Galaxy VX

UPS with 1000 kW I/O Cabinet 480 V

Installation

300 kW/kVA, 300 kW/kVA N+1,
400 kW/kVA, 400 kW/kVA N+1,
500 kW/kVA, 500 kW/kVA N+1,
625 kW/kVA, 625 kW/kVA N+1,
500 kW/kVA Expandable to 750 kW/kVA, 750 kW/kVA, 750 kW/kVA N+1,
500 kW/kVA Expandable to 1000 kW/kVA, 625 kW/kVA Expandable to 1000 kW/kVA,
750 kW/kVA Expandable to 1000 kW/kVA, 1000 kW/kVA, 1000 kW/kVA N+1

10/2019

www.schneider-electric.com

Legal Information

Table of Contents

Important Safety Instructions — SAVE THESE INSTRUCTIONS

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. The following safety messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a “Danger” or “Warning” safety message indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

⚠DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this type of safety message.

Failure to follow these instructions can result in equipment damage.

Please Note

Electrical equipment should only be installed, operated, serviced, and maintained by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

FCC Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Safety Precautions

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

All safety instructions in this document must be read, understood and followed.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Read all instructions in the Installation Manual before installing or working on this UPS system.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not install the UPS system until all construction work has been completed and the installation room has been cleaned.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- The product must be installed according to the specifications and requirements as defined by Schneider Electric. It concerns in particular the external and internal protections (upstream breakers, battery breakers, cabling, etc.) and environmental requirements. No responsibility is assumed by Schneider Electric if these requirements are not respected.
- After the UPS system has been electrically wired, do not start up the system. Start-up must only be performed by Schneider Electric.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The UPS system must be installed according to local and national regulations. Install the UPS according to:

- IEC 60364 (including 60364–4–41- protection against electric shock, 60364–4–42 - protection against thermal effect, and 60364–4–43 - protection against overcurrent), **or**
- NEC NFPA 70, **or**
- Canadian Electrical Code (C22.1, Part 1)

depending on which one of the standards apply in your local area.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Install the UPS system in a temperature controlled indoor environment free of conductive contaminants and humidity.
- Install the UPS system on a non-flammable, level and solid surface (e.g. concrete) that can support the weight of the system.

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The UPS is not designed for and must therefore not be installed in the following unusual operating environments:

- Damaging fumes
- Explosive mixtures of dust or gases, corrosive gases, or conductive or radiant heat from other sources
- Moisture, abrasive dust, steam or in an excessively damp environment
- Fungus, insects, vermin
- Salt-laden air or contaminated cooling refrigerant
- Pollution degree higher than 2 according to IEC 60664-1
- Exposure to abnormal vibrations, shocks, and tilting
- Exposure to direct sunlight, heat sources, or strong electromagnetic fields

Failure to follow these instructions will result in death or serious injury.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not drill or cut holes for cables or conduits with the gland plates installed and do not drill or cut holes in close proximity to the UPS.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

HAZARD OF ARC FLASH

Do not make mechanical changes to the product (including removal of cabinet parts or drilling/cutting of holes) that are not described in the Installation Manual.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTICE

RISK OF OVERHEATING

Respect the space requirements around the UPS system and do not cover the product's ventilation openings when the UPS system is in operation.

Failure to follow these instructions can result in equipment damage.

NOTICE

RISK OF EQUIPMENT DAMAGE

Do not connect the UPS output to regenerative load systems including photovoltaic systems and speed drives.

Failure to follow these instructions can result in equipment damage.

Electrical Safety

This manual contains important safety instructions that should be followed during the installation and maintenance of the UPS system.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Electrical equipment must be installed, operated, serviced, and maintained only by qualified personnel.
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- Disconnection devices for AC and DC must be provided by others, be readily accessible, and the function of the disconnect device marked for its function.
- Turn off all power supplying the UPS system before working on or inside the equipment.
- Before working on the UPS system, check for hazardous voltage between all terminals including the protective earth.
- The UPS contains an internal energy source. Hazardous voltage can be present even when disconnected from the mains supply. Before installing or servicing the UPS system, ensure that the units are OFF and that mains and batteries are disconnected. Wait five minutes before opening the UPS to allow the capacitors to discharge.
- The UPS must be properly earthed/grounded and due to a high leakage current, the earthing/grounding conductor must be connected first.

Failure to follow these instructions will result in death or serious injury.

When the UPS input is connected through external isolators that, when opened, isolate the neutral or when the automatic backfeed isolation is provided external to the equipment or is connected to an IT power distribution system, a label must be fitted at the UPS input terminals, and on all primary power isolators installed remotely from the UPS area and on external access points between such isolators and the UPS, by the user, displaying the following text (or equivalent in a language which is acceptable in the country in which the UPS system is installed):

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Risk of voltage backfeed. Before working on this circuit: Isolate the UPS and check for hazardous voltage between all terminals including the protective earth.

Failure to follow these instructions will result in death or serious injury.

Battery Safety

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Battery circuit breakers must be installed according to the specifications and requirements as defined by Schneider Electric.
- Servicing of batteries must only be performed or supervised by qualified personnel knowledgeable of batteries and the required precautions. Keep unqualified personnel away from batteries.
- Disconnect charging source prior to connecting or disconnecting battery terminals.
- Do not dispose of batteries in a fire as they can explode.
- Do not open, alter, or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.

Failure to follow these instructions will result in death or serious injury.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Batteries can present a risk of electric shock and high short-circuit current. The following precautions must be observed when working on batteries

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Wear protective glasses, gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect the charging source prior to connecting or disconnecting battery terminals.
- Determine if the battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electric shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).

Failure to follow these instructions will result in death or serious injury.

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

When replacing batteries, always replace with the same type and number of batteries or battery packs.

Failure to follow these instructions will result in death or serious injury.

NOTICE

RISK OF EQUIPMENT DAMAGE

- Wait until the system is ready to be powered up before installing batteries in the system. The time duration from battery installation until the UPS system is powered up must not exceed 72 hours or 3 days.
- Batteries must not be stored more than six months due to the requirement of recharging. If the UPS system remains de-energized for a long period, Schneider Electric recommends that you energize the UPS system for a period of 24 hours at least once every month. This charges the batteries, thus avoiding irreversible damage.

Failure to follow these instructions can result in equipment damage.

Specifications

Input Specifications

	300 kW	400 kW	500 kW	625 kW	750 kW	1000 kW
Connections	L1, L2, L3 + G[1]					
Input voltage (V)	480 -15/+20% at 100% load					
Nominal input voltage (V)	480					
Minimum input voltage (V)	408					
Maximum input voltage (V)	576[2]					
Frequency range (Hz)	40 – 70					
Nominal input current (A)	380	506	633	791	950	1266
Maximum input current (A)[3]	437	582	728	910	1092	1456
Input current limitation (A)	456	608	760	950	1140	1520
Total harmonic distortion (THDI)	<3% at 100% load <4% at 50% load <9% at 25% load					
Input power factor	0.99 at >40% load 0.98 at >20% load 0.97 at >10% load					
Protection	Backfeed contactors					
Ramp-in	Adaptive 1 – 40 Sec					

Bypass Specifications

	300 kW	400 kW	500 kW	625 kW	750 kW	1000 kW
Connection type	L1, L2, L3 + G[1]					
Nominal bypass voltage (V)	480					
Minimum bypass voltage (V)	432					
Maximum bypass voltage (V)	528					
Frequency (Hz)	50 or 60					
Frequency Range (Hz)	Programmable: +/-0.1, +/-3, +/-10. Default is +/-3.					
Nominal bypass current (A)	363	485	606	757	909	1211
Maximum short circuit rating	100 kA RMS[4]					
Thyristor I^2t (kA^*s^2)	7220[5]					

1. TN, TT, and IT power distribution systems are supported. Corner (line) grounding is not supported.
2. The system can operate at up to 600 V for 1 minute.
3. At nominal input voltage and full charge.
4. Conditioned by the internal molded switch with a 90 kA peak magnetic trip
5. If this value is exceeded, the thyristors will short.

	300 kW	400 kW	500 kW	625 kW	750 kW	1000 kW
BF2 magnetic trip	39 kA					
Protection	Molded switch with trip for backfeed protection					

Output Specifications

	300 kW	400 kW	500 kW	625 kW	750 kW	1000 kW
Nominal output voltage (V)	480					
Connections	L1, L2, L3 + G					
Overload capacity	150% for 1 minute (normal operation) 125% for 10 minutes (normal operation) 115% for 1 minute (battery operation) 1000% for 100 milliseconds (bypass operation)					
Output voltage tolerance	Symmetric load: +/- 1% Asymmetric load: +/- 3%					
Dynamic load response	+/- 5% after 2 ms +/- 1% after 50 ms					
Output power factor	1					
Nominal output current (A)	361	481	601	752	902	1203
Total harmonic distortion (THDU)	<2% at 100% linear load <3% at 100% non–linear load[6]					
Output frequency (Hz)	50/60 (synchronized to bypass) 50/60 Hz +/-0.1% (free-running)					
Slew rate (Hz/sec)	Programmable: 0.25, 0.5, 1, 2, 4, 6					
Output performance classification (according to IEC/ EN62040-3)	Double-conversion: VFI-SS-111					
Load crest factor	Up to 3 (THDU < 5%)					
Load power factor	0.7 leading to 0.5 lagging without derating					

Battery Specifications

NOTE: Refer to battery manufacturer's manual for information on installation and maintenance.

	300 kW	400 kW	500 kW	625 kW	750 kW	1000 kW
Charging power in % of output power	40% at ≤ 80% load 15% at 100% load					
Maximum charging power (kW)	45 at 100% load 120 at 80% load	60 at 100% load 160 at 80% load	75 at 100% load 200 at 80% load	93.75 at 100% load 250 at 80% load	112.50 at 100% load 300 at 80% load	150 at 100% load 400 at 80% load
Nominal battery voltage (VDC)	480					
Nominal float voltage (VDC)	546					
End of discharge voltage (full load) (VDC)	384					

6. Maximum non-linear load is 100 kVA.

	300 kW	400 kW	500 kW	625 kW	750 kW	1000 kW
End of discharge voltage (no load) (VDC)	420					
Battery current at full load and nominal battery voltage (A)	654	872	1090	1362	1634	2179
Battery current at full load and minimum battery voltage (A)	817	1090	1362	1703	2043	2724
Temperature compensation (per cell)	-3.3 mV per °C for T ≥ 25 °C 0 mV per °C for T < 25 °C					
Ripple current	< 5% C20 (5 minutes backup time)					
Battery test	Manual/automatic (selectable)					
Deep discharge protection	Yes					
Recharge according to battery temperature	Yes					

Recommended Upstream Protection and Cable Sizes

⚠ CAUTION

HAZARD OF FIRE

- Connect only to a circuit with the below specifications.
- Connect only to a circuit provided with maximum a 1600 A branch circuit overcurrent protection in accordance with the National Electrical Code, ANSI/NFPA70, and the Canadian Electrical Code, Part I, C22.1.

Failure to follow these instructions can result in injury or equipment damage.

NOTE: Overcurrent protection is to be provided by others.

NOTE: All wiring must comply with all applicable national and/or electrical code (National Electrical Code, ANSI/NFPA 70).

Cable sizes in this manual are based on Table 310.15 of the National Electrical Code 2014 (NEC) with the following assertions:

- 90 °C conductors (THHN) for 75 °C termination
- Not more than 3 current carrying conductors in each conduit
- An ambient temperature of max. 30 °C
- Use of copper or aluminium conductors
- 100% rated breakers
- Nominal operating conditions

If the ambient room temperature is greater than 30 °C, use larger or additional parallel conductors in accordance with the correction factors of the NEC. The maximum allowable conductor size is 600 kcmil.

Equipment Grounding Conductors (EGC) are sized in accordance with NEC Article 250.122 and Table 250.122 “Minimum size equipment conductor for grounding equipment.

NOTE: Always consider the EGC size according to the complete electrical installation.

Recommended Upstream Protection and Cable Sizes for 300 kW UPS

	Maximum OCPD (A)	Conductors per Phase Copper / Aluminium (kcmil)	Equipment Grounding Conductor Copper / Aluminium[7]
Input	500[8]	2x250 / 2x500	2 AWG / 1/0 AWG
Bypass	400[8]	1x500 / 2x250	3 AWG / 1/0 AWG
Output	400[8]	1x500 / 2x250	3 AWG / 1/0 AWG
Battery	1000[9]	3x350 / 3x500	2/0 AWG / 4/0 AWG

Recommended Upstream Protection and Cable Sizes for 400 kW UPS

	Maximum OCPD (A)	Conductors per Phase Copper / Aluminium (kcmil)	Equipment Grounding Conductor Copper / Aluminium[7]
Input	700[8]	2x350 / 2x500	1/0 AWG / 3/0 AWG
Bypass	500[8]	2x300 / 2x500	2 AWG / 1/0 AWG
Output	500[8]	2x300 / 2x500	2 AWG / 1/0 AWG
Battery	1200[8]	3x600 / 4x500	3/0 / 250

Recommended Upstream Protection and Cable Sizes for 500 kW UPS

	Maximum OCPD (A)	Conductors per Phase Copper / Aluminium (kcmil)	Equipment Grounding Conductor Copper / Aluminium[7]
Input	800[8]	2x600 / 3x400	1/0 AWG / 3/0 AWG
Bypass	700[8]	2x350 / 2x500	1/0 AWG / 3/0 AWG
Output	700[8]	2x350 / 2x500	1/0 AWG / 3/0 AWG
Battery	1600[9]	4x500 / 5x500	4/0 AWG / 350 kcmil

Recommended Upstream Protection and Cable Sizes for 625 kW UPS

	Maximum OCPD (A)	Conductors per Phase Copper/ Aluminium (kcmil)	Equipment Grounding Conductor Copper/Aluminium[7]
Input	1000[8]	3x400 / 3x600	2/0 AWG / 4/0 AWG
Bypass	800[8]	2x600 / 3x400	1/0 AWG / 3/0 AWG
Output	800[8]	2x600 / 3x400	1/0 AWG / 3/0 AWG
Battery	2000[9]	5x500 / 6x600	250 kcmil / 400 kcmil

Recommended Upstream Protection and Cable Sizes for 750 kW UPS

	Maximum OCPD (A)	Conductors per Phase Copper/ Aluminium (kcmil)	Equipment Grounding Conductor Copper/Aluminium[7]
Input	1200[8]	3x600 / 4x500	3/0 AWG / 250 kcmil
Bypass	1000[8]	3x400 / 3x600	2/0 AWG / 4/0 AWG
Output	1000[8]	3x400 / 3x600	2/0 AWG / 4/0 AWG
Battery	2500[9]	6x500 / 7x600	350 kcmil / 600 kcmil

7. If the conductors are run in conduits, there must be one conductor in each conduit.
8. Long-time setting (I_r) = 1.0
9. Long-time setting (I_r) = 0.9

Recommended Upstream Protection and Cable Sizes for 1000 kW UPS

	Maximum OCPD (A)	Conductors per Phase Copper/ Aluminium (kcmil)	Equipment Grounding Conductor Copper/Aluminium[10]
Input	1600[11]	4x600 / –	4/0 AWG / –
Bypass	1600[12]	4x400 / –	4/0 AWG / –
Output	1600[12]	4x400 / –	4/0 AWG / –
Battery	3000[11]	8x500 / –	400 kcmil / –

Recommended Bolt and Lug Sizes for Copper Cables

Cable Size	Terminal Bolt Diameter	Cable Lug Type	Crimping Tool	Die
1/0 AWG	M12 x 35 mm	LCCF1/0–12–X	CT930	CD-920–2/0 Black P45
2/0 AWG	M12 x 35 mm	LCCF2/0–12–X	CT930	CD-920–3/0 Orange P50
3/0 AWG	M12 x 35 mm	LCCF3/0–12–X	CT930	CD-920–4/0 Purple P54
250 kcmil	M12 x 35 mm	LCCF250–12–X	CT-940CH/CT-2940	CD-920–300 White P66
300 kcmil	M12 x 35 mm	LCCF300–12–6	CT-940CH/CT-2940	CD-920–350 Red P71
400 kcmil	M12 x 35 mm	LCCF400–12–6	CT-940CH/CT-2940	CD-920–500 Brown P87
500 kcmil	M12 x 35 mm	LCCF500–12–6	CT-940CH/CT-2940	CD-920–500A Pink P99
600 kcmil	M12 x 40 mm	LCCF600–12–6	CT-940CH/CT-2940	CD-920–750 Black P106

Recommended Bolt and Lug Sizes for Aluminium Cables

Cable Size	Terminal Bolt Diameter	Cable Lug Type	Crimping Tool	Die
2/0 AWG	M12 x 40 mm	LAB2/0-12-5	CT930	Olive P54
3/0 AWG	M12 x 40 mm	LAB3/0-12-5	CT930	Ruby P60
250 kcmil	M12 x 40 mm	LAB250-12-5	CT930	Red P71
300 kcmil	M12 x 40 mm	LAB300-12-2	CT930	Blue P76
400 kcmil	M12 x 40 mm	LAB400-12-2	CT930	Green P94
500 kcmil	M12 x 40 mm	LAB500-12-2	CT930	Pink P99
600 kcmil	M12 x 40 mm	LAB600-12-2	CT930	Black P106

Torque Specifications

Bolt size	Torque
M6	5 Nm (3.69 lb-ft)
M8	17.5 Nm (12.91 lb-ft)
M10	30 Nm (22 lb-ft)
M12	50 Nm (36.87 lb-ft)

10. If the conductors are run in conduits, there must be one conductor in each conduit.
11. Long-time setting (I_r) = 1.0
12. Long-time setting (I_r) = 0.8

Environment

	Operating	Storage
Temperature	0 °C to 40 °C (32 °F to 104 °F) 0 °C to 50 °C (32 °F to 122 °F) when derated to 75% power[13]	-15 °C to 40 °C (5 °F to 104 °F) for systems with batteries -25 °C to 55 °C (-13 °F to 131 °F) for systems without batteries
Relative humidity	0 – 95% non-condensing	0 – 95% non-condensing
Altitude derating according to ANSI C57.96–1999	1000 m (3300 ft): 1.000 1500 m (5000 ft): 0.975 2000 m (6600 ft): 0.950	0 – 15000 m (0 – 50000 ft)
Audible noise one meter (three feet) from surface	62 dB at 70% load 69.5 dB at 100% load for 400 V systems 68 dB at 100% load for 480 V systems	
Protection class	IP20	
Color	RAL 9003 white	

Heat Dissipation (BTU/hr) for a 300 kW UPS

Load	Normal Operation	ECO Mode	ECOnversion	Battery Operation
25%	12919	5723	5978	12353
50%	19937	6587	6742	20392
75%	28412	7719	7766	29227
100%	38039	9045	9032	39199

Heat Dissipation (BTU/hr) for a 400 kW UPS

Load	Normal Operation	ECO Mode	ECOnversion	Battery Operation
25%	98409	90496	93271	101770
50%	196084	176797	179590	197789
75%	294126	264155	266255	294870
100%	401035	352206	353243	393465

Heat Dissipation (BTU/hr) for a 500 kW UPS

Load	Normal Operation	ECO Mode	ECOnversion	Battery Operation
25%	18698	6495	7818	18234
50%	31855	7747	7747	31855
75%	50542	10319	10319	53313
100%	69234	13758	13758	78519

Heat Dissipation (BTU/hr) for a 625 kW UPS

Load	Normal Operation	ECO Mode	ECOnversion	Battery Operation
25% load	23373	6475	9772	22793
50% load	38672	9683	10770	39818

13. For temperatures between 40 °C and 50 °C, the load power rating must be derated with 2.5% per °C of rated output power. Above 40 °C the minimum input voltage is 340 V, and from 380 V to 340 V, the charge power must be linearly derated from 12% to 1%.

Load	Normal Operation	ECO Mode	ECOnversion	Battery Operation
75% load	58008	12898	12898	66641
100% load	81934	15033	17198	98149

Heat Dissipation (BTU/hr) for a 750 kW UPS

Load	Normal Operation	ECO Mode	ECOnversion	Battery Operation
25% load	27351	9742	11727	27351
50% load	46407	11620	12924	47782
75% load	73741	15478	15478	79969
100% load	106625	20637	20637	117778

Heat Dissipation (BTU/hr) for a 1000 kW UPS

Load	Normal Operation	ECO Mode	ECOnversion	Battery Operation
25%	36468	12112	15294	36468
50%	61876	15493	16657	63710
75%	95564	20637	20637	106625
100%	145873	27516	27516	157038

Weights and Dimensions for UPSs with 1000 kW I/O Cabinet

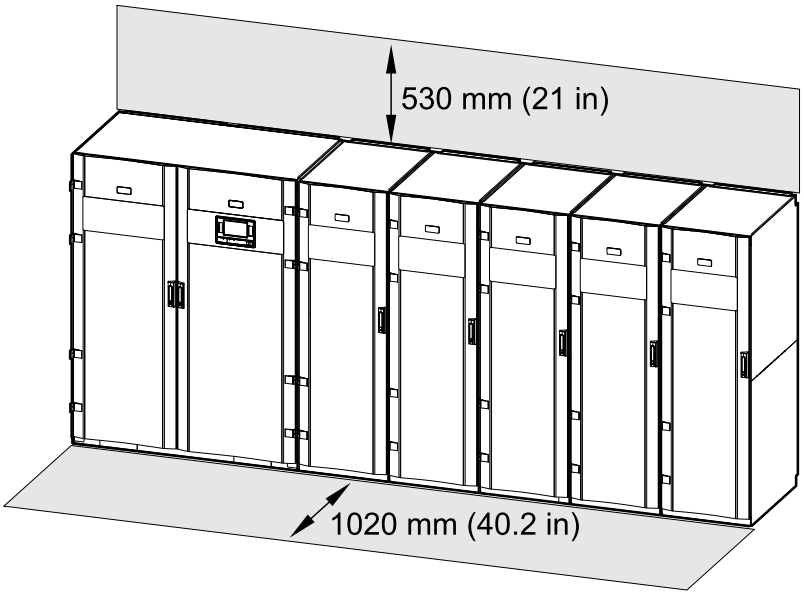
Part Number	Parts	Weight kg (lbs)	Height mm (in)	Width mm (in)	Depth mm (in)
GVX300K300GS GVX500K1000GS	In total – Power cabinets – I/O cabinet	1880 (4145) 2x540 (2x1190) 800 (1764)	1970 (77.6)	2700 (106) 2X600 (2x23.6) 1500 (59.1)	900 (35.4)
GVX625K1000GS GVX750K1000HS	In total – Power cabinets – I/O cabinet	2420 (5335) 3x540 (3x1190) 800 (1764)	1970 (77.6)	3300 (130.0) 3X600 (3x23.6) 1500 (59.1)	900 (35.4)
GVX1000K1000GS	In total – Power cabinets – I/O cabinet	2960 (6526) 4x540 (4x1190) 800 (1764)	1970 (77.6)	3900 (153.5) 4X600 (4x23.6) 1500 (59.1)	900 (35.4)
GVX1250K1000GS	In total – Power cabinets – I/O cabinet	3500 (7716) 5x540 (5x1190) 800 (1764)	1970 (77.6)	4500 (177.2) 5x600 (5x23.6) 1500 (59.1)	900 (35.4)

Clearance for UPSs with 1000 kW I/O Cabinet

NOTE: Clearance dimensions are published for airflow and service access only. Consult with the local safety codes and standards for additional requirements in your local area.

NOTE: The UPS system can be placed up against a wall and there is no requirement for rear or side access.

Front View of the I/O Cabinet and Five Power Cabinets

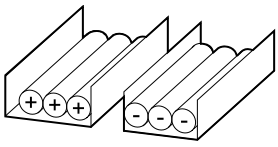
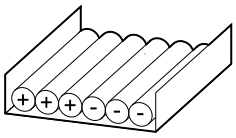
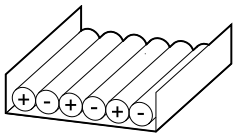
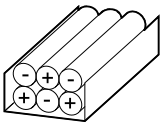


Guidance for Organizing Battery Cables

NOTE: For 3rd party batteries, use only high rate batteries for UPS applications.

NOTE: When the battery bank is placed remotely, the organizing of the cables is important to reduce voltage drop and inductance. The distance between the battery bank and the UPS must not exceed 200 m (656 ft). Contact Schneider Electric for installations with a longer distance.

NOTE: To minimize the risk of electromagnetic radiation, it is highly recommended to follow the below guidance and to use grounded metallic tray supports.

Cable Length				
<30 m	Not recommended	Acceptable	Recommended	Recommended
31–75 m	Not recommended	Not recommended	Acceptable	Recommended
76–150 m	Not recommended	Not recommended	Acceptable	Recommended
151–200 m	Not recommended	Not recommended	Not recommended	Recommended

Introduction

Overview of Configurations

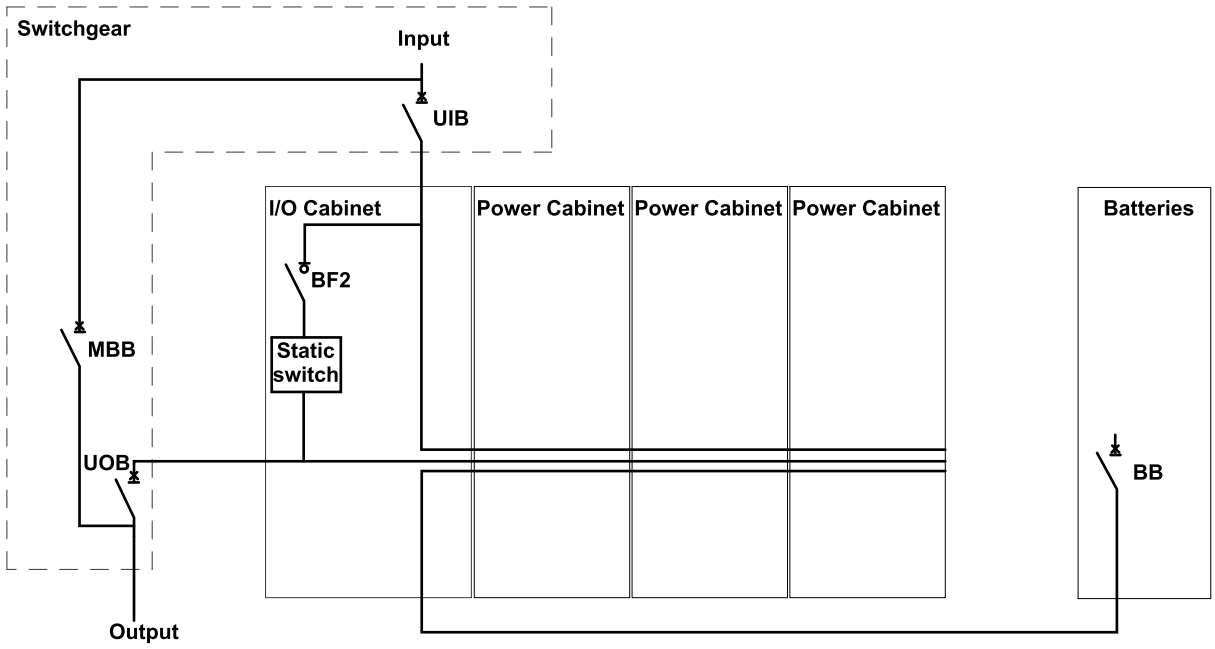
Breakers in the System

UIB	Unit input breaker
SSIB	Static switch input breaker
BB	Battery breaker
MBB	Maintenance bypass breaker
UOB	Unit output breaker
BF2	Backfeed protection switch

Overview of UPSs with 1000 kW I/O Cabinet – Single Utility/Mains System

The illustration shows a 750 kW UPS. The principle is the same for the other UPSs with the 1000 kW I/O cabinet.

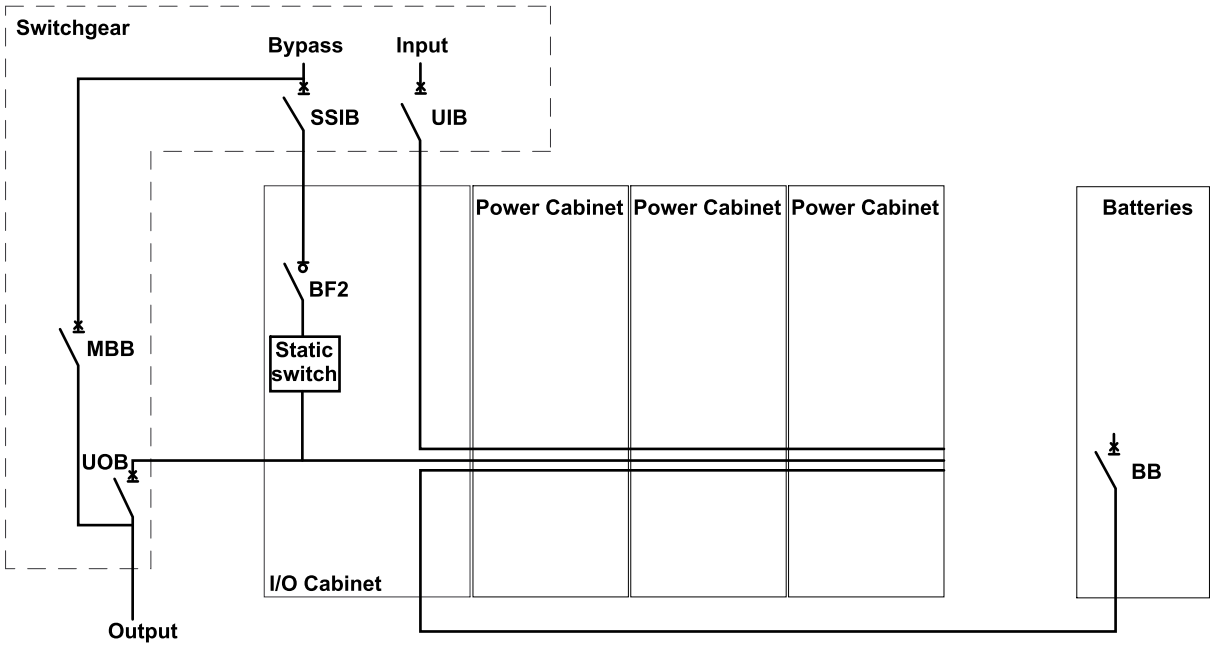
Galaxy VX 750 kW UPS



Overview of UPSs with 1000 kW I/O Cabinet – Dual Utility/Mains System

The illustration shows a 750 kW UPS. The principle is the same for the other UPSs with the 1000 kW I/O cabinet.

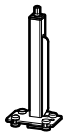
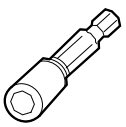
Galaxy VX 750 kW UPS



Overview of Supplied Installation Kits

Installation Kits Shipped with the I/O Cabinet

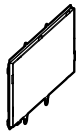
Installation Kit 0M-816661

Part	Used in	Number of units
Jack	*Remove the I/O Cabinet from the Pallet, page 25* and *Remove the Power Cabinet from the Pallet, page 31*	1 
Floor protection plate		1 
Hexagonal socket for drilling machine		1 

Installation Kit 0M-92447

Part	Used in	Number of units
Rear anchoring bracket 0M-0476	*Mount the Rear Anchoring Brackets, page 35*	1 
Front anchoring bracket 0M-0475	*Mount the Front Anchoring Bracket, page 64*	1 
M8x20 mm hexagonal torx with washer		9 

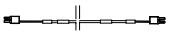
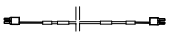
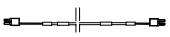
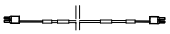
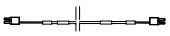
Installation Kit 0M-99582

Part	Used in	Number of Units
EMC cover right 0M-98993	*Position the Cabinets, page 36*	1 
M6 nut with washer		8 
M10x35 hexagonal torx with washer	*Install Busbars between the I/O Cabinet and the Power Cabinet, page 46*	8 

Installation Kit 0M-99046

Part	Used in	Number of Units
Ground interconnection busbar between I/O cabient and power cabinet 880–5665	*Install Busbars between the I/O Cabinet and the Power Cabinet, page 46*	1 
M8 x 30 hexagonal torx with washer		6 
Single utility/mains busbars 880–9642	*Install the Single Utility/Mains Kit, page 59*	6 
M10 nut with washer		12 

Installation Kit 0M-99130

Part	Used in	Number of units
Optical fiber cable 0W11378	*Connect the Signal Cables between the I/O Cabinet and the Power Cabinets, page 73*	1 
Optical fiber cable 0W11384		1 
Optical fiber cable 0W11385		1 
Optical fiber cable 0W12213		1 
Optical fiber cable 0W98928		1 
Cable ties for signal cables		50
Temperature sensor 0M-1160	*Connect the Signal Cables between the I/O Cabinet and the Classic Battery Cabinets, page 79*	2 
Terminator for modbus	*Connect the Modbus Cables, page 89*	2 

Installation Kit 0H-0889

Part	Used in	Number of Units
PBUS 1 cable 0W7995	*Connect the PBUS Cables between Parallel UPS Units, page 86*	1 
PBUS 2 cable 0W7996		1 

Installation Kit 0M-92449

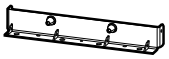
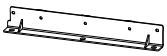
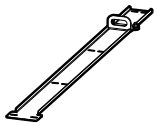
Part	Used in	Number of Units
Display	Do not install. Installation must be performed by Schneider Electric.	1 
M4x10 torx screw with washer		4 

Installation Kits Shipped with the Power Cabinet

Installation Kit 0H-9162 or 0H-9102

NOTE: The part number of the installation kit depends on the power cabinet version.

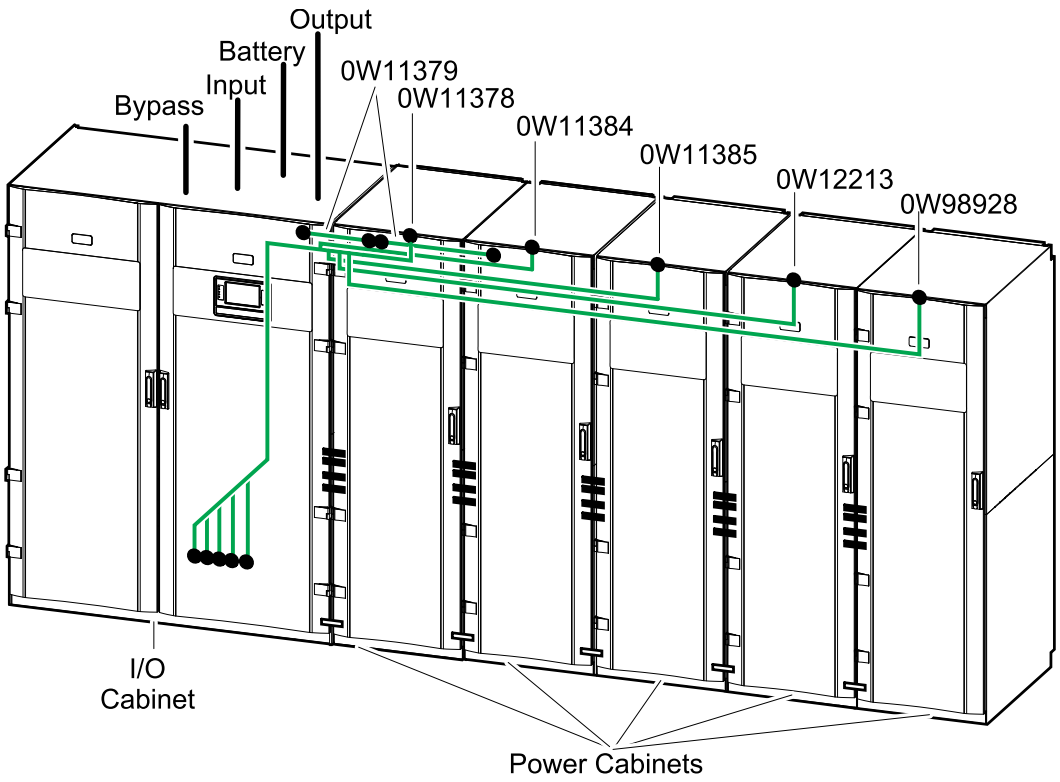
NOTE: These installation kit parts are shipped in the packaging of the power cabinet.

Part	Used in	Number of Units
Rear anchoring bracket for power cabinet 0M-818242	*Mount the Rear Anchoring Brackets, page 35*	1 
M8x20 hexagonal torx with washer		2 
Front anchoring bracket for power cabinet 0M-816684	*Mount the Front Anchoring Bracket, page 64*	1 
Long top baying bracket 0M-821220	*Position the Cabinets, page 36*	1 
M6x16 torx screw with washer		15 
1 mm leveling shims		10 
Ground interconnection busbar 880–5259 **or** 880–99027[14] from power cabinet to power cabinet	*Install Busbars between the I/O Cabinet and the Power Cabinet, page 46* and *Install Busbars between the Power Cabinets, page 50*	1 
M8x35 mm hexagonal torx with washer		4 
M8 nut with washer		4 
Interconnection busbar 880-10146 **or** 880–9720[14] from power cabinet to power cabinet (neutral)		1 
Interconnection busbar 0M-140035 power cabinet to power cabinet (battery +)		1 
Interconnection busbar 0M-97886 power cabinet to power cabinet (output)		3 
Interconnection busbar 0M-819336 power cabinet to power cabinet (battery -)		1 
Interconnection busbar 0M-97885 power cabinet to power cabinet (input)		3

14. The part number depends on the power cabinet version.

Part	Used in	Number of Units
		
M10 nut with washer		24 
M10x35 hexagonal torx with washer		12 

Installation Procedure



1. *Remove the I/O Cabinet from the Pallet, page 25*.
2. *Remove the Power Cabinet from the Pallet, page 31*.
3. *Mount the Rear Anchoring Brackets, page 35*.
4. *Position the Cabinets, page 36*.
5. *Install Busbars between the I/O Cabinet and the Power Cabinet, page 46*.
6. *Install Busbars between the Power Cabinets, page 50*.
7. Prepare the I/O cabinet for power cables. Follow one of the procedures:
   - *Prepare the I/O Cabinet for Power Cables in Top Cable Entry Systems, page 53*.
   - *Prepare the I/O Cabinet for Power Cables in Bottom Cable Entry Systems, page 55*.
8. In single utility/mains systems only: *Install the Single Utility/Mains Kit, page 59*.

9. *Connect the Power Cables, page 59*.
10. *Mount the Front Anchoring Bracket, page 64*.
11. Prepare for signal cables. Follow one of the procedures:
    – *Prepare the I/O Cabinet for Signal Cables in Top Cable Entry Systems, page 65*.
    – *Prepare the I/O Cabinet for Signal Cables in Bottom Cable Entry Systems, page 69*.
12. *Connect the Signal Cables between the I/O Cabinet and the Power Cabinets, page 73*.
13. *Connect the Signal Cables between the I/O Cabinet and the Switchgear, page 78*.
14. *Connect the Signal Cables for Battery Solutions, page 79*.
15. *Connect the Emergency Power Off (EPO), page 81*.
16. Option: *Connect External Synchronization, page 81*.
17. Option: *Connect Equipment to Input Contacts and Output Relays, page 84*.
18. Option: *Connect the PBUS Cables between Parallel UPS Units, page 86*.
19. Option: *Connect the Modbus Cables, page 89*.
20. *Final Mechanical Assembly, page 92*.

Mechanical Installation

Remove the I/O Cabinet from the Pallet

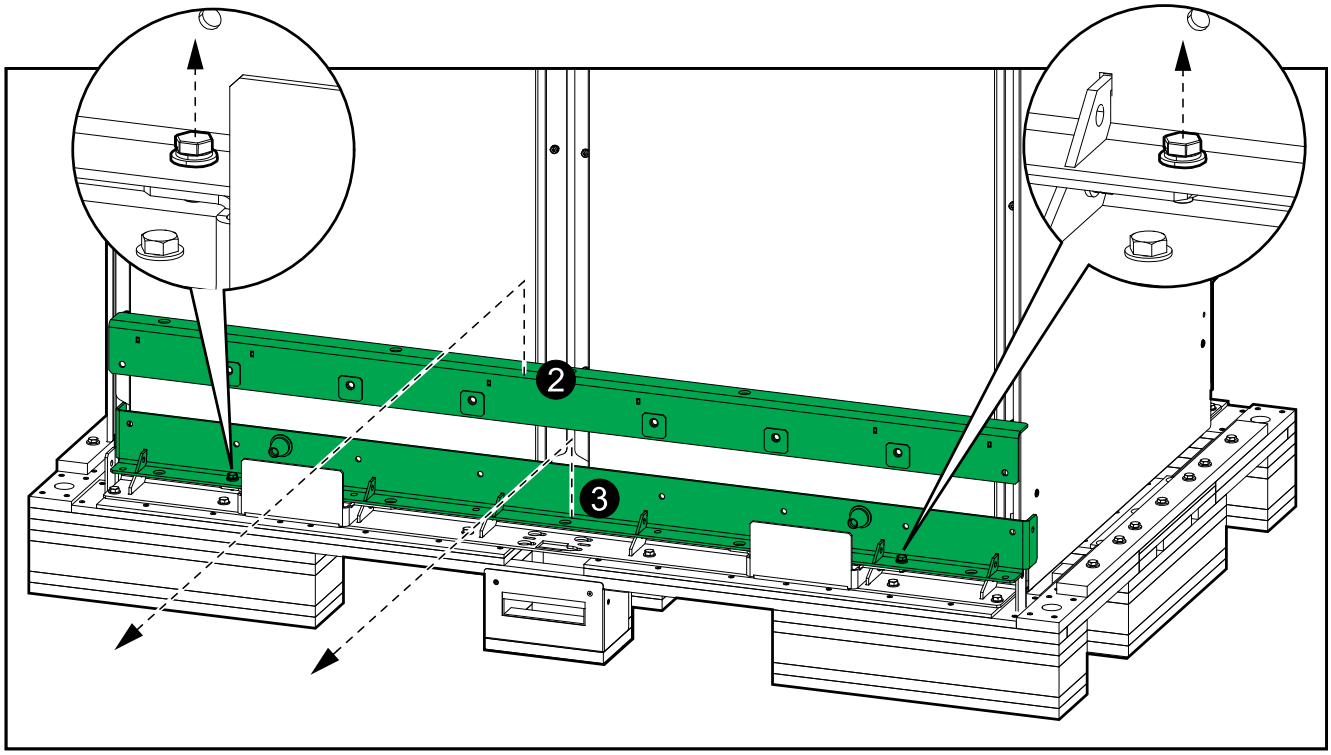
NOTICE
RISK OF EQUIPMENT DAMAGE Ensure that the floor is level and can support the weight of the jack when it carries the cabinet. **Failure to follow these instructions can result in equipment damage.**

NOTICE
RISK OF EQUIPMENT DAMAGE Be careful not to damage the cabinets when using the jack. **Failure to follow these instructions can result in equipment damage.**

NOTE: Remove the installation kits from the pallet and save for later use.

1. Take the installation kit 0M-816661 shipped with the I/O cabinet.
2. Lift up and remove the front anchoring bracket. Save it for later use.

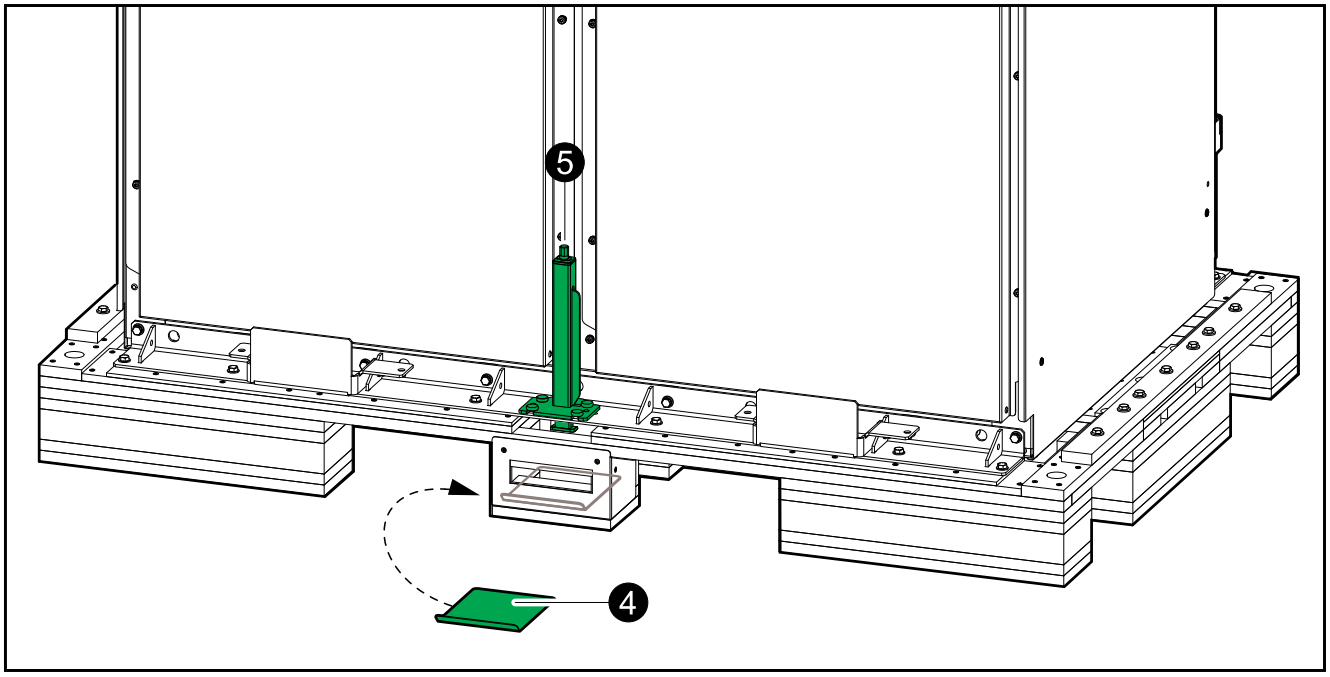
Rear View of the I/O Cabinet



3. Loosen the bolts and remove the rear anchoring bracket. Save it for later use.

4. Place the floor protection plate under the pallet on the rear of the cabinet.

Rear View of the I/O Cabinet

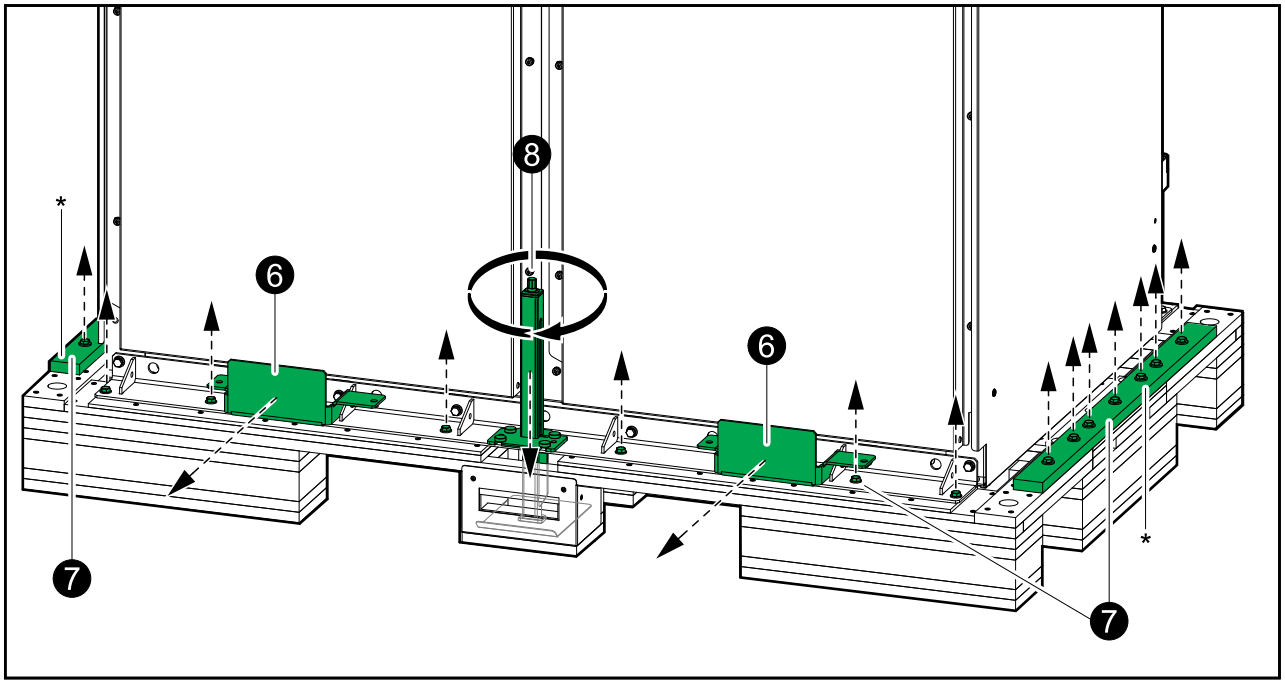


5. Place the jack from the installation kit in the hole in the transport bracket on the rear of the cabinet.

> **⚠WARNING**
>
> **HAZARD OF TILTING**
>
> Do not use a jack in the front and rear transport bracket at the same time.
>
> **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

6. Loosen the screws and remove the two indicated brackets.

Rear View of the I/O Cabinet



7. Loosen the screws from the rear transport bracket and from the middle pallet part. Save the two middle pallet parts for step 11.
8. Use a drilling machine with the provided hexagonal socket to activate the jack, slide it into position in the bracket, and to make contact with the floor protection plate.

   NOTE: Reduce the drill torque to minimum to prevent kickback.
9. Use the jack to lift the pallet to the top position.
10. Remove the rear and middle pallet parts.

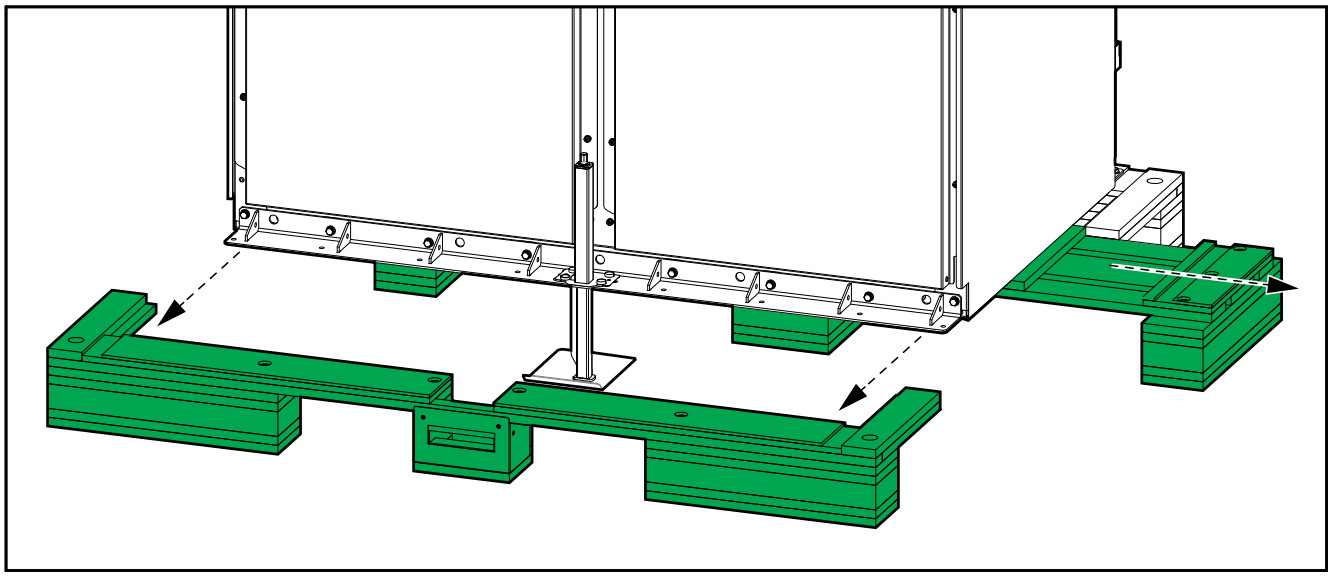
⚠WARNING

HAZARD OF SERIOUS INJURY

Do not put your hands or feet under the cabinet while removing the pallet parts.

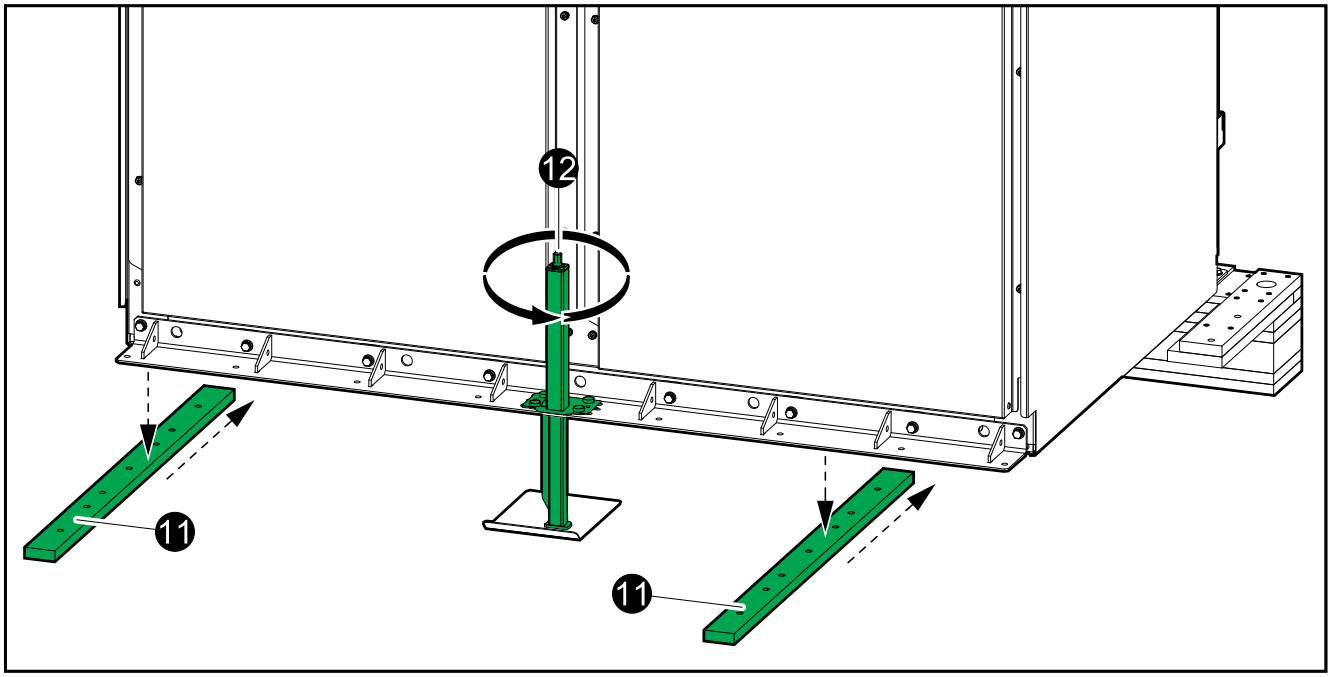
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Rear View of the I/O Cabinet



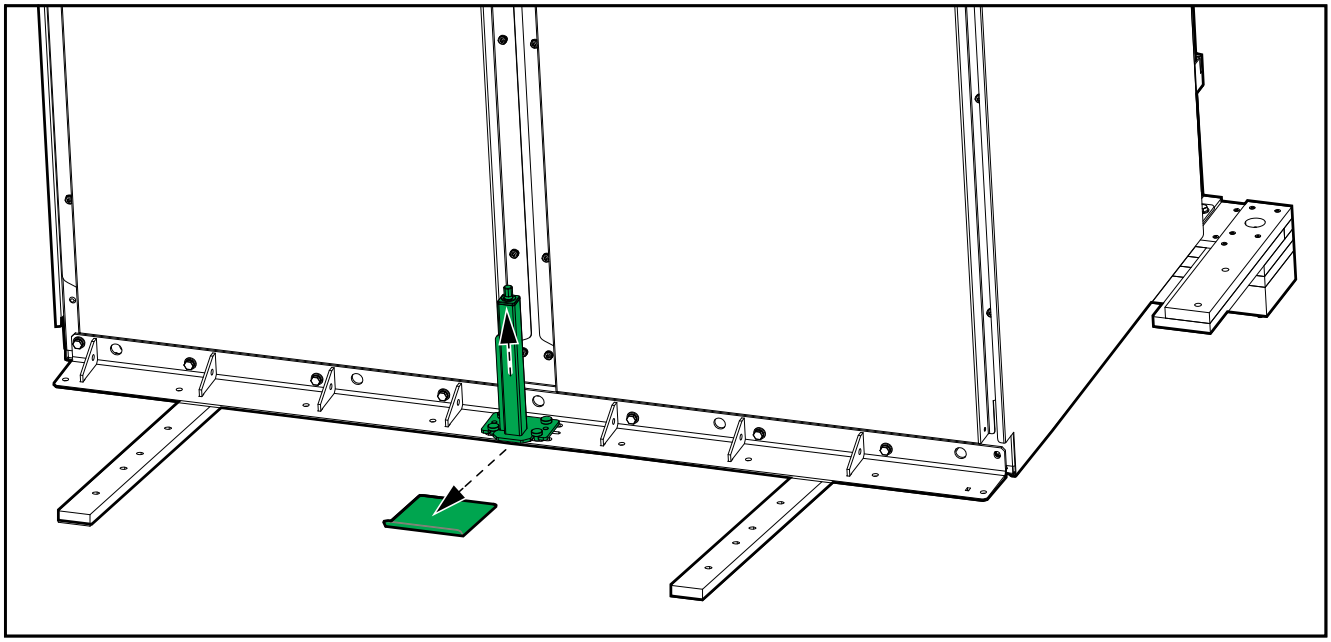
11. Place the two middle pallet parts removed in step 7 under the transportation bracket.

Rear View of the I/O Cabinet



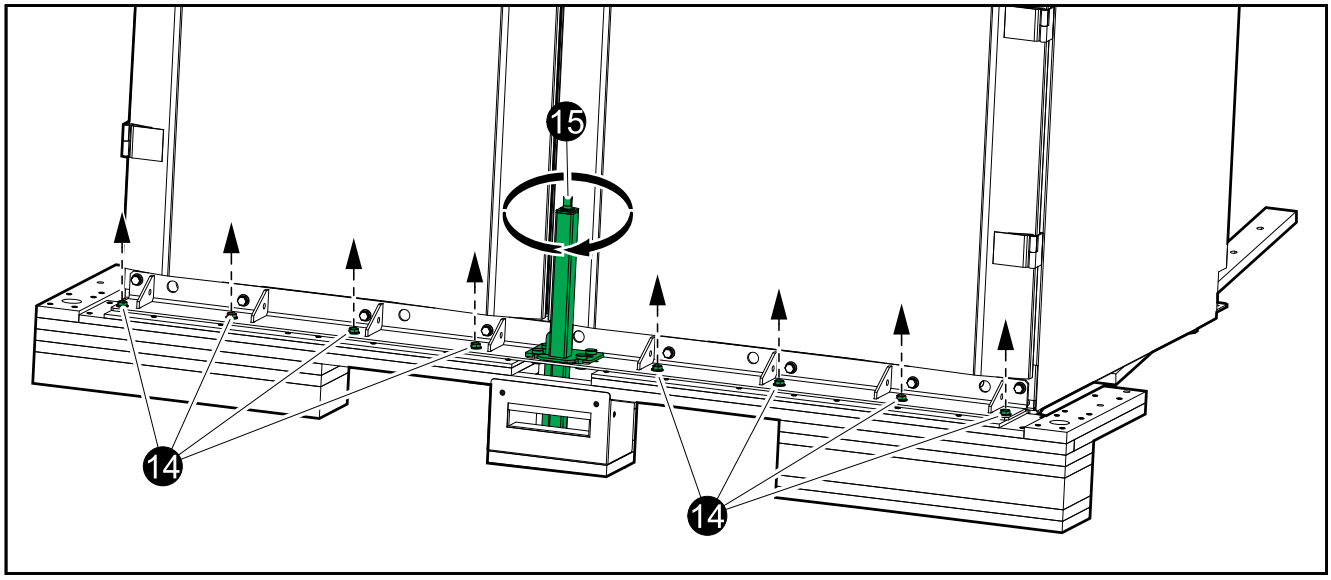
12. Use a drilling machine to lower the cabinet down onto the support.
13. Move the floor protection plate and the jack from the rear to the front side.

Rear View of the I/O Cabinet



14. Loosen and remove the bolts from the front transport bracket.

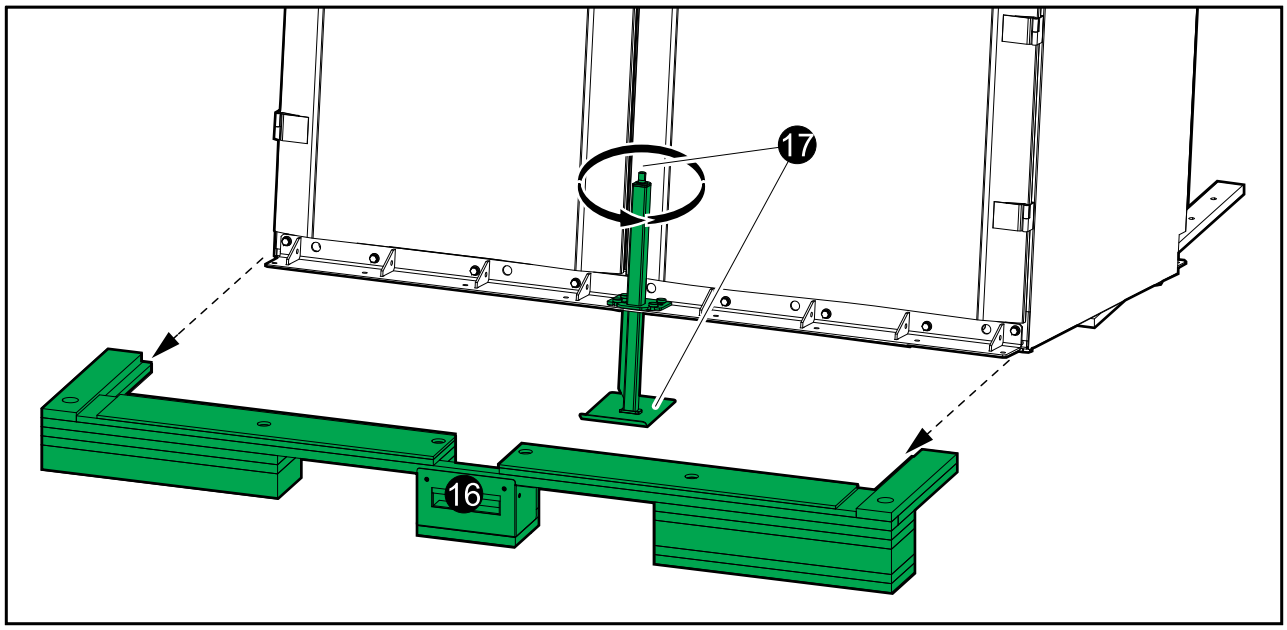
Front View of the I/O Cabinet



15. Use a drilling machine with the provided hexagonal socket to activate the jack, slide it into position in the bracket, and to lift the pallet to the top position.
16. Remove the front pallet parts.

> **⚠ WARNING**
>
> **HAZARD OF SERIOUS INJURY**
>
> Do not put your hands or feet under the cabinet while removing the wooden plate.
>
> **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

Front View of the I/O Cabinet

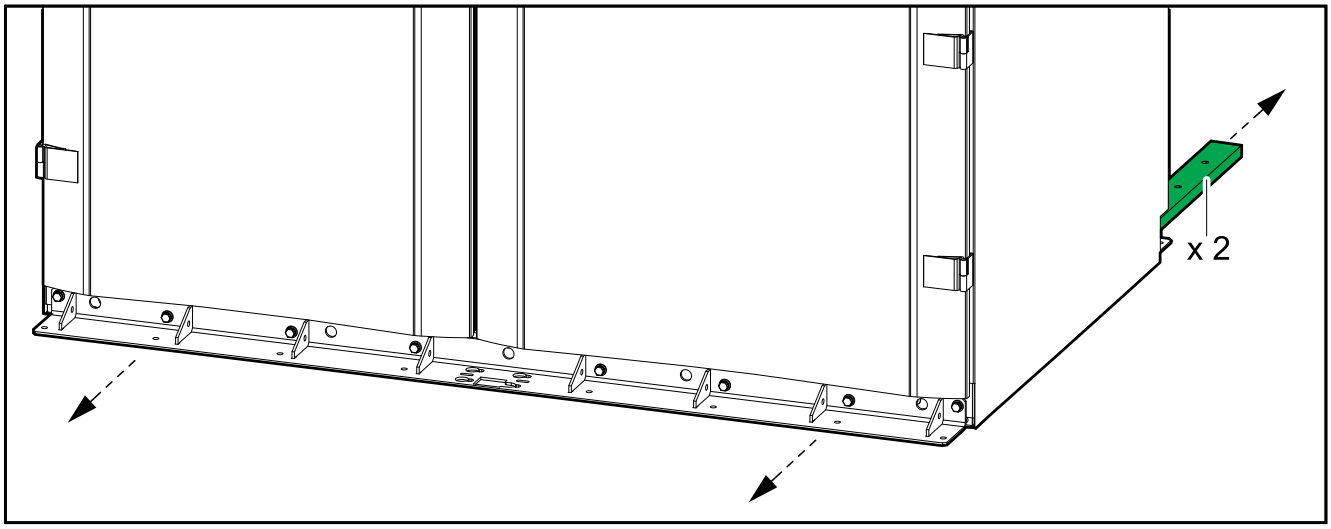


17. Use the jack to lower the cabinet onto the floor until the wheels connect with the floor. Remove the jack and the floor protection plate.

18. Wheel the cabinet away and remove the remaining pallet parts.

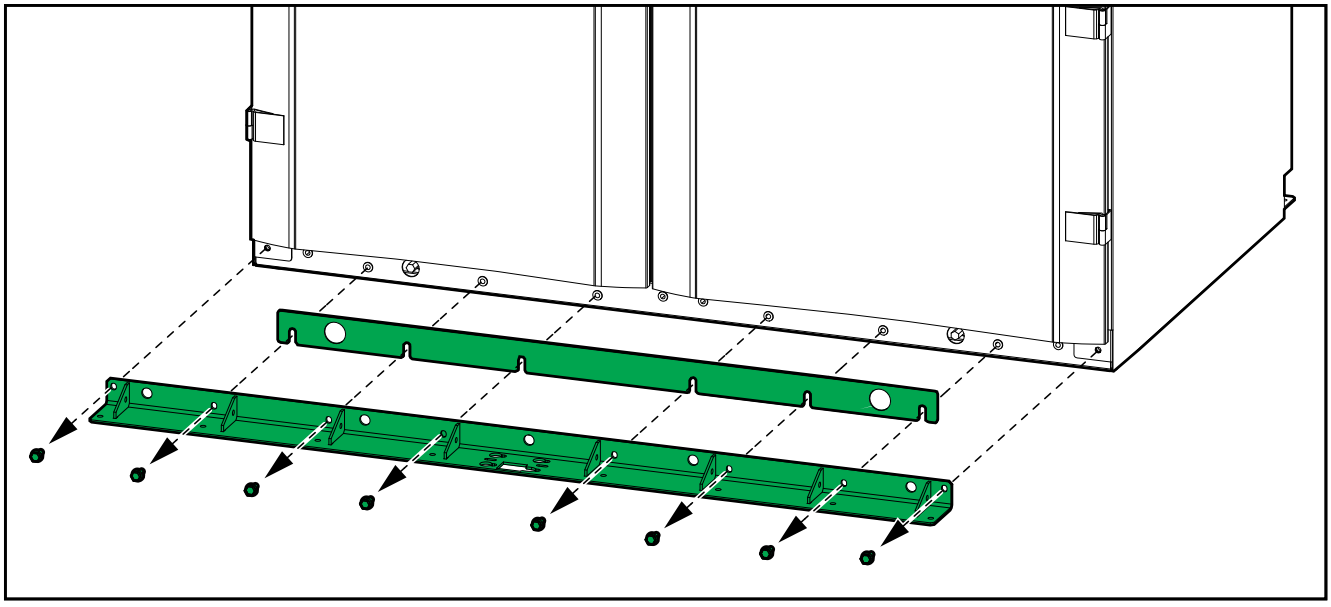
> **⚠WARNING**
>
> **HAZARD OF TILTING**
>
> Be alert to uneven floors and doorsteps when moving the cabinet on its wheels to avoid overbalancing and tipping the cabinet.

Front View of the I/O Cabinet



19. Remove the indicated brackets from both the front and the rear side of the I/O cabinet.

Front View of the I/O Cabinet



The cabinet can now be moved on the built-in wheels to the installation area.

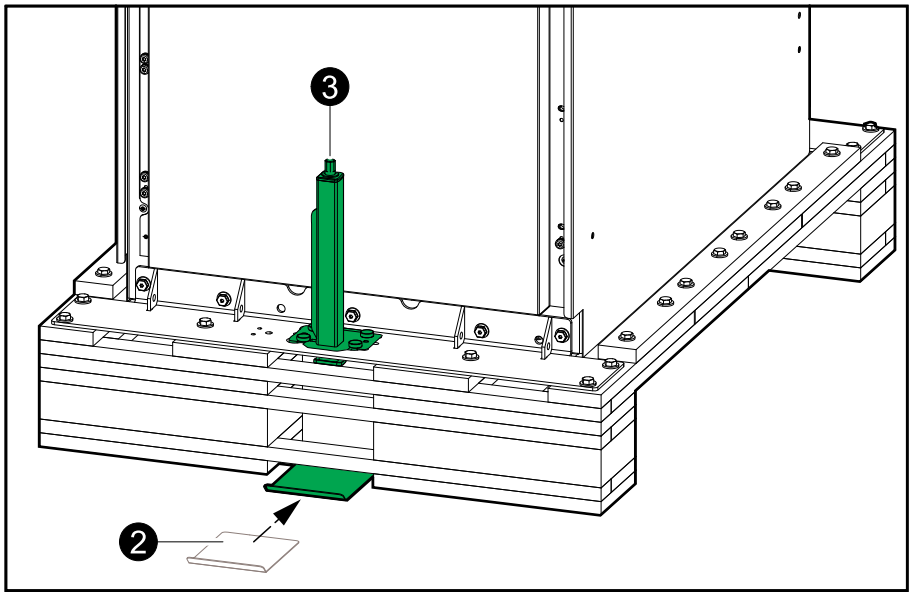
Remove the Power Cabinet from the Pallet

NOTICE
RISK OF EQUIPMENT DAMAGE Ensure that the floor is level and can support the weight of the jack when it carries the cabinet. **Failure to follow these instructions can result in equipment damage.**

NOTICE
RISK OF EQUIPMENT DAMAGE Be careful not to damage the cabinets when using the jack. **Failure to follow these instructions can result in equipment damage.**

1. Take the installation kit 0M-816661 shipped with the I/O cabinet. Use the jack and the floor protection plate in the kit for all cabinets in this procedure.
2. Place the floor protection plate under the pallet on the rear of the cabinet.

Rear View of the Power Cabinet

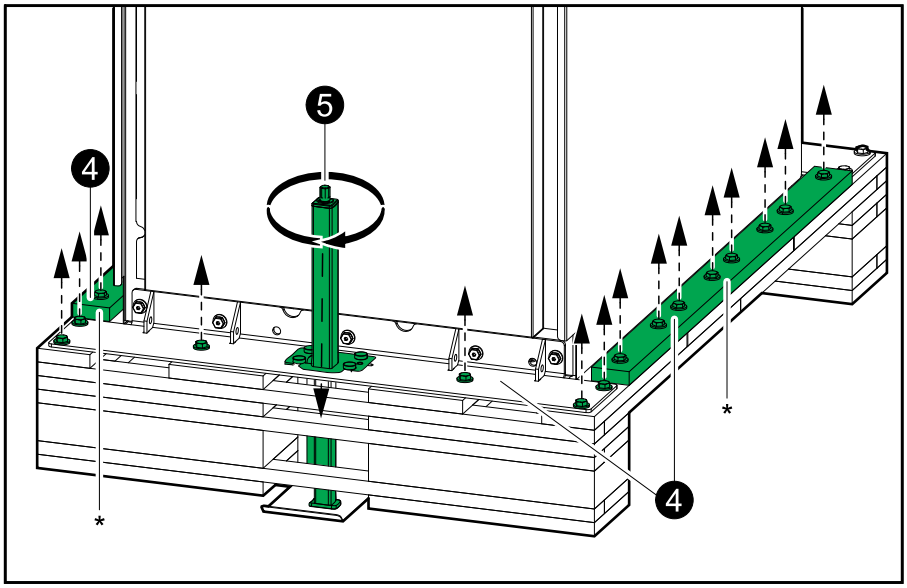


3. Place the jack from the installation kit in the hole in the transport bracket on the rear of the cabinet.

⚠WARNING
HAZARD OF TILTING Do not use a jack in the front and rear transport bracket at the same time. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

4. Loosen and remove the bolts from the rear transport bracket and from the middle pallet part. Save the two middle pallet parts for step 8.

Rear View of the Power Cabinet



5. Use a drilling machine with the provided hexagonal socket to activate the jack, slide it into position in the bracket, and to make contact with the floor protection plate.

   NOTE: Reduce the drill torque to minimum to prevent kickback.

6. Use the jack to lift the pallet to the top position.

7. Remove the rear and middle pallet parts. Save the middle pallet part for step 8.

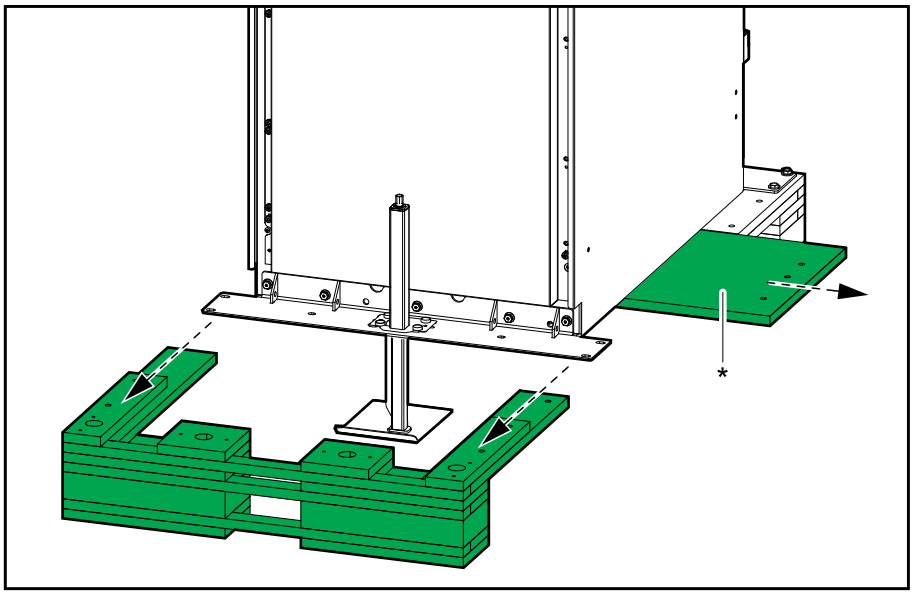
⚠WARNING

HAZARD OF SERIOUS INJURY

Do not put your hands or feet under the cabinet while removing the pallet parts.

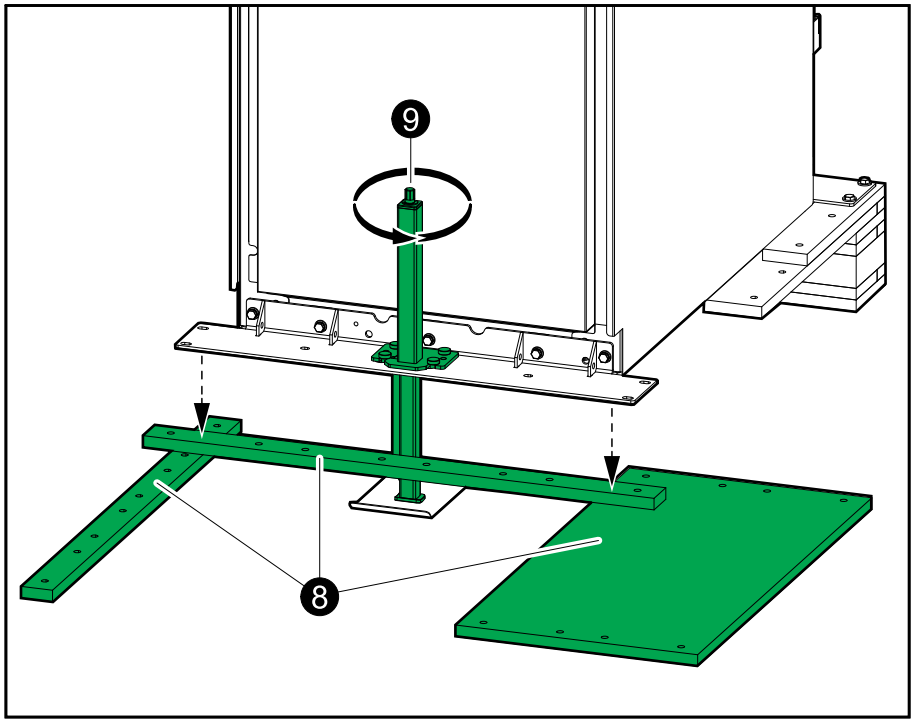
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Rear View of the Power Cabinet



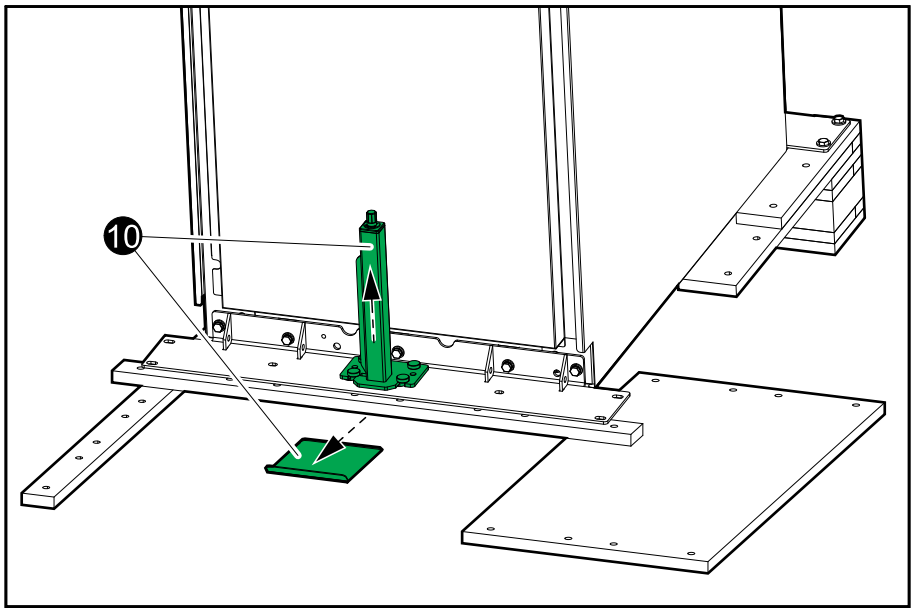
8. Place the pallet parts from step 4 and 7 under the transportation bracket.

Rear View of the Power Cabinet



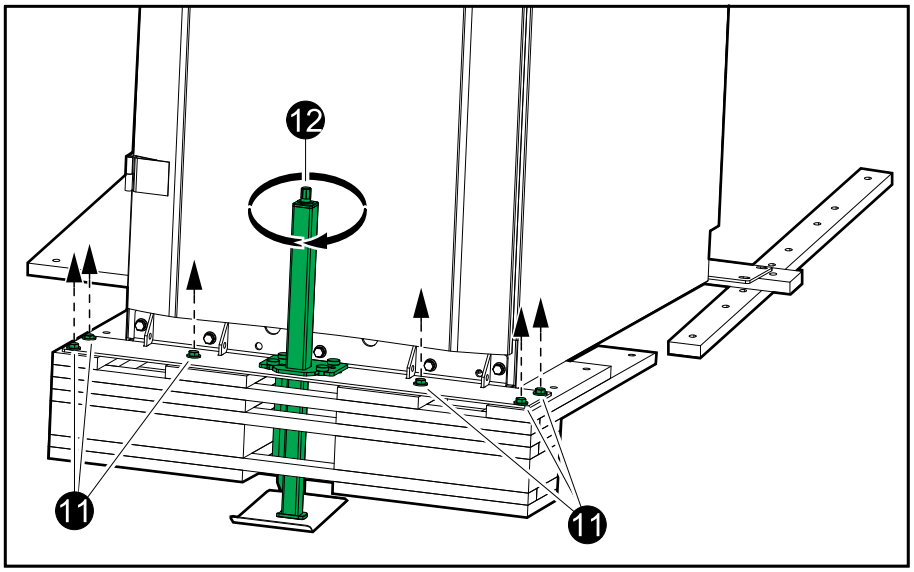
9. Use a drilling machine to lower the cabinet down onto the support.
10. Move the floor protection plate and the jack from the rear to the front side.

Rear View of the Power Cabinet



11. Loosen and remove the bolts from the front transport bracket.

Front View of the Power Cabinet



12. Use a drilling machine with the provided hexagonal socket to activate the jack, slide it into position in the bracket, and to lift the pallet to the top position.
13. Remove the front pallet parts.

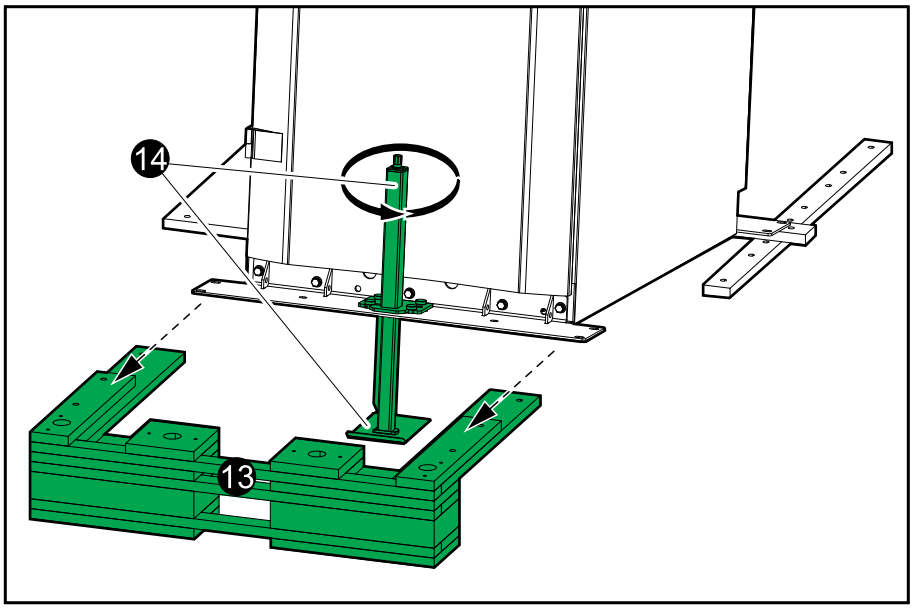
⚠WARNING

HAZARD OF SERIOUS INJURY

Do not put your hands or feet under the cabinet while removing the wooden plate.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Front View of the Power Cabinet



14. Use the jack to lower the cabinet onto the floor until the wheels connect with the floor. Remove the jack and the floor protection plate.

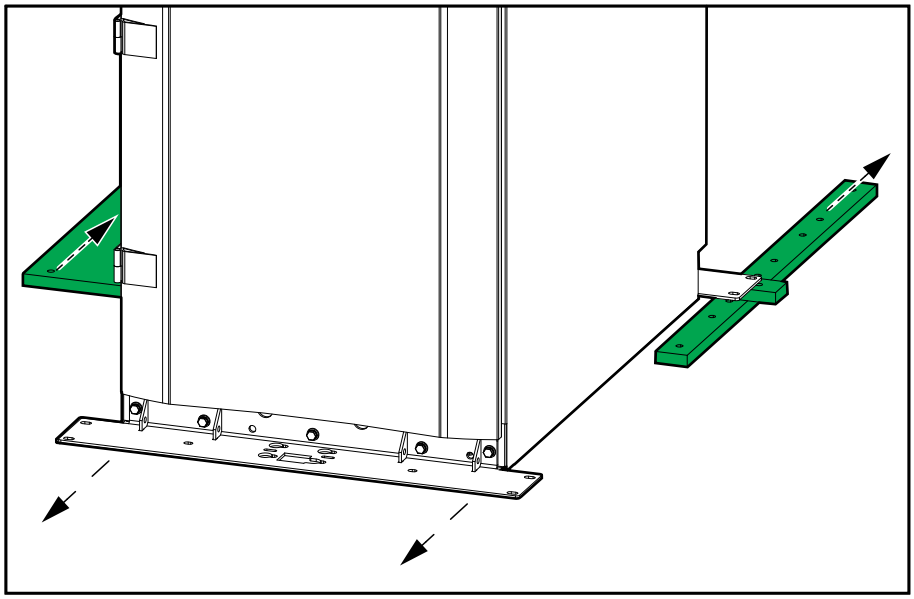
15. Wheel the cabinet away and remove the remaining pallet parts.

⚠WARNING

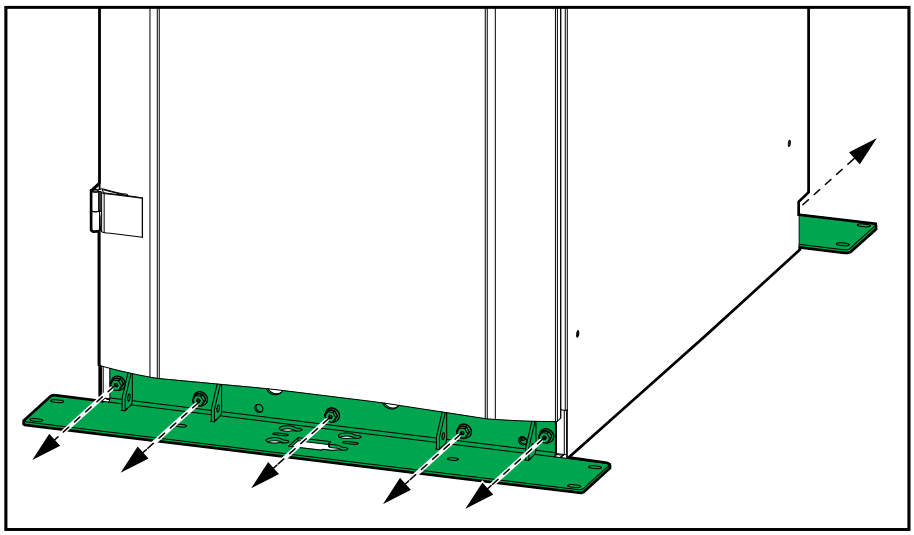
HAZARD OF TILTING

Be alert to uneven floors and doorsteps when moving the cabinet on its wheels to avoid overbalancing and tipping the cabinet.

Front View of the Power Cabinet



16. Remove the front and rear transportation brackets.



The cabinet can now be moved on the built-in wheels to the installation area.

Mount the Rear Anchoring Brackets

⚠DANGER

HAZARD OF TILTING

All rear and front anchoring brackets must be installed.

Failure to follow these instructions will result in death or serious injury.

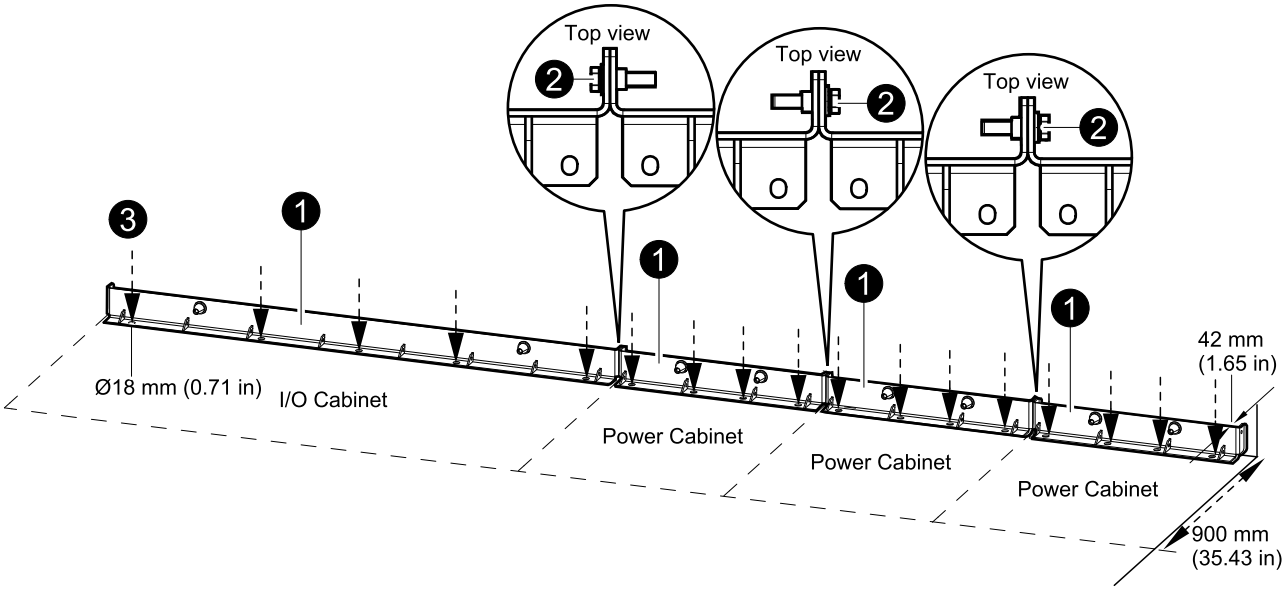
⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Leave the UPS system covered while making anchoring holes to prevent dust or other conductive particles from entering the system.

Failure to follow these instructions will result in death or serious injury.

1. Place the rear anchoring brackets of the I/O cabinet and the power cabinets in the final installation area.



2. Interconnect the rear anchoring brackets using the provided screws and bolts.
3. Mark the hole locations.
4. Drill anchoring holes according to national and local requirements.
5. Mount the rear anchoring brackets to the floor. Bolts are not supplied.
6. Use a bubble-leveler to ensure that the brackets are level. Use the provided leveling shims if necessary.

Position the Cabinets

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

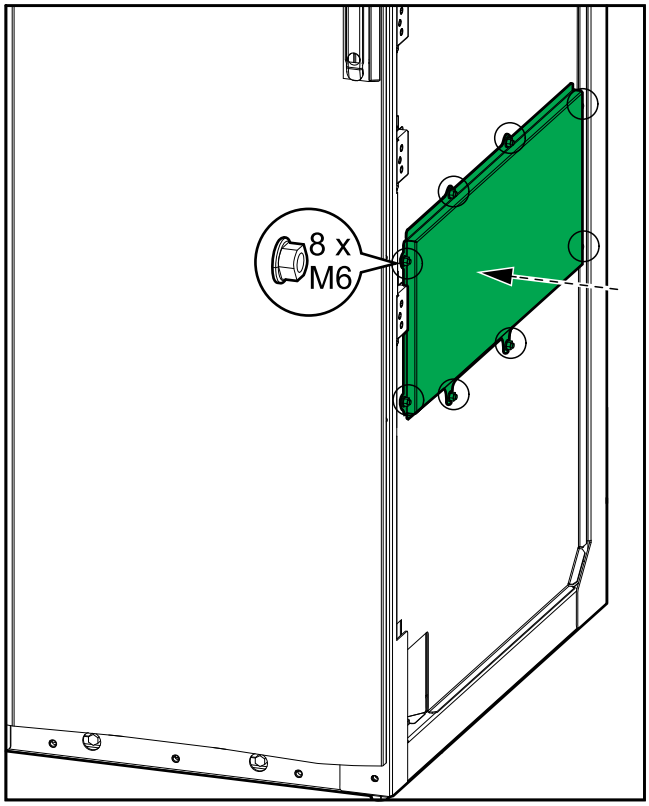
Do not step/walk on top of the cabinets.

Failure to follow these instructions will result in death or serious injury.

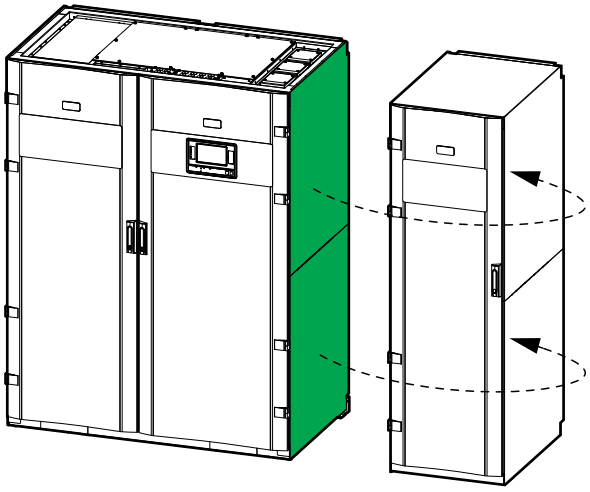
NOTE: For some of the steps below, only the power cabinet is shown. The procedure is the same for all cabinets.

1. Install the interconnection cover from the installation kit 0M-99582 on the right side (front view) of the right-most power cabinet and fasten with the M6 nuts.

Front View of the Power Cabinet

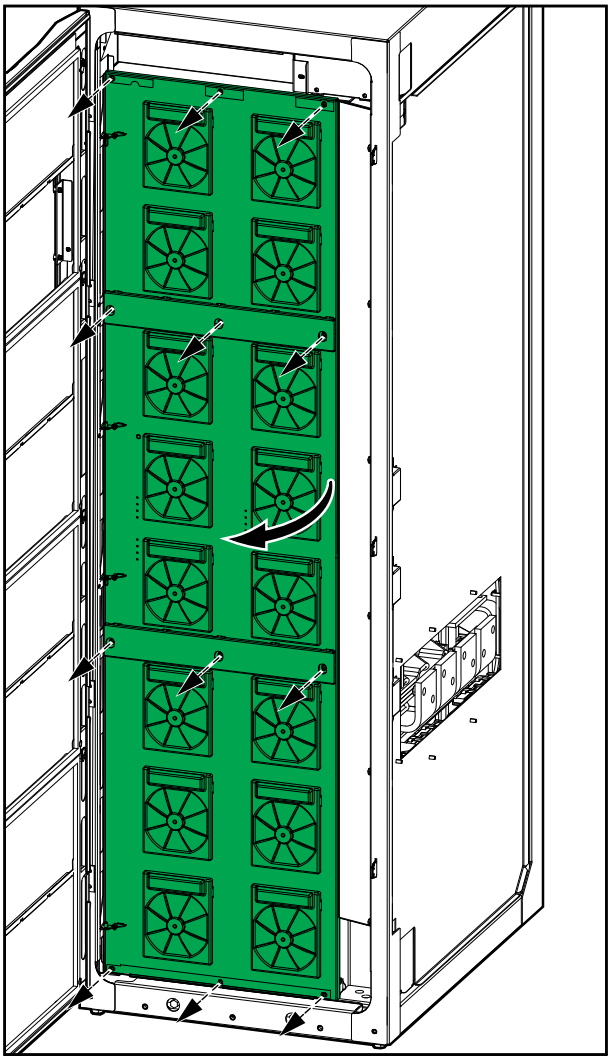


2. Move the side panel from the right side (front view) of the I/O cabinet and install it on the right side of the right-most power cabinet.

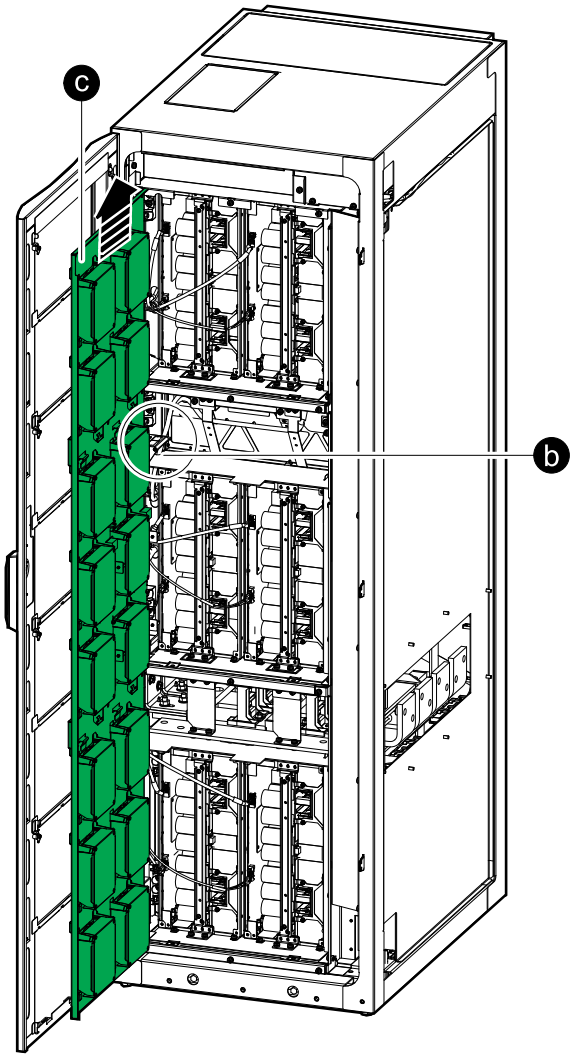


3. Perform the following steps on all power cabinets:

   a. Remove the 12 screws and open the fan door of the power cabinets.

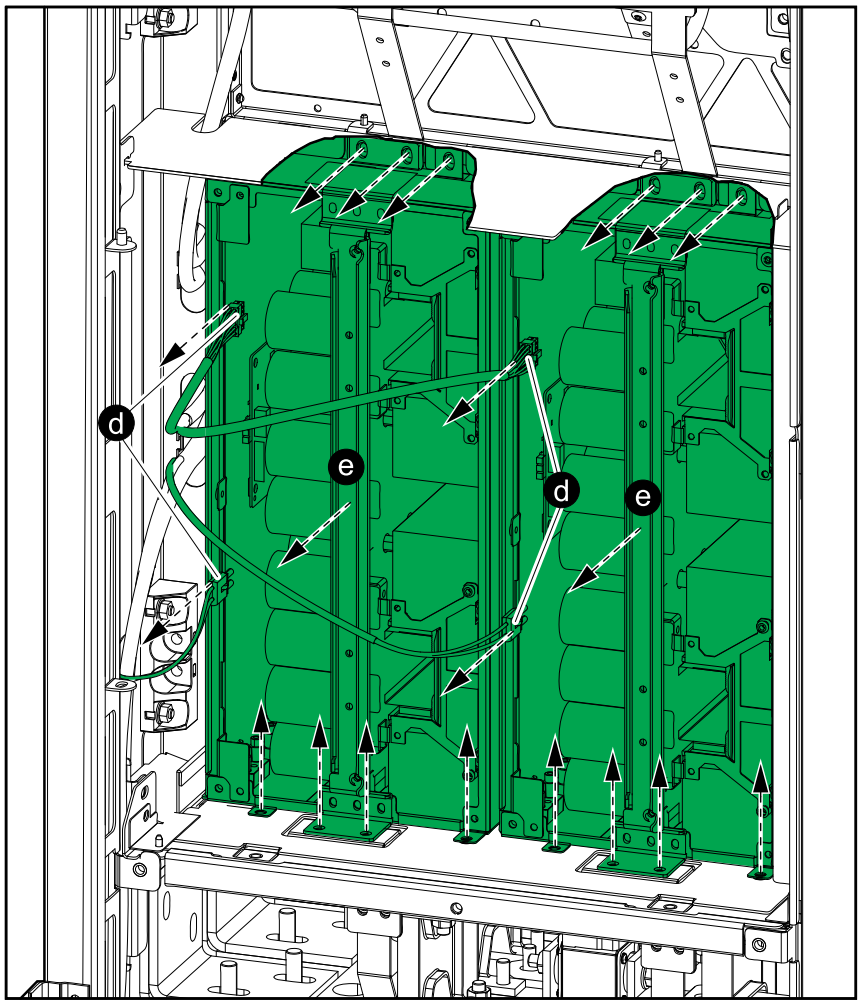


b. Disconnect the cable between the fan door and the power cabinet.



c. Lift the fan door up and remove it.

d. Disconnect the two cables from each of the two middle power blocks.

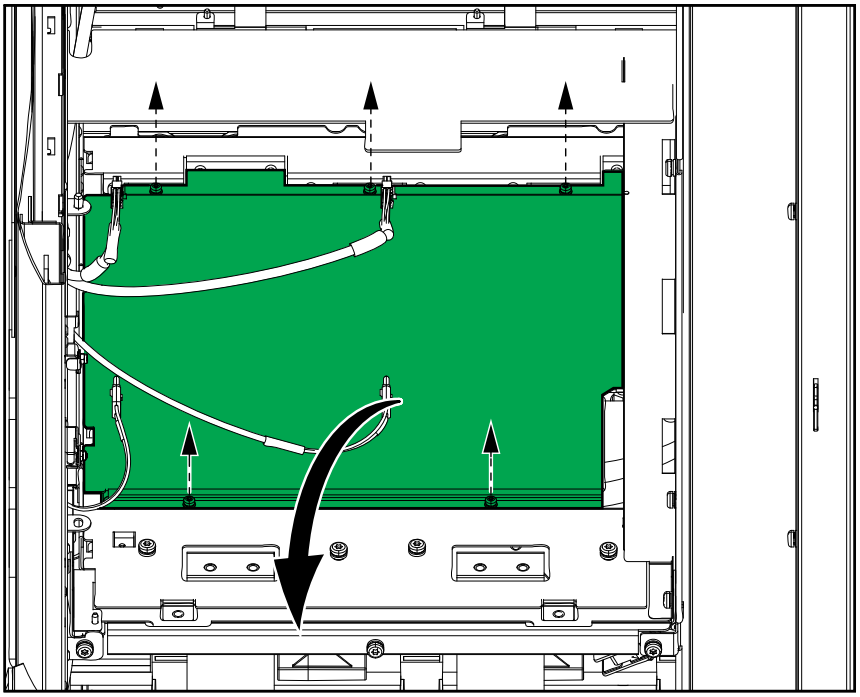


e. Loosen the screws and pull out the middle power blocks. Be careful not to damage the cables.

NOTICE
RISK OF EQUIPMENT DAMAGE Cover the power blocks when removed from the power cabinet to avoid dust in the power blocks. **Failure to follow these instructions can result in equipment damage.**

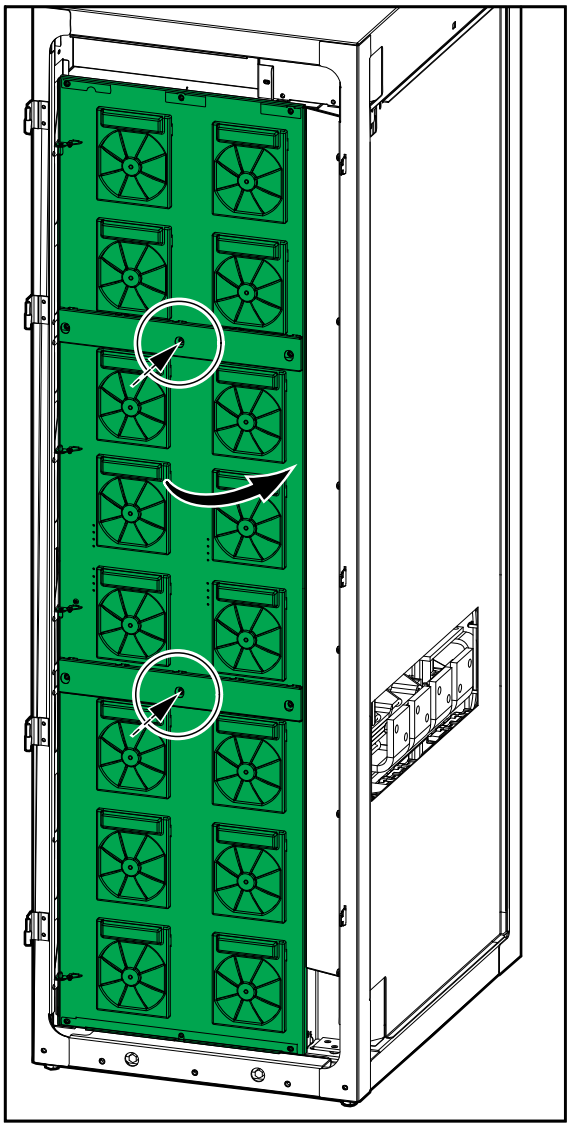
f. Loosen the screws and remove the plate below the power blocks.

Top Front View of the Power Cabinet

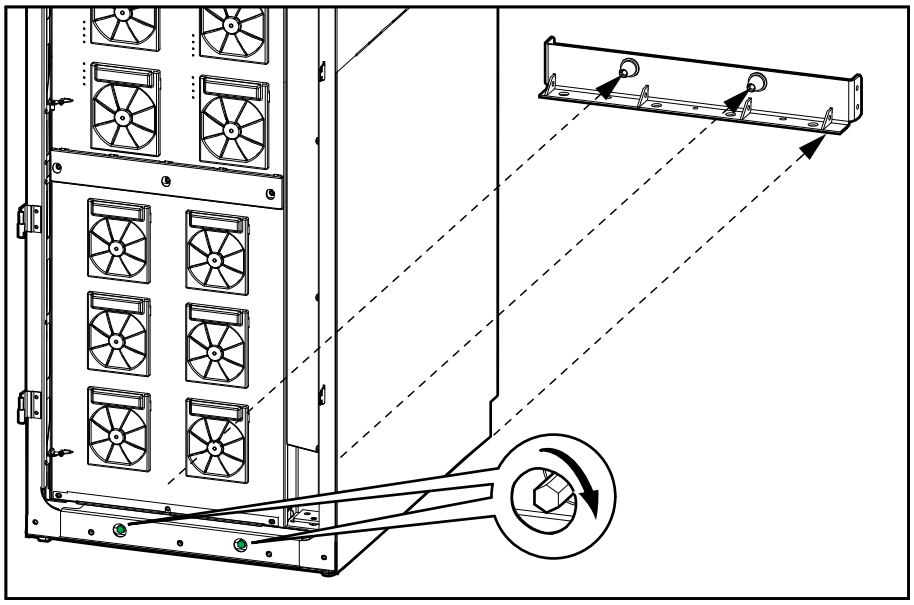


4. Install the fan doors temporarily on all power cabinets and fasten with two screws.

NOTICE
RISK OF EQUIPMENT DAMAGE The fan doors must be installed to avoid damaging the signal cables when pushing the power cabinets into position. **Failure to follow these instructions can result in equipment damage.**

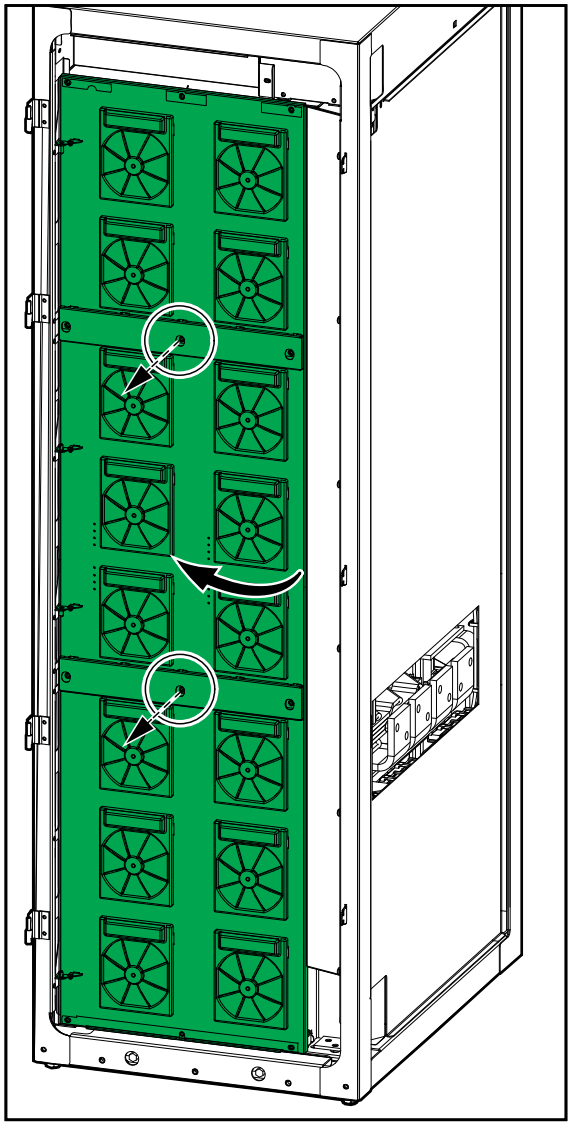


5. Push the I/O cabinet and the power cabinets one by one into position against the rear anchoring brackets – the cabinets will connect to the conic outcroppings on the brackets.

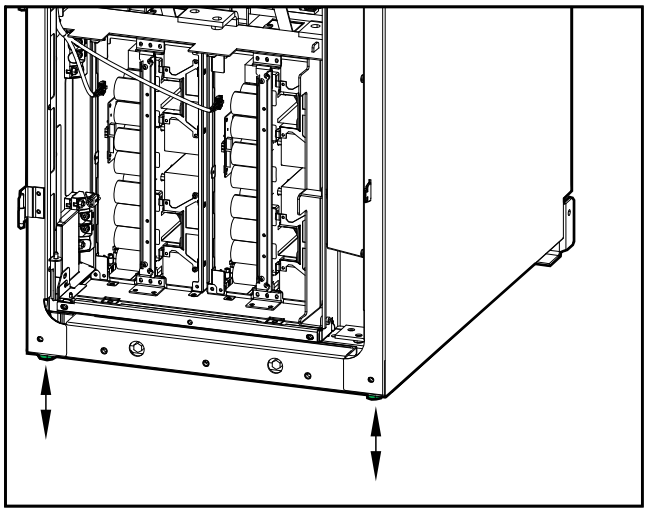


6. Fasten the cabinets to the rear anchoring brackets by tightening the bolts on the front of the cabinet. Torque to 50 Nm (36.87 lb-ft).

7. Remove the fan doors of the power cabinets.

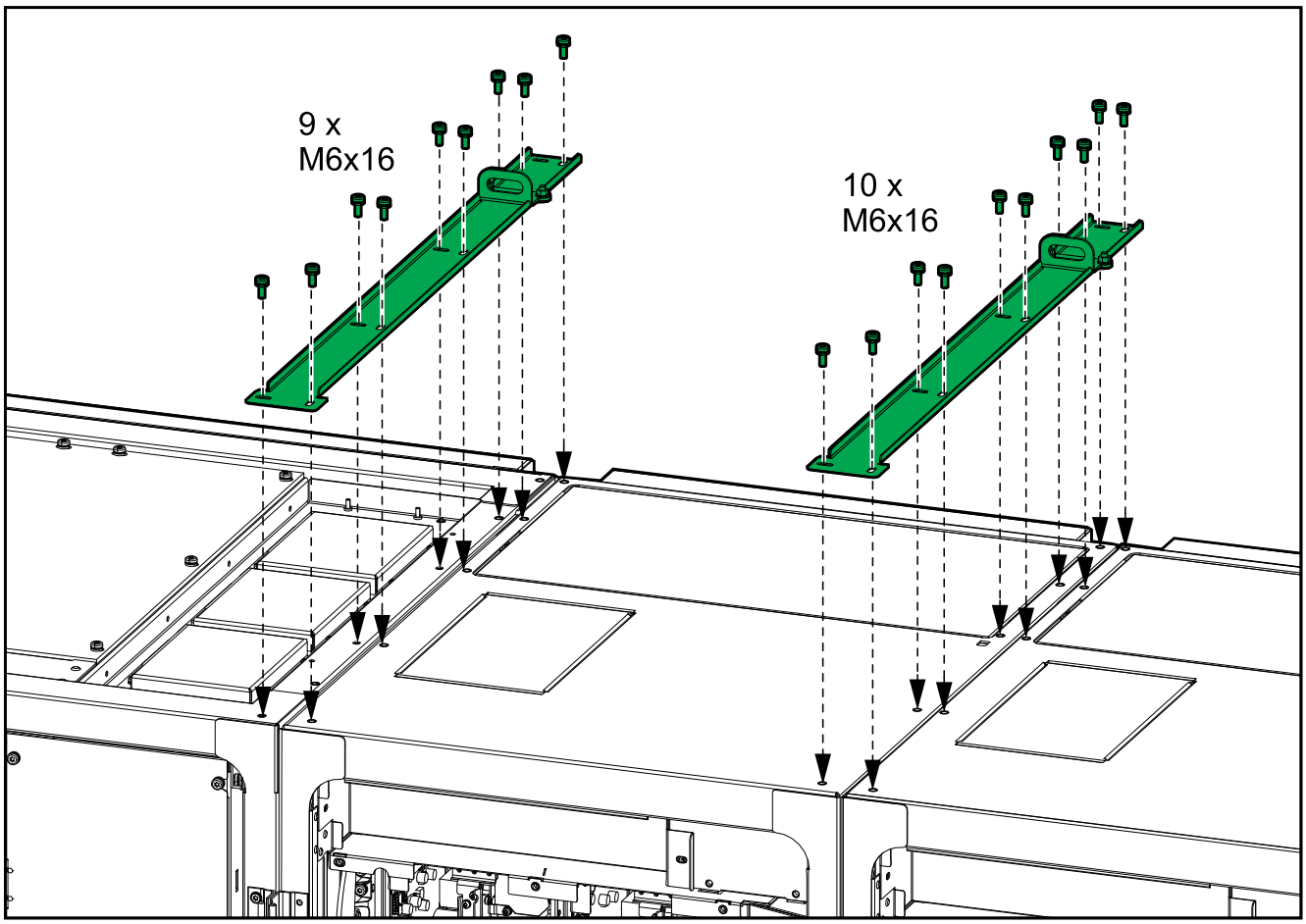


8. Lower the two front feet on all cabinets until they connect with the floor – use a bubble-leveler to ensure that the cabinets are level. Use the provided levelling shims if necessary.



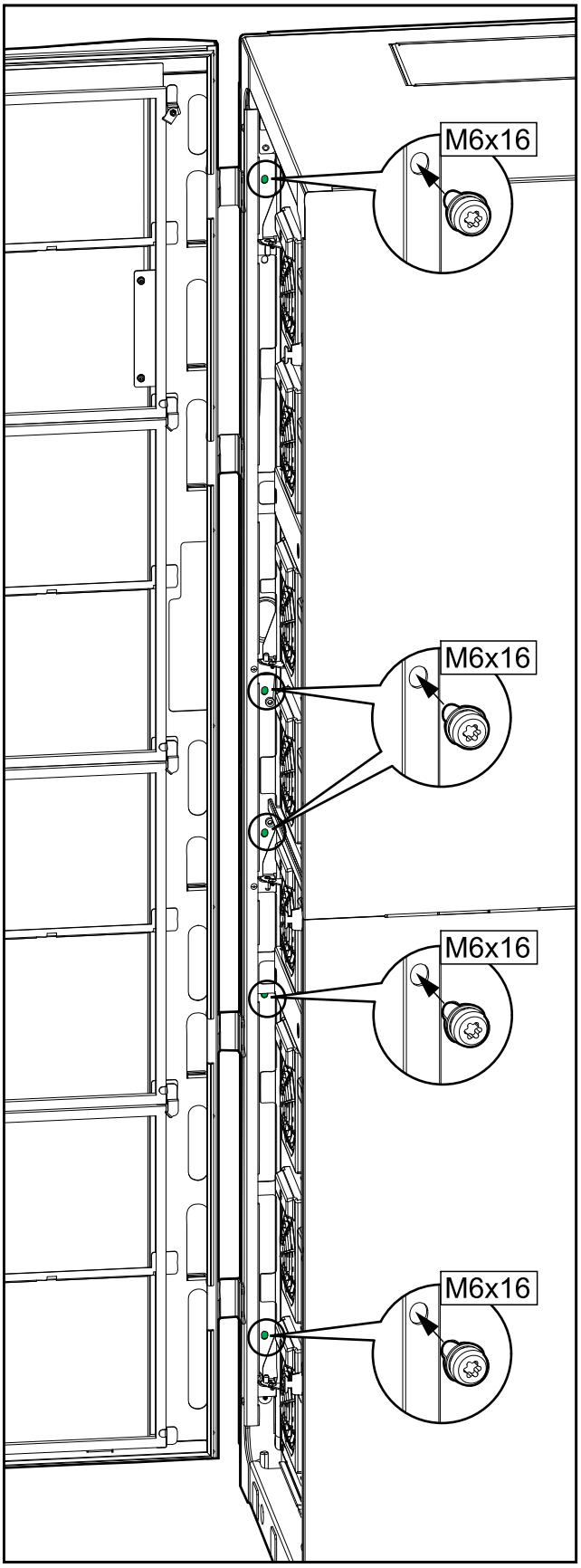
9. Install the top baying bracket on the top of the cabinets and fasten with the provided screws.

I/O Cabinet and Two Power Cabinets

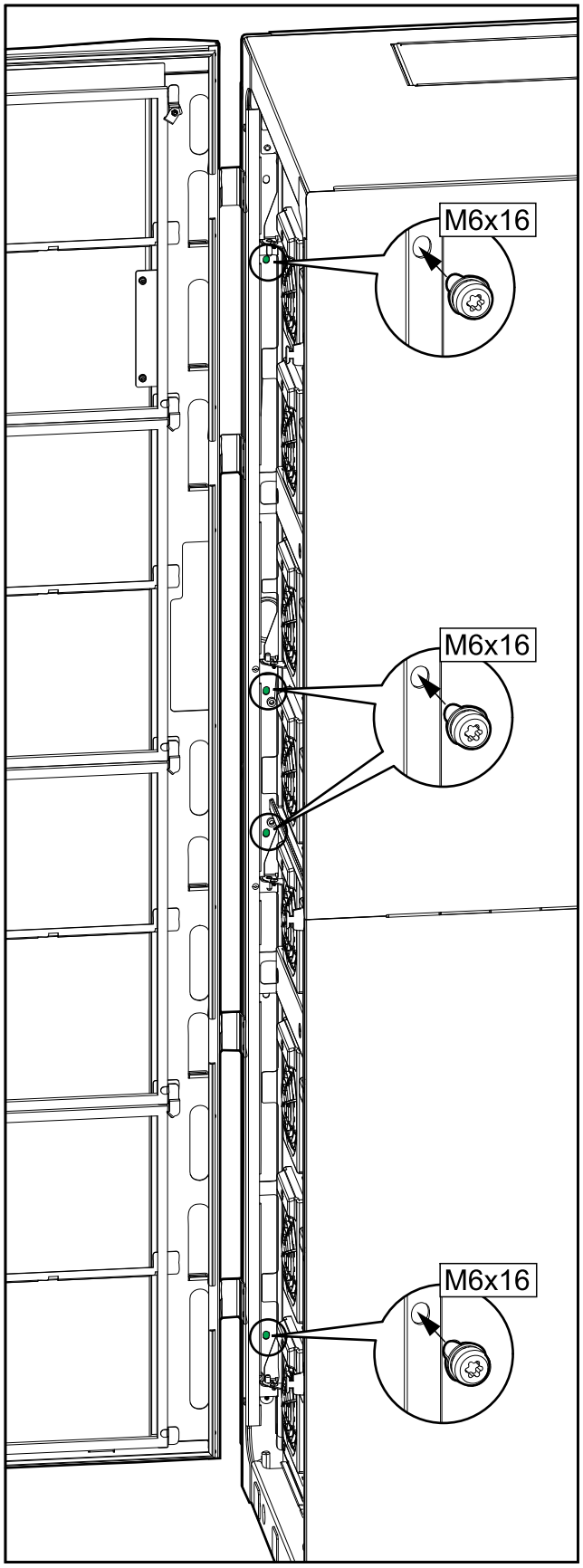


10. Mount the M6 screws from the installation kit from right to left in the five marked positions between the power cabinets and in the four marked positions between the power cabinet and the I/O cabinet to tighten the cabinets together.

From Power to Power Cabinet



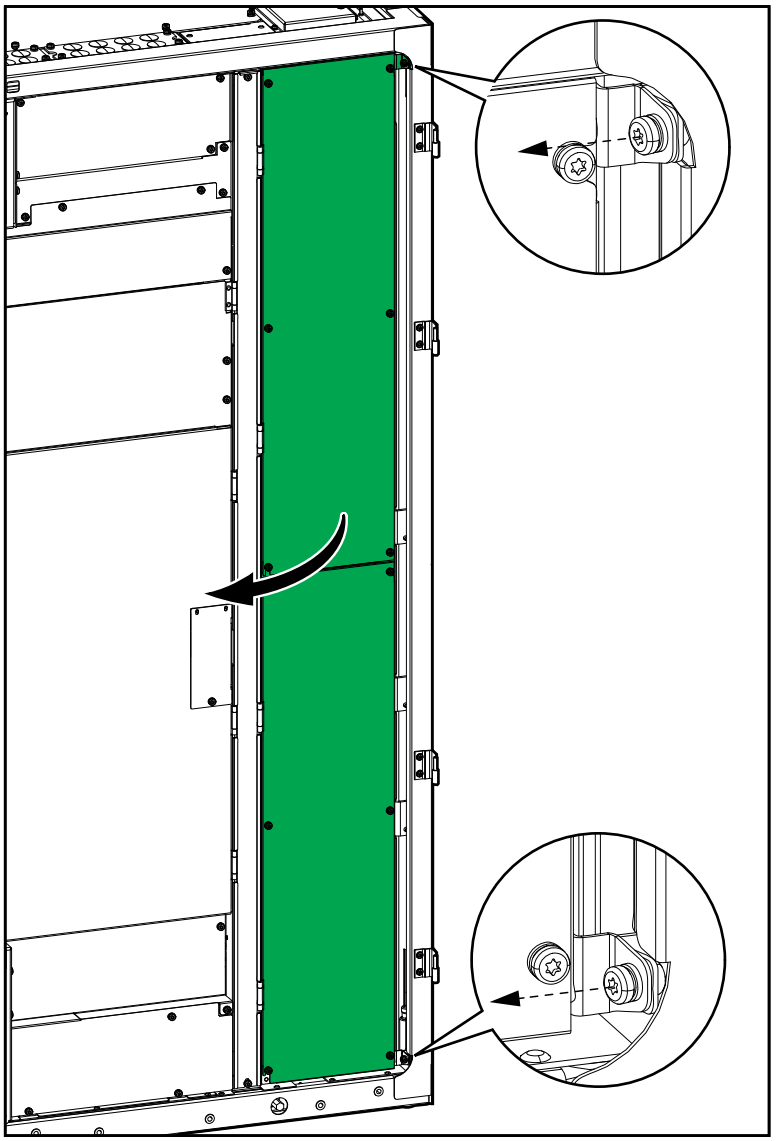
From Power to I/O Cabinet



Install Busbars between the I/O Cabinet and the Power Cabinet

1. Open the narrow door in the right side of the I/O cabinet.

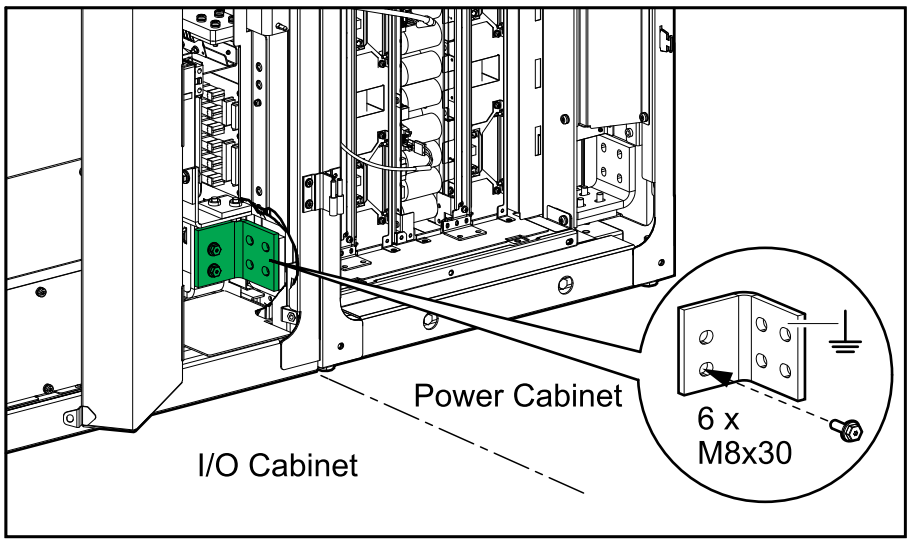
Front View of the I/O Cabinet



2. Install the grounding busbar 880–5665 from the installation kit 0M–99046 between the I/O cabinet and the left-most power cabinet.

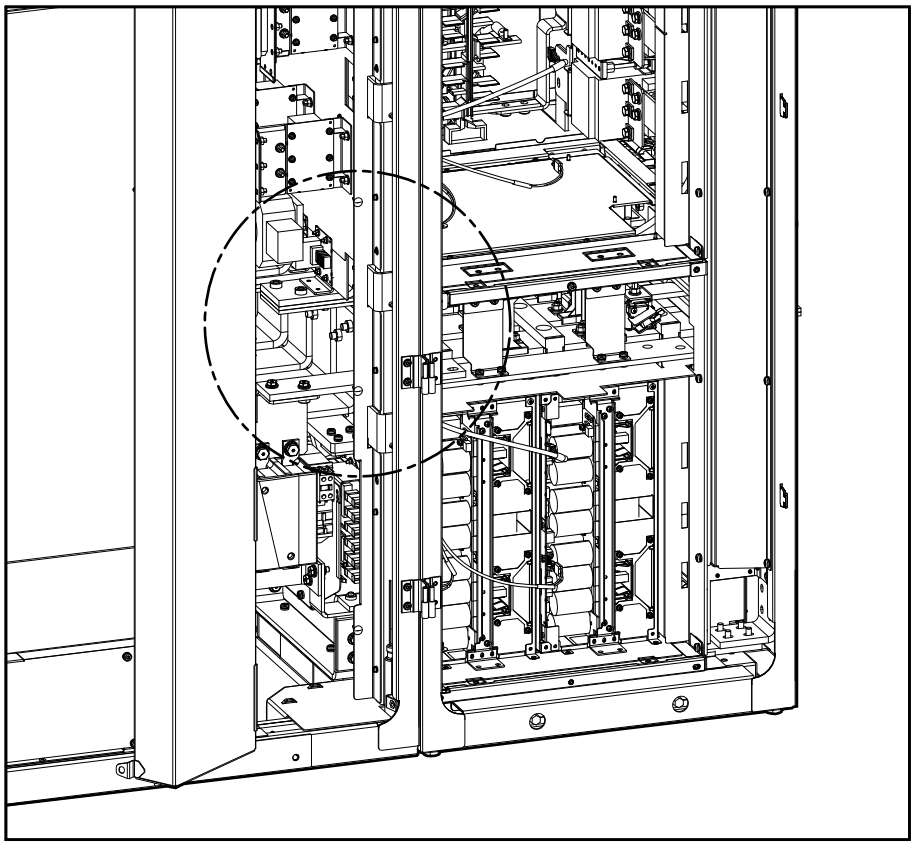
   NOTE: If the grounding busbar 880–5665 is not compatible with the power cabinet placed to the right of the I/O cabinet, the busbar kit 0J-0446 with flexible busbars must be used for the grounding connection instead of the grounding busbar. Contact Schneider Electric.

Front View of the I/O Cabinet and the Power Cabinet



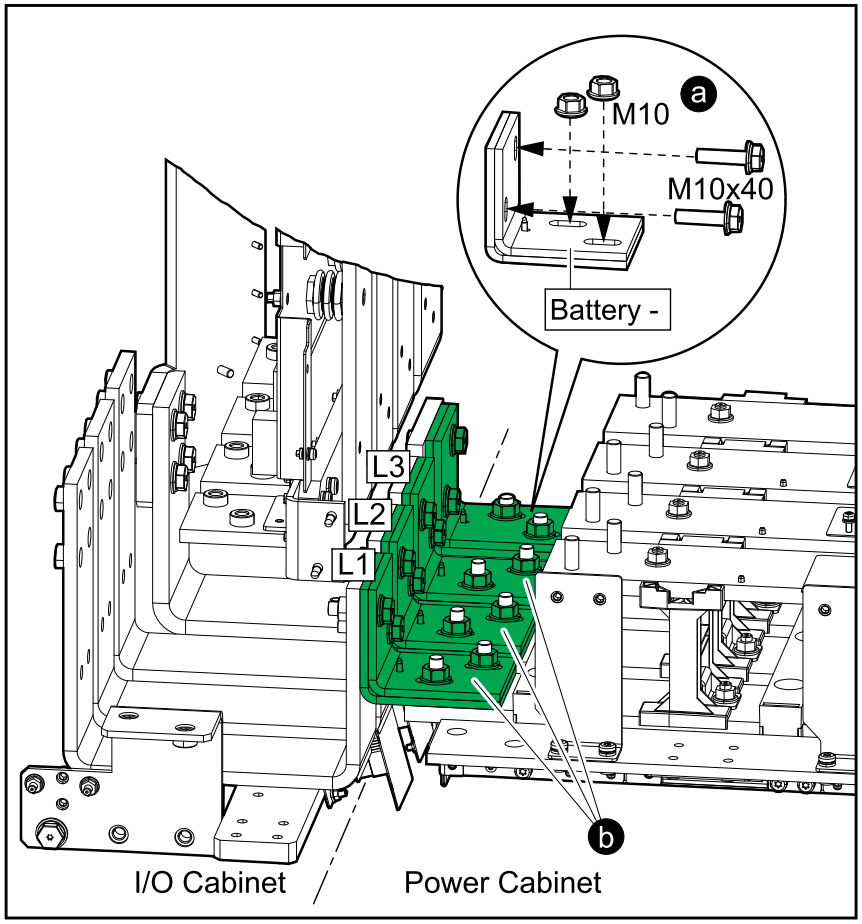
3. Install the interconnection busbars from the installation kit 0H-9162 **or** 0H-9102 (supplied with the power cabinet) between the I/O cabinet and the left-most power cabinet.

Front View of the I/O Cabinet and the Power Cabinet



a. Install the battery- interconnection busbar 0M-819336.

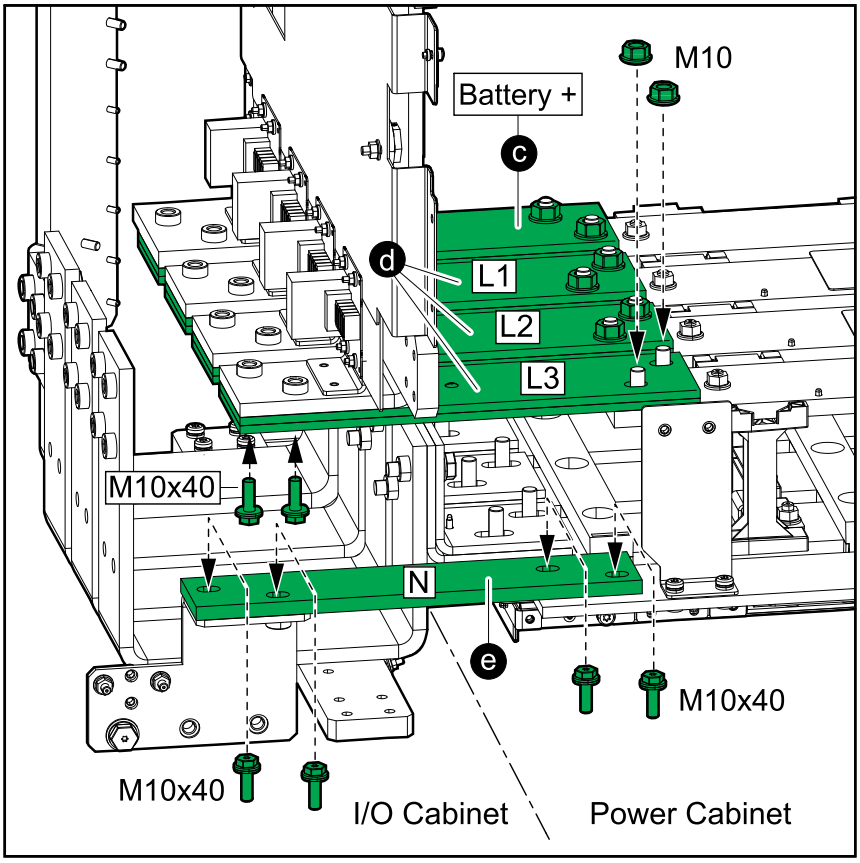
Front View of Busbar Connections



b. Install the three input interconnection busbars 0M-97885.

c. Install the battery+ interconnection busbar 0M-140035.

Front View of Busbar Connections



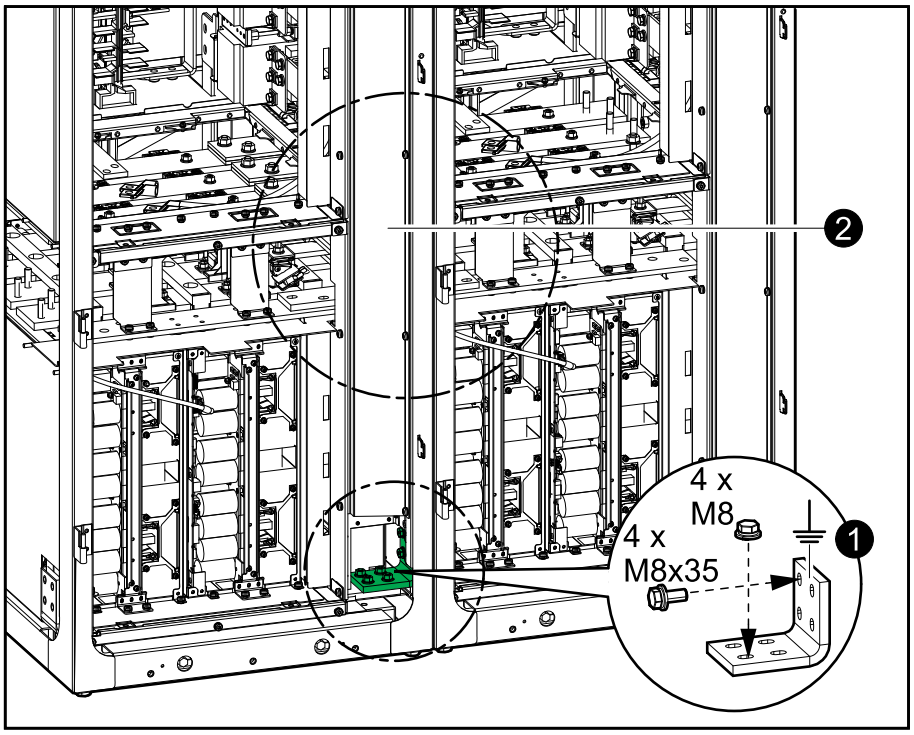
d. Install the three output interconnection busbars 0M-97886.

e. Install the neutral interconnection busbar 880–10146 **or** 880–9720.

Install Busbars between the Power Cabinets

1. Install the grounding busbars 880-99027 from the installation kit 0H-9162, or 0H-9102[15] between all power cabinets.

Front View of Two Power Cabinets

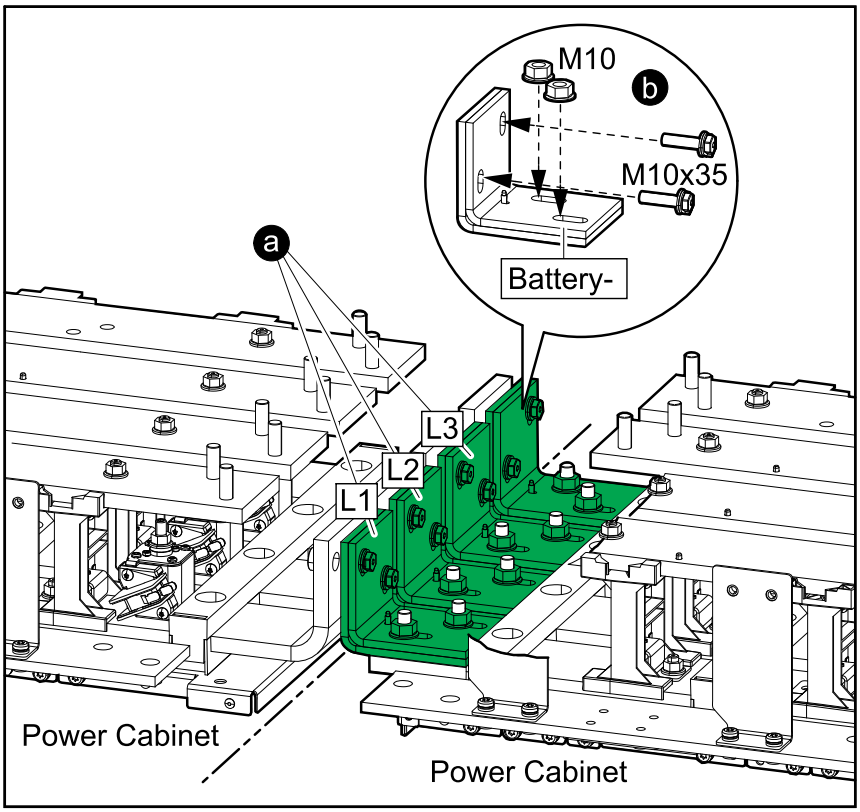


15. The part number depends on the power cabinet version.

2. Install the interconnection busbars from the installation kit 0H-9162, or 0H-9102[16] between all power cabinets.

   a. Install the three input interconnection busbars 0M-97885.

Front View of the Busbar Connections

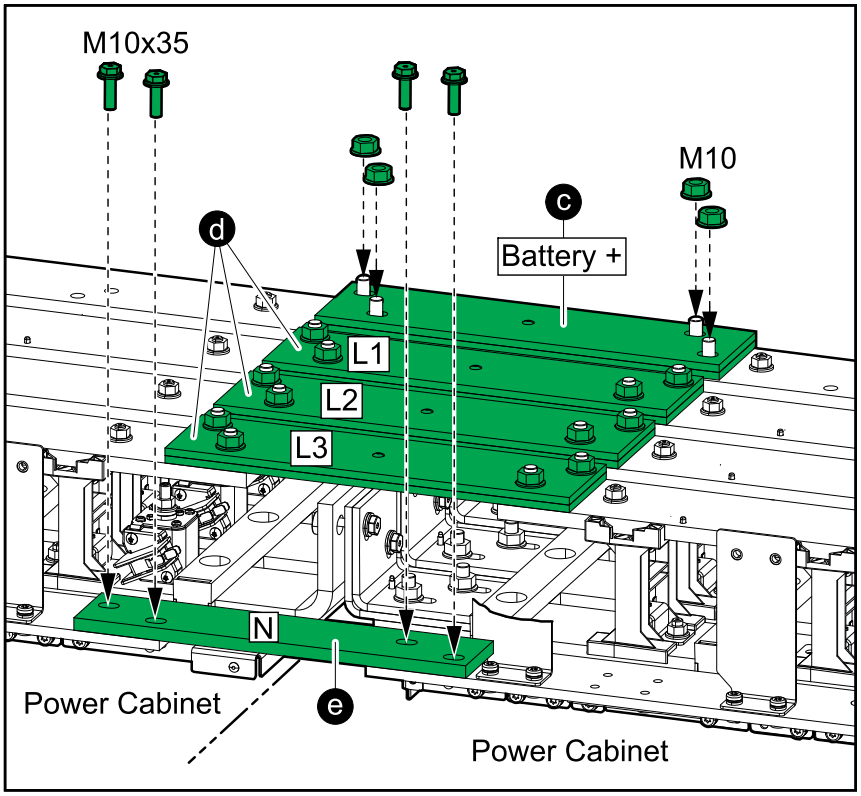


   b. Install the battery – interconnection busbar 0M-819336.

16. The part number depends on the power cabinet version.

c. Install the battery + interconnection busbar 0M-140035.

Front View of Busbar Connections



d. Install the output interconnection busbars 0M-97886.

e. Install the neutral interconnection busbar 880-10146 or 880-9720[17].

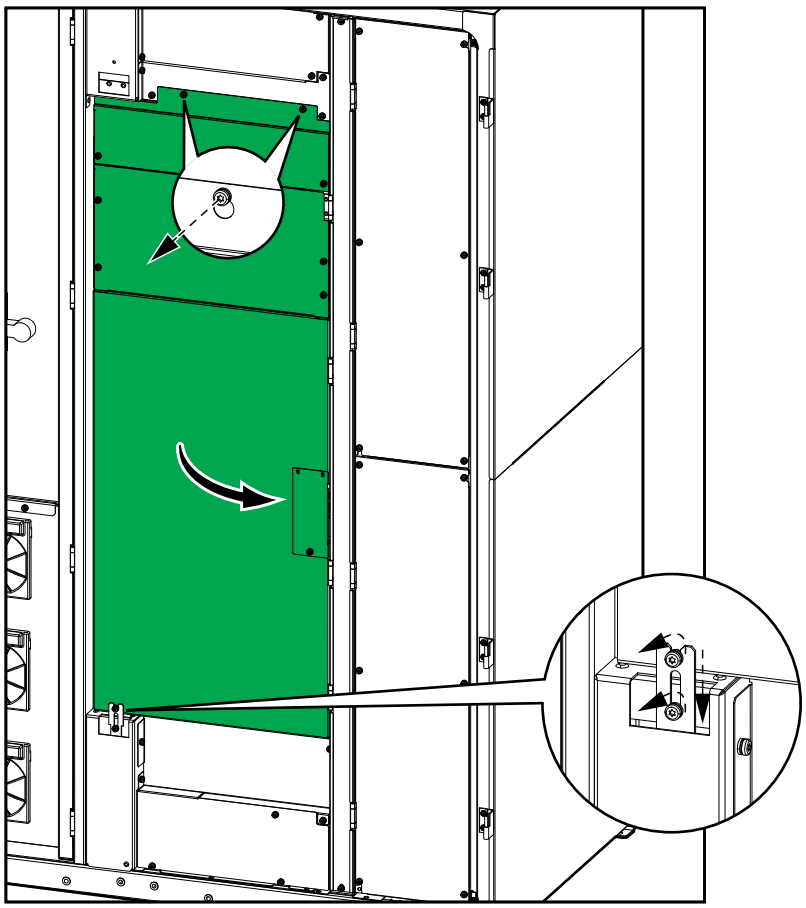
17. The part number depends on the power cabinet version.

Connect the Power Cables

Prepare the I/O Cabinet for Power Cables in Top Cable Entry Systems

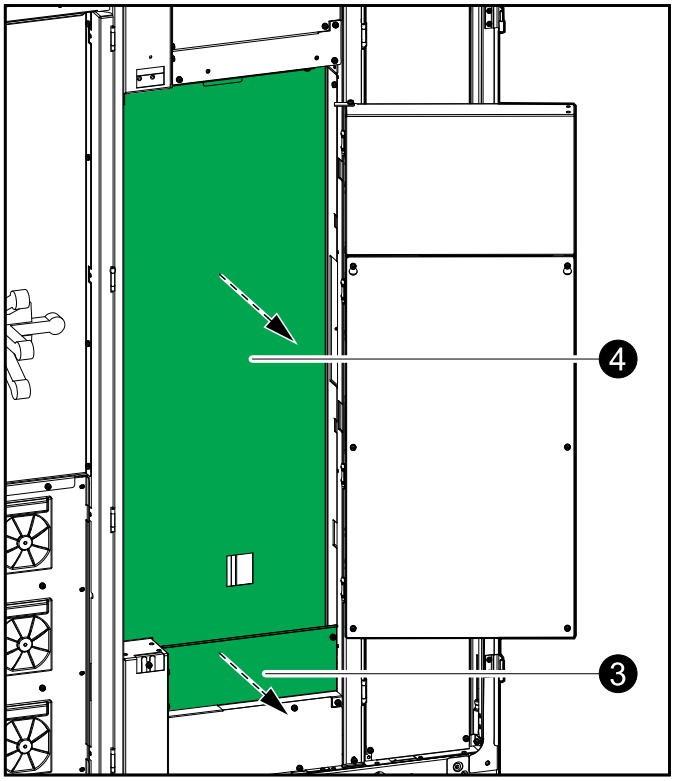
1. Open the front doors of the I/O cabinet.
2. Loosen the screws and open the inner door.

Front View of the I/O Cabinet



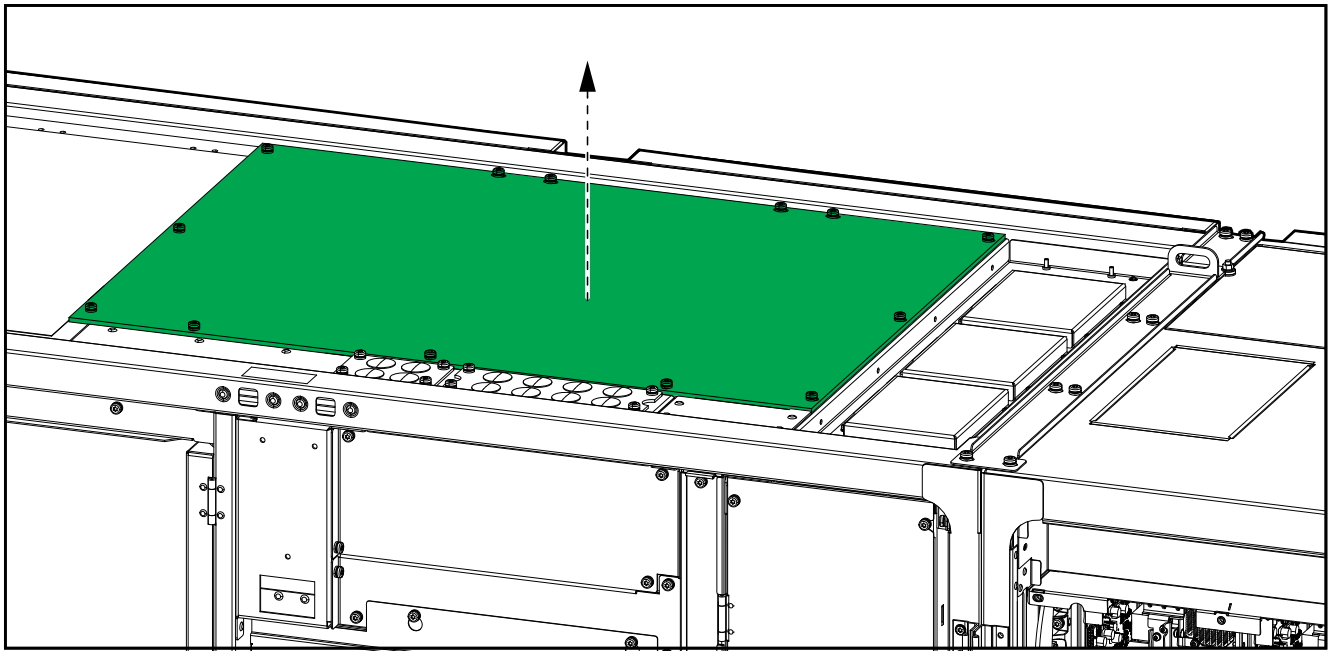
3. Remove the metal plate.

Front View of the I/O Cabinet



4. Remove the plastic plate.
5. Loosen the bolts and remove the gland plate from the top of the I/O cabinet

Front View of the I/O Cabinet



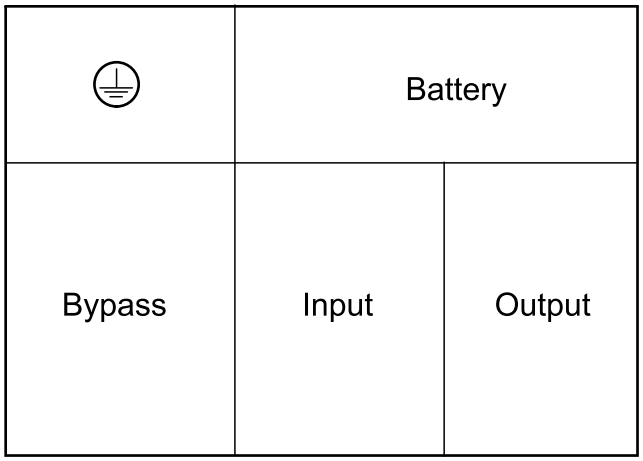
6. Drill or cut holes for cables/conduits in the top gland plate according to the guidelines.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not drill/punch holes for cables or conduits with the gland plates installed and do not drill/punch holes in close proximity to the UPS.

Failure to follow these instructions will result in death or serious injury.



7. Install conduits and reinstall the top gland plate.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Ensure that there are no sharp edges that can damage the cables.

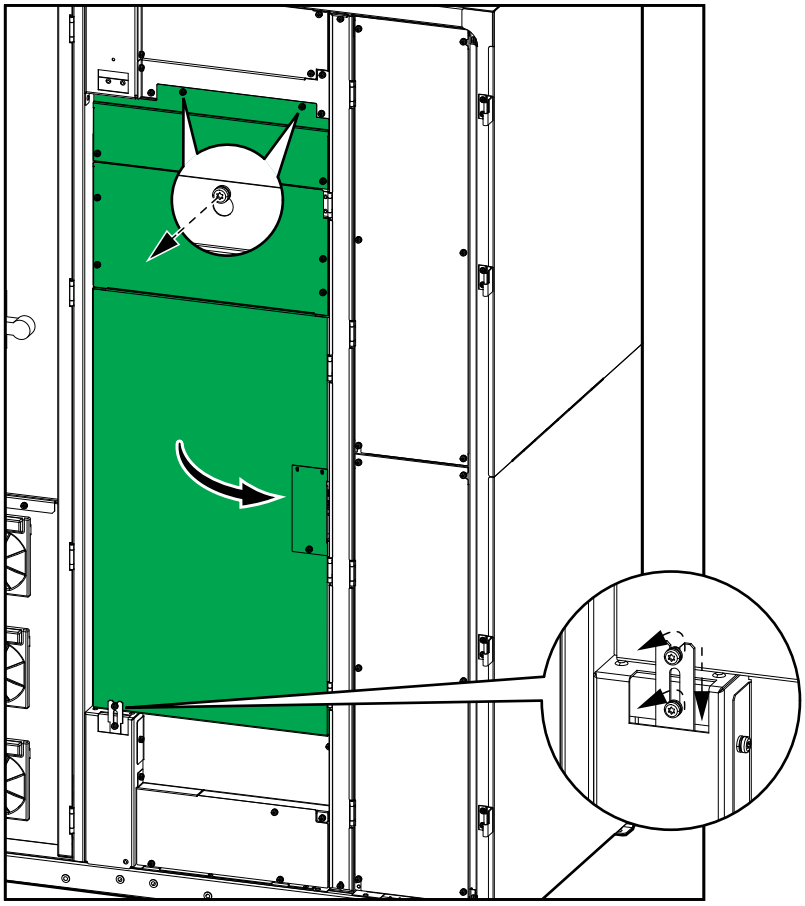
Failure to follow these instructions will result in death or serious injury.

Prepare the I/O Cabinet for Power Cables in Bottom Cable Entry Systems

1. Open the front doors of the I/O cabinet.

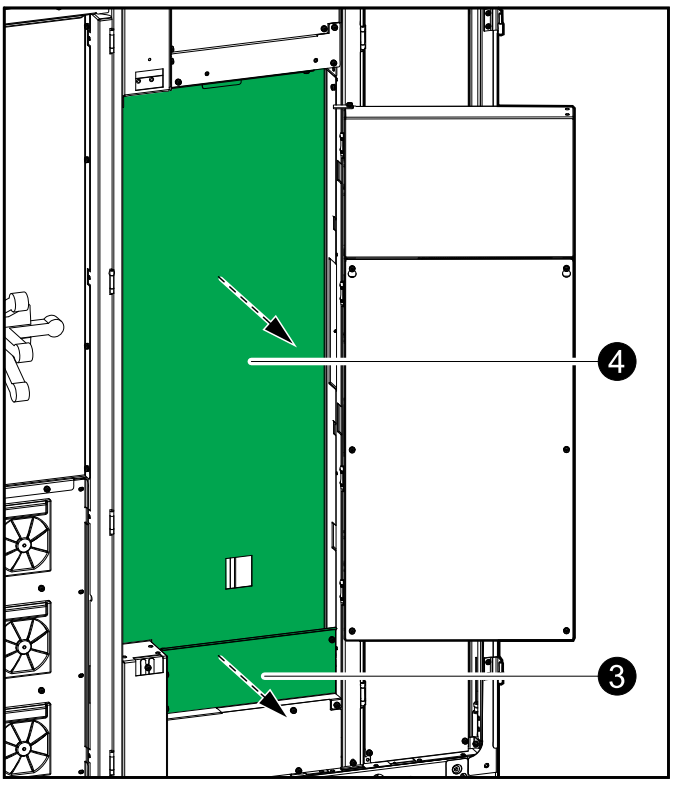
2. Loosen the screws and open the inner door.

Front View of the I/O Cabinet



3. Remove the metal plate.

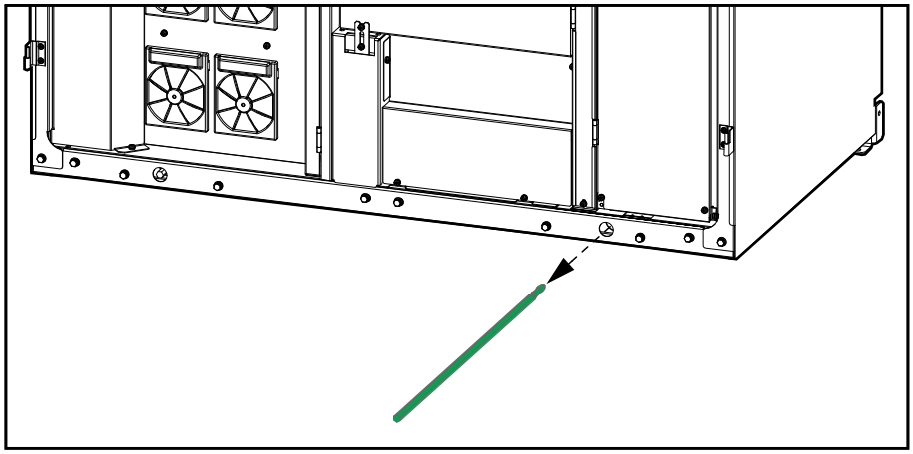
Front View of the I/O Cabinet



4. Remove the plastic plate.

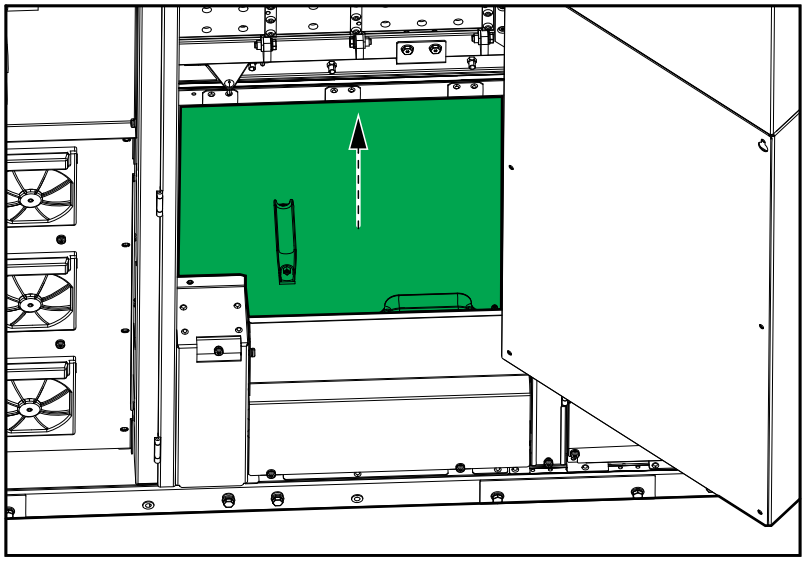
5. Remove the right rod of the I/O cabinet.

Front View of the I/O Cabinet



6. Loosen the bolts and remove the gland plate in the bottom of the I/O cabinet.

Front View of the I/O Cabinet



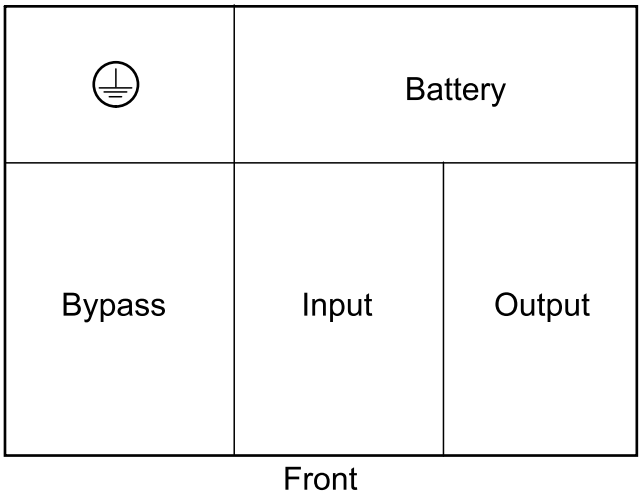
7. Drill or cut holes for cables/conduits in the bottom gland plate according to the guidelines.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Do not drill/punch holes for cables or conduits with the gland plates installed and do not drill/punch holes in close proximity to the UPS.

Failure to follow these instructions will result in death or serious injury.



8. Install conduits and reinstall the bottom gland plate.

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Ensure that there are no sharp edges that can damage the cables.

Failure to follow these instructions will result in death or serious injury.

Install the Single Utility/Mains Kit

NOTE: This procedure is only applicable to single utility/mains systems.

1. Install the single utility/mains kit between the input and bypass busbars. Connect L1 to L1, L2 to L2, and L3 to L3.

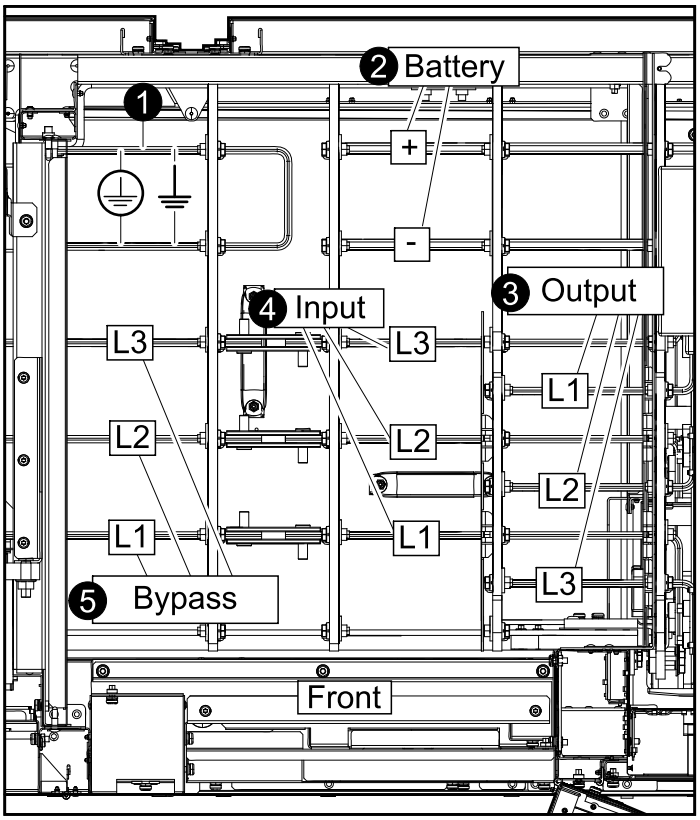
   NOTE: Two 880–9642 busbars are required for each connection.

Top Front View of the Power Connection Area in the I/O Cabinet

Connect the Power Cables

The grounding electrode conductor must be installed per NEC 250.30 and sized per NEC 250.66.

Top View of the Power Connection Area in the I/O Cabinet



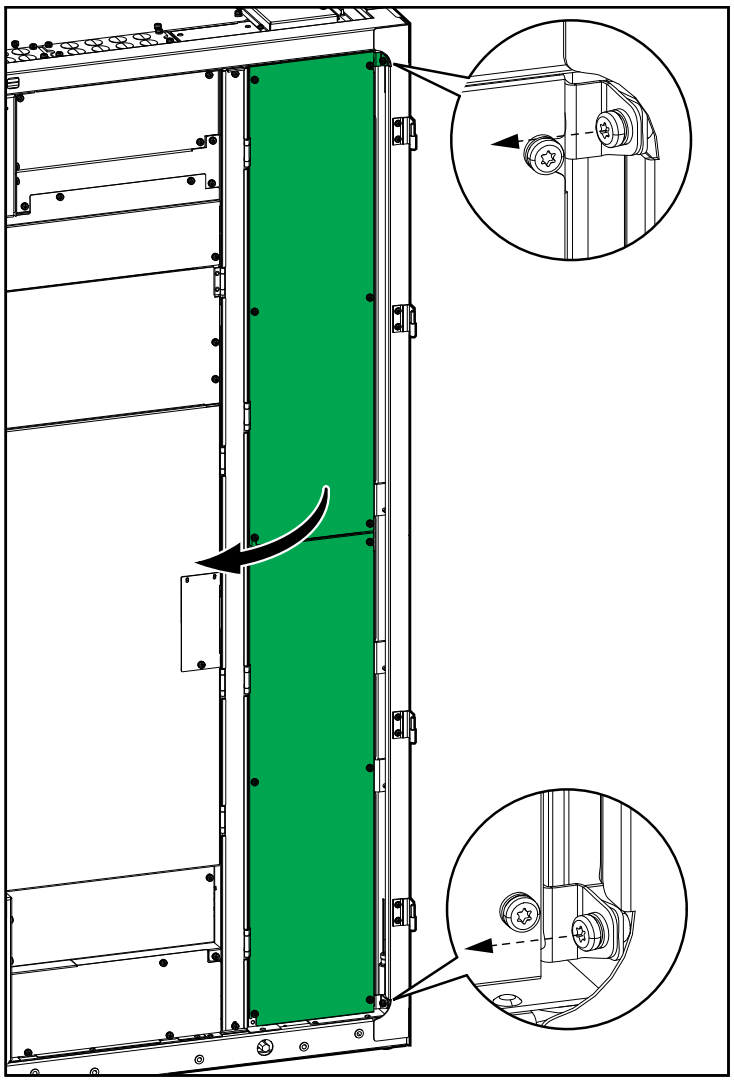
1. Connect the equipment grounding conductor to the equipment grounding bar.
2. Connect the battery cables to the battery + and battery – terminals.
3. Connect the output cables.
4. Connect the input cables.
5. Only applicable to dual mains systems: Connect the bypass cables.

6. Only applicable to high impedance grounding systems:

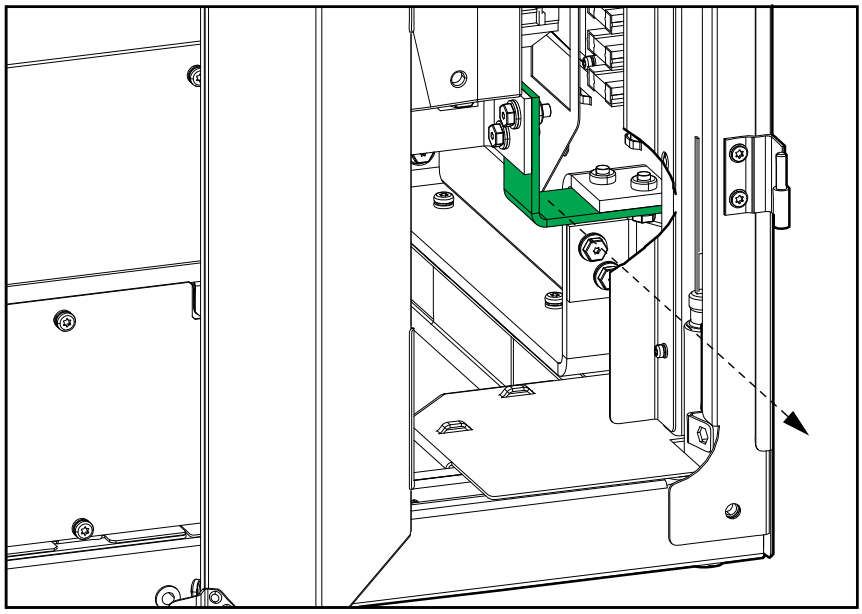
   NOTE: For high impedance grounding systems, the installation must include a ground-fault detection circuitry.

   a. Open the narrow door in the right side.

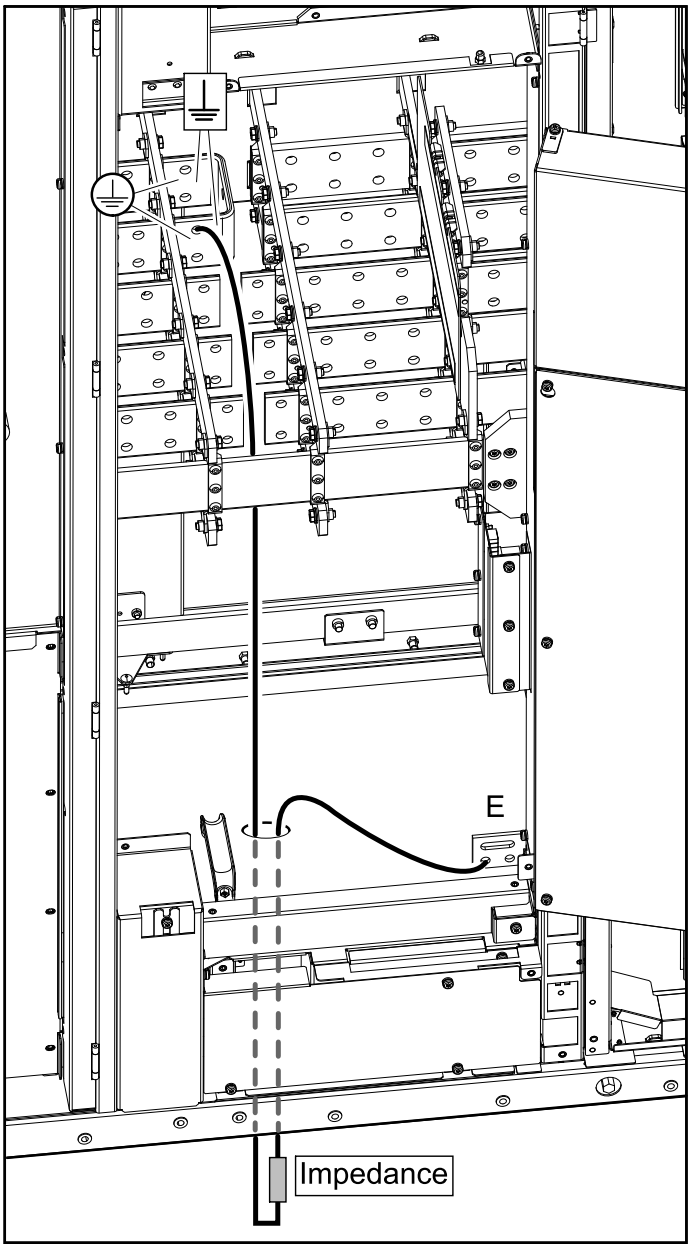
Front View of the I/O Cabinet



b. Remove the jumper busbar.



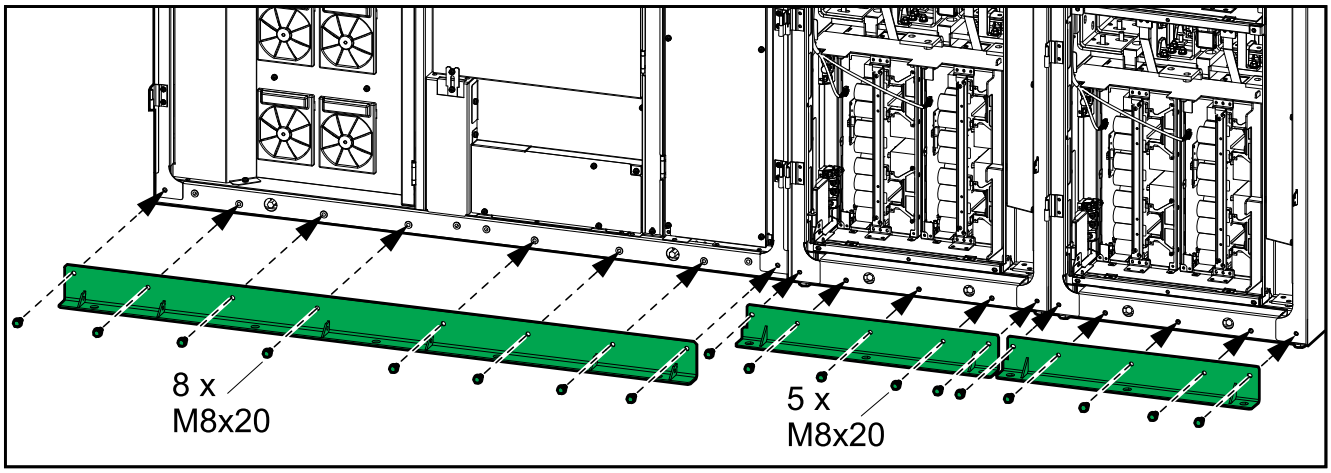
c. Connect an external impedance between the “E” terminal and the equipment grounding bar according to NEC 2014 article 250.36.



Mount the Front Anchoring Bracket

1. Fasten the front anchoring brackets to the front of the cabinets using the provided bolts.

Front View of the I/O Cabinet and Two Power Cabinets



2. Anchor the front anchoring brackets to the floor.

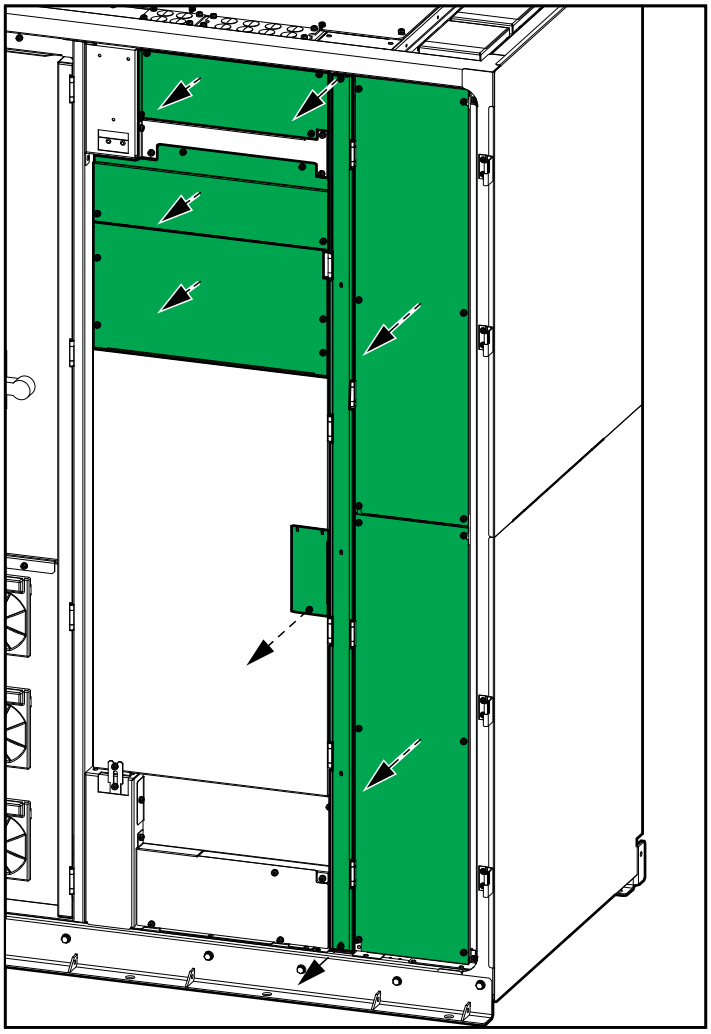
   NOTE: Floor anchoring bolts are not supplied.

Connect the Signal Cables

Prepare the I/O Cabinet for Signal Cables in Top Cable Entry Systems

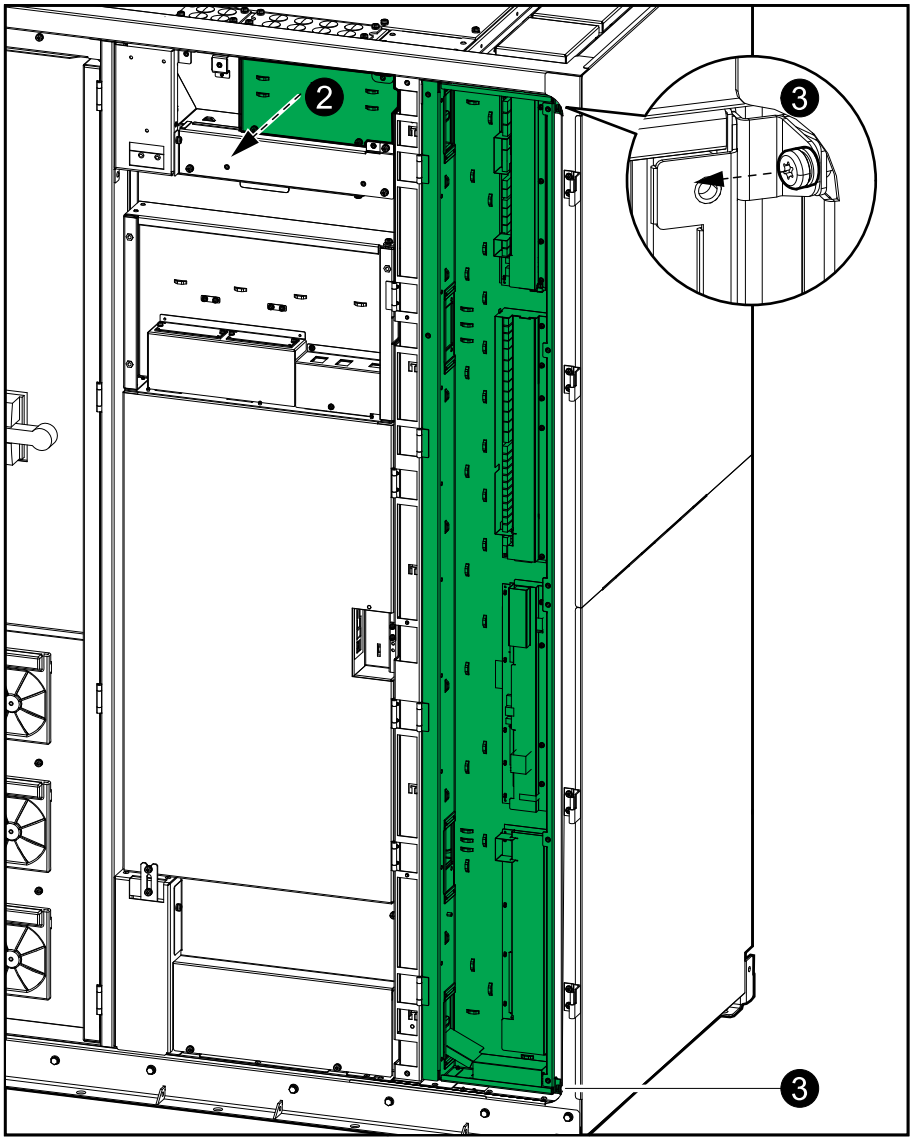
1. Remove the seven indicated plates.

Front View of the I/O Cabinet



2. Remove the indicated plate.

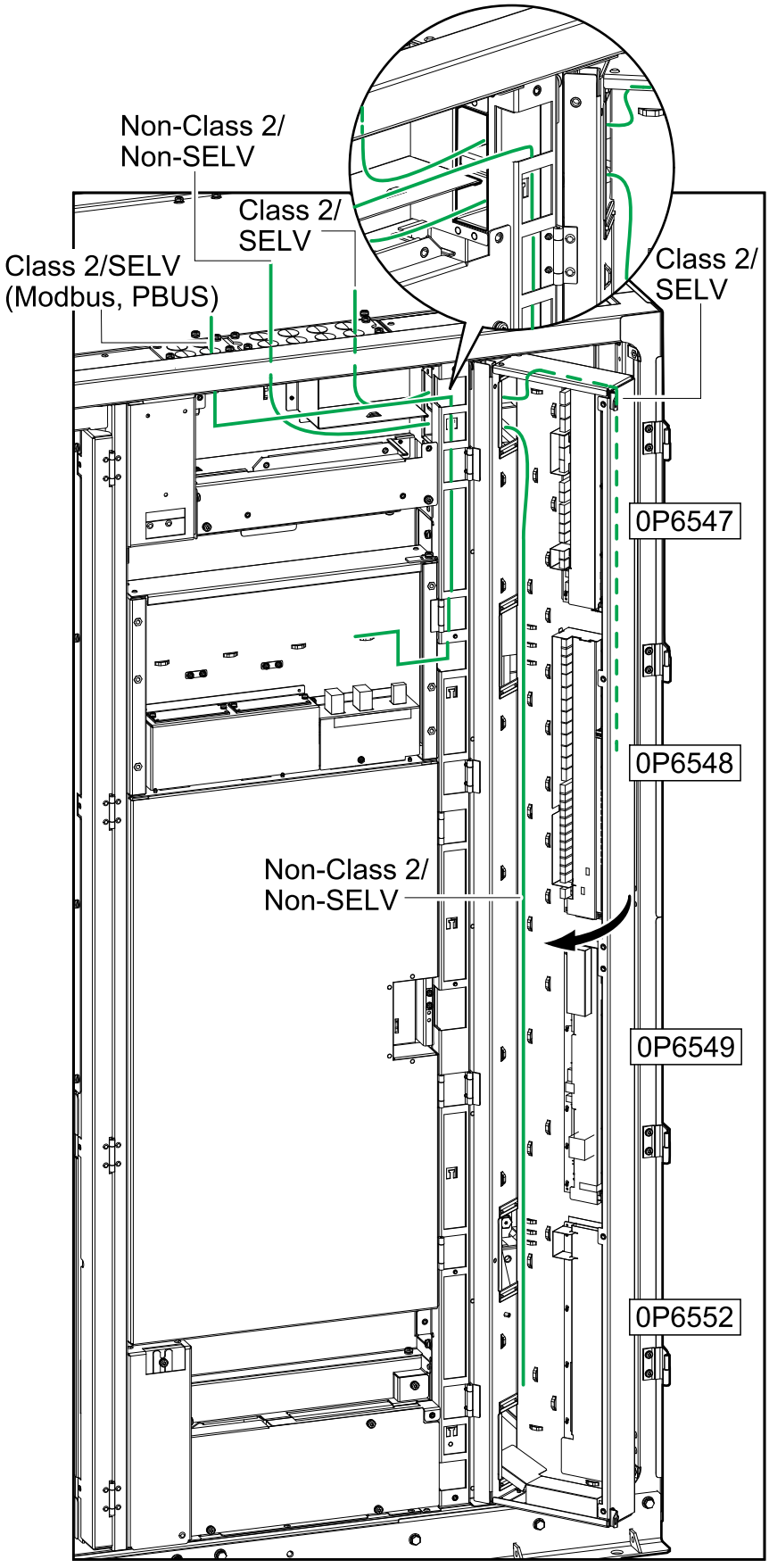
Front View of the I/O Cabinet



3. Loosen and remove the two screws and open the door.

4. Remove the plugs from the top of the cabinet and install conduits for the applicable Class 2/SELV and Non-Class 2/Non-SELV cables in the table below.

Front View of the I/O Cabinet



Class 2/SELV

Board	Terminal	Description	See
0P6548	J5502–J5506, J5508, J5510–J5512	Input contacts	*Connect Equipment to Input Contacts and Output Relays, page 84*
0P6548	J5520–J5525, J5528	Output relays	
0P6548	J5527	Kirk key control	*Connect the Signal Cables between the I/O Cabinet and the Switchgear, page 78*
0P6548	J5514	UOB lamp contol	
0P6548	J5515	MBB lamp control	
0P6548	J5516	SIB lamp control	
0P6548	J5517	SSIB lamp control	
0P6548	J5509	UOB 2	
0P6547	J4931–J4932	24 V SELV supply	
0P6547	J4936–J4938	EPO	*Connect the Emergency Power Off (EPO), page 81*
0P3643	PBUS 1 and PBUS 2	PBUS	*Connect the PBUS Cables between Parallel UPS Units, page 86*
0P6502		Modbus	*Connect the Modbus Cables, page 89*

Non-Class 2/Non-SELV

Board	Terminal	Description	See
0P6548	J4939–J4941[18]	Output relays	*Connect Equipment to Input Contacts and Output Relays, page 84*
0P6549	J5607	MBB	*Connect the Signal Cables between the I/O Cabinet and the Switchgear, page 78*
0P6549	J5608	SIB	
0P6549	J5620	SSIB	
0P6549	J5621	UOB	
0P6549	J5622	UIB	
0P6549	J5611–J5613	External synchronization	*Connect External Synchronization, page 81*
0P6548	J5529	Battery temperature sensor 1	*Connect the Signal Cables for Battery Solutions, page 79*
0P6549	J5609	Battery breaker 1	
0P6549	J5610	Battery breaker 2	
0P6547	J4942–J4943	24 V supply 1	
0P6547	J4929–J4930	24 V supply 2	
0P6547	J4923	DC shunt trip 1	
0P6547	J4924	DC shunt trip 2	
0P6552	J9019	Battery breaker 3	
0P6552	J9020	Battery breaker 4	
0P6552	J9021	Battery temperature sensor 2	
0P6552	J9022–J9023	24 V supply 3	
0P6552	J9024–J9025	24 V supply 4	

18. These output relays can also be Class 2/SELV but the three output relays must have identical reference.

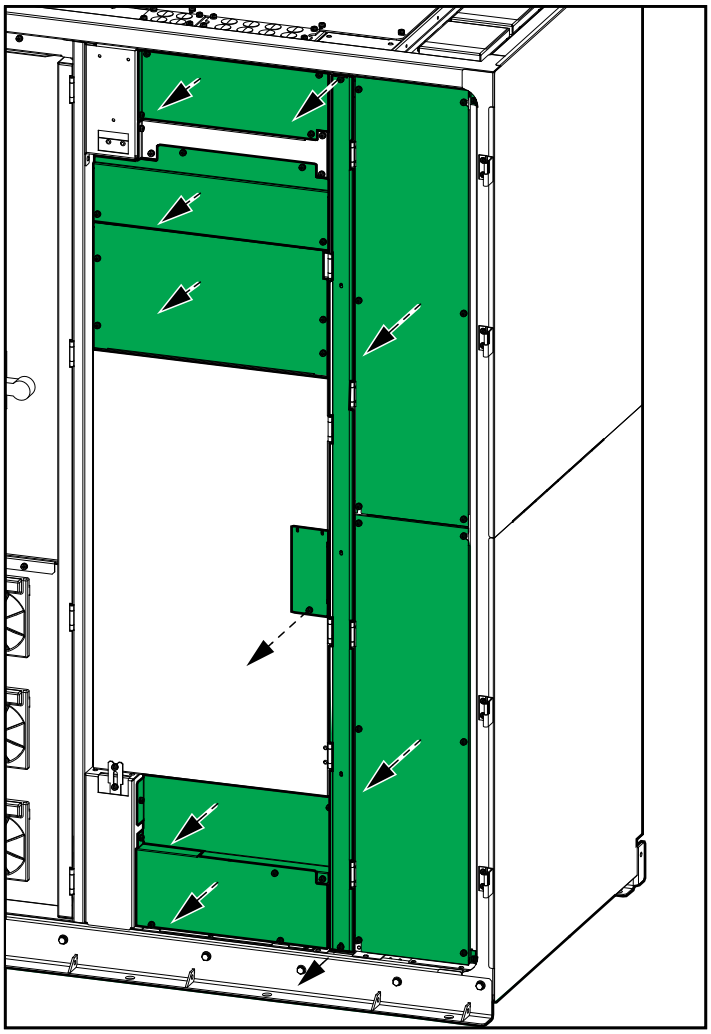
5. Route the cables through the top of the I/O cabinet and to the boards as shown on the illustration.

   NOTE: The Modbus and PBUS cables are routed on the outside of the plate removed in step 2.

Prepare the I/O Cabinet for Signal Cables in Bottom Cable Entry Systems

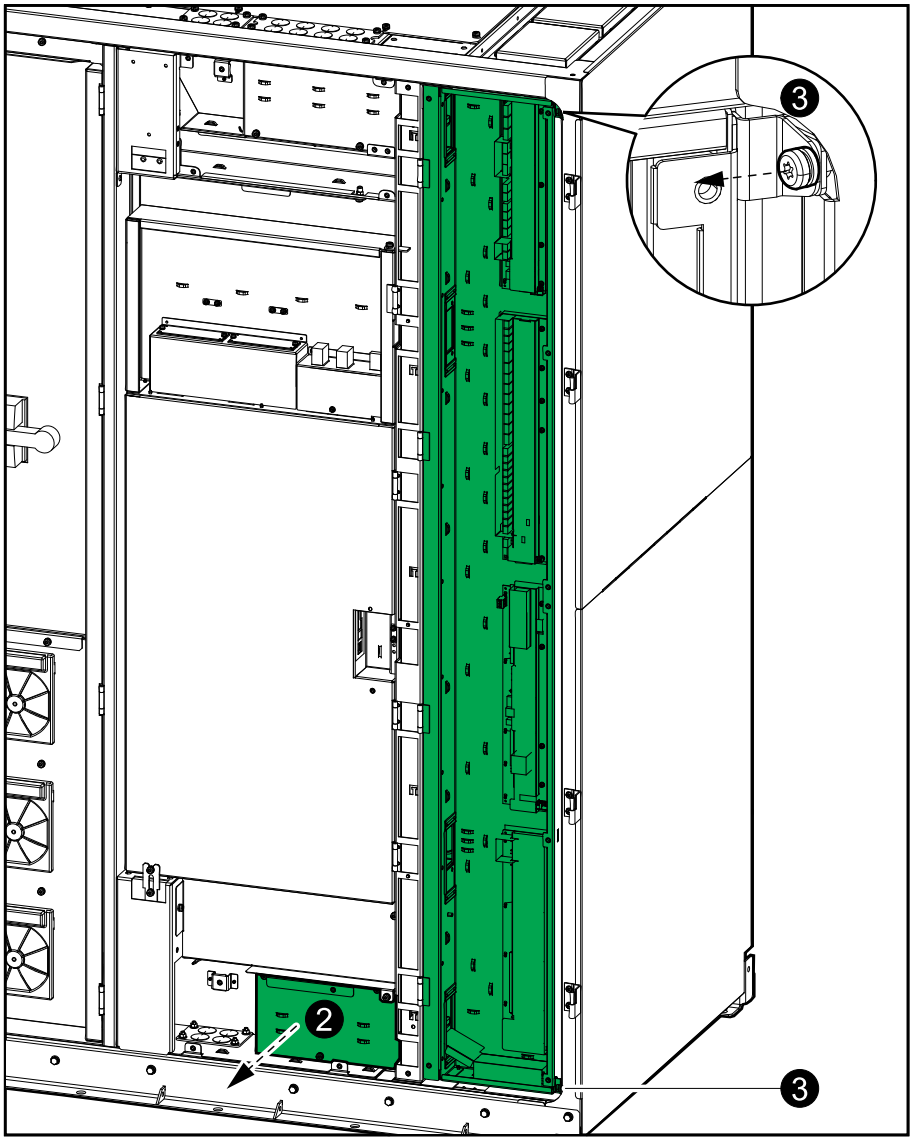
1. Remove the nine indicated plates.

Front View of the I/O Cabinet



2. Remove the indicated plate.

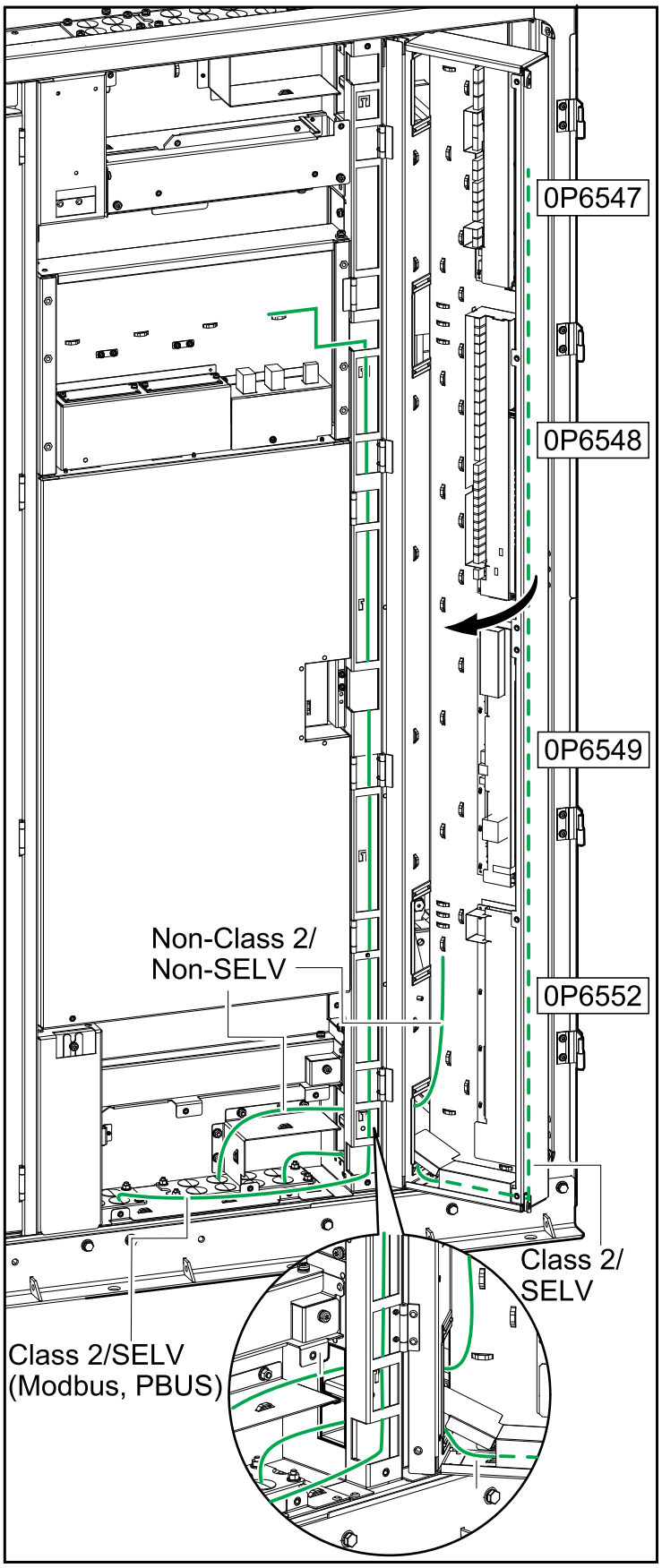
Front View of the I/O Cabinet



3. Loosen and remove the two screws and open the door.

4. Remove the plugs from the top of the cabinet and install conduits for the applicable Class 2/SELV and Non-Class 2/Non-SELV cables in the table below.

Front View of the I/O Cabinet



Class 2/SELV

Board	Terminal	Description	See
0P6548	J5502–J5506, J5508, J5510–J5512	Input contacts	*Connect Equipment to Input Contacts and Output Relays, page 84*
0P6548	J5520–J5525, J5528	Output relays	
0P6548	J5527	Kirk key control	*Connect the Signal Cables between the I/O Cabinet and the Switchgear, page 78*
0P6548	J5514	UOB lamp contol	
0P6548	J5515	MBB lamp control	
0P6548	J5516	SIB lamp control	
0P6548	J5517	SSIB lamp control	
0P6548	J5509	UOB 2	
0P6547	J4931–J4932	24 V SELV supply	
0P6547	J4936–J4938	EPO	*Connect the Emergency Power Off (EPO), page 81*
0P3643	PBUS 1 and PBUS 2	PBUS	*Connect the PBUS Cables between Parallel UPS Units, page 86*
0P6502		Modbus	*Connect the Modbus Cables, page 89*

Non-Class 2/Non-SELV

Board	Terminal	Description	See
0P6548	J4939–J4941[19]	Output relays	*Connect Equipment to Input Contacts and Output Relays, page 84*
0P6549	J5607	MBB	*Connect the Signal Cables between the I/O Cabinet and the Switchgear, page 78*
0P6549	J5608	SIB	
0P6549	J5620	SSIB	
0P6549	J5621	UOB	
0P6549	J5622	UIB	
0P6549	J5611–J5613	External synchronization	*Connect External Synchronization, page 81*
0P6548	J5529	Battery temperature sensor 1	*Connect the Signal Cables for Battery Solutions, page 79*
0P6549	J5609	Battery breaker 1	
0P6549	J5610	Battery breaker 2	
0P6547	J4942–J4943	24 V supply 1	
0P6547	J4929–J4930	24 V supply 2	
0P6547	J4923	DC shunt trip 1	
0P6547	J4924	DC shunt trip 2	
0P6552	J9019	Battery breaker 3	
0P6552	J9020	Battery breaker 4	
0P6552	J9021	Battery temperature sensor 2	
0P6552	J9022–J9023	24 V supply 3	
0P6552	J9024–J9025	24 V supply 4	

19. These output relays can also be Class 2/SELV but the three output relays must have identical reference.

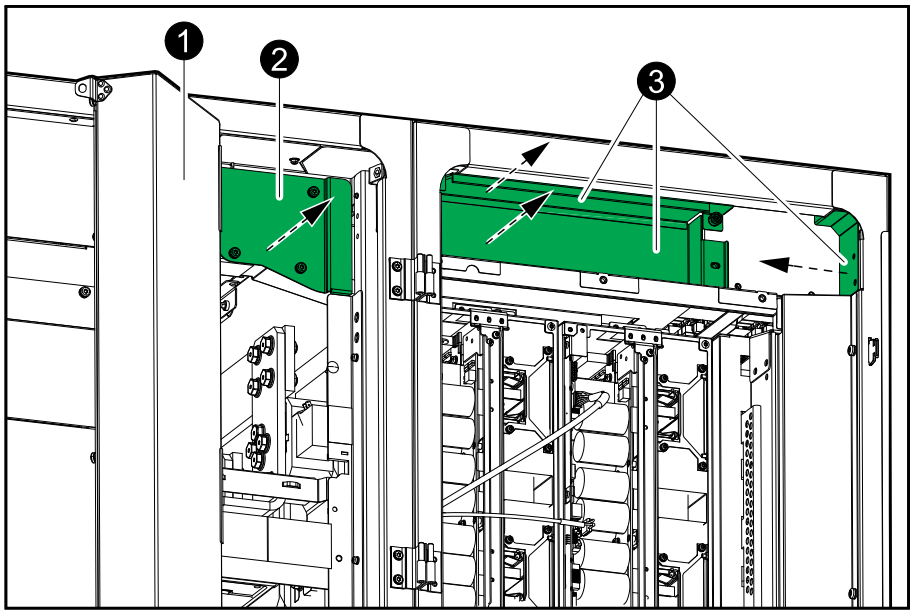
5. Route the cables through the bottom of the I/O cabinet and to the boards as shown on the illustration.

   NOTE: The Modbus and PBUS cables are routed on the outside of the plate removed in step 2.

Connect the Signal Cables between the I/O Cabinet and the Power Cabinets

1. Open the narrow door.

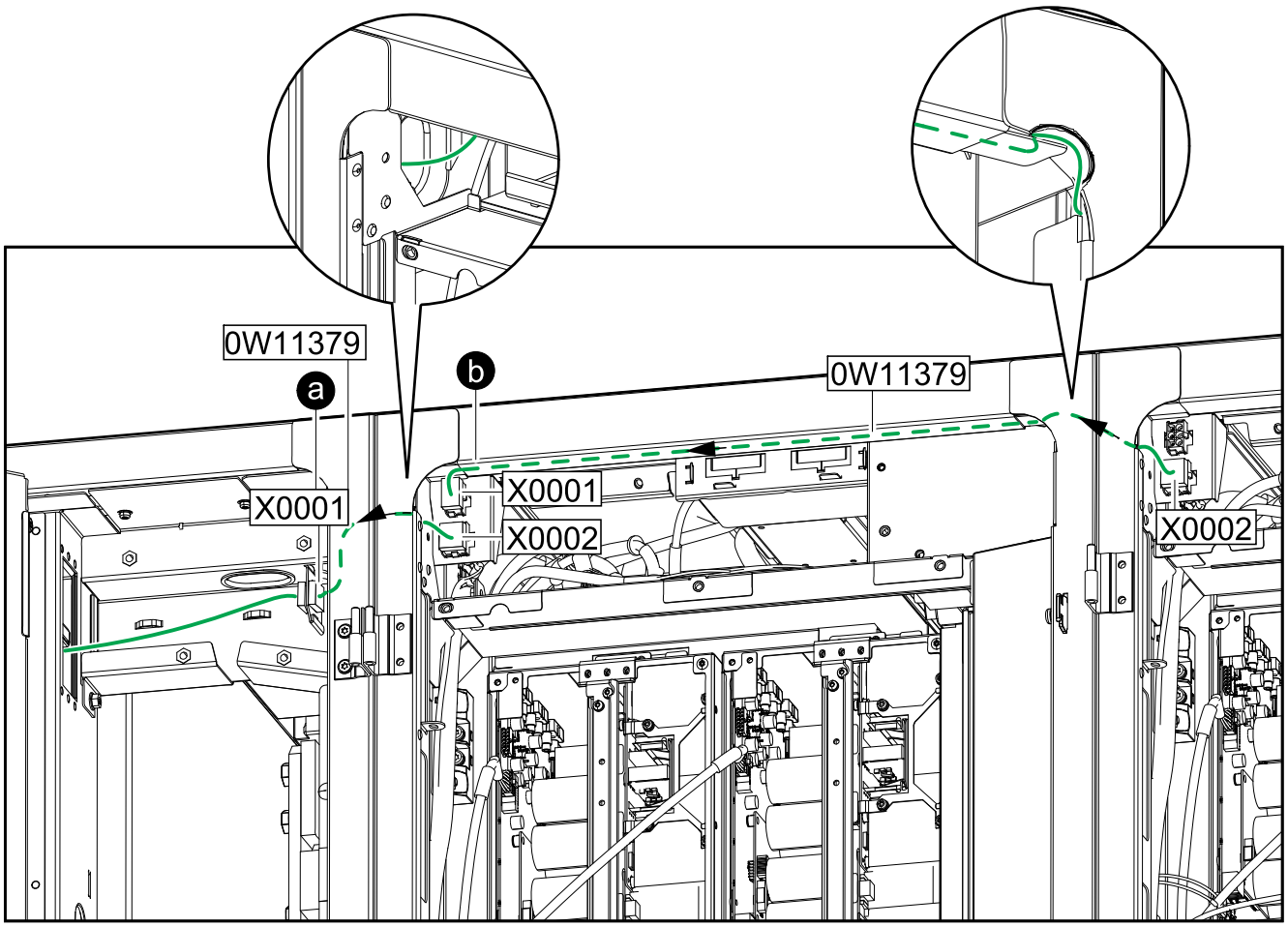
Front View of the I/O Cabinet and the Left-Most Power Cabinet



2. Remove the indicated plate from the I/O cabinet.
3. Remove the three indicated plates from the power cabinets.

4. Route and connect the two system power supply cables 0W11379 shipped in the power cabinets.

Front View of the I/O Cabinet and the Left-Most Power Cabinet



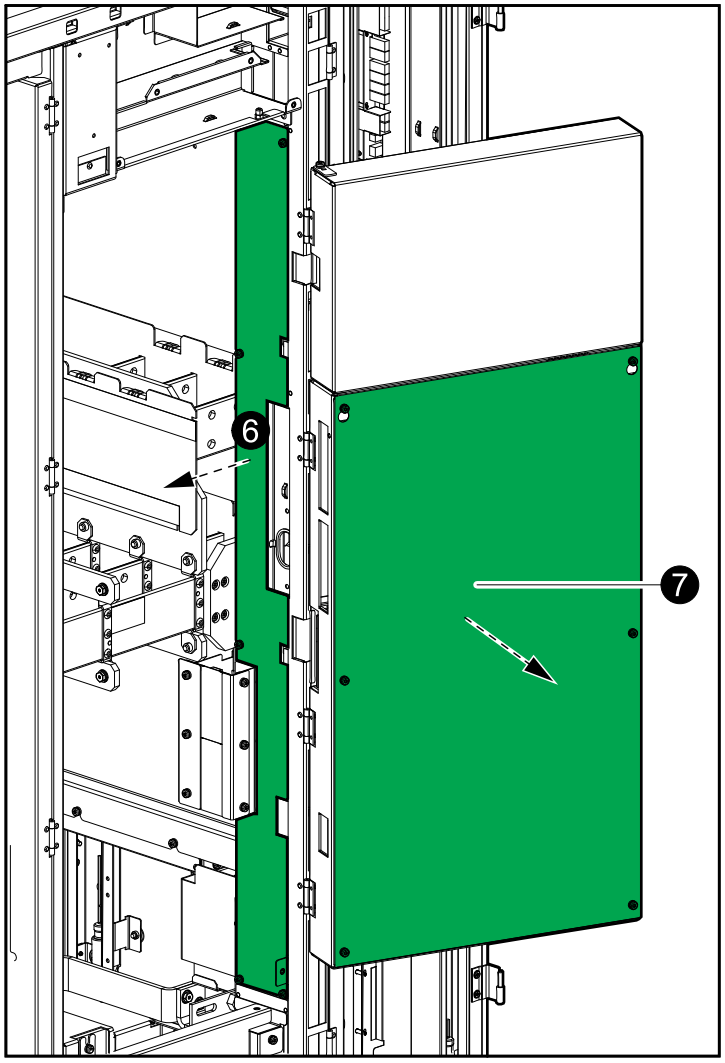
   a. Connect the signal cable 0W11379 from X0002 in the left-most power cabinet to X0001 in the I/O cabinet.

   b. Connect the signal cable 0W11379 from X0002 in the second power cabinet to X0001 in the left-most power cabinet.

5. Open the wide door in the I/O cabinet.

6. Remove the plate in front of the cable channel.

Front View of the I/O Cabinet

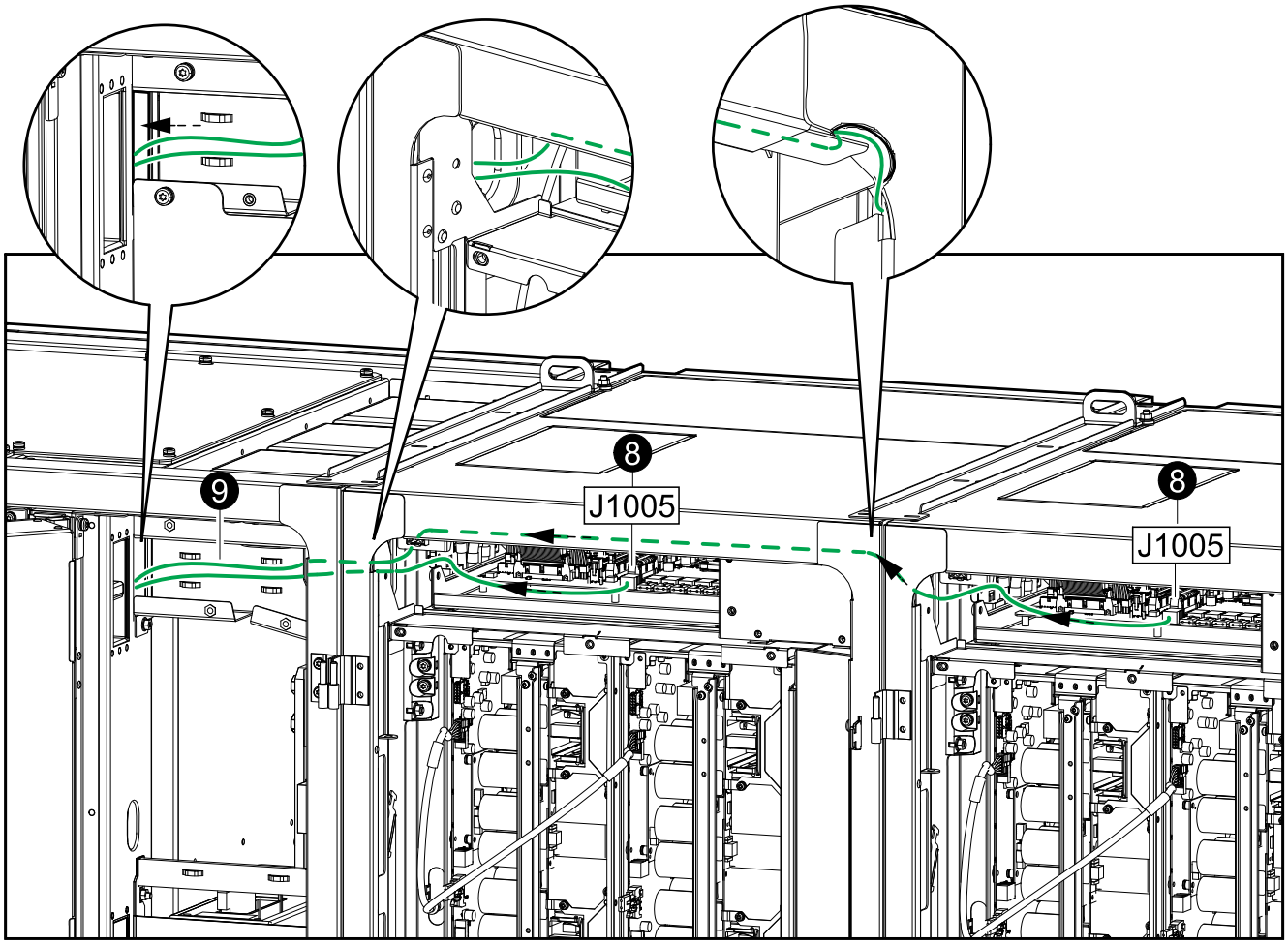


7. Remove the plate in front of the communication board.

8. Connect the signal cables in the power cabinets:

   NOTE: Minimum bending radius is 50 mm.

Front View of the I/O Cabinet and Two Power Cabinets



   a. Connect 0W11378 to 640–6515 J1005 in power cabinet 1.

   b. Connect 0W11384 to 640–6515 J1005 in power cabinet 2.

   c. Connect 0W11385 to 640–6515 J1005 in power cabinet 3 if available.

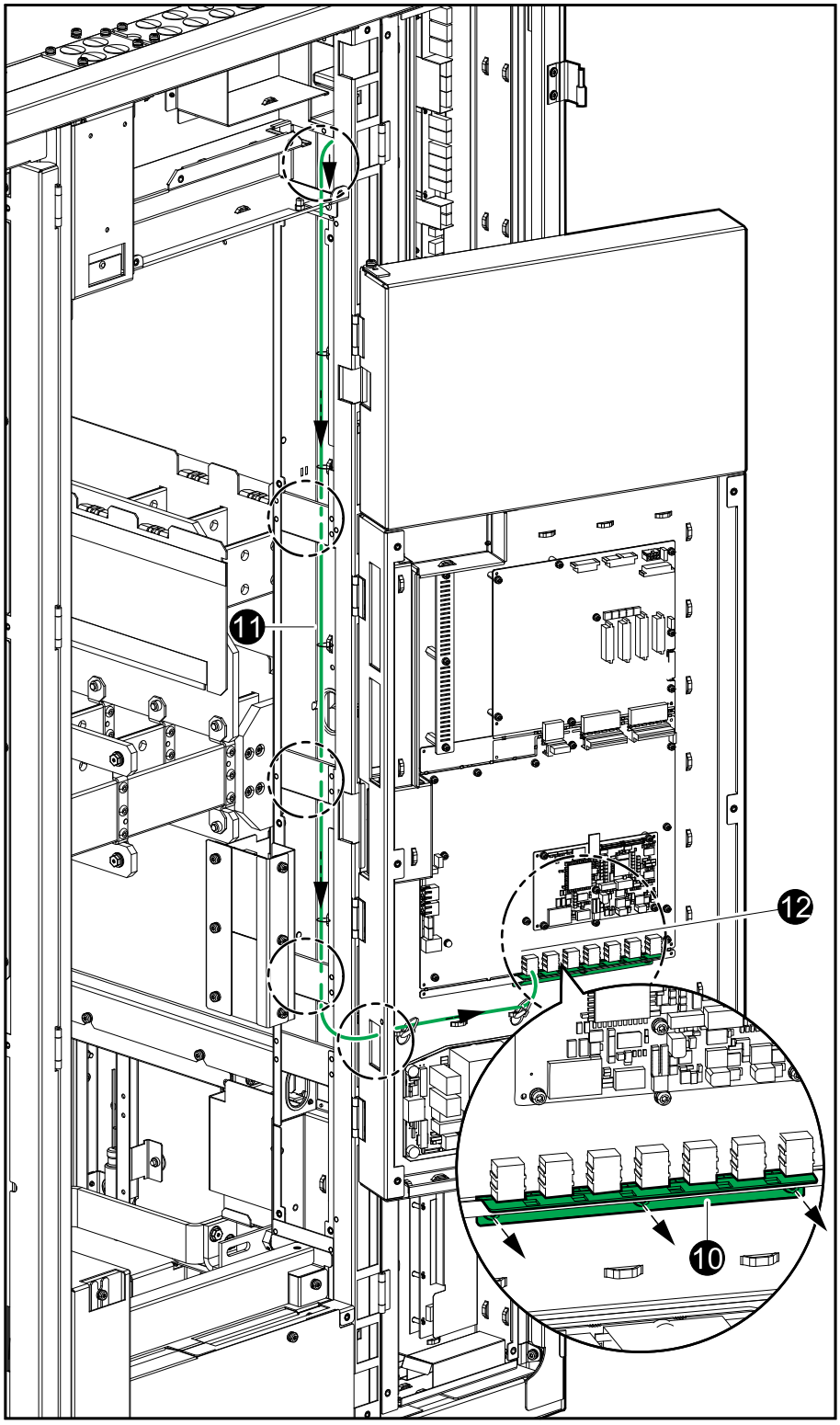
   d. Connect 0W12213 to 640–6515 J1005 in power cabinet 4 if available.

   e. Connect 0W98928 to 640–6515 J1005 in power cabinet 5 if available.

9. Route the signal cables into the I/O cabinet as shown.

10. Remove and dispose of the plastic plate below the terminals.

Front View of the I/O Cabinet



11. Route the signal cables as shown on the illustration and fasten with the provided cable ties.

12. Open the door to ensure that the cables will not be too tight and connect the signal cables in the I/O cabinet and fasten with the provided cable ties:

    NOTE: Minimum bending radius is 50 mm.

    a. Connect 0W11378 to 640–6502 J1100.

    b. Connect 0W11384 to 640–6502 J1101.

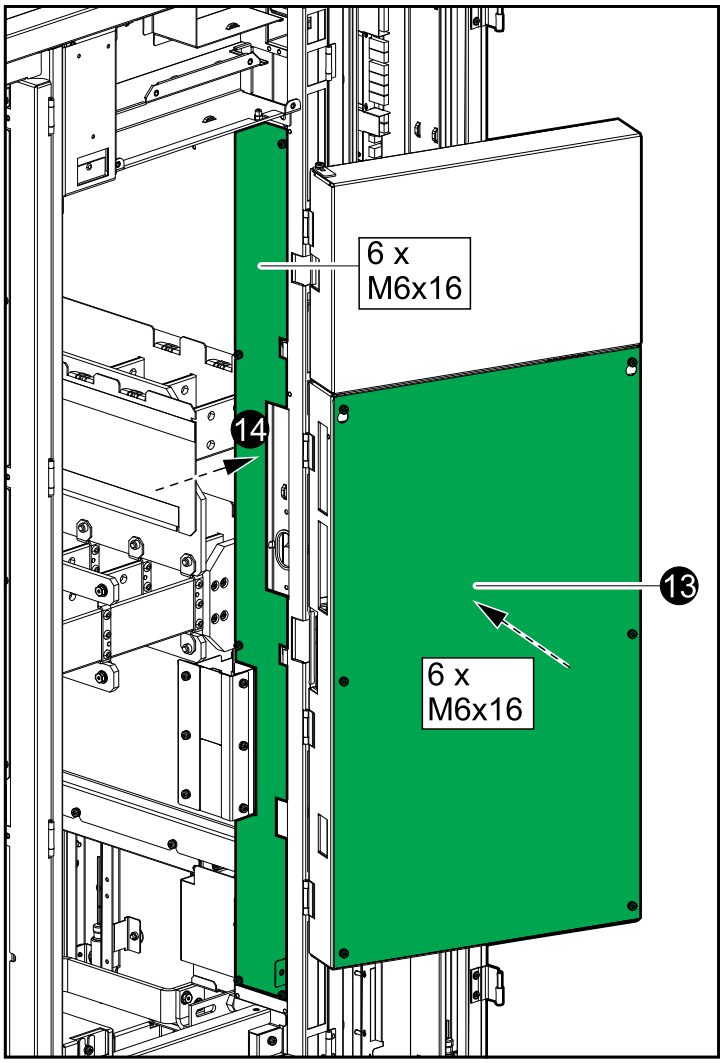
    c. Connect 0W11385 to 640–6502 J1102.

    d. Connect 0W12213 to 640–6502 J1103.

    e. Connect 0W98928 to 640–6502 J1104.

13. Reinstall the plate in front of the communication board.

Front View of the I/O Cabinet



14. Reinstall the plate in front of the cable channel.

Connect the Signal Cables between the I/O Cabinet and the Switchgear

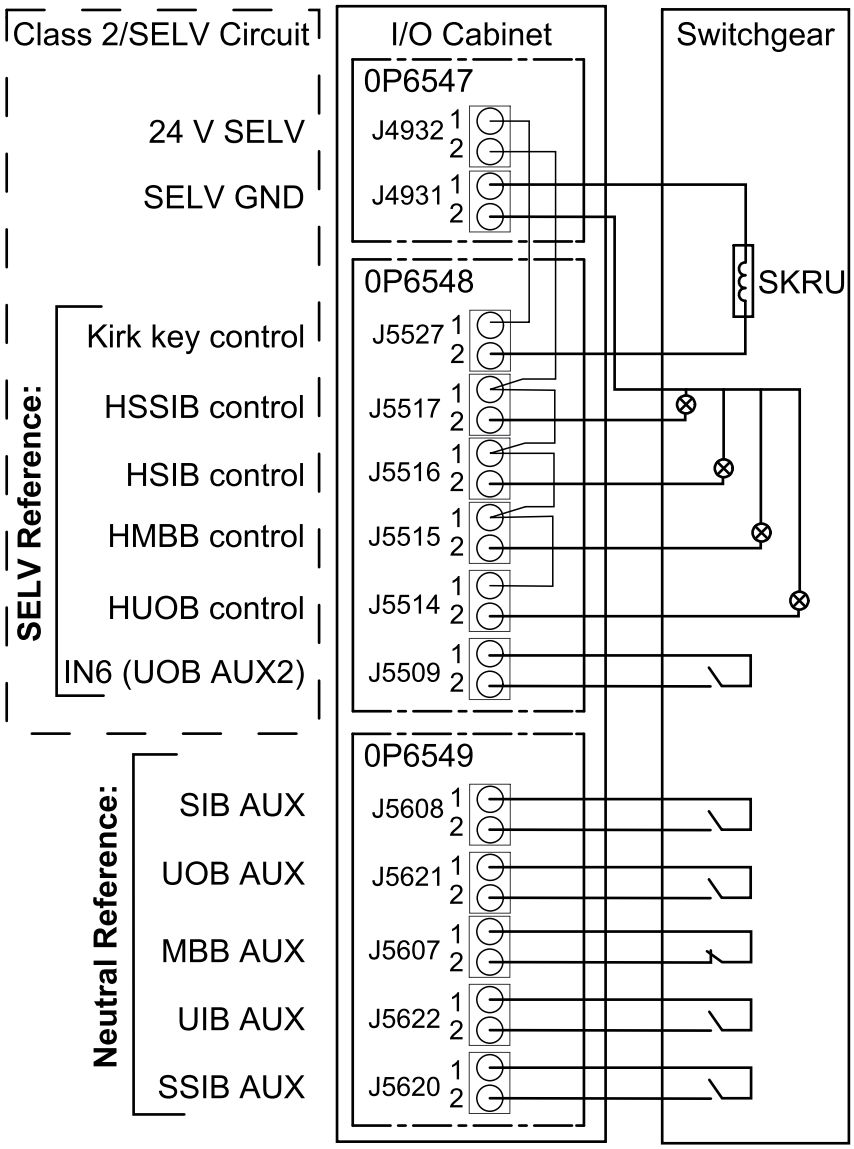
1. Open the door to ensure that the cables will not be too tight.

2. Route the cables from the switchgear through the top or bottom of the I/O cabinet and to the boards as shown in *Prepare the I/O Cabinet for Signal Cables in Top Cable Entry Systems, page 65* and *Prepare the I/O Cabinet for Signal Cables in Bottom Cable Entry Systems, page 69*. Class 2/SELV circuits must be separated from other cables as indicated on the illustrations.
3. Connect the below signal cables between the I/O cabinet and the switchgear.

   NOTE: The unit output breaker UOB must include two separated auxiliary switches.

   NOTE: The solenoid key release unit (SKRU) is only applicable to 480 V systems.

   All circuits connected must have the same 0 V reference.



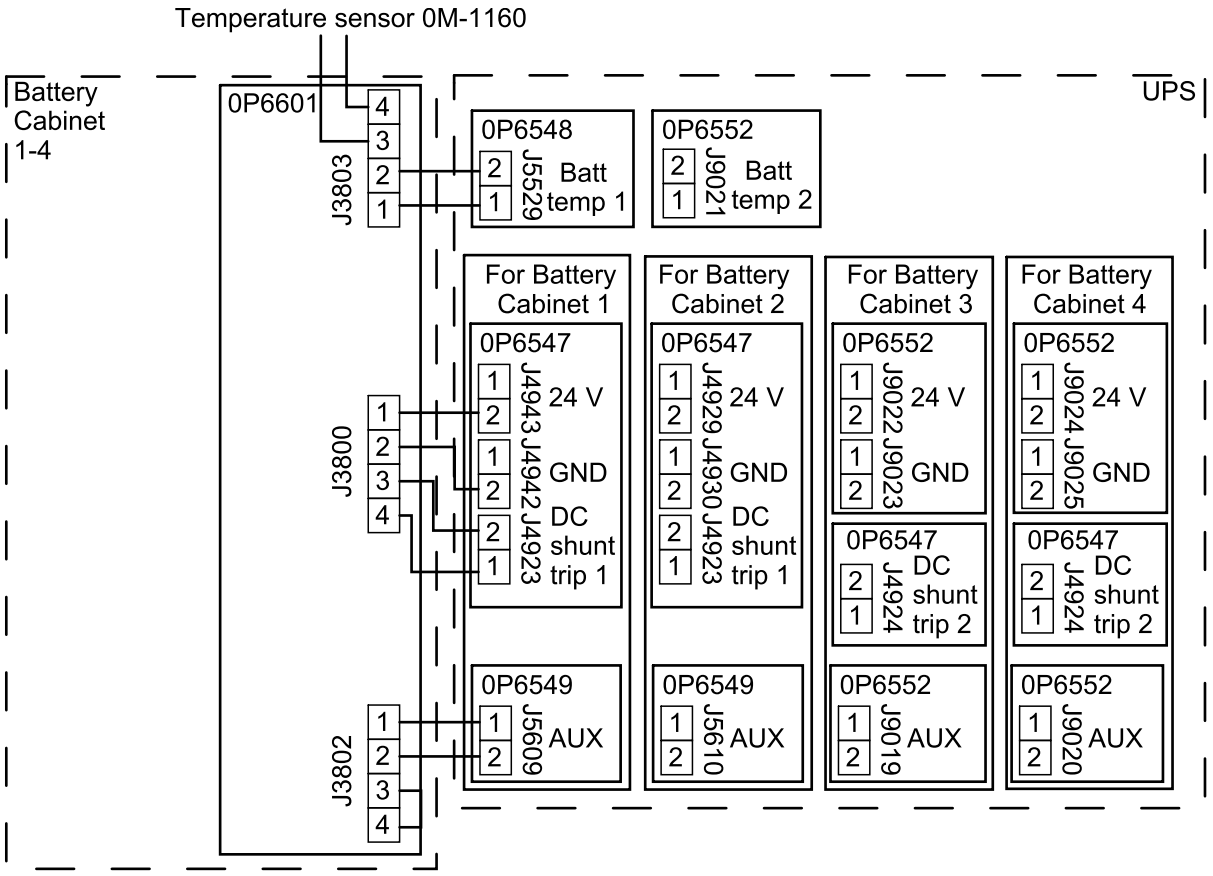
Connect the Signal Cables for Battery Solutions

Connect the Signal Cables between the I/O Cabinet and the Classic Battery Cabinets

NOTE: The illustration below shows a system with four battery banks each consisting of one classic battery cabinet. Connect signal cables according to the number of classic battery cabinets in your installation.

NOTE: If you have two classic battery cabinets in your battery bank, see *Connect the Signal Cables between Two Classic Battery Cabinets in One Battery Bank, page 80* for information on how to connect signal cables between two classic battery cabinets in one battery bank.

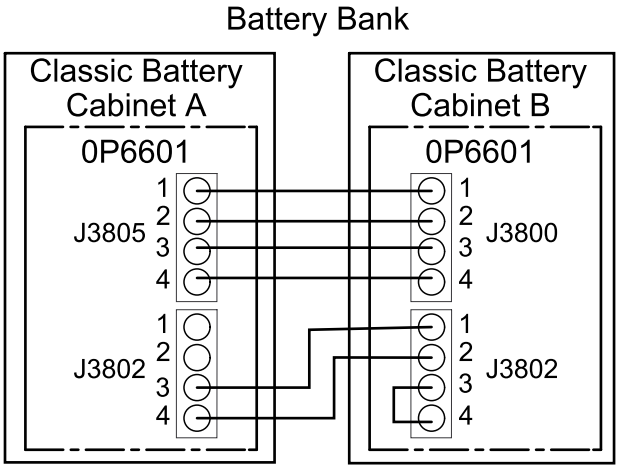
1. Route the signal cables from the battery banks through the top or bottom of the I/O cabinet to the boards.
2. Connect the signal cables between the I/O cabinet and the classic battery cabinets.



Connect the Signal Cables between Two Classic Battery Cabinets in One Battery Bank

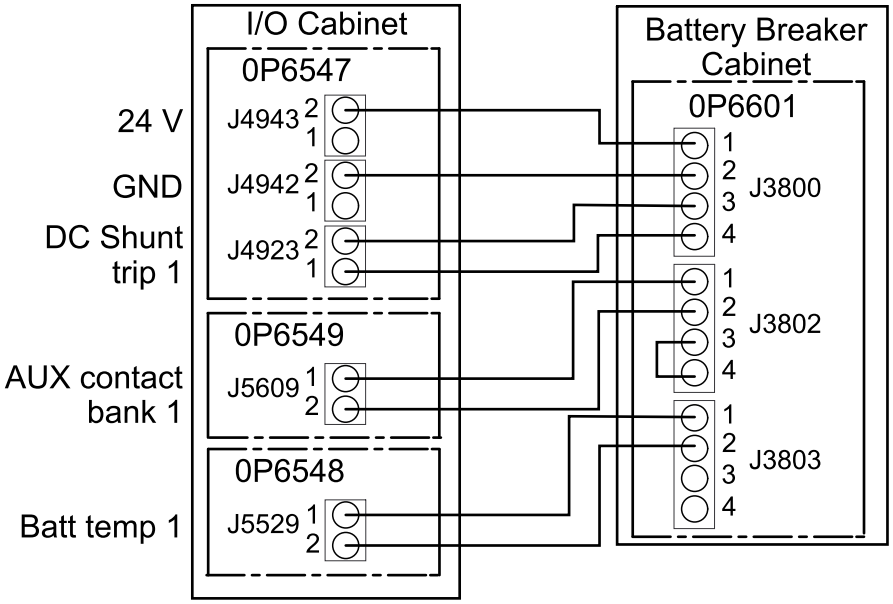
NOTE: The procedure is identical for all battery banks with two classic battery cabinets.

1. Remove the jumper between J3802 pin 3 and 4 in classic battery cabinet A.
2. Connect the signal cables between classic battery cabinet A and classic battery cabinet B.



Connect Signal Cables between the I/O Cabinet and the Battery Breaker Cabinet

1. Connect the below signal cables between the I/O cabinet and the battery breaker cabinet.

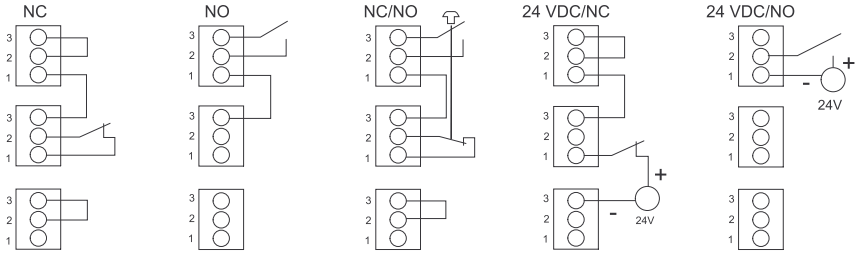


Connect the Emergency Power Off (EPO)

Do not connect any circuit to the EPO terminal block unless it can be confirmed that the circuit is Class 2/SELV.

All circuits connected must have the same 0 V reference.

1. Open the door to ensure that the cables will not be too tight.
2. Route the cables from your EPO through the top or bottom of the I/O cabinet and to the EPO terminals J4936–J4938 on 0P647 as shown in *Prepare the I/O Cabinet for Signal Cables in Top Cable Entry Systems, page 65* and *Prepare the I/O Cabinet for Signal Cables in Bottom Cable Entry Systems, page 69*.
3. Connect the building EPO according to one of the options below.



Connect External Synchronization

The signal cables must have a minimum rating of 600 V.

1. Open the door to ensure that the cables will not be too tight.
2. Route the external synchronization cables through the top or bottom of the I/O cabinet to 0P6549 as shown in *Prepare the I/O Cabinet for Signal Cables in Top Cable Entry Systems, page 65* and *Prepare the I/O Cabinet for Signal Cables in Bottom Cable Entry Systems, page 69*.

3. Connect the three phases:

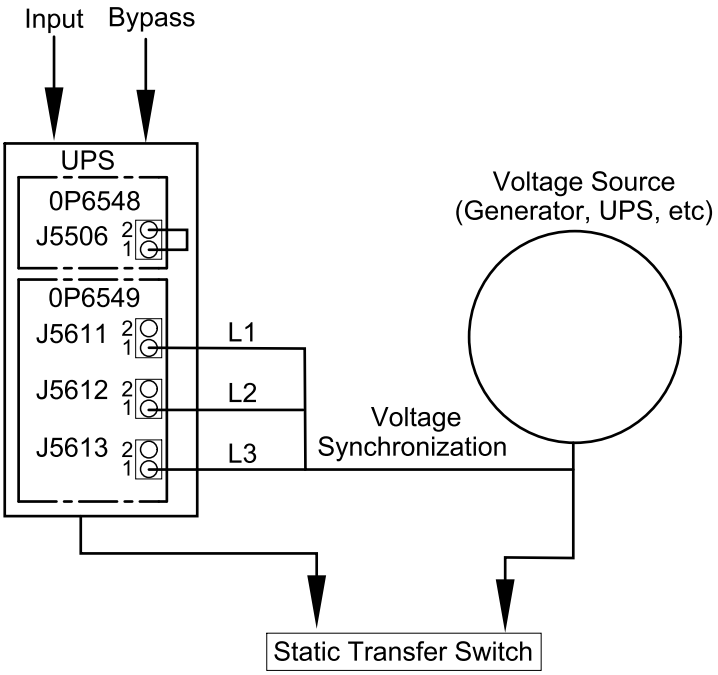
   NOTE: The phases from the synchronization source must be protected by a fuse of maximum 0.5 A.

   a. Connect L1 to J5611 on 0P6549.

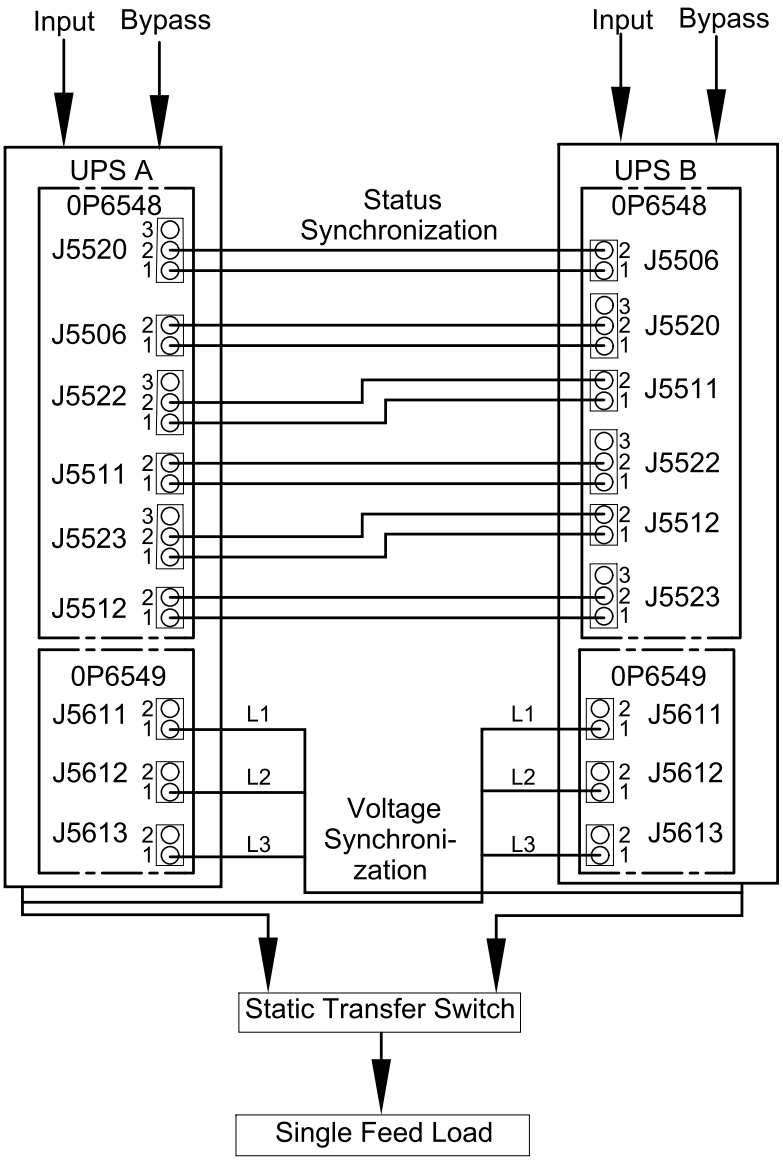
   b. Connect L2 to J5612 on 0P6549.

   c. Connect L3 to J5613 on 0P6549.

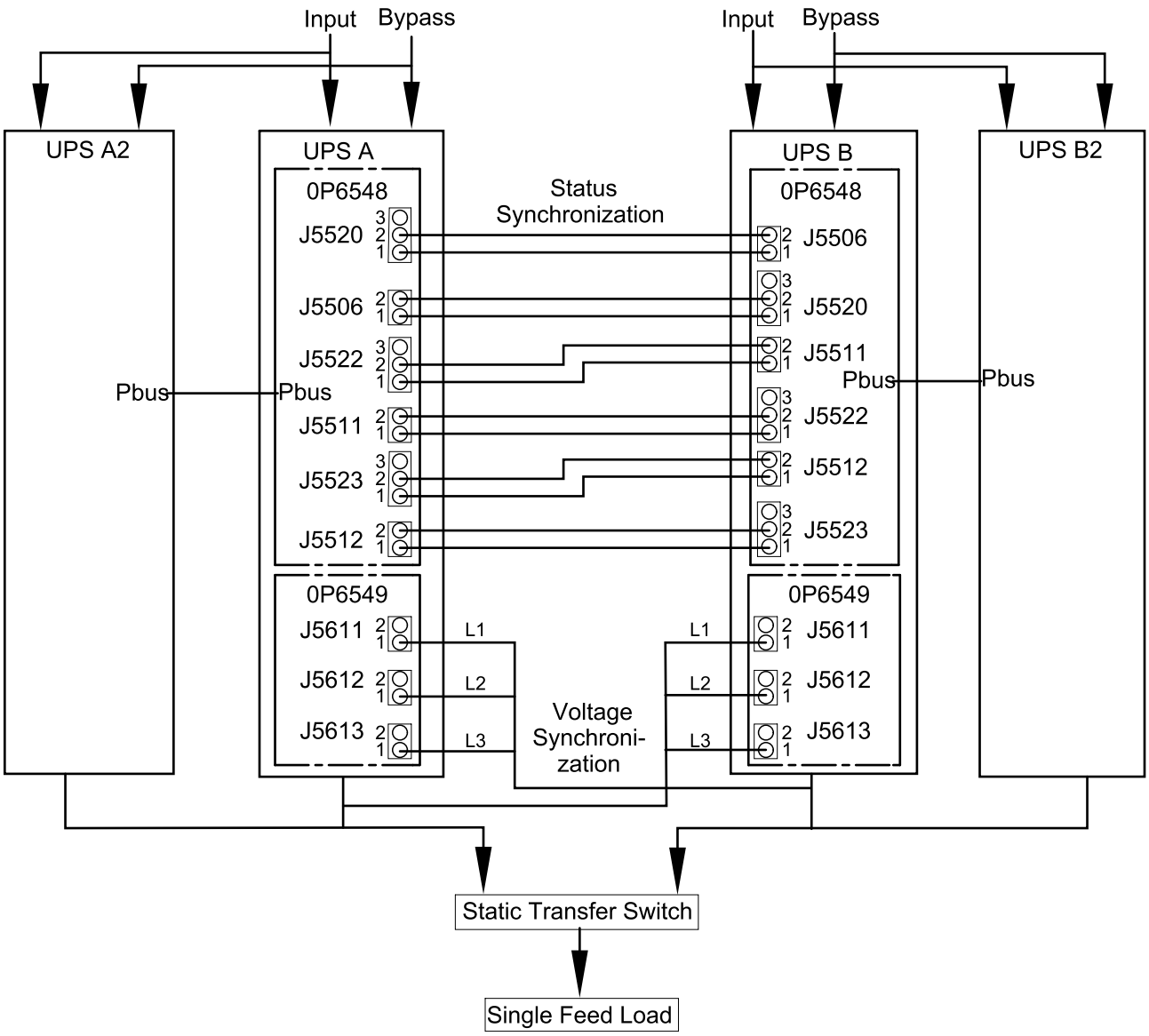
Basic UPS Synchronization to a Fixed Voltage Source



Dual UPS Synchronization with a Floating Synchronization Master



Fixed Parallel Synchronization Master



Connect Equipment to Input Contacts and Output Relays

1. Open the door to ensure that the cables will not be too tight.
2. Route the cables from your relays through the top or bottom of the I/O cabinet and to boards as shown in *Prepare the I/O Cabinet for Signal Cables in Top Cable Entry Systems, page 65* and *Prepare the I/O Cabinet for Signal Cables in Bottom Cable Entry Systems, page 69*.
3. Connect your equipment to the input contacts or output relays.

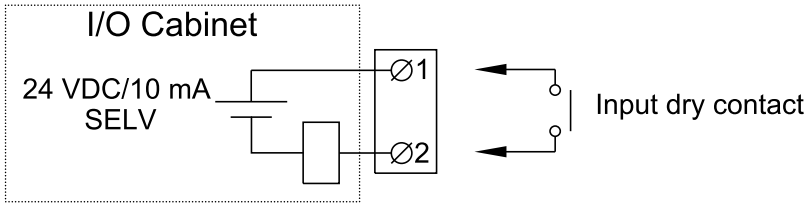
Overview of Input Contacts and Output Relays

Input Contacts

Do not connect any circuit to the input contacts unless it can be confirmed that the circuit is Class 2/SELV.

All circuits connected must have the same 0 V reference.

The switch SW5500 on 0P6548 is used to select between internal SELV supply for inputs (standard setting) and external supply[20]. If external supply is selected, the supply must be connected to J5530.

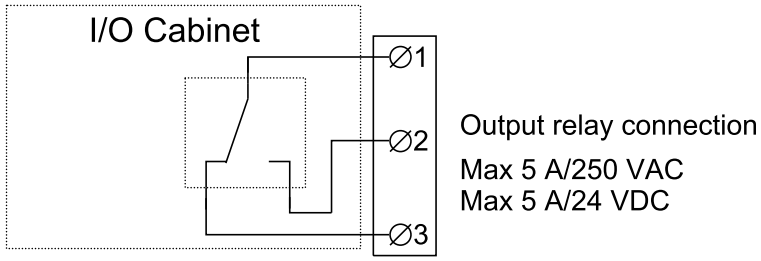


Name	Description	Location
IN 1 (Contact 1)	Configurable input contact	0P6548 terminal J5502[21]
IN 2 (Contact 2)	Configurable input contact	0P6548 terminal J5503[21]
IN 3 (Contact 3)	Configurable input contact	0P6548 terminal J5504[21]
IN 4 (Contact 4)	Configurable input contact	0P6548 terminal J5505[21]
IN 5 (Contact 5)	Configurable input contact	0P6548 terminal J5510[21]
IN 6	UOB redundant AUX contact	0P6548 terminal J5509[21]
IN 7	Transformer temperature switch	0P6548 terminal J5508[21]
IN 8	External bonding contact	0P6548 terminal J5507[21]
IN 9	Forced external synchronization input	0P6548 terminal J5506[21]
IN 10	External synchronization requested	0P6548 terminal J5511[21]
IN 11	Use static bypass standby	0P6548 terminal J5512[21]
IN 14	MegaTie	0P6552 terminal J9027[21]

Output Relays

NOTE: Maximum 250 VAC 5 A must be connected to the output relays.

All external circuitry must be fused with maximum 5 A fast acting fuses.



Name	Description	Location
OUT 1 (Relay 1)	Configurable output relay	0P6547 terminal J4939
OUT 2 (Relay 2)	Configurable output relay	0P6547 terminal J4940
OUT 3 (Relay 3)	Configurable output relay	0P6547 terminal J4941
OUT 4	Forced external synchronization output	0P6548 terminal J5520[21]
OUT 5	MegaTie	0P6548 terminal J5521[21]
OUT 6	External synchronization requested output	0P6548 terminal J5522[21]
OUT 7	UPS in inverter ON	0P6548 terminal J5523[21]
OUT 8 (Relay 4)	Configurable output relay	0P6548 terminal J5524[21]

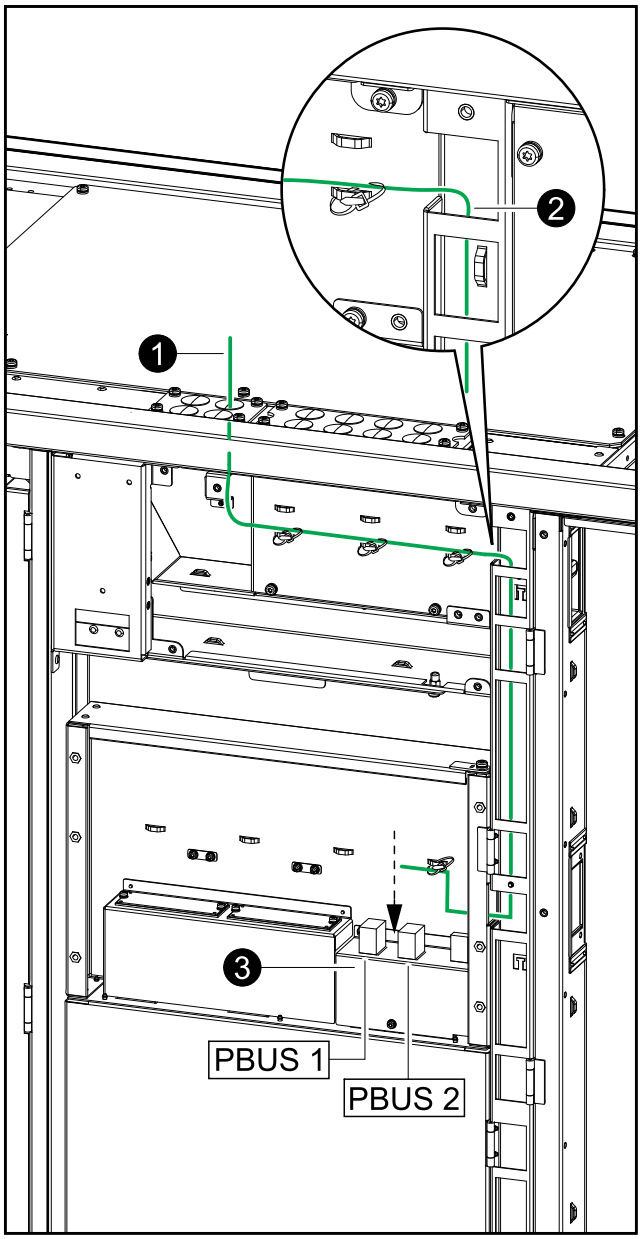
20. An external supply is useful in parallel systems where inputs are connected between different UPSs. This is to have a common reference and to avoid cross currents.
21. Class 2/SELV wiring

Name	Description	Location
OUT 9 (Relay 5)	Configurable output relay	0P6548 terminal J5525[22]
OUT 10 (Relay 6)	Configurable output relay	0P6548 terminal J5528[22]
OUT 14	Bonding contactor	0P6552 terminal J9029[22]

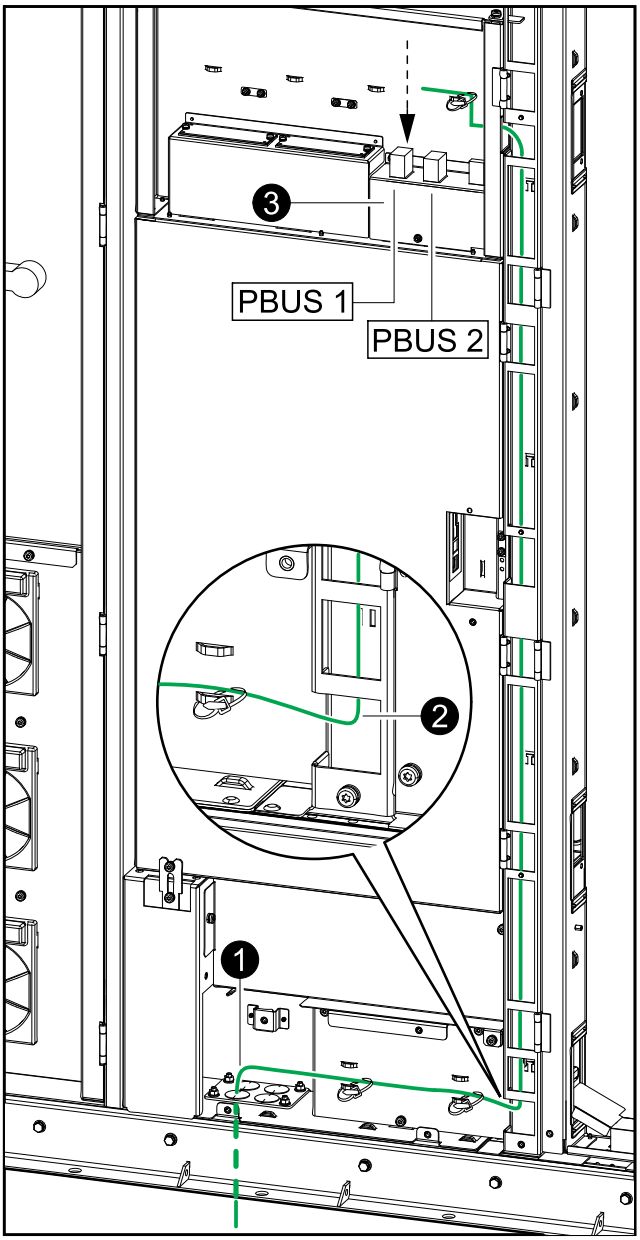
NOTE: Refer to the operation manual for configuration options.

Connect the PBUS Cables between Parallel UPS Units

Front View of the I/O Cabinet in Top Cable Entry Systems



Front View of the I/O Cabinet in Bottom Cable Entry Systems



1. Remove two plugs from either the top or bottom of the cabinet and install conduits.

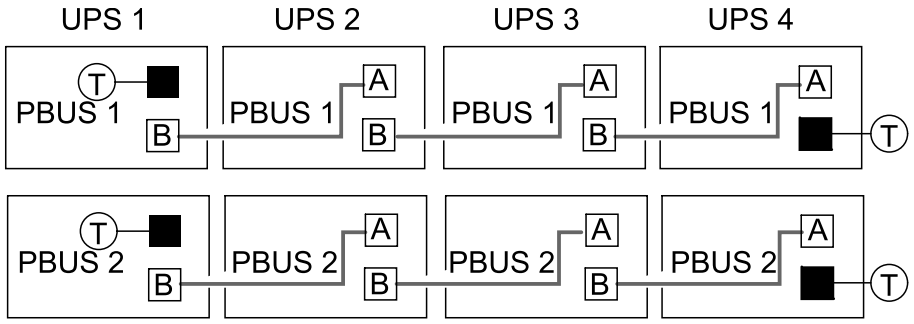
22. Class 2/SELV wiring

2. Route the PBUS cables from the installation kit 0H–0889 through either the top or the bottom of the I/O cabinet.
3. Connect the PBUS cables between the I/O cabinets of the parallel system according to the diagram below.

   NOTE: The PBUS 1 cables are white and the PBUS 2 cables are red.

   NOTE: The total length of the PBUS cables must not exceed 60 m (197 ft).

Example of System with Four UPSs in Parallel



External Communication

The following interfaces are supported:

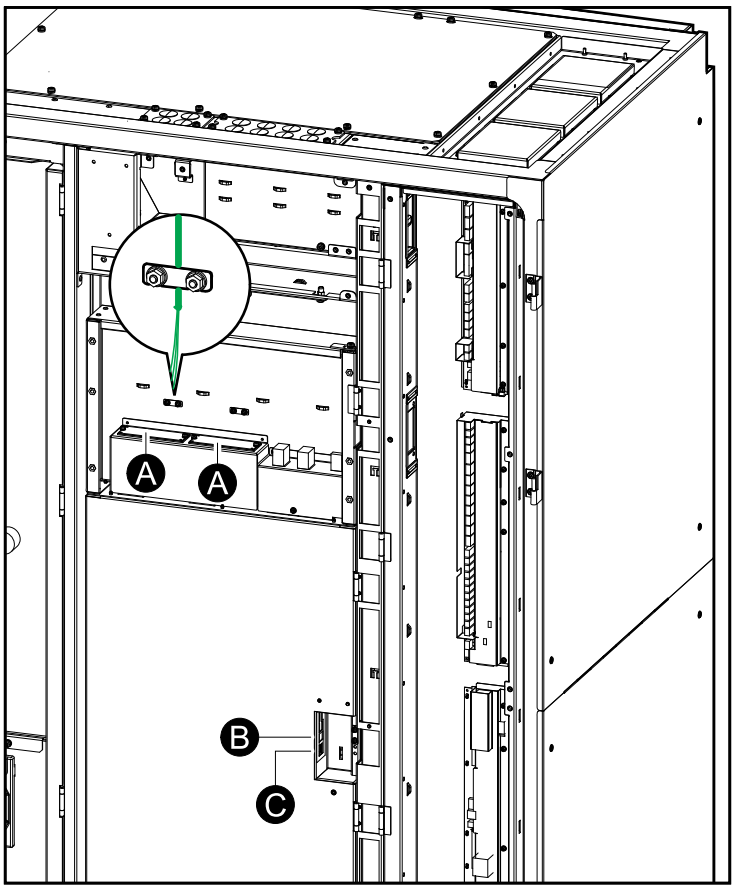
A. Two SmartSlots for optional network management cards (AP9630, AP9631, AP9635CH).

   NOTE: If the input dry contact AP9810 is connected to AP9631 or AP9635CH, the total length of cables for connected equipment must not exceed 30 m (98 ft). Use the plate for shielding.

B. Modbus and Modbus dip switch settings.

C. Network/ethernet.

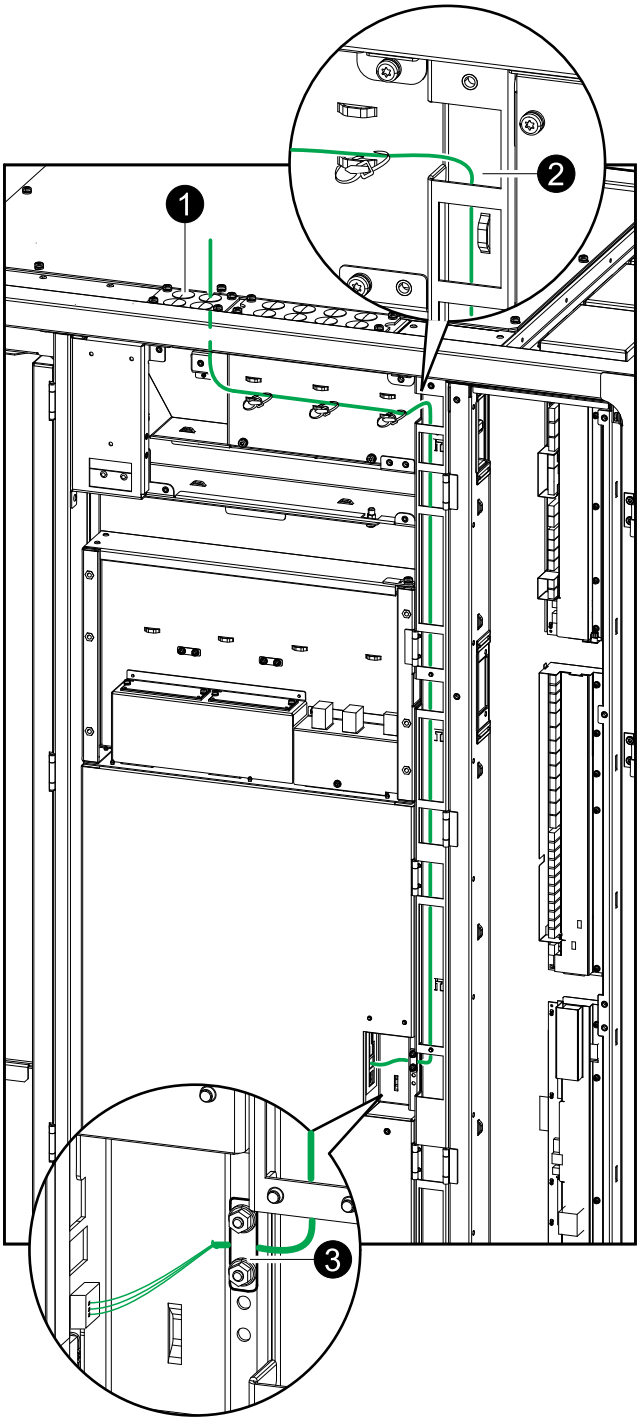
Front View of the I/O Cabinet



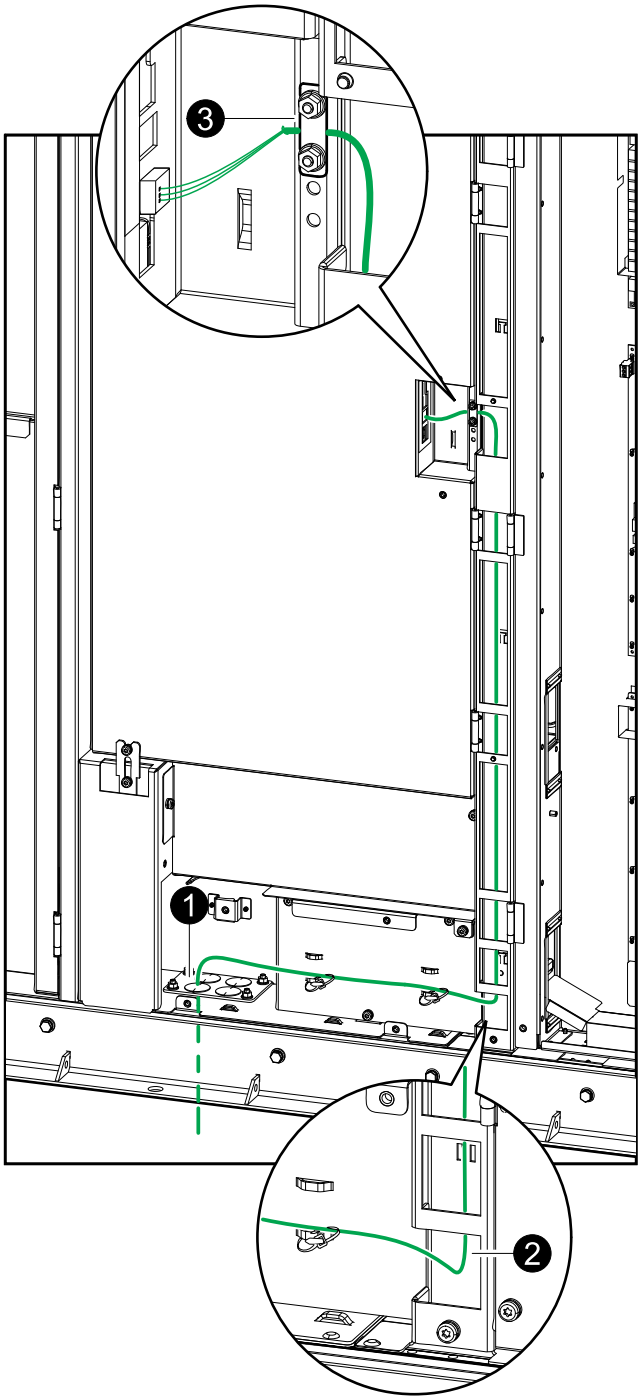
Connect the Modbus Cables

NOTE: Terminators for Modbus connection is provided in the installation kit 0M-99130.

Front View of the I/O Cabinet in Top Cable Entry Systems



Front View of the I/O Cabinet in Bottom Cable Entry Systems

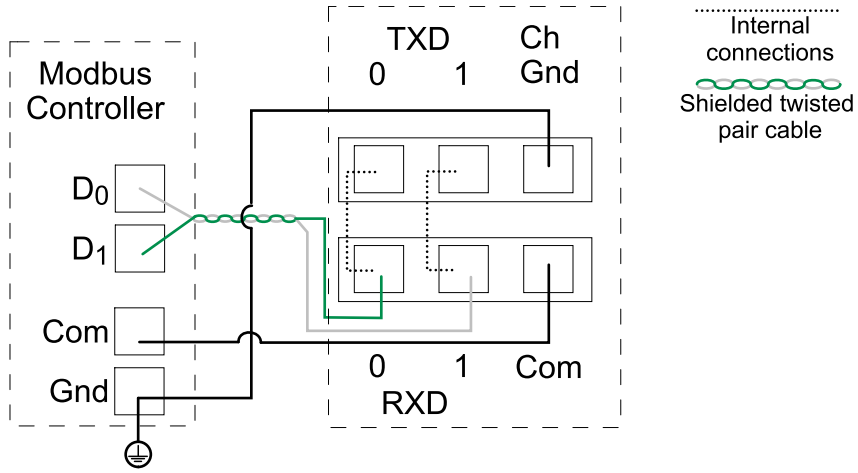


1. Remove the plugs from ether the top of the bottom of the I/O cabinet and install conduits.
2. Route the cables as shown on the illustrations.

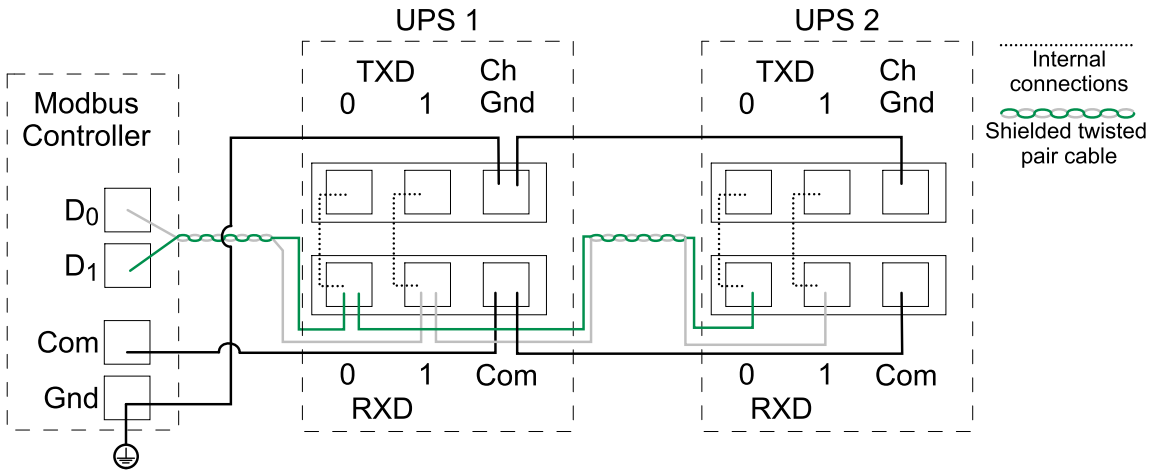
3. Connect the Modbus cables. Use either 2–wire or 4–wire connection. Shield the cables as shown.

   NOTE: Shielded cables must be used for Modbus connections.

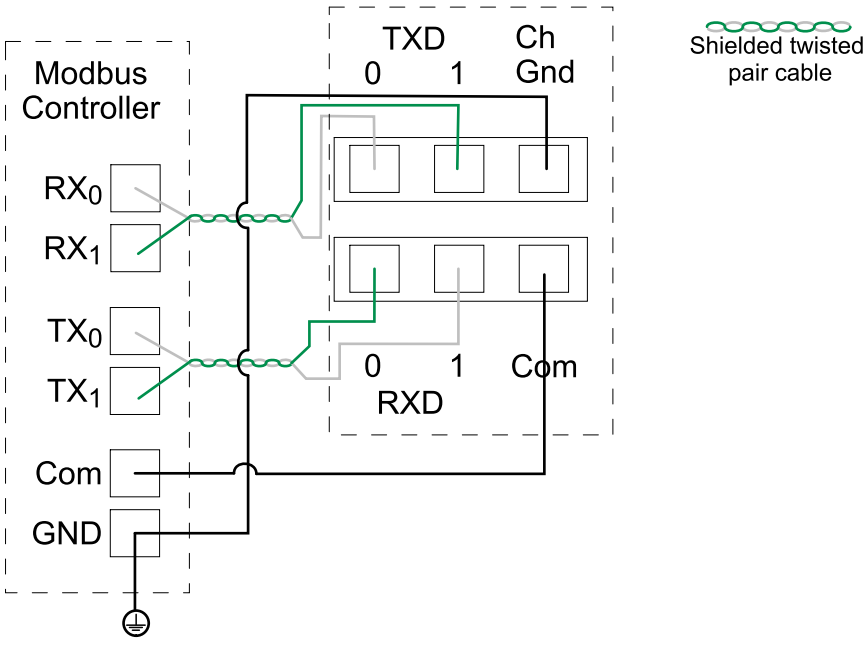
2–Wire Connection with One UPS



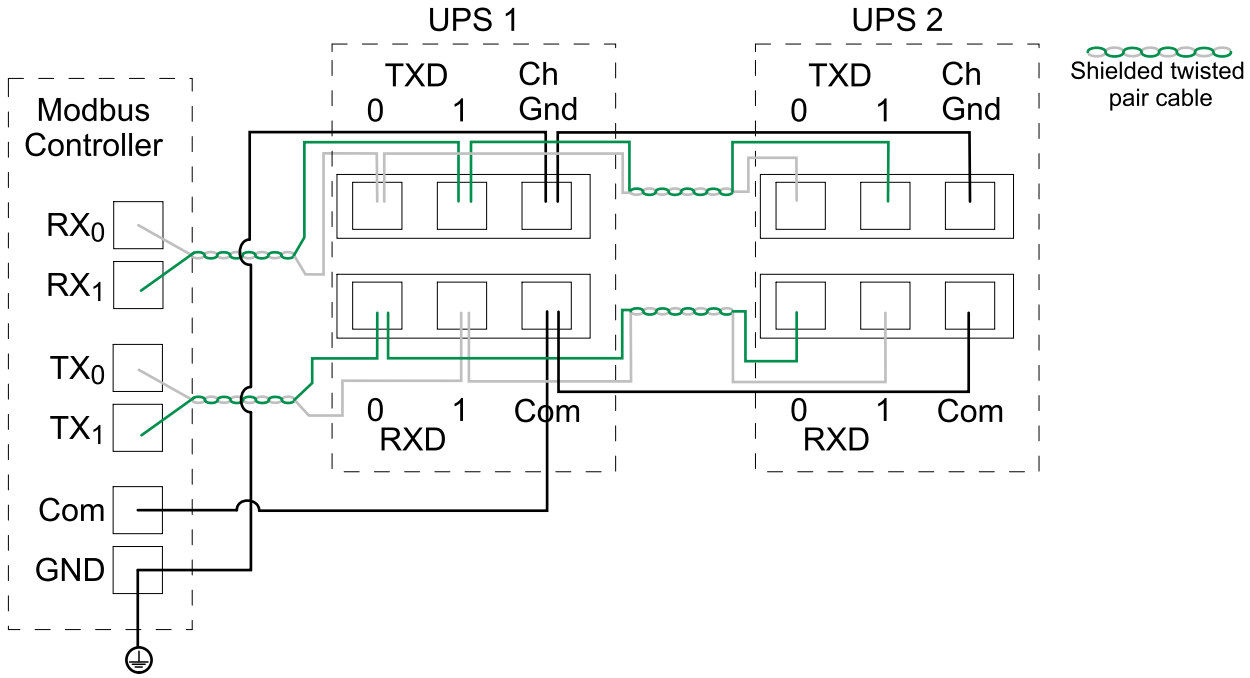
Example: 2–Wire Connection with Two UPSs



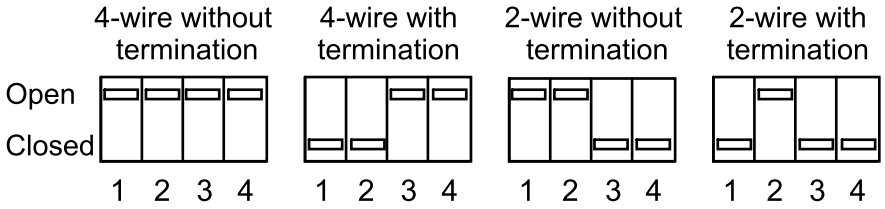
Example: 4–Wire Connection with One UPS



Example: 4–Wire Connection with Two UPSs



4. Set the modbus dip switches to match your installation.

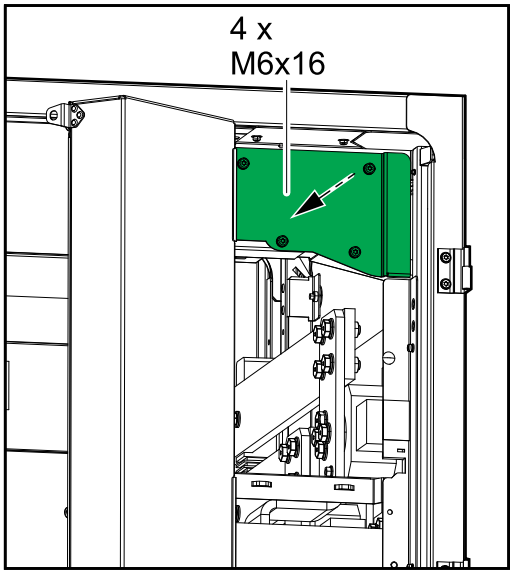


Final Mechanical Assembly

Final Mechanical Assembly of the I/O Cabinet

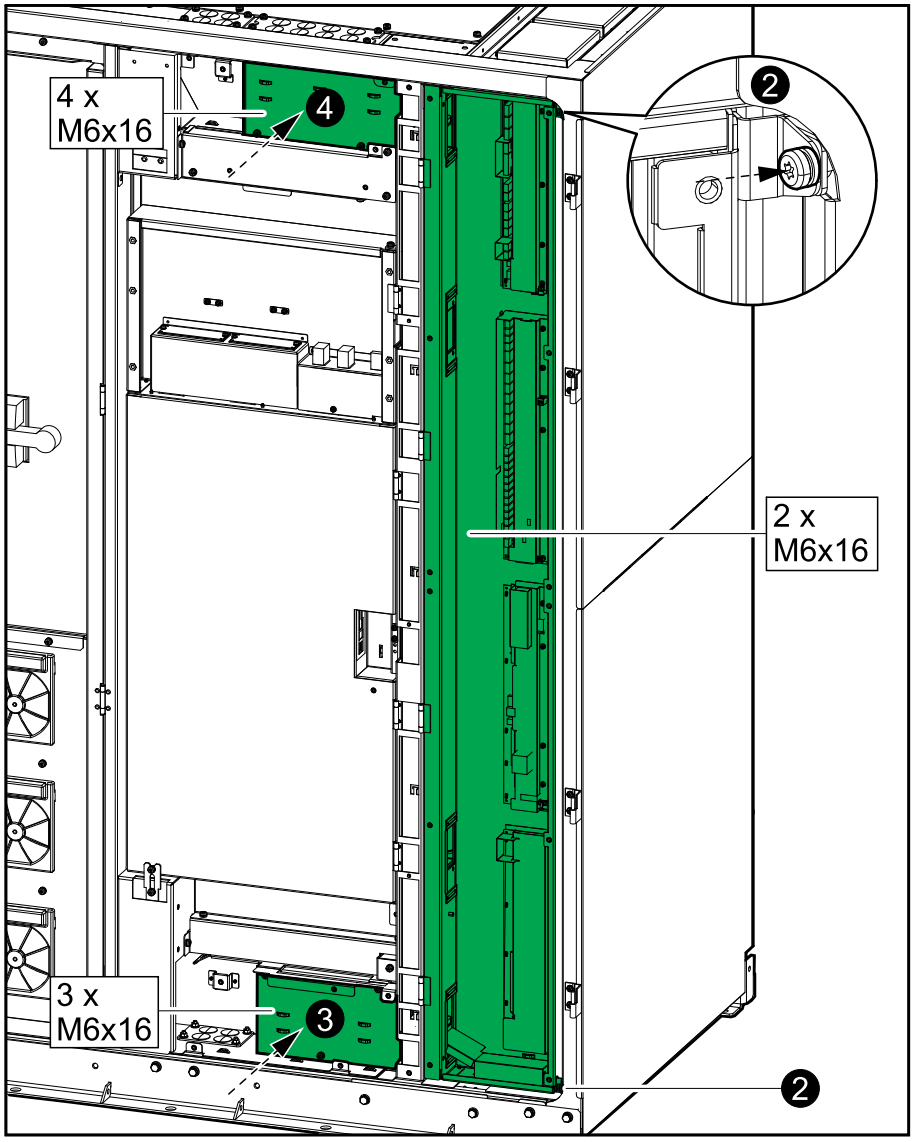
1. Install the plate in the top right corner of the I/O cabinet.

Front View of the I/O Cabinet



2. Close the door with the printed circuit boards and fasten with two screws.

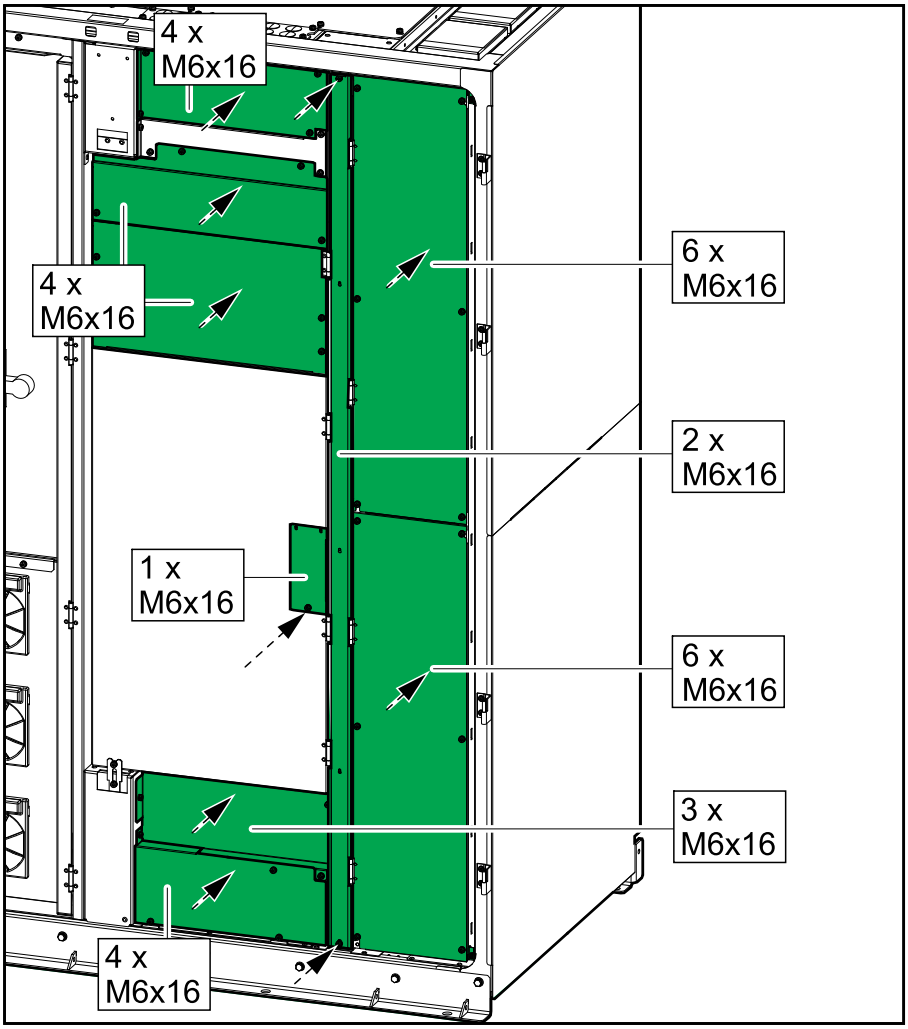
Front View of the I/O Cabinet



3. In bottom entry systems only, install the plate at the bottom of the I/O cabinet.
4. Install the plate at the top of the I/O cabinet.

5. Install the nine indicated plates.

Front View of the I/O Cabinet

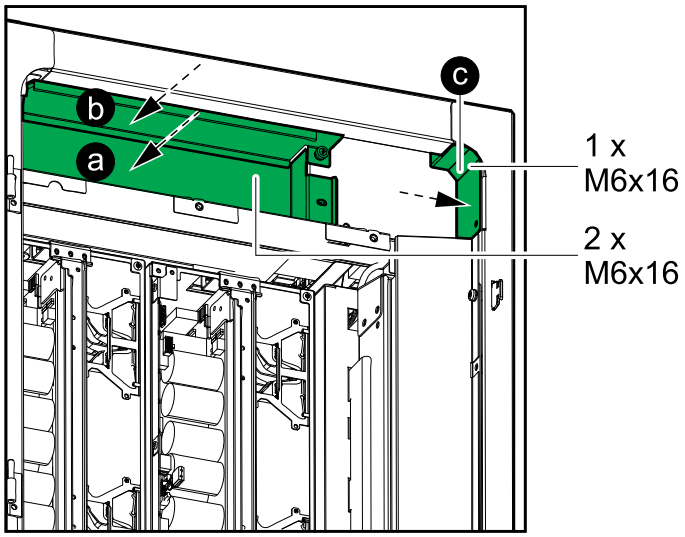


6. Close the front door.

Final Mechanical Assembly of the Power Cabinets

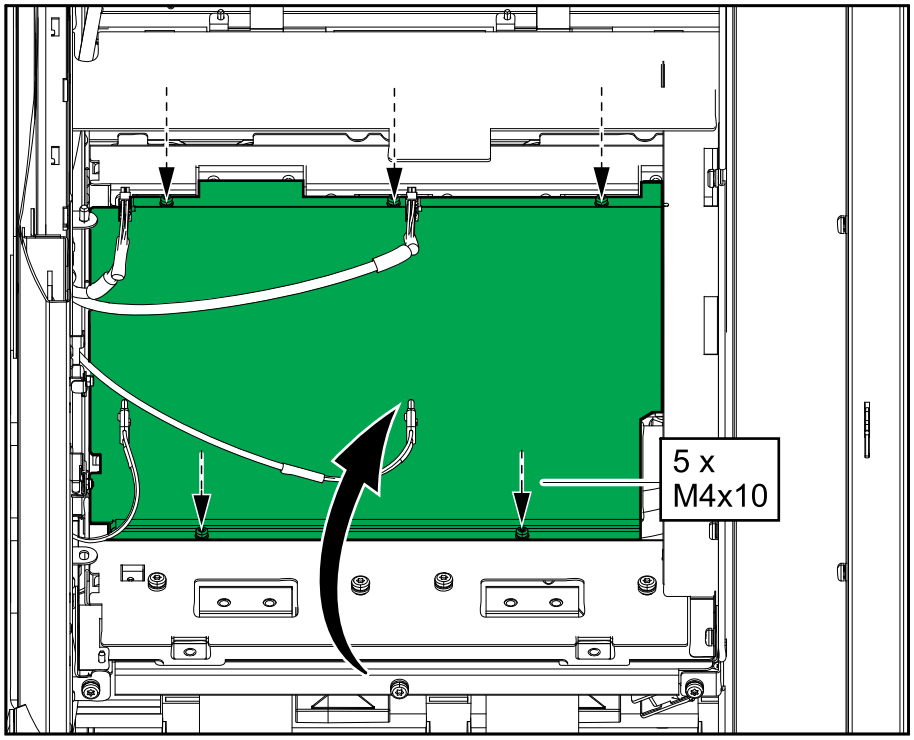
1. Reinstall the three plates in the top of each of the power cabinets in chronological order (a-c).

Front View of the Power Cabinet



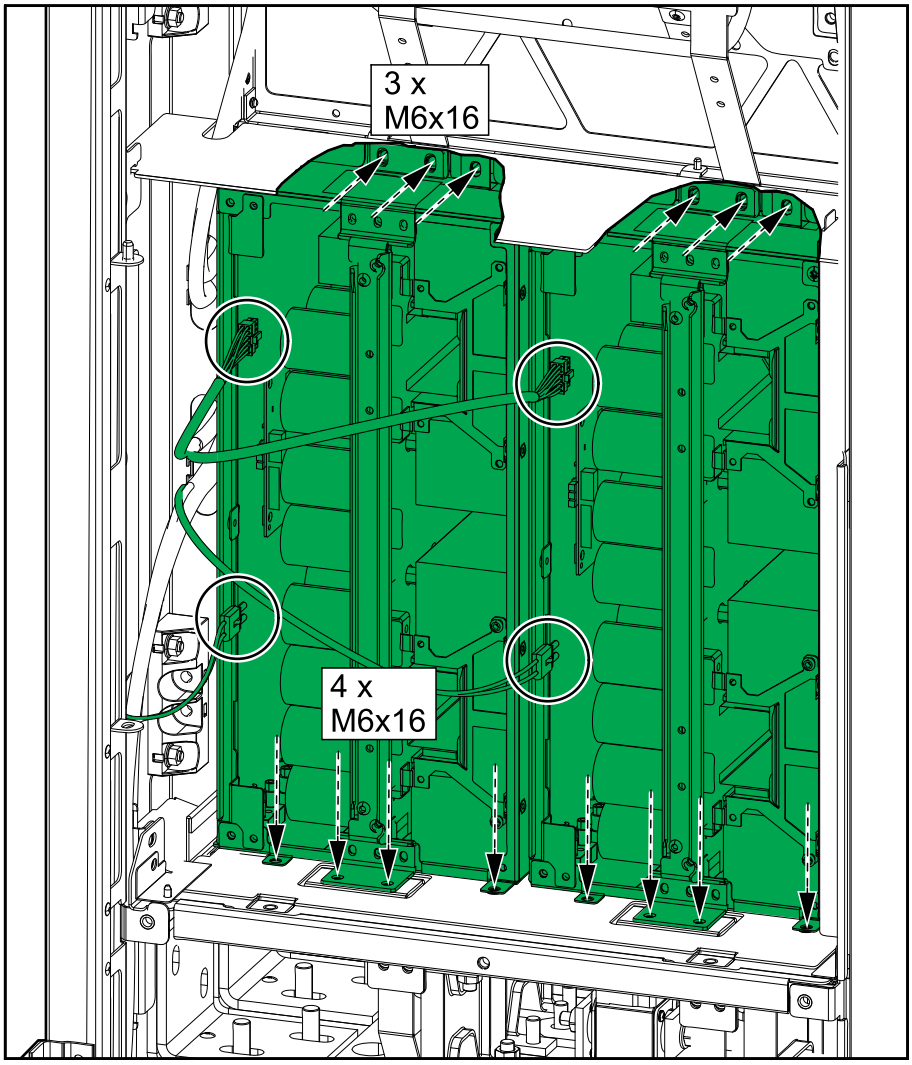
2. Reinstall the plate in each of the power cabinets.

Front View of the Power Cabinet



3. Push the two power blocks into each of the power cabinets and fasten with the screws.

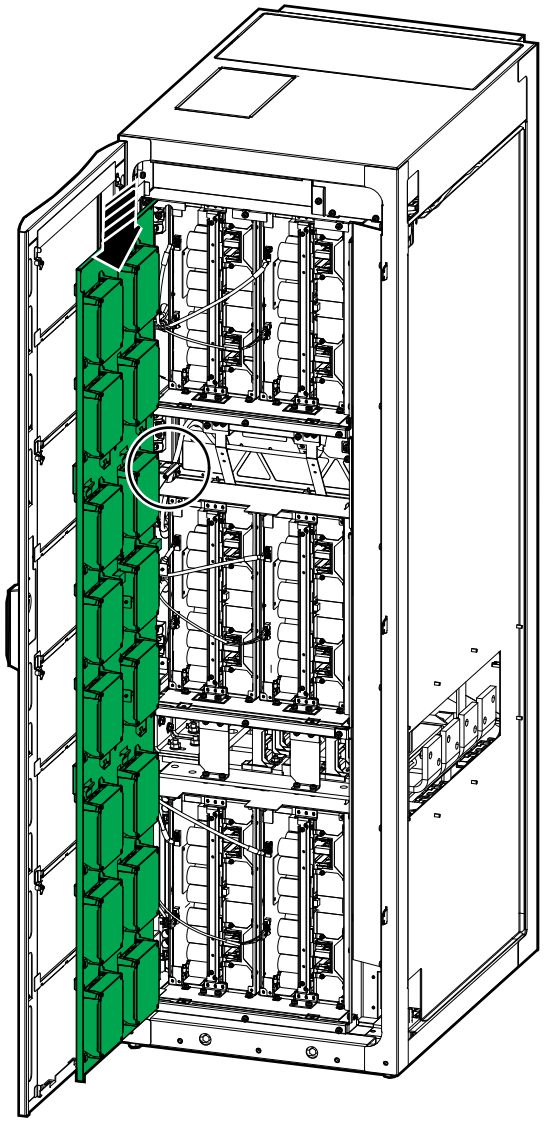
Front View of the Power Cabinet



4. Reconnect the two cables to each of the two middle power blocks.

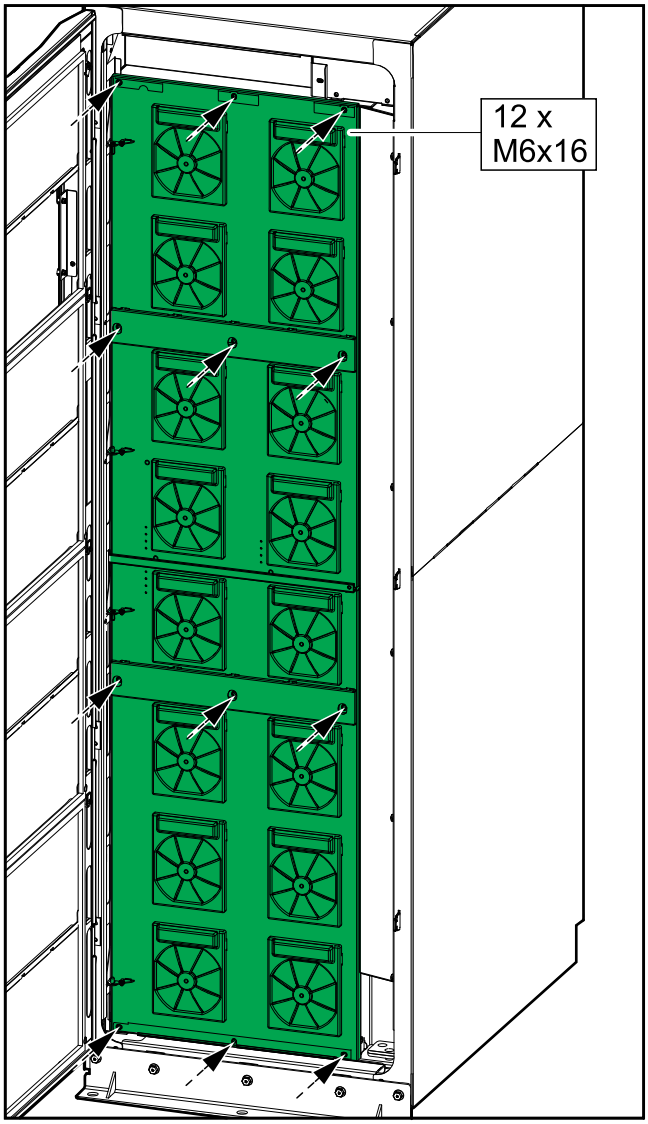
5. Reinstall the fan doors and reconnect the cable between the fan doors and each of the power cabinets.

Front View of the Power Cabinet



6. Close the fan doors and fasten them to each of the power cabinets with the 12 screws.

Front View of the Power Cabinet



7. Close the front door.

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As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

990-5810D-001