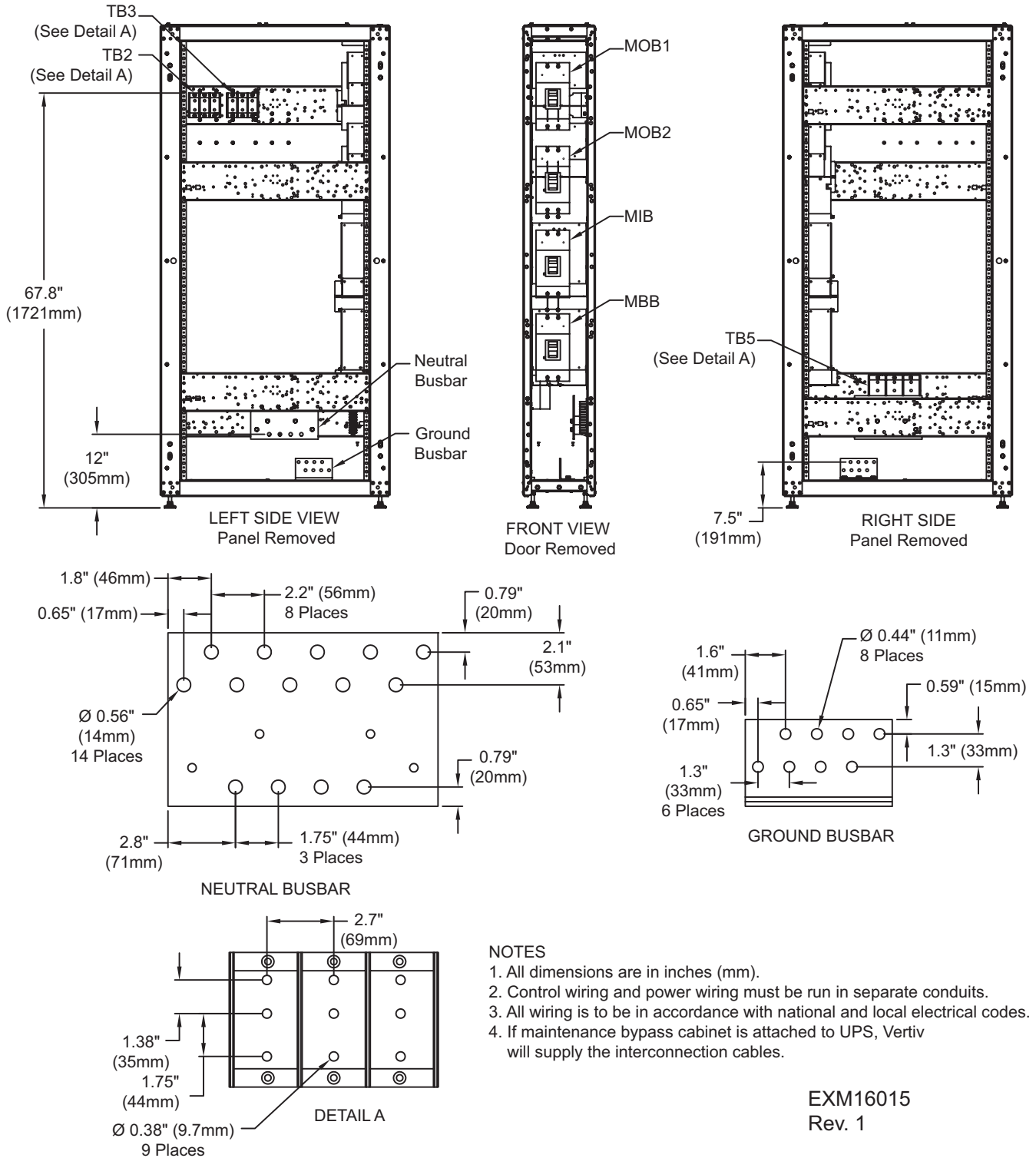
- MOB - Module Output Breaker
- MIB - Maintenance Isolation Breaker
- MBB- Maintenance Bypass Breaker

* External Overcurrent Protection By Others

----- Field-Supplied Wiring

EXM11016
Rev. 2

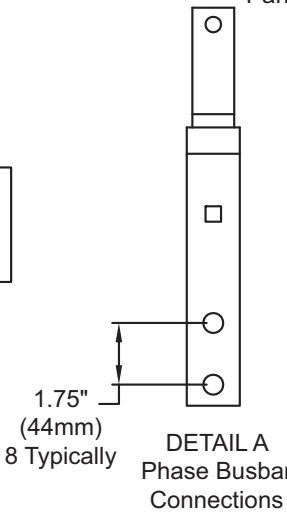
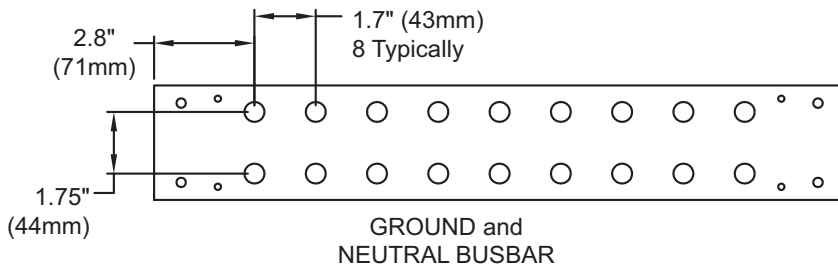
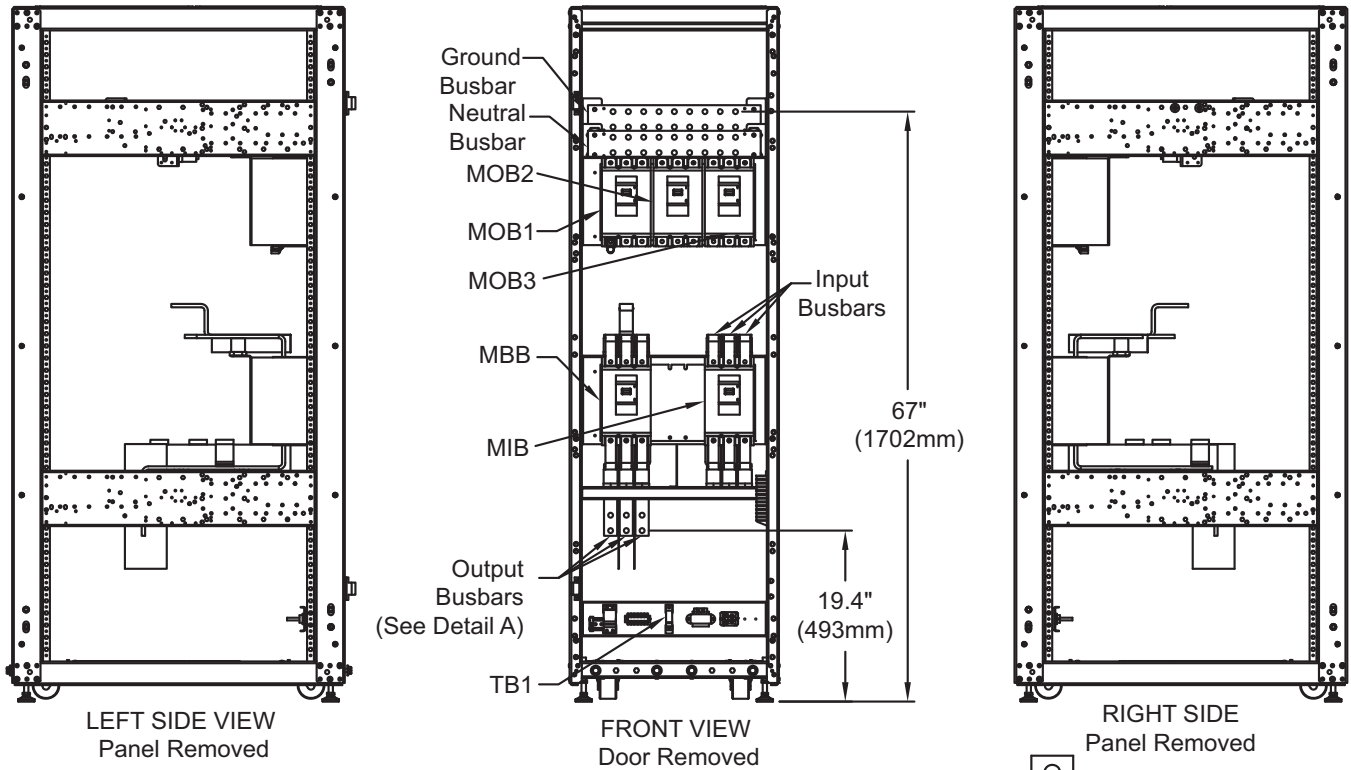
Figure 4 Main components—300mm 1+1 Liebert EXM Parallel Cabinet



- NOTES
1. All dimensions are in inches (mm).
 2. Control wiring and power wiring must be run in separate conduits.
 3. All wiring is to be in accordance with national and local electrical codes.
 4. If maintenance bypass cabinet is attached to UPS, Vertiv will supply the interconnection cables.

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Figure 5 Main components—600mm 2+1 Liebert EXM Parallel Cabinet,

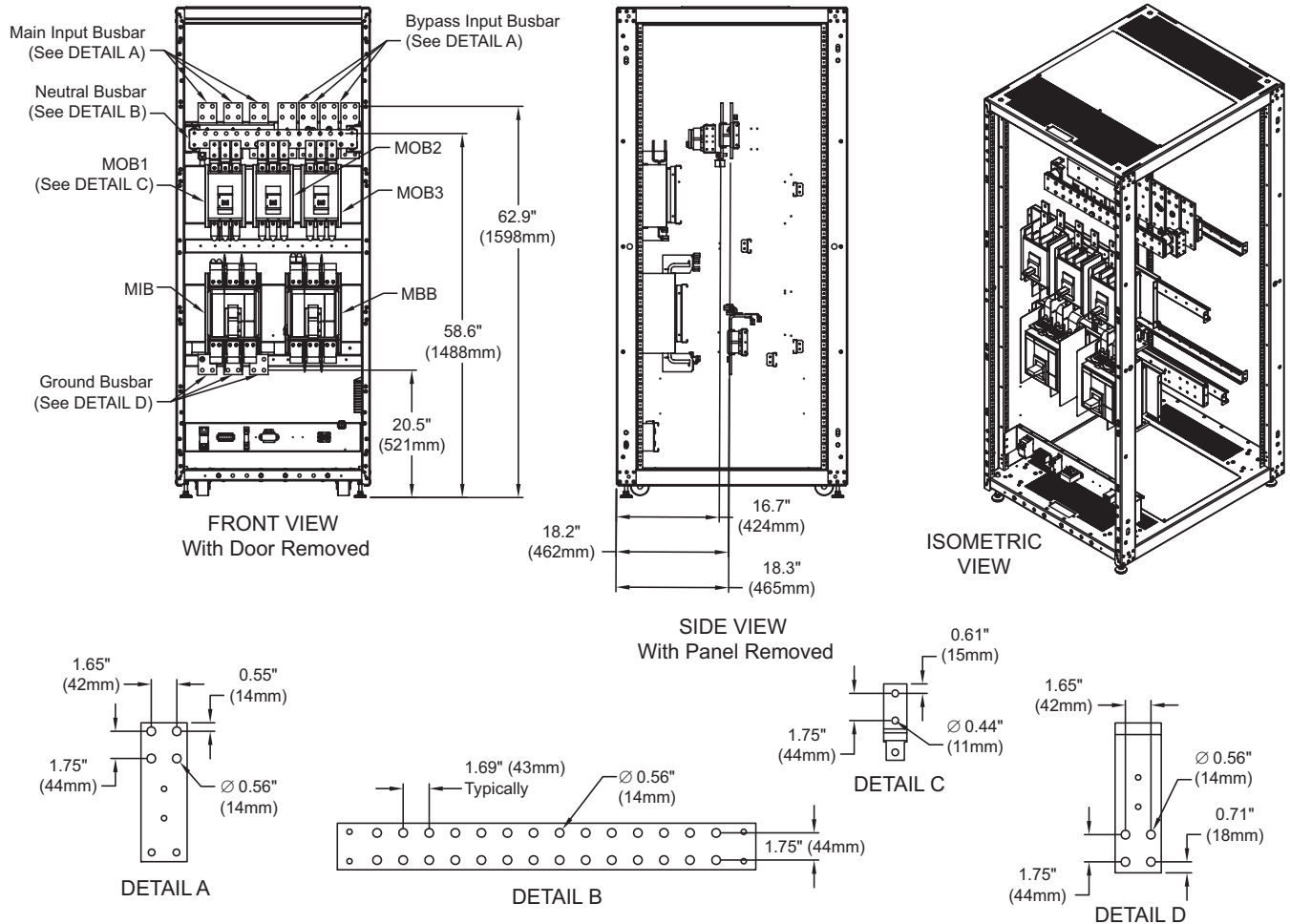


NOTES

1. Control wiring and power wiring must be run in separate conduits.
2. All wiring is to be in accordance with national and local electrical codes.
3. If maintenance bypass cabinet is attached to UPS, Vertiv will supply the interconnection cables.

EXM16017
Rev. 1

Figure 6 Main components—800mm 2+1 Liebert EXM Parallel Cabinet



NOTES

1. All dimensions are in inches (mm).
2. Control wiring and power wiring must be run in separate conduits.
3. All wiring is to be in accordance with national and local electrical codes.
4. If maintenance bypass cabinet is attached to UPS, Vertiv will supply the interconnection cables.
5. 2+1 available only from 120-160 kVA.

EXM16110
Rev. 0

Figure 7 Main components—800mm 1+1 and 2+0 Liebert EXM Parallel Cabinet

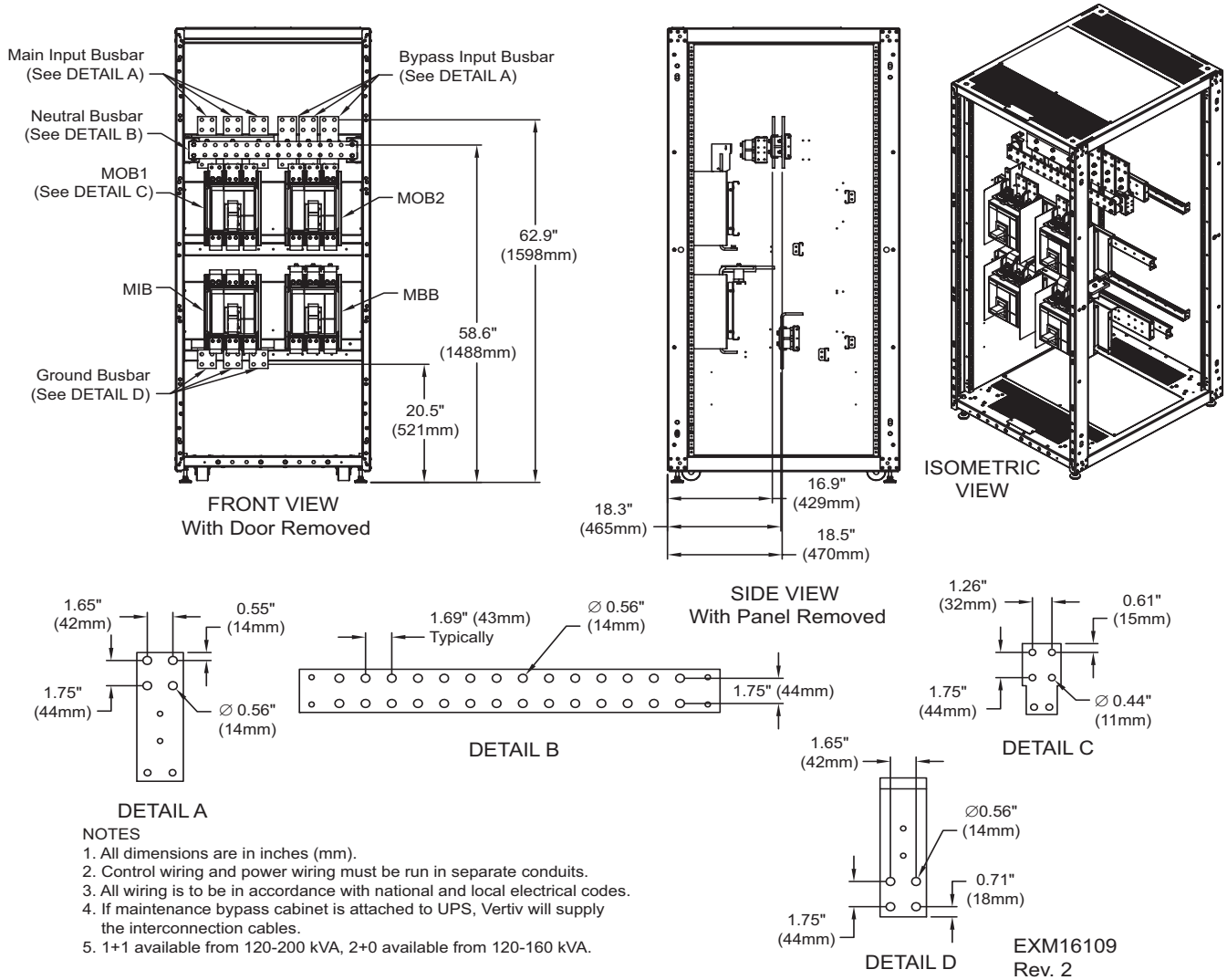
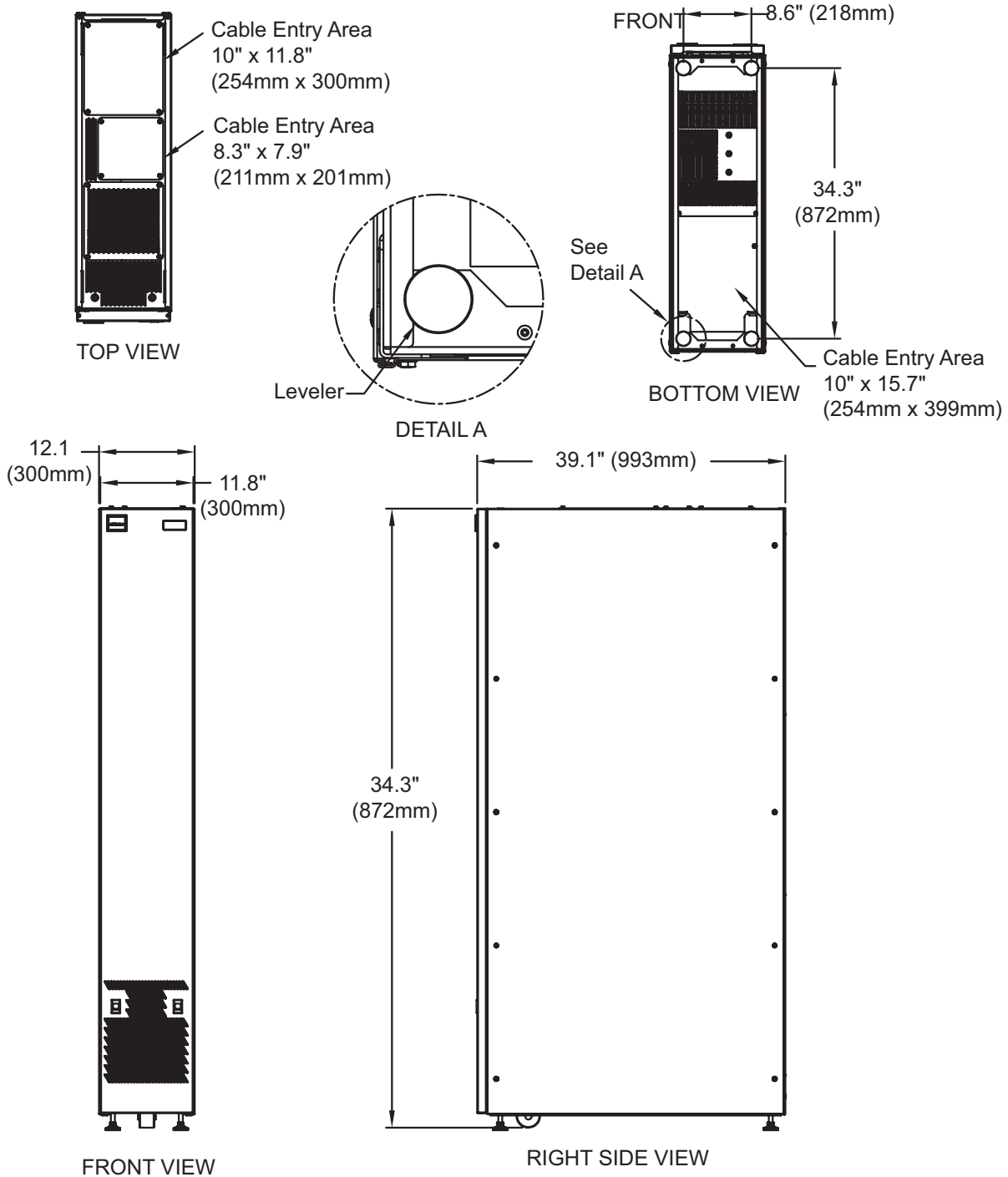


Figure 8 Outline drawing—300mm Liebert EXM Parallel Cabinet



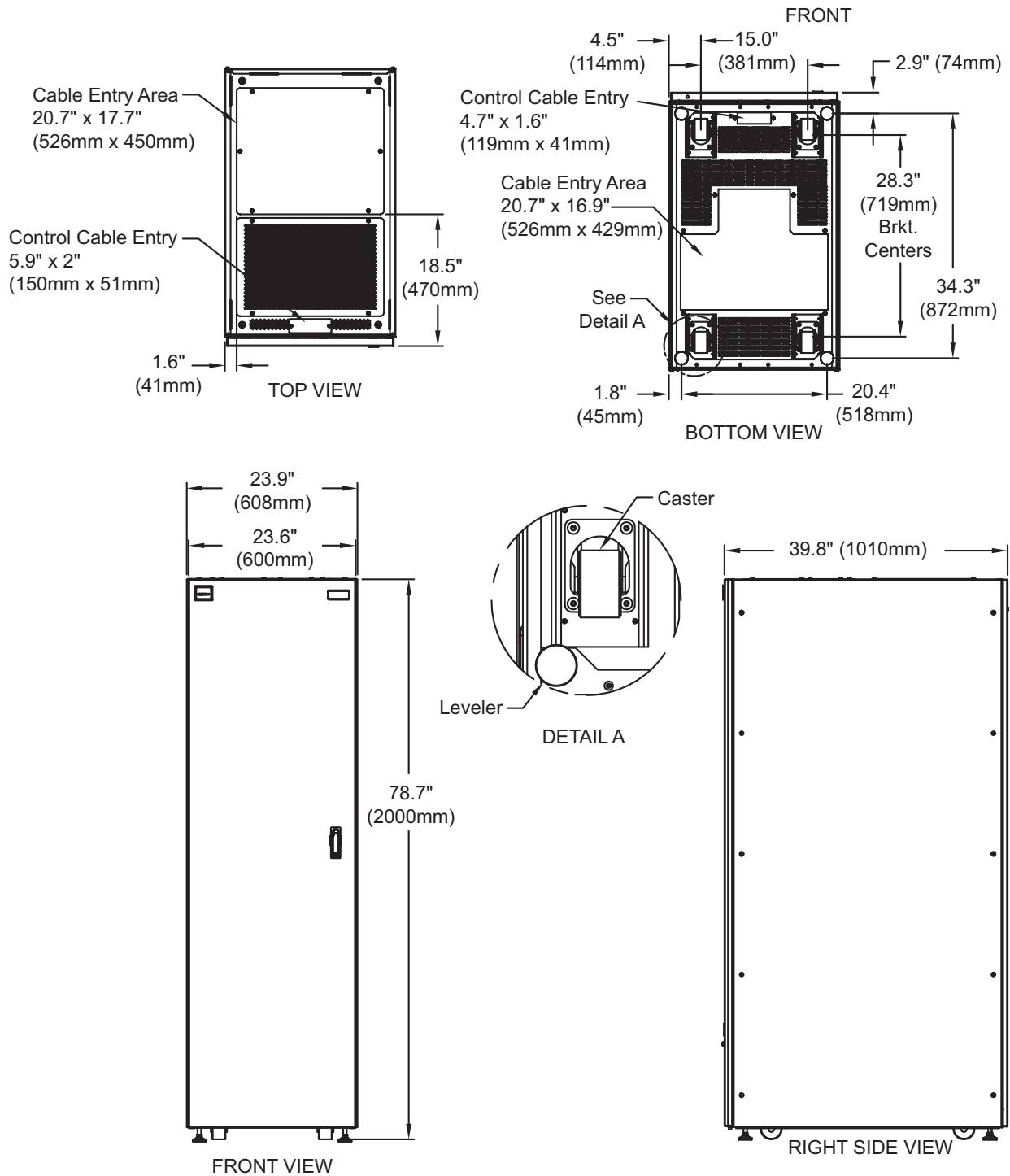
NOTES

1. All dimensions are in inches (mm).
2. 24" (610) minimum clearance above unit for air exhaust.
36" (914) front access required for service.
3. Keep cabinet within 15 degrees of vertical.
4. Top and bottom cable entry available through removable access plates. Remove, punch to suit conduit size and replace.
5. Unit bottom is structurally adequate for forklift handling.
6. Control wiring and power wiring must be run in separate conduits.
7. Copper cables only are recommended.
8. All wiring is to be in accordance with national and local electrical codes.

EXM12010A

Rev. 3

Figure 9 Outline drawing—600mm Liebert EXM Parallel Cabinet

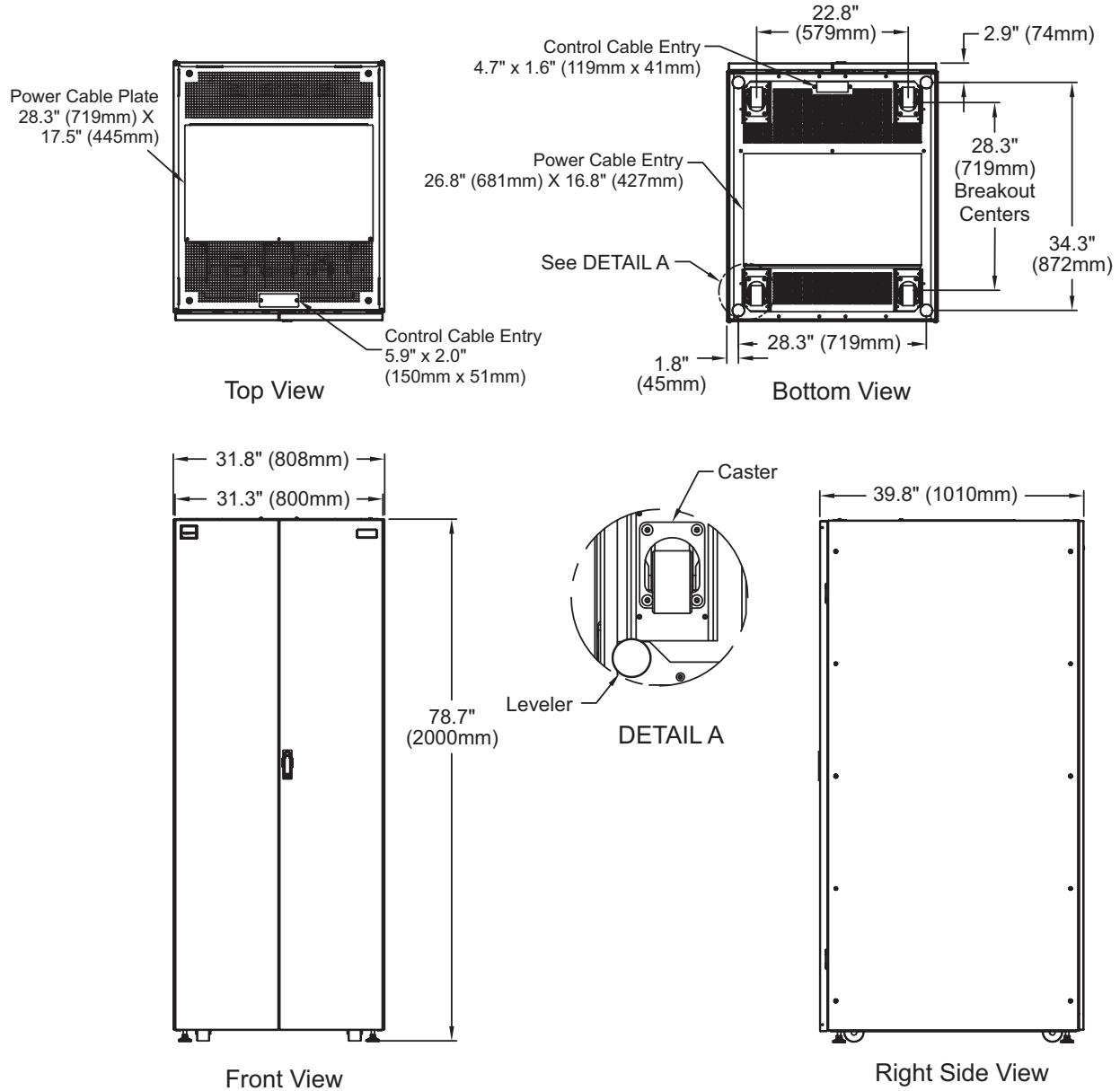


NOTES

1. 24" (610) minimum clearance above unit for air exhaust.
36" (914) front access required for service.
2. Keep 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. Unit bottom is structurally adequate for forklift handling.
5. Control wiring and power wiring must be run in separate conduits.
6. Copper cables only are recommended.
7. All wiring is to be in accordance with national and local electrical codes.

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Pg. 1, Rev. 3

Figure 10 Outline drawing—800mm Liebert EXM Parallel Cabinet



NOTES:

1. All dimensions are in inches (mm).
2. 24" (610) minimum clearance above unit for air exhaust. 36" (914) front access required for service.
3. Keep cabinet within 15 degrees of vertical.
4. Top and bottom cable entry is available through removable access plates. Remove, punch to suit conduit size 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 is to be done in accordance with national and local electrical codes.

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3.0 SPECIFICATIONS

Table 4 Liebert EXM Parallel Cabinet specifications

Model Size	10-40kVA	60-100kVA	120-200kVA
Cabinet Width	300mm	600mm	800mm
Input Parameters			
Input Voltage to Bypass, VAC	208/120V or 220/127V, 3-Phase, 4-Wire		
Input Current	Refer to UPS User Manual		
Input Frequency	60		
Output Parameters			
Output Power, kW	10-40	60-100	120-200
Output Voltage, VAC	208/120V or 220/127V, 3-Phase, 4-Wire		
Output Current, AAC	Refer to Tables 5 and 6		
Output Frequency	60		
Physical Parameters and Standards			
Dimensions, in. (mm)			
Cabinet Width, side panels attached	11.81 (300)	23.62 (600)	31.49 (800)
Depth, in. (mm)	39.4 (1000)		
Height, in. (mm)	78.74 (2000)		
Weight, lb (kg)			
1+1 & 2+0	263 (119.3)	—	—
1+1 & 2+0	—	594 (269.4)	—
2+1	—	594 (269.4)	—
1+1 & 2+0	—	—	686 (311.2)
2+1	—	—	714 (323.8)
Color	Black (ZP-7021)		
Degree of Protection for UPS Enclosure	IP 20 (with and without front door open)		
Standards and conformities	UL1778 5th Edition; CSA 22.2 107-3-14 ISTA Procedure 1H; WEEE		
Minimum Clearance, Top, in. (mm)	24 (610)		
Minimum Clearance, Back, in. (mm)	0		
Minimum Clearance, Sides, in. (mm)	0		
Cable Entrance	Top or Bottom		
Environmental Parameters			
Storage Temperature Range, °F (°C)	-13 to 158 (-25 to 70)		
Operating Temperature, °F (°C)	32 to 104 (0 to 40) (UPS)		
Relative Humidity	Maximum 95% Non-Condensing (Operating and Non-Operating)		
Maximum Altitude above MSL, ft. (m)	Refer to the UPS manual, SL-25648, SL-25650 or SL-26100.		

3.1 ELECTRICAL CHARACTERISTICS



NOTE

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

Table 5 Liebert EXM Parallel Cabinet output currents, 1+1 configuration

1+1 Configuration						
System Rating	Nominal Output Current	OCP Device Rating	Bolt Size	75°C Current Total	Copper Wire	Aluminum Wire
10	28	40	M10	50	(1) #6	(1) #2
15	42	60	M10	85	(1) #4	(1) #2
20	56	70	M10	115	(1) #2	(1) #2
30	83	110	M10	130	(1) 1/0	(1) 2/0
40	111	150	M10	175	(1) 3/0	(1) 4/0
60	167	225	M12	285	(1) 300	(2) 2/0
80	222	300	M12	400	(2) 3/0	(2) 4/0
100	278	350	M12	460	(2) 4/0	(2) 300 kcmil
120	333	450	M12	620	(2) 350 kcmil	(2) 500 kcmil
140	389	500	M12	620	(2) 350 kcmil	(2) 500 kcmil
160	444	600	M12	760	(2) 500 kcmil	—
180	500	700	M12	930	(3) 350 kcmil	(3) 500 kcmil
200	555	700	M12	930	(3) 350 kcmil	(3) 500 kcmil

Table 6 Liebert EXM Parallel Cabinet output currents, 2+0 and 2+1 configurations

2+0 and 2+1 Configuration							
UPS Size in Parallel	System Rating	Nominal Output Current	OCP Device Rating	Bolt Size	75°C Current Total	Copper Wire	Aluminum Wire
10	20	56	70	M10	115	(1) #2	(1) #2
15	30	83	110	M10	130	(1) 1/0	(1) 2/0
20	40	111	150	M10	175	(1) 3/0	(1) 4/0
30	60	167	225	M10	400	(2) 3/0	(2) 4/0
40	80	222	300	M10	460	(2) 4/0	(2) 300 kcmil
60	120	333	450	M12	501	(2) 300 kcmil	(2) 350 kcmil
80	160	444	600	M12	607	(3) 4/0	(3) 300 kcmil
100	200	555	700	M12	752	(3) 300 kcmil	(4) 250 kcmil
120	240	666	1000	M12	1003	(4) 300 kcmil	(4) 500 kcmil
140	280	778	1000	M12	1091	(4) 350 kcmil	(4) 500 kcmil
160	320	888	1200	M12	1337	(4) 500 kcmil	—



NOTE

For UPS input, bypass and output currents, see UPS user manuals.

Table 7 Recommended lug sizes (compression type) M10, 3/8" bolt

Cable Size	T&B Copper One Hole	T&B Aluminum One Hole	T&B Copper Two-Hole	T&B Aluminum Two-Hole
#8AWG	54132	60104-TB	—	—
#6AWG	54136	60109	256-030695-868	—
#4AWG	54140	60114	256-030695-733	—
#2AWG	54143	60118	54811BE	—
#1AWG	54148	60124	54857BE	—
#1/0AWG	54109	60130	256-30695-593	—
#2/0AWG	54110	60136	54862BE	60238
#3/0AWG	54111	60142	54864BE	60244
#4/0AWG	54112	60148	54866BE	60250
250kcmil	54174	60154	54868BE	60256
300kcmil	54179	60160	54870BE	60262
350kcmil	256-30695-112	—	54872BE	60267
400kcmil	256-30695-1403	—	54874BE	60269
500kcmil	256-30695-339	—	54876BE	60273

3.2 TORQUE REQUIREMENTS

All electrical connections must be tight.

Tables 8 and 9 provide the torque values for the connections to the Liebert EXM Parallel Cabinet. Use these values unless the equipment is labeled otherwise.

Table 8 Busbar torque for power wiring

Bolt Shaft Size	Torque lb-in (Nm)
3/8" (M10)	192 (22)
1/2" (M12)	428 (48)

Table 9 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.



