Liebert® ITA2 UPS

User Manual

15-20kVA, 400/230V

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Refer to local regulations and building codes relating to the application, installation, and operation of this product. The consulting engineer, installer, and/or end user is responsible for compliance with all applicable laws and regulations relation to the application, installation, and operation of this product.

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Technical Support Site

If you encounter any installation or operational issues with your product, check the pertinent section of this manual to see if the issue can be resolved by following outlined procedures.

Visit https://www.vertiv.com/en-us/support/ for additional assistance.

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Contacting Vertiv™ for Support

To contact Vertiv Services for information or repair service in the United States, call 1-800-543-2378. Vertiv Services offers a complete range of startup services, repair services, preventive maintenance plans and service contracts.

For repair or maintenance service outside the 48 contiguous United States, contact Vertiv Services, if available in your area.

For Vertiv Services to assist you promptly, have the following information available:

Part Numbers:
Serial Numbers:
Rating:
Date Purchased:
Date Installed:
Location:
Battery Voltage:
Battery Reserve Time:

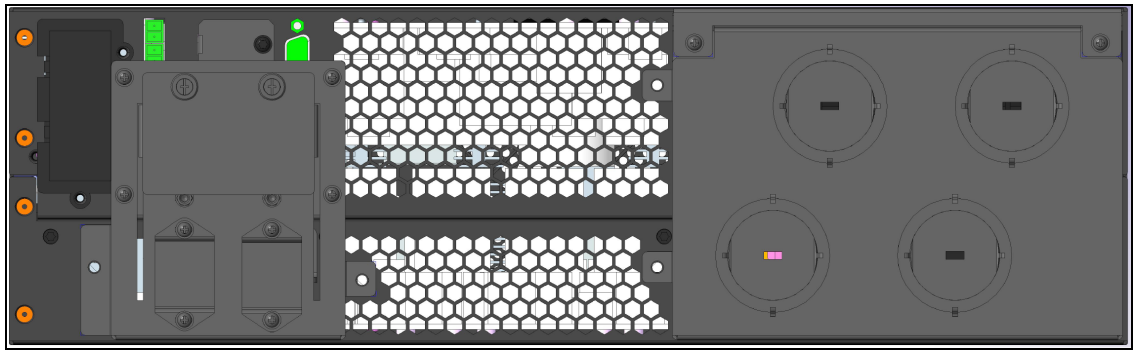
1 Introduction

Thank you for the purchase of the Vertiv™ Liebert® ITA2 UPS 3-phase uninterruptible power supply. The complete user manual is available at Vertiv's Web site, https://www.vertiv.com/en-us/products-catalog/critical-power/uninterruptible-power-supplies-ups/liebert-ita2-ups-3-phase-208v/

UPS Front below shows the front of the unit;, the rear of the UPS is shown in UPS Rear, 20kVA Unit below . The rear view without the conduit box is shown in 15/20kVA UPS Rear View without Conduit Box on page 6 .

Figure 1.1 UPS Front

Figure 1.2 UPS Rear, 20kVA Unit



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2 Installation and Commissioning

2.1 Unpacking and Inspection

Inspect the Vertiv™ Liebert® ITA2 UPS for damage when it arrives. If any problem is found, file a damage claim with the carrier immediately and send a copy to Vertiv™ at:

Vertiv™
1050 Dearborn Drive
P.O. Box 29186
Columbus, Ohio 43085 USA
Attn: Traffic Department

Check the accessories and model numbers against the delivery list. If any problem is found, notify your local Vertiv™ representative immediately.

2.2 Installation Tools

The following tools are required to properly install your UPS

- Utility knife
- #1, #2, and #3 Phillips-head screwdrivers
- Slotted screwdriver
- Torque wrench or torque screwdriver

2.3 Storage

If the ITA2 is not installed immediately, it should be stored indoors and protected from excessive moisture, heat and other harsh conditions. Store the batteries in a dry, well-ventilated environment with a temperature range of 68°F ~ 77°F (20°C ~ 25°C).

2.4 Connecting Power Cables

When connecting input and output cables, follow national and local wiring regulations, take the environment into account and refer to NFPA 70, Table 310-16.

Vertiv™ recommends using parity-sized ground conductors. Currents and Wire Size — UPS Rectifier Input below and Currents and Wire Size — UPS Bypass Input* and Output on the next page list the minimum size cables and recommended over current protection device. Ring Terminal / Lug Part Numbers on the next page lists the recommended lugs for the terminal blocks in the UPS

Table 2.1 Currents and Wire Size — UPS Rectifier Input

Unit Rating kVA	Maximum Input Current, Amps	Recommended OPD, Amp Trip	75°C THW Copper Wire (phase) Number of Cables per Phase: 1	75°C THW Copper Wire (neutral) Number of Cables: 1	75°C THW Copper Wire (Ground) Number of Cables: 1	Recommended Torque
20	44	50	10AWG	10AWG	12AWG	3.4Nm (30in-lb)
15	36	50	12AWG	12AWG	14AWG	3.4Nm (30in-lb)

Table 2.2 Currents and Wire Size — UPS Bypass Input* and Output

Unit Rating kVA	Maximum Input Current, Amps	Recommended OPD, Amp Trip	75°C THW Copper Wire (phase) Number of Cables per Phase: 1	75°C THW Copper Wire (neutral) Number of Cables: 1	75°C THW Copper Wire (Ground) Number of Cables: 1	Recommended Torque
20	31	40	12AWG	12AWG	12AWG	3.4Nm (30in-lb)
15	24	32	14AWG	14AWG	14AWG	3.4Nm (30in-lb)

Table 2.3 Ring Terminal / Lug Part Numbers

	10 (5.26) AWG (mm^2)	6 (13.3) AWG (mm^2)	4 (21.2) AWG (mm^2)	3 (26.7) AWG (mm^2)	2 (33.6) AWG (mm^2)
Mfr. Part #	McMaster-Carr: 7113K462	McMaster-Carr: 7113K366	McMaster-Carr: 7113K441	McMaster-Carr: 6926K54	McMaster-Carr: 6926K54
	Thomas & Betts: RC10-14	Thomas & Betts: RE6-14	Thomas & Betts: 54138NT02	Thomas & Betts: 54107NT	Thomas & Betts: 54107NT
	Tyco Electronics: 1577648-1	—	—	—	—

WARNING! Risk of electric shock. Can cause property damage, injury, and death. The unit has several circuits that are energized with high AC and DC voltages. Check for voltage with both AC and DC voltmeters before making contact and before working within the UPS. Only properly trained and qualified personnel wearing appropriate, OSHA-approved personal protective equipment (PPE) should prepare for installation, install, and maintain the equipment. When performing maintenance with any part of the equipment under power, service personnel and test equipment must stand on rubber mats.

WARNING! Risk of electrical shock. Can cause equipment damage, injury and death. Before beginning installation, verify that all external overcurrent protection devices are open (Off), and that they are locked-out and tagged appropriately to prevent activation during the installation. After the power cables are connected, the terminal block's protective cover must be reinstalled to remove the electric shock hazard.

2.4.1 Connecting I/O Cables – Single-Input Configuration

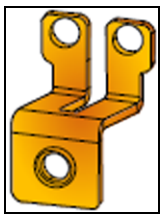
Connect the UPS power cables to the I/O terminal block on the UPS and the UPS conduit box as shown in 15/20kVA UPS Rear View without Conduit Box on page 6 .

1. Remove the conduit boxes on the UPS to gain access to the input and output terminal blocks.
2. Remove the knockouts and attach the conduits to the rear of the conduit box

Hardwire Connections – Main User Input

3. Leave the factory-supplied jumper busbars in place on the UPS User input terminal block

Figure 2.1 Jumper busbar



4. Using 15/20kVA UPS Rear View without Conduit Box on the next page , make these connections:
   - Phase A cable from the upstream feeder panel to UPS Input Terminal Jumper between rA-bA (L1)
   - Phase B cable from the upstream feeder panel to UPS Input Terminal Jumper between rB-bB (L2)
   - Phase C cable from the upstream feeder panel to UPS Input Terminal Jumper between rC-bC (L3)
   - Neutral cable from the upstream feeder panel to User Input Terminal Jumper between N-N
   - The safety equipment ground cable from upstream feeder panel to UPS ground busbars (PE).

Hardwire Connections—Main User Output

5. Using 15/20kVA UPS Rear View without Conduit Box on the next page , make these connections:
   - Phase A cable from UPS Output Terminal A to the downstream distribution panel Phase A on the panelboard main lug/breaker
   - Phase B cable from UPS Output Terminal B to the downstream distribution panel Phase B on the panelboard main lug/breaker
   - Phase C cable from User Output Terminal C to the downstream distribution panel Phase C on the panelboard main lug/breaker
   - Neutral cable from User Output Terminal Jumper N to the downstream distribution panel neutral bus
   - The safety equipment ground cable from UPS ground busbars (PE) to the downstream distribution panel ground bus
6. Replace the conduit box on the UPS and secure it to the unit chassis.

2.4.2 Connecting I/O Cables—Dual-Input Configuration

Dual-input configuration for the UPS requires that both input feeds be from the same solid N-G bonded source.

Connect the UPS power cables to the I/O terminal block on the UPS and UPS conduit box as shown in 15/20kVA UPS Rear View without Conduit Box on the next page .

1. Remove the conduit cover boxes on the UPS and UPS to gain access to the input and output terminal blocks.
2. Remove the knockouts and attach the conduits to the rear of the conduit plate
3. Remove the factory-supplied shorting busbars from the UPS input terminal block.

Hardwire Connections - UPS Rectifier Input

4. Using 15/20kVA UPS Rear View without Conduit Box on the next page , make these connections:
   - Phase A cable from the upstream feeder panel to UPS Input Terminal rA
   - Phase B cable from the upstream feeder panel to UPS Input Terminal rB
   - Phase C cable from the upstream feeder panel to UPS Input Terminal rC

- Neutral cable from the upstream feeder panel to UPS Input Terminal N
- The safety equipment ground cable from upstream feeder panel to UPS ground busbars (PE).

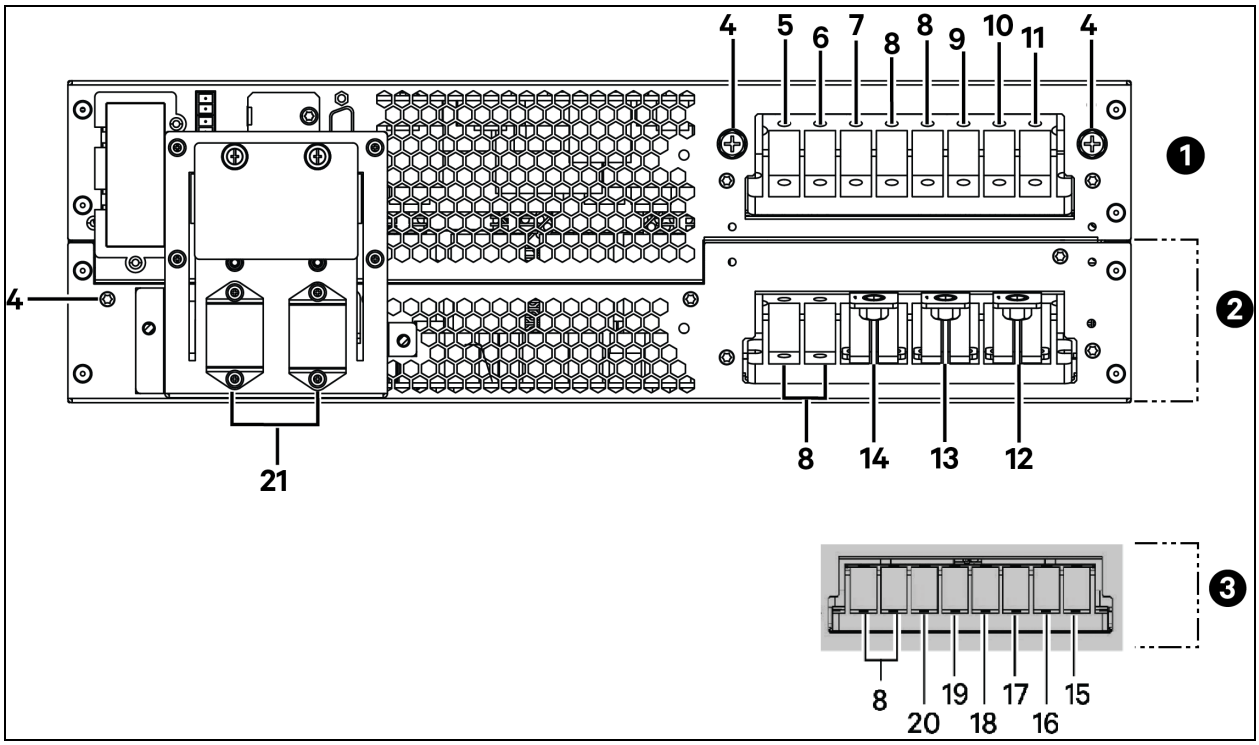
Hardwire Connections - UPS Bypass Input

5. Using 15/20kVA UPS Rear View without Conduit Box below , make these connections:
   - Phase A cable from the upstream feeder panel to UPS Input Terminal bA
   - Phase B cable from the upstream feeder panel to UPS Input Terminal bB
   - Phase C cable from the upstream feeder panel to UPS Input Terminal bC
   - Neutral cable from the upstream feeder panel to UPS Input Terminal N
   - The safety equipment ground cable from upstream feeder panel to UPS ground busbars (PE).

Hardwire Connections – Main User Output

6. Using 15/20kVA UPS Rear View without Conduit Box below , make these connections:
   - Phase A cable from User Output Terminal A to the downstream distribution panel Phase A on the panelboard main lug/breaker
   - Phase B cable from User Output Terminal B to the downstream distribution panel Phase B on the panelboard main lug/breaker
   - Phase C cable from User Output Terminal C to the downstream distribution panel Phase C on the panelboard main lug/breaker
   - Neutral cable from User Output Terminal Jumper N to the downstream distribution panel neutral bus
   - The safety equipment ground cable from UPS ground busbars (PE) to the downstream distribution panel ground bus
7. Replace the conduit boxes on the UPS and secure it to the unit chassis.

Figure 2.2 15/20kVA UPS Rear View without Conduit Box



ITeM	DESCRIPTION	ITeM	DESCRIPTION
1	AC Output Terminal Block	12	L1, Input /Bypass Phase A
2	AC Input Terminal Block – Single Input	13	L2, Input /Bypass Phase B
3	AC Input Terminal Block – Dual Input	14	L3, Input /Bypass Phase C
4	PE (Ground)	15	rA, Rectifier Input Phase A
5	C, Output Phase C	16	bA, Bypass Input Phase A
6	B, Output Phase B	17	rB, Rectifier Input Phase B
7	A, Output Phase A	18	bB, Bypass Input Phase B
8	N, Neutral	19	rC, Rectifier Input Phase C
9	pC, Programmable Output Phase C	20	bC, Bypass Input Phase C
10	pB, Programmable Output Phase B	21	Battery Connectors
11	pA, Programmable Output Phase A	—	—

2.4.3 Connecting a Battery Cabinet System

Do not reverse the polarity of the battery cables.

Connecting the Cables

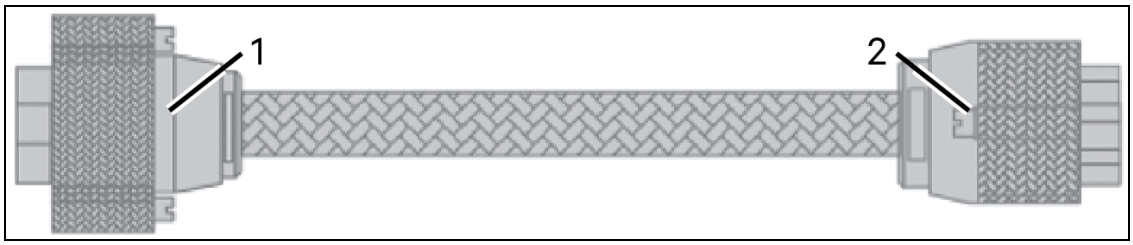
WARNING! Risk of electrical shock. Can cause property damage, injury, and death. The unit has several circuits that are energized with high AC and DC voltages. Check for voltage with both AC and DC voltmeters before making contact and before working within the UPS. Only properly trained and qualified personnel wearing appropriate, OSHA-approved personal protective equipment (PPE) should prepare for installation, install and maintain the equipment. When performing maintenance with any part of the equipment under power, service personnel and test equipment must stand on rubber mats.

WARNING! Risk of electrical shock. Can cause equipment damage, injury and death. Before beginning installation, verify that all external overcurrent protection devices are open (Off), and that they are locked-out and tagged appropriately to prevent activation during the installation. After the power cables are connected, the terminal block's protective cover must be reinstalled to remove the electric shock hazard.

WARNING! Risk of heavy unit falling. Improper handling can cause equipment damage, injury and death. Exercise extreme care when handling unit cabinets and rack-mounted units to avoid equipment damage or injury to personnel. The UPS weighs approximately 50.7 lb. (23 kg).

The factory-provided, battery power cables, see below, connects from Connector B on the UPS to Connector A on both battery cabinets in a single/first battery string.

Figure 2.3 Battery Power Cable, Factory-Provided

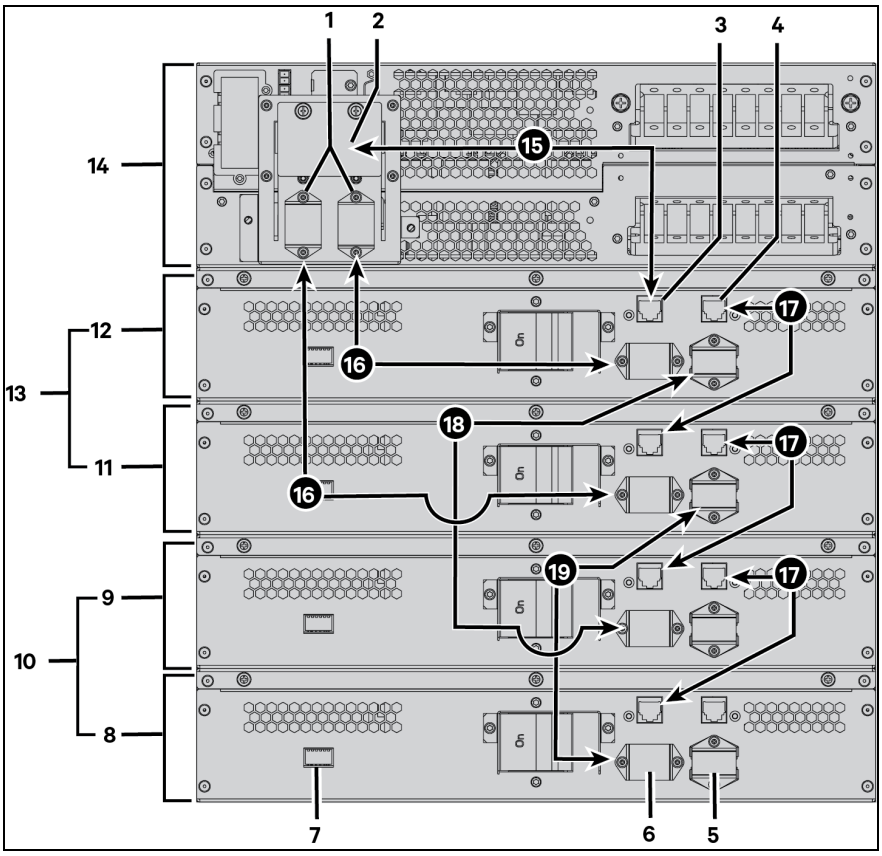


Item	Description
1	Terminal B Connector
2	Terminal A Connector

To connect the UPS with plug-n-play connectors to the battery cabinet system:

1. Make sure the battery breaker on the rear of the cabinet is open (Off).
2. Using a cable provided with the battery cabinet, Battery Power Cable, Factory-Provided above , connect the end labeled "Port B" to one of the connectors on the rear of the UPS and tighten the securing screws.
3. Connect the end labeled "Port A" to Connector A on the battery cabinet.
4. Repeat Steps 2 and 3, for the second battery cabinet.
5. Using a communication cable with RJ-45 connectors, refer to Liebert® ITA2 UPS Battery Connections, Sensors, Communication Ports on the facing page , and:
    a. Connect one end to the multifunction port on the rear of the UPS.
    b. Connect the other end to one of the RJ-45 communication ports on the first battery cabinet.
    c. Connect another cable from the remaining RJ-45 communication port on the first battery cabinet to one of the ports on the second battery cabinet.
6. For a single battery string, close the battery output breaker(s) - or – If you are installing additional battery strings (two battery cabinets each), refer to the ITA2 user manual.

Figure 2.4 Liebert® ITA2 UPS Battery Connections, Sensors, Communication Ports



Item	Description	Item	Description
1	DC Battery Connectors (Port B)	11	Battery Cabinet #2
2	Multifunction Port (RJ-45)	12	Battery Cabinet #1
3	Communication Port (RJ-45)	13	Battery String #1
4	Communication Port (RJ-45)	14	UPS Unit
5	Battery Connector (Port B)	15	Communication Cable, UPS to Battery Cabinet #1
6	Battery Connector (Port A)	16	Battery Power Cable, UPS to Port A on Battery Cabinets 1 &2 (Battery String #1)
7	Temperature Sensor DIP Switch	17	Communication Cable, From Battery Cabinet #1 to Battery Cabinet #2, #2 to #3, #3 to #4
8	Battery Cabinet #4	18	Battery Power Cable, Battery Cabinet #1 Port B to Port A on Battery Cabinet #3
9	Battery Cabinet #3	19	Battery Power Cable, Battery Cabinet #2 Port B to Port A on Battery Cabinet #4
10	Battery String #2		

NOTE: Item 2 and one end of item 15 are behind the junction box.

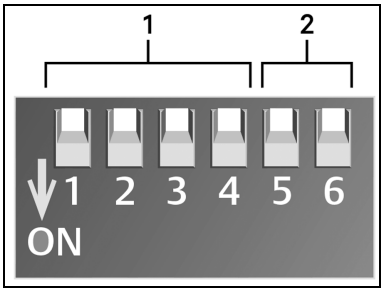
On 2U strings, refer to the table and figure below to set the DIP switch on both cabinets in each additional string before closing the battery output breaker(s). The settings for each cabinet must be unique in order for the UPS automatic battery detection feature to work properly.

NOTE: The settings for String 1 are the factory-default settings for all battery cabinets.

Table 2.4 DIP Switch Settings for String 1/All Battery Cabinets

String	Cabinet	DIP Switch Position					
		Group			Num		
		1	2	3	4	5	6
1	A	Off	Off	Off	Off	Off	On
	B	Off	Off	Off	Off	On	Off
2	A	Off	Off	Off	Off	On	On
	B	Off	Off	Off	On	Off	Off
3	A	Off	Off	Off	On	Off	On
	B	Off	Off	Off	On	On	Off
4	A	Off	Off	Off	On	On	On
	B	Off	Off	On	Off	Off	Off
5	A	Off	Off	On	Off	Off	On
	B	Off	Off	On	Off	On	Off

Figure 2.5 DIP Switch on Rear Panel of 2U Battery Cabinet



Item	Description
1	Group
2	Number

3 Operating Instructions

This section provides the steps to start and to operate the Vertiv™ Liebert® ITA2 UPS.

3.1 Startup

1. Close the upstream feeder breakers for the UPS rectifier and bypass (if wired as dual-input).
2. Close all downstream breakers including distributionpanel main breaker and/or branch circuit breakers.
3. If external battery cabinet(s) are installed, close the EBC breaker.
4. When the upstream breakers are closed, the UPS automatically begins the startup process and the boot-up system checks. These take 20-30 seconds.
5. Before continuing to Step 6, make any changes/customization to the UPS operating parameters for the installation or application, see Editing Display and Operation Settings in the UPS user manual.
6. After the system checks complete and/or operating parameters are set, press the power button at the front-panel display, then use the up/down arrow buttons to confirm turn on local INV.

3.2 Shutdown

NOTICE! Risk of improper shutdown. Can cause damage to the connected equipment.

Shutting down the ITA2 will disconnect input power to the connected equipment. Before shutting down the UPS, prepare the connected equipment, either by transferring it to an alternate input power source or shutting it down.

If shutting down the ITA2 is an emergency, either operate the REPO button, if installed, or remove the four-pin connector on the rear of the UPS for communication terminal block Pins 9-12.

To shut down the ITA2 to take it out of service, follow the procedures in the UPS user manual. Once the UPS has been shut down, open all upstream, downstream and battery circuit breakers to electrically isolate the UPS unit from power.

Figure 3.1 ITA2 Control Panel

Item	Description
1	Menu keys
2	LCD
3	Run indicator
4	Alarm indicator
5	Power button

4 UPS Specifications

Table 4.1 UPS Specifications

Parameter	15 kVA	20 kVA
UPS Rating	15 kVA/20 kW	20 kVA/30 kW
UPS Input		
Input Voltage Rating	380/400/415 VAC, 3 Phase 4 Wire + Ground	
Input Voltage Range	304-498 VAC	
Input Frequency Range	40-70 Hz	
Input Power Factor	0.99 at full load; 0.98 at half load	
Input Current Distortion	< 5% THDi	
UPS Output		
Output Voltage Rating	380/400/415 VAC, 3 Phase 4 Wire + Ground	
Output Frequency	50 Hz or 60 Hz	
Output Frequency Sync Range	± 3 Hz; configurable from +/-0.5 Hz to +/-5 Hz	
Output Frequency Slew Rate	0.5Hz/second; configurable 0.2/0.5/1 Hz/second	
Output Voltage Sync Range	Upper limit: +10%, +15% or +20%; Default: +20% Lower limit: -10%, -20%, -30% or -40%; Default: -40%	
Output Power Factor	1.0 (Unity)	
Output Voltage Distortion	2% THDv linear load; 5% THDv non-linear load	
Output Overload	105% ~ 125%, 10 minutes 125% ~ 150%, 1 minute >150%, 200 milliseconds	
AC-AC Efficiency	Up to 96%	
Battery		
Standard Type	External Matching Battery Cabinets Sealed, valve-regulated, lead acid (VRLA)	
Number of Batteries	24, 30, 32, 34, 36, 38, 40; 32 default setting	
Nominal Voltage (VDC)	288, 360, 384, 408, 432, 456, 480; 384 default setting	
Charge Current	13 A maximum	
Environmental / Agency		
Safety	cULus (UL 1778 5th Edition, CSA 22.2 No. 107.3); CE (IEC/EN62040-1+A1:2013)	
EMC	FCC Part 15, Class A; IEC/EN62040-2:2006	
Protection Level	NEMA 1; IP20	
Surge Protection	ANSI C62.41, 6kV/2Ohms; IEC/EN61000-4-4, 4kV (L-G), 2kV (L-L)	

Table 4.1 UPS Specifications (continued)

Parameter	15 kVA	20 kVA
Operating Temperature	0-50°C (derating to 70% of rating above 40°C)	
Operating Relative Humidity	0-95% Non-condensing	
Operating Altitude	Sea level to 3000 m, without derating	
Dimensions, W x D x H inches (mm)		
Unit	16.9 x 19.7 x 5.1 (430 x 500 x 130)	
Shipping	33.1 x 25.3 x 13.8 (842 x 642 x 350)	
Weight, lb. (kg)		
Unit	55.1 (25)	
Shipping	88.2 (40)	
Color	Black-Gray (RAL 7021)	

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