客服热线：400-830-3938　800-830-3938

城堡EX系列
CASTLE EX SERIES

使用手册
USER MANUAL

SANTAK®
山特电子(深圳)有限公司

感谢您使用山特产品！

请严格遵守本手册中和机器上的所有警告及操作说明，并妥善保管本手册。在没有阅读完所有的安全说明和操作说明以前，请不要操作本机。

本手册适用于城堡 EX 系列产品，包括：

3C3 EX 20KS/3C3 EX 20KS-ISO

3C3 EX 30KS/3C3 EX 30KS-ISO

3C3 EX 40KS/3C3 EX 40KS-ISO

3C3 EX 60KS/3C3 EX 60KS-ISO

3C3 EX 80KS/3C3 EX 80KS-ISO

严正声明

监管码声明

为了切实保障您的消费权益和用电安全，帮助您购买到真正的山特 UPS，请注意以下事项：

1. 认准山特注册商标：SANTAK® 山特®
2. 山特电子（深圳）有限公司在中国从未以任何形式授权委托其它公司生产 UPS；
3. 山特所有产品机身上均贴有“电子监管码”（“电子监管码”是国家质检总局为打击假货推行的一种产品身份识别码）。

查询方式：

网站查询：登录 www.95001111.com（中国产品质量电子监管网），输入监管码进行查询；

电话查询：95001111 进行查询（未开通地区可拨打 010-95001111）；

短信查询：编辑监管码发送至 106695001111（移动、联通均可）；

如有疑问，请拨打电话 95001111 或登录 www.95001111.com 点击“消费者通道”进行举报投诉。

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安全注意事项

操作安全

1. 在使用本产品前，请仔细阅读“安全注意事项”，以确保正确和安全的使用。并请妥善保存此手册。
2. 操作时，请注意所有警示标记，并按要求进行操作。
3. 请勿在阳光直接照射、雨淋或潮湿的环境使用本设备。
4. 本设备不能安装在靠近热源区域，或电暖炉、热炉等类似设备的附近。
5. 放置 UPS 时，四周要留有安全距离，保证通风散热及产品维护。安装时，请参照此手册。
6. 清洁时，请使用干燥的非导电物品进行擦拭。
7. 若遇火警，请正确使用干粉灭火器进行灭火。禁止使用液体灭火器。
8. 安装前要考虑楼层对机器和电池组的承重能力。
9. 使用本设备前，请确保负载功率与 UPS 额定功率及所配电池规格相匹配。

禁止事项

1. 电源设备内部有高压，非本公司或未经本公司授权的技术人员，请勿擅自打开机箱盖，否则会有触电的危险，同时失去保修资格。
2. 应用于下述负载设备前 , 请事先与经销商或山特公司讨论；其应用、设置、管理和维护等必须有特别的考虑和设计：
A. 精密工业、科学和医疗仪器、设备；
B. 电梯等有可能危及人身安全的设备；
C. 启动电流很大且产生负功的负载设备；
3. 电池严禁置于火中，以免爆炸。

电气安全

1. 上电前，请确认已正确接地，并检查配电线路和电池极性的正确性。
2. 电池保护装置需配置额定规格的过流保护断路器。
3. 当 UPS 需要移动或重新配线时，必须保证 UPS 完全关机，并将输入空气开关和电池开关断开，否则输出端仍可能带电，有触电的危险。
4. 为确保安全及产品性能，请使用山特指定的附加装置和附件。
5. 客户端在连接 UPS 前必须在配电系统中安装额定规格值的四极过流断路保护装置，断开所有的输入线路，以防有电击危险。

电池安全

1. 蓄电池的寿命随环境温度的升高而缩短。定期更换电池可保证 UPS 工作正常，并保证足够的后备时间。
2. 蓄电池的更换和维护只能由具备蓄电池专业知识的被授权人员来进行，必须使用相同类型和型号的蓄电池，且数量必须相同。
3. 蓄电池存在电击危险和短路电流危险。为避免触电伤人事故，在更换电池时，请遵守下列警告：
A. 不要佩带手表、戒指或类似金属物体；
B. 使用绝缘的工具；
C. 穿戴橡胶鞋和手套；
D. 请勿将金属工具或类似的金属零件放在电池上；
E. 在拆电池连接端子前，必须先断开连接在电池上的负载。
4. 严禁将蓄电池暴露于火中，以免引起爆炸，危及人身安全。
5. 非专业人士请勿打开或损毁蓄电池，因为电池中的电解液含有强酸等危险物质，会对皮肤和眼睛都会造成伤害。如果不小心接触到电解液，应立即用大量的清水进行清洗，并去医院检查。
6. 请勿将电池正负极短路，必须在电池箱里安装过电流保护装置，以防着火或电击危险。

使用保养

1. 使用环境及保存方法对本产品的使用寿命及可靠性有一定影响，因此，请注意避免在下列工作环境中使用 :
A. 超出技术指标规定（温度 0-40℃，相对湿度 0-95%）的高、低温和潮湿场所；
B. 有振动、易受撞的场所；
C. 有金属性粉尘、腐蚀性物质、盐份和可燃性气体的场所。
2. 如果长时间放置不使用，必须将 UPS（不带电池）存放在干燥的环境中，存贮温度范围 : -25-55℃。UPS 开机之前，必须先让环境温度回暖至 0℃以上，并维持 2 小时以上。
3. 请保持进、排气孔的通畅。进、排气孔的通风不畅会导致 UPS 内部的温度升高，使机器中元器件的寿命缩短，从而会影响到整机寿命。
4. 常温下当电池长期不用，电池连续三个月未充电时，需充电一次；在高温环境下，连续两个月未充电时就需充电一次，每次不得少于 10 小时；切勿空载放电，电池的持续放电时间应不超过 14 小时。

目录

第一章 简介

1.1 产品简介

城堡 EX 系列是具有高效率、高性能的双转换、纯在线式、三进三出的 UPS 产品。它提供了完美的电源保护解决方案，解决了断电、市电高压、市电低压、电压瞬时跌落、减幅振荡、高压脉冲、浪涌电压、谐波失真、杂波干扰、频率波动等电源问题，使产品可以广泛的应用在计算机设备，通信设备和其他控制类设备中，并且针对冲击性负载可以加装特定的选配件来应对复杂的工业环境。因此，城堡 EX 系列产品是电信、金融、交通、政府、制造、能源等多种行业或领域的最佳选择。

城堡 EX 系列产品的多种功能可为您的设备提供高品质的电源保证：

- 先进的 DSP 数字控制技术，有效提升产品性能和系统可靠性
- N ＋ X 并联冗余（支持并机共用电池）
- 优秀的工业环境防护性能
- 经济、安全的 ECO 模式运转可使 UPS 的整机效率达到 98％以上
- 高清晰人机交互的 LCD 界面，操作直观便捷
- 功能强大的通讯接口和远程监控
- 丰富的选配件，可根据实际需求灵活配置

1.2 常用符号说明

下面一些符号会在本说明书中用到，也可能会在实际应用过程中出现，请正确识别并知其含义。

符号及含义	
符　号	含　义
	注意安全
	当心触电
	交　流
	直　流
	保护接地
	重复循环
	勿与杂物一同放置

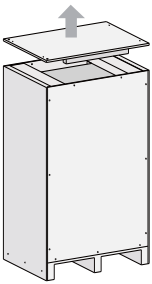
第二章 外观介绍

2.1 拆包检验

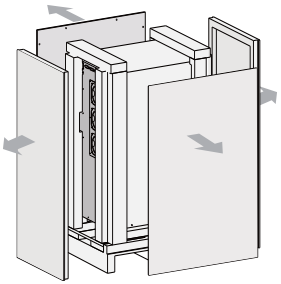
1. 打开包装，包装内应有：
1）UPS 主机一台
2）Winpower 光盘一张
3）随机附件，包括使用手册、环保信息卡和门锁钥匙两把

2. 检查 UPS 是否在运输中损坏，如发现损坏或部件缺少，请勿开机，立即联系承运商或经销商。
注意：搬运之前先确认门及通道内其它障碍物的高度。

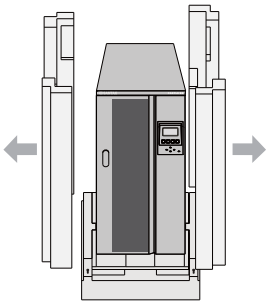
1）用套筒卸下顶盖上的螺丝，然后拆下顶盖



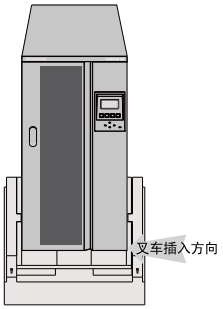
2）用套筒卸下箱体四侧的螺丝，拆下侧板



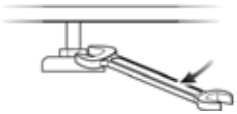
3）移走箱体四周的填充物和胶带



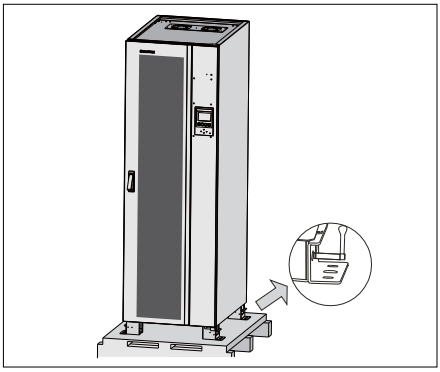
4）用叉车平稳的将箱体从包装栈板上移至地面

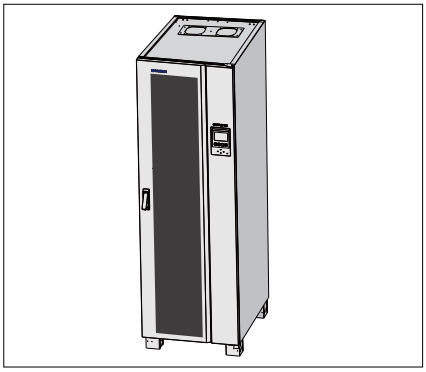


注：1) 3C3 EX 20KS/30KS/40KS 以及 ISO 机种配有刹车垫，请使用 19 号扳手，按顺时针旋转，将刹车垫旋到地面，即可防止机器移动。



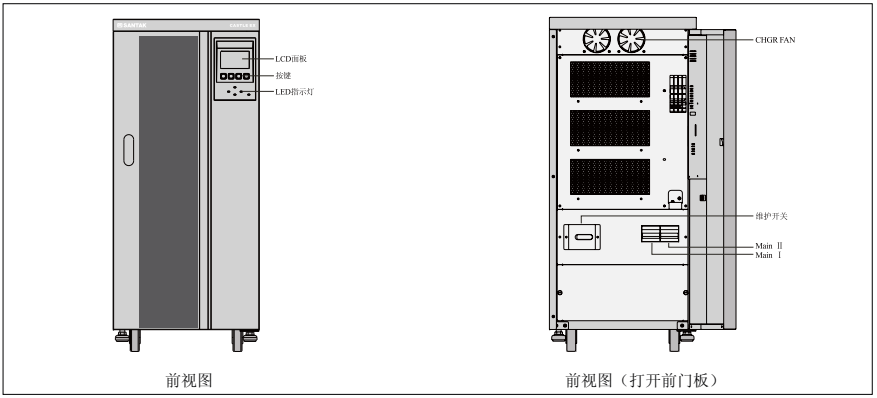
2) 3C3 EX 60KS/80KS 机器需先用扳手卸下固定 UPS 的角铁支架，然后用叉车平稳地将 UPS 移至地面，再取下角铁支架，固定于 UPS 的四侧。



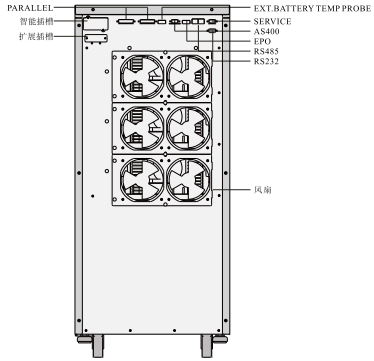


2.2 外观图

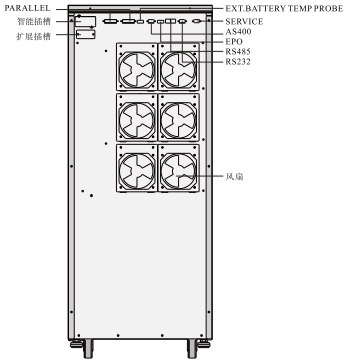
3C3 EX 20KS/30KS/40KS 外观图



前视图　　前视图（打开前门板）

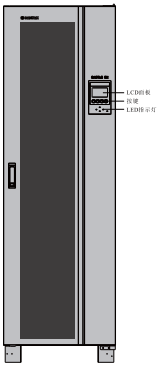


3C3 EX 20K 后视图

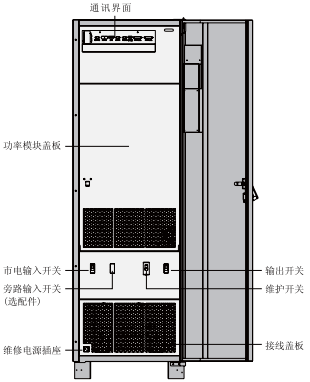


3C3 EX 30KS/40KS 后视图

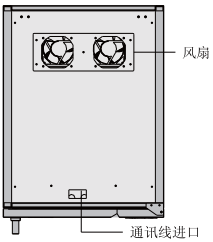
3C3 EX 60KS/80KS 机种外观图



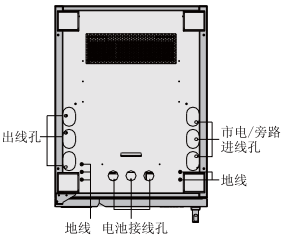
前视图



前视图（打开前门板）



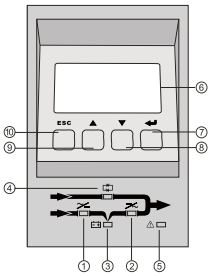
顶视图



底视图

2.3 LCD 面板指示说明

LCD 面板是用于人机交互的界面，通过 LCD 面板可以对 UPS 进行可视化操作，为 UPS 开机、关机、状态显示、故障报警、参数设置等功能提供了友好的界面。UPS 安装完后，用户对 UPS 的所有操作都可以通过 LCD 面板完成。LCD 面板包含状态显示灯、LCD 显示屏、导航键三部分。下表分别对状态指示灯和导航键按钮进行了描述。



注：LED 与 UPS 状态对应的详细信息可参考附录二。

- 状态指示灯：显示 UPS 当前的工作模式或状态

标识	指示灯名称	颜色	状态
①	市电	绿色	UPS 由市电供电给负载
②	逆变	绿色	UPS 电源通过逆变器供电给负载
③	电池	黄色	市电输入异常，UPS 由电池供电给负载
④	旁路	绿色	UPS 由旁路供电给负载
⑤	故障	红灯	UPS 发生异常，此灯长亮或闪烁，且发出连续或间歇的警报声

- LCD 显示屏—⑥：详细的显示 UPS 信息

- 导航键：菜单项的选择、打开、获取信息，改变系统参数等

标识	导航键	名称	功能
⑦	↵	确认 / 输入	打开所选菜单或确定一操作；密码操作时确定此位输入，进入下一位密码输入；状态界面下按动此键回到主菜单界面。
⑧	▼	向下	同级菜单下跳跃到下一屏显示
⑨	▲	向上	同级菜单下返回到上一屏显示
⑩	Esc	退出	退出当前界面返回上一界面或取消一操作；进行密码操作时可使当前输入密码为空；主菜单界面下按动此键回到状态界面。

第三章 安装说明

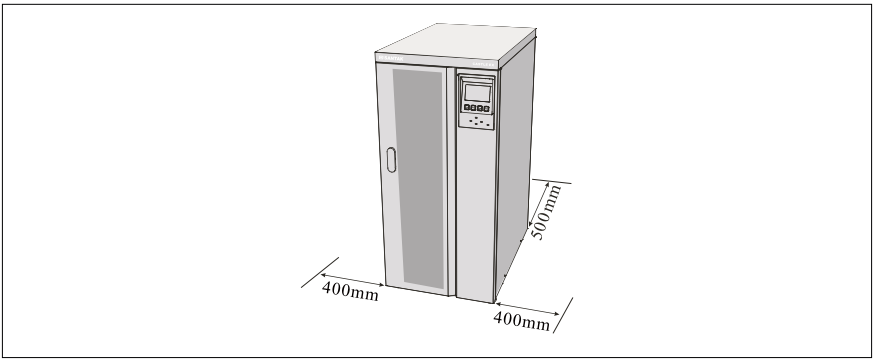
3.1 安装需知

1) 城堡 EX 系列产品的安装须由专业人员按照电工法规执行。
2) 在干净、平稳的环境中安装 UPS, 避开震动、灰尘、高湿、可燃性气体、可燃性液体或腐蚀性物质环境。
3) UPS 正常工作时的环境温度要求在 0-40℃之间。如果工作在 40℃以上的环境里，要求最大带载量按每增加 5℃，递减 12％额定值实施。UPS 工作时的最高环境温度要求不超过 50℃，高温环境下的长时间带载工作会影响 UPS 寿命。
4) 电池组建议在 15-25℃之间使用。
5) UPS 正常工作时的海拔要求为 1000 米以下，如果客户使用在 1000 米以上，必须采取递减额定值输出。如下表所列：

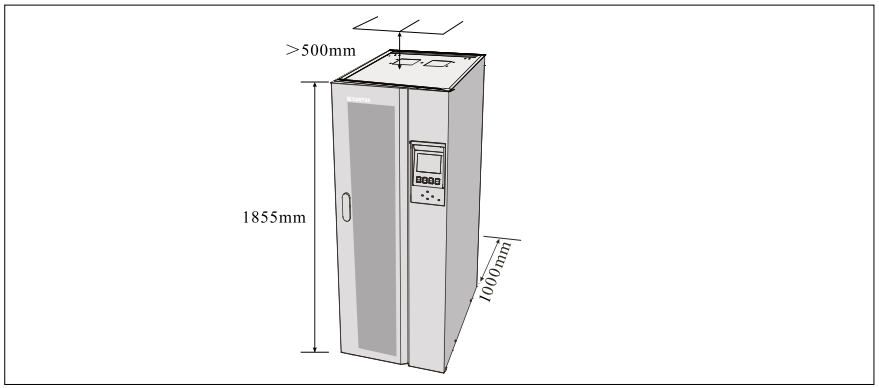
海拔（m）	1000	1500	2000	2500	3000	3500	4000	4500	5000
减额系数	100％	95％	91％	86％	82％	78％	74％	70％	67％

3.2 安装空间

3C3 EX 20KS/30KS/40KS 采取的是背面风扇强制冷却，安装场地必须考虑通风问题。同时机内维护是从正面进行，所以也要考虑预留维护空间，安装空间参考下图所示：



3C3 EX 60KS/80KS 采取底部进风、顶部出风，为确保正常有效地通风，请勿在 UPS 顶部堆放杂物，顶部空间预留不少于 500mm，否则 UPS 内部温度会异常升高。UPS 在选装 IP21 配件之前，避免安装在空调出风口下面，防止垂直水滴进入 UPS 内部，从而引发故障或起火燃烧。考虑到 UPS 内部以及主功率部分的维护，机器的正面和背面需各预留 1000mm 的维护空间，安装空间如下图所示：

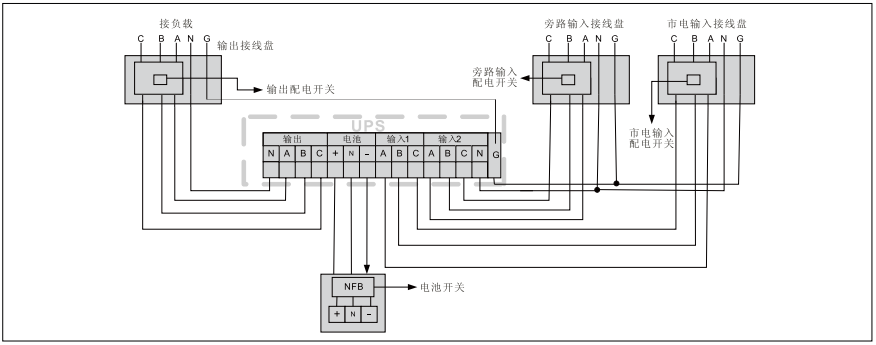


3.3 安装接线图

3C3 EX 20KS/30KS/40KS 标配为双电源输入，3C3 EX 60KS/80KS 标配为单电源输入，用户可根据需要要求客服工程师现场进行单 / 双电源输入配置的切换，所有的安装需由本公司或经本公司授权的技术人员进行操作，请勿擅自打开机箱盖，否则会有触电的危险。

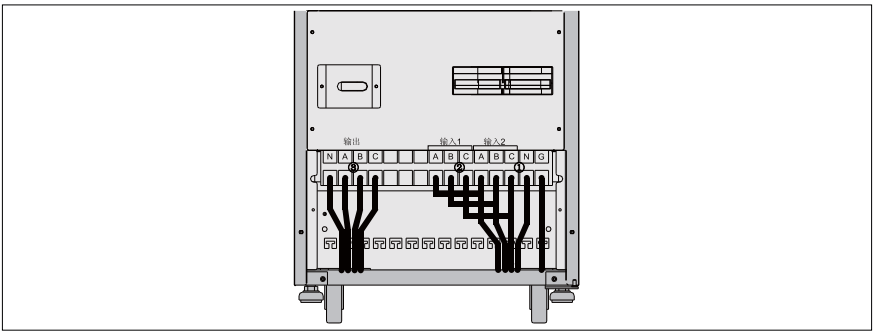
3C3 EX 20KS/30KS/40KS 接线方式：

1. 安装接线图：



2. 单电源输入：

因只有单电源输入，因此只需将市电 (3Φ4W) 接至市电输入端（Main Ⅰ）即可。
⑴ 接地导线必须连接到 UPS 的接地端
⑵ 将市电输入端的导线连接到端子排①
⑶ 将市电输入端的三根相线与旁路输入端的三根相线相连②
⑷ 将向负载供电的四根导线连接到端子排③



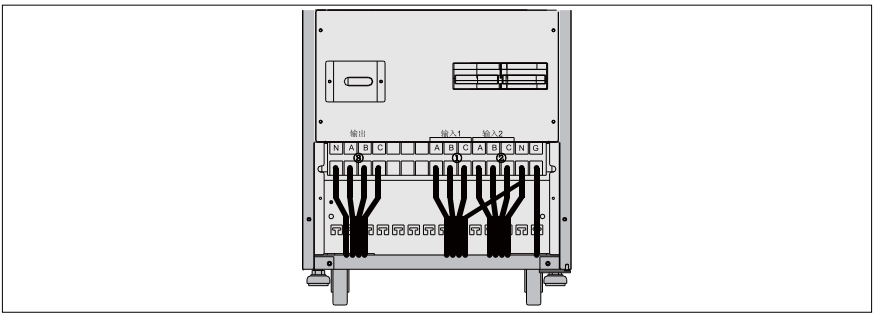
单电源 (3Φ4W): 20kVA~40kVA 接线图

注意事项：

- **请务必确认输入电源为 3 相 4 线，电源电压在允许的输入电压范围内（见附录一）；**
- **输入电源需为正相序，电池极性切勿接错；**

3. 双电源输入：

因有两个电源输入，因此首先必须先将端子台上之市电输入端与旁路输入端间之跳线拆除。
⑴ 接地导线必须连接到 UPS 的接地端；
⑵ 将市电输入端的四根导线连接到端子排①；
⑶ 将旁路输入端的四根导线连接到端子排②，输入 1 和输入 2 的 N 线连接在同个端子排；
⑷ 将向负载供电的四根导线连接到端子排③



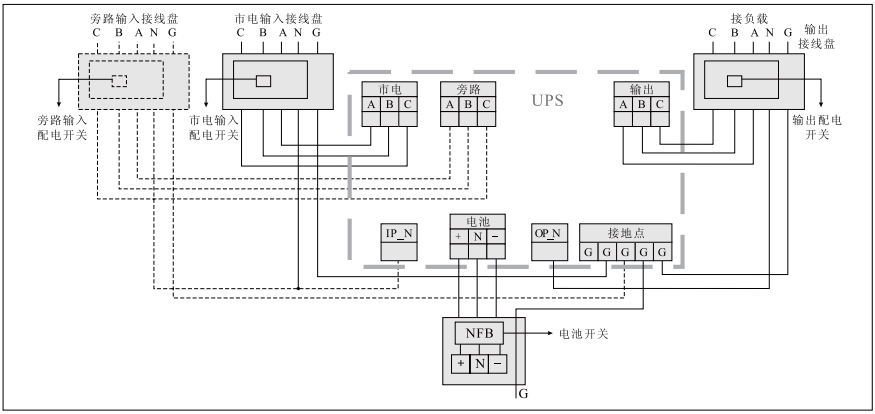
双电源 (3Φ4W): 20kVA~40kVA 接线图

注意事项：

- 请务必确认输入电源为 3 相 4 线，电源电压在允许的输入电压范围内（见附录一）；
- 市电输入电源与旁路输入电源需为正相序，电池极性切勿接错。

3C3 EX 60KS/80KS 接线方式：

1. 安装接线图：



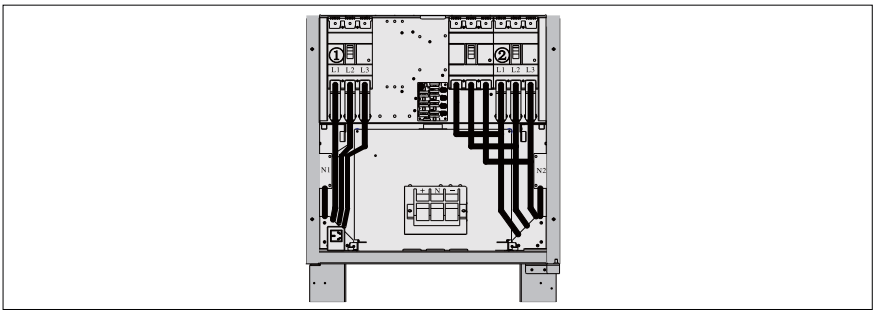
2. 单电源输入：

3C3 EX 60KS/80KS 标配单电源输入，因此只需将市电 (3Φ4W) 接至市电输入端即可。

⑴ 接地导线必须连接到 UPS 的接地端

⑵ 将市电输入端的导线连接到端子排①

⑶ 将向负载供电的四根导线连接到端子排②



单电源 (3Φ4W): 60kVA~80kVA 接线图

注意事项：

- 请务必确认输入电源为 3 相 4 线，电源电压在允许的输入电压范围内（见附录一）；
- 输入电源需为正相序，电池极性切勿接错；

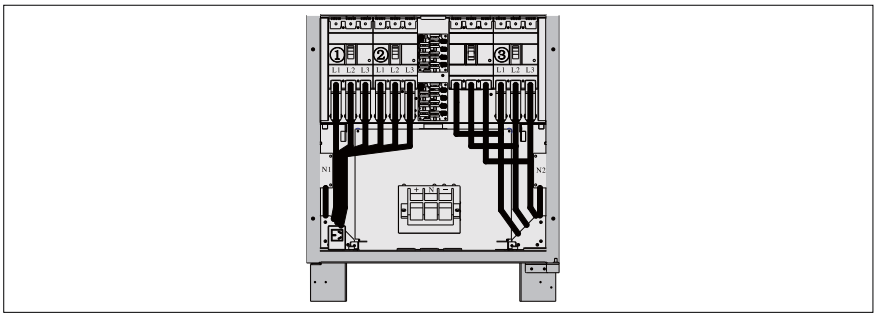
3. 双电源输入：

客户可根据实际需要选装双电源输入，由客服工程师现场配置旁路输入开关。

⑴ 接地导线必须连接到 UPS 的接地端

⑵ 将市电输入端的导线连接到端子排①，旁路输入端的导线连接到端子排②

⑶ 将向负载供电的四根导线连接到端子排③



双电源 (3Φ4W): 60kVA~80kVA 接线图

注意事项：

- 请务必确认输入电源为 3 相 4 线，电源电压在允许的输入电压范围内（见附录一）；
- 输入电源需为正相序，电池极性切勿接错；

3.4 城堡 EX 系列 UPS 配线表和保护装置

城堡 EX 系列 UPS 外接电池要求是串联连接正负各一组相同容量的 14-16 颗电池（12VDC 每颗），每组标称电压为 168VDC-192VDC，您可根据实际需要选择电池的容量和组数。电池组必须要配置电池直流开关和输入保险，电力线径也需考虑过载以及电网电压的因素进行选择，下表供用户参考：

机型	额定功率	输入火线线径	输出火线线径	电池正 / 负 /N 线线径	地线线径	N 线线径
3C3 EX 20KS	20kVA/16kW	10AWG/ 4mm²	10AWG/ 4mm²	6AWG/ 10mm²	10AWG/ 4mm²	6AWG/ 10mm²
3C3 EX 30KS	30kVA/24kW	6AWG/ 10mm²	6AWG/ 10mm²	4AWG/ 16mm²	6AWG/ 10mm²	4AWG/ 16mm²
3C3 EX 40KS	40kVA/32kW	6AWG/ 10mm²	6AWG/ 10mm²	1AWG/ 35mm²	6AWG/ 10mm²	1AWG/ 35mm²
3C3 EX 60KS	60kVA/48kW	2AWG/ 25mm²	2AWG/ 25mm²	0AWG/ 50mm²	2AWG/ 25mm²	0AWG/ 50mm²
3C3 EX 80KS	80kVA/64kW	1AWG/ 35mm²	1AWG/ 35mm²	0000AWG/ 95mm²	1AWG/ 35mm²	0000AWG/ 95mm²

机型	市电输入配电开关	旁路输入配电开关	电池开关	N 线开关	市电输入保险	电池输入保险
3C3 EX 20KS	3 Φ 50A/ 380VAC	3 Φ 63A/ 380VAC	3 Φ 125A/ 250VDC	1 Φ 80A/ 220VAC	63A 690V	30A 600V
3C3 EX 30KS	3 Φ 63A/ 380VAC	3 Φ 80A/ 380VAC	3 Φ 150A/ 250VDC	1 Φ 100A/ 220VAC	80A 690V	30A 600V
3C3 EX 40KS	3 Φ 80A/ 380VAC	3 Φ 100A/ 380VAC	3 Φ 200A/ 250VDC	1 Φ 150A/ 220VAC	100A 690V	30A 600V*2
3C3 EX 60KS	3 Φ 150A/ 380VAC	3 Φ 150A/ 380VAC	3 Φ 300A/ 250VDC	1 Φ 200A/ 220VAC	100A 690V*2	100A 690V
3C3 EX 80KS	3 Φ 175A/ 380VAC	3 Φ 175A/ 380VAC	3 Φ 400A/ 250VDC	1 Φ 250A/ 220VAC	100A 690V*2	100A 690V

备注：

1. 客户端在连接 UPS 前必须在配电系统中安装额定规格值的三极过流断路保护装置，断开所有的相线，N 线开关可单独配用；

2. 在单相电流超过 100A 时，所用保护空气开关必须带有灭弧装置，客户端建议是选用 UL 认证的 D 曲线空开；

3. 电池正 / 负 /N 线线径：表示 UPS 与电池箱配线线径，正极为红色线 , 负极为黑色线 ,N 极为蓝色线；

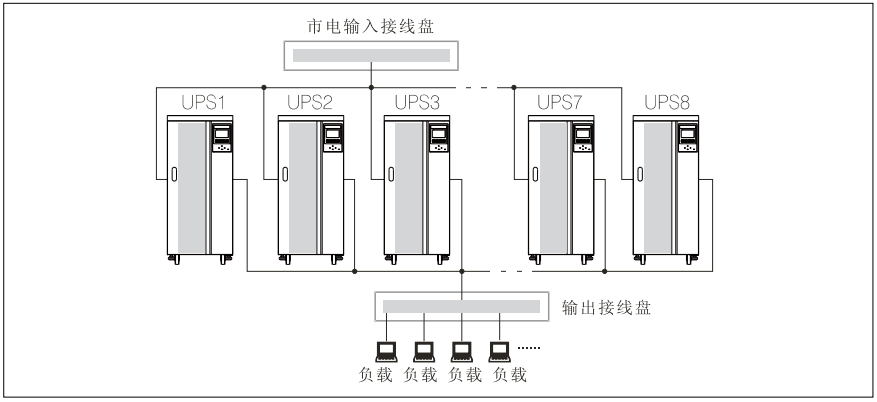
4. 电池线（正、负、N）必须长度相同，建议不要超过 40m；

3.5 并机安装

1. 冗余简介

N+X 是目前最可靠的供电结构，N 代表总负载所需的最少 UPS 数，X 代表的是冗余的 UPS 数，也就是系统可以同时承受的故障 UPS 数，当 X 越大，系统的可靠度就会越高。例如有一客户的总负载为 55kVA，采用 20KS 做 N+X 设计，N 为 3，X 可以依可靠度或是成本要求选择，假设用户选择 X=2，平时每台 UPS 均流供电 11kVA。当有 1 台 UPS 故障，其余 4 台 UPS 将以近 14kVA 均流供电。当同时有 2 台 UPS 故障时，剩下 3 台 UPS 将以约 18kVA 均流供电。此系统的最大容许度是同时有 2 台 UPS 故障，这样的机会远小于 1 台 UPS 故障，因此可以大大提高可靠度，对于讲究极高可靠度的使用场合是最佳的方式。

2. 城堡 EX 系列 UPS 具有直接并联功能，只需用并机线（选购件）连接可以进行 2 至 8 台 UPS 并联（60/80KS 机器支持 6 台并联），来实现扩容或功率冗余（N+X）。机器间距保持在 10cm 以上，每台 UPS 输入之配线请遵循单机之配线要求。各台 UPS 的输入 / 输出须接自同一个输入 / 输出接线盘，然后由接线盘配线去负载，见下图示：



注：

1）并机支持共用电池组；每组电池必须采用同一厂家同一型号同一批次的产品；

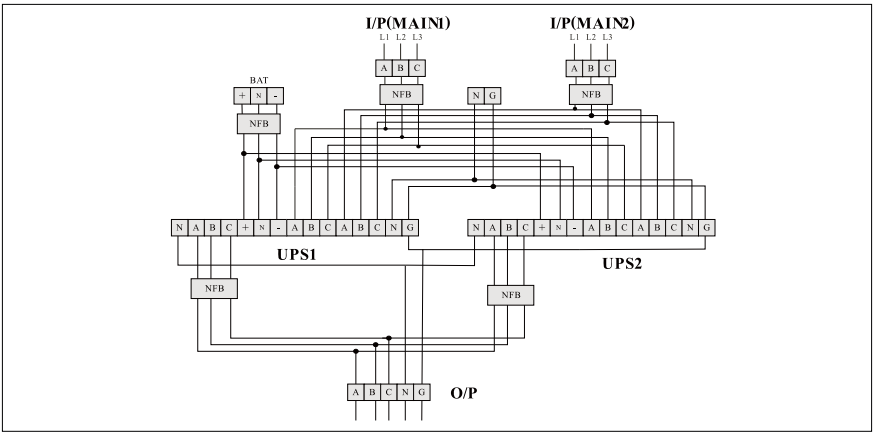
2）输出配线长度要求：

① 当每台 UPS 的输出端至输出接线盘间的引线长小于 20 米时，要求各线长差小于 20%

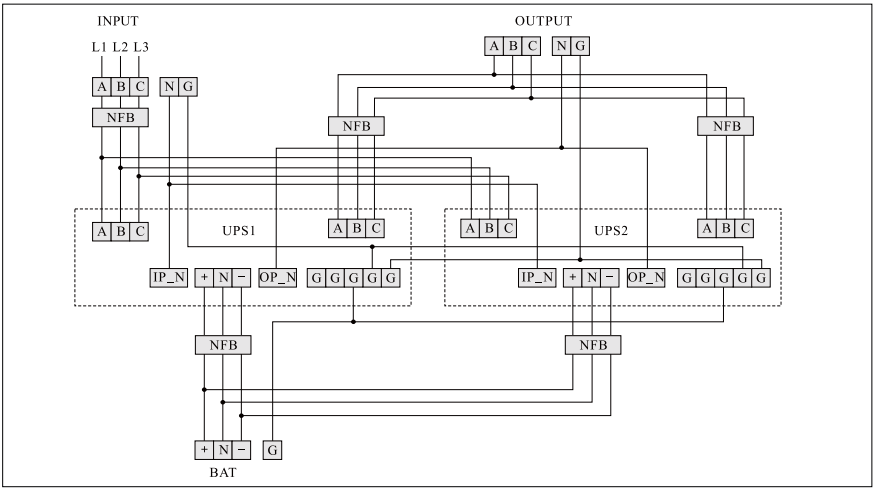
② 当每台 UPS 的输出端至输出接线盘间的引线长大于 20 米时，要求各线长差小于 10%

3. 并机接线图：

3C3 EX 20KS/30KS/40KS 机种



3C3 EX 60KS/80KS 机种



3.6 电池箱连接 UPS 的步骤

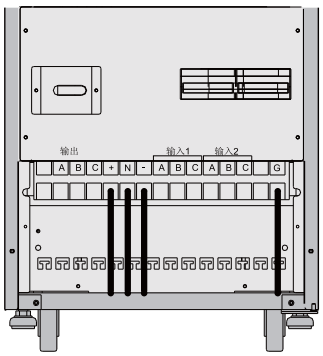
电池箱与 UPS 之间务必安装额定规格值的过流保护断路器，具体规格可见上一节的配线表。

⑴ 确保 UPS 的输入输出端均不带电，外接电池插座无电压输出；

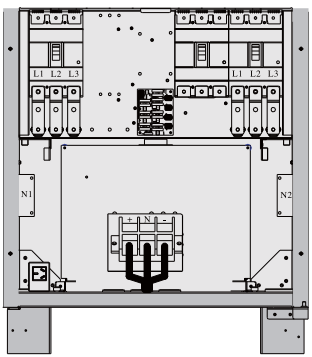
⑵ 将电池箱开关置于“OFF”状态；

⑶ 先将 UPS 的端子排盖板打开，然后将 UPS 端子排引出的电池 +、N、—线对应连接到电池箱上的 +、N、—线，切勿将电池正负极接反；

⑷ 用万用表（直流电压档）量测正负电池的电压以及电压正负，确保正负极连接正确，合上端子排盖板。



3C3 EX 20KS/30KS/40KS 电池接线图



3C3 EX 60KS/80KS 电池接线图

注：电池的连接与更换应在系统关机状态下进行，严禁带电以及非专业人士的操作，否则会有电击危险。

第四章 操作

4.1 单机操作

1 . 确定 A、B、C 电源相序连接正确，然后送电到 UPS。
2. 合上电池箱上的开关 (请确定 UPS 端子排 +、N、－与电池箱 +、N、－极一一对应)。
3. 合上 UPS 上的“输入开关”（市电输入开关：Main Ⅰ及旁路输入开关：Main Ⅱ；60K/80K 标配市电输入开关），此时风扇转动进行 UPS 自检，约 4 秒则自动进入主菜单，然后依下列液晶显示操作。

注：以 3C3 EX 20KS 为例，以下图中数据为参考值。

1) 市电输入

2) 约 4 秒自动进入

3) 按 ESC 键或 1 分钟内没有任何键被按下则进入

4) 按下▼键可以得到以下资料

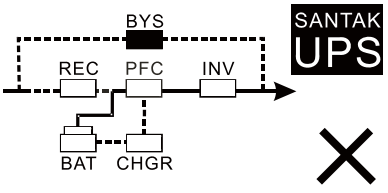
5) 再按下▼键可以得到以下资料

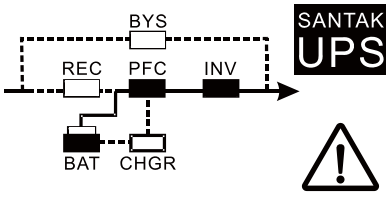
6) 再按下▼键可以得到以下资料

7) 再按下▼键可以得到以下资料

8) 再按下▼键可以得到以下资料

注：当有故障产生时，会在 LCD 界面的右下角显示“×”，当有警告产生时，会在 LCD 界面的右下角显示“⚠”（如以下界面，以电池模式为例）。





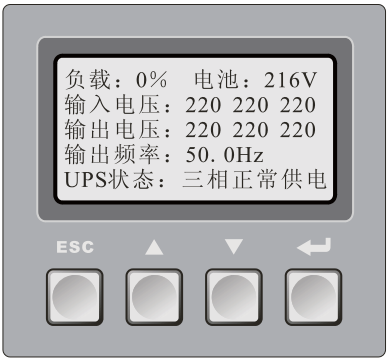
4. 开机动作（按 ESC 键可退出上列界面）

1) 开机界面

2) 按下 ENTER 键

3) 选择“是，确认”进行开机

4) 开机正常



5) 电池供电（切断市电）

5. 关机动作（按 ESC 键可退出上列界面）

1) 关机界面

2) 如果是单机则显示

3) 如果是并机则显示

4) 按下 ENTER 键

5) 选择“是，确认”进行关机

注：如果想关闭并机系统中的一台 UPS，则选择“单机关机”，如果想关闭整个并机系统，则选择“并机关机”。

6. 查询动作

1) 查询界面

2) 在查询画面处按下 ENTER 键

3) 在维修专线位置按下 ENTER 键

7. 设定动作

您可以通过使用者密码（使用者密码初始设置为：1234，用户可以自行更改）进入设定画面，进行以下程序的设定。

1) 设定界面（旁路供电）

2) 按下▼键

3) 按 ENTER 键，出现输入密码显示界面

4) 输入密码，按下 ENTER 键

8. 城堡 EX 系列 UPS 可在无市电输入状态下直流开机工作，面板相似于市电开机的画面，按照画面提示可执行直流开关机：

- 在 UPS 旁路模式下，预先将直流开机功能开启
- 确认电池正、负、N 线与 UPS 均正确连接
- 合上电池开关
- 轻触 ENTER 键
- 在 LCD 完成自检后 40 秒内手动执行开机命令

注：LCD 完成自检后 40 秒内无操作 UPS 会自动断电！

4.2 并机操作

城堡 EX 系列 UPS 具有直接并联功能，客户可根据实际需要在线增加新机实现功率冗余，一般操作要求可遵循单机之操作要求。在并机之前，本公司客服工程师会通过 LCD 显示屏将单机设置为并机模式等一些并机的前序操作。之后用并机线将各台 UPS 连接，UPS 之间的输出和输入并联起来，依次合上 UPS 输入开关，通过任何一台单机执行开机操作，所有单机显示“开机中”，并正常切换到逆变输出。

⑴ 开机动作遵循单机开机操作，开机正常，进入主界面：

⑵ 并联失败，UPS 无法正常开机，LCD 界面会显示如下：

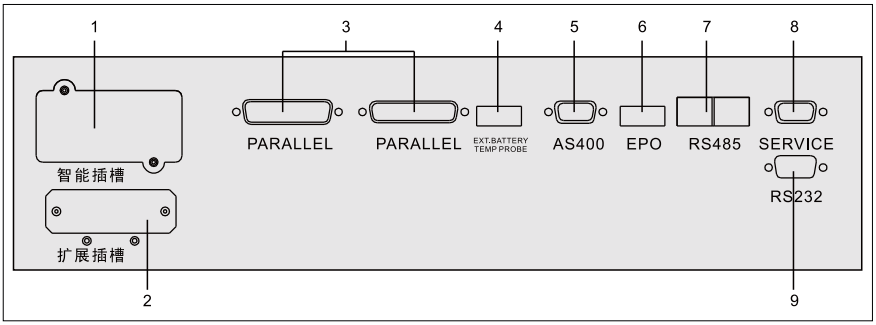
⑶ 并机系统可以选择关闭其中一台 UPS，亦可选择关闭整个并机系统：

注：市电状态下开机后，各 UPS 会同时跳到逆变状态；如在逆变状态下对并机系统关机时，所有的 UPS 同步关断逆变器转旁路供电，如果对单机逐一关机，则当最后一台 UPS 完成关机时，所有的 UPS 同步切换到旁路供电。

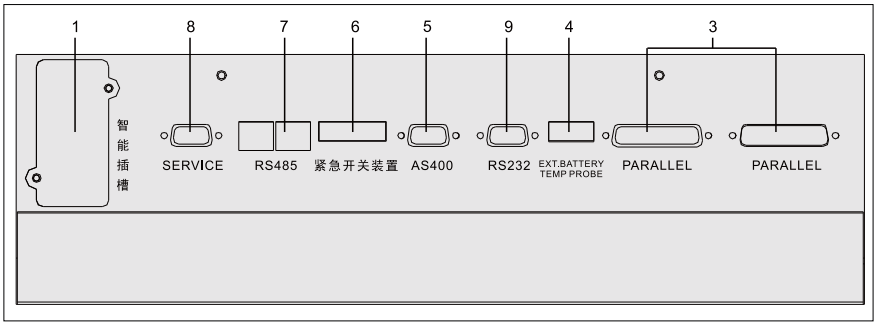
第五章 通讯界面

城堡 EX 系列 UPS 提供了智能插槽 (Intelligent Slot)、扩展插槽、PARALLEL、EXT. BATTERY TEMP PROBE、AS400、EPO、RS485、RS232 及本公司或本公司授权的技术人员专用的 SERVICE 监控通讯接口。

3C3 EX 20KS/30KS/40KS



3C3 EX 60KS/80KS

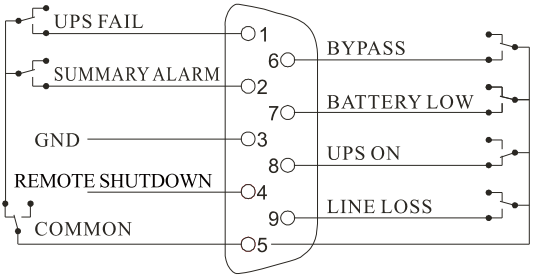


1. 智能插槽：适用于远程监控管理的 SNMP 卡（选购件）使用，您可以通过互联网（Internet）对 UPS 进行远程监控和管理。（SNMP 卡分长卡和短卡，城堡 EX 系列 UPS 需匹配短卡使用）。
2. 扩展插槽：20KS/30KS/40KS 单独配有的插槽，只提供给特殊需求用户，不对标配用户开放。

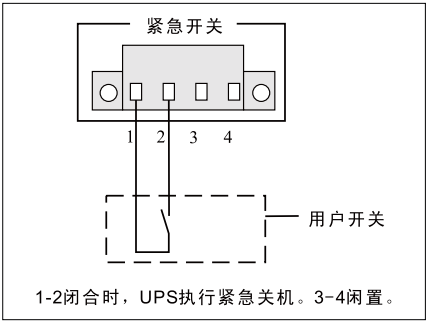
3. PARALLEL：并机使用时，并机通讯线接口，20KS/30KS/40KS 可实现 8 台并机，60KS/80KS 实现 6 台并机。
4. EXT.BATTERY TEMP PROBE ：外接电池柜温度接口，可以对电池温度进行监控，从而实现电池智能管理。
5. 标准 AS400 接口：为 UPS 外围监控提供干接点 (dry-contact) 界面，以接点讯号来反映 UPS 运行状态，实现电源的监控管理（附 AS400 通讯口的脚位说明）。
6. EPO ：紧急关机开关，提供有紧急关机需求用户，可以直接通过此开关关断 UPS 输出（附外部接线图说明）。
7. 标准 RS485 接口：可以在并机使用时进行 UPS 的监控管理，使得 UPS 的电源供应可以完全得到掌握（附 RS485 通讯口的脚位说明）。
8. SERVICE 接口：只允许本公司或本公司授权的技术人员使用。
9. 标准 RS232 接口：可以使用山特图形化管理的 WinPower 监控软件（附 RS232 通讯口的脚位说明）。
上述通讯接口的使用问题，请拨打山特 400-830-3938 或 800-830-3938 客服服务热线咨询。

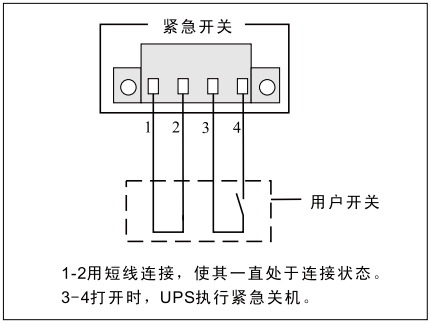
AS400 通讯口的脚位说明：

Pin#	Description	I/O
1	UPS Fail	Output
2	Summary Alarm	Output
3	GND	GND
4	Remote Shutdown	Input
5	Common	+12V
6	Bypass	Output
7	Battery Low	Output
8	UPS ON	Output
9	Line Loss	Output



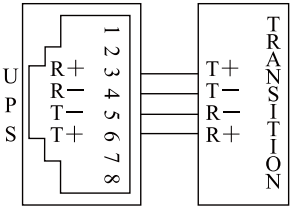
EPO 外部接线图说明：





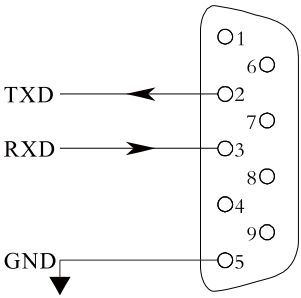
RS485 通讯口的脚位说明：

Pin#	Description	I/O
3	RXDA	Input
4	RXDB	Input
5	TXDB	Output
6	TXDA	Output



RS232 通讯口的脚位说明：

Pin#	Description	I/O
2	TXD	Output
3	RXD	Intput
5	GND	Output



第六章 选配件介绍

6.1 回流模块

回流模块作为城堡 EX 系列产品的辅助功能选配件开发的，其主要功能为解决 UPS 的能量再生负载带来的 BUS 高压问题，将负载产生的再生能量回馈给电网 / 电池，可适用于复杂工业环境下的特殊负载，如高速电梯、矿用提升机、轧钢机、电动机、卷绕机构张力系统及机床主轴驱动系统等，运行可靠，安装方便。

6.2 隔离变压器

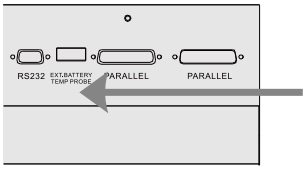
负载设备与 UPS 搭配使用时，常因电气特性之零地电压原因，而造成负载设备干扰或误动作等问题，在输出端接入特殊设计的隔离变压器可使输出的零地电压小于 1 伏，除此之外，在输入端连接隔离变压器可去掉电网三次谐波和减少干扰信号，可防止 UPS 所接的负载设备受到电网中其它设备的影响，客户可根据实际需求在输入或输出端接入变压器。(3C3 EX 20KS/30KS/40KS-ISO 为 UPS 内置变压器，3C3 EX 60KS/80KS-ISO 为外置变压器，具体操作可参考本手册)

6.3 双充电器板

城堡 EX 系列产品可通过扩容来提高电池的充电能力以及加快充电速度，安装非常方便，整机内已预留放置双充电板的空间，如需内部扩容，可直接增加一块充电板与标配的充电板并联即可。

6.4 温度传感器

电池为低寿命器件且对温度相对敏感，温度传感器可以及时侦测电池温度的变化，只需在 LCD 显示界面开启充电电压温度补偿的功能，电池充电电压则会自动调整，从而提高电池的使用寿命。

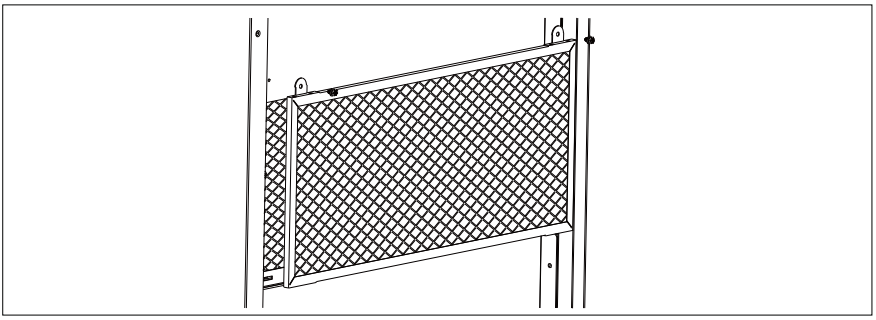


温度侦测端子

温度传感器

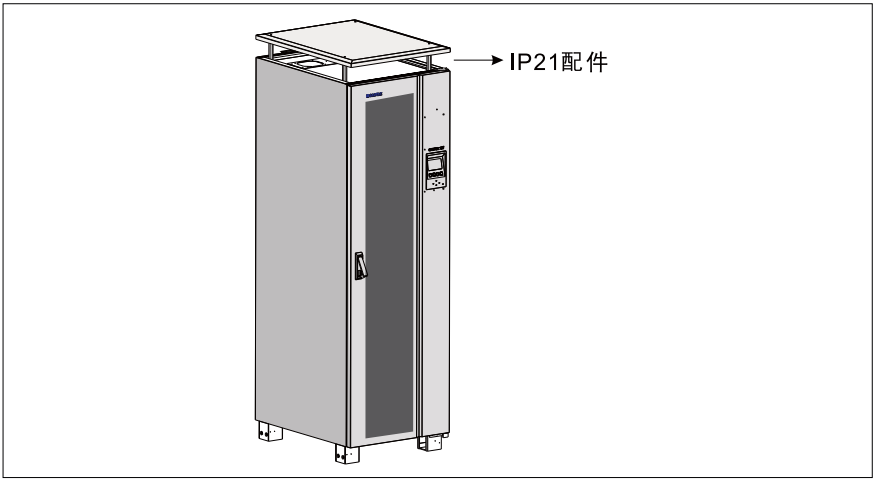
6.5 防尘过滤网

防尘网是城堡 EX 系列产品针对灰尘恶劣的环境（直径 1.0mm 的异物，特别是金属和类金属型）设计的选配件，使 UPS 正面防护等级达到 IP51，安装方便，易更换和清洗。



6.6 IP21 配件

城堡 EX 60-80K 采用结构顶部开孔，上下通风， 建议客户选装 IP21 选配件，对直径大于 12mm 的外来物体的侵入和垂直下落的水滴有防护作用。



第七章 运输、维护与故障排除

搬运 UPS

请遵守下列步骤进行 UPS 的搬运准备。

注意：由于 UPS 很重，需要特殊设备（如叉车）进行装卸。

1. 关闭与 UPS 相连的所有设备，并拆除 UPS 端子排的所有连接线。

2. 将 UPS 市电开关及电池组开关断开。

维护与保养

城堡 EX 系列 UPS 只需很少的维护。

1. 如果断开电池连接，负载设备将不受停电保护。

2. 正常情况下，如果发现电池状况不佳，则必须提前更换，电池更换应由培训合格的专业人员进行，用户不得擅自处理。需注意：

A. 更换电池以前，需关闭 UPS 并脱离市电

B. 脱下如戒指、手表之类的金属物品

C. 使用带绝缘手柄的螺丝刀，请勿将工具或其他金属物放在电池上以免短路引起触电或造成电池爆炸

D. 请勿将电池正负极短接或反接

3. 电池不宜个别更换，整体更换时应遵守电池供应商的指示，并由经授权的专业人员完成。

4. 注意 UPS 散热孔的通风顺畅，平均每隔半年清洁一次侧板和风扇的通风孔处的灰尘（清洁前请先断开市电及电池开关）。

故障排除

如果本设备需要检修，请先按以下步骤检查：

1．UPS 输入配线是否正确？

2．所有过流保护断路器是否断开？

3．输入电压是否符合规格要求？

再参考产品使用手册中的“异常状态表”以及附录二的“灯号参照表”说明进行适当处理：

异常状态表		
问题	液晶显示或可能原因	处理方法
“故障”灯亮，间歇警报	旁路下或逆变下过载	减小负载至额定值
	市电异常	检查输入配线是否掉线、输入电压是否异常
	电池未接	检查电池开关是否合上、电池配线是否接触良好
“故障”灯亮，连续警报	UPS 故障	请与山特客服中心联络
电池放电时间低于初次放电时间 1/3 以下	电池耗损	
	充电器故障	
LCD 面板不显示字符		长按 ESC 键 3 秒，LCD 复位

若问题依然存在，请与山特客服中心联系：400-830-3938（手机）/800-830-3938（固话），并务必提供以下信息：

- UPS 型号（MODEL NO.）、机器批号（SERIAL NO.）；

- 故障发生日期；
- 完整的问题说明（包括 LCD 信息、指示灯显示、蜂鸣器鸣叫情况、电力情况、负载容量等）

附录一　技术参数

技术参数指标						
型号		3C3 EX 20KS	3C3 EX 30KS	3C3 EX 40KS	3C3 EX 60KS	3C3 EX 80KS
额定容量		20KVA/16KW	30KVA/24KW	40KVA/32KW	60KVA/48KW	80KVA/64KW
输入	输入方式	三相 + 零线 + 地线				
	频率	40-70Hz				
	功率因数	≥ 0.99①				
	市电电压范围	380×(-45%~+25%)VAC （输入电压 <75% 时，输出功率需要降额 ）				
	旁路电压范围	380（-15% ~+15%）VAC			380（-20%~+15%）VAC②	
输出	额定电压	线电压 380×(1 ±1%) VAC 或相电压 220 ×(1 ±1%) VAC (带平衡负载)				
	功率因数	0.8				
	频率误差	50Hz±8%（跟踪旁路输入频率；旁路输入频率超过 ±8% 或在电池供电状态下 , 输出频率为额定之 ±0.1%）				
	过载时间	≥ 10min　110%< 负载≤ 125% ≥ 1min　125%< 负载≤ 150%				
效率	双转换模式	Up to 93%			Up to 94%	
	ECO 模式	Up to 98%③				
使用环境	环境温度	0-40℃				
	储藏温度	–25-55℃ (不含电池)				
	环境湿度	0-95 %				
	海拔高度	≤ 1000m				
电池标称电压 / 额定充电电压	28 节	±168VDC/±189VDC				
	30 节	±180VDC/±202.5VDC				
	32 节	±192VDC/±216VDC				
重量	净重 / 含变压器	82Kg/208Kg	110Kg/275Kg	114Kg/314Kg	282kg	306kg
	毛重 / 含变压器	122Kg/248Kg	160Kg/325Kg	164Kg/364Kg	356kg	380kg
机器尺寸 (宽 * 深 * 高) (mm)		420×643×956	470×710×1150	470×710×1150	600×800×1850	600×800×1850
安全标准	国家标准	GB4943				
	TLC 认证	YD/T1095				
EMS	静电放电抗扰度 (ESD)	GB/T 17626.2 等级 4				
	射频电磁场辐射抗扰度 (RS)	GB/T 17626.3 等级 3				
	电快速瞬变脉冲群抗扰度 (EFT)	GB/T 17626.4 等级 4				
	浪涌 (冲击) 抗扰度 (SURGE)	GB/T 17626.5 等级 4				
EMI	传导与辐射	GB 7260.2				
警告：本产品用于第二类环境中的商业和工业用途，可能需要采取安装限制或附加措施以抑制骚扰。						

备注：

① 3C3 EX 20KS-40KS 在额定半载下≥ 0.99；3C3 EX 60KS-80KS 在额定满载下≥ 0.99；

② ±15% 为默认值，－ 20% 到＋ 15% 之间可调；

③ 3C3 EX 20KS-40KS 支持单机 ECO 模式；3C3 EX 60KS-80KS 单机或并机系统下都支持 ECO 模式。

附录二　灯号参照表

序号	工作状态	面板指示灯显示					蜂鸣器
		旁路灯	市电灯	逆变灯	电池灯	故障灯	
1	Standby 模式						
	正常					8 秒一闪	8 秒一鸣
	故障					4 秒一闪	4 秒一鸣
	过载					1 秒一闪	1 秒一鸣
2	旁路模式						
	正常	●				2 分钟一闪	2 分钟一鸣
	故障	●				4 秒一闪	4 秒一鸣
	过载	●				1 秒一闪	1 秒一鸣
3	市电模式						
	正常		●	●			无
	故障		●	●		4 秒一闪	4 秒一鸣
	过载		●	●		1 秒一闪	1 秒一鸣
4	电池模式						
	正常			●	●	4 秒一闪	4 秒一鸣
	电池电压低			●	★	1 秒一闪	1 秒一鸣
	过载			●	●	1 秒一闪	1 秒一鸣
5	电池自检模式						
	正常	★	★	★	★	无	无
	故障	★	★	★	★	4 秒一闪	4 秒一鸣
	电池电压低			●	★	1 秒一闪	1 秒一鸣
	过载			●	●	1 秒一闪	1 秒一鸣
6	故障模式						
	正常①					长亮	长鸣
7	Converter 模式						
	正常		●	●		无	无
	故障		●	●		4 秒一闪	4 秒一鸣
8	ECO 模式						
	正常	●		1 分钟一闪		无	1 分钟一鸣
	故障	●				4 秒一闪	4 秒一鸣

若有出现不包含以上的显示或警示状况， 请与经销商或拨打山特服务热线咨询。

● 指示灯点亮　　★ 指示灯闪烁

故障包含以下一种或多种状况：

1. EPO 使能 2. 市电丢失 3. 输入中线丢失 4. 市电相序错误 5. 旁路丢失 6. 旁路相序错误 7. 电池未接 8. 电池电压低 9. 电池过充 10. 电池反接 11. 充电器故障 12. 电池过保 13. 电池过温 14. 风扇过保 15. BUS 电容过保 16. 风扇故障 17. 风扇未接 18. 电池低温 19. 通讯线未接 20. 附加充电器故障 21. 旁路 N 线断开 22. 电池 N 线断开 23. 地址冲突

备注：① 在故障模式下，旁路正常时有输出，此时旁路灯会亮（EPO 故障或输出短路故障等除外）

附录三　维修保证

本公司承诺：自购机之日起，为您提供三年免费保修服务。

- 凭经销商有效证明保修；
- 凭机器生产序号保修。

如机器发生故障，请拨打 400/800 电话联系。作为山特用户，您享有如下服务：

- 三年保修（含从山特购买的电池）；
- 2 4 小时服务热线（热线号码见箱体外盖警告标签）；
- 全国联合保修；
- 网上技术服务支持；
- UPS 保修期内提供免费上门维修服务。

发生以下情况，不在保修范围内：

- 人为故障；
- 保修期外；
- 生产序号更改、丢失的成品；
- 因不可抗拒及外来原因引起的损坏或损失；
- 未经授权私自拆机或修改；
- 违反机器操作 / 使用规定；
- 使电池深度放电或人为造成损坏。

Thanks for choosing Santak products!

All warnings and operation instructions in the manual and on the machine should be strictly followed，and this user manual should be kept properly for future reference. Do not attempt to operate the UPS until reading through all safety information and operating instructions of this manual carefully.

This manual applies to the Castle EX series products, including:

3C3 EX 20KS/3C3 EX 20KS-ISO

3C3 EX 30KS/3C3 EX 30KS-ISO

3C3 EX 40KS/3C3 EX 40KS-ISO

3C3 EX 60KS/3C3 EX 60KS-ISO

3C3 EX 80KS/3C3 EX 80KS-ISO

Solemn Statement

Supervision Code Statement

To ensure consumer rights and safe electricity application, help you purchase authentic SANTAK UPS, the following items should be heeded:

1. Make sure of SANTAK® 山特®
2. SANTAK Electronics (Shenzhen) Co. Ltd. never grants authorization in any form to any company to manufacture UPS;
3. Labeled on all SANTAK is an “electronic supervision code” (“electronic supervision code” is a code of product identification advocated by SIQSAQ in order to strike at fake commodities).

Inquiry method:

Website inquiry: Access the website:www.95001111.com (Product Identification, Authentification and Tracking System) and input the supervision code;

Tel inquiry: Call 95001111 to check (you may call 010-95001111 and follow the instructions to enquire the identification);

Message inquiry: Send text message to 106695001111 (available to both China Mobile and Unicom);

Any questions, you may call the telephone number at 95001111 or log on to www.95001111.com. for further details or lodge your complaints.

Copyright Statement

SANTAK is dedicated to a continued effort of technological innovation and provision of improved products and services to satisfy customers’ needs. Product design and technical specifications are subject to upgrading without notice. Actual product may differ from photo.

Please access www.santak.com.cn to download the latest version of product instructions.

Safety Instructions

Operation Safety

1. Prior to the application, please read “Safety Instructions” carefully to ensure correct and safe application. Please keep the user manual properly.
2. During operation, attention should be paid to all warning symbols and operations should be followed strictly as required.
3. Equipment is not supposed to be used in environment that directly exposed to the sunlight or raindrops or in humid environment.
4. The equipment should not be installed close to area of thermal sources or any area where there is presence of devices such as electric heaters and furnaces.
5. Make sure the safety space should be left for proper ventilation and product maintenance when placing UPS. Refer to the instructions during installation.
6. Dry and non-conductive items should be used for cleaning.
7. In case of a fire hazard, dry powder extinguisher should be used properly. Using liquid fire extinguisher may result in electric shock hazard.
8. Storey bearing capacity of machine and batteries should be taken into consideration prior to installation.
9. Using this device, please ensure that the load power is match with the rated power of UPS and the battery specifications.

Prohibitions

1. There is high voltage presented inside the UPS, non-licensed company or technical personnel is not allowed to open the case cover arbitrarily, otherwise there might be a danger of electric shock and loss of warranty eligibility.
2. When applied to the following equipment, please contact the dealer or Santak in advance since there might be special requirements and design for the application, setting, management and maintenance:
   A. Precision industrial, scientific and medical instruments and equipment;
   B. Equipment that might endanger physical safety such as elevator etc;
   C. Load equipment with large startup current and negative power;
3. Do not place battery to fire in order to avoid possible explosion.

Electric Safety

1. Before electricity is switched on, make sure earthing is properly done and wire and battery polarity are correctly connected.
2. Battery protection device must be configured with over-current breaker of rated specifications.
3. When UPS relocation or wire reconnection is necessary, AC and battery should be switched off and UPS should be completely turned off, otherwise there might be a danger of electric shock because output terminal might be still electrified.
4. Please use Santak specified appendix devices and accessories.
5. Prior to connecting the power distribution system to the UPS, make sure the rated quadrupole over-current breaker is installed to break off all the input lines and thus prevent a risk of electric shock.

Battery Safety

1. Battery service lifetime will be shortened as ambient temperature rises. Replace batteries periodically to guarantee normal UPS performance and sufficient back-up time.
2. Only personnel with proper expertise can carry out the maintenance of accumulator batteries.Replacement of accumulator batteries requires a match of same type and model with equal quantity.
3. As accumulator batteries may contain potential electric shock and short-circuit current danger, to avoid accidents that might be thus resulted, the following warnings should be observed during battery replacement:
   A. Do not wear watches, rings or similar metallic items;
   B. Use insulated tools;
   C. Put on rubber shoes and gloves;
   D. Do not place metallic tools or similar metallic parts on the batteries;
   E. Switch off load connected to the batteries before dismantling battery connection terminals.
4. Do not expose accumulator battery to fire in order to avoid possible explosion that might endanger physical safety.
5. Non-professionals are not allowed to open or destroy accumulator batteries for electrolytes in batteries contain strong acid and other dangerous substances which will cause damages to both human skins and eyes. Should electrolytes come into any contact with human body unintentionally, rinse with clean water and seek medical advice.

6. Do not cause battery positive and negative polarity short circuit otherwise electric shock or inflammation may occur.

Maintenance

1. Working environment and storage means can affect the service term and reliability of this product to some extent. Therefore, the product is not suitable for performance in the following environment:

A. Locations where temperature exceeds the maximum or goes below the minimum temperature as required by technical specifications or humidity is improper (temperature range: 0-40℃ ; relative humidity range: 0-95%).

B. Locations where vibration and collision are constant;

C. Locations where metallic dusts，corrosive substances as well as salts and inflammable gases are present.

2. For long-term inaction, UPS (without batteries) should be kept in dry environment with temperature ranging from -25-55℃ . Before start-up, ambient temperature should be brought back to 0 or above for a certain period of time (above 2 hours).

3. Keep good ventilation; otherwise, it will lead to internal temperature rise, shorten the lifetime of the components and thus shorten the lifetime of the UPS.

4. For long-term inaction, the battery should be charged once every three moths in normal temperature environment and once every two moths in high temperature environment with no less than 10 hours; no-load discharge is not allowed, and the battery continuous discharge time should not exceed 14 hours.

Contents

Chapter 1 Brief introduction

1.1 Product introduction

Castle EX Series products are high-efficiency and high-performance, double conversion, pure-online and three phase input and three phase output UPS.This series provides perfect solution for power source protection and successfully solves problems such as blackout, boost, brownouts, sags, decaying, oscillation, high voltage impulse, voltage fluctuations, surges, harmonic distortion, disturbances, frequency fluctuation etc, So that products can be widely used in computer equipment, communications equipment and other controlling equipments, and under the impact of the load for a particular election can be installed accessories to deal with complex industrial environment. Therefore, Castle EX Series products can be applied in a diversified multi-industries field such as telecommunications, financing, transportation, government, manufacturing and energy sectors.

Manifold function of Castle EX series products to provide high-quality power supply guarantee for your device:

- Advanced DSP digital control technology to effectively improve product performance and system reliability
- N + X parallel redundancy (support sharing batteries in parallel)
- Excellent performance of industrial environment protection
- Economy and security of ECO mode of operation allows UPS efficiency of more than 98%
- High-definition LCD interface for human-machine interaction, intuitive and convenient operation
- Powerful communication interface and remote monitoring
- Abundant optional accessories, can be flexibly configured according to actual demands.

1.2 Frequently used symbols

The following symbols will be frequently used in this User Manual as well as in the process of actual application; therefore, correct identification and understanding of their connotations prove necessary.

Symbols and Indications	
Symbol	Description
⚠	Attention
⚠	Dangerous high voltage
~	Alternating current(AC)
⎓	Direct current(DC)
⏚	Grounding Protection
♻	Recycle
	Do not dispose with sundries

Chapter 2 Exterior appearance

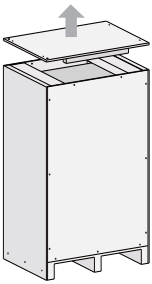
2.1 Unpacking inspection

1. Unpack and there should be:
1) UPS
2) Winpower Disc
3) Accessories including user manual、RoHS card and two keys of the door

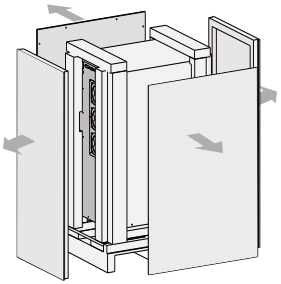
2. Check whether the UPS is damaged during the process of transportation or not. Should any damage be observed or parts be found missing, do not start the machine. Contact the forwarder and distributor immediately.

Note: Make sure that the heights of the door and some other obstacles are appropriate.

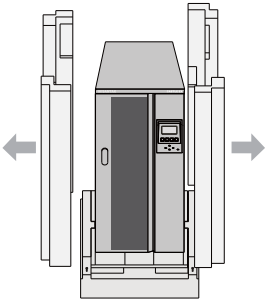
1)Remove the top cover plate by unlocking the wood screws with a sleeve.



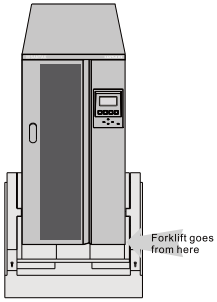
2）Remove the packing cardboards from the sides of the unit.



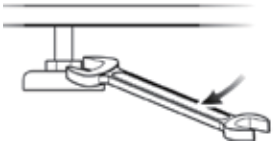
3）Remove the foam and plastic bag around the unit.



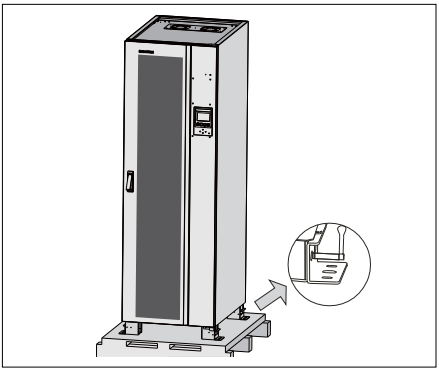
4）Move the frame smoothly from the pallet to the ground or the reserved position for installation with a forklift.

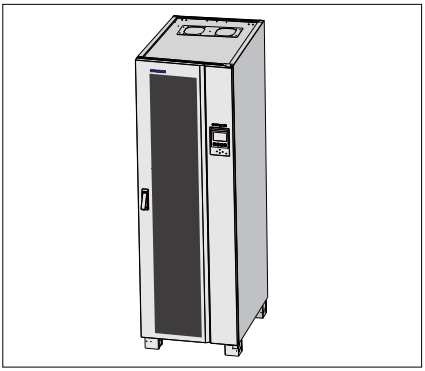


Note: 1) 3C3 EX 20KS/30KS/40KS and ISO models are provided with brake pads, rotate the wrench (NO.19) clockwise until the brake pad revolves to the ground, which can prevent the unit from moving.



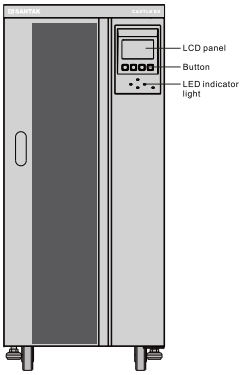
2) For 3C3 EX 60KS/80KS models, remove the iron brackets fixing the UPS with a wrench firstly, then move the frame smoothly from the pallet to the ground, and fix the UPS with the iron brackets again.



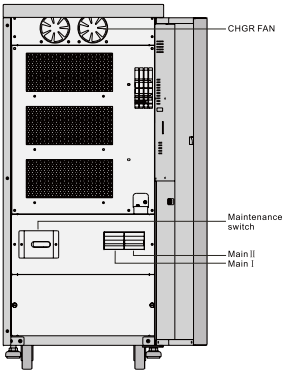


2.2 Exterior figure

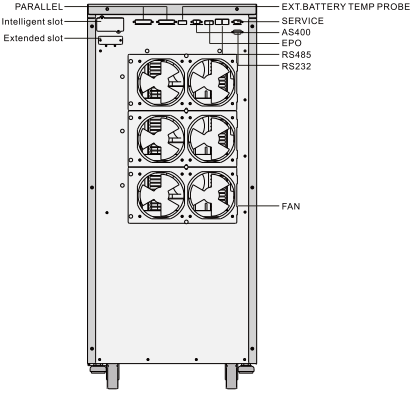
Exterior figure of 3C3 EX 20KS/30KS/40KS UPS



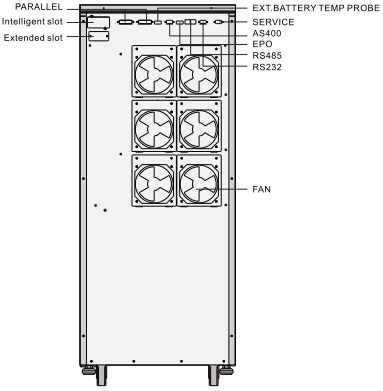
Front view



Front view(without front panel)

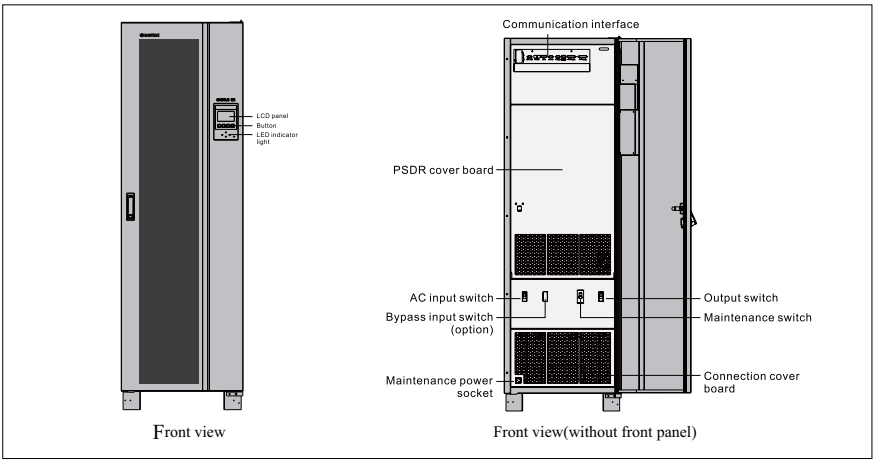


Rear view(3C3 EX 20K)



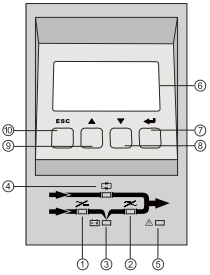
Rear view(3C3 EX 30KS/40KS)

Exterior figure of 3C3 EX 60KS/80KS UPS



2.3 Panel instructions

The LCD panel is the human-machine interface used to carry out the visual operations of the UPS, including the power-on, power-off, status display, fault alarm, parameter setting etc. And all the operations of the UPS can be realized through the LCD panel after installing the UPS. It consists of three parts: the LED indicators, LCD and function keys. Please refer to the table below for the description of the LED indicators and function keys.



Note: Please refer to Appendix 2 for detailed information of LED in accordance with the UPS status.

- Status LED Indicator: Display the current UPS operating mode or status.

Identifier	LED Indicator	Color	Status
①	AC	green	UPS is powered directly by AC
②	Inverter	green	UPS is powering through the inverter
③	Battery	yellow	Line input fault, UPS is powering by batteries
④	Bypass	green	UPS is powering the load by AC through bypass
⑤	Fault	red	LED will solid on with continuous warning tone or flash with intermission warning tone in case of UPS abnormal function

- LCD display screen—⑥：Display detailed UPS information

- Function Keys: selecting and opening menu items, accessing information and changing system parameters etc.

Identifier	Key	Name	Function
⑦	↵	Confirm/ Enter	Select a menu or confirm an operation; confirm the present input password letter and enter the next password letter input process; back to the main menu from the status screen.
⑧	▼	Page Down	Switch to next screen display under the same menu.
⑨	▲	Page UP	Return to last screen display under the same menu.
⑩	Esc	Escape	Return to previous menu or cancel a certain operation; cancel the input password; back to the status screen from the main menu.

Chapter 3 Installation instructions

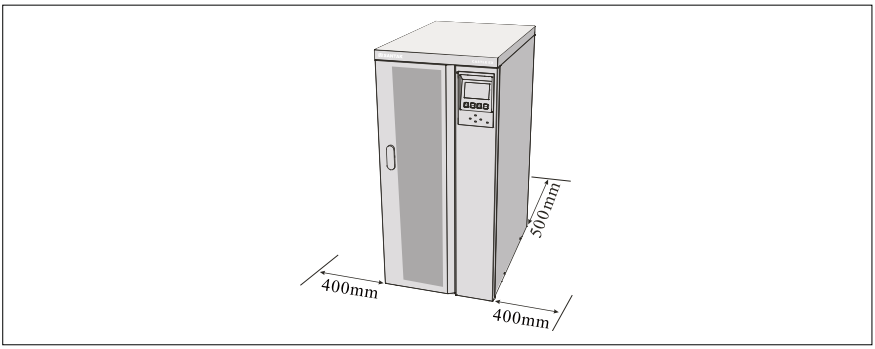
3.1 Installation Notice

1) The installation of Castle EX series products must be performed in compliance with the electrical code by professional personnel.
2) Install the UPS in a clean and stable environment that is free of vibration, dust, high humidity, flammable gas, and flammable liquid or caustic substance.
3) To ensure normal UPS performance, ambient temperature should range between 0-40℃. If temperature exceeds 40℃, maximum load should be decreased progressively by 12% of the rated amount along with every increase of temperature by 5℃. The maximum ambient temperature for normal UPS performance should not exceed 50℃.
4) It is suggested that battery pack should work within a temperature range from15℃ to 25℃.
5) Altitude for normal UPS function should not exceed 1000m. Should UPS be intended for application above 1000m, progressive decrease of rated output should be applied as listed in the following chart:

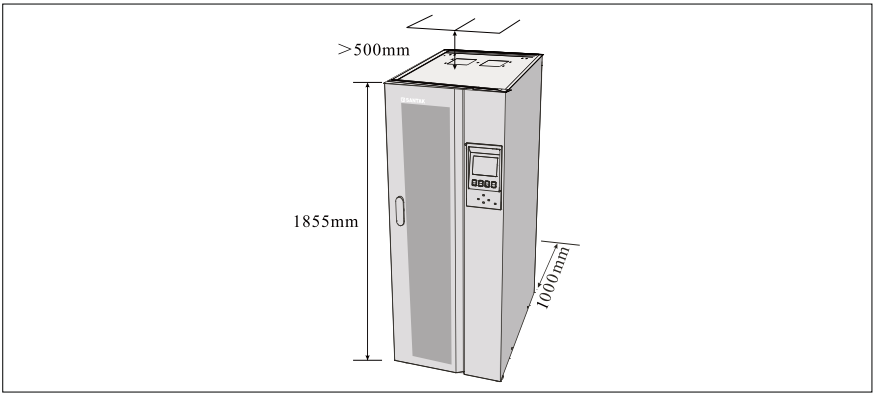
Altitude(m)	1000	1500	2000	2500	3000	3500	4000	4500	5000
Derating coefficient	100%	95%	91%	86%	82%	78%	74%	70%	67%

3.2 Installation space

3C3 EX 20KS/30KS/40KS series utilizes forced fan cooling and installation spot should make allowance for ventilation. Meanwhile, inside maintenance should be carried out from the front side and therefore maintenance space should also be considered in advance. Refer to the following figure for installation space:



3C3 EX 60KS/80KS series adopt the bottom air inlets and top air outlets to ensure good ventilation, do not put any sundries at the top of the UPS, and the ventilation spacing above the UPS should be no less than 500mm, otherwise the UPS internal temperature will rise dramatically. Do not install the UPS under the outtake of an air conditioner, otherwise, the water may drop into the UPS and thus cause UPS fault or a fire. There must be at least 1000mm of space reserved in front of and behind the UPS for internal and main power part maintenance,please refer to the figure below for installation space:

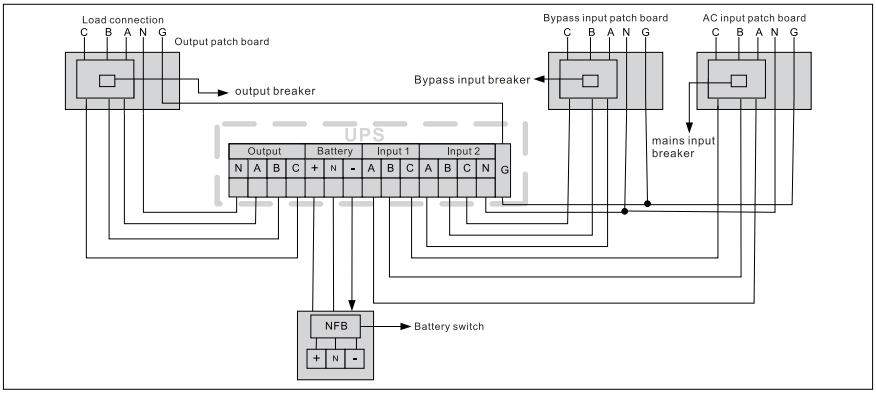


3.3 Installation and wiring connection diagram

3C3 EX 20KS/30KS/40KS standard models are integrated with dual power input, and 3C3 EX 60KS/80KS standard models with single power input. The switch between the single power and dual power supply can be carried out by customer service engineers according to customer’s request. All the operations should only be carried out by the technical personnel of the company or authorized by the company. Do not open the case cover arbitrarily; otherwise, electric shock may occur.

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

1. Wiring connection diagram:



2. Single power input:

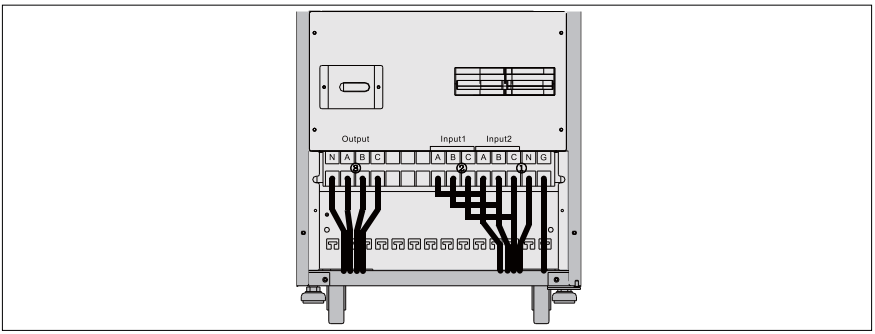
Only connect the AC (3Φ4W) to the Main 1.

(1)Ground wire should be connected to the UPS ground terminal;

(2)Connect the AC input cable to the terminal block ① ;

(3)Connect the AC three-phase input lines to the bypass three-phase input lines ②

(4)Connect the four load power wires to the terminal block ③



single power input(3Φ4W):20kVA~40kVA connection diagram

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 is the positive phase sequence and battery polarities are correctly connected.

3. Dual power input:

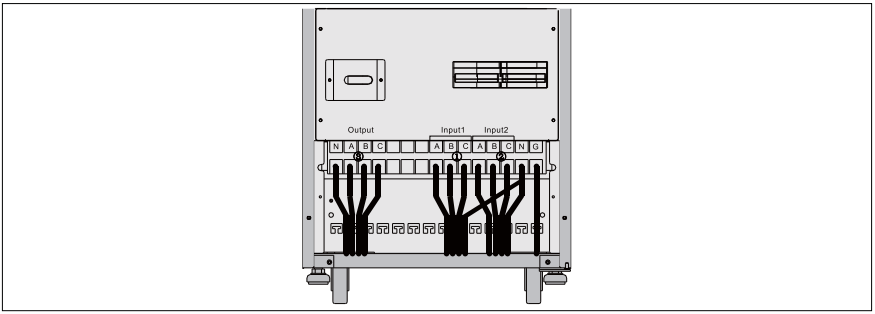
For dual power input, the conducting wire between AC input terminal and bypass input terminal must be removed firstly.

(1) Ground wire should be connected to the UPS ground terminal;

(2) Connect the four AC input wires to the terminal block ① ;

(3) Connect the four bypass input wires to the terminal block ② , N lines of the main 1 and main 2 are connected to the same terminal block;

(4) Connect the four load power wires to the terminal block ③



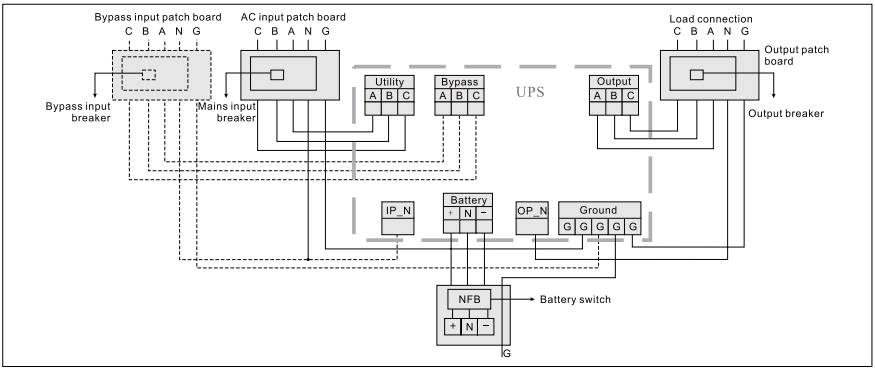
dual power input(3Φ4W):20kVA~40kVA connection diagram

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 is the positive phase sequence and battery polarities are correctly connected.

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

1. Wiring connection diagram:



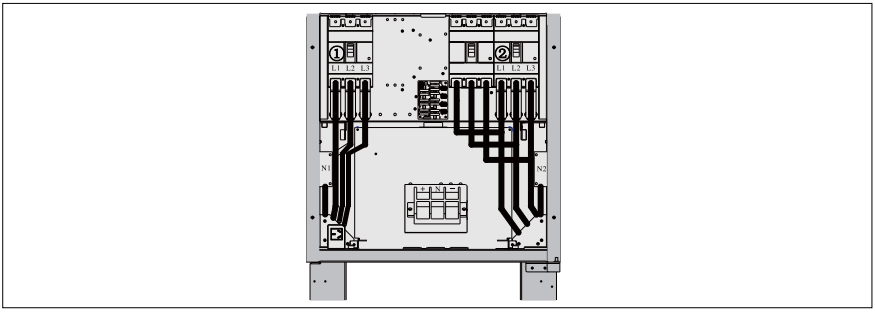
2. Single power input:

Only connect the AC (3Φ4W) to the main input terminal.

(1) Ground wire should be connected to the UPS ground terminal;

(2) Connect the AC input cable to the terminal block ① ;

(3) Connect the four load power wires to the terminal block ②



single power input(3Φ4W):60kVA~80kVA connection diagram

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 is the positive phase sequence and battery polarities are correctly connected.

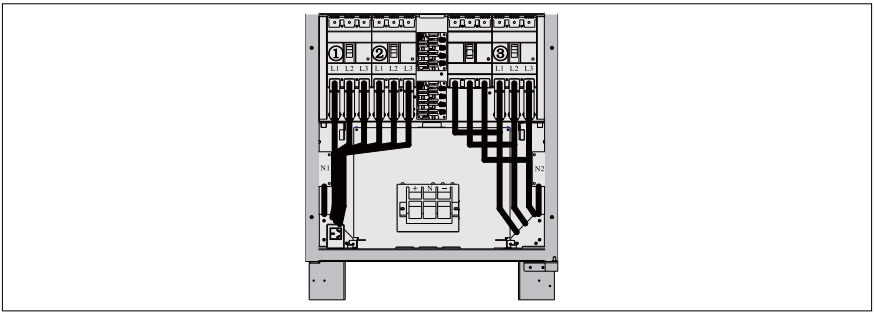
3. Dual power input:

Customers may choose the dual power input according to their needs, and the installation of the bypass input switch is carried out by the customer service engineers.

(1) Ground wire should be connected to the UPS ground terminal;

(2) Connect the AC input cable to the terminal block ① ,and the bypass input wire to the terminal block ② ;

(3) Connect the four load power wires to the terminal block ③



dual power input(3Φ4W):60kVA~80kVA connection diagram

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 is the positive phase sequence and battery polarities are correctly connected.

3.4 Requirements of wiring cables and protect device for Castle EX series UPS

External batteries of Castle EX Series UPS require serial connect positive and negative of each group of 14-16 batteries (12VDC per battery) with the same capacity, nominal voltage for each group being168VDC-192VDC. Battery capacity and number of group can be selected at your option. Battery pack must be equipped with DC switch and input fuse, and overload and line voltage should also be taken into consideration for wire diameter selection. Please refer to the table below for details:

Machine Model	Rated power	Input live wire diameter	Output live wire diameter	Battery positive /N negative wire diameter	Ground wire diameter	N wire diameter
3C3 EX 20KS	20kVA/16kW	10AWG/ 4mm^2	10AWG/ 4mm^2	6AWG/ 10mm^2	10AWG/ 4mm^2	6AWG/ 10mm^2
3C3 EX 30KS	30kVA/24kW	6AWG/ 10mm^2	6AWG/ 10mm^2	4AWG/ 16mm^2	6AWG/ 10mm^2	4AWG/ 16mm^2
3C3 EX 40KS	40kVA/32kW	6AWG/ 10mm^2	6AWG/ 10mm^2	1AWG/ 35mm^2	6AWG/ 10mm^2	1AWG/ 35mm^2
3C3 EX 60KS	60kVA/48kW	2AWG/ 25mm^2	2AWG/ 25mm^2	0AWG/ 50mm^2	2AWG/ 25mm^2	0AWG/ 50mm^2
3C3 EX 80KS	80kVA/64kW	1AWG/ 35mm^2	1AWG/ 35mm^2	0000AWG/ 95mm^2	1AWG/ 35mm^2	0000AWG/ 95mm^2

Machine Model	AC input breaker	Bypass input breaker	Battery switch	N wire switch	AC input fuse	Battery input fuse
3C3 EX 20KS	3 ϕ 50A/ 380VAC	3 ϕ 63A/ 380VAC	3 ϕ 125A/ 250VDC	1 ϕ 80A/ 220VAC	63A 690V	30A 600V
3C3 EX 30KS	3 ϕ 63A/ 380VAC	3 ϕ 80A/ 380VAC	3 ϕ 150A/ 250VDC	1 ϕ 100A/ 220VAC	80A 690V	30A 600V
3C3 EX 40KS	3 ϕ 80A/ 380VAC	3 ϕ 100A/ 380VAC	3 ϕ 200A/ 250VDC	1 ϕ 150A/ 220VAC	100A 690V	30A 600V*2
3C3 EX 60KS	3 ϕ 150A/ 380VAC	3 ϕ 150A/ 380VAC	3 ϕ 300A/ 250VDC	1 ϕ 200A/ 220VAC	100A 690V*2	100A 690V
3C3 EX 80KS	3 ϕ 175A/ 380VAC	3 ϕ 175A/ 380VAC	3 ϕ 400A/ 250VDC	1 ϕ 250A/ 220VAC	100A 690V*2	100A 690V

Remark:

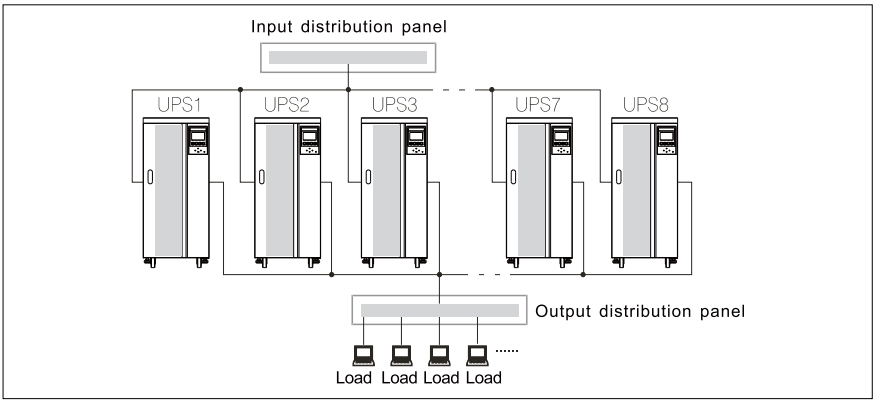
1. Prior to connecting the power distribution system to the UPS, make sure the rated triploid-pole over-current breaker is installed to break off all the input lines and the N line breaker can be configured individually.
2. When single-phase current exceeds 100A, switches of protective atmosphere should be equipped with arc control devices,It should be D-curve air switch with UL certification according to the customer requirement;
3. Battery positive/negative/N wire size: indicates UPS and battery bank wire size; red wire signifies the positive polarity and black wire the negative, while blue wire the neutral.
4. There should be the same length of the battery wires (positive, negative and N) of being no more than 40m.

3.5 Parallel UPS installation

1. Redundancy introduction

N+X is currently the most reliable power supply structure, in which N indicates the minimum UPS number required for the total load and X is the redundant UPS number, namely, the malfunctioning UPS number that the system can simultaneously bear. The larger X is, the higher reliability of system will be. For instance, if the total loads of a customer register 55kVA, we can use Castle 20KS for N+X design. With N taking up 3, X can be selected in accordance with reliability degree or cost requirement. Supposing customer selects X=2 and equalized UPS power supply is 11kVA for each unit, when one set of UPS breaks down with malfunction, the remaining four sets will provide power with almost 14kVA equalized current; if two sets of UPS fail, the remaining three sets of UPS are supposed to provide power supply with almost 18kVA equalized current. The maximum allowance of this system is for two sets of UPS going down at the same time, the chances of which are much smaller than those of one UPS malfunction. Therefore, the reliability degree can be largely enhanced, making it an optimal mode for application in locations where high degree of reliability is always a focus.

2. Castle EX Series UPS is capable of direct parallel connection, which only requires the parallel connection wires (optional) for 2 to 8 sets of UPS in parallel connection in order to realize power redundancy (N+X)(60KS/80KS support six sets of UPS parallel connection). Ventilation spacing between machine flanks should be a minimum of 10cm，input wiring for each set of UPS should follow the requirements for that of single unit. Each UPS input/output should be connected to the same input patch board, from which wires are distributed for load as illustrated in following figure:



Remark:

1）Common battery pack is applicable in parallel configuration; each battery pack should be of the same model and the same batch from the same manufacturer.

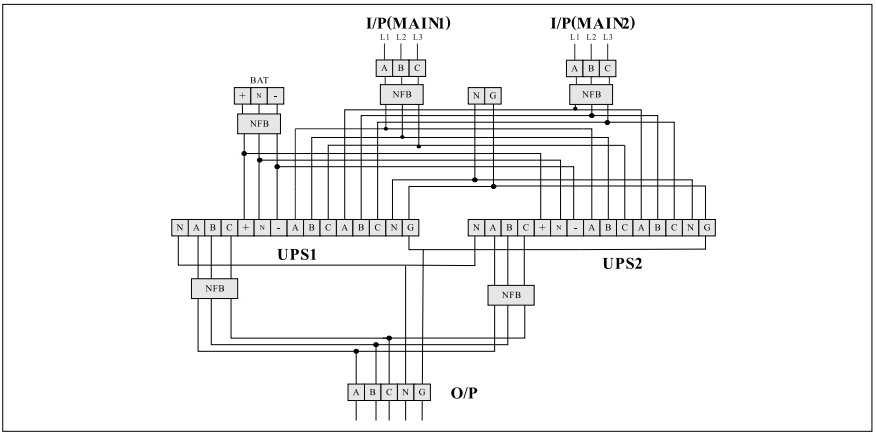
2) Requirement of output wiring length:

① When the lead from the output terminal of each set of UPS to the output patch board is less than 20m, wire difference should be less than 20%;

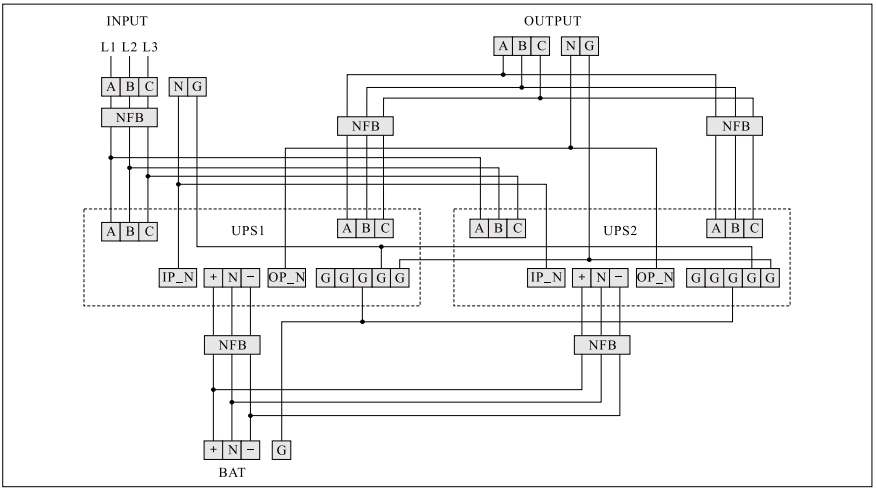
② When the lead from the output terminal of each set of UPS to the output patch board is longer than 20m, wire difference should be less than 10%.

3.Parallel machine wire connection drawing:

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



3C3 EX 60KS/80KS UPS



3.6 Procedures of connecting battery bank to UPS

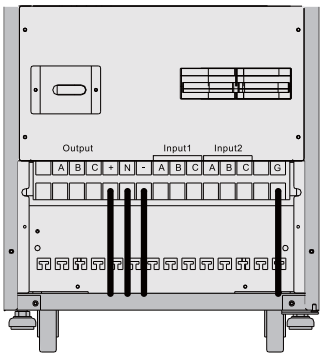
The rated over-current protection breaker should be installed between the battery bank and the UPS, please refer to the wiring table at the last section for the specification.

(1) Make sure that there are no voltages present on the input and output terminals, and there is no voltage output of the external battery socket;

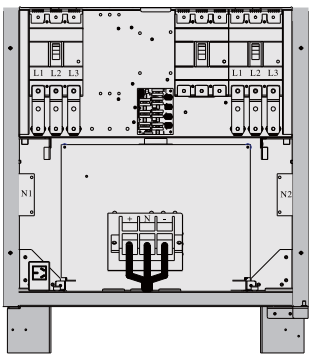
(2) Turn off the battery breaker;

(3) Remove the panel on the terminal bay and connect “+”, “N” and “-“ wires from UPS terminal bay to “+”, “N” and “-“ of the battery box; make sure the battery polarities are correctly connected;

(4) Use multimeter (DC Voltage) to measure the voltage of positive and negative batteries as well as positive and negative polarity, then close the cover of the terminal block.



3C3 EX 20KS/30KS/40KS battery connection diagram



3C3 EX 60KS/80KS battery connection diagram

Remark: Battery connection and replacement should be operated under the system shutdown, Non-professionals are not allowed to carry out the task otherwise electric shock may occur.

Chapter 4 Operation

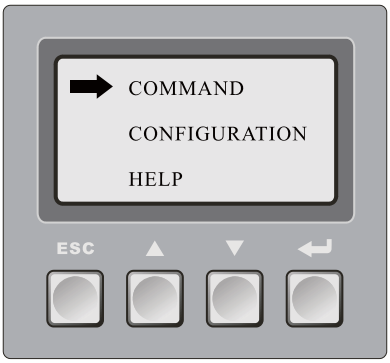
4.1 Single UPS operation

1. Make sure A, B and C phase sequences are correctly connected and then supply power to UPS.
2. Turn on the breaker of the battery bank (make sure that the “+”, “N” and “-” of terminal bay are in accordance with those on the output of the battery bank).
3. Switch on “input breaker” (Line input breaker: Main Ⅰ; bypass input breaker: Main Ⅱ; line input breaker for 60K/80K standard models) on the UPS and fans start to rotate for UPS self-inspection. Main menu can be accessed within about 4sec and then operations should be carried.

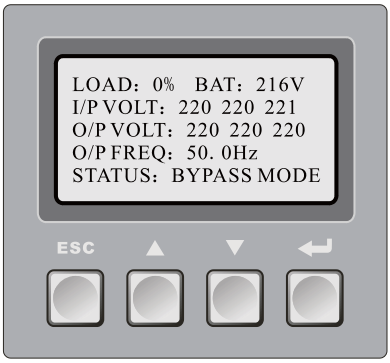
Remark: the following drawing takes 3C3 EX 20KS as an example and statistics are only for reference.

1) Power on

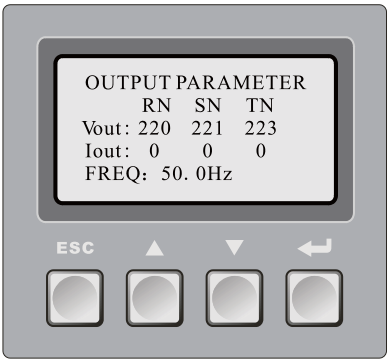
2) Automatic access within about 4s



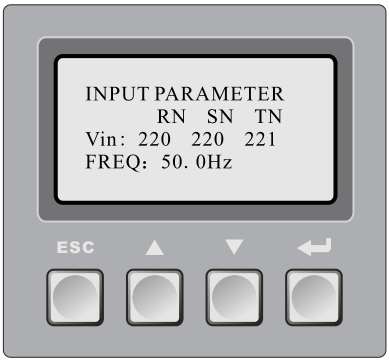
3) Press ESC to access or automatically access within 1min with no button being pressed



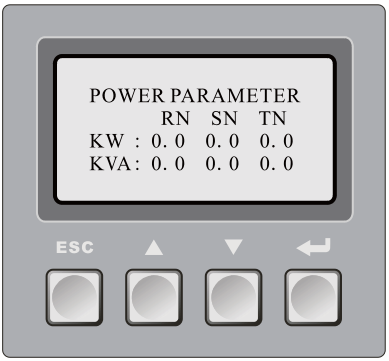
4) Press ▼ to obtain the below information



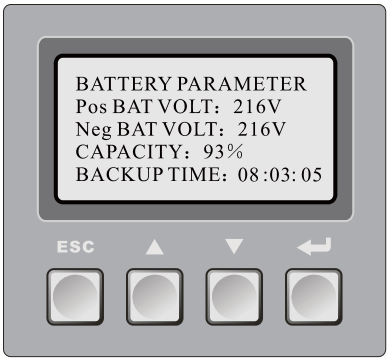
5) Press ▼ again to obtain the below information



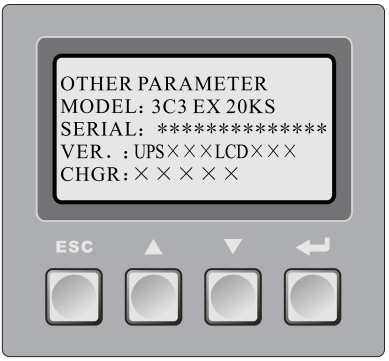
6) Press ▼ again to obtain the below information



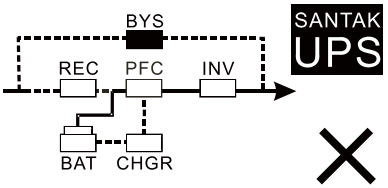
7) Press ▼ again to obtain the below information

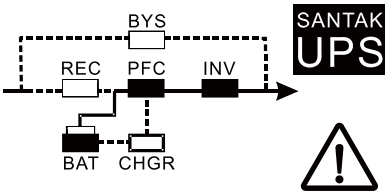


8) Press ▼ again to obtain the below information



Remark: when malfunction occurs, "x" will appear at the lower right corner of the picture while when warning occurs " ⚠ " will appear at the same position (as illustrated in the below picture with battery mode as an example).

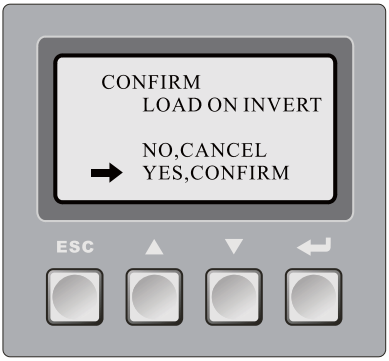




4. Start-up action (press ESC to exit the above picture)

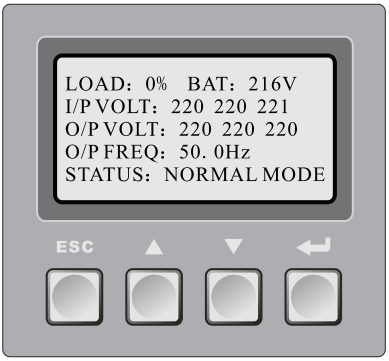
1) Switch-on picture

2) Press ENTER

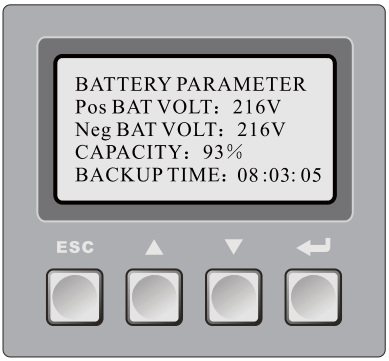


3) Select “Yes, Confirm” to switch on the machine

4) Normal Switch-on



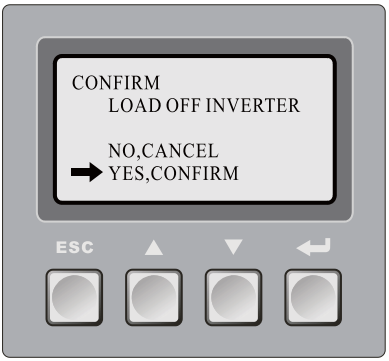
5) Battery power supply (switch off line input breaker)



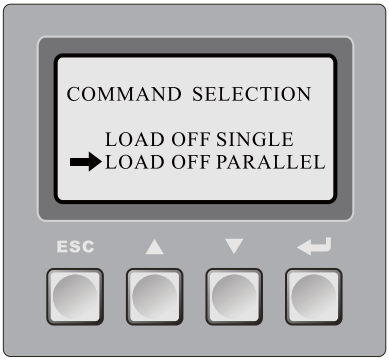
5. Switch-off action (press ESC to exit above picture)

1) Switch-off picture

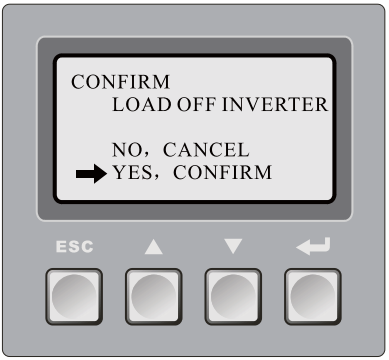
2) If it is in single machine mode, the following will appear



3) If it is in parallel machine mode, the following will appear



4) Press ENTER



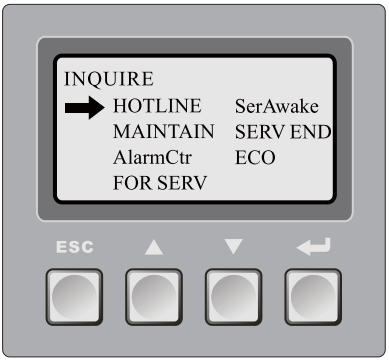
5) Select “Yes, Confirm” to switch off the machine

Remark: If you intend to switch off only one set of UPS among the parallel machine system, select “single machine switch-off”; if switch-off is intended for the entire parallel machine system, select “parallel machine switch-off”.

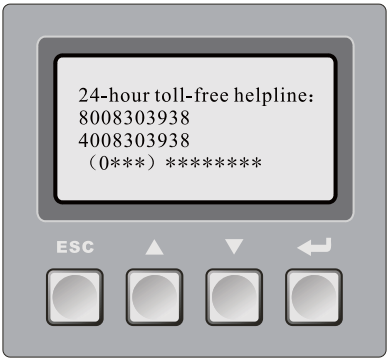
6. Help

1) Help picture

2) Press ENTER on help picture



3) Press ENTER on SERVICE HOTLINE picture



7. Setting action (press ESC to exit the above picture)

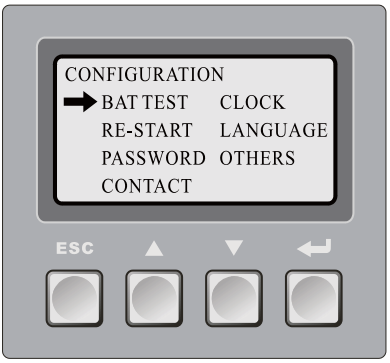
You are able to access Setting picture by using user combination (default: 1234, subject to personal modification) so as to set the following programs.

1) Setting picture (bypass power supply)

2) Press ▼

3) Input Password display

4) Input password and press ENTER



8. Castle EX Series is capable of DC start-up without AC input, panel display being similar to switch-on picture with AC supply. DC switch-on and off are available by following instructions appearing in the pictures:

- Firstly, activate DC switch-on function set under the bypass mode
- Make sure that “+”, “-” and “N” wires of batteries are properly connected to UPS
- Switch on batteries
- Lightly touch ENTER
- Manually conduct switch-on order within about 40s after LCD self-inspection

Remark: UPS will be switched off automatically if there is no operation within 40s after LCD self-inspection is completed!

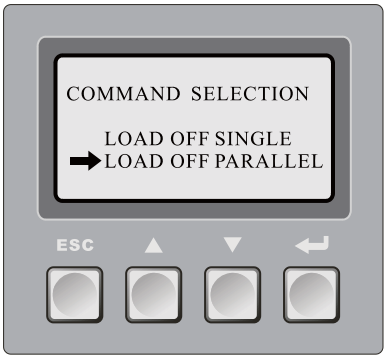
4.2 Parallel UPS operation

Castle EX Series is capable of direct parallel connection, customers can add additional machines on line to realize power redundancy and follow single machine operation instructions for general operation. Before parallel operation, the customer service engineers will change the stand-alone mode into the parallel mode through the LCD display panel. Then connect the parallel lines of UPS and switch on the UPS input in sequence, turn on the system through any of the single machine, then all the single machines will display “UPS is loading on”, and then switch to inverter output.

(1) Normal switch on: Follow the operation for single UPS and switch on the machine:

(2) If parallel operation fails,the following will appear:

(3) Select to switch off one of the single machines or the parallel system:

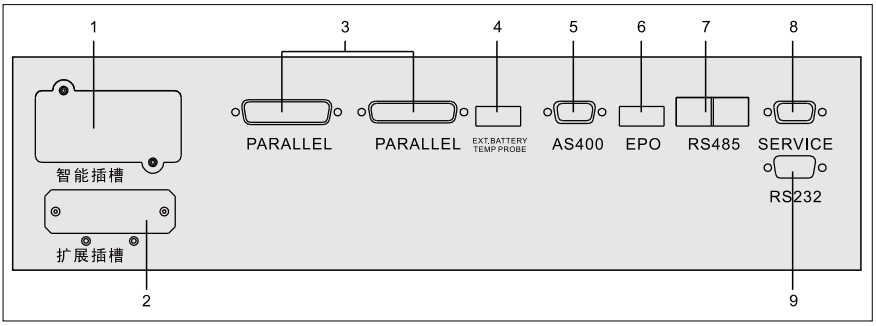


Remark: After turning on in Line mode, all UPSs will transfer to INV mode; Turn off: when turn-off is conducted under INV mode, all UPSs will simultaneously turn off inverter and then transfer to the bypass mode, if turn off the UPSs one by one, all UPSs will simultaneously transfer to the bypass mode after the last UPS completes turn-off action.

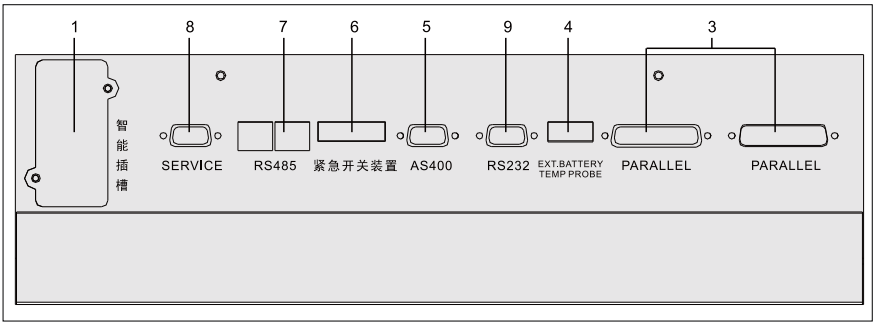
Chapter 5 Communication Interface

Castle EX Series provides Intelligent Slot, Expanded Slot, PARALLEL, EXT.BATTERY TEMP PROBE, AS400, EPO, RS485 and RS232 as well as SERVICE Supervising Communication Interface exclusively available to Santak technical personnel.

3C3 EX 20KS/30KS/40KS



3C3 EX 60KS/80KS

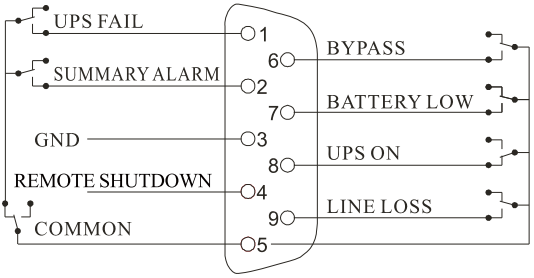


1. Intelligent slot: suitable for WebPower card (optional) of remote supervising management, enabling you to realize remote supervising management on UPS by accessing Internet. (Intelligent slot adapter card is divided into long card and short card; Castle EX Series requires the latter.)

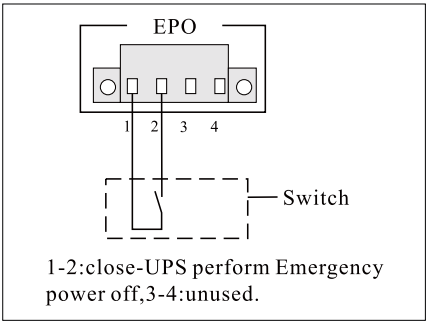
2. Expanded slot: only applicable for 20KS/30KS/40KS models, and available only to users with special requirements and not for standard configuration.
3. PARALLEL: communication connections for parallel configuration, 8 sets of UPS in parallel for 20KS/30KS/40KS models and 6 for 60KS/80KS models.
4. EXT.BATTERY TEMP PROBE: temperature interface for external battery cabinet, capable of battery temperature supervision so as to realize battery intelligent management.
5. Standard AS400 interface: provides dry-contact interface for UPS supervising, the contact signals can reflect the UPS operation states so as to realize power source management (See Appendix for AS400 Port pin definition).
6. EPO: emergency power off, which provides users having emergency power-off need with direct UPS output off function. (See Appendix for EPO external wiring diagram)
7. Standard RS485 Interface: capable of UPS supervising management when parallel machine, providing complete control over UPS power supply (See Appendix for RS485 port Pin definition).
8. SERVICE Interface: available only to Santak internal technical professionals and not open to users.
9. Standard RS232 Interface: applicable to WinPower management software (See Appendix for RS232 port Pin definition).

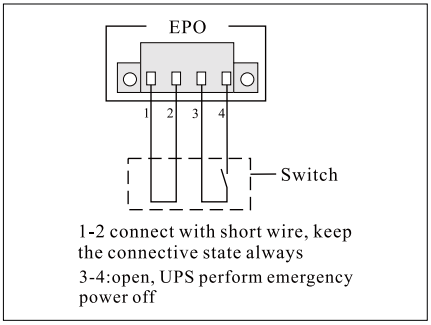
AS400 PORT：

Pin#	Description	I/O
1	UPS Fail	Output
2	Summary Alarm	Output
3	GND	GND
4	Remote Shutdown	Input
5	Common	+12V
6	Bypass	Output
7	Battery Low	Output
8	UPS ON	Output
9	Line Loss	Output



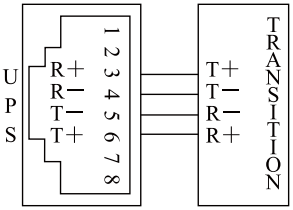
EPO external wiring diagram：





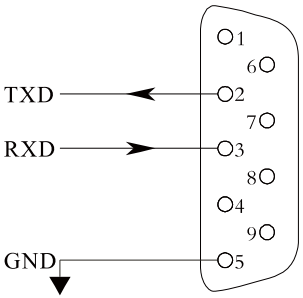
RS485 PORT：

Pin#	Description	I/O
3	RXDA	Input
4	RXDB	Input
5	TXDB	Output
6	TXDA	Output



RS232 PORT：

Pin#	Description	I/O
2	TXD	Output
3	RXD	Intput
5	GND	Output



Chapter 6 Optional accessories

6.1 Power Feedback Module

Power feedback module is an optional spare part specially designed for Castle EX series to provide perfect solution for high BUS voltage by feeding back the regenerative energy to the power system or battery. And it is applicable to special fields in complex industrial environment with reliable operation and flexible installation, such as high-speed elevators, mining elevators, rolling mill, motor, tension control system of wind mechanism and principle bearing drive system of lathes etc.

6.2 Transformer

When the UPS is applied to load devices, there might be disturbances or malfunctions caused by the Neutral to Ground voltage. However, the installation of the special transformer to the output will make the Neutral-to Ground voltage be less than 1V; besides, the installation of the special transformer to the input will avoid three times of harmonic of the power system and reduce disturbances, thus prevent the load devices from disturbing by other devices connected to the power system. It is recommended to connect the transformer to the input or output according to application requirements. (Internal transformer for 3C3 EX 20KS/30KS/40KS-ISO models and external for 3C3 EX 60KS/80KS-ISO models; please refer to this manual for operation instructions).

6.3 Double Charge Boards

Castle EX Series UPS is capable of improving the charge capability and speed by battery capacity expansion. It is flexible to install an additional charge board in parallel connection with the standard charge board since there is space for double charge boards reserved.

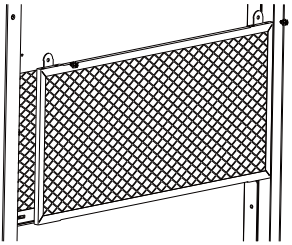
6.4 Temperature Sensor

For battery with short lifetime and being sensitive to temperature, the temperature sensor can be used to detect the temperature change, enable the temperature compensation function of charge voltage, the battery charge voltage will be adjusted automatically to prolong the lifetime of the battery.

temperature detect terminal　　temperature sensor

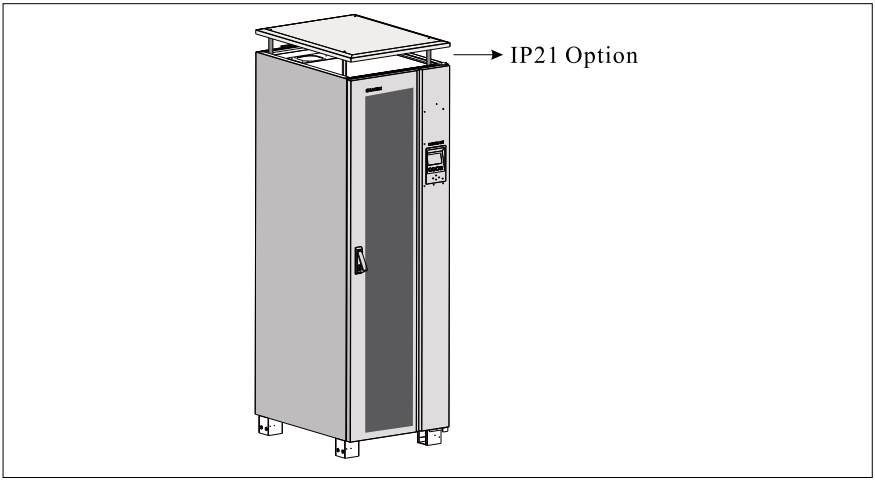
6.5 Dustproof Net

Dustproof net is an optional spare part specially designed for Castle EX Series UPS to work in dust environment (dust diameter no less than 1.0mm, especially metallic and metalloid dusts) in order to upgrade UPS frontal protection grade to IP51 with flexible installation and maintenance.



6.6 IP21 Option

Castle EX 60~80K Series UPS adopts top perforation and top and bottom ventilation, it is recommended to install the IP21 option to prevent objects with diameter larger than 12mm and water drops.



Chapter 7 Transportation, Maintenance and Troubleshooting

Move UPS

Make preparation for UPS relocation according to the following steps.

Remark: special equipment (folklift) is needed for loading and unloading due to the heavy weight of UPS.

1. Switch off all equipments connected to UPS.
2. Turn off UPS AC switch and battery pack switch.
3. Disconnect all wires from UPS terminal bay.

Maintenance

Castle EX Series UPS requires minimum maintenance.

1. If battery is switched off, loaded equipments will not be covered for power-off protection.
2. Under normal circumstance, batteries should be found in poor performance, replacement should be done as soon as possible only by qualified personal with proper training. Users are not allowed to replace without authorization.

Remark:

A. Prior to battery replacement, switch off UPS and remove it from AC.

B. Take off metallic articles such as rings and watches.

C. Use screw drivers equipped with insulated handles and do not place tools or other metallic substances on the batteries.

D. Short circuit or reverse connection is forbidden for battery polarity connection.

3. It is not recommended to replace batteries individually. Complete replacement should follow instructions given by battery suppliers.
4. Make sure UPS vent are properly ventilated and clean side frames and fan vents from dusts every half a year (switch off AC and battery power prior to cleaning).

Troubleshooting

Should maintenance prove necessary, the following steps should be followed :

1. Check if UPS input wiring is done properly.
2. Check if all air switches are tripped off.
3. Check if voltage input is within specified range.

Please refer to “Reference Table of LED indicators and LCD display” of this User Manual first and then conduct proper treatment.

Table of Malfunctions		
Symptom	LCD Display or Possible cause	Solution
The fault LED is lit, periodic beeps	Overloaded in bypass or inverter mode	Remove some load. Loading level shall be less than the nominal power capacity.
	Mains out of tolerance	Check that the input wiring and input voltage are normal
	Battery disconnected	Check the battery breaker and the battery wiring
The fault LED is lit, continuous beeps	UPS fault	Contact SANTAK customer service center
Battery discharging time less than 1/3 of initial discharging time	Battery exhausted	
	Charger fault	
LCD panel has no display		Long press ESC 3S,LCD replacement.

If problems still exist, please contact SANTAK service hotline at 400-830-3938/800-830-3938 and provide the following information:

- MODEL and SERIAL NO of the UPS;

- Failure date
- Detailed failure description (including LCD malfunction, indicator condition, buzzer information, power and load capacity etc.).

Appendix 1
Techinial parameters and specifications

Model		3C3 EX 20KS	3C3 EX 30KS	3C3 EX 40KS	3C3 EX 60KS	3C3 EX 80KS
Power Rating		20KVA/16KW	30KVA/24KW	40KVA/32KW	60KVA/48KW	80KVA/64KW
Input	Connection	3-Phase + N+G				
	Frequency	40-70Hz				
	Power factor	≥ 0.99①				
	Utility voltage range	380×(-45%~ +25%)VAC（when input voltage<75%, output power derating is required）				
	Bypass Voltage range	380×(-15%~ +15%)VAC			380×(-20%~ +15%)VAC②	
Output	Voltage rating	Line voltage 380×(1±1%)VAC or phase voltage 220×(1±1%)VAC(with balanced load)				
	Power factor	0.8				
	Frequency tolerance	50Hz±8%（track bypass frequency input ;when input frequency exceeds ±8% or under the mode of battery power supply, frequency output should be±0.1%of nominal）				
	Overload time	≥ 10min 110%<Load ≤ 125% ≥ 1min 125%<Load ≤ 150%				
Efficiency	Double-conversion mode	Up to 93%			Up to 94%	
	ECO mode	Up to 98%③				
Operating Environment	Ambient temperature	0~40℃				
	Storage temperature	–25~55℃ (without battery)				
	Ambient humidity	0-95%				
	Altitude	≤ 1000m				
Nominal battery voltage/Rated charging voltage	28 Pcs	±168VDC/±189VDC				
	30 Pcs	±180VDC/±202.5VDC				
	32 Pcs	±192VDC/±216VDC				
Weight	N.W/Contain transformer	82Kg/208Kg	110Kg/275Kg	114Kg/314Kg	282Kg	306Kg
	G.W/Contain transformer	122Kg/248Kg	160Kg/325Kg	164Kg/364Kg	356Kg	380Kg
UPS Dimension(W*D*H)（mm）		420×643×956	470×710×1150	470×710×1150	600×800×1850	600×800×1850
Safety Standard	National Standard	GB4943				
	TCL certification	YD/T1095				
EMS	ESD	GB/T 17626.2 Level 4				
	RS	GB/T 17626.3 Level 3				
	EFT	GB/T 17626.4 Level 4				
	SURGE	GB/T 17626.5 Level 4				
EMI	Radiation and Conduction	GB 7260.2				
	WARNING: This is a product for commercial and industrial application in the second environment-installation restrictions or additional measures may be needed to prevent disturbances.					

Remark:

① 3C3 EX 20KS-40KS ≥ 0.99 at 50% load;3C3 EX 60KS-80KS ≥ 0.99 at full load.

② ±15% default;-20% ～+ 15% regulate.

③ ECO mode is supported by 3C3 EX20KS-40KS only in single machine mode ;ECO mode is supported by 3C3 EX 60KS-80KS in single and parallel machine mode.

Appendix 2 Light reference table

NO	Working condition	Indicator					Buzzer
		Bypass LED	Line LED	Inverter LED	Battery LED	Fault LED	
1	Standby Mode						
	Normal					One flashing every 8 sec	One beep every 8 sec
	Fault					One flashing every 4 sec	One beep every 4 sec
	Overload					One flashing every 1 sec	One beep every 1 sec
2	Bypass Mode						
	Normal	●				One flashing every 2 min	One beep every 2 min
	Fault	●				One flashing every 4 sec	One beep every 4 sec
	Overload	●				One flashing every 1 sec	One beep every 1 sec
3	Line Mode						
	Normal		●	●			None
	Fault		●	●		One flashing every 4 sec	One beep every 4 sec
	Overload		●	●		One flashing every 1 sec	One beep every 1 sec
4	Battery Mode						
	Normal			●	●	One flashing every 4 sec	One beep every 4 sec
	Low battery voltage			●	★	One flashing every 1 sec	One beep every 1 sec
	Overload			●	●	One flashing every 1 sec	One beep every 1 sec
5	Battery Self Diagnosis Mode						
	Normal	★	★	★	★	None	None
	Fault	★	★	★	★	One flashing every 4 sec	One beep every 4 sec

	Low battery voltage			●	★	One flashing every 1 sec	One beep every 1 sec
	Overload			●	●	One flashing every 1 sec	One beep every 1 sec
6	Fault Mode						
	Normal					Long light	Long beep
7	Converter Mode						
	Normal		●	●		None	None
	Fault		●	●		One flashing every 4 sec	One beep every 4 sec
8	ECO Mode						
	Normal	●		One flashing every 1 min		None	One beep every 1 min
	Fault	●				One flashing every 4 sec	One beep every 4 sec

Should any display or warning message excluded in the above table be found,please contact distributor or call EATON Hot line for advice.

● Indicator light is on

★ Indicator light flashes

Warning include one or more than one of these:

1.EPO active
2.Line loss
3.Neutral loss
4.Line phase error
5.Bypass loss
6.Bypass phase error
7.Battery open
8.Low battery voltage
9.Over charger
10.Battery reverse
11.Charger failure
12.Battery over restrict
13.Battery over temperature
14.Fan over restrict
15.BUS capacitor over restrict
16.Fan failure
17.Fan disconnected
18.Low temperature Battery
19.communication disconnected
20.Auxiliary charger failure
21.Bypass N wire cut
22.Battery N wire cut
23.Address conflict

Remark:

In fault mode,there is output presented with normal bypass and the bypass LED will lit(except ECO fault or output short circuit).

Appendix 3 Warranty

Our company promises: SANTAK its products to be offered free warranty service for three years from the date of purchase.

- To obtain service under warranty via a valid guarantee offered by dealers;
- To obtain service under warranty via serial number.

As a user of SANTAK, if your UPS fails, please contact our 400/800 hotline for the following service:

- Three-year warranty (covering batteries purchased from SANTAK);
- 24-hour toll-free helpline (See the hot line number at the warning label located on the cabinet cover);
- Nationwide warranty;
- Technical support on our web site;
- Toll-free on-site service.

This limited warranty does not apply to conditions as follows:

- Man-made fault;
- Out of warranty;
- The finished product of which the serial number is changed or lost;
- Damage or loss resulted from force majeure or external causes;
- Disassembly or modifications to the unit with no authorization;
- Disobeying provisions of operating/using the unit;
- Battery over discharged or man-made damage.

www.santak.com.cn

山特电子(深圳)有限公司 www.santak.com.cn

厂址：深圳市宝安72区宝石路8号 邮编：518101

客服热线:400-830-3938/800-830-3938 客服传真:(0755)27572730

客服中心 E-mail 地址: stkservice@eaton. com