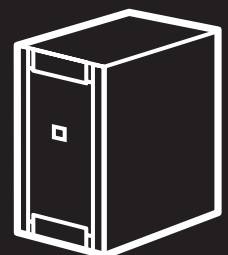


Smart-UPS[®] VT

10-40kVA
400V

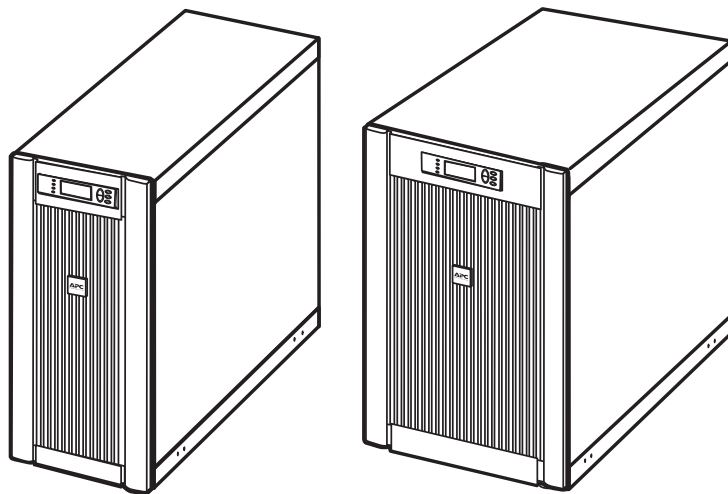
Site Preparation and Installation Manual



Smart-UPS® VT

10-40kVA 400V

Site Preparation & Installation Manual



IMPORTANT!

**THIS DOCUMENT CONTAINS IMPORTANT SAFETY INSTRUCTIONS –
PLEASE SAVE THESE INSTRUCTIONS!**

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Safety

General Safety Instructions

Symbols used in this guide



WARNING!
Risk of electric shock.



CAUTION!
Read this information to avoid equipment damage.



Note

Indicates important information.



Indicates that more information is available on this subject in a different section of this manual.



See also

Indicates that more information is available on the same subject in a different manual.

Environmental symbols

Temperature	Ventilation requirements	Humidity	Dust/Fumes	Altitude

General safety



WARNING!

All electrical power and control wiring must be installed by a qualified electrician and comply with local and national codes.



WARNING!

When connected, the UPS contains energy from both AC and DC sources. If the UPS has dual mains supply, be aware of the two AC supply sources.



Hazardous voltage from batteries may be present even when the unit is disconnected from the utility power source(s). Follow the *“Total-Power-Off Procedure”* on page 26 procedure in this manual to completely de-energize the system. Disconnect charging source prior to connecting or disconnecting battery terminals.



WARNING!

Only trained personnel familiar with the construction and operation of the equipment, and the electrical and mechanical hazards involved, may install and remove system components.



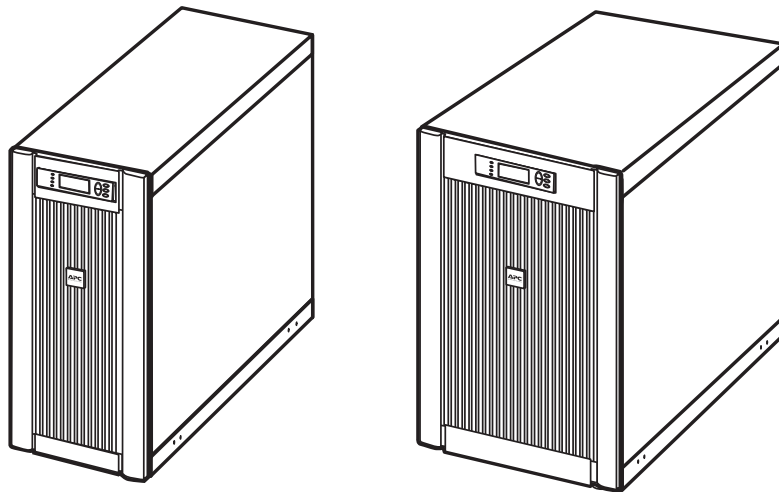
See also

For configurations including customer-supplied external batteries, refer to manufacturer’s battery installation and maintenance instructions.

Introduction

Welcome to the Site Preparation and Installation Manual for the Smart-UPS® VT. This manual contains information on how to prepare your site for the installation of the UPS and optional APC equipment (also available at www.apc.com) and instructions on how to carry out the electrical/mechanical installation. Separate manuals are available on:

- Receiving and Unpacking – part no. 990-2284
- Operation and Maintenance – part no. 990-2282



Note

Don't stand on, sit on or place any objects on UPS.



Note

For more information on APC products and services, visit us at www.apc.com

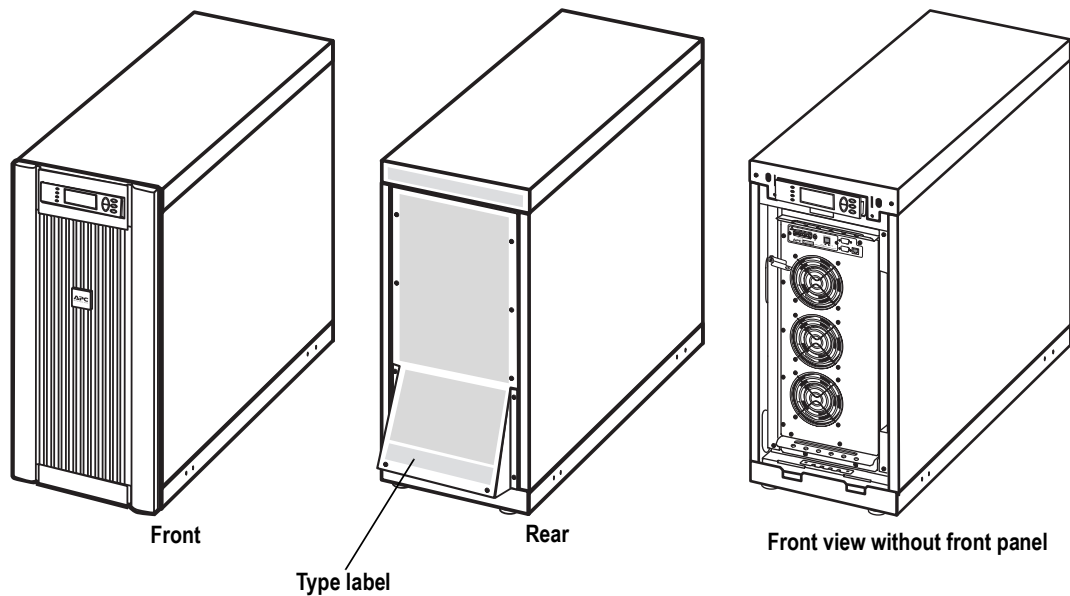


Note

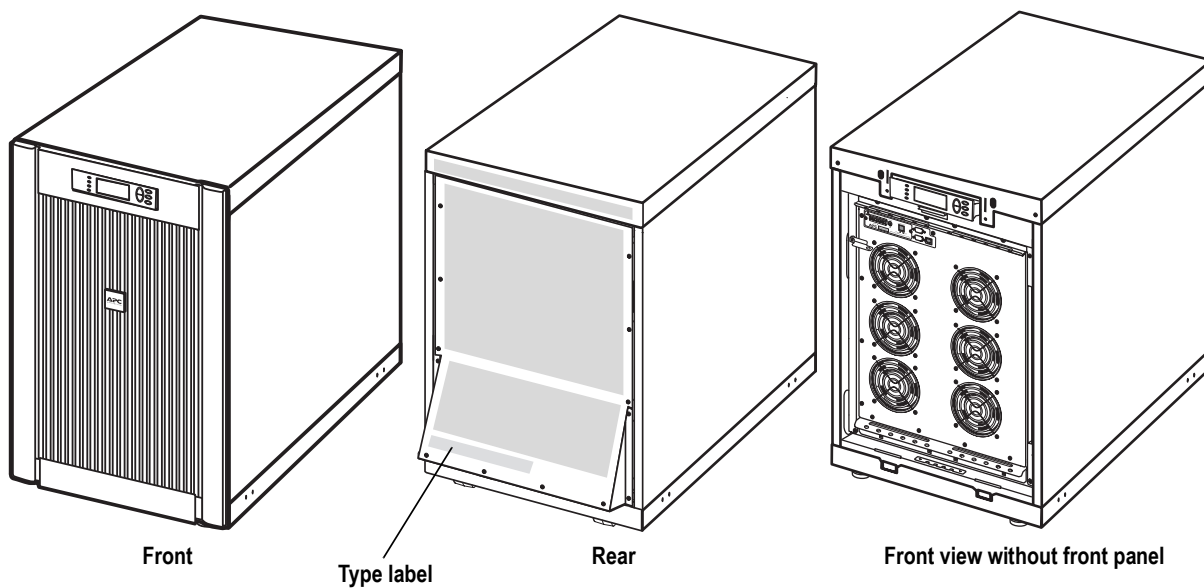
Most illustrations show 523mm Enclosures but apply to both Enclosure sizes (352mm and 523mm). Any differences between the two Enclosure sizes will be addressed in the manual.

UPS Family Range and Components

352mm Enclosures – 10-20kVA



523mm Enclosures – 30-40kVA




Serial number

The serial number is available on the type label on the rear side of the UPS.


Type label

Hotline in US/Canada/LAM: +1 800 800 4APC ☿ Hotline in EMEA: +353 91 70 2000 ☿ Worldwide Support numbers: www.apcc.com/support/contact/							
Mark acc. to SKU No.	APC SKU	APC SKU w.startup	Model	Apparent/Active Power	Rated Input Current	Rated Output Current	Battery Current
	SUVT10KH	SUVT10KHS	APC Smart-UPS VT 10kVA 400V	10kVA/8kW	14.4/13.6/13.1A, 380/400/415V	15.2/14.4/13.9A, 380/400/415V	27.5A
	SUVT15KH	SUVT15KHS	APC Smart-UPS VT 15kVA 400V	15kVA/12kW	21.5/20.5/19.7A, 380/400/415V	22.8/21.7/20.9A, 380/400/415V	41.2A
	SUVT20KH	SUVT20KHS	APC Smart-UPS VT 20kVA 400V	20kVA/16kW	28.7/27.2/26.3A, 380/400/415V	30.4/28.9/27.8A, 380/400/415V	55.0A
	SUVT30KH	SUVT30KHS	APC Smart-UPS VT 30kVA 400V	30kVA/24kW	43.1/40.9/39.4A, 380/400/415V	45.6/43.3/41.7A, 380/400/415V	82.5A
	SUVT40KH	SUVT40KHS	APC Smart-UPS VT 40kVA 400V	40kVA/32kW	57.4/54.6/52.6A, 380/400/415V	60.8/57.7/55.6A, 380/400/415V	109.9A


Unit serial number	Voltage & Connection Types		
	AC Input	AC Output	DC Input
	380Y/220V 4W+GND 50/60Hz	380Y/220V 4W+GND 50/60Hz	+/- 192V
	400Y/230V 4W+GND 50/60Hz	400Y/230V 4W+GND 50/60Hz	
415Y/240V 4W+GND 50/60Hz	415Y/240V 4W+GND 50/60Hz		



SEE INSTALLATION INSTRUCTIONS BEFORE CONNECTING TO THE SUPPLY



THIS REAR COVER MUST BE PLACED ON UPS



APC
www.apc.com

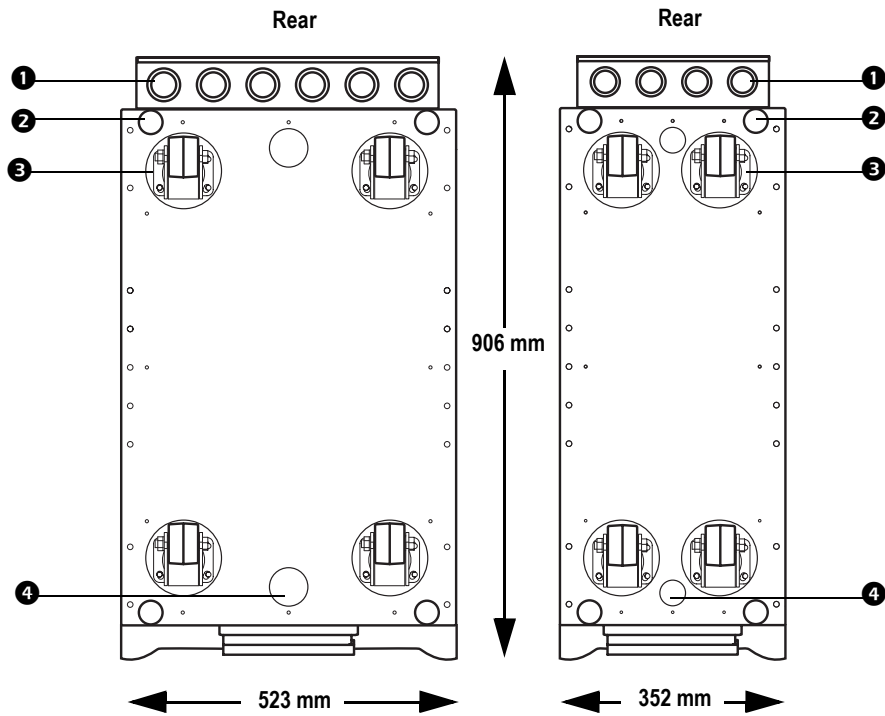
885-2532_rev01

UPS sizes and weights

Height (identical for all Enclosure sizes)	823mm
Depth – including Front Panel (identical for all Enclosure sizes)	906mm

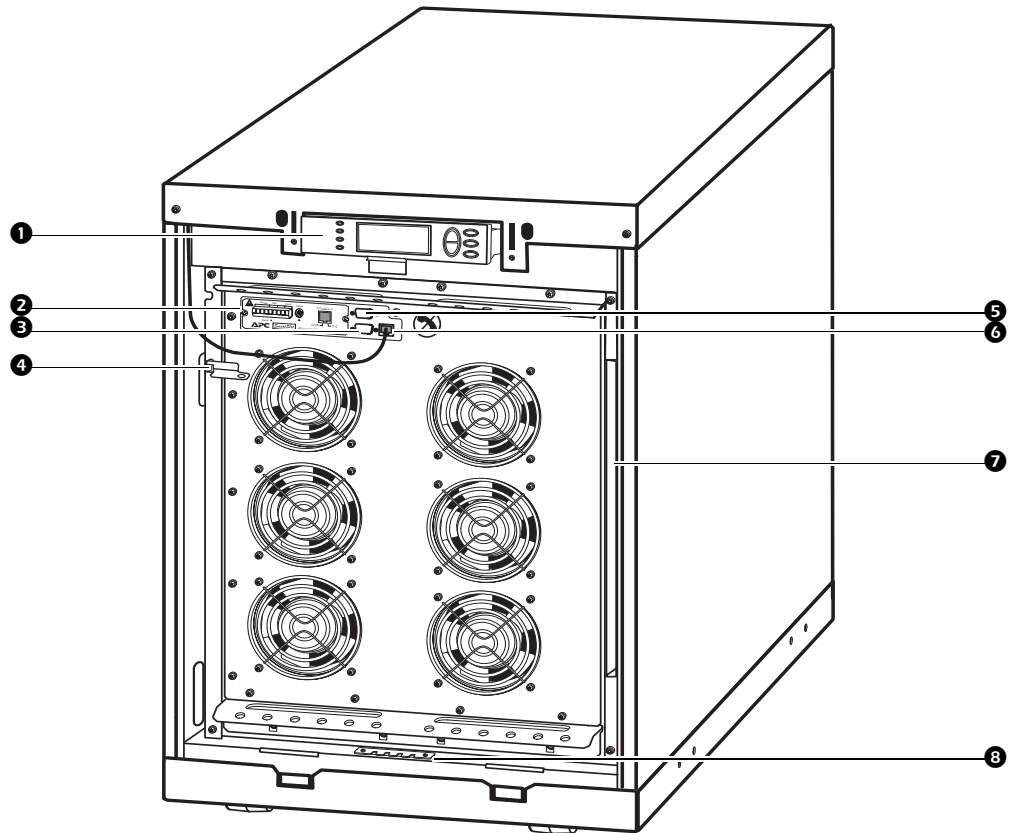
System Size/ Enclosure width	APC Part No.	Installed weight
10kVA 352mm	SUVT10KHS	134kg
15kVA 352mm	SUVT15KHS	134kg
20kVA 352mm	SUVT20KHS	134kg
30kVA 523mm	SUVT30KHS	182.5kg
40kVA 523mm	SUVT40KHS	182.5kg

Foot print



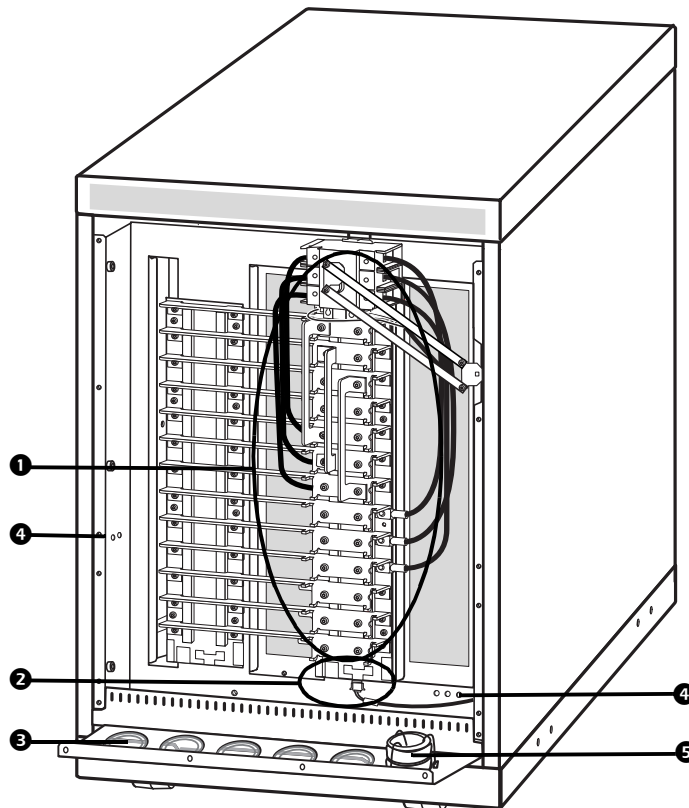
- ❶ Cable Entry.
- ❷ Levelling feet.
- ❸ Castors.
- ❹ Communication cable inlets.

User interface



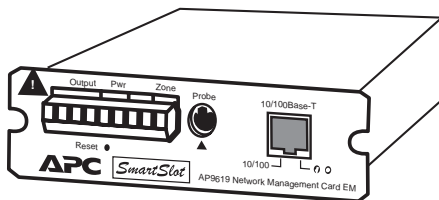
- ❶ Display: user-control interface used to configure the functionality, monitor the system, set alarm thresholds, and provide audible and visual alarms.
- ❷ Network Management Card with Environmental Monitor (AP9619): used for remote system control and monitoring, e-mail notifications, etc.
- ❸ Computer-interface port for the connection of computers with APC Powerchute® software.
- ❹ Mechanical Bypass Lever: used to bypass the upstream mains power around the UPS to support the load directly = internal mechanical bypass operation.
- ❺ Service port (for APC maintenance personnel only).
- ❻ Display port for the connection of display communication cable.
- ❼ Documentation storage.
- ❽ Inlet for communication cables.

Connection interface (rear)



- ❶ Power connection.
- ❷ Communication wiring connection (EPO signalling, Battery Temperature Sensor).
- ❸ Power cable entry.
- ❹ Protective earth.
- ❺ Ferrite cores for DC connection (do not remove).

APC Network Management Card AP9619 (installed in UPS) and APC Humidity Sensor (Optional)



See also

For installing Humidity Sensor see “*Connection of APC Humidity Sensor*” on page 40.

APC Smart-UPS VT Battery Temperature Sensor (Optional) 1 delivered with UPS



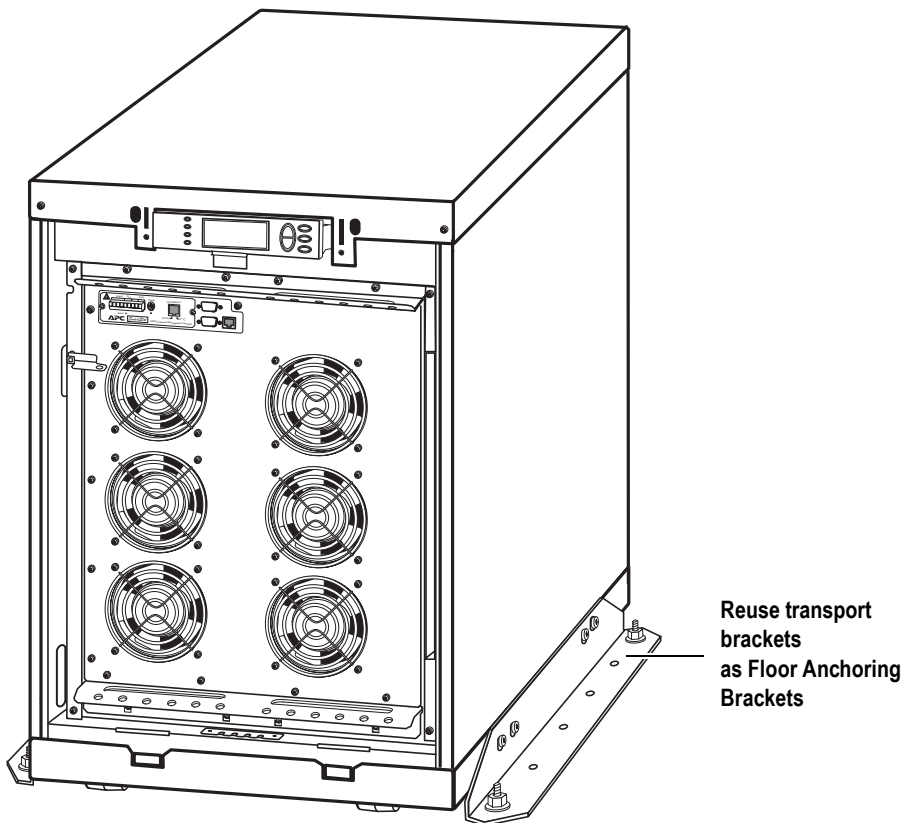
APC SmartUPS VT Battery Temperature Sensor for External Battery Cabinet	SUVTOPT007
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For installation procedures concerning the APC Smart UPS VT Battery Temperature Sensor see “Connecting the APC Battery Temperature Sensor” on page 42.

Note

Floor anchoring (Optional)





Note

Floor-anchoring bolts are not provided with the UPS. Use floor anchoring bolts suitable for your floor material.



Note

For floor anchoring installation procedures see “*Floor Anchoring Preparation*” on page 14, and “*Floor Anchoring (Option)*” on page 46.

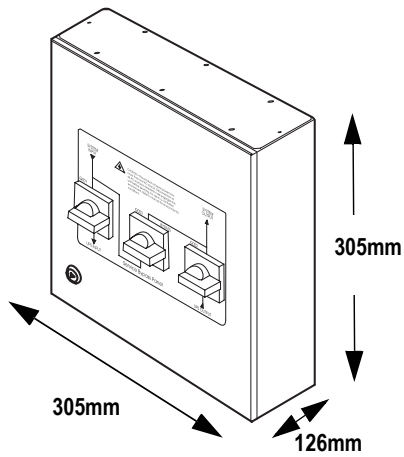
Options

Maintenance Bypass Panels

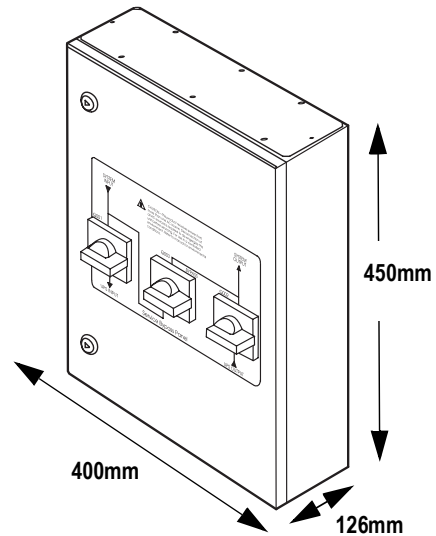


Further details on APC Maintenance Bypass Panel (MBP) are available at www.apc.com.

MBP for SUVT 10-20kVA



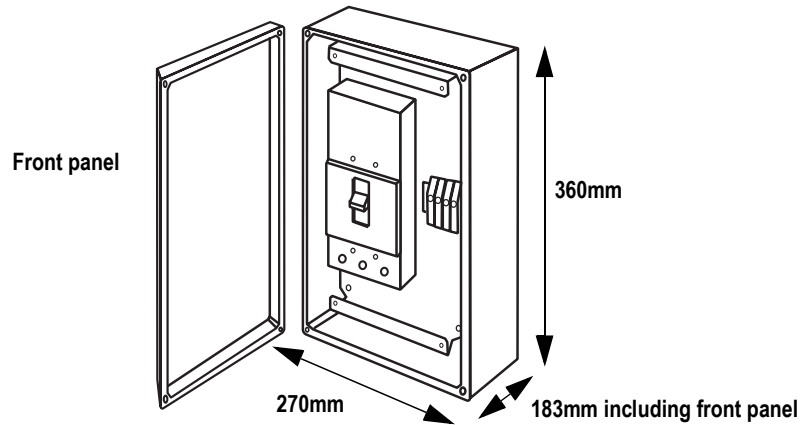
MBP for SUVT 30-40kVA



Part no. APC MBP for SUVT 10-20kVA	SBPSU10K20HC1M1-WP
Part no. APC MBP for SUVT 30-40kVA	SBPSU30K40HC1M1-WP

The Maintenance Bypass Panel provides overcurrent protection to the entire UPS system. It is also used to bypass the mains power around the UPS instead of through the system, e.g. when UPS maintenance is carried out.

APC Smart-UPS VT 10-40kVA Battery Breaker Box

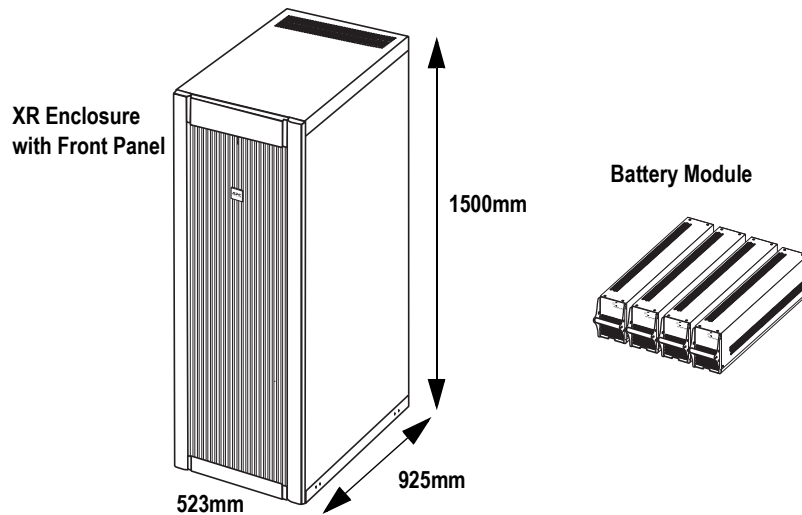


Part no. APC Smart-UPS VT 10-40kVA 400V Battery Breaker Box	SUVTBB10K40H
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Customized Battery solutions

Customized battery solutions are available from our Custom Engineering Group. Contact CEG through APC's Customer Support (contact numbers available on rear cover).

Smart-UPS® VT Extended Run Battery Enclosure (XR Enclosure) and Battery Module



For more details on optional APC equipment for the APC Smart-UPS® VT, contact APC Customer Support. Refer to the rear cover for contact numbers.

Site Preparation

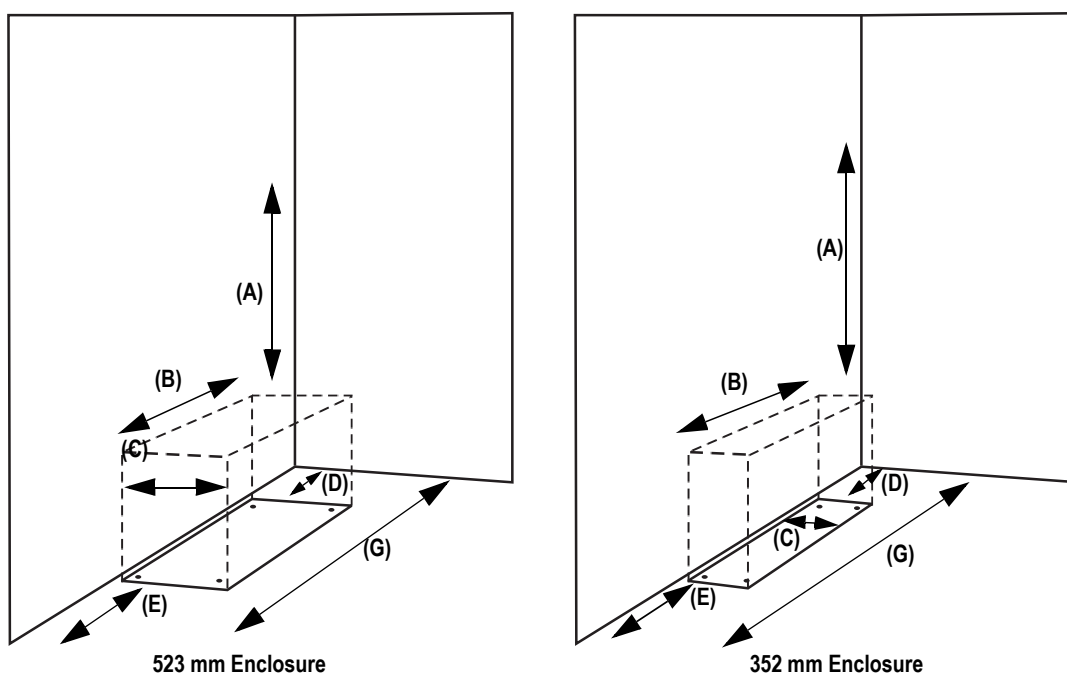
Installation Space Requirements



Note

Allow for enough working space behind the Enclosure for electrical work to be carried out (e.g. if you want to connect other equipment at a later stage).

Clearance



Space requirements	523mm Enclosure	352mm Enclosure
Minimum clearance above Enclosure (A)	500	500
Enclosure depth (B)	906	906
Enclosure width (C)	523	352
Minimum free rear space for airflow* (D)	100	100
Minimum front clearance (E)	1000	1000
No side clearance required (add width of Enclosure Stabilizing Brackets (2x80mm) for floor anchoring protection if applicable)*	0	0
Total installation depth, inclusive of Front Panel, and minimum front and rear clearances (G)	2006	2006

*) All physical installations must comply with local standards.

Floor Anchoring Preparation



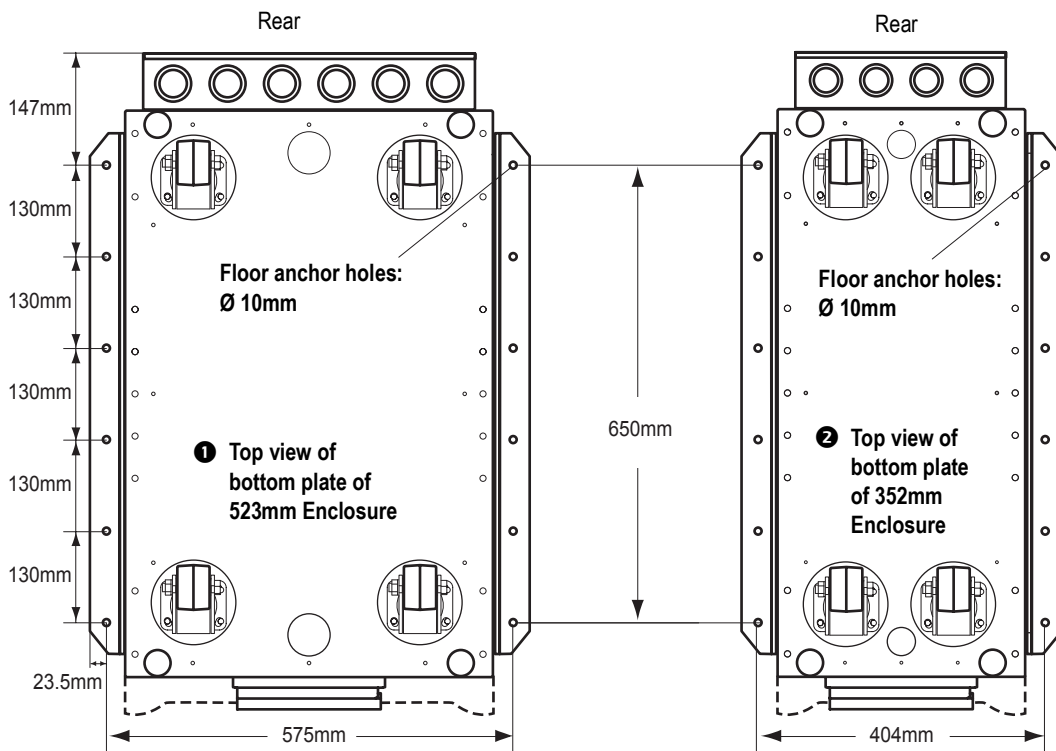
If floor anchoring is required in your area, read this section. If not, proceed to “*Operating Environment*”.

Drill holes for floor anchoring



Anchoring your UPS to the floor requires re-use of the brackets previously used to secure the Enclosure to its pallet. Refer to the drawings below for proper hole positions.

Hole positions for floor anchors



❶ Refer to this drawing for floor anchor positions for 523mm Enclosure.

❷ Refer to this drawing for 352mm Enclosure.



The Floor Anchoring procedure is described in section “*Floor Anchoring (Option)*” on page 46.

Operating Environment

Operating conditions



Note

Install the UPS in an indoor, temperature-controlled area, that is free of conductive contaminants.

Temperature Range: 0° to 40°C	Keep Ventilated Front-to-Rear Airflow (see space considerations)	Relative Humidity: <95% Non-condensing	No Conductive Dust or Corrosive Fumes	Altitude derating table: 1000m: 100% load 1500m: 95% load 2000m: 91% load 2500m: 86% load 3000m: 82% load

Heat dissipation

UPS size	kW at fully charged batteries	BTU
10kVA	0.5	1,501
15kVA	0.75	1,761
20kVA	1.0	2,566
30kVA	1.5	2,866
40kVA	2.0	4,367

Audible noise

	10-20kVA	30-40kVA
Audible noise at 100% load: (1m from the UPS)	64dBA	67dBA
Audible noise at <70% load (1 m from the UPS)	56dBA	59dBA

Recommended source connections



The UPS must be supplied from a:
380Y/220V 4W + GND 50/60Hz or
400Y/230V 4W + GND 50/60Hz or
415Y/240V 4W + GND 50/60Hz source.



CAUTION!

Verify clockwise phase-rotation (L1, L2, L3) and make sure a neutral connection is present.



See “*Recommended phase-conductor sizes for a 30°C temperature environment*” on page 20.

Recommended current protection



AC output over-current protection and AC output disconnect must be provided by the customer.

Note

Dual/single mains configuration	Connection	10kVA	15kVA	20kVA	30kVA	40kVA	Notes
Dual	Mains input	20A breaker (30kA)	35A breaker (30kA)	50A breaker (30kA)	63A breaker (30kA)	80A breaker (30kA)	1+2
Dual	Bypass input	20A breaker (30kAIC)	35A breaker (30kA)	50A breaker (30kA)	63A breaker (30kA)	80A breaker (30kA)	1+2
Single	Mains/Bypass input	20A breaker (30kA)	35A breaker (30kA)	50A breaker (30kA)	63A breaker (30kA)	80A breaker (30kA)	1+2
Any	Output	20A Class gL (gG) fuse	35A Class gL (gG) fuse	50A Class gL (gG) fuse	63A Class gL (gG) fuse	80A Class gL (gG) fuse	3
DC	Max. batt. Voltage ±192V	22A	33A	44A	66A	88A	4
DC	Low. batt. Voltage ±154V	27.5A	41.2A	55A	82.5A	109.9A	4

Note 1:

If the available fault current of the installation is below 30kA, a lower Icu-rated breaker can be used.

Note 2:

For breaker settings, refer to below tables listing available overload currents.

Note 3:

Maximum rating of a single fuse configuration if the internal bypass must be protected during a load short circuit. Selectivity is not ensured by the configuration.

Note 4:

Maximum DC currents in Smart-UPS VT. Size cable for maximum DC currents as in table above. Use 150° cable for installation.

Minimum breaker settings for 10kVA UPS

Overload Event	Mains input	Bypass input	Output	Duration	Notes
Internal fault	2kA	1.7kA	9kA	<10ms	1
800% overload bypass operation	–	121.5A	121.5A	500ms	
150% overload normal/battery operation	–	–	22.8A	30s	
125% overload normal/battery operation	–	–	19A	60s	
Continuously (380V)	16.4A	16.7A	16.7A	∞	

Note 1: For the output value, the short-circuit-level is indicated.

Minimum breaker settings for 15kVA UPS

Overload Event	Mains input	Bypass input	Output	Duration	Notes
Internal fault	2.1kA	1.8kA	9kA	<10ms	1
800% overload bypass operation	–	182A	182A	500ms	
150% overload normal/battery operation	–	–	34.2A	30s	
125% overload normal/battery operation	–	–	25.4A	60s	
Continuously (380V)	24.6A	25.1A	25.1A	∞	

Note 1: For the output value, the short-circuit-level is indicated.

Minimum breaker setting for 20kVA UPS

Overload Event	Mains input	Bypass input	Output	Duration	Notes
Internal fault	2.5kA	2.3kA	9kA	<10ms	1
800% overload bypass operation	–	244A	244A	500ms	
150% overload normal/battery operation	–	–	45.6A	30s	
125% overload normal/battery operation	–	–	38A	60s	
Continuously (380V)	32.5A	33.4A	33.4A	∞	

Note 1: For the output value, the short-circuit-level is indicated.

Minimum breaker setting for 30kVA UPS

Overload Event	Mains input	Bypass input	Output	Duration	Notes
Internal fault	3 kA	2.3kA	14 kA	<10 ms	1
800% overload bypass operation	–	365A	365A	500ms	
150% overload normal/battery operation	–	–	68.4A	30s	
125% overload normal/battery operation	–	–	57A	60s	
Continuously (380V)	49.2A	50.1A	50.1A	∞	

Note 1: For the output value, the short-circuit level is indicated.

Minimum breaker setting for 40kVA UPS

Overload Event	Mains input	Bypass input	Output	Duration	Notes
Internal fault	3 kA	2.3kA	14 kA	<10 ms	1
800% overload bypass operation	–	487A	487A	500ms	
150% overload normal/battery operation	–	–	91.2A	30s	
125% overload normal/battery operation	–	–	76A	60s	
Continuously (380V)	65.6A	66.9A	66.9A	∞	

Note 1: For the output value, the short-circuit level is indicated.

Recommended phase-conductor sizes for a 30°C temperature environment



DC input for non APC Battery Breakers see “Recommended current protection” on page 17.

UPS	[mm ²] sizes	Mains input [mm ²]	AC output [mm ²]	DC input [mm ²] 70°C Wire*
10kVA		2.5	2.5	50
15kVA		6	6	50
20kVA		10	10	50
30kVA		16	16	50
40kVA		25	25	50

* Data only applicable for APC Smart-UPS VT 10-40kVA Battery Breaker Box!



Note

Use Molex lug type or equivalent, and crimp to manufacturer’s specifications.



WARNING!

At 100% non-linear load (EN50091-3 standard), the neutral shall be rated for 200% phase current.

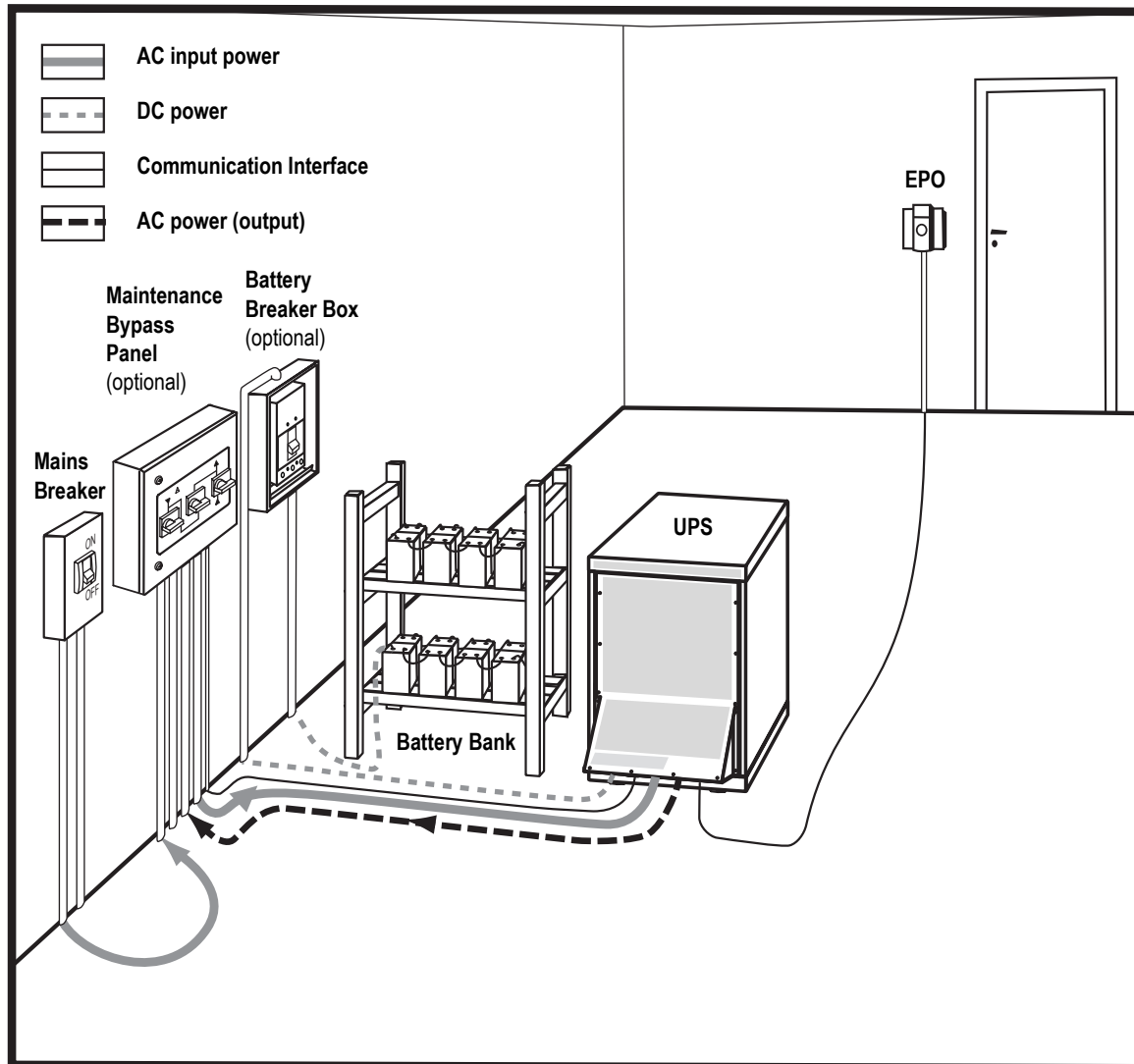
EPO switch wiring

The UPS must be connected to either a dry contact or a 24V_{DC} Emergency Power Off (EPO) switch or according to national rules.

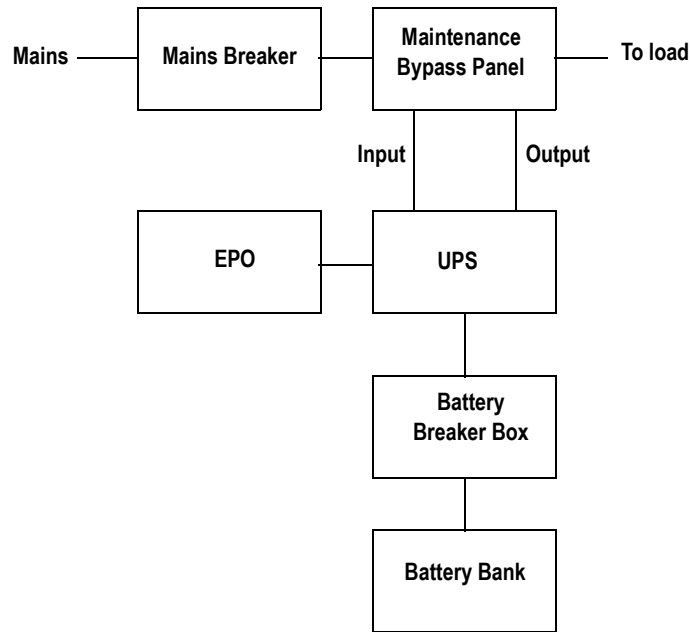


See “*Communication Wiring to EPO and Optional Equipment*” on page 37 in this manual.

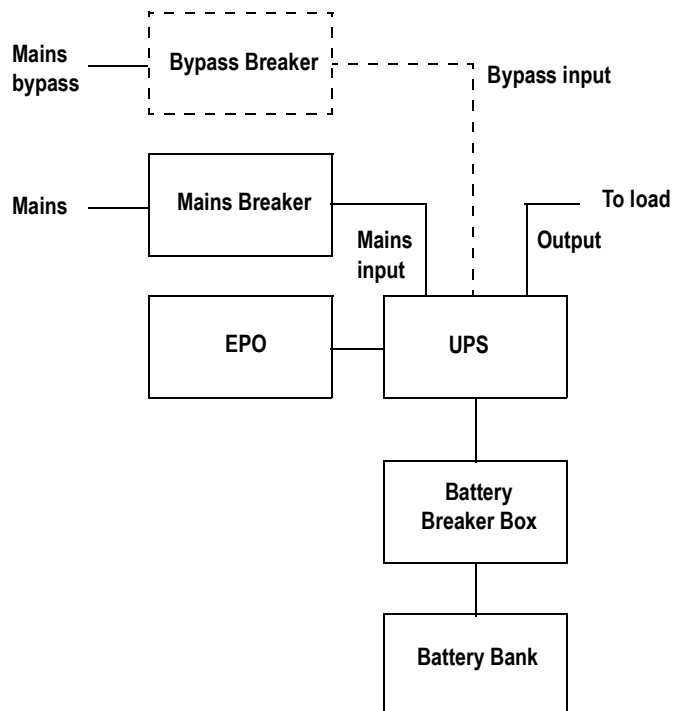
Basic Wiring Overview



Wiring Diagram with Maintenance Bypass Panel



Wiring Diagram without Maintenance Bypass Panel



Site Preparation Checklist

System components. Have you –

- considered Service Program or Extended Warranty plan?

Site Preparation. Have you –

- verified that input voltage and current are available?
- considered correct operating space, floor strength (see “*Installation Space Requirements*” on page 13), cooling, and environment (see “*Operating Environment*” on page 15).
- reviewed all electrical work to determine wiring requirements?

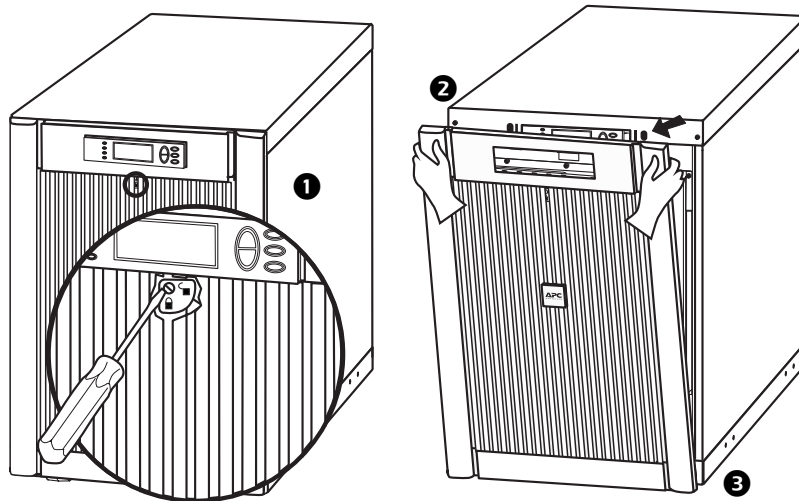
Arrival Preparation. Have you –

- verified that space and handling equipment are available to receive the UPS? (Including unloading the UPS from the delivery truck).
- scheduled an authorized electrician to install the UPS?

Electrical Installation

Preparing for Installation

Front Panel removal



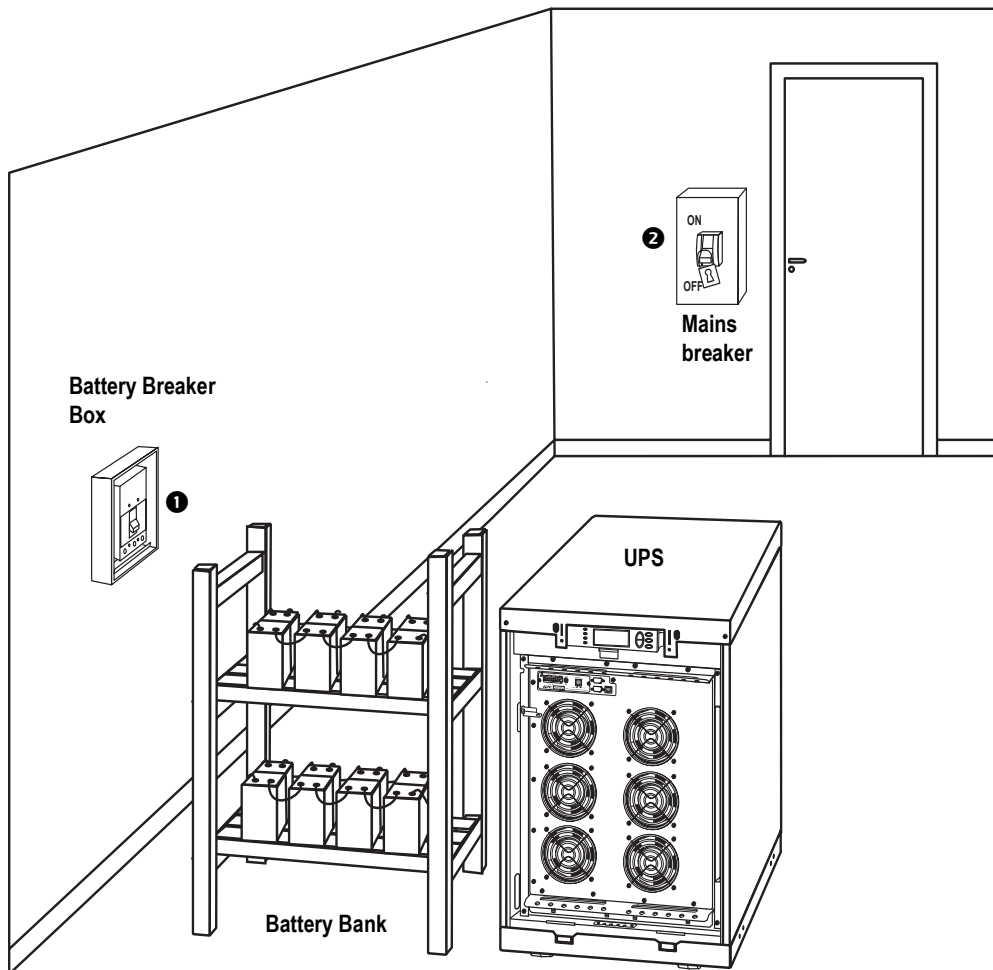
- ➊ To remove a Front Panel, turn screw clockwise to unlocked position.
- ➋ Pull top of Front Panel free of UPS.
- ➌ Lift the Front Panel free of the two slots at the bottom of the UPS.

Total-Power-Off Procedure



WARNING!

Risk of electric shock - parts inside the UPS are energized from the battery supply even when the AC power is disconnected. Before electrical installation begins, follow the Total-Power-Off procedure to completely de-energize the system.



- 1 Set the Battery Breaker to the OFF position following the specifications provided by the manufacturer.
- 2 Set the mains breaker to the OFF or LOCKED-OUT position. If the UPS has dual mains supply, set both supplies to the OFF or LOCKED-OUT position.



WARNING!

Correct lock-out procedures at mains breaker must be followed. If necessary, install a padlock.

System-Electrical Information



WARNING!

All electrical power and power control wiring must be installed by a qualified electrician, and must comply with local and national regulations for maximum power rating.

UPS ratings (380V)	10kVA 8kW	15kVA 12kW	20kVA 16kW	30kVA 24 kW	40kVA 32kW
Input voltage (V)/per phase	3x380/ 220V	3x380/ 220V	3x380/ 220V	3x380/ 220V	3x380/ 220V
Input current (nominal) (A)	13.0	19.4	26.0	38.6	51.7
Maximum input current (continuous, at minimum mains voltage)/per phase	14.3	21.5	28.6	42.5	56.8
Input current protection for mains source or single mains supply (external to UPS, not supplied) (A)	3x20	3x35	3x50	3x63	3x80
Input current protection for bypass source in dual mains configuration (external to UPS, not supplied) (A)	20	35	50	63	80
Input frequency (Hz) range	40-70	40-70	40-70	40-70	40-70
Output voltage (on line). (V) Minimum and maximum values (+/- 1%)	3x380/ 220V	3x380/ 220V	3x380/ 220V	3x380/ 220V	3x380/ 220V
Output current (nominal) (A)	15.2	22.8	30.4	45.6	60.8
Maximum output current (in bypass only at 110% overload per phase)	16.7	25.1	35.4	50.1	66.9
Bypass input current (A) (in bypass only at 110% overload, per phase)	16.7	25.1	35.4	50.1	66.9
Neutral output current (with 100% switch mode load) (A)	25.0	37.5	50.0	75.0	100.0
Output current protection (external to UPS, not supplied) (A)	20	35	35	63	80
Output frequency range (Hz)	50/60	50/60	50/60	50/60	50/60
DC overcurrent protection and disconnect switch for external safety: (A)	22	33	44	66	88
DC voltage rating of the battery supply	+/- 192	+/- 192	+/- 192	+/- 192	+/- 192
Maximum available battery short-circuit current.	10kA	10kA	10kA	10kA	10kA

UPS ratings (400V)	10kVA 8kW	15kVA 12kW	20kVA 16kW	30kVA 24 kW	40kVA 32kW
Input voltage (V)/per phase	3x400/ 230V	3x400/ 230V	3x400/ 230V	3x400/ 230V	3x400/ 230V
Input current (nominal) (A)	12.4	18.6	24.8	37.2	49.6
Maximum input current (continuous, at minimum mains voltage)/per phase	13.6	20.5	27.3	40.9	54.6
Input current protection for mains source or single mains supply (external to UPS, not supplied) (A)	3x20	3x35	3x50	3x63	3x80
Input current protection for bypass source in dual mains configuration (external to UPS, not supplied) (A)	20	35	50	63	80
Input frequency (Hz) range	40-70	40-70	40-70	40-70	40-70
Output voltage (on line). (V) Minimum and maximum values (+/- 1%)	3x400/ 230V	3x400/ 230V	3x400/ 230V	3x400/ 230V	3x400/ 230V
Output current (nominal) (A)	14.4	21.7	28.9	43.3	57.7
Maximum output current (in bypass only at 110% overload per phase)	15.9	23.8	31.8	47.6	63.5
Bypass input current (A) (in bypass only at 110% overload, per phase)	15.9	23.8	31.8	47.6	63.5
Neutral output current (with 100% switch mode load) (A)	25.0	37.5	50.0	75.0	100.0
Output current protection (external to UPS, not supplied) (A)	20	35	35	63	80
Output frequency range (Hz)	50/60	50/60	50/60	50/60	50/60
DC overcurrent protection and disconnect switch for external safety: (A)	22	33	44	66	88
DC voltage rating of the battery supply	+/- 192	+/- 192	+/- 192	+/- 192	+/- 192
Maximum available battery short-circuit current.	10kA	10kA	10kA	10kA	10kA

UPS ratings (415V)	10kVA 8kW	15kVA 12kW	20kVA 16kW	30kVA 24 kW	40kVA 32kW
Input voltage (V)/per phase	3x415/ 240V	3x415/ 240V	3x415/ 240V	3x415/ 240V	3x415/ 240V
Input current (nominal) (A)	11.9	17.8	23.8	35.3	47.3
Maximum input current (continuous, at minimum mains voltage)/per phase	13.1	19.6	26.2	38.9	52.1
Input current protection for mains source or single mains supply (external to UPS, not supplied) (A)	3x20	3x35	3x50	3x63	3x80
Input current protection for bypass source in dual mains configuration (external to UPS, not supplied) (A)	20	35	50	63	80
Input frequency (Hz) range	40-70	40-70	40-70	40-70	40-70
Output voltage (on line). (V) Minimum and maximum values (+/- 1%)	3x415/ 240V	3x415/ 240V	3x415/ 240V	3x415/ 240V	3x415/ 240V
Output current (nominal) (A)	13.9	20.9	27.8	41.7	55.6
Maximum output current (in bypass only at 110% overload per phase)	15.3	23.0	30.6	45.9	61.2
Bypass input current (A) (in bypass only at 110% overload, per phase)	15.3	23.0	30.6	45.9	61.2
Neutral output current (with 100% switch mode load) (A)	25.0	37.5	50.0	75.0	100.0
Output current protection (external to UPS, not supplied) (A)	20	35	35	63	80
Output frequency range (Hz)	50/60	50/60	50/60	50/60	50/60
DC overcurrent protection and disconnect switch for external safety: (A)	22	33	44	66	88
DC voltage rating of the battery supply	+/- 192	+/- 192	+/- 192	+/- 192	+/- 192
Maximum available battery short-circuit current.	10kA	10kA	10kA	10kA	10kA

Source connections



The UPS must be supplied from a:
380Y/220V 4W + GND 50/60Hz or
400Y/230V 4W + GND 50/60Hz or
415Y/240V 4W + GND 50/60Hz source.



CAUTION!
Verify clockwise phase-rotation (L1, L2, L3) and make sure a neutral connection is present.



CAUTION!
The installation must comply with all local and national codes.

Wiring



Note

Make sure the UPS is in its final installation location before wiring.



CAUTION!

Verify clockwise phase-rotation (L1, L2, L3) and make sure a neutral connection is present.



Note

Power terminal lug diameter: min. 6mm, max. 8mm.

Torque value: 7Nm.



Note

If floor anchoring is required, attach the Floor Anchoring Brackets to the UPS now. Follow instructions under Floor Anchoring.



Note

Leave a copy of your wiring diagram with the customer to facilitate maintenance and troubleshooting.

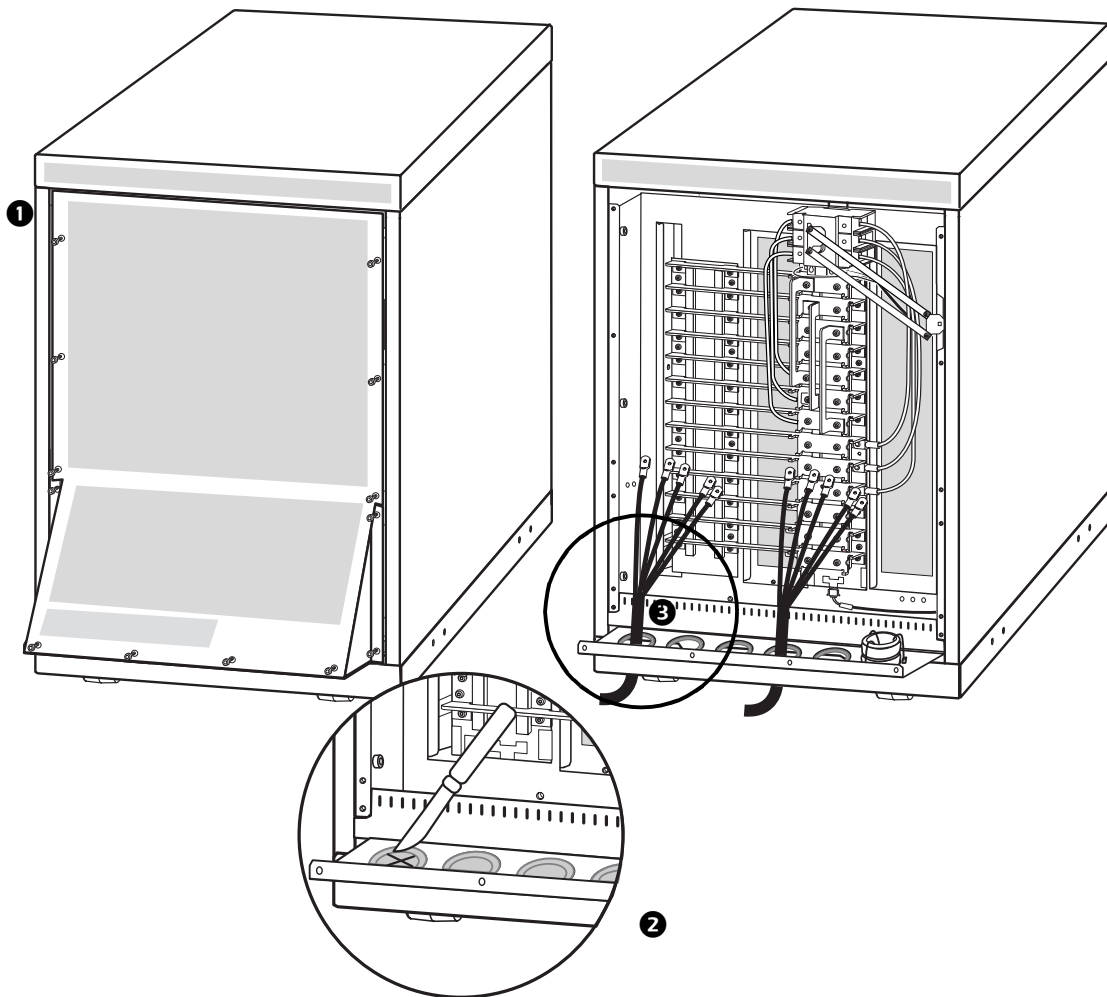
Input/Output Wiring – Single Mains (default)

The UPS is designed for both single (default) and dual mains installations. Carry out the “*Total-Power-Off Procedure*” on page 26, and follow the below steps to install the UPS in a single-mains installation.

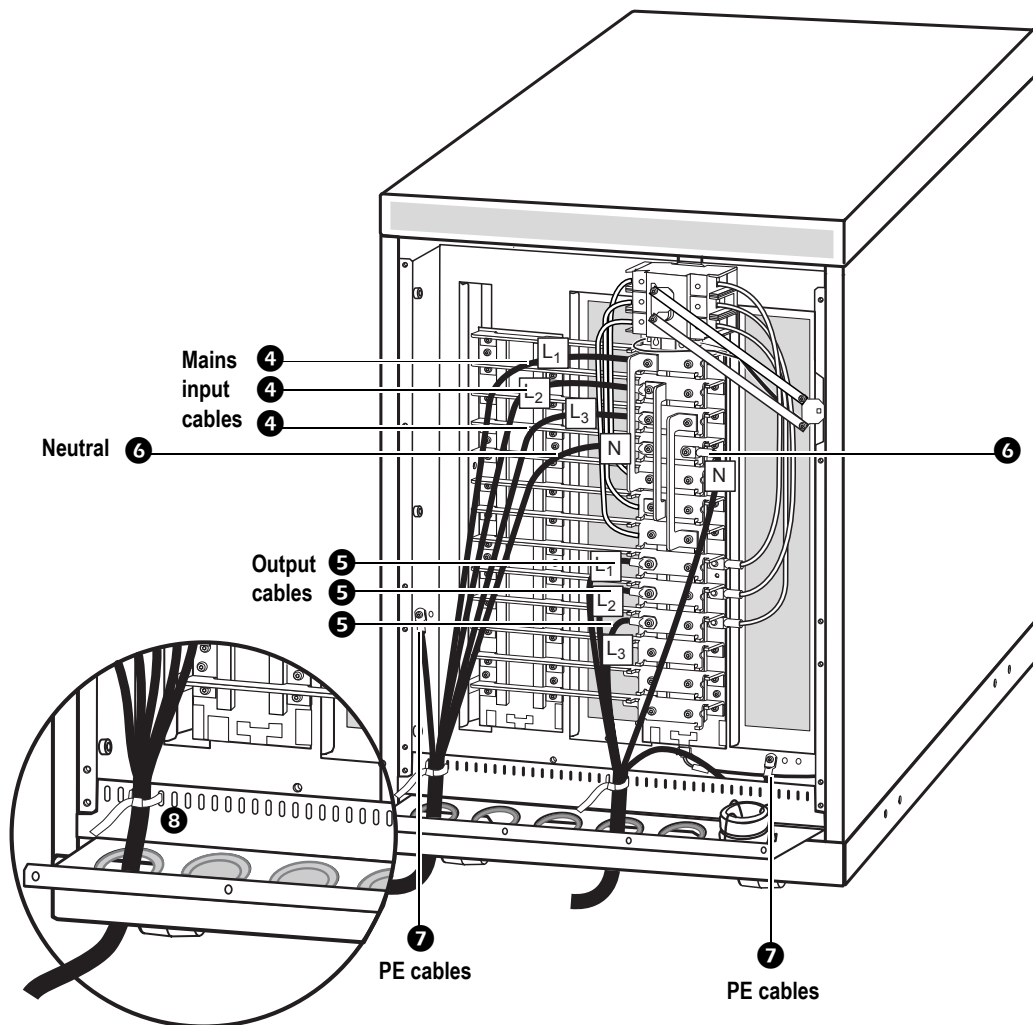


Note

The illustrations show a 523mm Enclosure, but installation procedures are identical for 352mm Enclosures.



- ❶ Loosen the 14 (13 in 352mm enclosure) M4 screws with torque screwdriver from the rear cover, and remove.
- ❷ Cut a cross in the blanking plugs.
- ❸ Route the cables through the blanking plugs and into the cable land area.



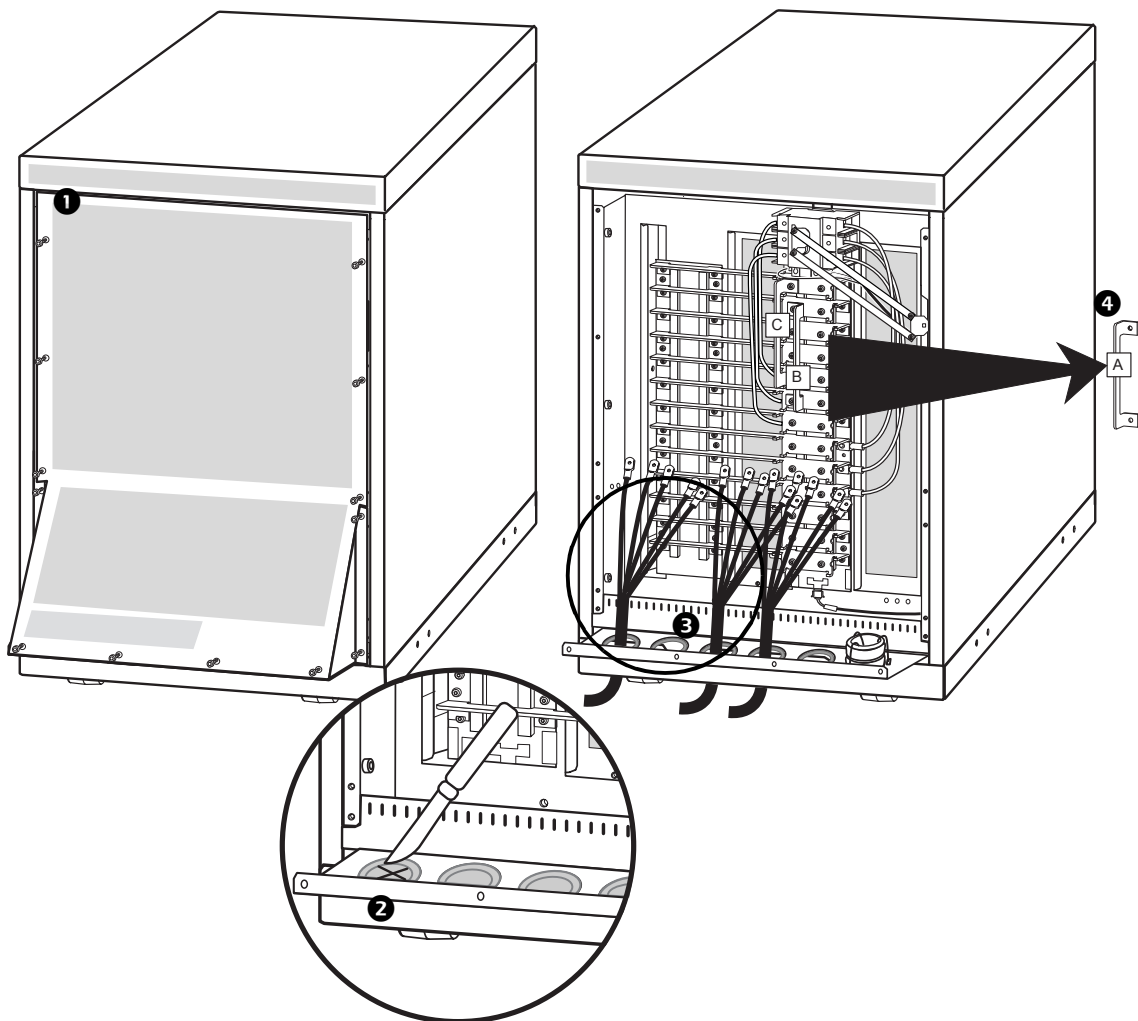
- ④ Attach input cable lugs on L1, L2 and L3 input busbars (left side in the UPS), using the provided M6 torque screws.
- ⑤ Attach output cable lugs on L1, L2 and L3 output busbars, using the provided M6 torque screws.
- ⑥ Attach N where shown, using the provided torque screws.
- ⑦ Attach PE (Protective Earth) where shown, using the provided torque screws.
- ⑧ Fasten cables with cable ties.

Input/Output Wiring – Dual Mains

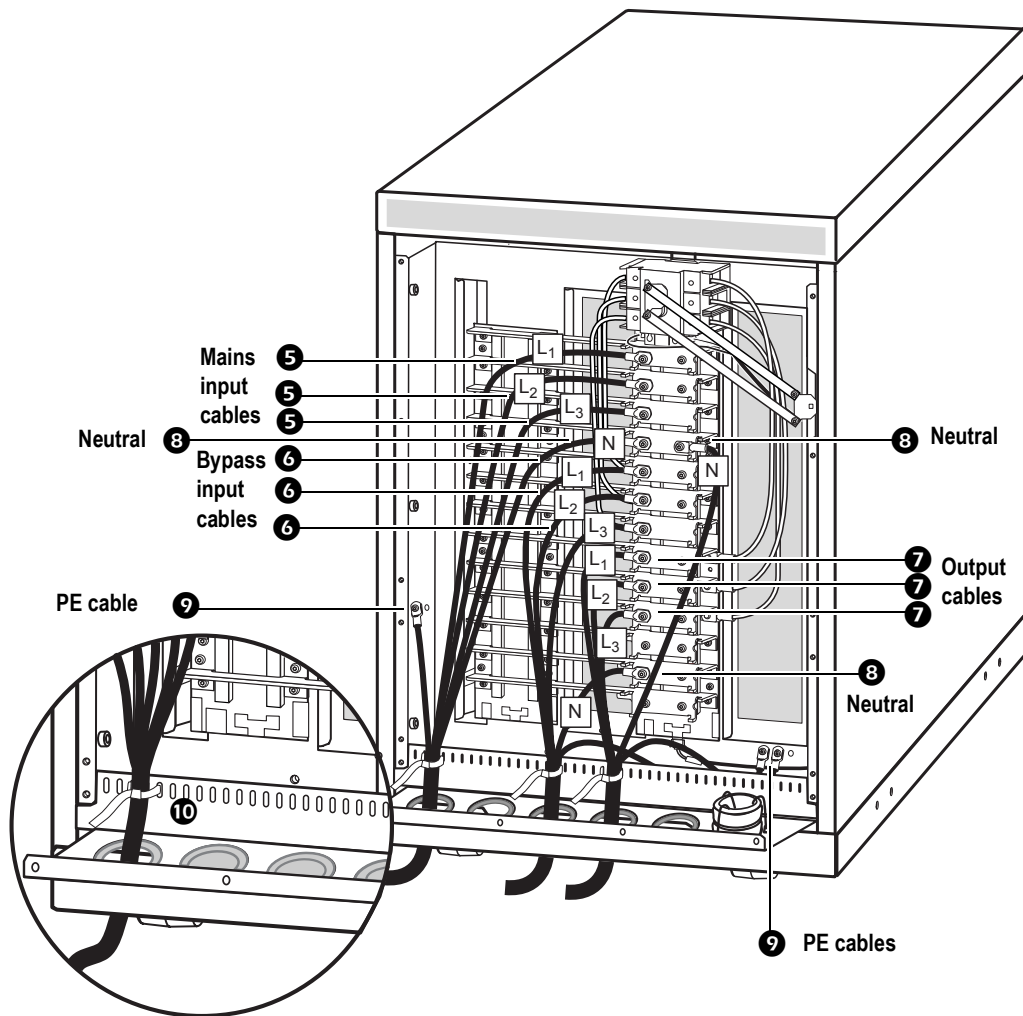
The UPS is designed for single mains installation as default. Carry out the “*Total-Power-Off Procedure*” on page 26, and follow the below instructions to install the UPS in a dual-mains installation.



The illustrations show 523mm Enclosures, but the installation procedures are identical for 352mm Enclosures.

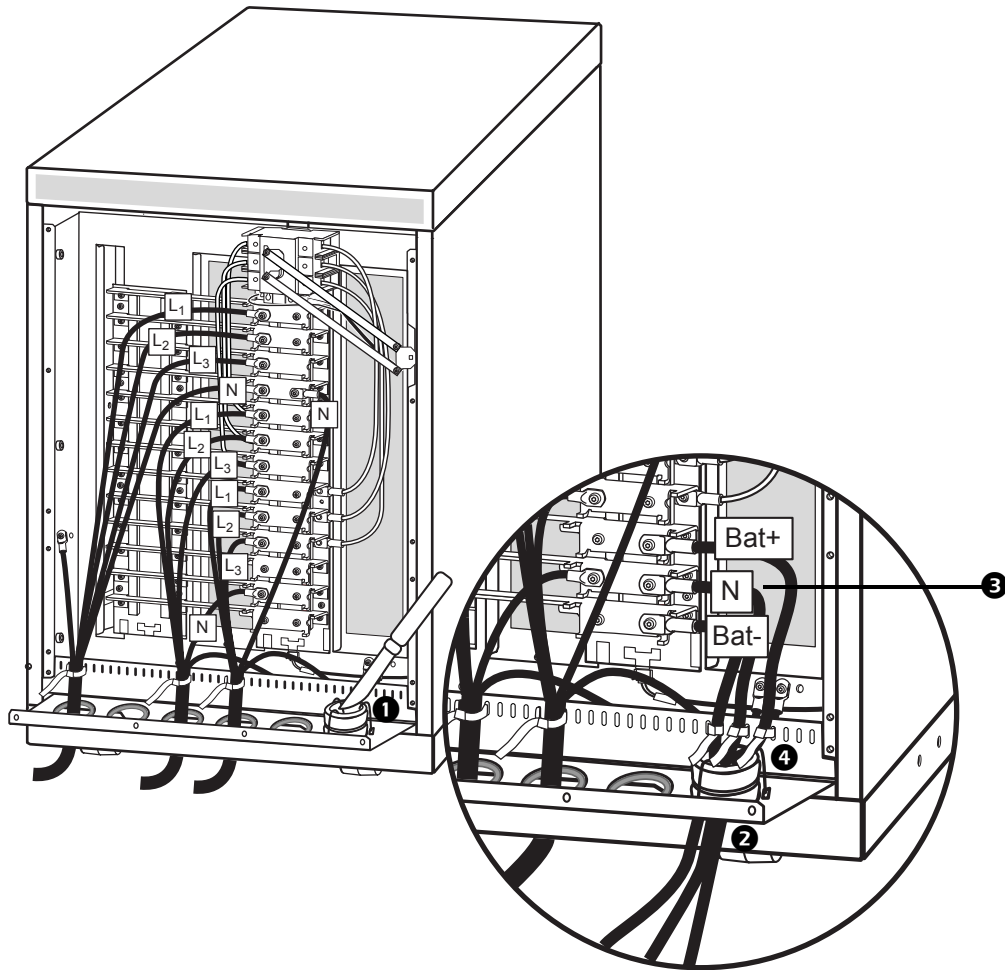


- 1 Loosen the 14 (13 in 352mm enclosure) M4 with torque screwdriver from the cover for the cable termination area and remove.
- 2 Cut a cross in the blanking plugs.
- 3 Route the cables through the blanking plugs and into the cable land area.
- 4 Remove the 2 torque screws from brackets A, B, and C and remove all 3 brackets.



- ➊ Attach the mains input cable lugs to input busbars L1, L2, L3, using the provided torque screws.
- ➋ Attach the bypass input cable lugs to L1, L2, L3 bypass busbars, using the provided torque screws.
- ➌ Attach the output cable lugs to the L1, L2, L3 output busbars and attach, using the provided torque screws.
- ➍ Attach N where shown, using the provided torque screws.
- ➎ Attach PE (Protective Earth) where shown.
- ➏ Fasten all cables with cable ties.

DC wiring



- ❶ Cut a cross in the blanking plug.
- ❷ Guide DC cables through cable entry and ferrite cores.
- ❸ Install cables on busbars.
- ❹ Fasten cables with cable ties.



Note

Do not remove the ferrite cores.

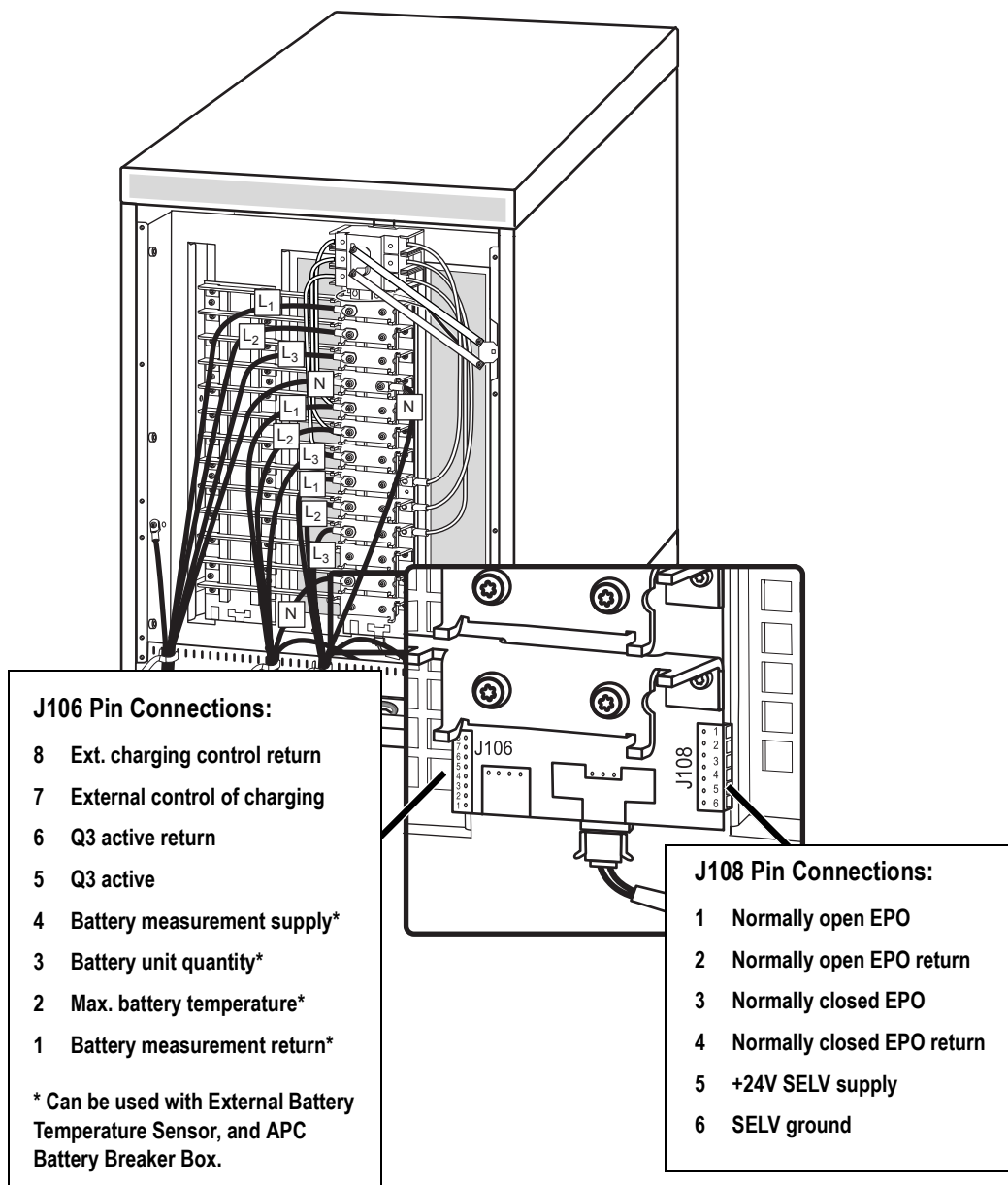
Communication Wiring to EPO and Optional Equipment



EPO switch and wiring must be suited for use in a SELV circuit.

Note

Pin connections J106 and J108 (EPO)



Pin connections J106 for Battery Temperature Sensor, APC Maintenance Bypass Panel, and Generator Control wiring

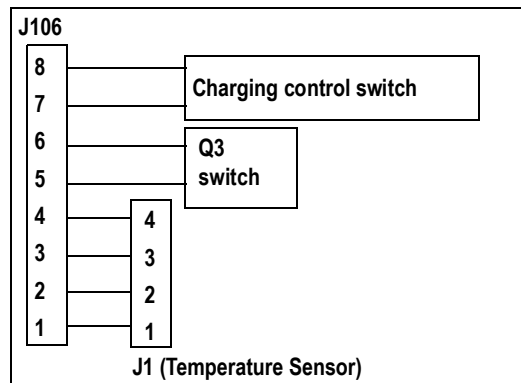
Pins 1 through 4 are for battery measurement (only through external temperature sensor).



See “Connecting the APC Battery Temperature Sensor” on page 42.

Pins 5 & 6 are for external maintenance bypass Q3. When Q3 is closed, signals are fed back to the UPS controller.

Pins 7 & 8 are for external charge control. When 7 & 8 are closed, the UPS charges batteries with a pre-defined percentage (0-100%) of the maximum charging power. To be used in generator applications, or if special codes require control of charging.



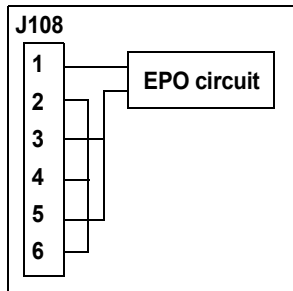
When connecting the Q3 auxiliary signal, use gold-plated N/C auxiliary switch on Q3.

Note

Pin connections J108 (for EPO wiring options)

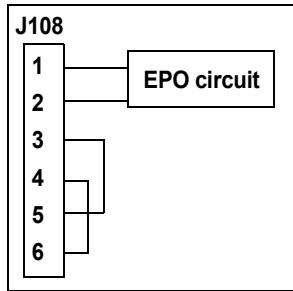
Connect the EPO cable, using one of the following 4 wiring configurations.

**1: Dry Contracts
Normally Open**



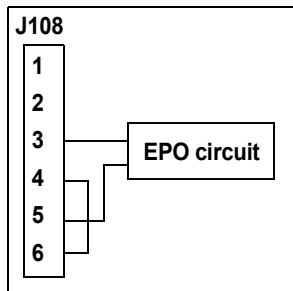
EPO is activated when pin 1 is connected to pins 3, and 5.

2: +24V Normally Open



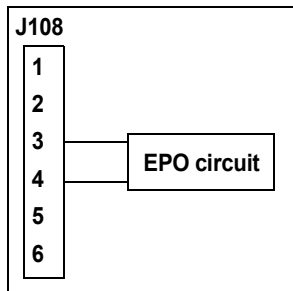
EPO is activated when an isolated SELV 24V_{DC} voltage is supplied on pin 1 with reference to pin 2.

**3: Dry Contacts
Normally Closed**



EPO is activated when a connection from pin 3 to pin 5 is opened.

**4: +24V Normally
Closed**

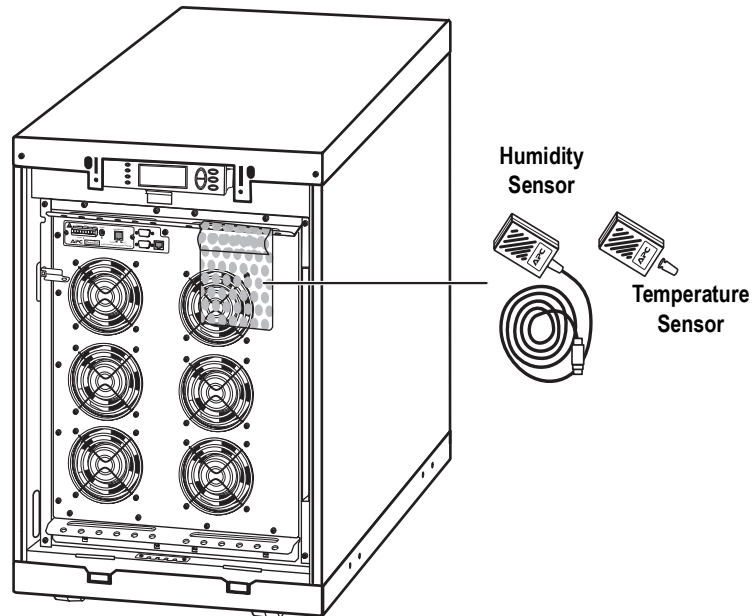


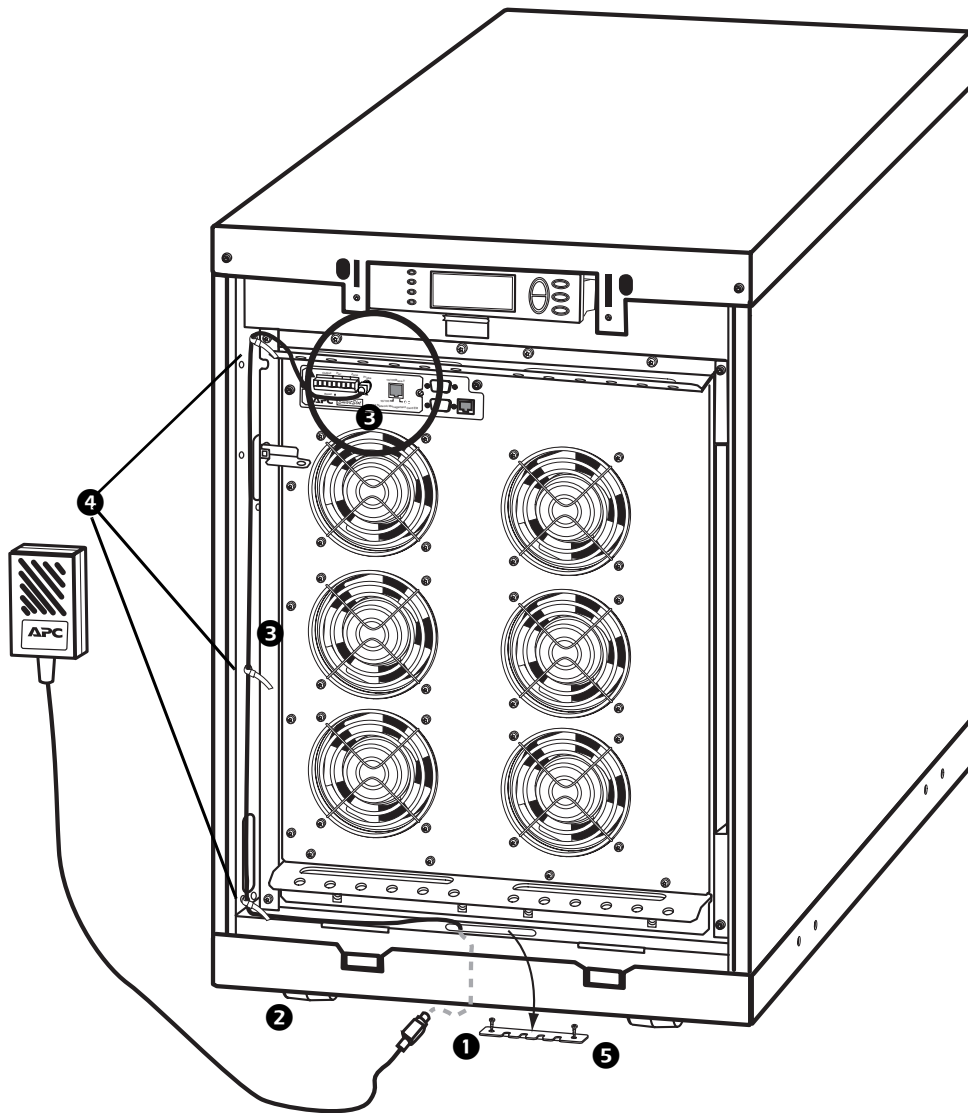
EPO is activated when a SELV 24V_{DC} voltage is removed from pin 3 with reference to pin 4.

Connection of APC Humidity Sensor



The Humidity Sensor and Temperature Sensor are provided in a plastic bag attached to the front of the UPS.





- ❶ Remove the 2 screws from the cable inlet at the front – and remove cable-inlet plate.
- ❷ Guide the cable through the hole in the bottom plate and up through the cable inlet.



See “Foot print” on page 6 for locating the bottom cable inlet.

- ❸ Guide the cable up alongside the side panel and insert the Humidity Sensor plug into the socket marked “Probe”.
- ❹ Fasten the cable to the side panel with the enclosed cable ties
- ❺ Remount the cable-inlet plate.

Place the Humidity Sensor where applicable.

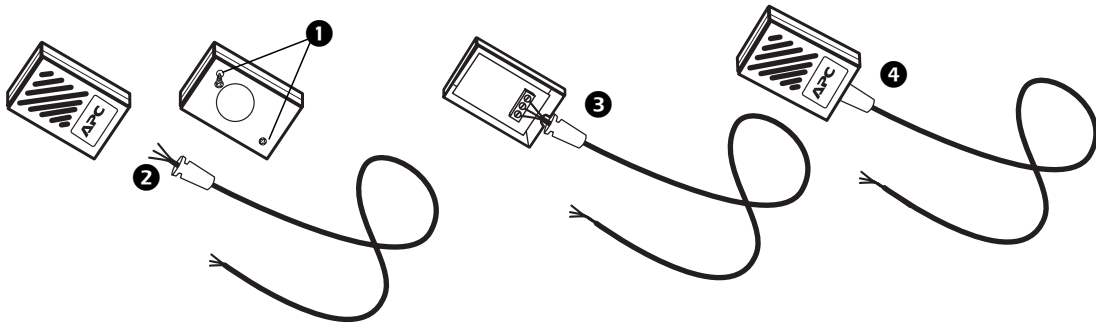
Connecting the APC Battery Temperature Sensor



Note

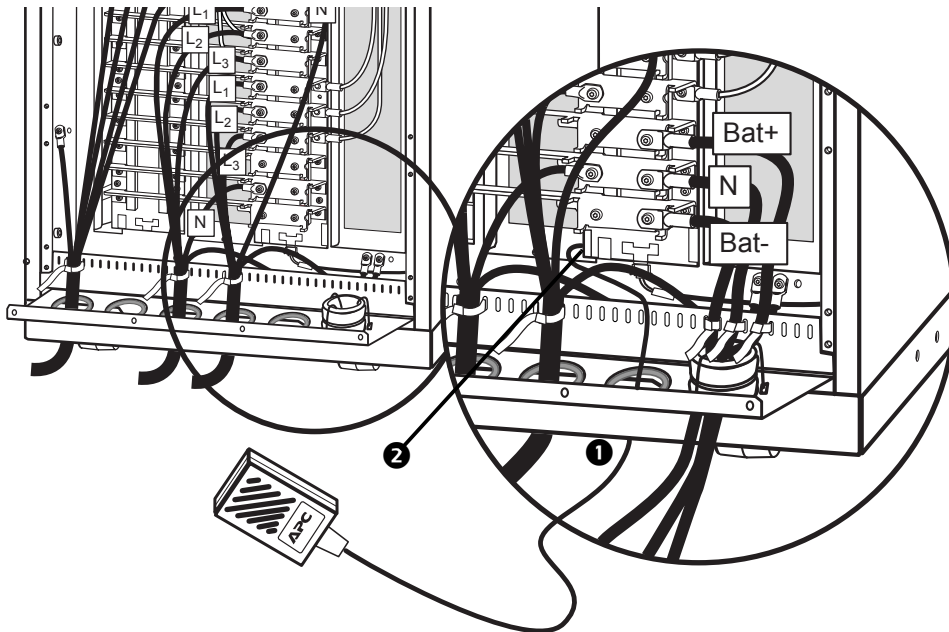
Cable to be used for temperature sensor: Double-insulated cable 0.75mm² – maximum cable length 100m.

Connect cable 0.75 mm² to Battery Temperature Sensor housing



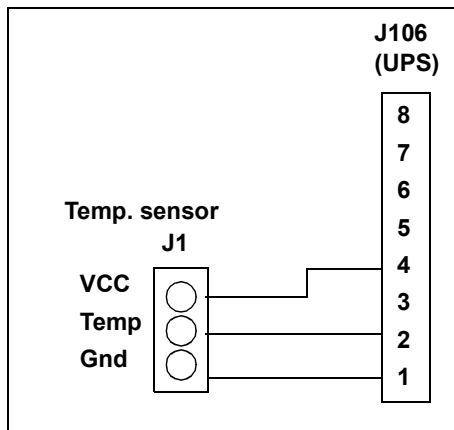
- 1 Loosen two screws and open housing.
- 2 Guide double-insulated cable through grommet.
- 3 Fill in cables and fasten screws (see schematics on next page).
- 4 Close housing.

Connect APC Battery Temperature Sensor to UPS



- 1 Guide cable through cable entry.
- 2 Connect cable to J106.

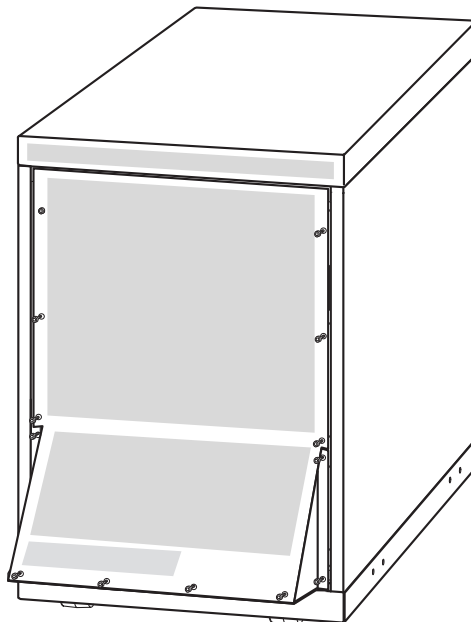
Connect cable to J1 as illustrated:



Battery Temperature Sensor must be placed between batteries.

Note

Reinstall rear cover



Levelling Feet



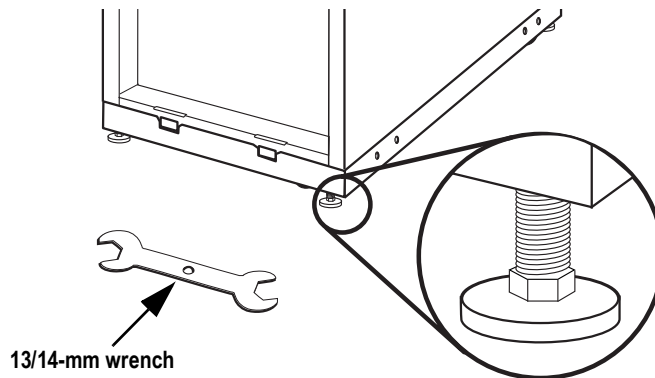
Verify that the installation has been electrically wired before setting the levelling feet.



After the Levelling Feet have been lowered, remember to reinstall the Front Panel. If Floor Anchoring is required, carry out these procedures first. (See “*Floor Anchoring Preparation*” on page 14 and “*Floor Anchoring (Option)*” on page 46).

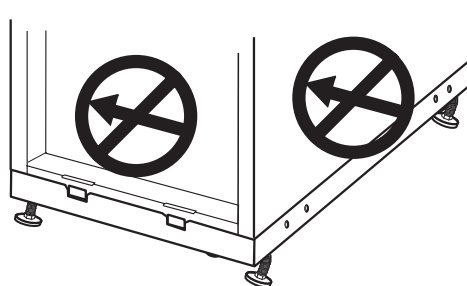
Setting the levelling feet

Set the levelling feet to stabilize the UPS in its final installation position. Use a 13/14-mm wrench (shipped with UPS) to adjust all 4 levelling feet from front to back, and left to right, until the pads make solid contact with the floor. Use a level tube to check the Enclosure is horizontal.



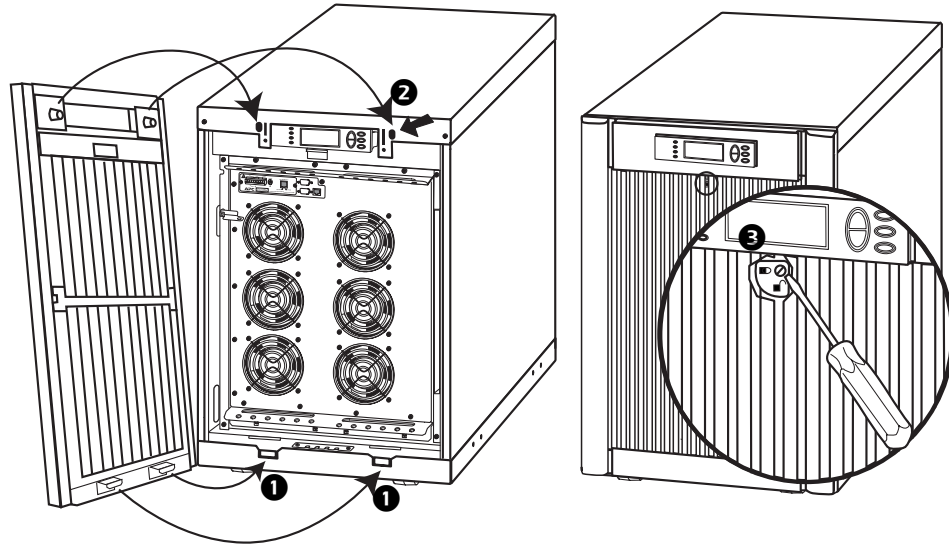
CAUTION!

To avoid equipment damage, do not push or pull the UPS after the levelling feet have been lowered.



Front Panel Installation

Front Panel installation



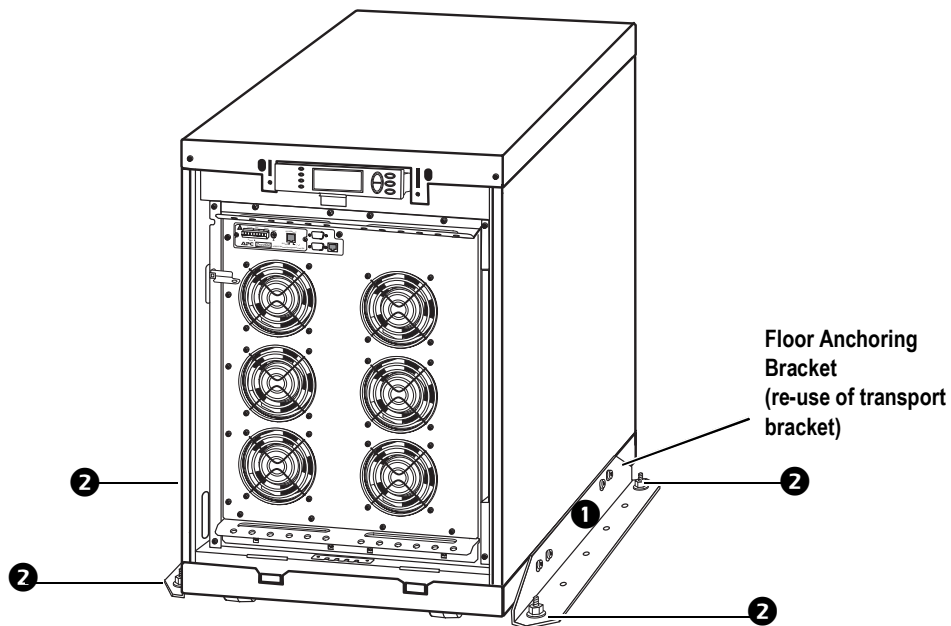
- ❶ To install a Front Panel, insert the two guide taps at the bottom of the Front Panel into the two slots at the bottom of the UPS.
- ❷ Push the Front Panel into place.
- ❸ To secure the Front Panel, turn the screw counterclockwise to locked position.

Floor Anchoring (Option)



Floor anchoring is an option. If your installation does not require this option, proceed to “*Front Panel Installation*” on page 45.

- 1 Use the two transport brackets that secured the UPS to the pallet during transport for floor anchoring.



- 2 Align the 4 holes in the bottom angle of the Floor Anchoring Bracket on either side of the UPS to the pre-drilled holes in the floor.



Floor anchoring procedures are identical for both 352mm and 523mm UPS Enclosures.



See also

See “*Floor Anchoring Preparation*” on page 14 and install a minimum of 4 anchors on each Enclosure (minimum size: M8) where shown, following the specifications provided by the manufacturer.

Wiring Verification Procedure

Use following procedure to verify that the UPS has been wired properly:

- 1. Make sure the DC breaker is in the OFF position.
- 2. Ensure all power wiring is torqued to 7Nm.
- 3. Switch the DC breaker in the ON position.



Note

If a problem occurs, call APC Customer Support. Refer to rear cover for contact numbers.

- 4. Reinstall all rear cover and Front Panels to the UPS.



Note

If you have installed any optional equipment, refer to product-specific manuals.

Installation Site Checklist

This checklist should be completed by the electrician after the wiring has been completed:

Installed at (company name, date, contact) _____

Name and telephone number of electrician: _____

UPS serial number: _____

Input Circuit Breaker size and type: _____

Output fuse size and type: _____

Location of protection devices (room): _____

Breaker ID: _____

EPO type: _____

Wire size and type: _____

PE connection method and location: _____

Warranty

LIMITED FACTORY WARRANTY

The limited warranty provided by American Power Conversion Corporation (“APC”) in this Statement of Limited Factory Warranty applies only to Products you purchase for your commercial or industrial use in the ordinary course of your business.

APC product covered

Smart-UPS® VT.

Terms of warranty

APC warrants that the Product shall be free from defects in materials and workmanship for a period of one (1) year from the date of start-up when APC authorized service personnel performed the start-up of the Product, or a maximum of 18 months from the date of Product shipment from APC, when APC authorized service personnel have not performed the start-up of the Product (“Warranty Period”). In the event that the Product fails to meet the foregoing warranty, APC shall repair or replace any defective parts, such repair or replacement to be without charge for on-site labor and travel if APC authorized personnel have conducted start-up of the Product. An APC Start-Up Service must be performed/completed by APC authorized service personnel or replacement of defective parts only will be covered. APC shall have no liability and no obligation to repair the installed Product if non-authorized personnel performed the start-up and such start-up caused the Product to be defective. Any parts furnished under this warranty may be new or factory-remanufactured. **Repair or replacement of a defective product or part thereof does not extend the original warranty period.**

Non-transferable warranty extends to first purchaser for use

This Warranty is extended to the first person, firm, association or corporation (herein referred to by “You” or “Your”) for whom the APC Product specified herein has been purchased. This Warranty is not transferable or assignable without the prior written permission of APC.

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APC will assign to you any warranties which are made by manufacturers and suppliers of components of the APC Product and which are assignable. Any such warranties are assigned “AS IS” and APC makes **no representations** as to the effectiveness or extent of such warranties, assumes NO RESPONSIBILITY for any matters which may be warranted by such manufacturers or suppliers and extends no coverage under this Warranty to such components.

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APC warrants for the Warranty Period and on the terms of the Warranty set forth herein that the APC Product will substantially conform to the descriptions contained in the APC Official Published Specifications or any of the drawings certified and agreed to by an authorized APC representative, if applicable thereto (“Specifications”). It is understood that the Specifications are **not warranties of performance** and **not warranties of fitness for a particular purpose**.

Warranty claims procedure

To obtain service under Warranty, contact APC Customer Support (see rear cover). You will need the model number of the Product, the serial number, and the date purchased. A technician will ask you to describe the problem. If it is determined that the Product will need to be returned to APC you must obtain a returned material authorization (RMA) number from APC Customer Support. Products that must be returned must have the RMA number marked on the outside of the package, and be returned with transportation charges prepaid. If it is determined by APC Customer Support that on-site repair of the Product is allowed, APC will arrange to have APC authorized service personnel dispatched to the Product location to repair or replace the Product at the discretion of APC.

Exclusions

APC shall not be liable under the Warranty if its testing and examination discloses that the alleged defect in the product does not exist or was caused by your or any third person’s misuse, negligence, improper installation or testing, unauthorized attempts to repair or modify, or any other cause beyond the range of the intended use, or by accident, fire, lightning or other hazard.

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Customer support for this or any other APC product is available at no charge in any of the following ways:

- Visit the APC Web site to access documents in the APC Knowledge Base and to submit customer support requests.
 - **www.apc.com** (Corporate Headquarters)
Connect to localized APC Web sites for specific countries, each of which provides customer support information.
 - **www.apc.com/support/**
Global support searching APC Knowledge Base and using e-support.
- Contact an APC Customer Support center by telephone or e-mail.
 - Regional centers:

Direct InfraStruXure Customer Support Line	(1)(877)537-0607 (toll free)
APC headquarters U.S., Canada	(1)(800)800-4272 (toll free)
Latin America	(1)(401)789-5735 (USA)
Europe, Middle East, Africa	(353)(91)702000 (Ireland)
Japan	(0) 3 5434-2021
Australia, New Zealand, South Pacific area	(61) (2) 9955 9366 (Australia)

- Local, country-specific centers: go to **www.apc.com/support/contact** for contact information.

Contact the APC representative or other distributor from whom you purchased your APC product for information on how to obtain local customer support.

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