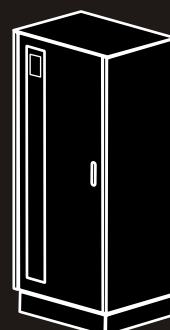




AIS 5000 UPS

**10-100 kVA
480 V**

Installation Manual



IMPORTANT!

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

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Safety

IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS

IMPORTANT SAFETY INSTRUCTIONS - SAVE THESE INSTRUCTIONS

This guide contains important safety instructions for the AIS series that should be followed during installation and maintenance of the UPS. See battery installation manual for this series for safety instructions regarding batteries.

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.



Use a pallet jack or a forklift for components over 120 lbs.



Two people to lift components weighing between 40 - 70 lbs.

User Safety



WARNING!

This UPS contains hazardous AC and DC voltages. Only qualified electricians should connect the UPS, AC line and external batteries, and must be familiar with batteries and battery installation.

Before installing, maintaining or servicing the UPS, shut off the UPS and disconnect all sources of AC and DC power.

As the UPS has no built-in disconnection devices to switch off external AC and DC input power, ensure that disconnection devices are available as separate parts in connection with the installation!

AC and/or DC voltage will always involve a potential risk of AC voltage at UPS output generated from either batteries or utility. To avoid equipment damage or personal injury, always assume that there may be voltage at UPS output.

This system is equipped with an auto-start function. If activated, the system may start without warning. Refer to the “Programming” section for information on de-activation.

The installer must provide each external disconnecting device for this UPS system with labels with the following text:

“Isolate the Uninterruptible Power Supply (UPS) as instructed in this guide before working on circuit”



TEST BEFORE YOU TOUCH!

To reduce the risk of fire or electric shocks, install the UPS and external batteries in a temperature and humidity controlled indoor area, free of conductive contaminants.



UPS batteries are high-current sources. Shorting battery terminals, DC terminals or DC busbars can cause severe arcing, equipment damage and injury. A short circuit can cause a battery to explode. Always wear protective clothing and eye protection and use insulated tools when working on batteries.



CAUTION!

This unit contains components sensitive to electrostatic discharge (ESD). If you do not follow the ESD procedures, you may cause severe damage to electronic components.

General Information

About this manual

This Installation Guide gives a detailed overview of the various functions of the APC UPS system and contains information on how to install, connect, program and maintain the AIS 5000 UPS system.

Further information on the AIS 5000 series is available on www.apc.com.

Receiving and Unpacking

Receiving and inspecting the UPS

Your AIS 5000 UPS system has been tested and inspected for quality assurance prior to shipment from APC. To ensure that the UPS has not been damaged during transportation, carefully inspect both the exterior and interior of the equipment immediately upon receipt.

Verify that all parts ordered were received as specified and that the UPS is the correct size and voltage.

Inspect the exterior of the packaging:

If any damage to the packaging is noted - or if the UPS is not received in upright position (see indication on packaging) - contact APC Worldwide Customer Support for information on how to file a claim with the shipping company. (Phone number on back cover).

Storing the UPS before installation:

If the UPS is not to be installed immediately, the delivered goods should be stored in a safe place, protected from humidity and dust. The storage temperature must be between 14 and 131° F (-10 and +55° C).



Note

The UPS system should be installed and started up within 18 months after delivery. If this is not the case, APC must be contacted before installation and start up.

Unpacking and moving to site



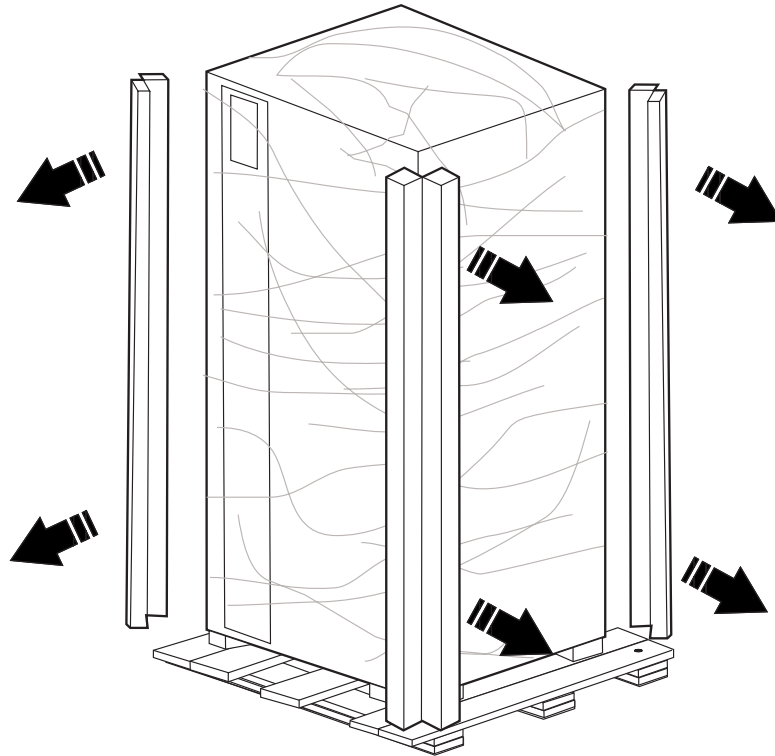
Note

Always unpack the equipment in a clean and dry environment. Damaged packaging or equipment should always be left untouched until the shipping company as well as the insurance company have inspected it.



Note

The actual packing of the UPS system may be different than illustrated.



- ❶ Remove cardboard sleeve (not shown on illustration).
- ❷ Remove corner protection and cardboard cover on top (cover not shown on illustration).
- ❸ Use scissors or knife to remove the plastic wrapping - be cautious not to damage the equipment.
- ❹ Remove manuals and commissioning parts from underneath the UPS.
- ❺ Lift the system from the pallet with a forklift or a pallet-truck.




Pay attention to the center of gravity and the weight of the system!

- ❻ Move the system to its installation place.
- ❼ Copy type label data (serial number) to label copy below for easy identification of system (type label is placed on inside of UPS front door).



Note

If the UPS is not taken into operation immediately, plastic foil or the cardboard top can be put over the system to protect it from humidity and dust.



www.apc.com

Hotline Support US/Canada/LAM

Hotline Support EMEA

World Wide Support numbers

800 800 4APC

+353 91 70 2000

www.apc.com/support/service/geomap_world.cfm

Place label according to SKU no.	SKU no.	Model	Voltage	Current in/out	Weight	Battery	
			3Ø+PE 60Hz			Nom. Vdc	Current
	IS10KG	AIS 5000 10kVA 480V for external batteries 10kVA / 8kW	480V	16A / 12A	1213 lbs 550 kg	240V	38A
	IS20KG	AIS 5000 20kVA 480V for external batteries 20kVA / 16kW	480V	32A / 24A	1433 lbs 650 kg	240V	75A
	IS30KG	AIS 5000 30kVA 480V for external batteries 30kVA / 24kW	480V	47A / 36A	1653 lbs 750 kg	240V	112A
	IS40KG	AIS 5000 40kVA 480V for external batteries 40kVA / 32kW	480V	62A / 48A	1984 lbs 900 kg	240V	148A
	IS60KG	AIS 5000 60kVA 480V for external batteries 60kVA / 48kW	480V	92A / 72A	2425 lbs 1100 kg	240V	220A
	IS80KG	AIS 5000 80kVA 480V for external batteries 80kVA / 64kW	480V	121A / 96A	2866 lbs 1300 kg	240V	291A
	IS100KG	AIS 5000 100kVA 480V for external batteries 100kVA / 80kW	480V	151A / 120A	3307 lbs 1500 kg	240V	364A
TEST PERSONNEL DATE AND SIGNATURE _____							

Moving the equipment to site:

Before moving the equipment to the installation site, the following should be checked:

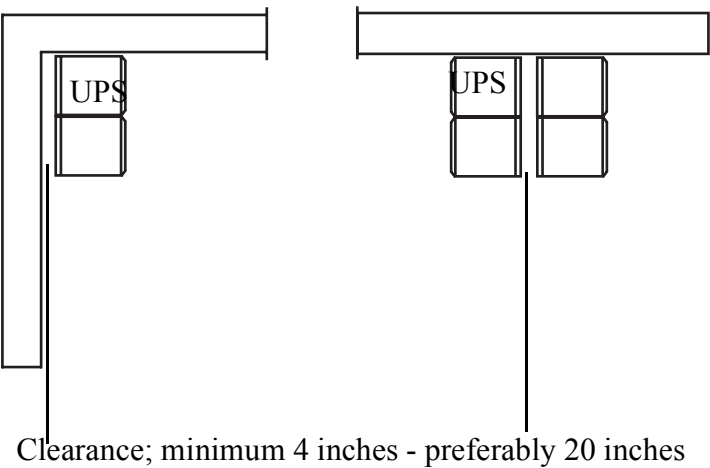
- Can the transport equipment handle the weight of the system?
- Is there enough space to transport the system to its final destination?
- Can the raised floor (double floor) handle the weight of the system?

The equipment is delivered on a pallet and can be transported on a fork-lift or a pallet truck.

The UPS is contained in a cubicle with a stable frame. This frame can carry heavy components such as transformers, chokes etc. The frame can be placed directly on a levelled concrete floor.

Clearance at installation site. The system can be installed with the back to the wall or back-to-back - however, a distance of minimum 4 inches (approx. 100mm) between the wall and the UPS is necessary. 20 inches (approx. 500mm) is the preferred distance (see below illustration).

A clearance of 20 inches (approx. 500mm) above the system is necessary to ensure sufficient space for air circulation.



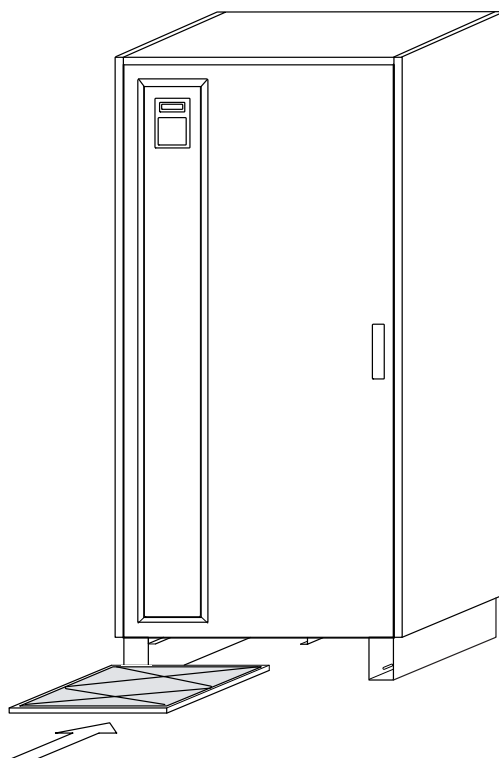
Air Filter

The air filter is to be fitted at the air inlet of the UPS, and is designed for extra protection of UPS systems installed in environments with conductive dust. If the UPS is provided with both an air filter and a NEMA 12 drip shield, the NEMA 12 protection class is obtained.



For further information on drip shield, see section “NEMA 12 Drip Shield” on page 56.

Fitting the air filter

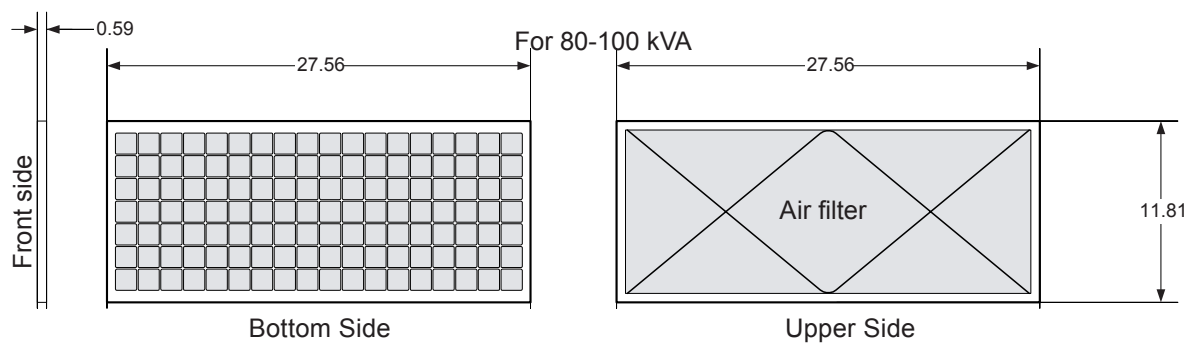
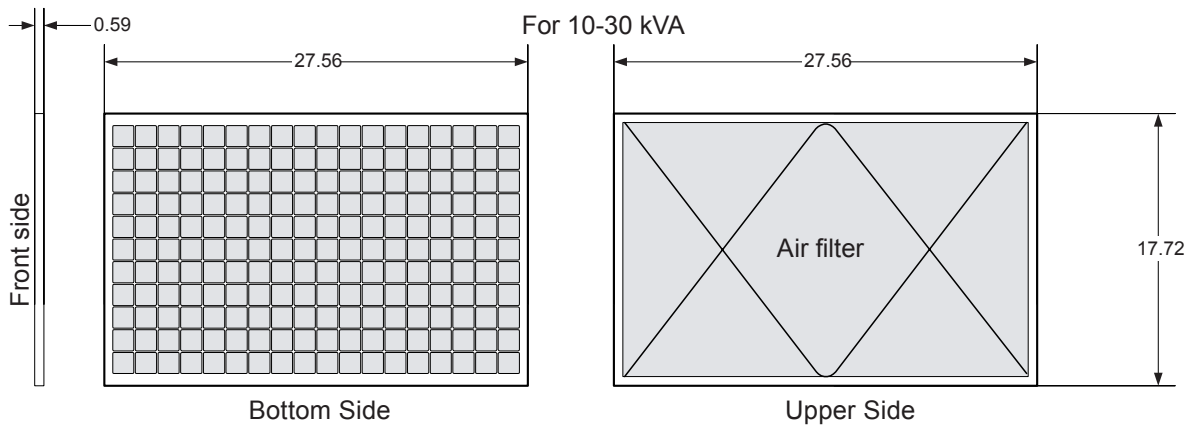
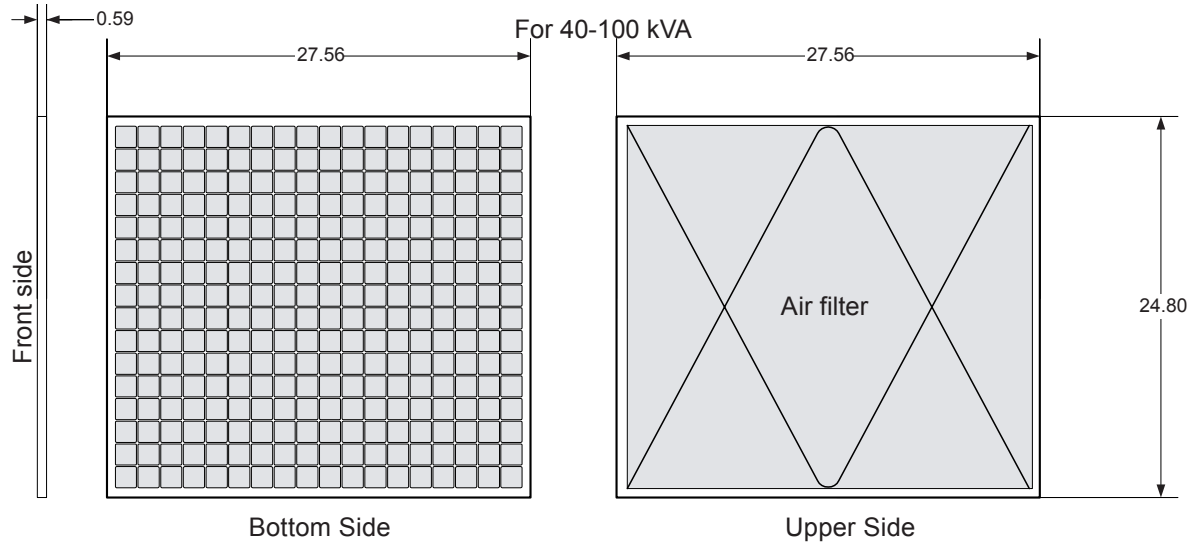


Insert the air filter in the brackets and slide it completely into the UPS enclosure.



The air filter can be mounted/replaced during normal operation of the UPS.

Air filter sizes

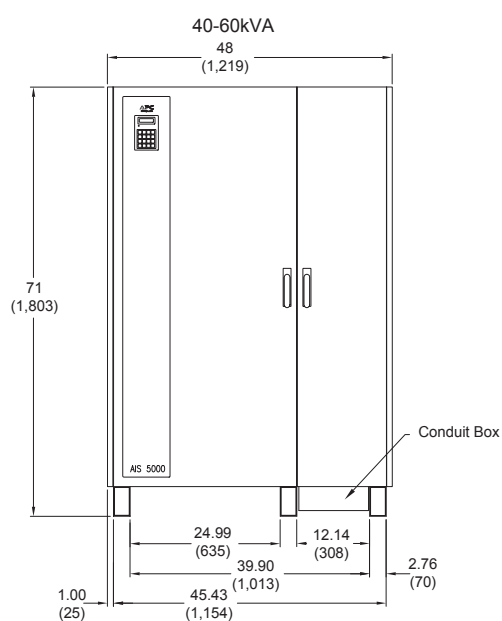
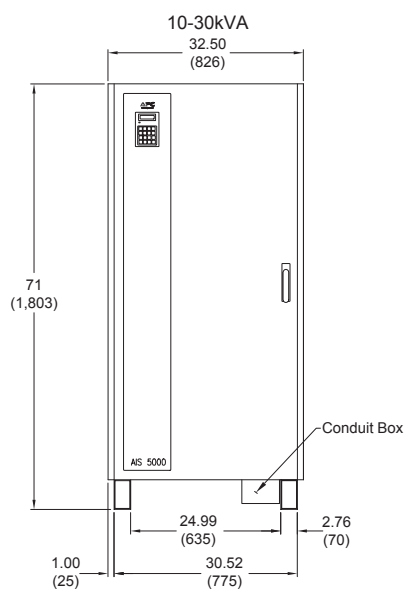


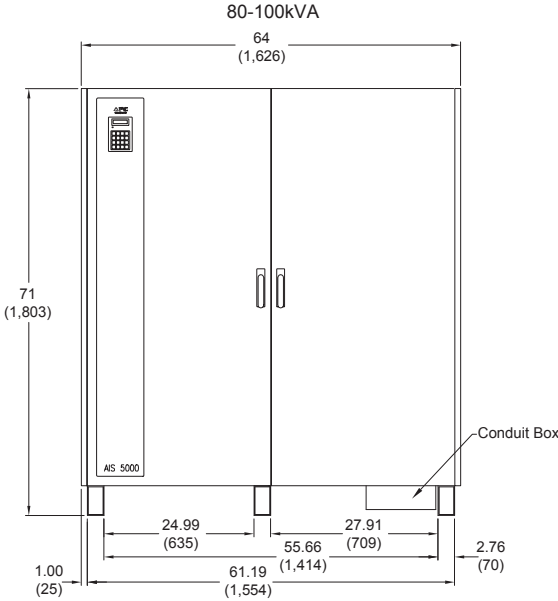
A (cut view)

Enclosure dimensions and footprint

Enclosure dimensions.

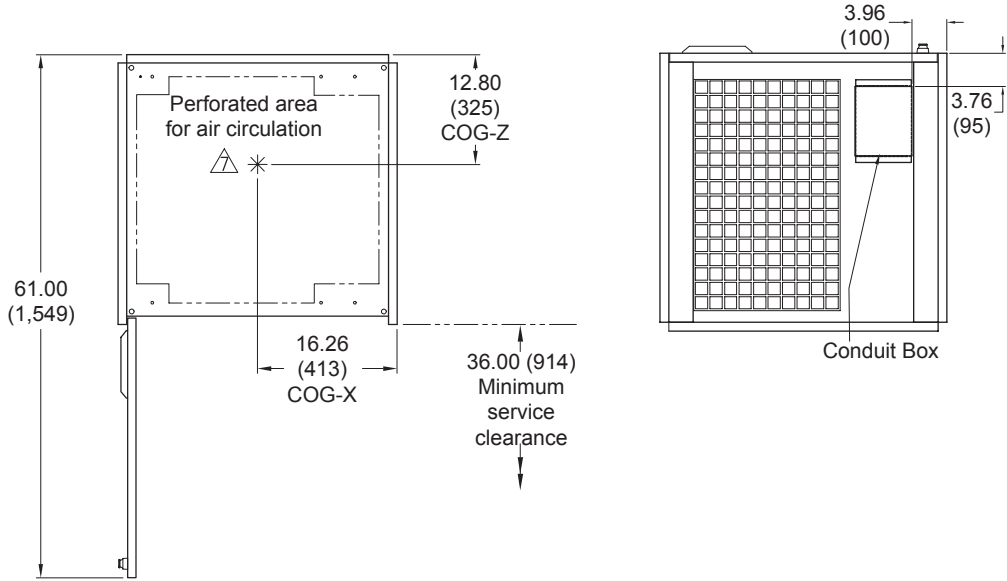
UPS	Height (inches)	Width (inches)	Depth (inches)	Weight (lbs)
10kVA	71	32.50	32	1,213
20kVA	71	32.50	32	1,433
30kVA	71	32.50	32	1,653
40kVA	71	48	32	1,984
60kVA	71	48	32	2,425
80kVA	71	64	32	2,866
100kVA	71	64	32	3,307



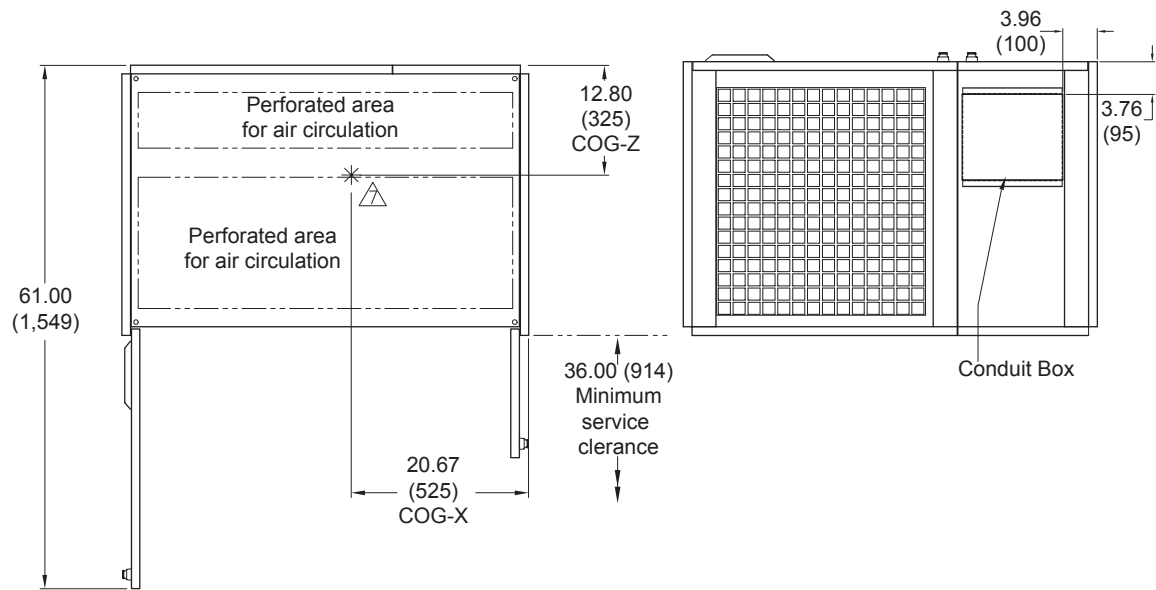


Footprint.

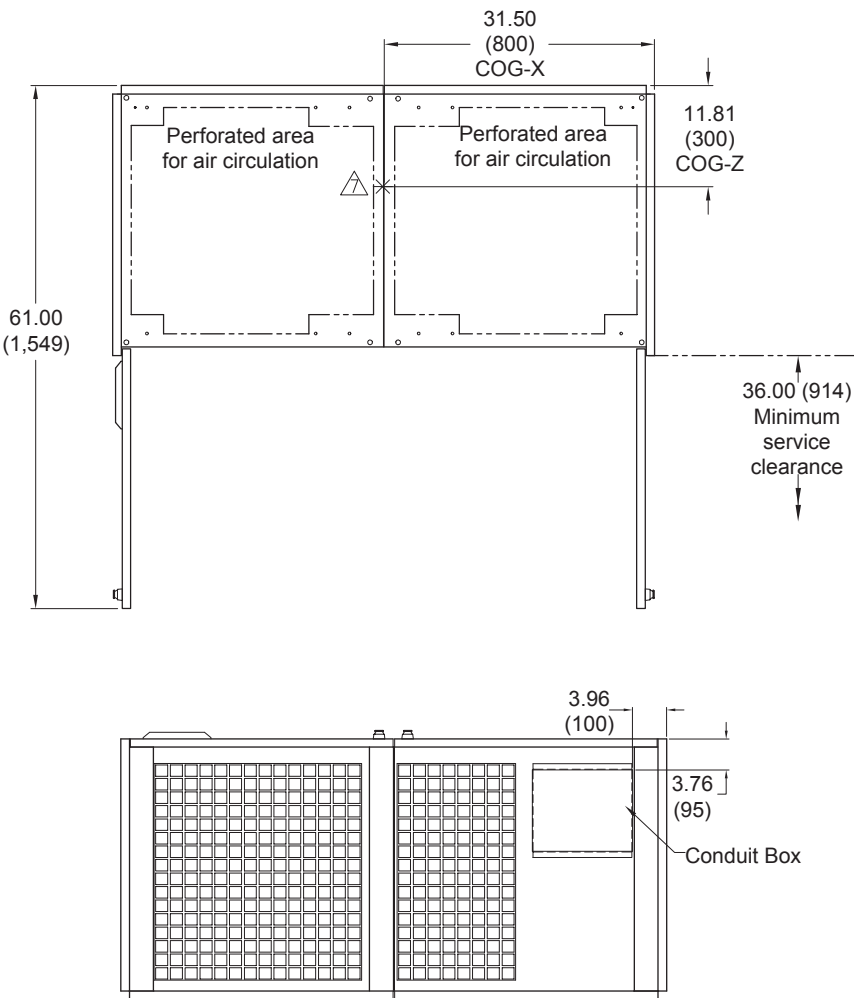
Top and bottom view of 10-30kVA UPS:



Top and bottom view of 40-60kVA UPS:



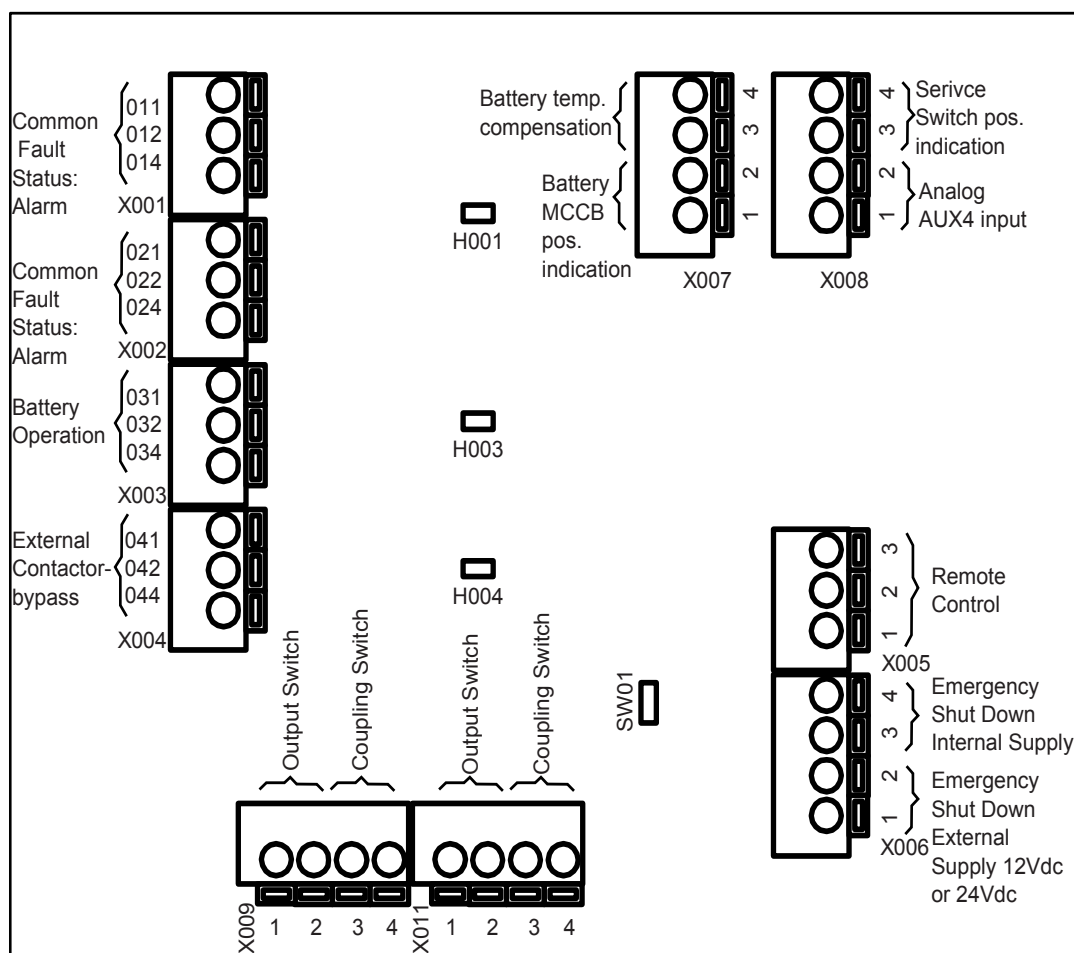
Top and bottom view of 80-100kVA UPS:



External Connection

Connecting the UPS

External connection board



Note

X001-X004 are relay change-over contacts 2A, 250Vac (0, 5A, 60Vdc). X006 is Emergency Power Off (EPO) on the input. X001-X004 is NEC class 1 wiring. X005-X011 is NEC class 2 wiring. NEC class 1 and NEC class 2 wiring must be kept separate. X007 pin 3-4 for Battery Temperature Sensor.

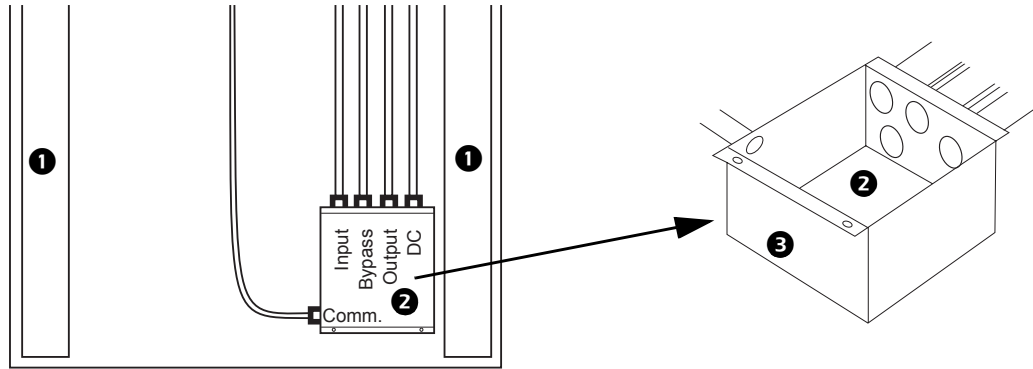


Note

Use 16 to 18AWG CU conductors only.

Installing Conduit Boxes

Top view:



- ❶ UPS Feet
- ❷ Conduit Box
- ❸ Front of Conduit Box

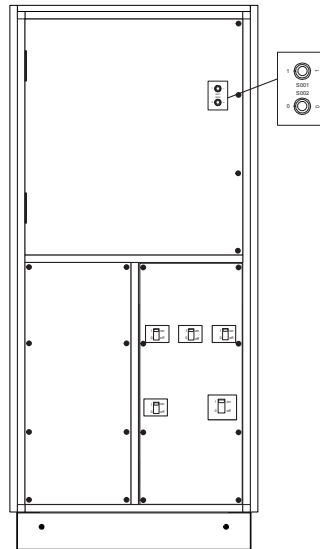


Keep NEC class 1 and NEC class 2 wiring separate!

Note

Mounting the Conduit Box:

1. Open UPS front door.
2. Remove cover of input/output section.



In order to remove the cover of the in- and output section, please remove all 8 M6x12 torx screws.

3. Place Conduit Box under UPS and align it with hole in UPS bottom plate.
4. Take out Conduit Box and make holes in Conduit Box according to below table.

Conduit sizes:

	Input Conduit (Class 1 wiring)	Output/Bypass Conduit (Class 1 wiring)	Battery Conduit (Class 1 wiring)	Alarm Conduit (Class 2 wiring)
10kVA	1/2"	1/2"	1/2"	1/2"
20kVA	3/4"	1/2"	1"	1/2"
30kVA	1"	3/4"	1.25"	1/2"
40kVA	1"	1"	1.50"	1/2"
60kVA	1.25"	1"	2.50"	1/2"
80kVA	1.50"	1.25"	2 x 1.50"	1/2"
100kVA	1.50"	1.25"	2 x 2"	1/2"

5. Install Conduit Box under UPS. Push projecting edge of Conduit Box into slot on UPS bottom plate. From inside the UPS, mount front of Conduit Box onto UPS bottom plate using 2 M4x12 crosshead screws for 10-30kVA and 3 M4x12 crosshead screws for 40-100kVA.
6. Mount conduits.
7. Feed cables.
8. Install cables according to the procedures described in the following sections.

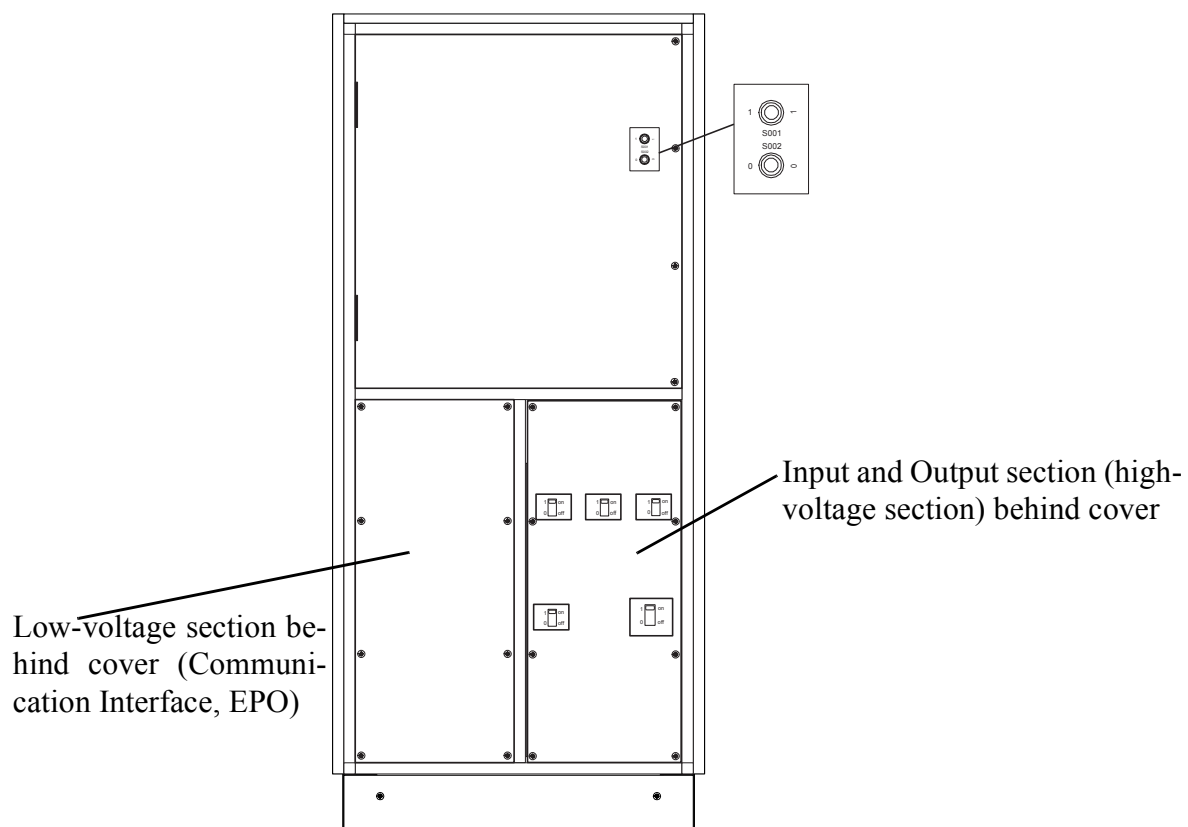
Access to Input/Output section

To access cable terminals, open front door, remove screws and lift off front cover (remember earth wire on rear side).

Remember to remount front cover (and earth wire) before system start-up.

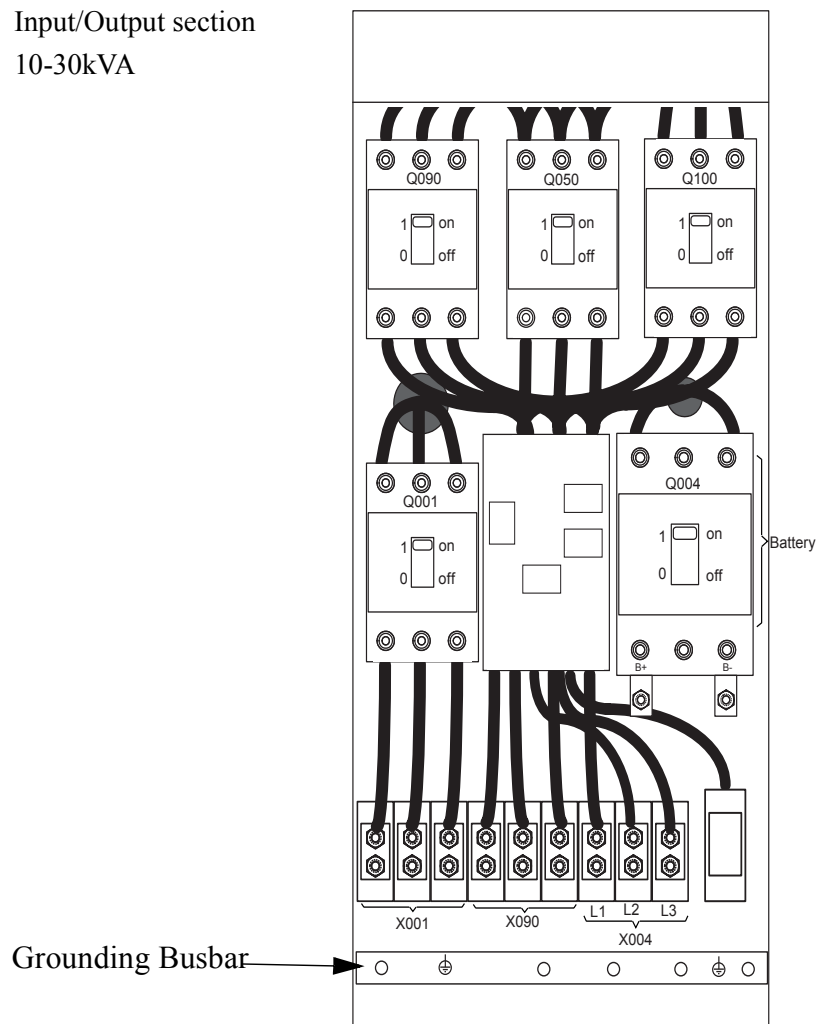


Ensure correct phase rotation of utility input voltage! Max. power cable size: see section with technical specifications starting on page 27.



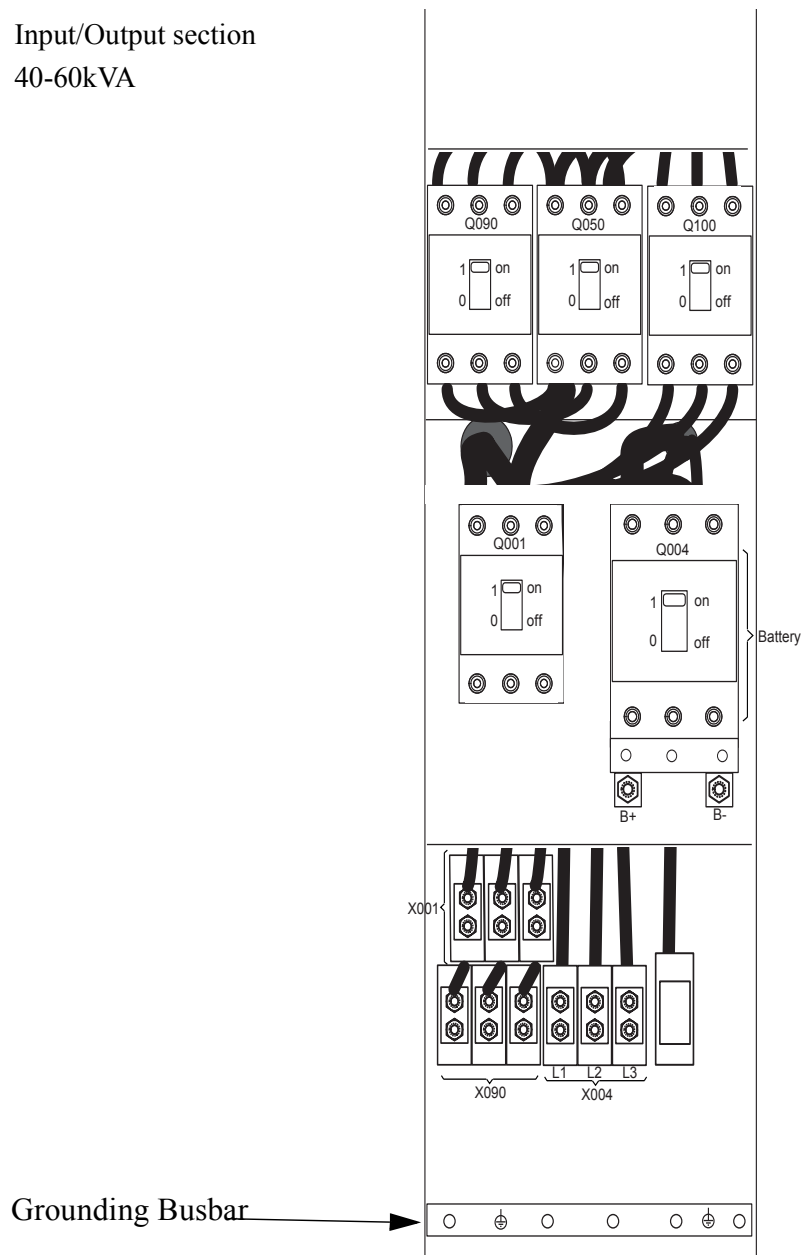
Connecting cables

Input/Output section
10-30kVA



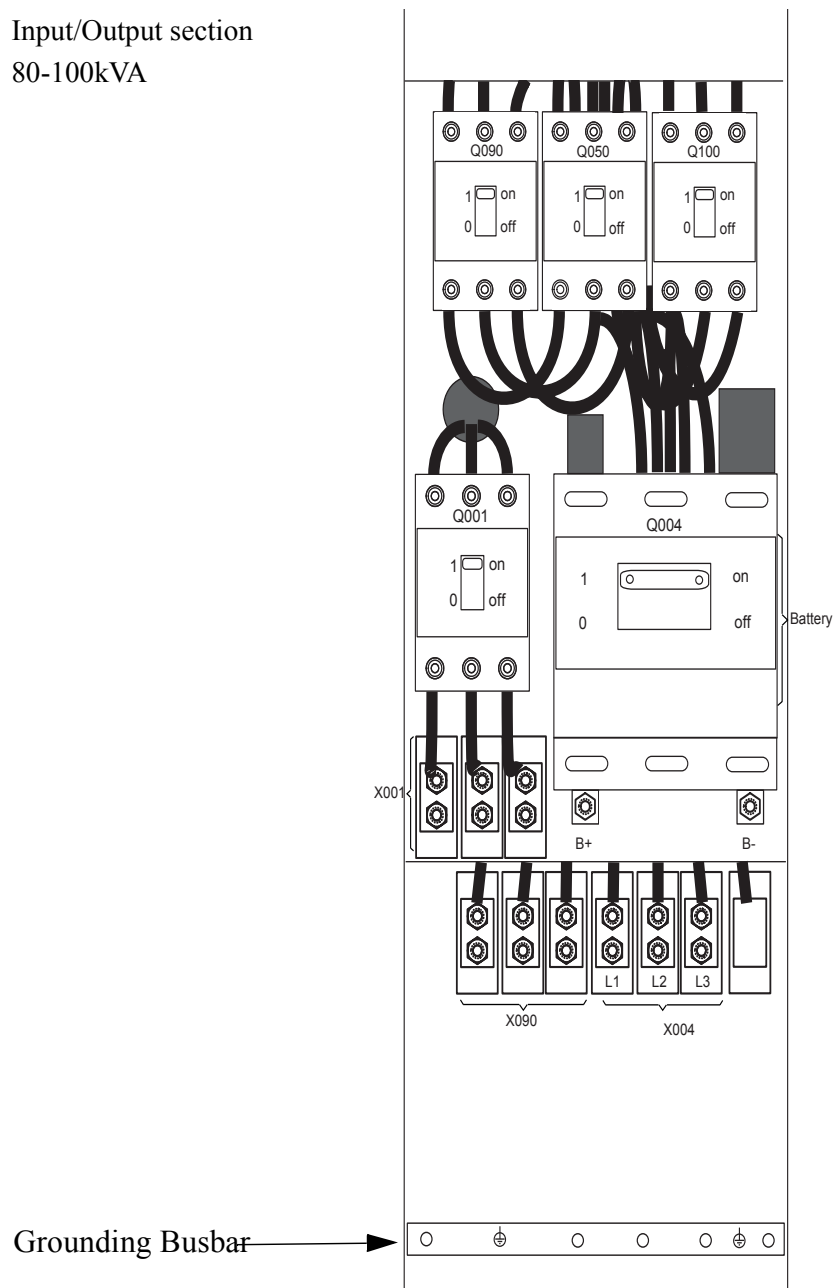
- X001 Mains Input
- X090 Bypass Input
- X004 Output (L1, L2, L3)
- Q004 Battery

Input/Output section
40-60kVA



- X001 Mains Input
- X090 Bypass Input
- X004 Output (L1, L2, L3)
- Q004 Battery

Input/Output section
80-100kVA



- X001 Mains Input
- X090 Bypass Input
- X004 Output (L1, L2, L3)
- Q004 Battery

Terminals.

	Input X001/Output X004/Bypass Input X090	Battery Q004	PE
10kVA	M6	Direct on breaker terminals	Direct on Earth Busbar
20kVA	M6	Direct on breaker terminals	Direct on Earth Busbar
30kVA	M6	Direct on breaker terminals	Direct on Earth Busbar
40kVA	M8	Direct on breaker terminals	Direct on Earth Busbar
60kVA	M8	Direct on breaker terminals	Direct on Earth Busbar
80kVA	M10	Direct on breaker terminals	Direct on Earth Busbar
100kVA	M10	Direct on breaker terminals	Direct on Earth Busbar

Recommended Panduit cable lugs and crimping tools.

Cable size (AWG)	Bolt sizes	Recommended cable lug / pin terminal type
18	N/A	PV18-P47-C
16	N/A	PV14-P47-C
14	M6	PN14-14R-C
12	M6	PN10-14R-L
10	M6	PN10-14R-L
8	M6 M8	LCAB-14-L LCAB-38-L
6	M6 M8	LCA6-14-L LCA6-38-L
4	M6 M8	LCA4-14-L LCA4-38-L
2	M6 M8 M10	LCA2-14-Q LCA2-38-Q LCA2-12-Q
1	M6 M8 M10	LCA1-14-E LCA1-38-E LCA1-12-E

Cable size (AWG)	Bolt sizes	Recommended cable lug / pin terminal type
1/0	M6 M8 M10	LCA1/0-14-X LCA1/0-38-X LCA1/0-12-X
2/0	M6 M8 M10	LCA2/0-14-X LCA2/0-38-X LCA2/0-12-X
3/0	M6 M8 M10	LCA3/0-14-X LCA3/0-38-X LCA3/0-12-X
4/0	M6 M8 M10	LCA4/0-14-X LCA4/0-38-X LCA4/0-12-X
250kcmil	M6 M8 M10	LCA250-14-X LCA250-38-X LCA250-12-X
300kcmil	M8 M10	LCA300-38-X LCA300-12-X



Note

Please use Panduit recommended crimping tool. For cable sizes please see section with technical specifications starting on page 27.



Note

The UPS input / bypass input is 3-Wire + Ground.

Torque specifications.

Stud size	6 mm	8 mm	10 mm	12 mm
Torque	66/7.5 lb-in/Nm	133/15 lb-in/Nm	266/30 lb-in/Nm	443/50 lb-in/Nm

Grounding

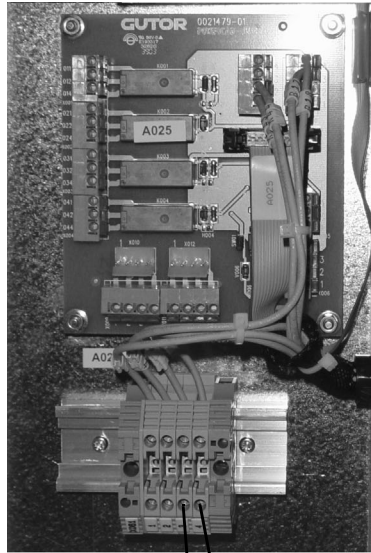
System grounding:

According to local NEC code requirements, provisions must be made as follows:

Grounding busbar marked “Grounding” must be connected by grounding electrode conductor to a local grounding electrode according to NEC 250-26 (See grounding busbar on illustrations starting on page 19).

Emergency Power Off (EPO)

The UPS is equipped with an EPO input (X006) on the external connection board (part of the low-voltage section). The battery breaker is equipped with a shunt trip function (X061: 3, 4).



Shunt Trip function (120Vac)

Communication interface

The 3-port communication interface (located in the low voltage section) is used when an interaction between UPS and an electrical device has to be established. The main purpose is to ensure a controlled shut-down of the device in case of failures in the mains power supply.



Note

This is NEC class 2 wiring - must be separated from all alarms and NEC class 1 wirings.

Communication interface ports

COM-PORT: X005

The com-port consists of 4 relay outputs from which the following information is available:

- UPS System ON/OFF
- Normal Operation/Bypass Operation
- Normal Operation/Battery Operation
- Battery Voltage OK/Battery Voltage low

One input is for remote shut-down of the UPS system.

Normally, the COM-PORT is used in connection with the automatic shut-down of computers in case of extended mains failures.

Serial Interface 20mA Current Loop: X004

This interface consists of a 0-20mA Current loop with galvanic isolation. Information on the UPS-measured values is available on this interface.

Multicom RS232: X003

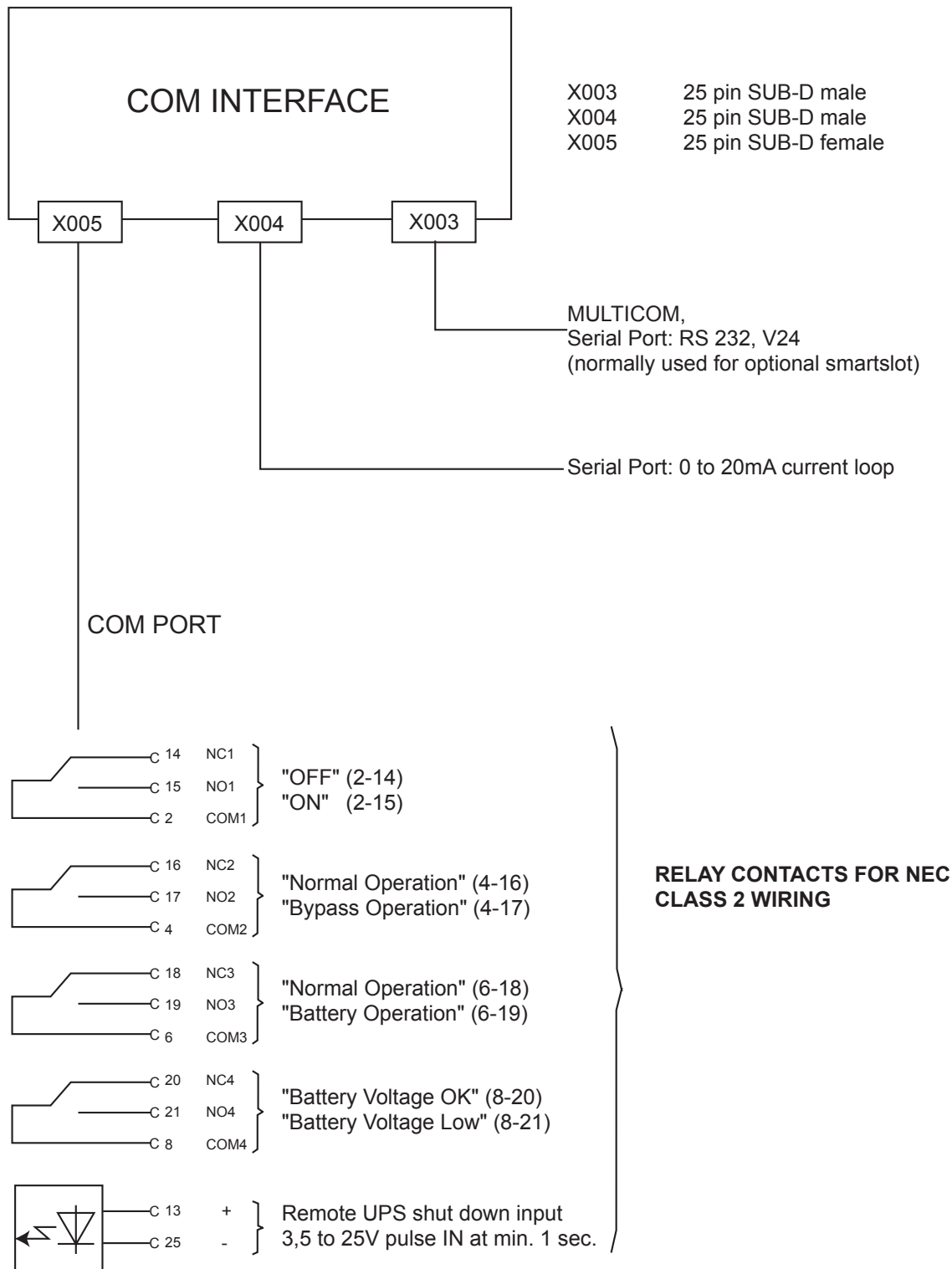
X003 is normally used for the optional smartslot, but can be used for other purposes in its place. This interface also has galvanic isolation and provides information on the UPS condition and measured values.



Note

For further information on these 2 interfaces, a protocol can be requested from APC.

Overview of Communication interface



10kVA 480V UPS

IS10KG

Performance - Linear Load

DC to AC Efficiency [%]	87.0
AC to AC Efficiency [%]	83.5
Heat Dissipation [BTU/h] [W]	5,391 / 1,579

Electrical Input

Mains

Voltage	480 V 3 Wire + G
P Nom.	9.6 kW
I Nom.	13.4 A
(Nominal input current based on nominal mains voltage and batteries fully charged at 100% ohmic load)	
I Max.	16.7 A
(Maximum input current based on full battery recharge and nominal mains voltage at 100% ohmic load)	
Over-Current protection [A]	20 A
(Based on continuous full load)	
Input Voltage Range	+ 10%, -15% programmable
Input Frequency	60 Hz \pm 6% programmable
Current Distortion	< 12%
Power Factor	0.8 - 0.9

Bypass

Voltage	480 V 3 Wire + G
I Nom	12 A
Over-Current protection [A]	15 A
(Based on continuous full load)	
Bypass Voltage Range	\pm 10% programmable

Electrical Output

Voltage	480 V 3 Wire + G
Nominal Current	12 A
(The output Current is based on the nominal apparent power of the UPS)	
Frequency Range	60Hz (adjustable 0.25, 0.50, 1-8%)
Frequency Regulation	60 Hz, \pm 0.1% free running

Electrical Output

Output Voltage Range	100% static symmetrical load $\pm 1\%$, 100% static asymmetrical load $\pm 3\%$, no load to full load $\pm 4\%$
Output Harmonic Distortion	<3% linear load <5%
Load Crest Factor	5: 1
Load Power Factor	0.9 leading to 0.7 lagging
Overload Capacity	150% for 1 min., 125% for 10 min., Bypass Operation 1000% for 5 cycles
Connection Type	Hardwire 3 PH + G

Battery - External Only

Nominal Voltage (Nominal battery voltage assumed to be 2.0 V/cell (lead technology))	240 V
Number of Battery Cells	120
Float Charge Voltage	272 Volt DC programmable
Charge Voltage Range	100 to 115% of the DC nominal Voltage, $\pm 1\%$ IU characteristic
Low Battery Warning Range	210-222 Vdc (Factory Setting 210 V)
Low Battery Shutdown	204 Vdc
Full Load (P) (The battery power takes in to account the DC-AC efficiency of the main inverter for linear load)	9.2 kW
Recommended Breaker Size [A]	60 A
Connection Type	Hard Wire 3-wire (DC+/- + G)
Nominal Discharge Current [A] (The battery nominal discharge current is based on the nominal cell Voltage of 2.0 V/cell - number of cells = 120 which gives a total Voltage of 240V)	38 A
Max. Discharge Current [A] (The battery max. discharge current is based on a cell end Voltage of 1.70V/cell which gives a total Voltage of 204V)	46 A

Communication and Management

Control Panel	Multi-function LCD status and control console
RS232 Port	Yes
Network Management Card 10/100 Base T	Optional
Audible Alarm	Audible and visible alarms prioritized by severity
Slots Empty	2
Modbus/BMS Card	Optional
Emergency Power Off (EPO)	Yes

Physical Values**Dimensions (H x W x D)**

Unit	71 x 32.5 x 32 in
Shipping	82 x 40 x 40 in

Weight

Unit	1,213 lbs
Shipping	1,300 lbs

Max. Power Cable size [AWG]	8
-----------------------------	---

Recommended Cable sizes

Ext. Input Cable [AWG]	12
Ground Cable [AWG]	8
Ext. Output Cable [AWG]	14
Ext. Battery Cable [AWG]	8
Ext. Alarm Cable Max. [AWG]	14

Recommended Conduit sizes

Input	1/2"
Output/Bypass	1/2"
Battery	1/2"
Alarm	1/2"

Environmental Values**Temperature**

Operating	32° - 104° F
Storage	-40° - 158° F

Elevation

Operating	0 - 3,300 ft
Storage	0 - 15,000 ft

Humidity	Max. 95% non-conditioned
----------	--------------------------

Protection Class	NEMA 1 (NEMA 12 optional)
------------------	---------------------------

Transient Attenuation	Differential mode 60 to 80 dB, Common mode 120 dB
-----------------------	---

Audible Noise at 3.28 feet (1 m)	60-70 dB, depending on type
----------------------------------	-----------------------------

Compliance

Approvals	FCC Part 15 Class A, UL1778, VFI-SS-112
-----------	---

Options

NEMA 12 Roof	34 x 34 in
Relay Boards	2 relay boards with each 16 dry contacts

Options

Network Management Card 10/100

Base T

Modbus/BMS Card

20kVA 480V UPS

IS20KG

Performance - Linear Load

DC to AC Efficiency [%]	89.0
AC to AC Efficiency [%]	85.4
Heat Dissipation [BTU/h] [W]	9,312 / 2,727

Electrical Input

Mains

Voltage	480 V 3 Wire + G
P Nom.	18.7 kW
I Nom.	23.6 A
(Nominal input current based on nominal mains voltage and batteries fully charged at 100% ohmic load)	
I Max.	33.1 A
(Maximum input current based on full battery recharge and nominal mains voltage at 100% ohmic load)	
Over-Current protection [A]	40 A
(Based on continuous full load)	
Input Voltage Range	+ 10%, -15% programmable
Input Frequency	60 Hz \pm 6% programmable
Current Distortion	< 12%
Power Factor	0.8 - 0.9

Bypass

Voltage	480 V 3 Wire + G
I Nom.	24.1 A
Over-Current protection [A]	30 A
(Based on continuous full load)	
Bypass Voltage Range	\pm 10% programmable

Electrical Output

Voltage	480 V 3 Wire + G
Nominal Current	24.1 A
(The output Current is based on the nominal apparent power of the UPS)	
Frequency Range	60Hz (adjustable 0.25, 0.50, 1-8%)
Frequency Regulation	60 Hz, \pm 0.1% free running

Electrical Output

Output Voltage Range	100% static symmetrical load $\pm 1\%$, 100% static asymmetrical load $\pm 3\%$, no load to full load $\pm 4\%$
Output Harmonic Distortion	<3% linear load <5%
Load Crest Factor	5: 1
Load Power Factor	0.9 leading to 0.7 lagging
Overload Capacity	150% for 1 min., 125% for 10 min., Bypass Operation 1000% for 5 cycles
Connection Type	Hardwire 3 PH + G

Battery - External Only

Nominal Voltage (Nominal battery voltage assumed to be 2.0 V/cell (lead technology))	240 V
Number of Battery Cells	120
Float Charge Voltage	272 Volt DC programmable
Charge Voltage Range	100 to 115% of the DC nominal Voltage, $\pm 1\%$ IU characteristic
Low Battery Warning Range	210 - 222 Vdc (Factory Setting 210 V)
Low Battery Shutdown	204 Vdc
Full Load (P) (The battery power takes in to account the DC-AC efficiency of the main inverter for linear load)	18.0 kW
Recommended Breaker Size [A]	125 A
Connection Type	Hard Wire 3-wire (DC+/- + G)
Nominal Discharge Current [A] (The battery nominal discharge current is based on the nominal cell Voltage of 2.0 V/cell - number of cells = 120 which gives a total Voltage of 240V)	75 A
Max. Discharge Current [A] (The battery max. discharge current is based on a cell end Voltage of 1.70V/cell which gives a total Voltage of 204V)	91 A

Communication and Management

Control Panel	Multi-function LCD status and control console
RS232 Port	Yes
Network Management Card 10/100 Base T	Optional
Audible Alarm	Audible and visible alarms prioritized by severity
Slots Empty	2
Modbus/BMS Card	Optional
Emergency Power Off (EPO)	Yes

Physical Values**Dimensions (H x W x D)**

Unit	71 x 32.48 x 33.07 in
Shipping	82 x 40 x 40 in

Weight

Unit	1,433 lbs
Shipping	1,520 lbs

Max. Power Cable size [AWG]	3
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Recommended Cable sizes

Ext. Input Cable [AWG]	8
Ground Cable [AWG]	8
Ext. Output Cable [AWG]	10
Ext. Battery Cable [AWG]	3
Ext. Alarm Cable Max. [AWG]	14

Recommended Conduit sizes

Input	1"
Output	1/2"
Battery	1"
Alarm	1/2"

Environmental Values**Temperature**

Operating	32° - 104° F
Storage	-40° - 158° F

Elevation

Operating	0 - 3,300 ft
Storage	0 - 15,000 ft

Humidity	Max. 95% non-conditioned
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Protection Class	NEMA 1 (NEMA 12 optional)
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Transient Attenuation	Differential mode 60 to 80 dB, Common mode 120 dB
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Audible Noise at 3.28 feet (1 m)	60-70 dB, depending on type
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Compliance

Approvals	FCC Part 15 Class A, UL1778, VFI-SS-112
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Options

NEMA 12 Roof	34 x 34 in
Relay Boards	2 relay boards with each 16 dry contacts

Options

Network Management Card 10/100

Base T

Modbus/BMS Card

30kVA 480V UPS

IS30KG

Performance - Linear Load

DC to AC Efficiency [%]	90.0
AC to AC Efficiency [%]	86.4
Heat Dissipation [BTU/h] [W]	12,902 / 3,778

Electrical Input

Mains

Voltage	480 V 3 Wire + G
P Nom.	27.8 kW
I Nom.	39.2 A
(Nominal input current based on nominal mains voltage and batteries fully charged at 100% ohmic load)	
I Max.	49 A
(Maximum input current based on full battery recharge and nominal mains voltage at 100% ohmic load)	
Over-Current protection [A]	60 A
(Based on continuous full load)	
Input Voltage Range	+ 10%, -15% programmable
Input Frequency	60 Hz \pm 6% programmable
Current Distortion	< 12%
Power Factor	0.8 - 0.9

Bypass

Voltage	480 V 3 Wire + G
I Nom	36.1 A
Over-Current protection [A]	45 A
(Based on continuous full load)	
Bypass Voltage Range	\pm 10% programmable

Electrical Output

Voltage	480 V 3 Wire + G
Nominal current	36.1 A
(The output current is based on the nominal apparent power of the UPS)	
Frequency Range	60Hz (adjustable 0.25, 0.50, 1-8%)
Frequency Regulation	60 Hz, \pm 0.1% free running

Electrical Output

Output Voltage Range	100% static symmetrical load $\pm 1\%$, 100% static asymmetrical load $\pm 3\%$, no load to full load $\pm 4\%$
Output Harmonic Distortion	<3% linear load <5%
Load Crest Factor	5: 1
Load Power Factor	0.9 leading to 0.7 lagging
Overload Capacity	150% for 1 min., 125% for 10 min., Bypass Operation 1000% for 5 cycles
Connection Type	Hardwire 3 PH + G

Battery - External Only

Nominal Voltage (Nominal battery voltage assumed to be 2.0 V/cell (lead technology))	240 V
Number of Battery Cells	120
Float Charge Voltage	272 Volt DC programmable
Charge Voltage Range	100 to 115% of the DC nominal Voltage, $\pm 1\%$ IU characteristic
Low Battery Warning Range	210 - 222 Vdc (Factory Setting 210 V)
Low Battery Shutdown	204 Vdc
Full Load (P) (The battery power takes in to account the DC-AC efficiency of the main inverter for linear load)	26.7 kW
Recommended Breaker Size [A]	150 A
Connection Type	Hard Wire 3-wire (DC+/- + G)
Nominal Discharge Current [A] (The battery nominal discharge current is based on the nominal cell Voltage of 2.0 V/cell - number of cells = 120 which gives a total Voltage of 240V)	111 A
Max. Discharge Current [A] (The battery max. discharge current is based on a cell end Voltage of 1.70V/cell which gives a total Voltage of 204V)	135 A

Communication and Management

Control Panel	Multi-function LCD status and control console
RS232 Port	Yes
Network Management Card 10/100 Base T	Optional
Audible Alarm	Audible and visible alarms prioritized by severity
Slots Empty	2
Modbus/BMS Card	Optional
Emergency Power Off (EPO)	Yes

Physical Values**Dimensions (H x W x D)**

Unit	71 x 32.50 x 32 in
Shipping	82 x 40 x 40 in

Weight

Unit	1,653 lbs
Shipping	1,740 lbs

Max. Power Cable size [AWG]	1/0
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Recommended Cable sizes

Ext. Input Cable [AWG]	4
Ground Cable [AWG]	8
Ext. Output Cable [AWG]	8
Ext. Battery Cable [AWG]	1/0
Ext. Alarm Cable Max. [AWG]	14

Recommended Conduit sizes

Input	1.25"
Output	3/4"
Battery	1.25"
Alarm	1/2"

Environmental Values**Temperature**

Operating	32° - 104° F
Storage	-40° - 158° F

Elevation

Operating	0 - 3,300 ft
Storage	0 - 15,000 ft

Humidity	Max. 95% non-conditioned
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Protection Class	NEMA 1 (NEMA 12 optional)
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Transient Attenuation	Differential mode 60 to 80 dB, Common mode 120 dB
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Audible Noise at 3.28 feet (1 m)	60-70 dB, depending on type
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Compliance

Approvals	FCC Part 15 Class A, UL1778, VFI-SS-112
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Options

NEMA 12 Roof	34 x 34 in
Relay Boards	2 relay boards with each 16 dry contacts

Options

Network Management Card 10/100

Base T

Modbus/BMS Card

40kVA 480V UPS

IS40KG

Performance - Linear Load

DC to AC Efficiency [%]	90.5
AC to AC Efficiency [%]	86.9
Heat Dissipation [BTU/h] [W]	16,504 / 4,832

Electrical Input

Mains

Voltage	480 V 3 Wire + G
P Nom.	36.8 kW
I Nom.	51.9 A
(Nominal input current based on nominal mains voltage and batteries fully charged at 100% ohmic load)	
I Max.	64.0 A
(Maximum input current based on full battery recharge and nominal mains voltage at 100% ohmic load)	
Over-Current protection [A]	80 A
(Based on continuous full load)	
Input Voltage Range	+ 10%, -15% programmable
Input Frequency	60 Hz \pm 6% programmable
Current Distortion	< 12%
Power Factor	0.8 - 0.9

Bypass

Voltage	480 V 3 Wire + G
I Nom	48.1 A
Over-Current protection [A]	60 A
(Based on continuous full load)	
Bypass Voltage Range	\pm 10% programmable

Electrical Output

Voltage	480 V 3 Wire + G
Nominal current	48.1 A
(The output current is based on the nominal apparent power of the UPS)	
Frequency Range	60Hz (adjustable 0.25, 0.50, 1-8%)
Frequency Regulation	60 Hz, \pm 0.1% free running

Electrical Output

Output Voltage Range	100% static symmetrical load $\pm 1\%$, 100% static asymmetrical load $\pm 3\%$, no load to full load $\pm 4\%$
Output Harmonic Distortion	<3% linear load <5%
Load Crest Factor	5: 1
Load Power Factor	0.9 leading to 0.7 lagging
Overload Capacity	150% for 1 min., 125% for 10 min., Bypass Operation 1000% for 5 cycles
Connection Type	Hardwire 3 PH + G

Battery - External Only

Nominal Voltage (Nominal battery voltage assumed to be 2.0 V/cell (lead technology))	240 V
Number of Battery Cells	120
Float Charge Voltage	272 Volt DC programmable
Charge Voltage Range	100 to 115% of the DC nominal Voltage, $\pm 1\%$ IU characteristic
Low Battery Warning Range	210 - 222 Vdc (Factory Setting 210 V)
Low Battery Shutdown	204 Vdc
Full Load (P) (The battery power takes in to account the DC-AC efficiency of the main inverter for linear load)	35.4 kW
Recommended Breaker Size [A]	200 A
Connection Type	Hard Wire 3-wire (DC+/- + G)
Nominal Discharge Current [A] (The battery nominal discharge current is based on the nominal cell Voltage of 2.0 V/cell - number of cells = 120 which gives a total Voltage of 240V)	147 A
Max. Discharge Current [A] (The battery max. discharge current is based on a cell end Voltage of 1.70V/cell which gives a total Voltage of 204V)	179 A

Communication and Management

Control Panel	Multi-function LCD status and control console
RS232 Port	Yes
Network Management Card 10/100 Base T	Optional
Audible Alarm	Audible and visible alarms prioritized by severity
Slots Empty	2
Modbus/BMS Card	Optional
Emergency Power Off (EPO)	Yes

Physical Values**Dimensions (H x W x D)**

Unit	71 x 48 x 32 in
Shipping	82 x 56 x 40 in

Weight

Unit	1,984 lbs
Shipping	2,100 lbs

Max. Power Cable size [AWG]	3/0
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Recommended Cable sizes [AWG]

Ext. Input Cable [AWG]	3
Ground Cable [AWG]	8
Ext. Output Cable [AWG]	6
Ext. Battery Cable [AWG]	3/0
Ext. Alarm Cable Max. [AWG]	14

Recommended Conduit sizes

Input	1.25"
Output	1"
Battery	1.5"
Alarm	1/2"

Environmental Values**Temperature**

Operating	32° - 104° F
Storage	-40° - 158° F

Elevation

Operating	0 - 3,300 ft
Storage	0 - 15,000 ft

Humidity	Max. 95% non-conditioned
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Protection Class	NEMA 1 (NEMA 12 optional)
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Transient Attenuation	Differential mode 60 to 80 dB, Common mode 120 dB
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Audible Noise at 3.28 feet (1 m)	60-70 dB, depending on type
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Compliance

Approvals	FCC Part 15 Class A, UL1778, VFI-SS-112
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Options

NEMA 12 Roof	50 x 34 in
Relay Boards	2 relay boards with each 16 dry contacts

Options

Network Management Card 10/100

Base T

Modbus/BMS Card

60kVA 480V UPS

IS60KG

Performance - Linear Load

DC to AC Efficiency [%]	91.0
AC to AC Efficiency [%]	87.4
Heat Dissipation [BTU/h] [W]	23,719 / 6,945

Electrical Input

Mains

Voltage	480 V 3 Wire + G
P Nom.	54.9 kW
I Nom.	77 A
(Nominal input current based on nominal mains voltage and batteries fully charged at 100% ohmic load)	
I Max.	97.3 A
(Maximum input current based on full battery recharge and nominal mains voltage at 100% ohmic load)	
Over-Current protection [A]	125 A
(Based on continuous full load)	
Input Voltage Range	+ 10%, -15% programmable
Input Frequency	60 Hz \pm 6% programmable
Current Distortion	< 12%
Power Factor	0.8 - 0.9

Bypass

Voltage	480 V 3 Wire + G
I Nom	72.2 A
Over-Current protection [A]	90 A
(Based on continuous full load)	
Bypass Voltage Range	\pm 10% programmable

Electrical Output

Voltage	480 V 3 Wire + G
Nominal current	72.2 A
(The output current is based on the nominal apparent power of the UPS)	
Frequency Range	60Hz (adjustable 0.25, 0.50, 1-8%)
Frequency Regulation	60 Hz, \pm 0.1% free running

Electrical Output

Output Voltage Range	100% static symmetrical load $\pm 1\%$, 100% static asymmetrical load $\pm 3\%$, no load to full load $\pm 4\%$
Output Harmonic Distortion	<3% linear load <5%
Load Crest Factor	5: 1
Load Power Factor	0.9 leading to 0.7 lagging
Overload Capacity	150% for 1 min., 125% for 10 min., Bypass Operation 1000% for 5 cycles
Connection Type	Hardwire 3 PH + G

Battery - External Only

Nominal Voltage (Nominal battery voltage assumed to be 2.0 V/cell (lead technology))	240 V
Number of Battery Cells	120
Float Charge Voltage	272 Volt DC programmable
Charge Voltage Range	100 to 115% of the DC nominal Voltage, $\pm 1\%$ IU characteristic
Low Battery Warning Range	210 - 222 Vdc (Factory Setting 210 V)
Low Battery Shutdown	204 Vdc
Full Load (P) (The battery power takes in to account the DC-AC efficiency of the main inverter for linear load)	52.7 kW
Recommended Breaker Size [A]	300 A
Connection Type	Hard Wire 3-wire (DC+/- + G)
Nominal Discharge Current [A] (The battery nominal discharge current is based on the nominal cell Voltage of 2.0 V/cell - number of cells = 120 which gives a total Voltage of 240V)	220 A
Max. Discharge Current [A] (The battery max. discharge current is based on a cell end Voltage of 1.70V/cell which gives a total Voltage of 204V)	266 A

Communication and Management

Control Panel	Multi-function LCD status and control console
RS232 Port	Yes
Network Management Card 10/100 Base T	Optional
Audible Alarm	Audible and visible alarms prioritized by severity
Slots Empty	2
Modbus/BMS Card	Optional
Emergency Power Off (EPO)	Yes

Physical Values**Dimensions (H x W x D)**

Unit	71 x 48 x 32 in
Shipping	82 x 56 x 40 in

Weight

Unit	2,425 lbs
Shipping	2,540 lbs

Max. Power Cable size	300kcmil
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Recommended Cable sizes

Ext. Input Cable [AWG]	1/0
Ground Cable [AWG]	6
Ext. Output Cable [AWG]	2
Ext. Battery Cable	300kcmil
Ext. Alarm Cable Max. [AWG]	14

Recommended Conduit sizes

Input	1.25"
Output	1"
Battery	2.5"
Alarm	1/2"

Environmental Values**Temperature**

Operating	32° - 104° F
Storage	-40° - 158° F

Elevation

Operating	0 - 3,300 ft
Storage	0 - 15,000 ft

Humidity	Max. 95% non-conditioned
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Protection Class	NEMA 1 (NEMA 12 optional)
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Transient Attenuation	Differential mode 60 to 80 dB, Common mode 120 dB
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Audible Noise at 3.28 feet (1 m)	60-70 dB, depending on type
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Compliance

Approvals	FCC Part 15 Class A, UL1778, VFI-SS-112
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Options

NEMA 12 Roof	50 x 34 in
Relay Boards	2 relay boards with each 16 dry contacts

Options

Network Management Card 10/100

Base T

Modbus/BMS Card

80kVA 480V UPS

IS80KG

Performance - Linear Load

DC to AC Efficiency [%]	91.5
AC to AC Efficiency [%]	87.8
Heat Dissipation [BTU/h] [W]	30,258/8,860

Electrical Input

Mains

Voltage	480 V 3 Wire + G
P Nom.	72.9 kW
I Nom.	102.1 A
(Nominal input current based on nominal mains voltage and batteries fully charged at 100% ohmic load)	
I Max.	126.0 A
(Maximum input current based on full battery recharge and nominal mains voltage at 100% ohmic load)	
Over-Current protection [A]	160 A
(Based on continuous full load)	
Input Voltage Range	+ 10%, -15% programmable
Input Frequency	60 Hz \pm 6% programmable
Current Distortion	< 12%
Power Factor	0.8 - 0.9

Bypass

Voltage	480 V 3 Wire + G
I Nom	96.2 A
Over-Current protection [A]	125 A
(Based on continuous full load)	
Bypass Voltage Range	\pm 10% programmable

Electrical Output

Voltage	480 V 3 Wire + G
Nominal current	96.3 A
(The output current is based on the nominal apparent power of the UPS)	
Frequency Range	60Hz (adjustable 0.25, 0.50, 1-8%)
Frequency Regulation	60 Hz, \pm 0.1% free running

Electrical Output

Output Voltage Range	100% static symmetrical load $\pm 1\%$, 100% static asymmetrical load $\pm 3\%$, no load to full load $\pm 4\%$
Output Harmonic Distortion	<3% linear load <5%
Load Crest Factor	5: 1
Load Power Factor	0.9 leading to 0.7 lagging
Overload Capacity	150% for 1 min., 125% for 10 min., Bypass Operation 1000% for 5 cycles
Connection Type	Hardwire 3 PH + G

Battery - External Only

Nominal Voltage (Nominal battery voltage assumed to be 2.0 V/cell (lead technology))	240 V
Number of Battery Cells	120
Float Charge Voltage	272 Volt DC programmable
Charge Voltage Range	100 to 115% of the DC nominal Voltage, $\pm 1\%$ IU characteristic
Low Battery Warning Range	210 - 222 Vdc (Factory Setting 210 V)
Low Battery Shutdown	204 Vdc
Full Load (P) (The battery power takes in to account the DC-AC efficiency of the main inverter for linear load)	69.9 kW
Recommended Breaker Size [A]	400 A
Connection Type	Hard Wire 3-wire (DC+/- + G)
Nominal Discharge Current [A] (The battery nominal discharge current is based on the nominal cell Voltage of 2.0 V/cell - number of cells = 120 which gives a total Voltage of 240V)	291 A
Max. Discharge Current [A] (The battery max. discharge current is based on a cell end Voltage of 1.70V/cell which gives a total Voltage of 204V)	353 A

Communication and Management

Control Panel	Multi-function LCD status and control console
RS232 Port	Yes
Network Management Card 10/100 Base T	Optional
Audible Alarm	Audible and visible alarms prioritized by severity
Slots Empty	2
Modbus/BMS Card	Optional
Emergency Power Off (EPO)	Yes

Physical Values**Dimensions (H x W x D)**

Unit	71 x 64 x 32 in
Shipping	82 x 72 x 40 in

Weight

Unit	2,866 lbs
Shipping	3,000 lbs

Max. Power Cable size	500kcmil
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Recommended Cable sizes

Ext. Input Cable [AWG]	3/0
Ground Cable [AWG]	4
Ext. Output Cable [AWG]	1/0
Ext. Battery cable	2 x 2/0
Ext. Alarm Cable Max. [AWG]	14

Recommended Conduit sizes

Input	1.5"
Output	1.25"
Battery	2 x 1.5"
Alarm	1/2"

Environmental Values**Temperature**

Operating	32° - 104° F
Storage	-40° - 158° F

Elevation

Operating	0 - 3,300 ft
Storage	0 - 15,000 ft

Humidity	Max. 95% non-conditioned
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Protection Class	NEMA 1 (NEMA 12 optional)
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Transient Attenuation	Differential mode 60 to 80 dB, Common mode 120 dB
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Audible Noise at 3.28 feet (1 m)	60-70 dB, depending on type
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Compliance

Approvals	FCC Part 15 Class A, UL1778, VFI-SS-112
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Options

NEMA 12 Roof	66 x 34 in
Relay Boards	2 relay boards with each 16 dry contacts

Options

Network Management Card 10/100

Base T

Modbus/BMS Card

100kVA 480V UPS

IS100KG

Performance - Linear Load

DC to AC Efficiency [%]	91.5
AC to AC Efficiency [%]	87.8
Heat Dissipation [BTU/h] [W]	37,822 / 11,075

Electrical Input

Mains

Voltage	480 V 3 Wire + G
P Nom.	91.1 kW
I Nom.	127.7 A
(Nominal input current based on nominal mains voltage and batteries fully charged at 100% ohmic load)	
I Max.	158.0 A
(Maximum input current based on full battery recharge and nominal mains voltage at 100% ohmic load)	
Over-Current protection [A]	200 A
(Based on continuous full load)	
Input Voltage Range	+ 10%, -15% programmable
Input Frequency	60 Hz \pm 6% programmable
Current Distortion	< 12%
Power Factor	0.8 - 0.9

Bypass

Voltage	480 V 3 Wire + G
I Nom	120.3 A
Over-Current protection [A]	160 A
(Based on continuous full load)	
Bypass Voltage Range	\pm 10% programmable

Electrical Output

Voltage	480 V 3 Wire + G
Nominal current	120.3 A
(The output current is based on the nominal apparent power of the UPS)	
Frequency Range	60Hz (0.25, 0.50, 1-8%)
Frequency Regulation	60 Hz, \pm 0.1% free running

Electrical Output

Output Voltage Range	100% static symmetrical load $\pm 1\%$, 100% static asymmetrical load $\pm 3\%$, no load to full load $\pm 4\%$
Output Harmonic Distortion	<3% linear load <5%
Load Crest Factor	5: 1
Load Power Factor	0.9 leading to 0.7 lagging
Overload Capacity	150% for 1 min., 125% for 10 min., Bypass Operation 1000% for 5 cycles
Connection Type	Hardwire 3 PH + G

Battery - External Only

Nominal Voltage (Nominal battery voltage assumed to be 2.0 V/cell (lead technology))	240 V
Number of Battery Cells	120
Float Charge Voltage	272 Volt DC programmable
Charge Voltage Range	100 to 115% of the DC nominal Voltage, $\pm 1\%$ IU characteristic
Low Battery Warning Range	210 - 222 Vdc (Factory Setting 210 V)
Low Battery Shutdown	204 Vdc
Full Load (P) (The battery power takes in to account the DC-AC efficiency of the main inverter for linear load)	87.4 kW
Recommended Breaker Size [A]	500 A
Connection Type	Hard Wire 3-wire (DC+/- + G)
Nominal Discharge Current [A] (The battery nominal discharge current is based on the nominal cell Voltage of 2.0 V/cell - number of cells = 120 which gives a total Voltage of 240V)	364 A
Max. Discharge Current [A] (The battery max. discharge current is based on a cell end Voltage of 1.70V/cell which gives a total Voltage of 204V)	442 A

Communication and Management

Control Panel	Multi-function LCD status and control console
RS232 Port	Yes
Network Management Card 10/100 Base T	Optional
Audible Alarm	Audible and visible alarms prioritized by severity
Slots Empty	2
Modbus/BMS Card	Optional
Emergency Power Off (EPO)	Yes

Physical Values**Dimensions (H x W x D)**

Unit	71 x 64 x 32 in
Shipping	82 x 72 x 40 in

Weight

Unit	3,307 lbs
Shipping	3,470 lbs

Max. Power Cable size [AWG]	2 x 4/0
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Recommended Cable sizes

Ext. Input Cable [AWG]	250kcmil
Ground Cable [AWG]	3
Ext. Output Cable [AWG]	1/0
Ext. Battery Cable [AWG]	2 x 4/0
Ext. Alarm Cable Max. [AWG]	14

Recommended Conduit sizes

Input	2.50"
Output	1.25"
Battery	2 x 2"
Alarm	1/2"

Environmental Values**Temperature**

Operating	32° - 104° F
Storage	-40° - 158° F

Elevation

Operating	0 - 3,300 ft
Storage	0 - 15,000 ft

Humidity	Max. 95% non-conditioned
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Protection Class	NEMA 1 (NEMA 12 optional)
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Transient Attenuation	Differential mode 60 to 80 dB, Common mode 120 dB
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Audible Noise at 3.28 feet (1 m)	60-70 dB, depending on type
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Compliance

Approvals	FCC Part 15 Class A, UL1778, VFI-SS-112
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Options

NEMA 12 Roof	66 x 34 in
Relay Boards	2 relay boards with each 16 dry contacts

Options

Network Management Card 10/100

Base T

Modbus/BMS Card

Options

For information on options and accessories available in your region, please contact APC - See “How to Contact” on the back cover of this manual.

NEMA 12 drip shields, Communication cards and Relay boards are described in the following.

NEMA 12 Drip Shield

If the UPS is installed in an environment with dripping, non-corrosive liquids, install a NEMA 12 drip shield to prevent such non-corrosive liquids from dripping into the UPS.

To achieve protection class 12, the UPS must be equipped with the NEMA 12 drip shield and an air filter at the bottom.

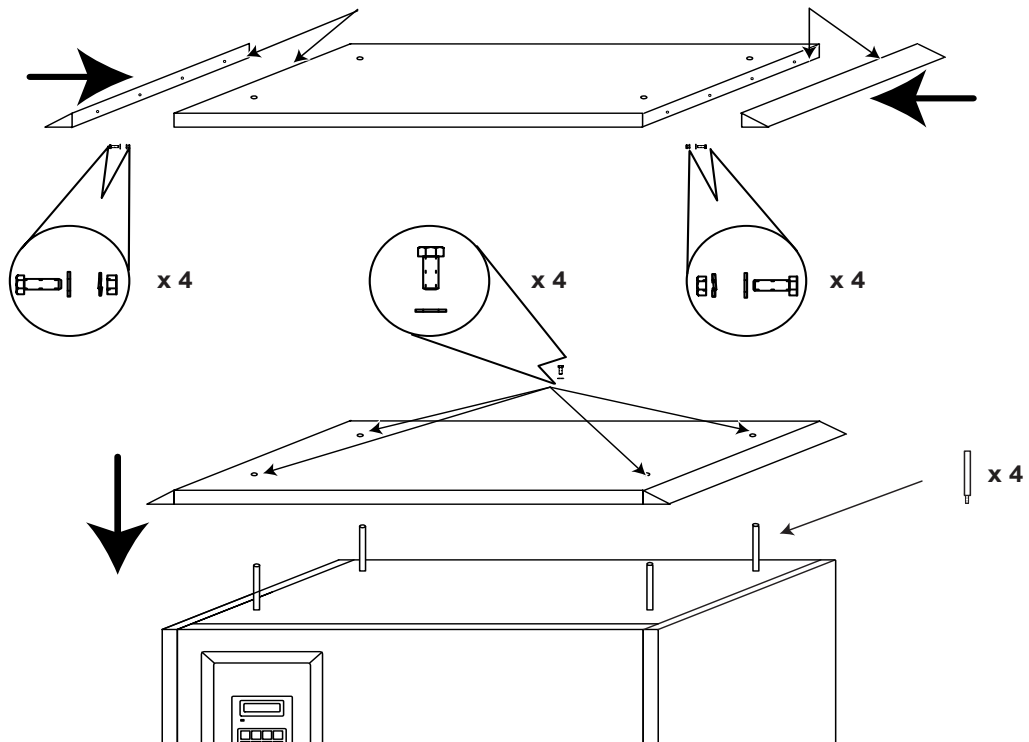


For further information on air filter, see section on “Air Filter” on page 8.

Mounting the NEMA 12 drip shield

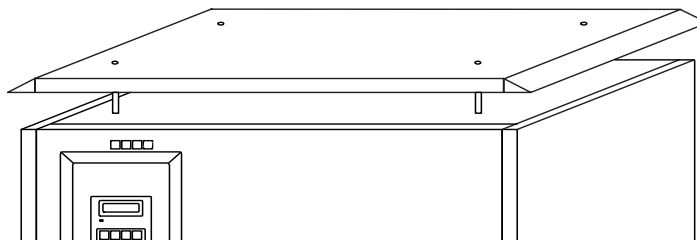
1 Remove protection foil before assembly!
(not shown on illustration)

2 Mount sides on drip shield

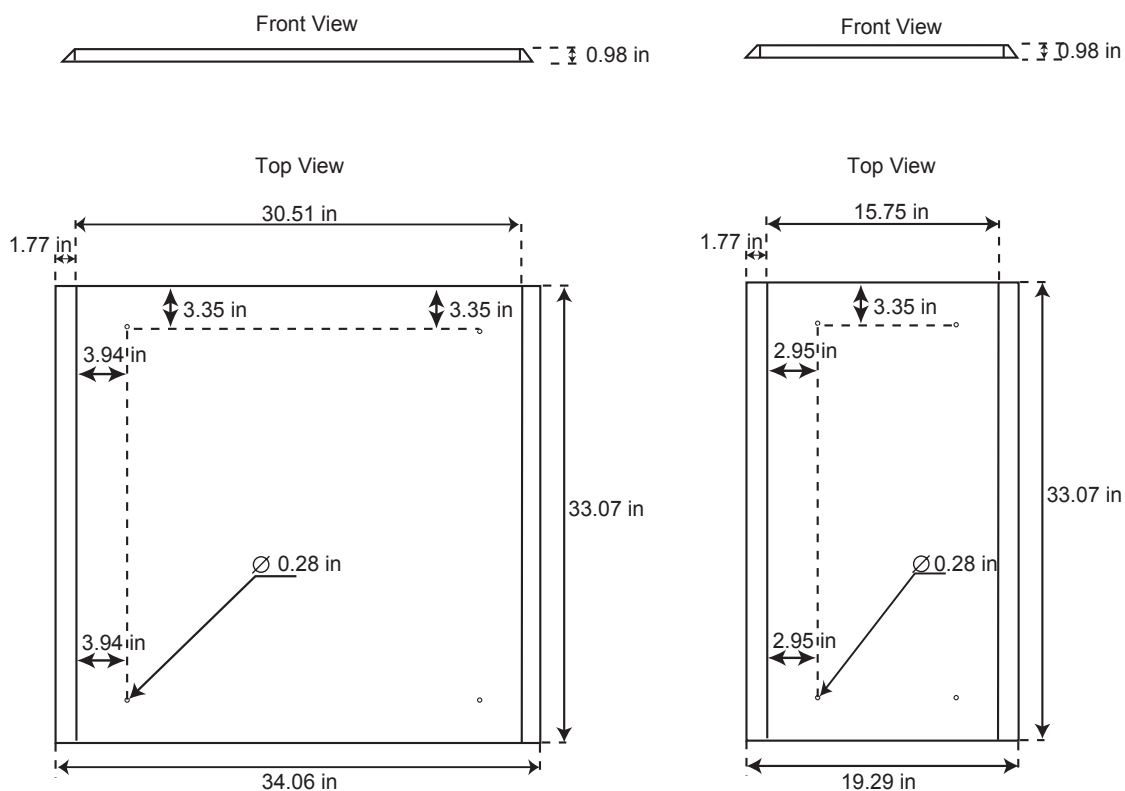


3 Remove the 4 bolts from UPS drip shield and mount the 4 stand-offs.

4 Reuse bolts from UPS roof to attach NEMA 12 drip shield

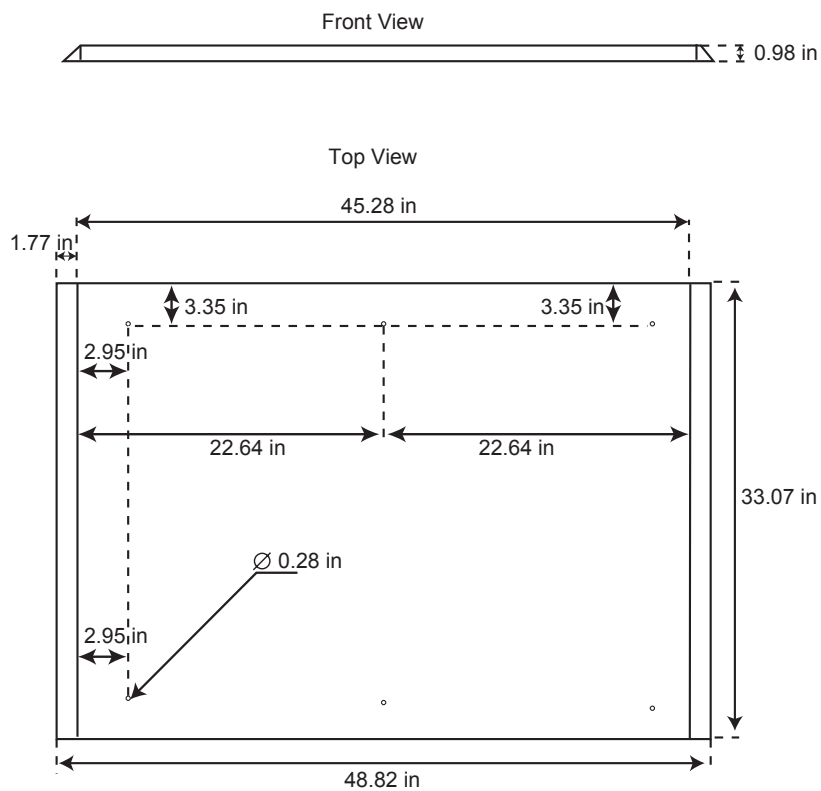


NEMA 12 sizes



NEMA 12 for 10-30 and 80-100 kVA UPS

NEMA 12 for Battery Enclosure



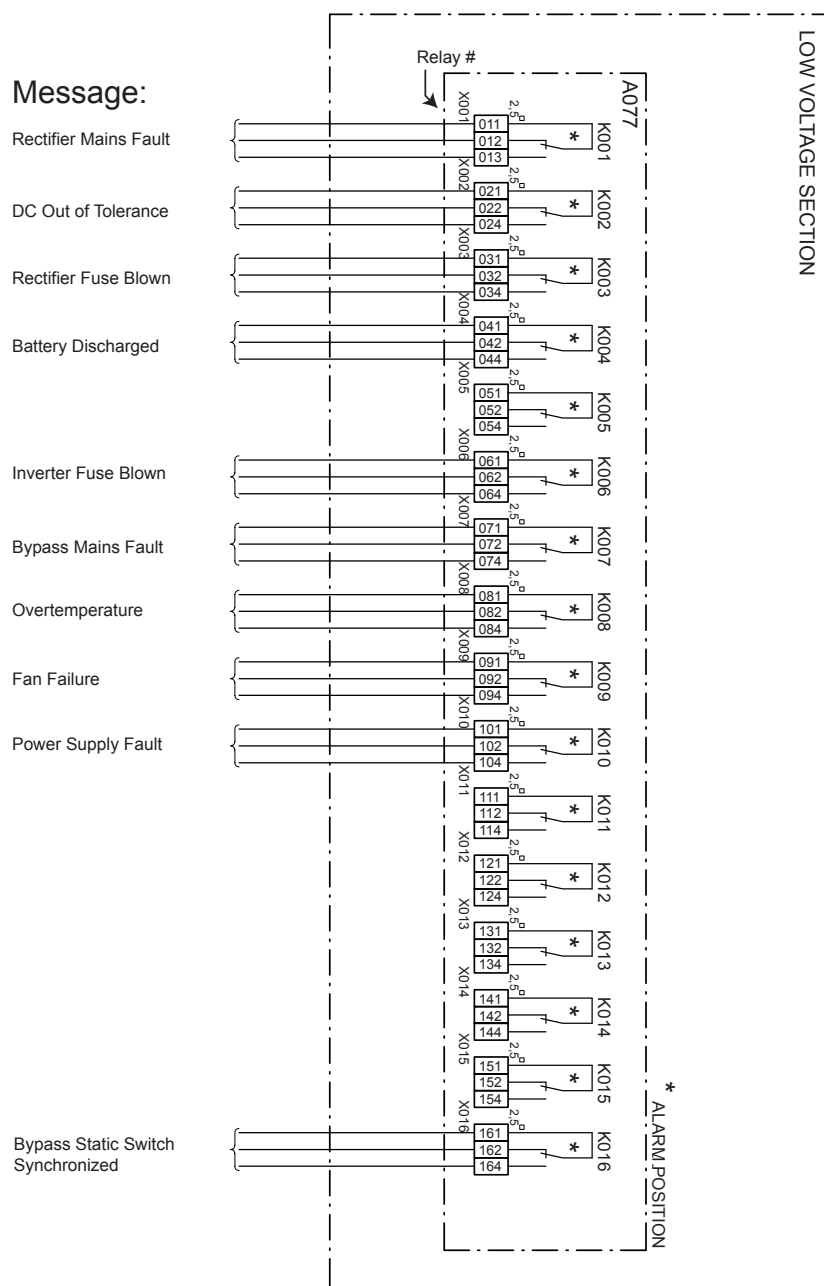
NEMA 12 for 40-60 kVA UPS

Relay Board

All alarms are shown in alarm position (*). Status is shown in status position (Δ). All relay change-over contacts are 2A 250Vac or 0.5 60Vdc. Maximum cable size is AWG 14 (2.5mm²).



Please use NEC class 1 wiring methods!





Please use NEC class 1 wiring methods!

Message:

Output Static Switch
Inhibited

Bypass Static Switch
Inhibited

Asynchronous

Overload Inv/Bypass

Inverter Fault

Battery Operation

Rectifier Failure

EN ON

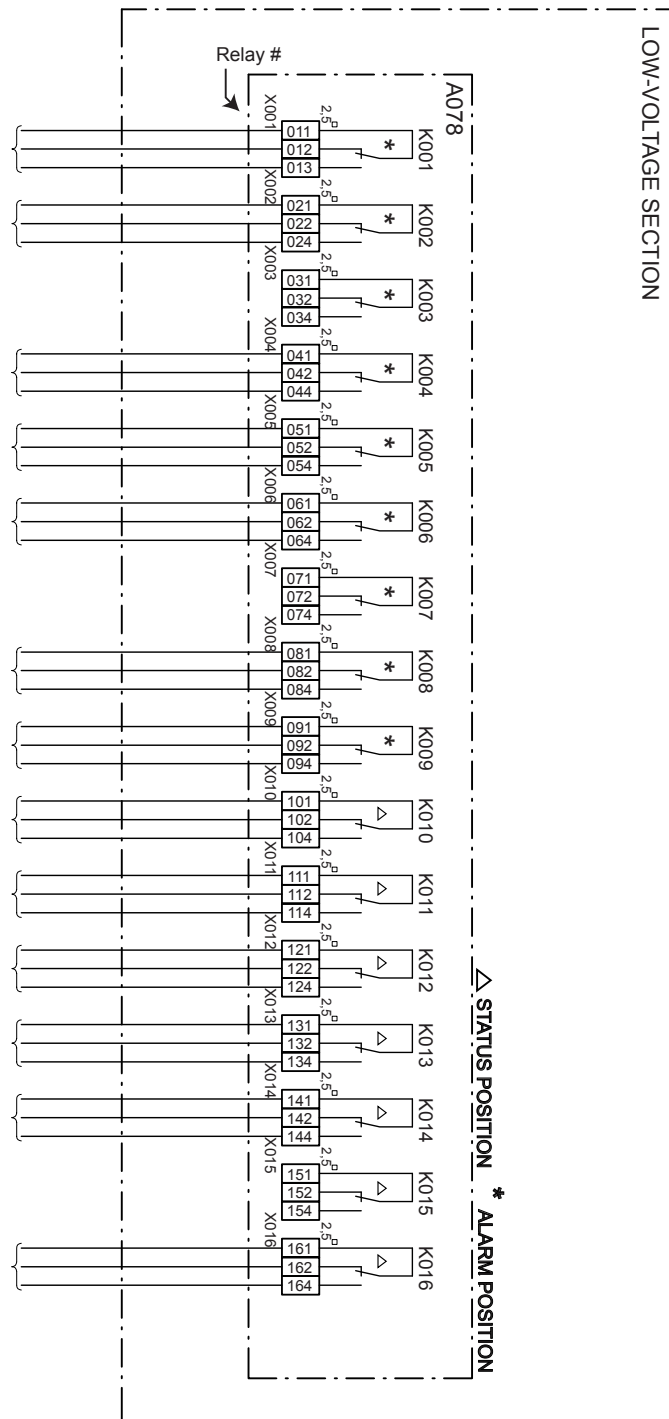
EA ON

Inverter ON

Boost Charge ON

Charger ON

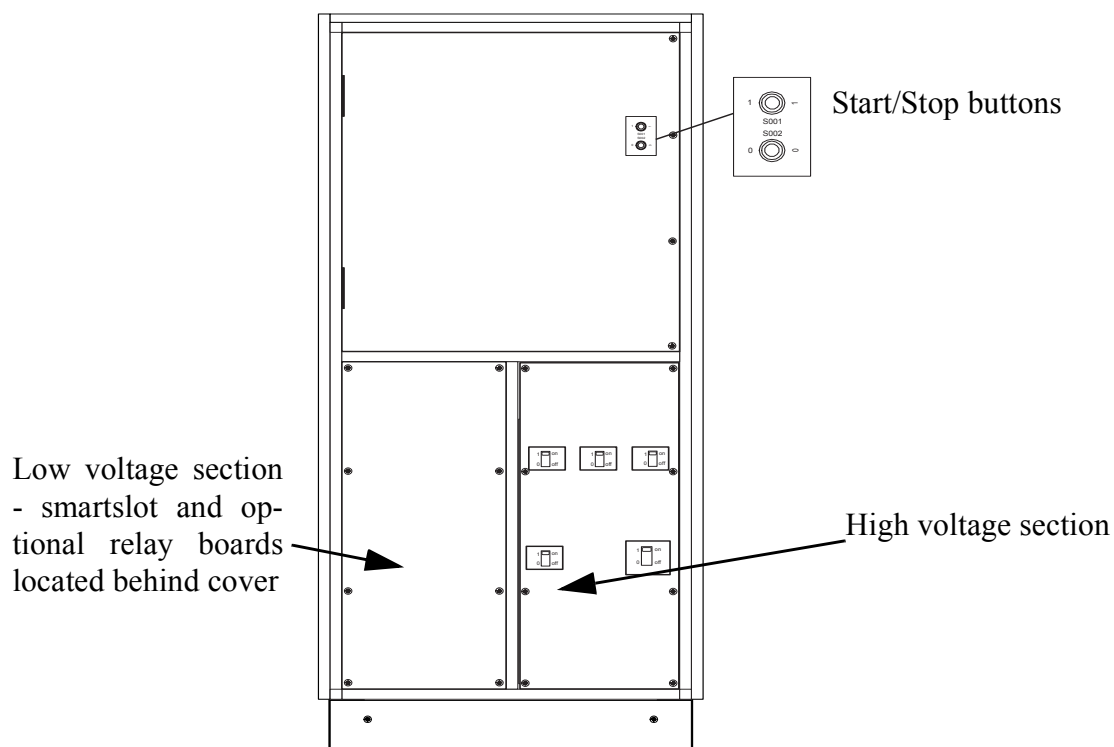
External Horn



Communication Cards

Available cards and slots

Two slots are provided for optional communication cards behind the cover of the low voltage section.



There are 4 cards available for the AIS 5000 UPS from APC:

- Network Management Card
- Modbus/BMS Card
- Environmental Monitoring Card
- Network Management/Environmental Monitoring Card



For further information, please contact APC (phone numbers on the back of this manual) or visit our Web-site on www.apc.com where you will find detailed product descriptions, features & benefits and product literature for the above cards.

Display

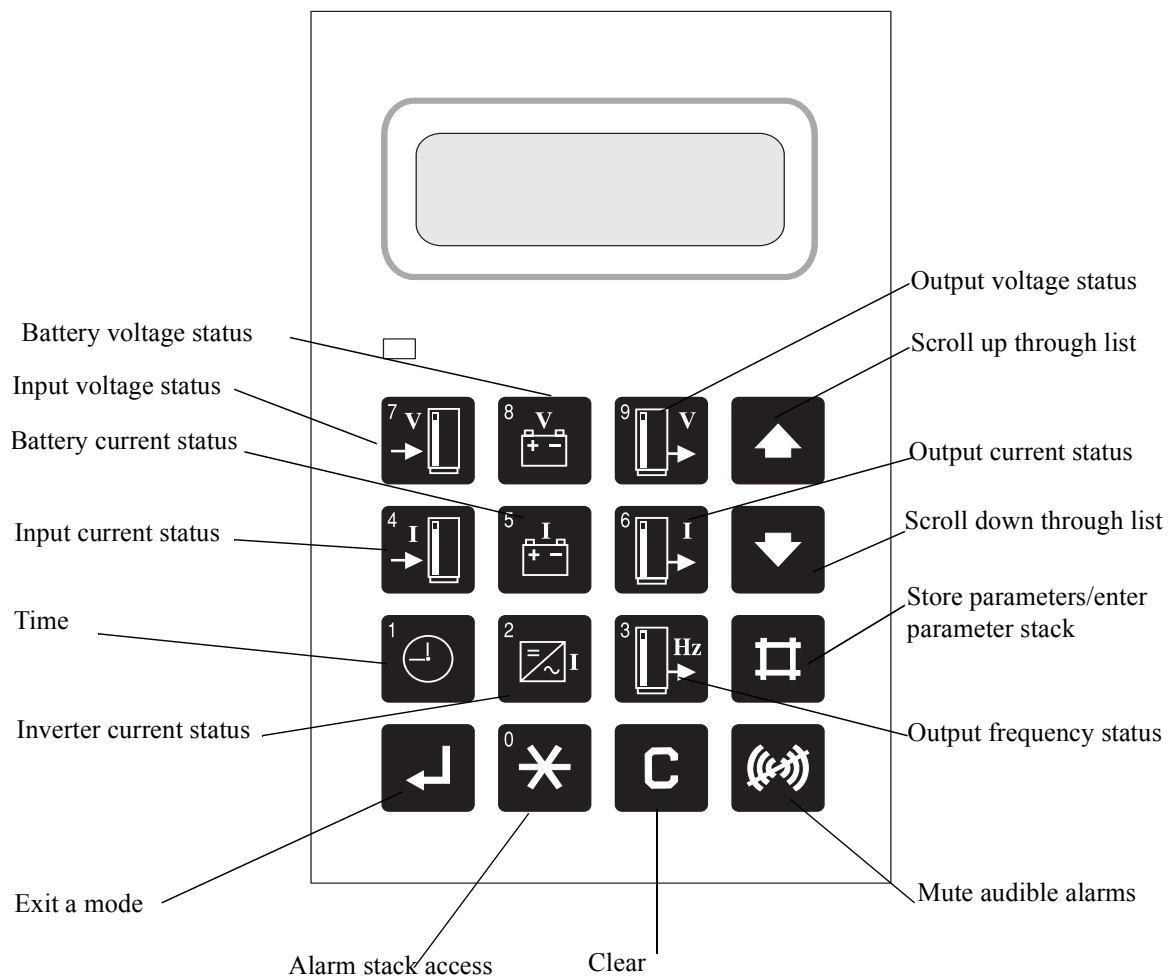
The display on the front of the UPS is the interface between the user and the UPS. The display is provided with a Light Emitting Diode (LED) alarm indicator and a keyboard. The display shows measured values and alarm messages. When keys are activated, or in alarm situations, the back light in an active display is set to switch off automatically after 5 minutes of inactivity.

Use the keyboard to program operating parameters, and to display parameters / alarm messages. The display will show the current operational mode of the UPS.



Display accuracy: $\pm 2\%$, ± 1 digit.

Display functions



For a status report on the UPS, or to program the system, press the applicable display key.

To increase the back light contrast, press  and  simultaneously. To decrease the contrast press  and  simultaneously.



Note

Following a 20-second inactivity, the display will automatically switch back to show the current operational mode.


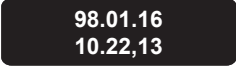



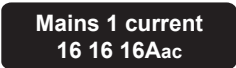



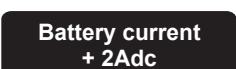



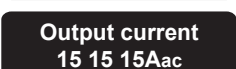



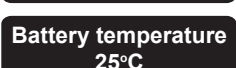

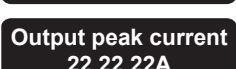

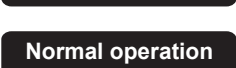

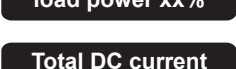

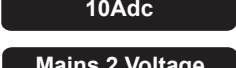

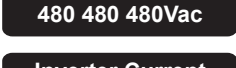


Note

If the operation mode is changed, the display will automatically show the new operational mode. In such situations, all entries must be repeated by using the keyboard for UPS programming or status display.

Display messages

To read measurements, press one or two keys simultaneously as shown below. (Illustrated values are examples only).






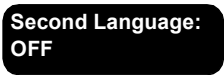







Action	Display Messages	Description
		Shows date/time: Year, month, day/hour, minute, second
		Utility 1 voltage is 3 x 480V
		Utility 1 current is 3 x 16A
		Battery voltage is 272Vdc
		Charging current is (+) 2 Adc (Discharging current (-))
		Output voltage is 3 x 480V
		Output current is 3 x 15A
		Output frequency is 60Hz
		Battery temperature is 25°C (77°F) (OPTION)
		Output peak current is 3 x 22A
		Returns to normal display status. If the display is inactive for 20 sec., it will automatically switch back to show current operation mode.
		Total DC current (10Adc)
		Utility 2 voltage is 3 x 480V
		Inverter current is 3 x 40A


















Mains = Utility








Programming the UPS















User stack









Parameter	Comments
Language	<p>Default language: English. Second language: Spanish.</p> <p>To activate the second language, push  and browse through the user stack, using the cursor keys  or  until the display shows:</p> <p>To activate the second language, push  The display shows:</p> <p>To return to English, push </p> <div>   </div>
Autostart	<p>To activate the autostart function, push  and browse through the user stack, using the cursor keys  or  until the display shows:</p> <p>To activate the autostart function, push  and deactivate by pressing </p> <p>If Autostart is on and the UPS is in Standby mode, the UPS will restart automatically when the utility supply is restored.</p> <div>  </div>

<p>Bypass Operation</p>	<p>Push  and the cursor keys  or  until the display shows:</p> <p>To select Bypass Operation, push </p> <p>The UPS will switch to Bypass Operation if the bypass mains is within the specified tolerance range. The display will show:</p> <p>Now the load is supplied from the bypass mains through the static switch. Bypass mains voltage and output voltage will appear on the display.</p> <p>To return to Normal Operation, push </p> <p>The UPS transfers from one operation mode to the other without affecting the load.</p> <div data-bbox="1129 282 1353 353" style="background-color: black; color: white; padding: 2px; text-align: center;">Bypass Operation: OFF</div> <div data-bbox="1129 461 1353 533" style="background-color: black; color: white; padding: 2px; text-align: center;">Bypass Operation</div>
<p>Boost Charge</p>	<p>To program the UPS for Boost Charge, press  and browse through the user stack, using the cursor keys  or </p> <p>The display shows:</p> <p>Boost Charge is chosen by selecting </p> <p>To deactivate, press </p> <p>When the Boost Charge function is selected, the UPS will only stay in the Boost Charge operational mode for 8 hours. To change the boost charge operating time, contact APC. (The UPS can be programmed to stay in this mode up to 24 hrs).</p> <div data-bbox="1129 1008 1353 1079" style="background-color: black; color: white; padding: 2px; text-align: center;">Boost Charge: OFF</div>

<p>Auto Boost Charge</p>	<p>To program the UPS for Auto Boost Charge, select </p> <p>Browse through the user stack, using the cursor keys  or  until this message appears:</p> <div data-bbox="1193 338 1417 409" style="background-color: black; color: white; padding: 5px; border-radius: 5px; display: inline-block;"> Auto Boost Charge: OFF </div> <p>Select Auto Boost Charge by pressing </p> <p>Deactivate by pressing </p> <p>When the Auto Boost Charge function is selected, the system will automatically switch to Boost Charge Operation if the battery has been discharged.</p> <p>The UPS will only stay in the Boost Charge operational mode for 8 hours. When the UPS is working in Auto Boost Charge operational mode, the charger is outside the battery current limitation. To change the Auto Boost Charge operating mode, contact APC. (The UPS can be programmed to stay in this mode up to 24 hrs).</p>
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Battery Capacity Test	<p>Make sure the UPS has been in normal operation for at least 8 hrs. and that the batteries are fully charged before performing this test.</p> <p>1. To test the Battery Capacity press  and browse through the user stack, using the cursor keys  or  until the display shows:</p> <p>(xxx indicates the backup time from the last Battery Capacity test). If this test has not been performed before - or if the test has been aborted, the display shows:</p> <p>2. To proceed with the test, press  or  to abort.</p> <p>3. The display shows:</p> <p>Wait until the display shows:</p> <p>a short audible alarm will be active.</p> <p>4. Press  until the display shows: (xxx represents the actual backup time in minutes)</p> <p>5. Press  or wait 20 seconds until the display shows:</p> <p>If a utility failure occurs during a battery capacity test, the test will be aborted immediately. No test results will be obtained and the display will show:</p>	<div>Battery Capacity Test: xxx</div> <div>???</div> <div>Battery Operation Time > ...min</div> <div>Normal Operation Load Power xx%</div> <div>Battery Capacity Test: xxx</div> <div>Normal Operation Load Power xx%</div> <div>???</div>
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<p>Battery Monitor Test</p>	<p>This parameter will only appear on the display, if the Advanced Battery Monitor option is installed.</p> <p>To perform the Battery Monitor Test, push  and browse through the user stack, using the cursor keys  or  until the display shows:</p> <p>Battery Monitor Test: OFF</p> <p>To perform a Battery Monitor Test, select  To deactivate, press </p> <p>The Battery Monitor Test checks the battery condition by switching off the rectifier, and letting the inverter run in battery operation until 25% of the battery capacity is used.</p> <p>In the event of a battery failure, the rectifier will automatically switch on. There will be no output voltage loss.</p> <p>If the battery condition is within the tolerance range, no alarms will appear on the display.</p> <p>In case of reduced battery capacity, one of the following two alarms will appear on the display:</p> <ol style="list-style-type: none"> 1. Battery Monitor Warning - means that the battery capacity is reduced by 25% or more. 2. Battery Monitor Alarm - no battery capacity or capacity is reduced by 50% or more. <p>Battery Monitor Warning</p> <p>Battery Monitor Alarm</p>
<p>Battery Monitor Reset</p>	<p>This parameter will only appear on the display, if the Advanced Battery Monitor option is installed.</p> <p>To reset the battery monitor, push  and browse through the user stack, using the cursor keys  or  until the display shows:</p> <p>Battery Monitor Reset: OFF</p> <p>To reset the Battery Monitor Alarms, press </p>
<p>Settings for Redundant Systems</p>	
<p>Adaptive Slew rate</p>	<p>To program the UPS for Adaptive Slewrate, press </p> <p>Browse through the user stack, using the cursor keys  or  until the display shows:</p> <p>Adaptive Slewrate: OFF</p> <p>Select Adaptive Slewrate by pressing </p> <p>Deactivate by pressing </p>

Enter New Date	<p>To program the date setting, press </p> <p>Browse through the user stack, using the cursor keys  or  until the display shows:</p> <div data-bbox="1129 300 1353 371">Enter new date YY.MM.DD</div> <p>Enter the new date by using the numeric keys - enter year, month and day.</p> <p>Store by pressing </p>
Enter New Time	<p>To program the time setting, press </p> <p>Browse through the user stack, using the cursor keys  or  until the display shows:</p> <div data-bbox="1129 672 1353 743">Enter new time HH.MM.SS</div> <p>Enter the new time by using the numeric keys - enter hour, minute and second.</p> <p>Store by pressing </p>



Setting stack

In the setting stack, the following parameters are changeable:

Parameter	Factory Setting
Normal Charge Voltage	272Vdc
Boost Charge Voltage	272Vdc - no boost required
Charge Current Max.	Refer to below table
Low Battery Warning	216Vdc
Low Battery Shutdown	204Vdc
Boost Charge Time	8 hours
Slewrate 0 - 4	1Hz
Charger ON/OFF	ON
Inverter and Bypass ON/OFF	ON
Battery Back-up Time	Until a battery capacity test has been performed, display will show xxx
High Battery Temperature	35°C
Auto Battery Monitor	ON
Battery Summary Error	OFF
Remote Shutdown	OFF
Remote Shutdown Polarity	HIGH
Remote Shutdown Time	2 minutes


Max. Charge Current	
UPS	ADC
10kVA	5
20kVA	10
30kVA	15
40kVA	20
60kVA	30
80kVA	40
100kVA	50



How to change factory settings:

Press  and  simultaneously and enter 282828

Browse through the setting stack, using  or  until the setting you wish to change is displayed.

Enter the new setting by using the numeric keys on the keyboard.

When the new setting is entered press  to store.

If the setting only has an ON or OFF function, press  to choose ON and  to choose OFF.

Operation Modes

The display automatically indicates the current UPS operation mode. See the below table for examples of operation modes and their descriptions.

Operation mode descriptions:

Operation Mode	Description of Operation Mode
Normal Operation	The inverter supplies the load. The charger uses the utility supply to feed the inverter.
Battery Operation	The inverter supplies the load. The battery bank supplies the inverter. In battery operation the load support time is limited; when the batteries are discharged the UPS is unable to supply the load.
Bypass Operation	The bypass static switch supplies the load, meaning that the load is supplied directly from the bypass utility. When working in bypass operation the UPS can switch to battery operation if the bypass utility fails.
Charger Only	The charger is recharging the battery. The inverter is shut down.
Economy Operation	The UPS is in permanent bypass operation and will only switch to battery operation if the bypass utility is out of tolerance.
Hot Standby	In redundant configurations, one UPS can switch off the inverter, but still keep the inverter ready for immediate start in case another UPS fails.



Note




In stand-by mode, the UPS has no output voltage.




Note

Users do not require electrical qualifications to switch the UPS to and from stand-by mode/normal operation.

Normal to Bypass Operation

1. Press  and the cursor keys  or  until the display shows:

2. Press  If the bypass utility is within the tolerance range, the UPS will transfer to electronic bypass. The display shows:

**Bypass Operation:
OFF**

Bypass Operation








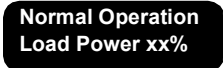
The load is now supplied directly from the bypass utility.

If the bypass utility fails during bypass operation, the UPS will automatically switch to normal operation, provided that the rectifier utility is available. If the battery supply is available, and within the tolerance range, the UPS will switch to battery operation.



Depending on the programming, a short loss of output voltage may occur.

Bypass to Normal Operation

1. Press  and the cursor keys  or  until the display shows:	
2. Press  The display will show:	







The load is now supplied by the UPS.

Normal to Manual Bypass Operation



CAUTION!

Never operate the manual bypass switch when the UPS is in normal operation.

1. Press  and the cursor keys  or  until the display shows:	Bypass Operation: OFF
2. Press  if the bypass utility is within tolerance range, the UPS will transfer to electronic bypass. The display shows:	Bypass Operation
3. Make sure that the Bypass Static Switch is turned on.	
4. Switch on the Manual Bypass Switch (Q050).	
5. Switch off the output breaker Q100.	Standby
6. Push the S2 button on the front panel in order to turn the UPS off. The UPS changes to standby operation. Display shows:	
7. Switch off the Q090, Q001 and Q004.	
8. Wait 30 seconds until the UPS display and all LED indications are switched off.	



Note

The load is now supplied directly from the bypass utility.













CAUTION!

When the UPS is in bypass operation, the load support will be disrupted if the bypass utility fails.

Manual Bypass to Normal Operation

(start up procedure included)

1. Switch on the rectifier utility supply by closing Q001. The display shows:	System Type UPS AIS 5000
After 10 seconds the display message changes to:	Standby
2. Press the S001 button “System On” on the front panel. The display shows:	Normal Operation Load Power xx%
3. Check the battery voltage reading on the display by selecting 	
4. Connect the battery by closing Q004.	
5. Check that the inverter output voltage is within tolerance range by pressing 	
6. Switch the Q090 on.	
7. Wait 10 seconds to ensure that the UPS is synchronized.	
8. Switch the UPS to bypass operation by pressing  and the cursor keys  or  until the display shows:	Bypass Operation: OFF
9. Press  and if the bypass utility is within the tolerance range, the UPS will transfer to electronic bypass. The display shows:	Bypass Operation
10. Make sure that the Bypass Static Switch is on.	
11. Switch the output breaker Q100 on.	
12. Switch the Manual Bypass Switch (Q050) off.	
13. Switch the UPS to normal operation by pressing  and the cursor keys  or  until the display shows:	Bypass Operation: ON
14. Press  The display will show:	Normal Operation Load Power xx%
15. Verify that the alarm LED changes to green light.	



Note

The load is now supported by the UPS.

Warranty

Factory Warranty

APC warrants that the unit, when properly installed and commissioned by APC or APC authorized service personnel, shall be free from defects in materials and workmanship for a period of (1) year from the date of installation or maximum 18 months after manufacturing. In the event that the unit fails to meet the foregoing warranty, APC shall for a period of one (1) year repair or replace any defective parts, without charge for on-site labor and travel if trained & authorized APC personnel has conducted start-up of the unit.

An APC Start-Up Service must be performed/completed by APC or by service personnel authorized by APC. If not, the on-site factory warranty will be voided and replacement of defective parts only will be covered. APC shall have no liability and no obligation to repair the installed unit if non-authorized APC personnel performed the start-up and such start-up caused the unit to be defective.

APC shall not be liable under the warranty if its testing and examination disclose that the alleged defect in the product does not exist or was caused by purchaser's 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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