CASTLE Series

20K(S) -200K(S)

USER MANUAL

SANTAK®

An Eaton Brand

Thank you for choosing SANTAK products!
Please adhere to the warnings and instructions specified in the manual and on the equipment, and keep the manual properly for future reference. Do not try to operate the equipment before reading all the safety information and operation instructions.

The manual applies to the 3C3 PRO series, including:

3C3 PRO 20KS

3C3 PRO 30KS

3C3 PRO 40KS

3C3 PRO 60KS

3C3 PRO 80KS

3C3 PRO 100KS

3C3 PRO 120KS

3C3 PRO 160KS

3C3 PRO 200KS

IMPORTANT NOTICE

Copyright Notice

SANTAK is committed to technological innovation as it continues to deliver better products and services to customers. We reserve the rights to modify and update product design, technical specifications and user manuals without further notice. Actual products may differ from pictures shown in the manual.
The latest version of the user manual is available on www.santak.com

Safety Instructions

General

1. Please read through the Safety Instructions carefully before you start to operate the equipment and keep the manual well for future reference.
2. Please pay attention to the warning symbols and follow the instructions in the manual during operation.
3. Do not use the equipment in direct sunlight or rain, or in humid conditions.
4. Do not install the equipment near any sources of heat, such as heating devices like electric heaters or furnaces.
5. Please make sure there is adequate space for ventilation or maintenance around the equipment. Please follow the instructions in the manual for installation.
6. For the purpose of cleaning, please use dry and non-conductive tools to wipe down the equipment.
7. In case of a fire, please use dry powder extinguishers. Liquid fire extinguishers are not allowed.
8. Please make sure the floor on which the equipment is installed is strong enough to support the weight of the equipment with battery.
9. Please make sure the total wattage requirements of the loads do not exceed the power rating of your UPS or the capacity of the battery.

Prohibited Activities

1. Having service personnel without authorization from SANTAK to open the UPS cabinet, which contains lethal voltages is not allowed. Unauthorized opening may cause an unsafe condition, and will void the warranty.
2. Applying the following types of loads , the application, configuration, management and maintenance of which may be subject to special requirements, please inquire from dealers or SANTAK in advance:
A. High-precision industrial, scientific-research or medical instruments;
B. Facilities of which malfunctions may lead to life-threatening situations, such as elevator;
C. Loads with large inrush current and negative power consumption;
3. Exposing batteries to fire, which may cause explosions.

Electrical Safety

1. Please make sure that the grounding is firmly connected and the wiring and battery polarity are correctly connected.
2. Battery protection devices must be configured with a suitable over-current circuit breaker.
3. Before you remove your UPS or reconnect the wiring, please shut down your UPS and disconnect the air circuit breaker and the battery to ensure that the output terminals do not carry live voltage which may cause an electric shock.
4. To ensure safety and the best performance of your UPS, please choose from accessories recommended by SANTAK.
5. A proper four-pole over-current circuit breaker shall be installed before connecting clients to your UPS to prevent electric shock by disconnecting all the input wiring.

Battery Safety

1. The service life of a battery is shortened as the ambient temperature rises. Regular battery replacement ensures that your UPS work well and provides sufficient back-up time.
2. Battery replacement and maintenance must be performed by authorized personnel with professional knowledge in battery. Please replace an equivalent number of batteries of the same type and model.
3. There are risks of electric shock and short circuit with the battery. Please observe the following rules while replacing the battery to reduce the risks of electric shock:
A. Do not wear watches, rings or any other metallic objects;
B. Use insulated tools;
C. Wear rubber shoes and gloves;
D. Do not place metal tools or any other metallic accessories on the battery;
E. Disconnect the loads connected to the battery before removing terminals from the battery.
4. Do not expose the battery to fire to avoid the risks of explosion that may result in personal injury.
5. Non- professionals shall not open or disassemble the battery as electrolytes in the battery contain strong acid and other dangerous substances which may cause damage to skin and eyes. Please clean with water immediately and seek medical assistance if the electrolytes come in contact with human skin.
6. Do not connect the battery positive and negative poles as it may cause short circuit. Over current protection device is needed to avoid risks of burns or electric shock.

Maintenance

1. The working environment and storage method of UPS can affect its service life and reliability. Do not use your UPS in any of the following environments where:
A. the temperature and humidity are outside the required ranges, i.e.0-40°C and 0-95% humidity; or
B. your UPS is at high risks of vibration and collision;
C. there are metal shavings, corrosive materials, salt and flammable gases.
2. If you plan to leave your UPS idle for a long time, please store it in dry conditions with an ambient temperature ranging between -25-55°C. Before you start up your UPS, please keep it in an environment where the ambient temperature is at or above 0°C for 2 hours or longer.
3. Keep the air inlets and outlets clear for proper ventilation. Poor ventilation will cause the temperature inside your UPS to rise, shortening the service life of the components and that of your UPS.
4. The battery should be charged at least once every three months if it is left idle and stored in an environment with a room temperature, or at least once every two months if left idle in a high temperature environment; each charge should take more than10 hours; do not discharge with no loads connected or discharge for more than 14 hours continuously.

Contents

Chapter 1 Introduction

1.1 Introduction

The 3C3 PRO series are high-efficiency pure online UPS products with excellent performance that provide double conversion, and three-phase input and output. With perfect power source protection solutions, the 3C3 PRO effectively address multiple power source problems such as power outage, high-voltage AC and low voltage AC, voltage sag, damped oscillation, high voltage impulse, voltage surge, harmonic distortion, clutter interference and frequency variation, the 3C3 PRO series is widely applied for computers, communications devices and other controlling devices safely. You can choose our optional accessories to enhance your UPS in order to cope with inrush load situations in complicated industrial environment. For the governments and a range of industries including telecommunications, financing, transportation, manufacturing and energy, the 3C3 PRO series is the best choice of UPS.

The following functions of the 3C3 PRO series ensure high quality power for your equipment:

- Advanced DSP digital control technology enabling improved product performance and system reliability.
- N+X parallel redundancy (common batteries are allowed).
- Excellent protection to harsh industrial environment.
- Economic and safe ECO operation model that ensures 98% or higher USP efficiency.
- High-resolution LCD that ensures clear and easy operation.
- Powerful communications interface and remote monitor.
- Plenty of accessories that meet a variety of needs.

1.2 Symbols

The following symbols may appear in the manual or other occasions. You are suggested to understand the symbols and their meanings.

Symbols and Meanings	
Symbol	Meaning
	DANGER
	HAZARDOUS VOLTAGE
	Alternating Current (AC)
	Direct Current (DC)
	Protective Grounding
	Recycle
	Keep Surroundings Uncluttered

Chapter 2 Appearance Description

2.1 Unpacking and Inspection

1. Unpack the package, the unit should contain the following items:
1) 1 UPS
2) Accessories, including User Manual, RoHS Certificate of Compliance and 2 door keys.

2. Check to see if the UPS is damaged during delivery. In case of any damage or any component missing, please do not start the UPS and contact the carrier or dealer forwarder or distributor immediately.
Note: Make sure that there is a sufficient minimum clearance from any obstacle before moving the UPS.
Figure 1: Cut the packing straps and remove the top cover plate.
Figure 2: Unbend the tucks locking all plates together, then remove these plates.
Figure 3: Remove the plastic bag and foam around the unit.
Figure 4: Remove the shipping brackets fixing the UPS to the pallet.
Figure 5: Attach the ramp to the front of the pallet.
Figure 6: Roll the UPS down the ramp and move it to the installation spot.

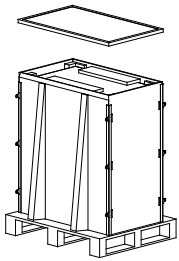


Figure 1

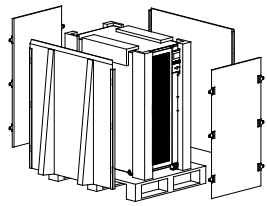


Figure 2

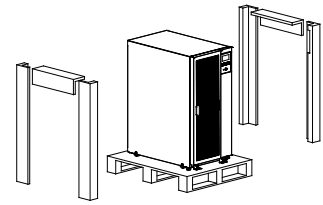


Figure 3

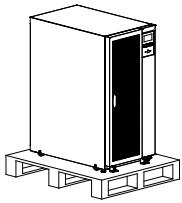
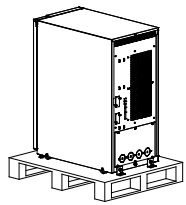


Figure 4



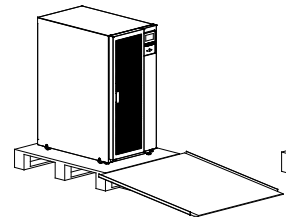


Figure 5

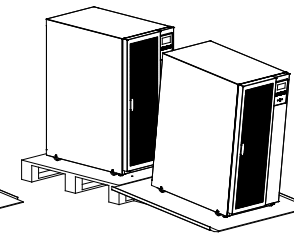
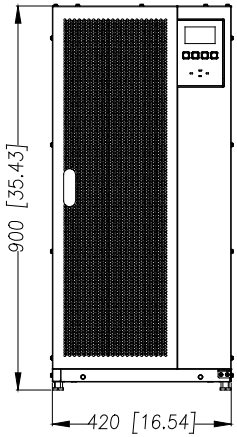


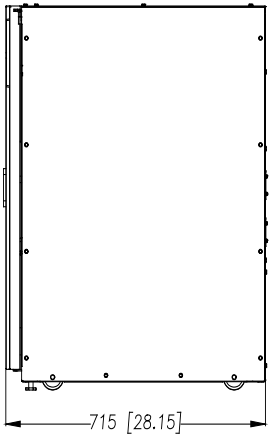
Figure 6

2.2 UPS Cabinet Dimensions

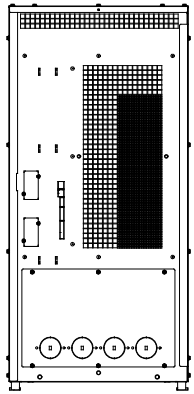
3C3 PRO 20KS/30KS/40KS Cabinet Dimensions



FRONT VIEW

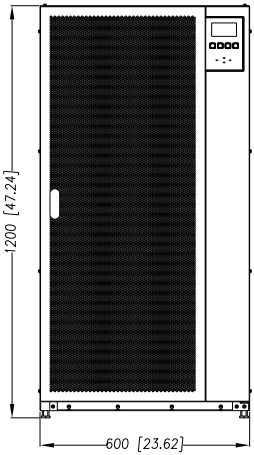


RIGHT VIEW

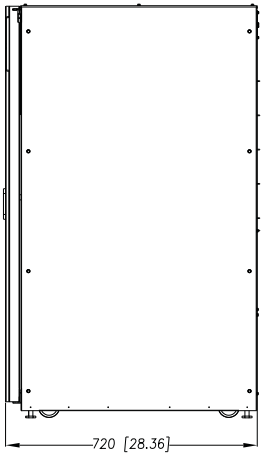


REAR VIEW

3C3 PRO 60KS/80KS Cabinet Dimensions



FRONT VIEW



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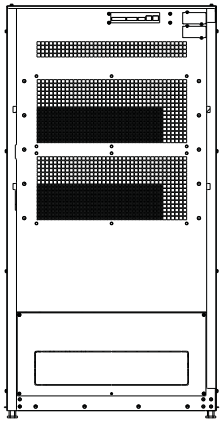
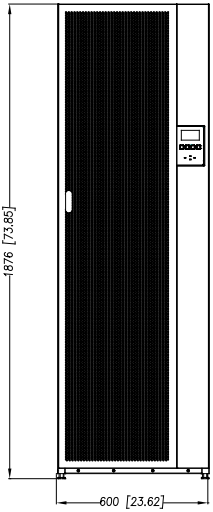
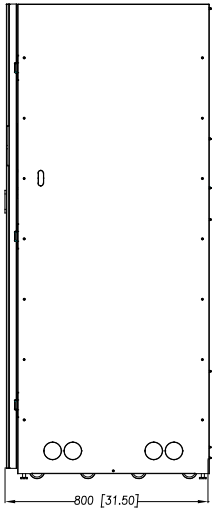


REAR VIEW

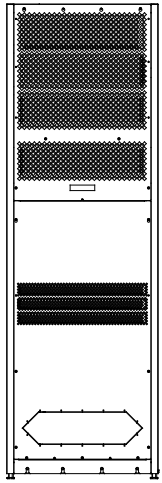
Cabinet Dimensions of 3C3 PRO 100KS/120KS



FRONT VIEW

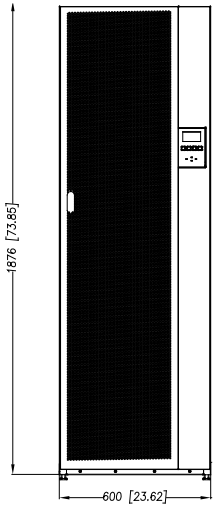


RIGHT VIEW

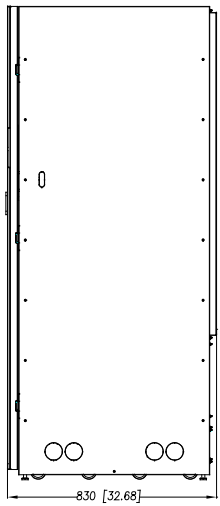


REAR VIEW

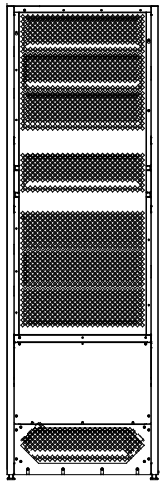
3C3 PRO 160KS/200KS Cabinet Dimensions



FRONT VIEW

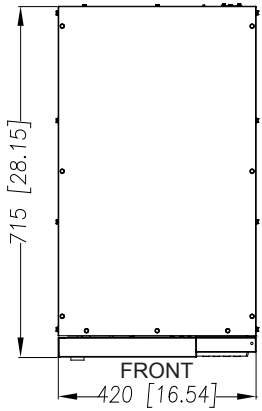


RIGHT VIEW

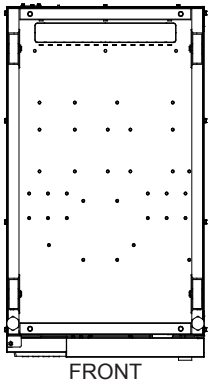


REAR VIEW

3C3 PRO 20KS/30KS/40KS Top and Bottom Views

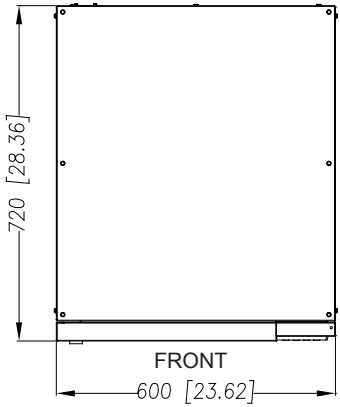


TOP VIEW

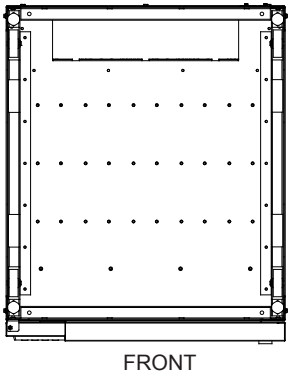


BOTTOM VIEW

60KS/80KS Top and Bottom Views

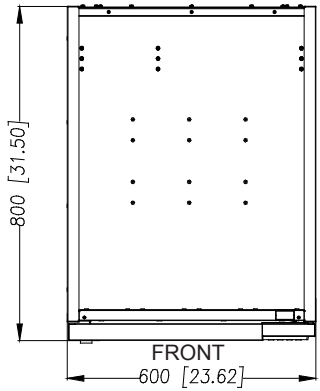


TOP VIEW

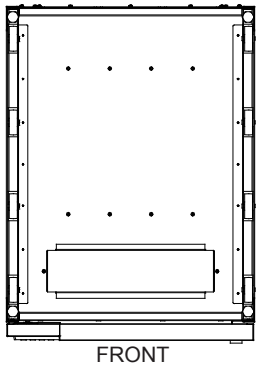


BOTTOM VIEW

3C3 PRO 100KS Top and Bottom Views

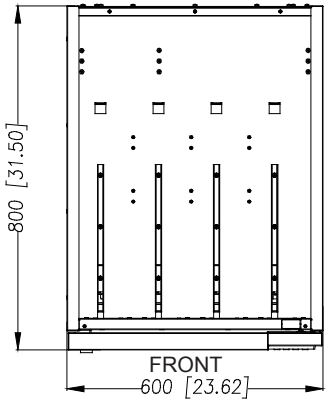


TOP VIEW

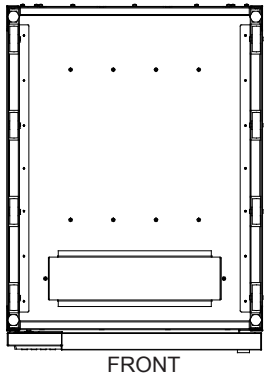


BOTTOM VIEW

3C3 PRO 120KS Top and Bottom Views

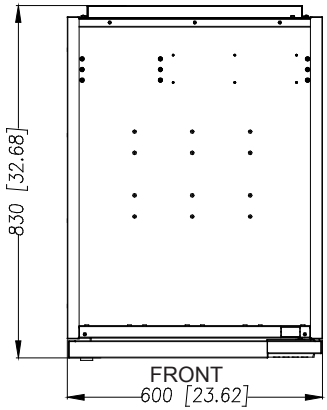


TOP VIEW

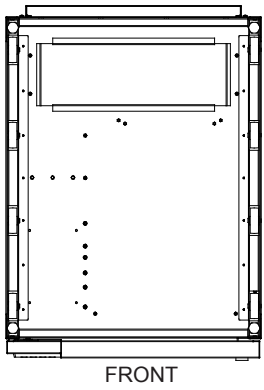


BOTTOM VIEW

3C3 PRO 160KS/200KS Top and Bottom Views

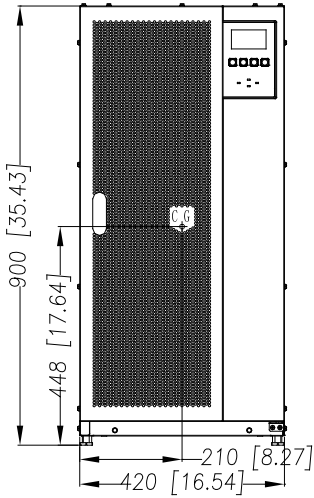


TOP VIEW

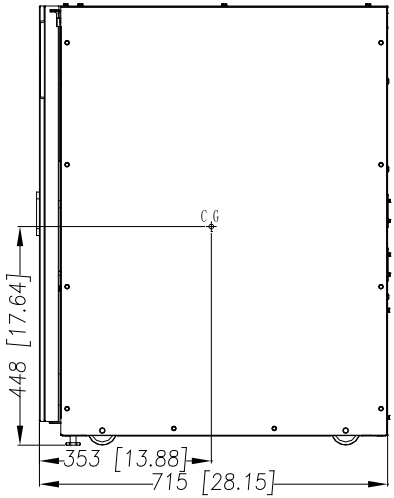


BOTTOM VIEW

Center of Gravity of 3C3 PRO 20KS/30KS/40KS

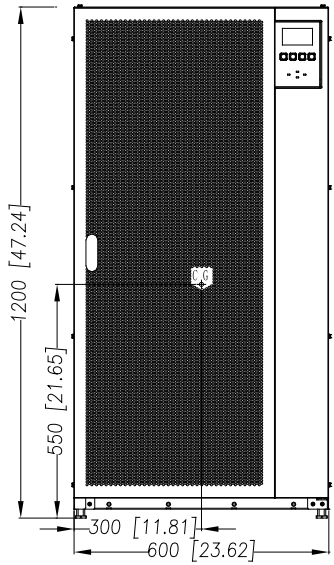


FRONT VIEW

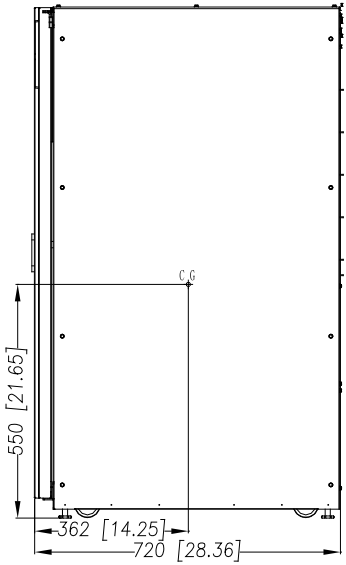


RIGHT VIEW

Center of Gravity of 3C3 PRO 60KS/80KS

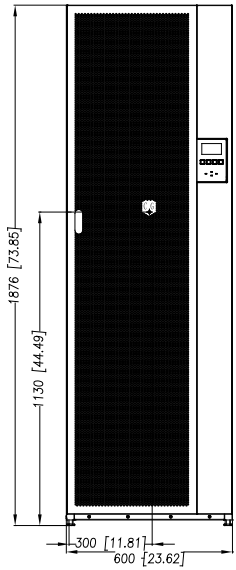


FRONT VIEW

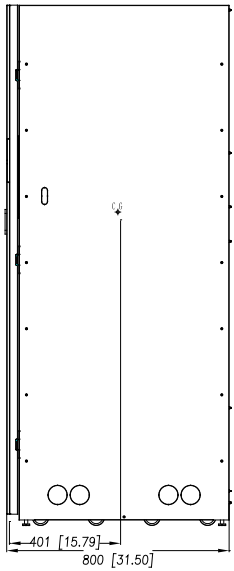


RIGHT VIEW

Center of Gravity of 3C3 PRO 100KS/120KS

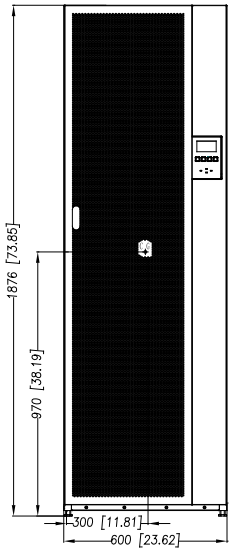


FRONT VIEW

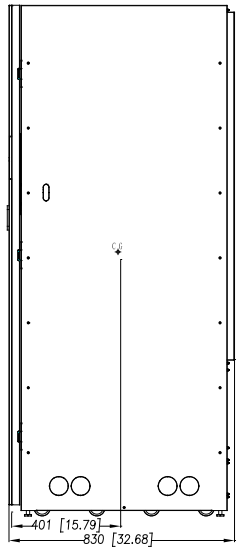


RIGHT VIEW

Center of Gravity of 3C3 PRO 160KS/200KS



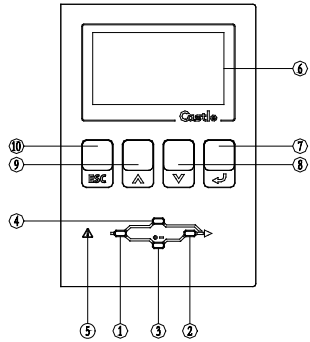
FRONT VIEW



RIGHT VIEW

2.3 LCD Panel Instructions

The LCD panel is a human-machine interface providing information on the operating status of your UPS, including power-on, power-off, status display, fault alarm, and parameter setting. After your UPS is installed, all the operations can be performed with the LCD panel. The LCD panel consists of LED status indicators, a LCD display and navigation pushbuttons. Please refer to the table below for the description of LED status indicators and navigation pushbuttons.



Note: See Appendix II for the description of each LED status indicator.

• LED status indicators: indicating the UPS working mode and status

No.	Definition	Color	Status Indicated
①	AC Mains	Green	The UPS is delivering the AC mains power to the loads.
②	Inverter	Green	The inverter is feeding the loads.
③	Battery	Yellow	AC mains abnormal and battery converter feed the loads.
④	Bypass	Yellow	The UPS is powering the loads through the bypass.
⑤	Fault	Red	In case of UPS abnormal function, the indicator illuminates solid or flashes with a continuous or intermittent alarm

• LCD display ⑥: providing detailed information about the UPS

• Navigation pushbuttons: Selecting and opening menu items, accessing information and changing system parameters, etc.

No.	Navigation Pushbutton	Definition	Functions
⑦	↵	Confirm / Input	Open the selected menu or confirm a command; confirm the present password letter input and start the next password letter input; return to the main menu from the status screen.
⑧	▼	Down	Switch to next screen display under the same menu.
⑨	▲	Up	Return to last screen display under the same menu.
⑩	Esc	Exit	Exit the current page and return to the previous page or cancel a command; delete the input password; return to the status page from the main menu.

Chapter 3 Installation Instructions

3.1 Installation Notice

1) The installation of the 3C3 PRO series UPS products must be performed by professional personnel in compliance with the electrician law.
2) Please install your UPS in a clean and stable environment free of vibration, dust, high humidity, flammable gas, and flammable liquid or caustic substance.
3) To ensure that your UPS functions well, please operate it in an environment with an ambient temperature ranging between 0 - 40°C. If the ambient temperature exceeds 40°C, the UPS should be de-rated by 12% for every increase of 5°C in the temperature; the maximum ambient temperature should not exceed 50°C as UPS operating with loads in high-temperature environments for a long time will result in the reduction of the battery life.
4) It is suggested that the battery packs be used at a temperature within the range of 15 - 25°C.
5) UPS functions normally at an altitude lower than 1,000m. If your UPS is used at an altitude exceeding 1,000m, please de-rate it according to the table below

Altitude (m)	1000	1500	2000	2500	3000	3500	4000	4500	5000
De-rating Factor	100%	95%	91%	86%	82%	78%	74%	70%	67%

3.2 Required Clearance for Installation

3C3 PRO 20KS/30KS/40KS/60KS/80KS/100KS/120KS/160KS/200KS series use forced air cooling to regulate internal component temperature. Enough space for installation or maintenance is required. The clearances required around the UPS cabinet are shown as follows:

From Top of Cabinet	300mm at least
From Front of Cabinet	900mm at least
From Back of Cabinet	Please refer to the table below
From Right Side of Cabinet	Please refer to the table below
From Left Side of Cabinet	Please refer to the table below

Required Clearance between paralleled adjacent UPS or between UPS and adjacent PDU.

Temperature	20KS/30KS/40KS		Temperature	60KS/80KS	
	L1(mm)	L2(mm)		L1(mm)	L2(mm)
25 °C	≥ 120	≤ 50	25 °C	≥ 150	≤ 50
30 °C			30 °C		
35 °C	≥ 150		35 °C	≥ 200	
40 °C			40 °C		

Temperature	100KS/120KS		Temperature	160KS/200KS	
	L1(mm)	L2(mm)		L1(mm)	L2(mm)
25 °C	≥ 150	≤ 50	25 °C	≥ 300	≤ 50
30 °C			30 °C		
35 °C	≥ 300		35 °C	≥ 500	
40 °C			40 °C		

Note:

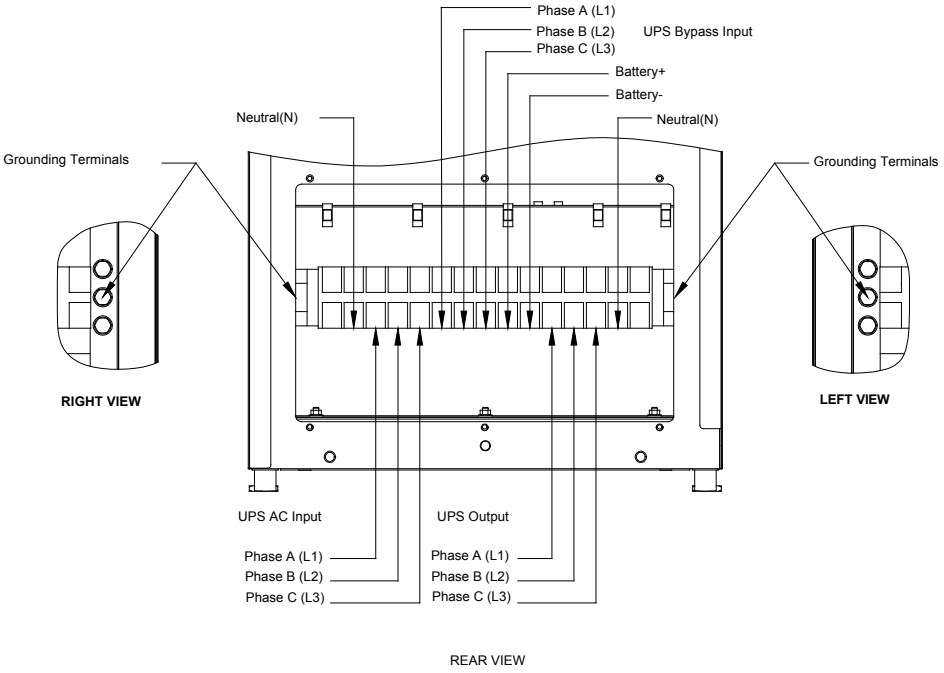
- L1 refers to the required clearance between the rear side of UPS and wall.
- L2 refers to the required clearance between the adjacent paralleled UPS or UPS and adjacent PDU. Parallel UPS should be as close as possible.
- UPS featuring rear connections require additional rear clearance for installation.

3.3 Terminals

The standard models of 3C3 PRO 20KS/30KS/40KS/60KS/80KS are single feed,100KS/120KS/160KS/200KS UPS are dual feed. The UPS can be converted from single feed to dual feed or from dual feed to single feed. All operations should only be carried out by trained service personnel authorized by Santak.

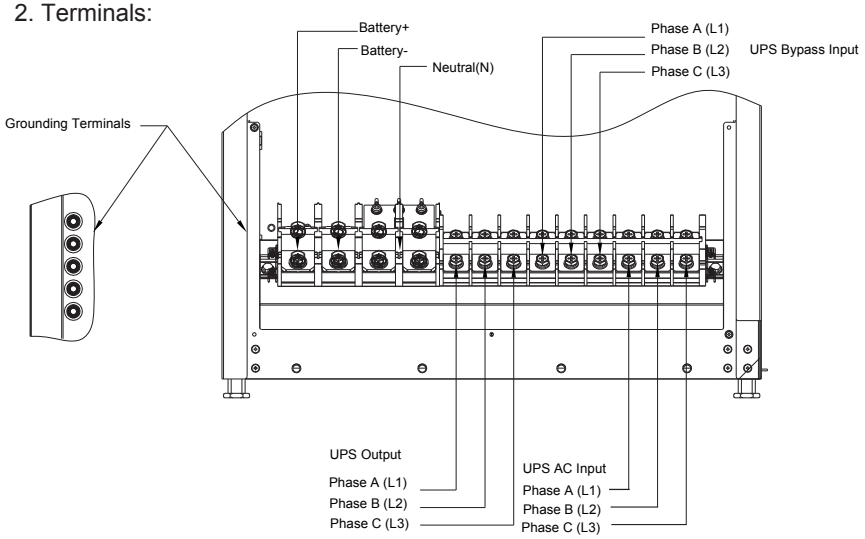
3C3 PRO 20KS/30KS/40KS wiring connection:

1. Terminals:



3C3 PRO 60KS/80KS wiring connection:

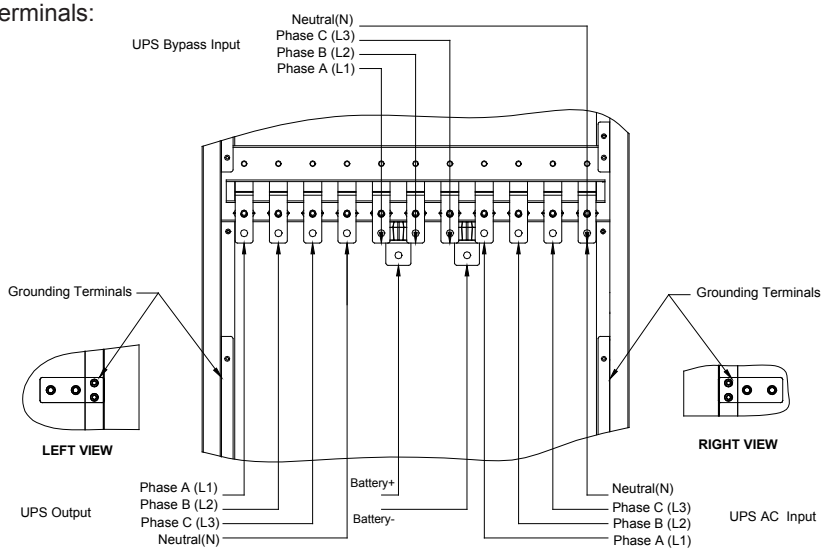
2. Terminals:



REAR VIEW

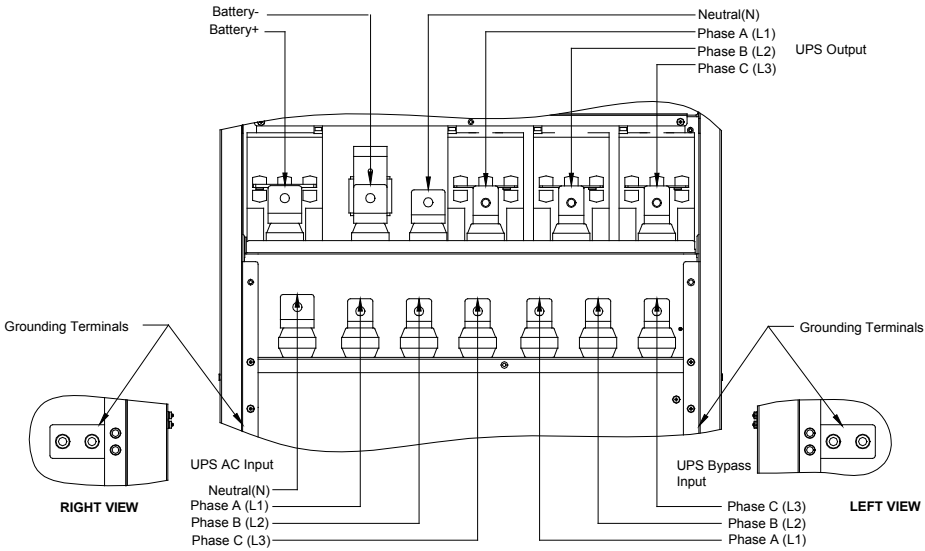
3C3 PRO 100KS/120KS wiring connection:

3. Terminals:



3C3 PRO 160KS/200KS wiring connection:

4. Terminals:



Notes:

- Please make sure that the input power is three-phase with 4 wires, and the input voltage is within the allowable voltage range(refer to Appendix 1).
- Make sure the input power phase sequence is close-wise and battery polarities are correctly connected.

3.4 Wiring requirements and protective devices for 3C3 PRO series

External batteries of 3C3 PRO series UPS should be groups of 28-40 battery packs (12V per cell) with the same capacity, and the battery voltage should be within 336V-480V. The number and total capacity of the battery packs are at your option. The battery packs must be equipped with a DC switch and DC fuse, and overload and line voltage should also be taken into consideration for wire diameter selection. Please refer to the table below for details:

Rated Capacity	cross-sections refer to the IEC 62040-1	Unit					
		kVA kW	20 18	30 27	40 36	60 54	80 72
Input /Output Voltage		Volts	400/400	400/400	400/400	400/400	400/400
AC Input Full Load Current (three-phase, one neutral wire, one ground wire)		Amps	31	46	61	92	122
Wire Size (A\B\C\N wire size)	min	mm^2	6×1	6×1	16×1	16×1	25×1
	max	mm^2	10×1	25×1	25×1	50×1	70×1
Bypass Input Full Load Current (three-phase, one neutral wire, one ground wire)		Amps	29	44	58	87	116
Wire Size (A\B\C\N wire size)	min	mm^2	6×1	6×1	16×1	16×1	25×1
	max	mm^2	10×1	25×1	25×1	50×1	70×1
DC Input Current (36 units of batteries) (one positive wire, one negative wire)		Total Amps	45	68	91	136	181
Power Wiring Size (positive and negative)	min	mm^2	6×1	10×1	16×1	35×1	50×1
	max	mm^2	25×1	35×1	50×1	50×2	70×2
AC Output Current (three-phase, one neutral wire, one ground wire)		Amps	29	44	58	87	116
Input Wiring Size (A\B\C\N wire size)	min	mm^2	6×1	6×1	16×1	16×1	25×1
	max	mm^2	10×1	25×1	25×1	50×1	70×1
Grounding	1.0 times						
neutral wire (N wire)	1.7 times						

UPS Rated Capacity	Cross Sections Please refer to the IEC 62040-1	Unit				
		kVA	100	120	160	200
		kW	90	108	144	180
Input/Output Voltage		Volts	400/400	400/400	400/400	400/400
AC Input Full Load Current (three-phase, one neutral wire, one ground wire)		Amps	154	187	248	309
Wire Size (A/B/C/N wire size)	min	mm^2	35×1	50×1	70×1	95×1
	max	mm^2	95×1	120×1	150×1	240×1
Bypass Input Full Load Current (three-phase, one neutral wire, one ground wire)		Amps	144	173	231	298
Wire Size (A/B/C/N wire size)	min	mm^2	35×1	50×1	70×1	95×1
	max	mm^2	95×1	120×1	150×1	240×1
DC Input Current (one positive wire, one negative wire)		Total Amps	206	247	330	412
Battery Wire Size (Positive pole and negative pole)	min	mm^2	50×1	70×1	185×1	300×1
	max	mm^2	120×1	150×1	400×2	400×2
AC Output Full Load Current (three-phase, one neutral wire, one ground wire)		Amps	144	173	231	298
Output Wire Size (A/B/C/N wire size)	min	mm^2	35×1	50×1	70×1	95×1
	max	mm^2	95×1	120×1	150×1	240×1
Grounding	1.0 times					
Neutral wire (N)	1.7 times					

NOTE:

1. Before connecting to the UPS, a proper three pole over-current circuit breaker should be installed in the power distribution system, with Phase A, Phase B, Phase C disconnected , and Neutral switch is optional.
2. For single-phase current exceeding 100A, the air circuit breakers used must feature an arc-quenching mechanism. It is suggested that the clients be equipped with a UL-listed D-curve air circuit breakers.
3. Positive/negative battery wire diameter refers to the diameter of the wires used to connect the UPS and the battery cabinet; the positive wire is red and negative wire black.
4. The positive and negative battery wires, which must be of the same length and should not be longer than 40m.

3C3 PRO 20KS\30KS\40KS UPS External Power Source Terminals

Terminals Function	Terminals	Function	Bus landing	Tightening Torque Nm (lb in)	Screw Size and Type
			20KS/30KS/40KS		
AC Mains Input to UPS Rectifier	L1	Phase A	M6 bolt mounting	5 (44)	28.26 mm^2(M6)
	L2	Phase B	M6 bolt mounting	5 (44)	28.26 mm^2(M6)
	L3	Phase C	M6 bolt mounting	5 (44)	28.26 mm^2(M6)
	N	Neutral	M6 bolt mounting	5 (44)	28.26 mm^2(M6)
AC Mains Input to Bypass	L1	Phase A	M6 bolt mounting	5 (44)	28.26 mm^2(M6)
	L2	Phase B	M6 bolt mounting	5 (44)	28.26 mm^2(M6)
	L3	Phase C	M6 bolt mounting	5 (44)	28.26 mm^2(M6)
	N	Neutral	M6 bolt mounting	5 (44)	28.26 mm^2(M6)
UPS Output to Loads	L1	Phase A	M6 bolt mounting	5 (44)	28.26 mm^2(M6)
	L2	Phase B	M6 bolt mounting	5 (44)	28.26 mm^2(M6)
	L3	Phase C	M6 bolt mounting	5 (44)	28.26 mm^2(M6)
	N	Neutral	M6 bolt mounting	5 (44)	28.26 mm^2(M6)
DC Input	+	Battery (+)	M6 bolt mounting	5 (44)	28.26 mm^2(M6)
	–	Battery (-)	M6 bolt mounting	5 (44)	28.26 mm^2(M6)
Grounding	Ground		M8 bolt mounting	15 (133)	50.24 mm^2(M8)

3C3 PRO 60KS\80KS UPS External Power Source Terminals

Terminals Function	Terminals	Function	Bus landing	Tightening Torque Nm (lb in)	Screw Size and Type
			60KS/80KS/100KS/120KS		
AC Mains Input to UPS Rectifier	L1	Phase A	M8 bolt mounting	15 (133)	50.24 mm^2(M8)
	L2	Phase B	M8 bolt mounting	15 (133)	50.24 mm^2(M8)
	L3	Phase C	M8 bolt mounting	15 (133)	50.24 mm^2(M8)
	N	Neutral	M10 bolt mounting	24 (213)	78.5 mm^2(M10)
AC Mains Input to Bypass	L1	Phase A	M8 bolt mounting	15 (133)	50.24 mm^2(M8)
	L2	Phase B	M8 bolt mounting	15 (133)	50.24 mm^2(M8)
	L3	Phase C	M8 bolt mounting	15 (133)	50.24 mm^2(M8)
	N	Neutral	M10 bolt mounting	24 (213)	78.5 mm^2(M10)
UPS Output to Loads	L1	Phase A	M8 bolt mounting	15 (133)	50.24 mm^2(M8)
	L2	Phase B	M8 bolt mounting	15 (133)	50.24 mm^2(M8)
	L3	Phase C	M8 bolt mounting	15 (133)	50.24 mm^2(M8)
	N	Neutral	M10 bolt mounting	24 (213)	78.5 mm^2(M10)
DC Input	+	Battery (+)	M10 bolt mounting	24 (213)	78.5 mm^2(M10)
	–	Battery (-)	M10 bolt mounting	24 (213)	78.5 mm^2(M10)
Grounding	Ground		M8 bolt mounting	15 (133)	50.24 mm^2(M8)

3C3 PRO 160KS\200KS UPS External Power Source Terminals

Terminals Function	Terminals	Function	Bus landing	Tightening Torque Nm (lb in)	Screw Size and Type
				160KS/200KS	
AC Mains Input to UPS Rectifier	L1	Phase A	M10 bolt mounting	24 (212)	78.540 mm^2(M10)
	L2	Phase B	M10 bolt mounting	24 (212)	78.540 mm^2(M10)
	L3	Phase C	M10 bolt mounting	24 (212)	78.540 mm^2(M10)
	N	Neutral	M10 bolt mounting	24 (212)	78.540 mm^2(M10)
AC Mains Input to Bypass	L1	Phase A	M10 bolt mounting	24 (212)	78.540 mm^2(M10)
	L2	Phase B	M10 bolt mounting	24 (212)	78.540 mm^2(M10)
	L3	Phase C	M10 bolt mounting	24 (212)	78.540 mm^2(M10)
	N	Neutral	M10 bolt mounting	24 (212)	78.540 mm^2(M10)
UPS Output to Loads	L1	Phase A	M10 bolt mounting	24 (212)	78.540 mm^2(M10)
	L2	Phase B	M10 bolt mounting	24 (212)	78.540 mm^2(M10)
	L3	Phase C	M10 bolt mounting	24 (212)	78.540 mm^2(M10)
	N	Neutral	M10 bolt mounting	24 (212)	78.540 mm^2(M10)
DC Input	+	Battery (+)	M10 bolt mounting	24 (212)	78.540 mm^2(M10)
	–	Battery (-)	M10 bolt mounting	24 (212)	78.540 mm^2(M10)
Grounding	Ground		M10 bolt mounting	24 (212)	78.540 mm^2(M10)

Recommended Input Circuit Breaker Ratings

UPS Models	Circuit Breaker Rating	
	Load	400V
3C3 PRO-20	80%-rated	38A
	100%- rated	31A
3C3 PRO-30	80%-rated	57A
	100%- rated	46A
3C3 PRO-40	80%-rated	77A
	100%- rated	61A
3C3 PRO-60	80%-rated	115A
	100%- rated	92A
3C3 PRO-80	80%-rated	153A
	100%- rated	123A
3C3 PRO-100	80%-rated	192A
	100%- rated	154A
3C3 PRO-120	80%-rated	234A
	100%- rated	187A
3C3 PRO-160	80%-rated	310A
	100%- rated	248A
3C3 PRO-200	80%-rated	386A
	100%- rated	309A

Recommended Bypass Circuit Breaker, Output Circuit Breaker and Bypass Fuse Ratings

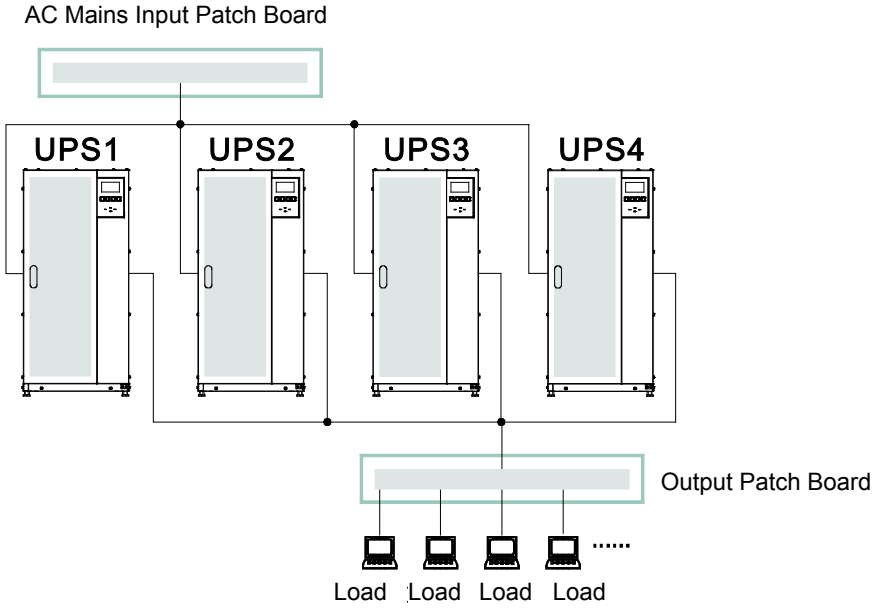
UPS Model	Circuit Breaker Rating		Fuse Parameters	
	Load	400V	Current/Min	I2T/Max
3C3 PRO-20	80%-rated	36A	40A	10200A^{2}Sec
	100%- rated	29A		
3C3 PRO-30	80%-rated	54A	63A	10200A^{2}Sec
	100%- rated	43A		
3C3 PRO-40	80%-rated	72A	80A	10200A^{2}Sec
	100%- rated	58A		
3C3 PRO-60	80%-rated	108A	125A	72500A^{2}Sec
	100%- rated	87A		
3C3 PRO-80	80%-rated	144A	160A	72500A^{2}Sec
	100%- rated	114A		
3C3 PRO-100	80%-rated	180A	200A	202500A^{2}Sec
	100%- rated	144A		
3C3 PRO-120	80%-rated	216A	250A	202500A^{2}Sec
	100%- rated	173A		
3C3 PRO-160	80%-rated	289A	300A	225000A^{2}Sec
	100%- rated	231A		
3C3 PRO-200	80%-rated	361A	400A	225000A^{2}Sec
	100%- rated	289A		

Recommended DC Circuit Breaker Ratings

UPS Model	Load	Circuit Breaker Rating	
		Rated Battery Voltage (DC 432V, 36)	Rated Battery Voltage (DC480V, 40)
3C3 PRO-20	80%-rated	57A	NA
	100%- rated	46A	NA
3C3 PRO-30	80%-rated	86A	NA
	100%- rated	69A	NA
3C3 PRO-40	80%-rated	114A	NA
	100%- rated	92A	NA
3C3 PRO-60	80%-rated	172A	NA
	100%- rated	137A	NA
3C3 PRO-80	80%-rated	229A	NA
	100%- rated	183A	NA
3C3 PRO-100	80%-rated	NA	257A
	100%- rated	NA	206A
3C3 PRO-120	80%-rated	NA	309A
	100%- rated	NA	247A
3C3 PRO-160	80%-rated	NA	412A
	100%- rated	NA	330A
3C3 PRO-200	80%-rated	NA	515A
	100%- rated	NA	412A

3.5 Parallel Installation

The 3C3 PRO Series support parallel installation. The parallel connection wires (optional) can be used to connect 2 to 4 UPS units in parallel to achieve power redundancy (N+X). The minimum clearance between two UPS units is 10cm. The input wiring requirements for paralleled UPS units are the same with those for single unit. The input/output of paralleled UPS units should all be connected to the same input/output patch board, from which wires are distributed for load as illustrated in the following figure:



NOTE:

1) Paralleled UPS units can share the battery packs; The batteries of each battery pack should be batteries of the same type and from the same batch produced by the same manufacturer;

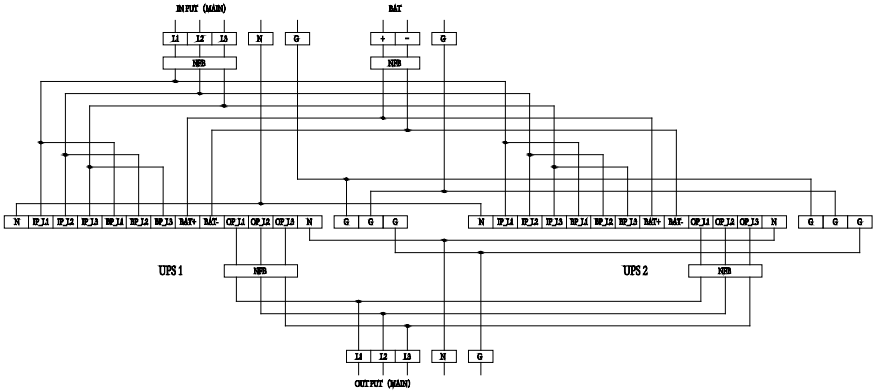
2) Requirements for output wire length:

① When the wires connecting the input (output) terminals of paralleled UPS units with the input (output) patch board are shorter than 20m, the difference in wire length should be smaller than 20% of the length

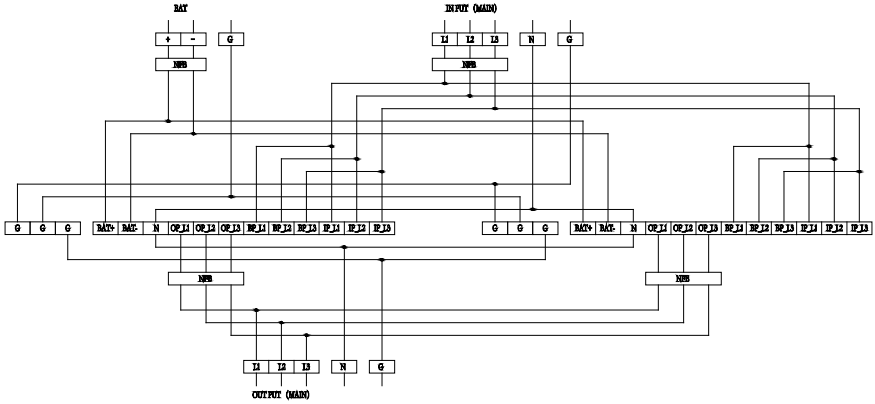
② When the wires connecting the input (output) terminals of paralleled UPS units to the input (output) patch board are longer than 20m, the difference should be smaller than 10%.

3. Parallel machine wire connection drawing:

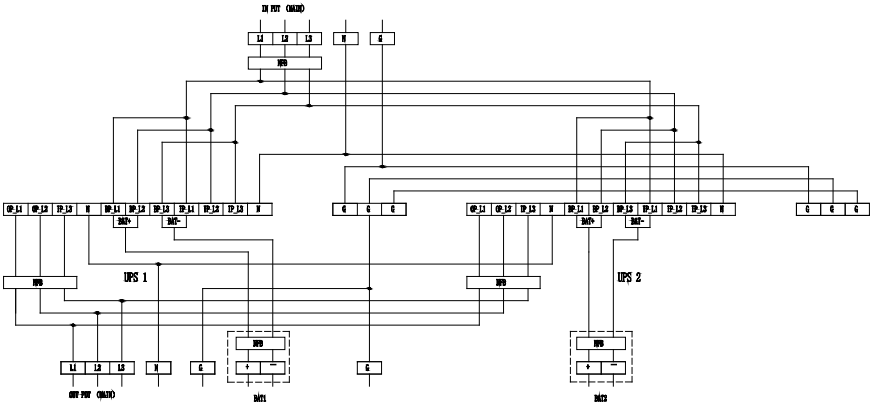
3C3 PRO 20KS/30KS/40KS UPS



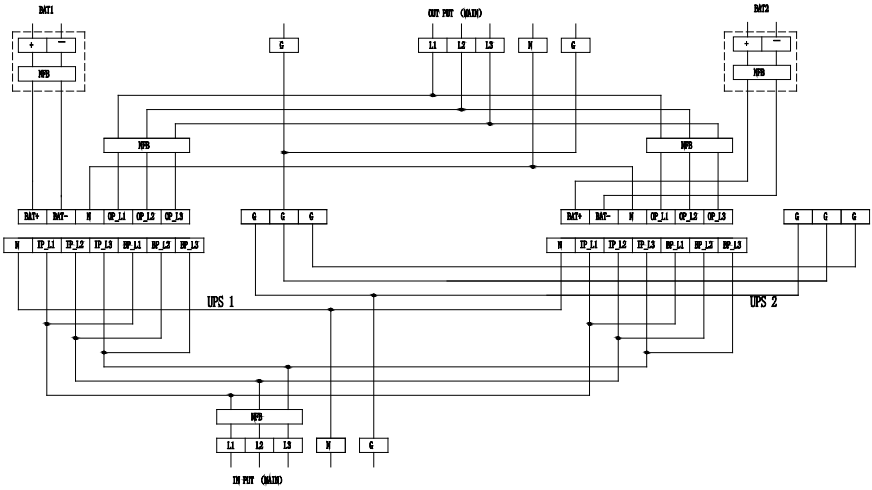
3C3 PRO 60KS/80KS UPS



3C3 PRO 100KS/120KS UPS



3C3 PRO 160KS/200KS UPS



3.6 Steps of connecting battery cabinets to UPS

A proper over-current circuit breaker should be installed between the battery cabinet and the UPS. To choose the right circuit breakers, please refer to the tables in the above section.
(1) Make sure that the input and output terminals is non-electrified and the external battery sockets are power off.
(2) Switch off the battery breaker of battery cabinet.
(3) Remove the cover on the terminals bay and connect the "+" and "-" wires from the UPS terminals to "+" and "-" wires of the battery box; make sure the battery polarities are correct.
(4) Use multi-meter (DC Voltage) to measure the voltage of positive and negative batteries as well as positive and negative polarity, make sure the positive and negative connectivity is correct then put the cover back on the terminals bay.

NOTE: To prevent electric shock, the installation and replacement of battery must be performed by professional personnel and after the UPS is shut down.

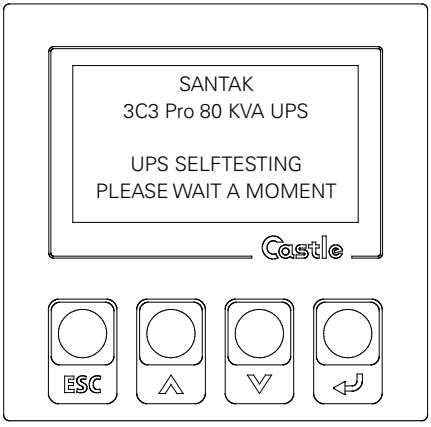
Chapter 4 Operation

4.1 Operations of Single UPS

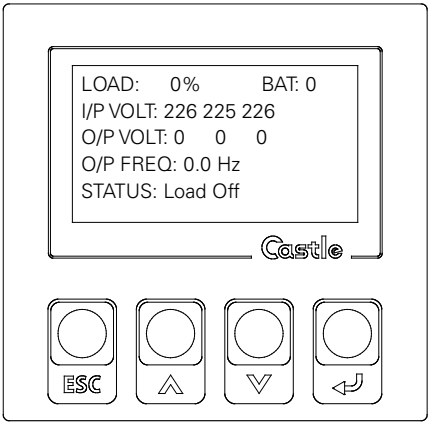
1. Make sure Phase A, B and C are in correct phase sequence, and then supply power to the UPS.
2. Turn on the battery (make sure that the battery "+" and "-" terminals are correctly connected to the UPS terminals).
3. Turn on the "Input Switch" on the UPS (the AC Input Switch), and the UPS will start to check its functionality with the cooling fan operating. You will access the main menu in about 4 seconds. Then please operate according to the following screen display.

NOTE: The data shown in the following pictures on the operations of 3C3 PRO 80KS are for reference only.

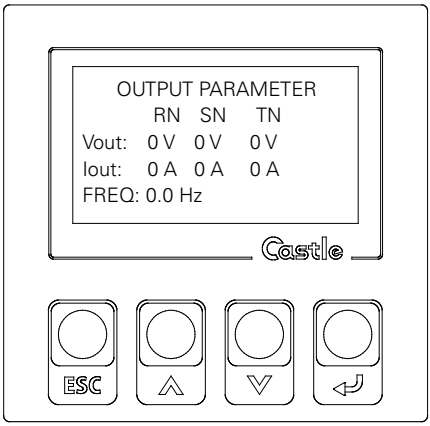
1) Turn on the "Input Switch", and the UPS will start to check its functionality, The main menu will be displayed after 15 seconds of inactivity.



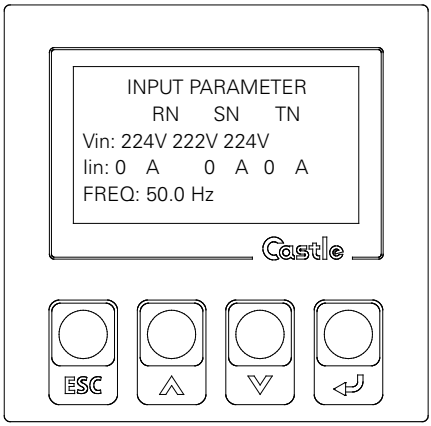
2) Get to the main menu.



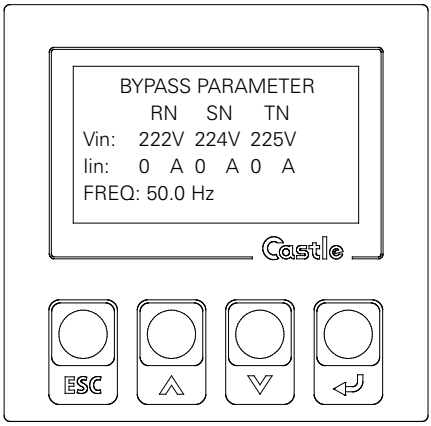
3) Press the ▼ button for the following information.



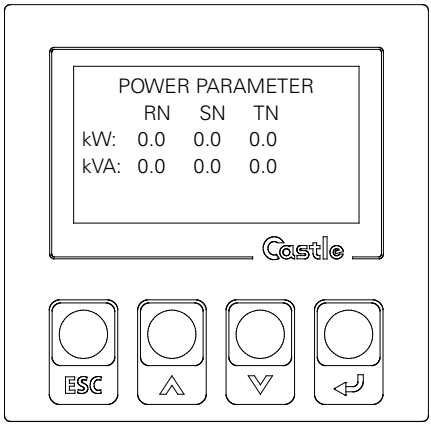
4) Press the ▼ button for the following information.



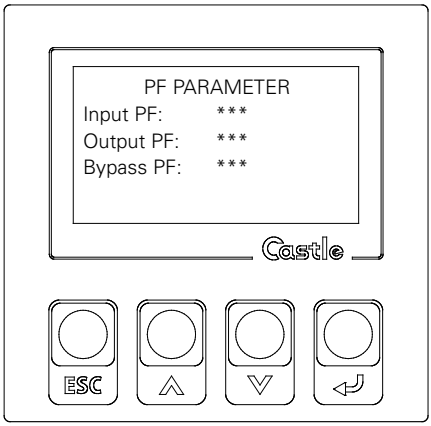
5) Press the ▼ button for the following information.



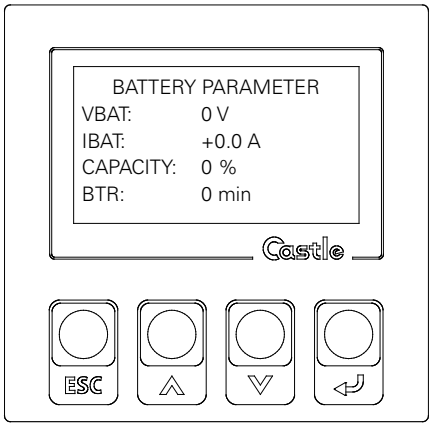
6) Press the ▼ button for the following information.



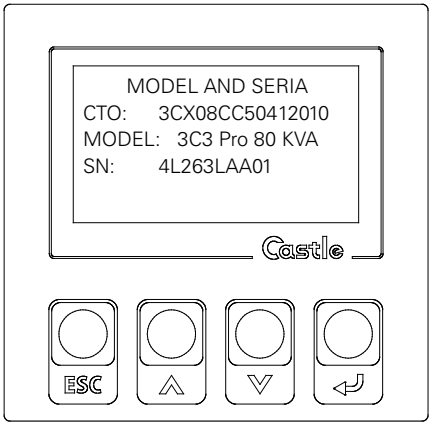
7) Press the ▼ button for the following information.



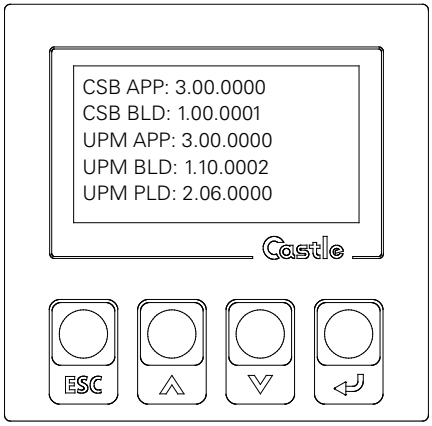
8) Press the ▼ button for the following information.



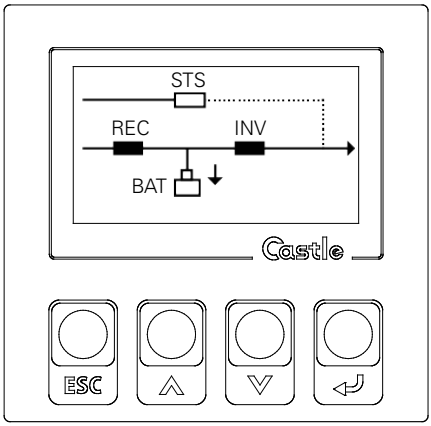
9) Press the ▼ button for the following information.



10) Press the ▼ button for the following information.

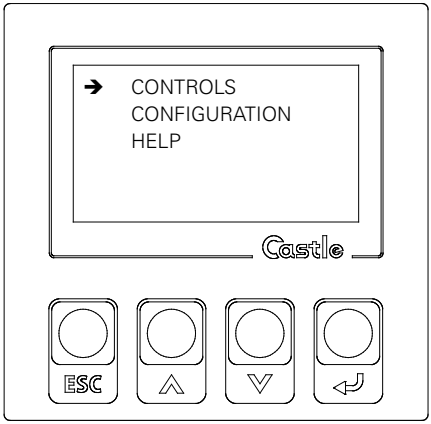


11) Press the ▼ button for the following information.

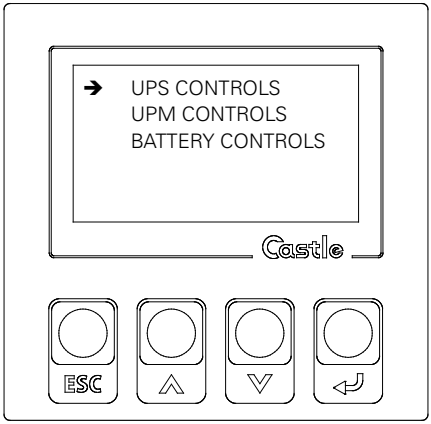


4. Start-up and shut-down operations

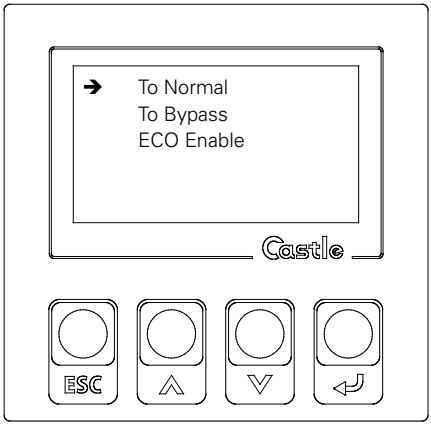
1) Access the control interface.



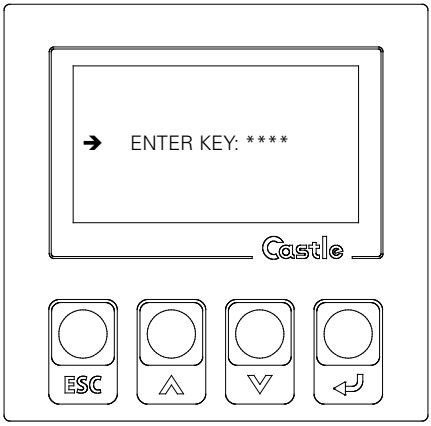
2) Press the ENTER button.



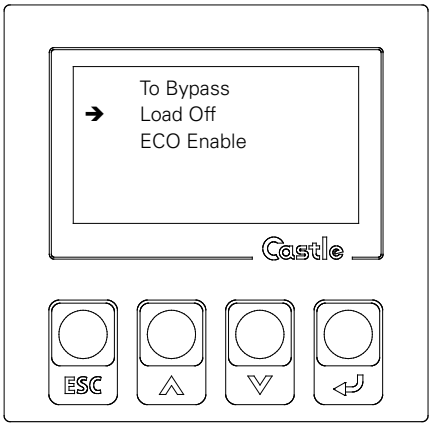
3) Select "Start-up".



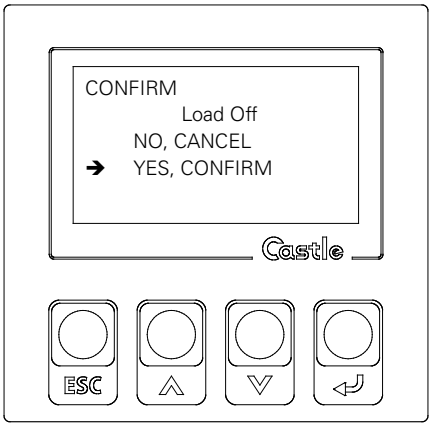
4) Enter the password to access the home page.



5) Select "Shut-down".



6) Confirm that you want to shut down the UPS.



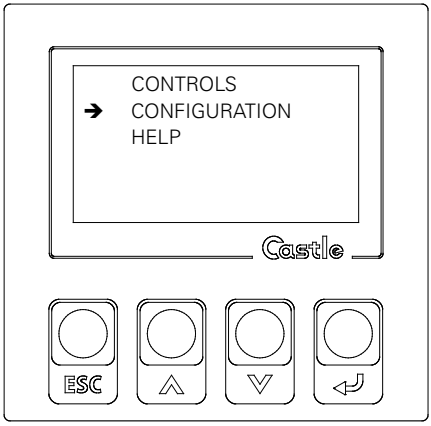
The 3C3 PRO series can start and operate with battery in the absence of AC mains supply, with a panel display similar to that in the case of AC supply. You can just follow the instructions displayed on the panel to start or shut down the UPS with battery:

- Make sure that the battery "+" and "-" terminals and the N wire are correctly connected to the UPS.
- Turn on the battery.
- Press the ENTER button.
- The LCD will undergo a self-test. Please manually start the UPS within 40s after the LCD self-test is completed.

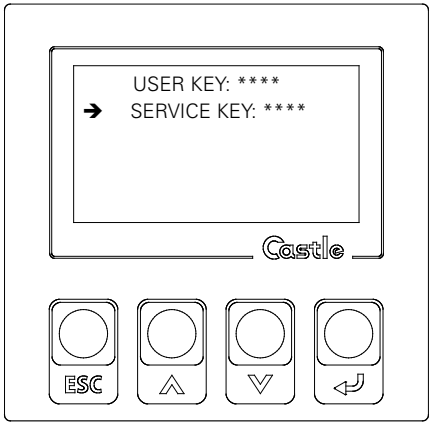
NOTE: The power supply to the UPS will be automatically cut off if there is no operation within 40s after the LCD self-test is completed!

5. Enter the start-up password to access the Settings page to configure the following settings:

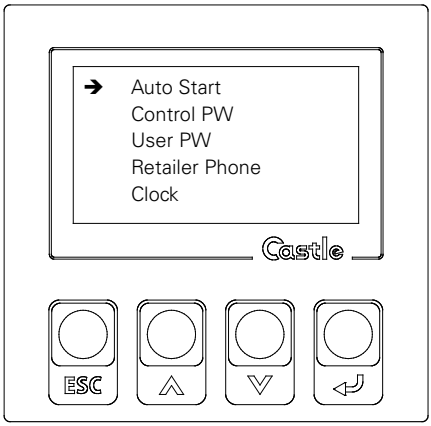
1) Press the ▼ button and select "Settings".



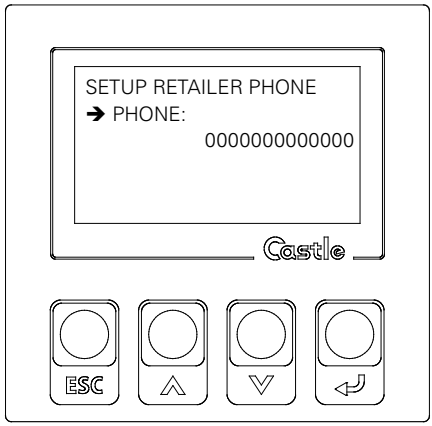
2) User/Service password setting page
Access the User Setting page;
Enter the service password
To access the Service Personnel setting page .



3) User Setting page.

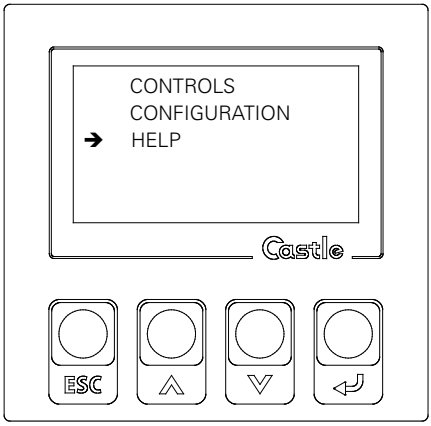


4) Retailer Telephone Number setting page.

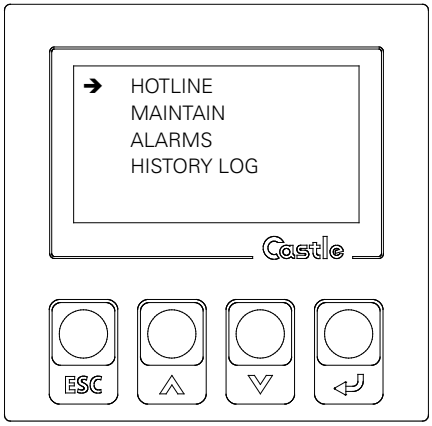


6. Inquiry

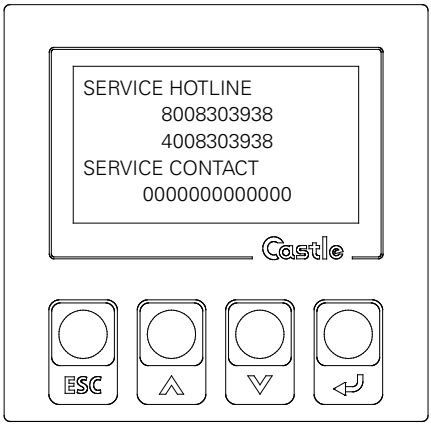
1) You can access the Inquiry page by entering the start-up password.



2) Inquiry page.

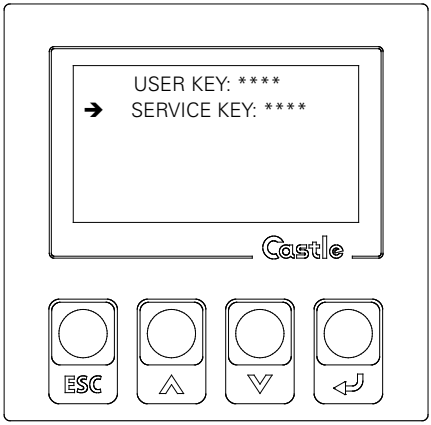


3) Hot-line and dealer Telephone
Number inquiry page (for China market only).

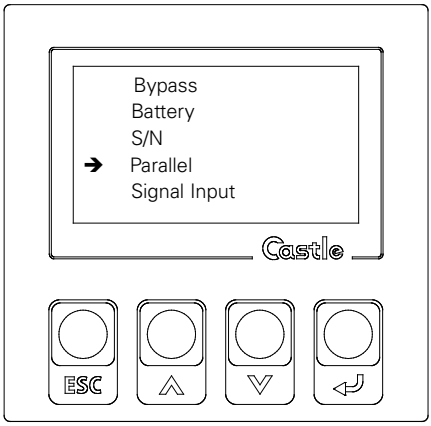


4.2 Operations of UPS in Parallel Connection

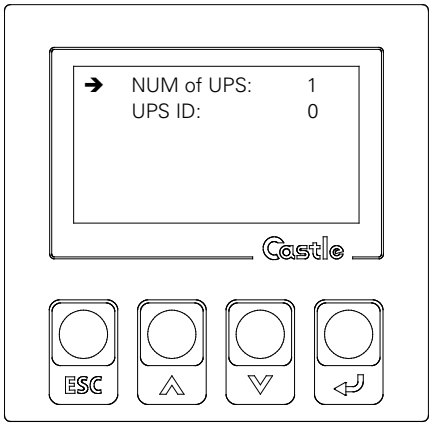
1) Enter the user password or service password.



2) Access the UPS Parallel Connection Setting page.



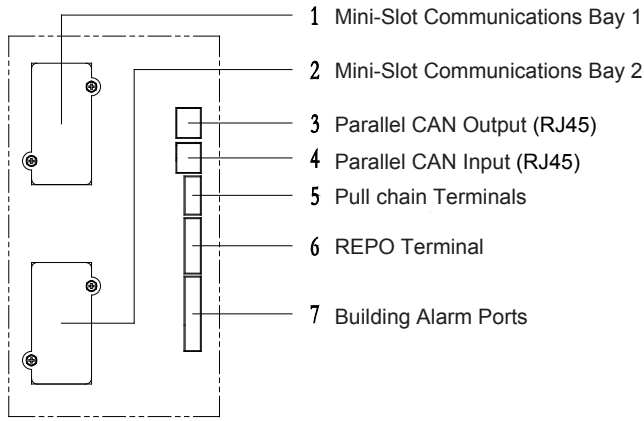
3) UPS Parallel Connection Parameter Setting page.



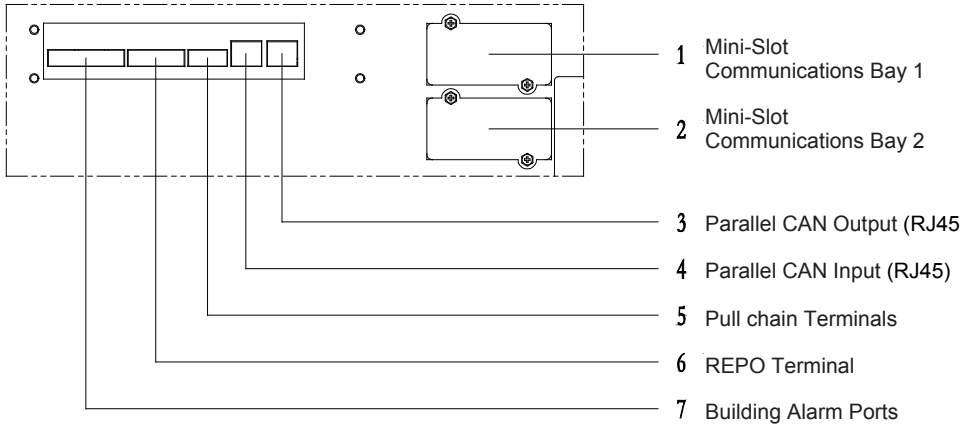
Chapter 5 Communications Interface

The 3C3 PRO series provide Expansion Slot, Parallel (RJ45) and REPO as well as special communication tools used by SANTAK service engineer or technical personnel authorized by SANTAK.

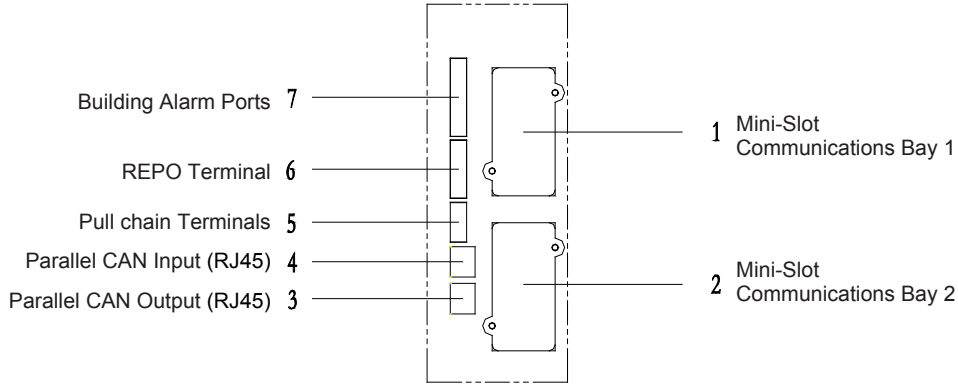
3C3 PRO 20KS/30KS/40KS



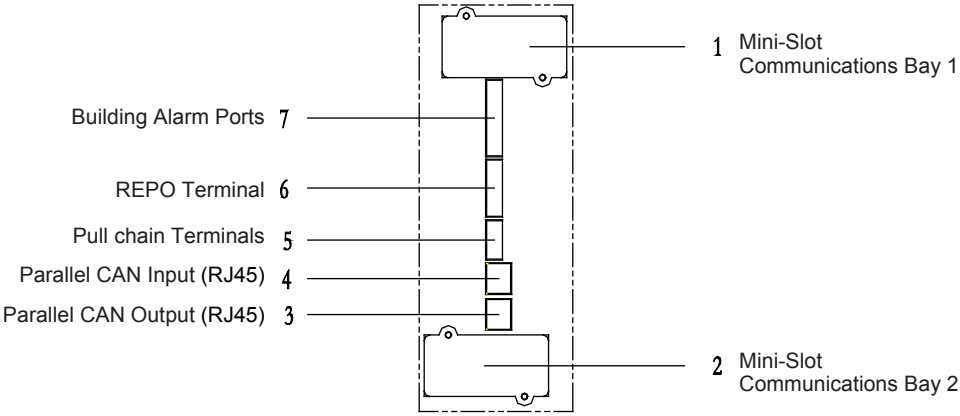
3C3 PRO 60KS/80KS



3C3 PRO 100KS/120KS



3C3 PRO 160KS/200KS



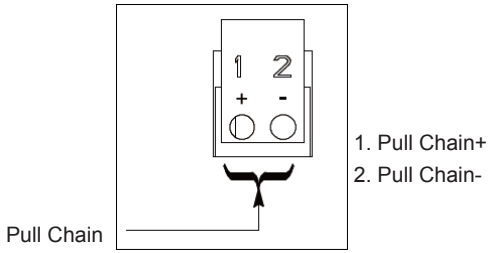
1 (2). Expansion slots: Slots exclusively available on the 20KS-200KS models and only accessible by users with special requirements. Standard users have no access to the slots.

3. Parallel Connection Terminals (RJ45) Parallel CAN Output used for communications between paralleled UPS units. Up to four 20KS-200KS models can be connected in parallel.

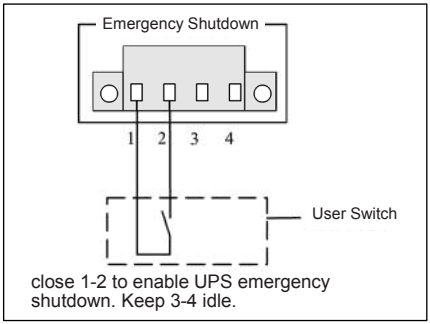
4. Parallel Connection Terminals (RJ45) Parallel CAN Input.
5. Pull chain Terminals: Check to make sure the UPS system is shut down, and connect the UPS intended for parallel connection according to the parallel connection diagram.
6. The REPO is used for emergency shutdown, which enables users to cut off the UPS output in case of an emergency.
7. Building Alarm Ports This standard feature enables you to connect UPS ports to your building alarms, such as" On generator". Please use twisted-pair wires to connect the alarms and the corresponding UPS ports. You can choose which building alarm you want to connect to a certain UPS port through LCD.

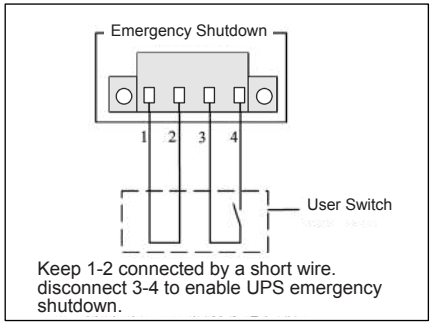
If you have any questions on the use of the above communications terminals, please call SANTAK's local distributors or email to santak_int@eaton.com.

Pull Chain Terminals:



REPO external wiring:



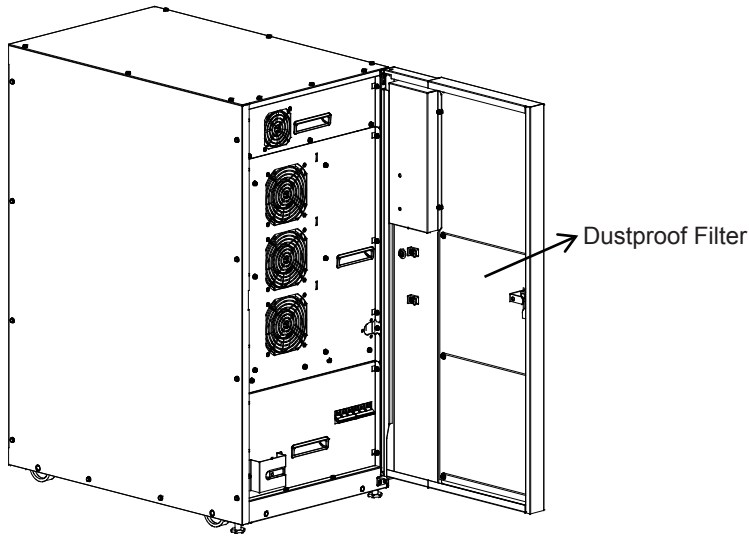


Chapter 6 Optional Accessories

Dustproof Filter

Dustproof filter is an standard accessory specially designed for the 3C3 PRO series to provide IP51 protection for the front side of the UPS in environments where there is heavy dust (dust diameter no less than 1.0mm, especially metallic and metalloid dust). It is easy to install, replace and clean.

3C3 PRO Dustproof Filter



Chapter 7 Transportation, Maintenance and Troubleshooting

Transporting the UPS

Prepare for transporting the UPS according to the following steps:
Note: Special equipment, such as a forklift, is needed for loading and unloading due to the heavy weight of the UPS.

1. Turn off all equipment that is being powered by the UPS, and disconnect all connectors to the power terminal of the UPS.
2. Disconnect the UPS from utility power and turn off the battery.

Servicing and Maintenance

The 3C3 PRO series require only minimal maintenance.

1. If the battery is disconnected, loads will not be protected from power failure.
2. Under normal circumstances, early replacement should be made if the battery is found not in good condition. The battery should only be replaced by qualified personnel. Users should not replace the battery themselves. The following precautions should be observed:
A. Turn off and disconnect the UPS from the AC mains prior to battery replacement.
B. Remove watches, rings, or other metal objects.
C. Use screwdrivers with insulated handles, and do not lay tools or metal objects on the battery. Otherwise the battery can present a risk of electrical shock or explosion from high short-circuits current.
D. Short circuit or reverse connection between the positive and negative terminals of the battery is strictly forbidden.
3. It is not recommended to replace batteries individually. All batteries should be replaced at the same time only by authorized personnel following the instructions from the battery supplier.
4. Keep the air inlets and outlets clear for proper ventilation and clean side frames and fan vents from dust every 6 months (disconnect the UPS from utility power and turn off the battery prior to the cleaning).

Troubleshooting

Go through the following checklist if the UPS is operating abnormally:

1. Check if the input wiring of the UPS is connected correctly.
2. Check if any over-current circuit breaker has tripped.
3. Check if input voltage is within the specified limits.

If the problem remains unsolved after you go through the checklist above, please refer to "Table of Malfunctions" and "Reference Table of LED Indicators" in Appendix II for further instructions.

Table of Malfunctions		
Problem	LCD Display or Possible Cause	Solution
The "Fault" LED is on, and the UPS emits an intermittent beeping sound.	The UPS is overloaded in bypass or inverter mode.	Reduce the load on the UPS until the UPS works within nominal capacity.
	AC mains failure.	Make sure the input wiring is connected correctly and input voltage is normal.
	The battery is not connected.	Make sure battery switch is turned on and the battery wiring is correctly connected.
The "Fault" LED is on and the UPS emits a constant beeping sound.	UPS Failure.	Please contact SANTAK local distributors.
Battery discharging time is less than1/3 of its initial discharging time.	The battery is exhausted.	
	Charger Failure.	
No display no the LCD panel.		Press the "ESC" button for 3 seconds and reset the LCD panel.

If the problem persists, please contact SANTAK local distributors or email to santak_int@eaton.com, and provide the following information:

- UPS MODEL NO. and SERIAL NO.;

- The date when the problem arose.
- A complete description of the problem (including indications from the LCD panel, LED indicators, horns, and power condition and load capacity).

Appendix I Specifications

3C3 PRO 20KS/30KS/40KS/60KS/80KS Specifications

Specifications						
Models		3C3 PRO 20KS	3C3 PRO 30KS	3C3 PRO 40KS	3C3 PRO 60KS	3C3 PRO 80KS
Rated Capacity		20KVA/18KW	30KVA/27KW	40KVA/36KW	60KVA/54KW	80KVA/72KW
Input	Input Type	Three Phase + Neutral Wire + Ground Wire				
	Frequency	42-72Hz				
	Power Factor	≥ 0.99				
	AC Mains Voltage Range	Rating: 230/400Vac (Optional: 220/380, 240/415) 100% Load: 190/330 to 276/478Vac (-15%, +20%) 50% Load: 116/201 to 276/478Vac (-50%, +20%)				
	Bypass Voltage Range	Rating: 230/400Vac (Optional: 220/380, 240/415) 207/359 to 253/438Vac (Default Rated Voltage Range: ±10%, Maximum Optional Range: ±20%)				
Output	Rated Voltage	230/400 Vac, Three Phase + Neutral Wire + Ground Wire, (Optional: 220/380, 240/415)				
	Power Factor	0.9				
	Frequency Tolerance	(42-72)Hz±4Hz				
	Overload Time	60 min for 102-110% load, 10 min for 111-125% load, 1 min for 126-150% load, and 150 ms for >151% load at an ambient temperature of 40°C .				
Efficiency	Double-conversion Mode	94%				
	ECO Mode	98%				
Operating Environment	Ambient Temperature	0-40°C				
	Storage Temperature	–15 to +55°C with the protective package in good conditions				
	Humidity	0-95%, noncondensing				
	Operating Altitude	No derating within 1,000m above sea level; The maximum operating altitude: 2,000m; The UPS should be derated by 1% for every 100m increase.				
Nominal Battery Voltage/ Rated Charging Voltage		336V (168 Cells) to 480V (240 Cells), default setting: 384V (192 Cells)				
Weight	Net Weight (without battery)	77Kg	86Kg	86Kg	177Kg	184Kg
	Gross Weight (without battery)	115Kg	124Kg	124Kg	223Kg	230Kg
Dimensions (W x D x H) (mm)		420×715×900			600×720×1200	
Safety Standards	National Safety Standards of China	GB4943				
	TLC Certification	YD/T1095				
EMC	National Safety Standards of China International Safety Standards	GB/7260.2 IEC/62040.2				
	WARNING: This product is intended for commercial and industrial application in the secondary environment. Installation restrictions or additional measures may be needed to prevent disturbances.					

3C3 PRO 100KS/120KS/160KS/200KS Specifications

Specifications					
Models		3C3 PRO 100KS	3C3 PRO 120KS	3C3 PRO 160KS	3C3 PRO 200KS
Rated Capacity		100KVA/90KW	120KVA/108KW	160KVA/144KW	200KVA/180KW
Input	Input Type	Three Phase Conductors + Neutral Wire + Ground Wire			
	Frequency	42-72Hz			
	Power Factor	≥ 0.99			
	Mains Voltage Range	Rating: 230/400Vac (Optional: 220/380, 240/415) 100% Load: 190/330 to 276/478 Vac (-15%, +20%) 50% Load: 116/201 to 276/478 Vac (-50%, +20%)			
	Bypass Voltage Range	Rating: 230/400Vac (Optional: 220/380, 240/415) 207/359 to 253/438Vac (Default Rated Voltage Range: ±10%, Maximum Range: ±20%)			
Output	Rated Voltage	230/400 Vac, Three Phase Conductors + Neutral Wire + Ground Wire, (Optional: 220/380, 240/415)			
	Power Factor	0.9			
	Frequency Tolerance	(42-72)Hz±4Hz			
	Overload Time	60 min for 102-110% load, 10 min for 111-125% load, 1 min for 126-150% load, and 150 ms for >151% load at an ambient temperature of 40°C .			
Efficiency	Double-conversion Mode	94%			
	ECO Mode	98%			
Operating Environment	Ambient Temperature	0-40°C			
	Storage Temperature	–15 to +55°C with the protective package in good conditions			
	Humidity	0-95%, noncondensing			
	Operating Altitude	No derating within 1,000m above sea level; The maximum operating altitude: 2,000m; The UPS should be derated by 1% for every 100m increase.			
Nominal Battery Voltage/ Rated Charging Voltage		432V(216 Cells) to 480V (240 Cells), default setting: 480V (240 Cells)			
Weight	Net Weight (without battery)	283Kg	311Kg	457Kg	457Kg
	Gross Weight (without battery)	351Kg	379Kg	525Kg	525Kg
Dimensions (W x D x H) (mm)		600×800×1876		600×830×1876	
Safety Standards	National Safety Standards of China	GB4943			
	TLC Certification	YD/T1095			
EMC	National Safety Standards of China International Safety Standards	GB/7260.2 IEC/62040.2			
	WARNINGS: This product is intended for commercial and industrial application in the secondary environment. Installation restrictions or additional measures may be needed to prevent disturbances.				

Appendix II Reference Table of LED Indicators

No.	Status	LED					Buzzer
		Bypass LED	Mains LED	Inverter LED	Battery LED	Failure LED	
1	Mains Mode						
	Normal		●	●			
	Warning		●	●		●	★
2	Bypass Mode						
	Normal	●					
	Warning	●				●	★
3	Battery Mode						
	Normal			●	●		
	Warning			●	●	●	★
4	BatteryECT						
	Normal	●		●	●		
	Warning	●		●	●	●	★
5	ACECT						
	Normal	●	●	●			
	Warning	●	●	●		●	★
6	ECO Mode						
	Normal	●		●			
	Warning	●		●		●	★
7	LOAD OFF						
	Normal						
	Warning					●	★

If there is no LED status in the table above be found in your equipment, please contact authorized distributors or email to santak_int@eaton.com.

- ● Indicator light is on
- ★ The working cycle of buzzer is 3s: ringing 0.5s and being silent for 2.5s.

For more specific failure information, please contact SANTAK service representative.

Appendix III Warranty

The company provides: two-year free warranty service from the date of purchase. For repair or replacement of the warranted items, please provide:

- Valid certification by an authorized distributor;
- The serial number of your product.

In case of product failures, please call local distributors or email to santak_int@eaton.com. SANTAK's customers are entitled to the following services:

- Two-year warranty;
- Online technical support service;
- Free on-site repair within the warranty period of UPS.

The warranty does not cover:

- Human initiated failures;
- Failures that occur after the warranty expires;
- Items of which the serial numbers are changed or lost;
- Damage or loss caused by force majeure;
- Items that underwent unauthorized disassembly or modification;
- Failures arising from no-compliance with operation instruction;
- Damages arising from battery over discharge or human irritated damages.

614-02189-01

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