

Eaton DX 系列使用手冊

6K/10K CN(XL)/10K CNXL3:1 USER MANUAL



Powering Business Worldwide

感谢您使用伊顿产品！

请严格遵守本手册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。

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。并请妥善保存说明书。
2. 操作时，请注意所有警示标记，并按要求进行操作。
3. 避免在阳光直接照射、雨淋或在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，或有电暖炉、热炉等类似的设备附近。
5. 放置UPS时，在其四周要留有安全距离，保证通风。安装时，请参照说明书。
6. 清洁时，请使用干燥的物品进行擦拭。
7. 若遇火警，请正确使用干粉灭火器进行灭火。若使用液体灭火器会有触电危险。

电气安全

非专业人员请勿打开机壳，请有授权的维修人员操作。

1. 上电前，请确认已正确接地，并检查接线和电池极性的连接正确。
2. 当UPS需要移动或重新接线时，应断开UPS 所有电气连接，保证UPS完全停机，否则输出端仍可能带电，有触电的危险。
3. 请使用伊顿指定的附加装置和附件。
4. 小心电击：
维护由UPS供电设备时，请断开设备与UPS的连接；
维护和安装UPS输入输出端子时，请关闭UPS，并断开UPS 所有电气连接。

电池安全

1. 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. 蓄电池维护只能由具备蓄电池专业知识的人员来进行。
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、戒指或类似的金属物体；
 - B. 使用绝缘的工具；
 - C. 穿戴橡胶鞋和手套；
 - D. 不能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. 请不要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. 请不要将电池正负极短路，会导致电击或着火。

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，请不要在以下工作环境中使用：
 - A. 超出技术指标规定（温度 $0^{\circ}\text{C}\sim 40^{\circ}\text{C}$ ，相对湿度 $20\%\sim 90\%$ ）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： $-25^{\circ}\text{C}\sim +55^{\circ}\text{C}$ 。UPS开机之前，必须先让环境温度回暖至 0°C 以上，并维持2小时以上。

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1、简介

本系列UPS 是一种先进的在线式正弦波不间断供电系统，可以为您的精密设备提供可靠、优质的交流电源。其适用范围很广，可以用在电脑设备、通信系统以及工业自动控制设备上，同时还可提供丰富的选配件功能，满足不同需求。它的双转换在线式设计，不同于后备式UPS。当市电正常时，它会对市电进行调整、滤波，为您的设备提供更加优质的电源；当市电异常或中断时，它会无时间中断地从备用电池为您的设备提供优质的后备电源；在过载或逆变失败情况下，UPS 会转换到旁路状态，由市电供电；若过载情况消除，UPS 会自动转回到逆变器供电状态。

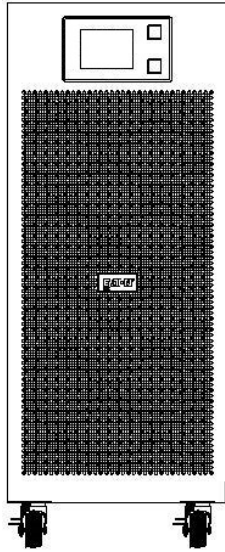
本手册适用于EATON DX系列产品，包括：

- FZ'8MEP：内置电池的标准机型。
- FZ'8MEPZN：可外接电池的长延时机型。
- FZ'10K'EP：内置电池的标准机型。
- FZ'32MEPZN：可外接电池的长延时机型。
- FZ'10K'EPZN'5-3：三相输入单相输出，可外接电池的长延时机型。

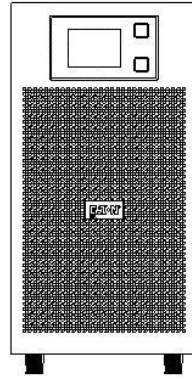
1.1 符号说明

符号及含义	
符号	含义
	注意
	危险
	交流电
	直流电
	保护接地导体
	保护连接导体
	循环
	勿与杂物一同放置
	过载
	电池
	开关机

1.2 前视图

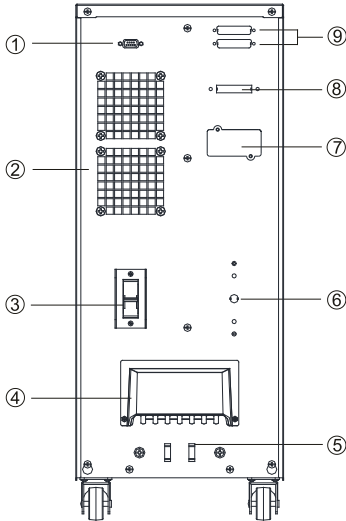


FZ'6K'10K'EP

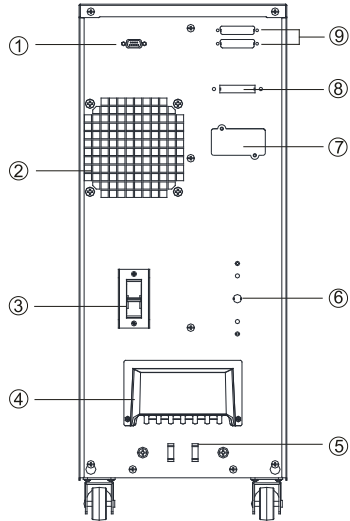


FZ'6K'10K'EP ZN'32MEP ZN5-3

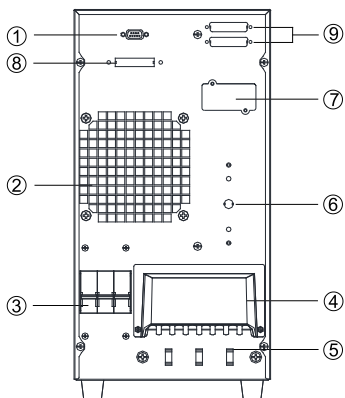
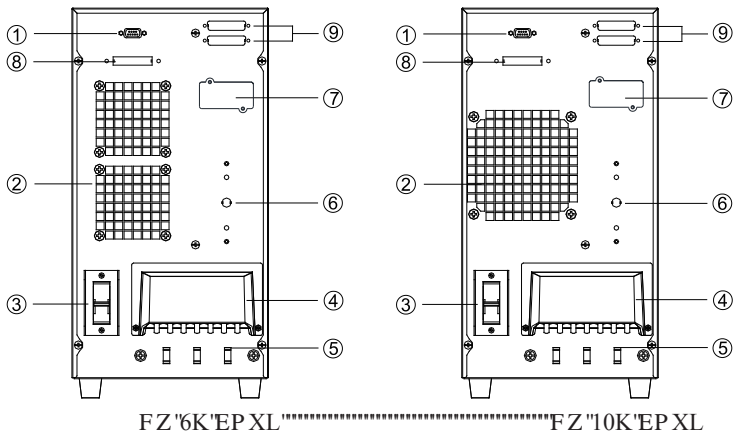
1.3 后视图



FZ'6K'EP



FZ'10K'EP



FZ'10K'EP ZN3:1


- ① 计算机接口
- ② 风扇
- ③ 输入保护开关
- ④ 端子排盖板
- ⑤ 束线架
- ⑥ 维护开关（选配件）
- ⑦ 智能插槽
- ⑧ EPO（选配件）
- ⑨ 并机卡（选配件）

1.4 产品规格

机器型号	FZ'6K'EP	FZ'6K'EPZN	FZ'10K'EP	10K'EPZN	10K'EPZN5-3
尺寸 (宽×深×高)	248×496×616	212×496×420	248×496×616	212×496×420	212×496×420
净重 (Kg)	58.9	14.2	62.1	15.9	16.9
功率					
视在功率 (KVA) / 有功功率 (KW)	6KVA / 5.4KW	6KVA / 5.4KW	10KVA / 9KW	10KVA / 9KW	10KVA / 9KW
市电					
电压范围	120VAC~275VAC (相电压)				
电流*	32.1A.max	36.1A.max	52.6A.max	56.6A.max	56.6A.max
频率范围	40Hz~70Hz				
功率因数	0.99				0.95
输出					
电压	220VAC×(1±1%)				
电流	27A		45A		
频率	50Hz×(1±0.1%); 锁相范围内跟随市电				
功率因数	0.9				
过载能力	105%~125%, 常温 (环境温度0~30度) 10分钟后转旁路, 高温 (环境温度30~40度) 1分钟后转旁路; 125%~150%, 30秒后转旁路; >150%, 0.5秒后转旁路				
峰值因数	3: 1				
失真度	THD < 2% (线性满载)				
蓄电池 (电池在高温下使用, 寿命会急剧下降)					
后备时间	4分钟 (满载)	取决于外接电池容量	3分钟 (满载)	取决于外接电池容量	
充电时间	7小时充至90%	取决于外接电池容量	7小时充至90%	取决于外接电池容量	

* 最大电流是在UPS输入187V, 输出带额定满载, 充电器满负荷工作的条件下获得。


机器型号	DX 6K CN	DX 6K CNXL	DX 10K CN	10K CNXL	10K CNXL3:1
EMC标准	IEC 62040-2 2005 / GB 7260-2-2009				
国家标准	GB4943.1-2011				
行业标准	YD/T 1095-2008 / CQC3108-2011				
工作环境温度	0℃~40℃				
存储温度	-25℃~55℃				
环境湿度	20%~90%（无冷凝）				
海拔高度	<1000m				

 警告：本产品用于第2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。


注：建议UPS输出线不大于10m，外接通信线、并机线及温度侦测线等不大于3m，否则，可能需要采取安装限制或附加措施以抑制骚扰。

高海拔地区负载量=额定功率×降额系数（和海拔对应的）

海拔（m）	1000	1500	2000
降额系数	100%	95%	91%

 注意：若UPS被使用在海拔1000m以上，必须采用递减额定值输出，降额系数参见上表。

2、安装


 危险：为了保证安全，请注意在安装前切断市电配电开关，如果是长延时机型，还应断开电池输入。

 注意：

1. 以下接线必须由专业人员，依当地法规执行。
2. 建议以落地安装的方式使用。
3. 安装时应保持前面板和后盖板通风孔不被阻塞，确保箱体与四周其它物体之间的距离大于0.5米。
4. 当接显示器或激光打印机之类的感性负载时，因其运行时启动功率过大，应以启动功率计算UPS的容量。

2.1 拆包检查

1. 拆开UPS 包装，目测机器外观，检查其是否在运输中有碰撞损坏。
2. 如发现运输损坏现象或随机附件缺少，请立即联系经销商或承运商。
随机附件：使用手册一本。

 循环：包装材料是可重复使用的，请保留包装材料，以备将来使用。

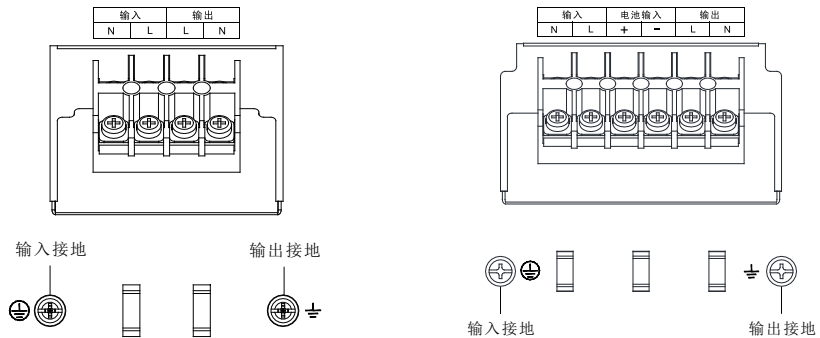
2.2 配线表

 注意：
电缆的直径和导线的横截面积取决于UPS额定功率。最小配置参考以下配线表。

下表中L对三相机而言，表示L1、L2、L3且三相线径相同。

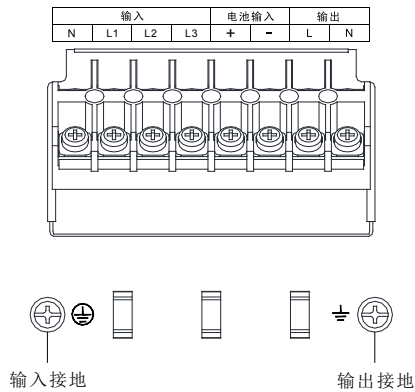
型号		DX 6K CN	DX 6K CNXL	DX 10K CN	10K CNXL	10K CNXL3:1
输入	G	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
	N	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
	L	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
电池	+	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
	-	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
	G	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
输出	L	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
	N	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
	G	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²

单相端子排:



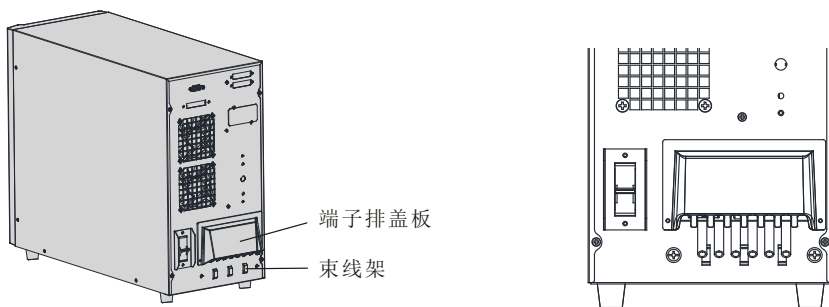
FZ "6K 110K" EP FZ 6K/10K" EP ZN

三相端子排:

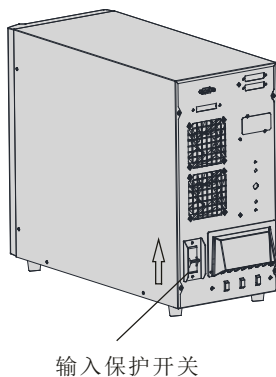


FZ "10K" EP ZN5-3

7. 将绑线穿过束线架。
8. 用绑线将输入、输出、电池线捆好，将绑线调节到合适位置，固定好电缆。
9. 重新装上盖板并用螺丝锁紧盖板。



10. 接通市电，将UPS输入保护开关置于“ON”，UPS通电。



2.4 外接电池的安装

Eaton DX长延时机均采用16节电池，串联成192VDC为1组，可多组电池并联；
电池连接程序非常重要，若未按照程序进行，可能会有电击危险，所以请严格按照下列步骤进行：

1. 串联合适的电池组，建议电池组中串接保险丝进行保护。
2. 选择合适的电池电缆连接电池和UPS（参照2.2配线表）。UPS和电池之间必须接一个空气直流开关，开关的电压电流规格不得小于下表所示对应型号UPS 的电池电压和电流规格：

16节电池 192VDC

型号	DX 6K CNXL	DX 10K CNXL	10K CNXL3:1
电池电压	192VDC	192VDC	192VDC
电池电流	36.5A. max	60.5A. max	60.5A. max

 危险：切不可先接UPS端，否则会有电击危险。

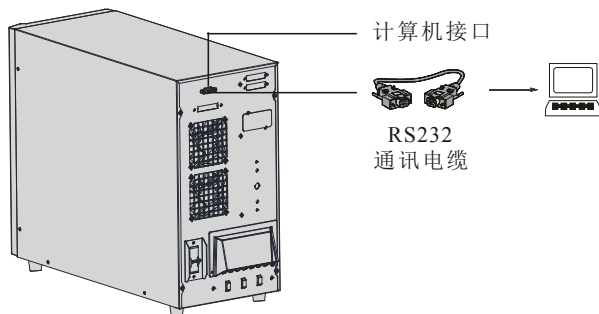
3. 将电池连接线对应接UPS，完成UPS与电池连接，UPS先不接任何负载，然后将电池组开关置于“ON”，接通市电，UPS开始对电池组充电。

 注意：请确认电池与UPS正、负极正确连接。

2.5 连接到计算机接口

计算机接口：标准的RS232接口，用RS232通讯电缆连接UPS与监控设备。

1. 将RS232通讯电缆一端连接到计算机的串行口。
2. 将RS232通讯电缆另一端连接到UPS的计算机接口。



2.6 并机卡（选件）

1. 冗余简介

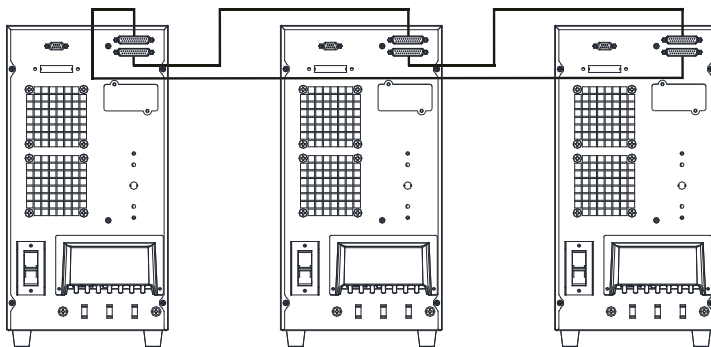
$N+X$ 是目前最可靠的供电结构， N 代表总负载所需的最少UPS数， X 代表的是冗余的UPS数，也就是系统可以同时承受的故障UPS数。当 X 越大，系统的可靠度就会越高。对于讲究极高可靠度的使用场合， $N+X$ 是最佳方式。

只需加装并机选配件，即可进行最多3台UPS并联，来实现功率冗余（ $N+X$ ）。

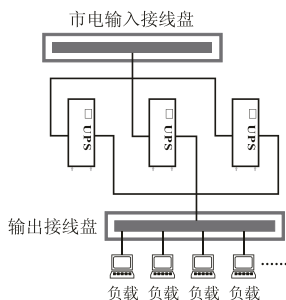
2. 并机安装

并机功能是UPS的选装功能，用户自行购买并机功能部件后由客服人员为用户安装至机器上，并机数量最多是三台，并机UPS必须独立配置电池。

1) 客服工程师安装并机卡，连接并机线：并机卡是并机UPS间的通讯接口，通过并机卡，用并机线将UPS依次相连。



2) 所有并机UPS 输出线接至一输出接线盘，然后由输出接线盘配线去负载。



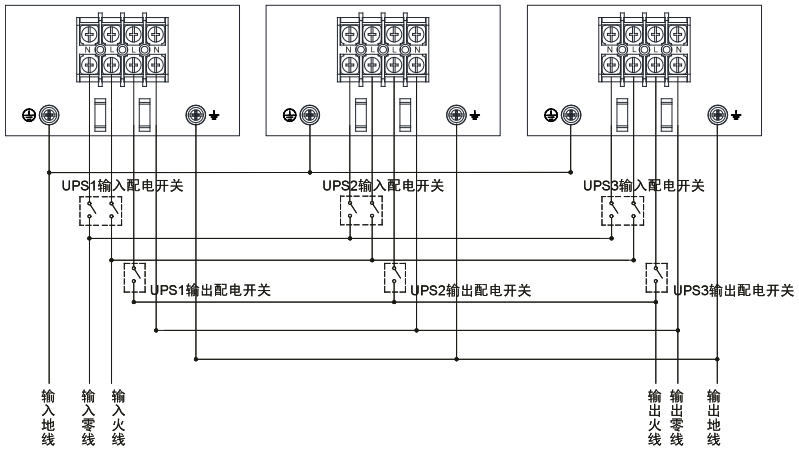
注意：

输出配线长度要求：

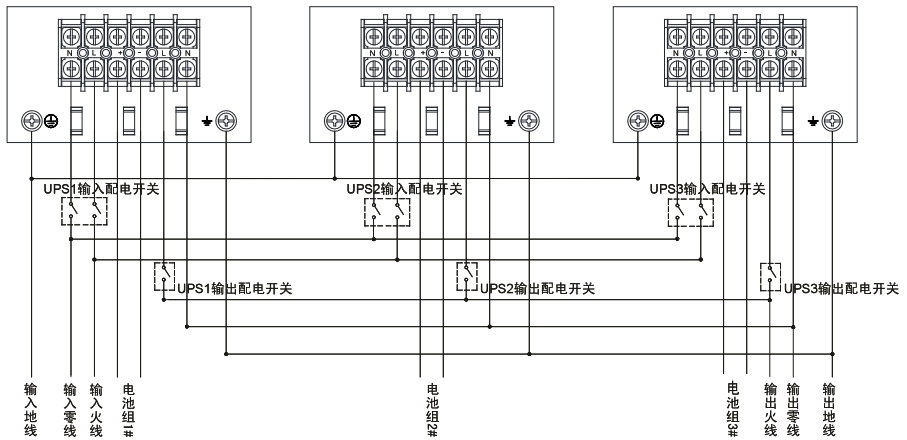
当负载至并机使用的每台UPS间的距离小于20米时，要求各线长差距小于20%；

当负载至并机使用的每台UPS间的距离大于20米时，要求各线长差距小于10%。

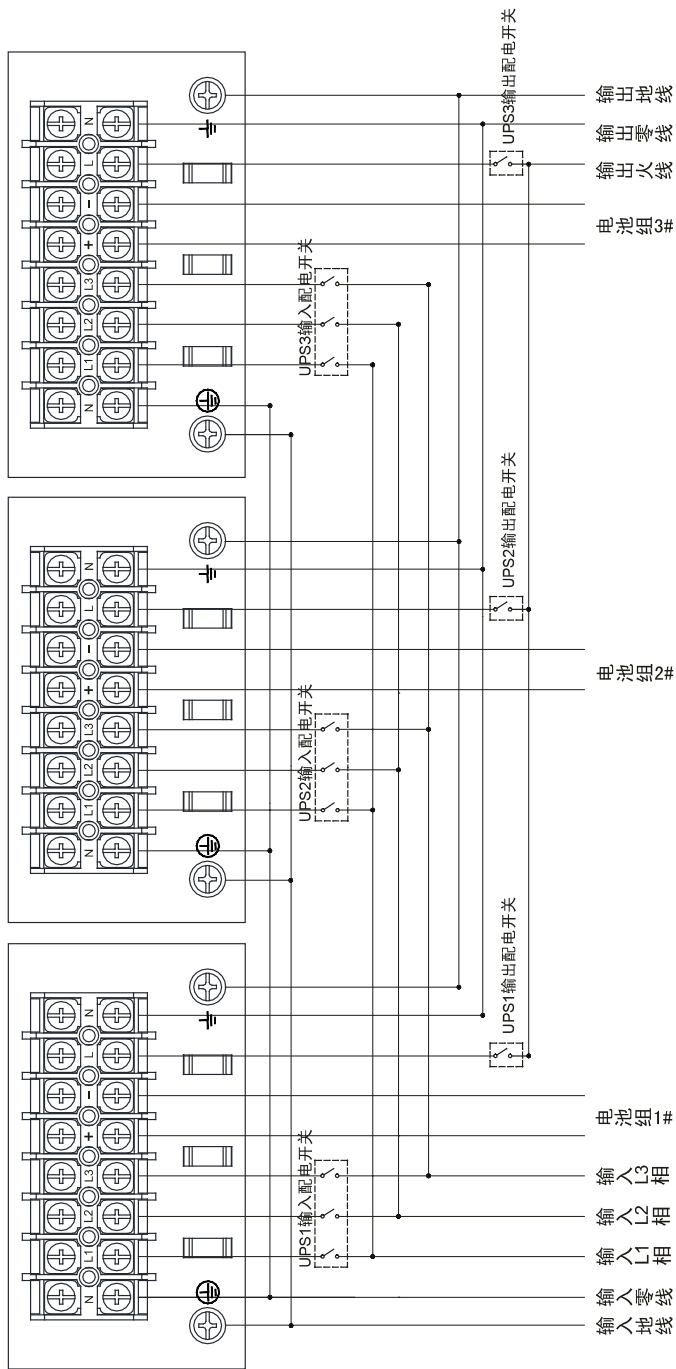
- 3) 并机UPS端子排输入输出部分的并机示意图如下, 每台UPS 输入输出之配线请遵循单机之配线要求。
- 4) 并机的每台UPS 需单独配备电池。



DX 6K/10K CN并机接线图



DX 6K/10K CNXL并机接线图



DX 10K CNXL3:1 并机接线图

3. UPS并机优点介绍（主动冗余式）

这种方式通过冗余结构提高了供电系统的可靠性。两台UPS容量相同并平均分配负载，当其中任意一台故障时，另外一台UPS可独立承担整个负载的运行。因此称作1/2冗余。

4. 操作说明

1) 一般操作必须遵循单机之操作要求。

2) 并机开机

市电开机：市电接通后，只需长按其中任意一台UPS开机，其他机器将同时开机，然后同时跳到逆变状态；

电池开机：先短按每台UPS开机键，机器建立工作电源，然后只需长按其中任意一台机器开机，其他机器将同时开机，所有机器将工作在电池模式下。

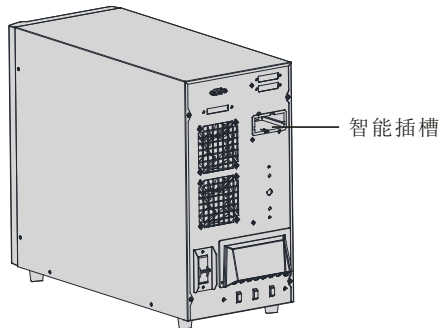
3) 并机关机

持续按下其中任意一台机器关机键4秒以上（两声有效声音提示），实现并机关机；按下其中任意一台机器关机键1秒以上，4秒以下（有效声音提示），实现单机关机。

 注意：长按是1秒以上，短按小于0.5秒。

2.7 智能卡（选件）

智能卡是UPS的选装配件，用户自行购买智能卡部件（智能卡）后由客服人员为用户安装至机内，安装智能卡的过程中需要停止UPS。



智能插槽：可选装AS400卡、NMC卡、CMC卡或USB+RS232卡任意一种。

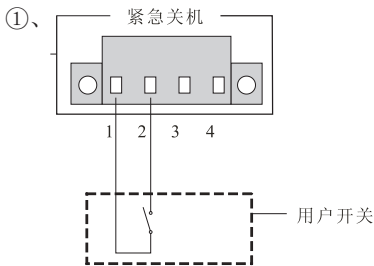
- AS400卡：可直接利用有AS400接口系统的监控功能，对电源进行监控管理。
- NMC卡：通过Internet实现对UPS的远程监控和管理功能。
- CMC卡：集中监控卡。
- USB+RS232卡：提供标准的USB和RS232通讯接口，任选一种接口监控UPS的运行状态。

⚠ 注意:

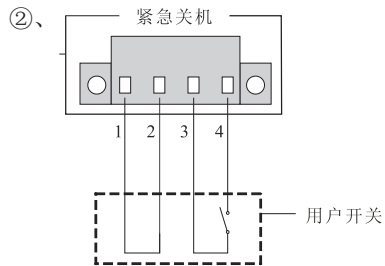
- 监控卡需通过代理商购买，安装方法请参照智能插槽包装内的安装说明。
- WinPower 软件及AS400、NMC、CMC、USB+RS232卡的使用请参考其他相关资料，如果对上述接口的使用有疑问，请联络伊顿客服中心。
- 智能插槽适配卡分长卡与短卡，本手册描述的机种需匹配短卡使用。

2.8 EPO（选件）

EPO（Emergent Power Off）即紧急关机功能，EPO位于UPS单元后面板，呈绿色端子，通过EPO可以在紧急情况下关断UPS电源，关闭UPS。具体使用接线方法有两种：



1-2闭合时，UPS执行紧急关机。
3-4闲置。



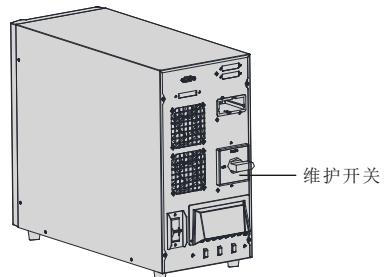
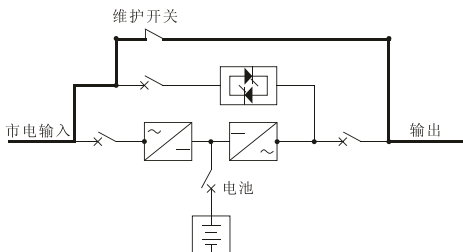
1-2用短线连接，使其一直处于连接状态。
3-4打开时，UPS执行紧急关机。

* 详细安装方法请参照EPO包装内的安装说明。

2.9 维护开关（选件）

维护开关实现UPS的在线维护。

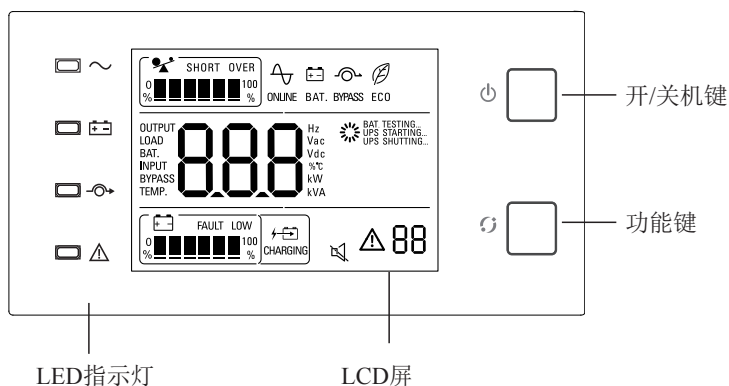
如下图所示，不论是市电、电池、旁路模式，UPS内部主要部分都带电。通过维护开关可以将UPS和市电隔离开来，UPS的在线维护安全性得到了保障。



* 详细安装方法请参照维护开关包装内的安装说明。

3、控制面板

操作显示面板位于UPS的前面板，包括2个控制键、4个LED指示灯和LCD屏。



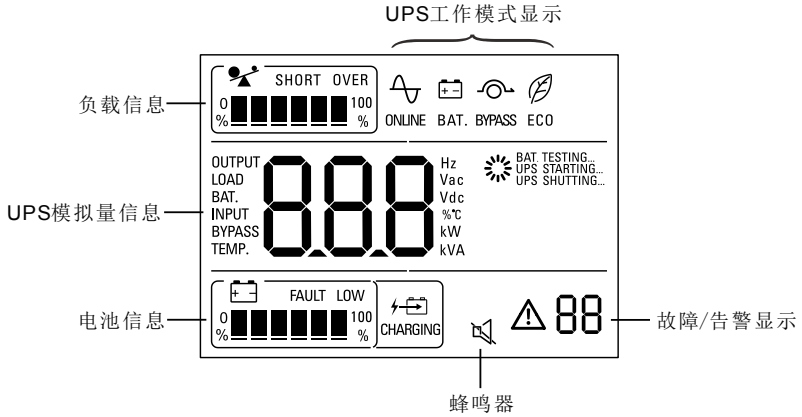
1、开/关机键：控制UPS的开启与关断

2、功能键：静音（旁路和电池模式下长按2秒以上，10秒以下，消除旁路和电池模式告警声；长按10秒以上，消除所有告警声。重复操作可取消静音）；电池自检（市电模式下长按2秒以上，10秒以下）；短按切换LCD显示信息。

3、LED指示灯：包括正常指示灯、电池指示灯、旁路指示灯、故障指示灯。

指示灯	状态	描述
正常	亮	UPS 正常运行，功率模块向关键负载供电。
	灭	负载由旁路供电（非ECO模式）或无输出电压
电池	亮	UPS处于电池供电状态，同时正常LED灯也点亮
	1秒1闪	充电器异常或电池异常
旁路LED	亮	UPS处于ECO模式（同时正常LED灯也点亮）或旁路供电状态
	1秒1闪	旁路异常
故障LED	亮	UPS处于故障状态，有旁路输出（非EPO及短路故障）

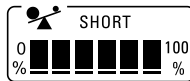
4、LCD屏



(1) 负载信息：负载量显示，用%表示，档位显示规格如下：

显示档位（从左至右）	负载量
第一档	0%~15%
第二档	16%~35%
第三档	36%~55%
第四档	56%~75%
第五档	76%~95%
第六档	≥96%

- 当UPS输出短路时，“短路”图标会出现在负载信息栏。



- 当UPS处于过载运行状态时，“过载”图标会出现在负载信息栏。




(2) UPS模拟量信息：输入电压、频率、输出电压、频率、电池电压、负载量信息；短按功能键切换显示类别，同一类别内的显示项目自动切换。

类别	项目		
输出	电压	频率	
负载	功率	伏安	百分比
电池	电压	容量	节数
输入	频率	三相电压	
旁路	电压	频率	

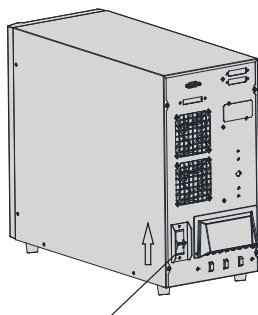
4、操作

4.1 开机

 注意：虽然电池在出厂时已充满电，但经过运输、存储，电量会有所损失，建议在第一次使用UPS前应先对电池充电12小时以上，以保证有足够的备用时间。

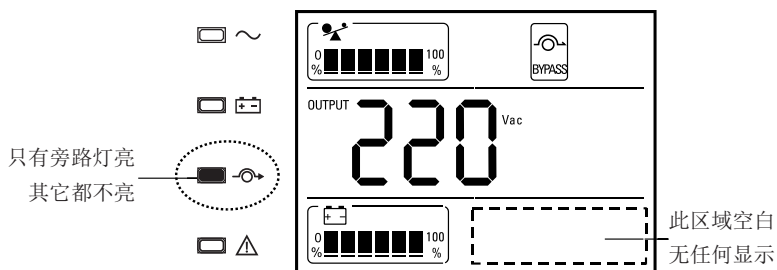
开机准备


1.接通市电，先闭合电池输入开关，然后将UPS旁路保护开关置于“ON”，请根据控制面板显示查看电池的节数（按功能键切换），如显示值与实际电池节数不一致，请拨打伊顿服务热线或与经销商联系。



输入保护开关

2.将UPS输入保护开关置于“ON”，检查控制面板显示是否如下图所示，若如下虚线框区域出现告警码或故障码，请拨打伊顿服务热线或与经销商联系。

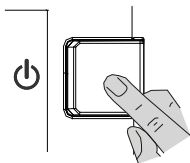


 注意：断电维护前请断开所有开关。

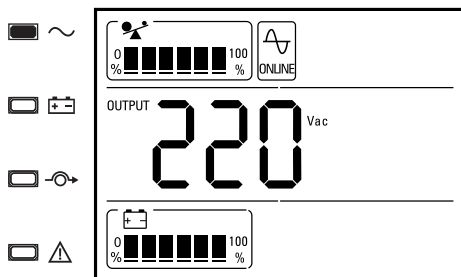
UPS开机操作分为：市电开机和无市电直流开机。

市电开机

- 长按开机键1秒以上，UPS 执行开机，开机时UPS会进行自检。




- UPS自检结束后进入正常工作，指示灯及显示屏处于如下状态：
正常指示灯亮，无任何故障告警显示。



(市电逆变工作模式)

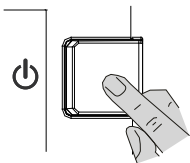
指示灯状态说明：■亮，□不亮。

⚠ 注意：如果市电异常UPS将工作在电池模式下。

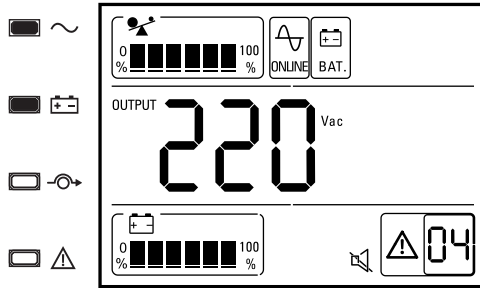
- 负载由UPS供电，“”图标显示UPS内置充电器正在给电池充电。

无市电直流开机（冷启动）

- 长按开机键1秒以上，UPS执行开机，开机时UPS会进行自检。



- 开机后电池指示灯亮，UPS所接负载电力由电池提供。

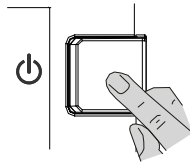


（电池工作模式）

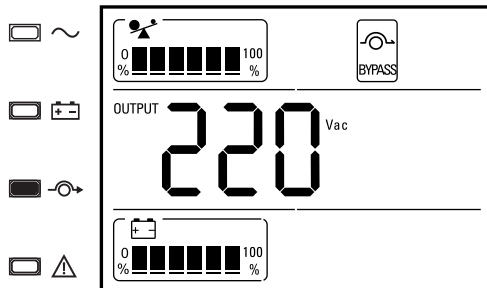
- 电池工作模式下，蜂鸣器4秒1叫，提示用户UPS工作在电池模式下，静音请按功能键2秒以上。
- 由于无市电输入，LCD屏右下角会交替出现04、08告警码。

4.2 关机

- 长按关机键1秒以上，UPS 执行关机。



- 关机后，UPS仍有旁路输出，指示灯及显示屏处于如下状态：



（旁路工作模式）



- UPS工作在旁路模式下，旁路指示灯亮，蜂鸣器2分钟叫1次，静音请按功能键2秒以上。
- 要使UPS无输出，请将市电断开，并断开旁路保护开关及电池开关。

5、电池维护与保养

- 本系列UPS 只需很少维护。标准机的电池为密封式、低维护型、只需经常保持充电以获得期望寿命。UPS 在同市电连接时，不管开机与否，始终向电池充电，并且提供过充、过放电保护功能。
- 如果长期不使用UPS，应每隔四到六个月对UPS 充电一次；在高温地区，电池每隔两个月充、放电一次，每次充电时间不得少于12 小时。
- 正常情况下，电池使用寿命为三到五年，如果发现状况不佳，则必须提早更换。更换电池时，必须由专业人员执行。
- 更换电池时，遵循数量一致，型号一致的原则。
- 电池不宜个别更换，整体更换时应遵守电池供应商的指示。
- 正常时（UPS 很少后备供电的前提下），电池每四到六个月充、放电一次，放电至关机后连续充电，且标准机充电时间不得少于12 小时。
- UPS长期在无人职守地点工作时，需定期检查电池是否处于正常状态，避免电池过放电损坏。

6、常见故障处理

如果 LCD 显示屏出现异常代码，故障指示灯亮，蜂鸣器鸣叫，说明 UPS 运行异常，请按下表排除解决问题。

故障现象	告警图标 	告警代码 	原因	解决方法
开机键按下后，UPS无法启动			按开机键时间过短	按开机键持续1s以上
		0A/0b	UPS没有接电池或电池电压过低	可靠连接电池线到UPS并闭合电池开关；若电池电压过低，需先用外置充电器给电池充电
UPS无输出	常亮	22	过载或负载异常导致UPS过载	检查负载是否超出UPS允许的负载量；检查负载是否存在异常导致过载
		23	UPS内部过热	1.查看UPS是否过载；2.通风口是否有堵塞；3.环境温度是否超过40摄氏度。如无以上情况，请切断负载断电关机10分钟后再尝试重新启动UPS，若问题依然存在，请联系供应商。
		10	输出短路	切断所有负载，观察故障是否依然存在，若故障依然存在，联系供应商，否则可能是负载存在短路现象，请检查负载
无法转入交流供电模式	闪烁	04	交流输入市电电压或频率异常	检查交流输入市电是否存在电压或频率异常
		06	相序错误	任意交换两相输入电源
		07	输入零地电压异常	检查地线是否正确连接
电池LED闪烁	闪烁	0b	电池电压低	检查UPS电池是否损坏，若已损坏，尽快更换电池；检查电池开关是否处于“ON”状态
电池放电时间短			电池未充满	保持充电器持续给电池充电足够的时间
			输出过载	检查负载水平并移除非关键性设备
			电池老化，容量下降	更换电池
旁路LED闪烁	闪烁	08	旁路异常	检查UPS后盖板上旁路breaker是否处于“ON”状态

Thank you for selecting a EATON product to protect your electrical equipment.

This manual contains important instructions that you should follow during installation and maintenance of the UPS and batteries. Please read all instructions before operating the equipment and save this manual for future reference.

Safety Instructions

Please read carefully the following user manual and the safety instructions before installing or operating the unit!

Operation Safety

1. Please read all instructions before operating the equipment and connecting to mains power, save this manual for future reference.
2. Please pay attention to all the warning indication, understand and follow all the instruction.
3. Do not install the UPS where it would be exposed to direct sunlight , Rain or damp environment.
4. Do not install the UPS near to heating equipment or heating source and heating environment.
5. Do not block ventilation openings on the UPS's housing. Ensure the air vents on the front, side and rear of the UPS are not blocked. Recommended at least 50cm of space on each side.
6. Use dry cloth for cleaning.
7. Use dry-chemical fire extinguisher when UPS present fire danger, do not use fluid-fire extinguisher, fluid- fire extinguisher will cause hazards shock.

Electricity Safety

Do not remove the enclosure. This system is to be serviced by qualified service person only. There are NO USER SERVICEABLE PARTS inside the UPS.

1. Assure UPS is reliably connected to earth properly verify connecting wire and battery polarity is correct before turn on UPS with mains power.
2. If UPS requests moving to another place or reconnecting power wire, it is imperative to disconnect all the power connections of UPS, and turn off UPS.

3. Please use the UPS accessories specified by EATON.
4. Shock Risk.

If equipment powered by UPS requires any type of maintenance, it is imperative to disconnect it from UPS before maintenance.

If input or output terminals need any maintenance or installation, it is imperative to disconnect all the power connections of UPS and turn UPS off.

BATTERY SAFETY

1. The service lifetime of UPS battery depends on ambient temperature, high ambient temperature will impact the service lifetime of UPS battery. Replacing the battery regularly can help to keep UPS running efficiently and provide backup time as expected.
2. Batteries must be maintained and replaced only by a qualified person.
3. Batteries have a high short-circuited current and pose a risk of shock. Take all precautionary measures specified below and any other measures necessary when working with batteries:
 - A. Remove all jewellery, wristwatches, rings and other metal objects.
 - B. Use only tools with insulated grips and handles.
 - C. Wear rubber gloves and boots.
 - D. Do not lay tools or metal parts on top of batteries.
 - E. Disconnect the charging source prior to connecting or disconnecting battery terminals.
4. Do not attempt to dispose of batteries by burning them. It could cause explosion.
5. Do not open or destroy batteries. Effluent electrolyte can cause injury to the skin and eyes. It may be toxic. If cause injury by Effluent electrolyte, use cool water for washing and go to hospital ask for help immediately.
6. Do not short the battery with metal objects, It could cause an electric shock, fire or explosion.

Maintenance

1. The operation environment and store environment will impact on the service lifetime and reliability of UPS.
Do not install or store the UPS in the places where are listed below.
 - A. Do not install UPS in place where the ambient temperature lower than 0°C or higher than 40°C.
 - B. Do not install/store UPS in place where the relative humidity lower than 20% or higher than 90%.
 - C. Do not install/store UPS in place where there is flammable or corrosive gas, place with large amounts of conductive dust, place exposed to shock or vibration, or outdoor.
2. If you would store the UPS for a long period, the storing area temperature should be the range of -25°C to 55°C , and before turning on UPS, it is highly suggested to put UPS in the ambient temperature above 0°C and last at least 2 hours.

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1. Introduction

The EATON DX On-Line-Series is an uninterruptible power supply incorporating double-converter technology. It provides perfect protection specifically for Computer equipment, communication systems and industry control systems.

The double-converter principle eliminates all mains power disturbances. A rectifier converts the alternating current from the socket outlet to direct current. This direct current charges the batteries and powers the inverter. On the basis of this DC voltage, the inverter generates a pure sinusoidal AC voltage, which permanently supplies the loads.

Computers and periphery are thus powered entirely by the mains voltage. In the event of power failure, the maintenance-free batteries power the inverter. In the event of inverter failure/Overload, UPS transfer to bypass mode, after the failure/overload remove, UPS transfer to inverter mode continue supplies the loads.

This manual covers the UPS listed as follows. Please confirm whether it is the model you intend to purchase by performing a visual inspection of the Model No. on the rear panel of the UPS.

DX 6K CN: Single phase input single phase output, Standard with battery.

DX 6K CNXL: Single phase input single phase output, can work with external EBM to get longer backup time.











DX 10K CN: Single phase input single phase output, Standard with battery.

DX 10K CNXL: Single phase input single phase output, can work with external EBM to get longer backup time.

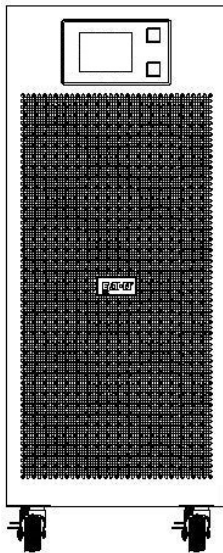
DX 10K CNXL 3:1: Three phase input single phase output, can work with external EBM to get longer backup time.

1.1 Symbol and Explanation

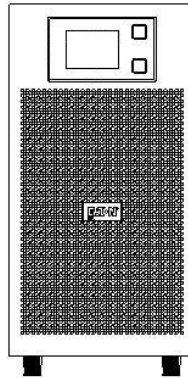
Some or all of the following symbols may be used in this manual. It is advisable to familiarize yourself with them and understand their meaning:

Symbol and Explanation			
Symbol	Explanation	Symbol	Explanation
	Alert you to pay special attention		Alternating current source (AC)
	Caution of high voltage		Direct current source (DC)
	Turn on the UPS		Protective ground
	Turn off the UPS		Recycle
	Idle or shut down the UPS		Do not dispose with ordinary trash

1.2 Front view

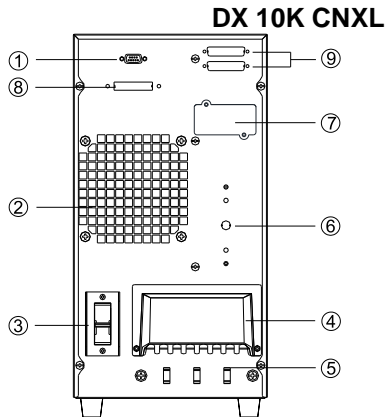
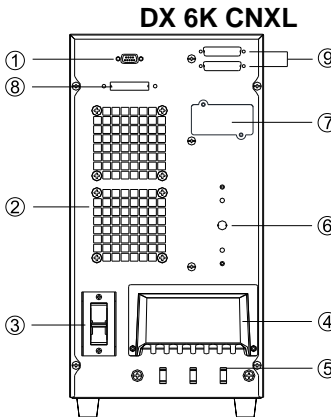
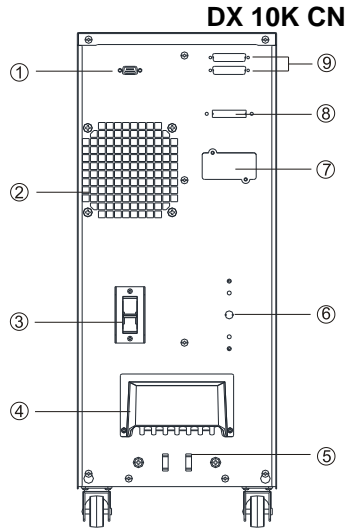
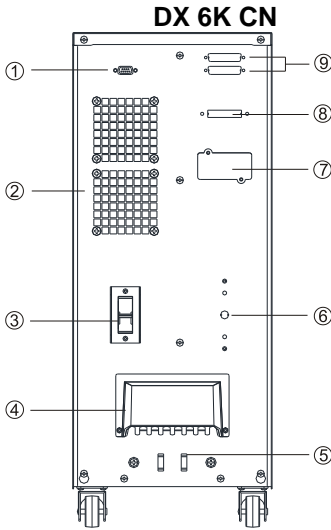


DX 6K/10K CN

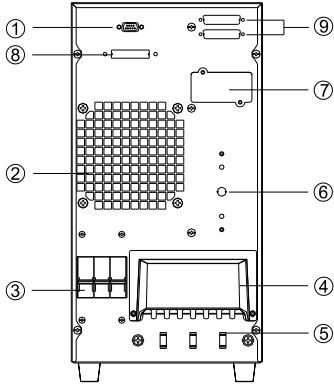


DX 6K/10K CNXL/10K CNXL3:1

1.3 Rear View



DX 10K CNXL 3:1





- ① RS232
- ② Fan
- ③ AC Input Breaker
- ④ Terminal Cover
- ⑤ Beam Frame
- ⑥ Maintenance Bypass Switch (Optional)
- ⑦ Intelligent Slot
- ⑧ EPO (Optional)
- ⑨ Parallel Card(Optional)

1.4 product specification

Model	DX 6K CN	DX 6K CNXL	DX 10K CN	DX 10K CNXL	DX 10K CNXL 3:1
Dimensions W*D*H(mm)	248 x 496 x616	212 x496 x420	248 x496 x616	212 x496 x420	212 x496 x420
Weight(kg)	58.9	14.2	62.1	15.9	16.9
Power					
Apparent Power (KVA) / Active power (KW)	6KVA/ 5.4KW	6KVA/ 5.4KW	10KVA/ 9KW	10KVA/ 9KW	10KVA/ 9KW
Mains					
Voltage range	120Vac-275Vac(phase to phase)				
Current*	32.1A max	36.1A max	52.6 A max	56.6 A max	56.6 A max
Frequency range	40Hz-70Hz				
Power factor	0.99				0.95
Output					
Rating Voltage	220Vac(±1%)				
Rating Current	27A		45A		
Frequency range	50Hz x (1 ± 1%); Follow main power in phase lock range				
Power factor	0.9				
Output Overload	105%-125%, load transfer to bypass mode after 10 min (0-30°C) or 1min(30°C-40); 125%-150%,load transfer to bypass mode after 30s; Over 150%, load transfer to bypass after 0.5s				
Load crest ratio	3:1(max)				
THD	<2%(100% Line load)				
Battery(under high temperature, battery life will decrease)					
Backup Time	4 min Full Load	Depend on external battery capacity	3 min Full Load	Depend on external battery capacity	
Charge Time	7 Hours to 90%	Depend on external battery capacity	7 Hours to 90%	Depend on external battery capacity	
EMC Standard	EN62040-2:2005/GB7260-2:2009				
Safety Standard	EN62040-1:2008+A1:2013				
YD Standard	YD/T1095-2008/CQC3108-2011				
Operation temperature	0-40°C				
Store temperature	-25°C to 55°C				
Relative humidity	20% to 90%				
Altitude	<1000m				


*The max current is under 176Vac input, full rating load and empty battery charging.

 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.


 note: It is recommended that the UPS output line is not more than 10m, the external communication line, and the machine line and the temperature detection line is not more than 3m, otherwise it may need to take installation restrictions or additional measures to suppress interference.


Altitude load=Rating load*Altitude correction factor.

Altitude (m)	1000	1500	2000
Altitude correction factor	100%	95%	91%

 note: if UPS used over 1000m altitude, the rating must be derating according to above table.

2. Installation

 Danger: For safety consideration, please make sure cut off all the mains power.

 Note:

1. Installation and power cable connection must be conducted by qualified person according to local regulations.
2. We recommend UPSs installed as floor standing equipment.
3. After installation, ensure the air vents on the front, side and rear of the UPS are not blocked. Recommended at least 50cm of space on each side.
4. If it is necessary to connect the inductance load such as a monitor or a laser printer to the UPS, the start-up power should be used for calculating the capacity of the UPS, as its start-up power consumption is too big when it is started.

2.1 Inspection the pack and equipment.

1. Open UPS pack, inspection whether UPSs have been damaged during shipment.
2. If find any equipment damaged, please contact your local EATON representative.

Accessory: 1 pcs of user manual.



Recycle

The UPS package is recycling, please save it for further use.

2.2 Power cable.


 Note:

The diameter and cross-sectional area depends of power cable depend on the UPS rating power, the minim diameter and cross-sectional area of power cable see below power cable table.

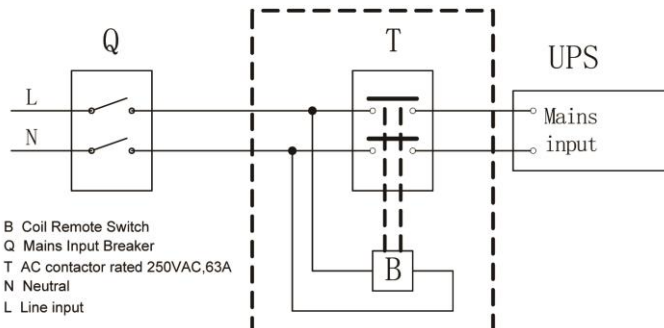
For 3 phase input UPS, “L” means L1/L3/L3 and they are the same cable width.

Model		DX 6K CN	DX 6K CNXL	DX 10K CN	DX 10K CNXL	DX 10K CNXL 3:1
Input	G	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
	N	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
	L	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
Battery	+	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
	-	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
	G	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
Output	L	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
	N	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²
	G	6mm ²	6mm ²	10mm ²	10mm ²	10mm ²

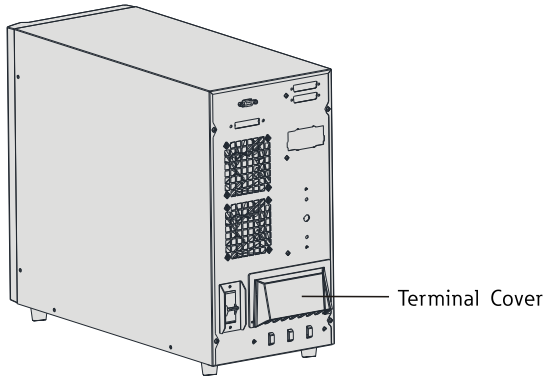
2.3 UPS Power Connection

 **DANGER:** In order to avoid the Mains power switch current overload when UPS carries with rating load, the Mains power switch rating current must be more than the bypass switch rating current. (bypass mode max current refer to 1.4 product specification)


It is suggested to install an external isolating device against current backfeed between Mains input and UPS (see Fig.). After the device is installed, it must add a warning label with the following wording or the equivalent on the external AC contactor : RISK OF VOLTAGE BACKFEED. Isolate the UPS before operating on this circuit, then check for hazardous voltage between all terminals.

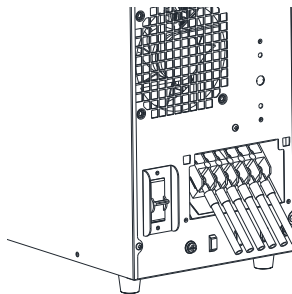


1. Select power cable referring to power cable table.
2. Open UPS terminal cover.

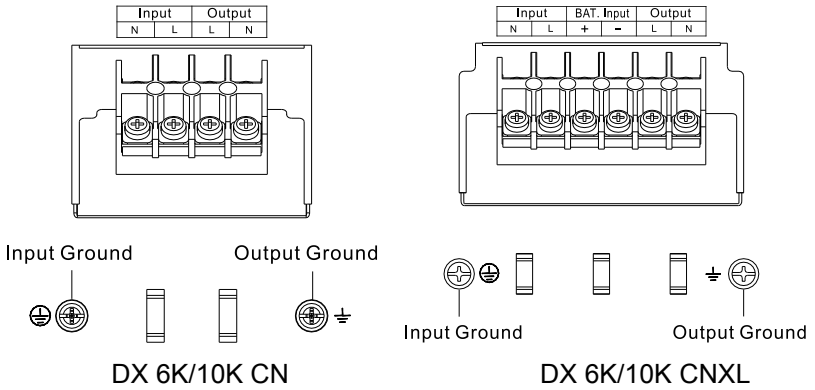


3. Connect the protective earthing conductors to the rear panel left earthing terminal.
4. Connect the protective bonding conductors to the rear panel right earthing terminal.
5. Connect the output cable to the output terminal.
6. Connect the input cable to the input terminal, if EBM is required, connect EBM cable to the EBM terminal.

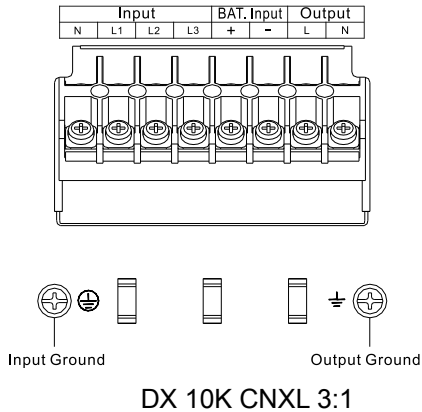
 **DANGER:** In order to reduce the risk of fire and hazards shock, make sure all the connections are reliable and stightly !



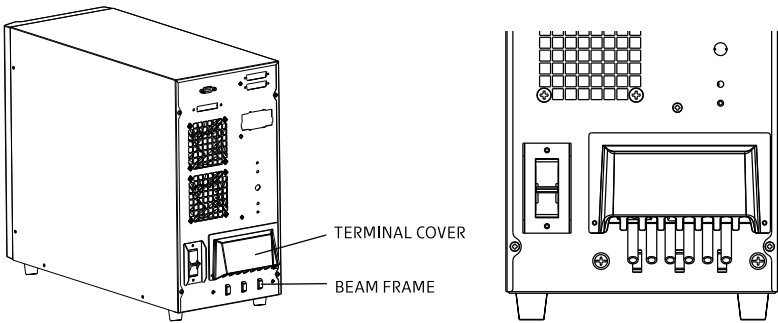
Single Phase Terminals:



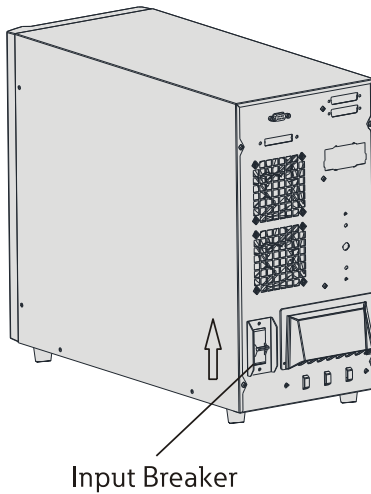
Three Phase Terminals:



7. Make the straps through across the Beam frame.
8. Adjust the straps to proper position; Fix the input cable, output cable, EBM cable tightly.
9. Re-screw the terminal cover.



10. Connect the main power, set input protect breaker to “ON” to power UPS



2.4 EBM Connecting and Installation


The nominal DC voltage of battery pack is 192Vdc with 16 pieces of 12V maintenance free batteries in series. EBM consists multi-battery packs.

In order to avoid hazards shock, make sure Battery/battery string connecting in compliance with below procedure.

1. Connect proper battery string, recommend use fuse for protection in battery string.

2. Select proper power cable(refer 2.2 power cable table) connect EBM and UPS. Make sure install a DC breaker(eg.EATON LZMN1-A160) between UPS and EBM connection. The minimum rating voltage and rating current of DC breaker not less than below table.

UPS Type	DX 6K CNXL	DX 10K CNXL	DX 10K CNXL 3:1
Battery voltage	192Vdc	192Vdc	192Vdc
Battery current	36.5A. Max	60.5A. Max	60.5A. Max

 **DANGER:** In order to avoid hazards shock, do not connect EBM to UPS Before finish EBM connecting.

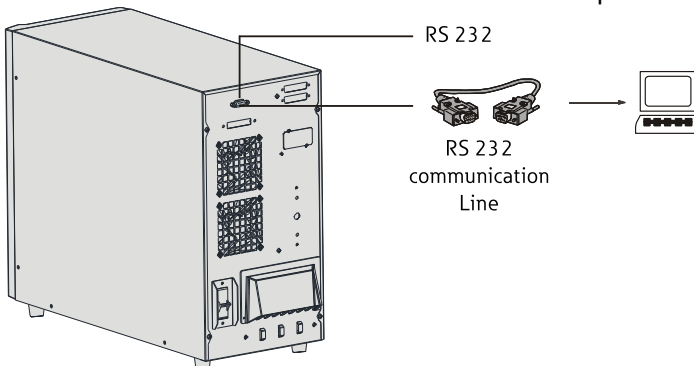
3. Connect EBM to UPS, after finish connecting between EBM and UPS, UPS output does not carry with any load, then turn on EBM switch to On position, and turn on mains power switch, UPS begins to charge EBM at the time.

 **Note:** Verify the battery connect to UPS with the correct polarity.

2.5 UPS Connect To Computer Port

RS232 interface is for the monitoring software and firmware update. UPS connect to monitor device with RS232 cable.

1. One end of RS232 cable connects to computer RS232 port.
2. One end of RS232 cable connects to UPS RS232 port.



2.6 UPS Parallel Card (Optional)

1. Brief introduction of the redundancy

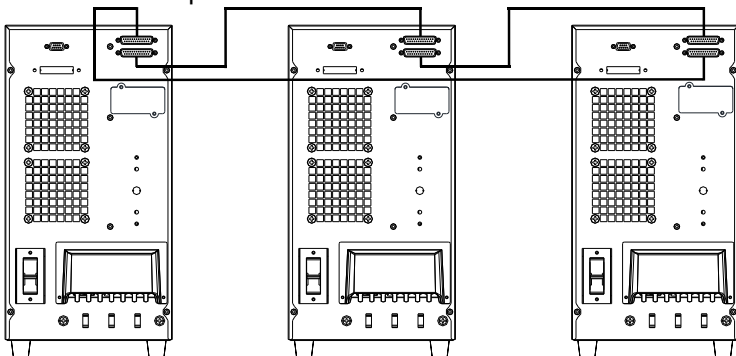
$N+X$ is currently the most reliable power supply structure. N represents the minimum UPS number that the total load needs, X represents the redundant UPS number, i.e. the fault UPS number that the system can handle simultaneously.

When the X is larger, the reliability of the power system is higher. For occasions where reliability is highly depended on, $N+X$ is the optimal mode. As long as the UPS is equipped with parallel cables, up to 3 UPSs can be connected in parallel to realize output power sharing and power redundancy.

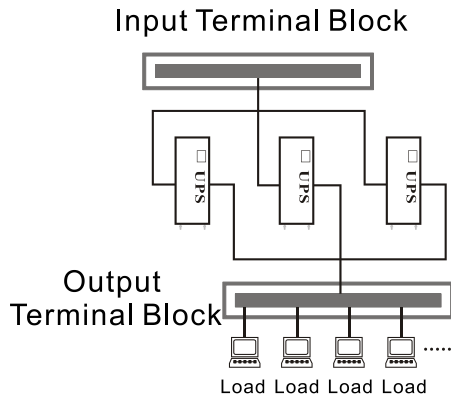
2. Parallel installation and operation

Parallel UPS is an optional function for user, before installing a new parallel UPS, user need to prepare parallel accessories and ask service person to help for installation. The quantity of parallel UPS is up to 3 max. Each parallel UPS need an independent battery pack

- 1) Service person installs the parallel card on UPS, connect each UPS one by one with the parallel cable, the parallel card is the communication port between UPSs.



- 2) Connect the output wire of the parallel UPSs to an output terminal block, load connect to the output terminal block via load wire.



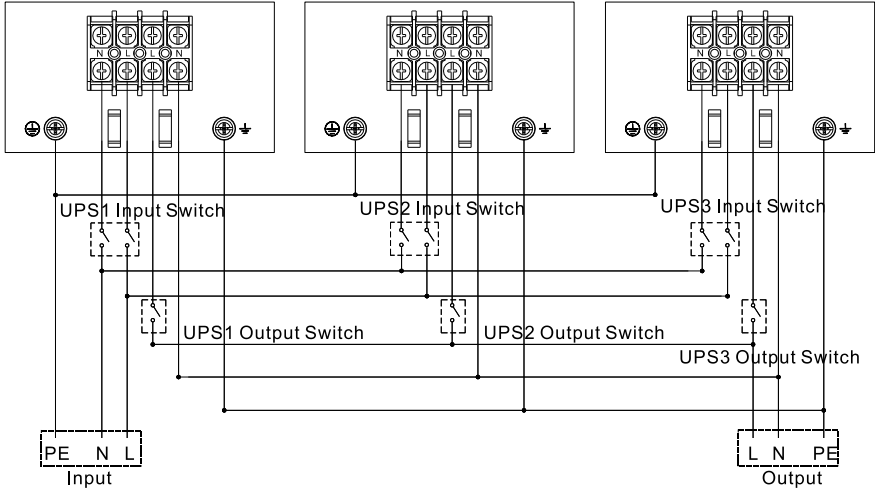
 Note:

Output wire requirement:

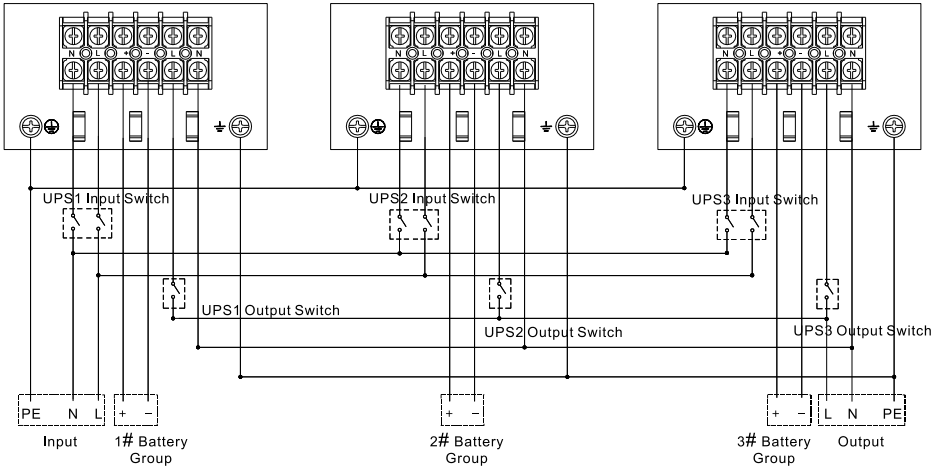
The distance between the UPSs in parallel is less than 20 meters. The difference between the wires of input and output of the UPSs is required to be less than 20%. The distance between the UPSs in parallel is more than 20 meters. The difference between the wires of input and output of the UPSs is required to be less than 10%.

3) The parallel UPS input terminal panel and output terminal panel see below, the wires of each parallel UPS must follow the wire requirement for single UPS.

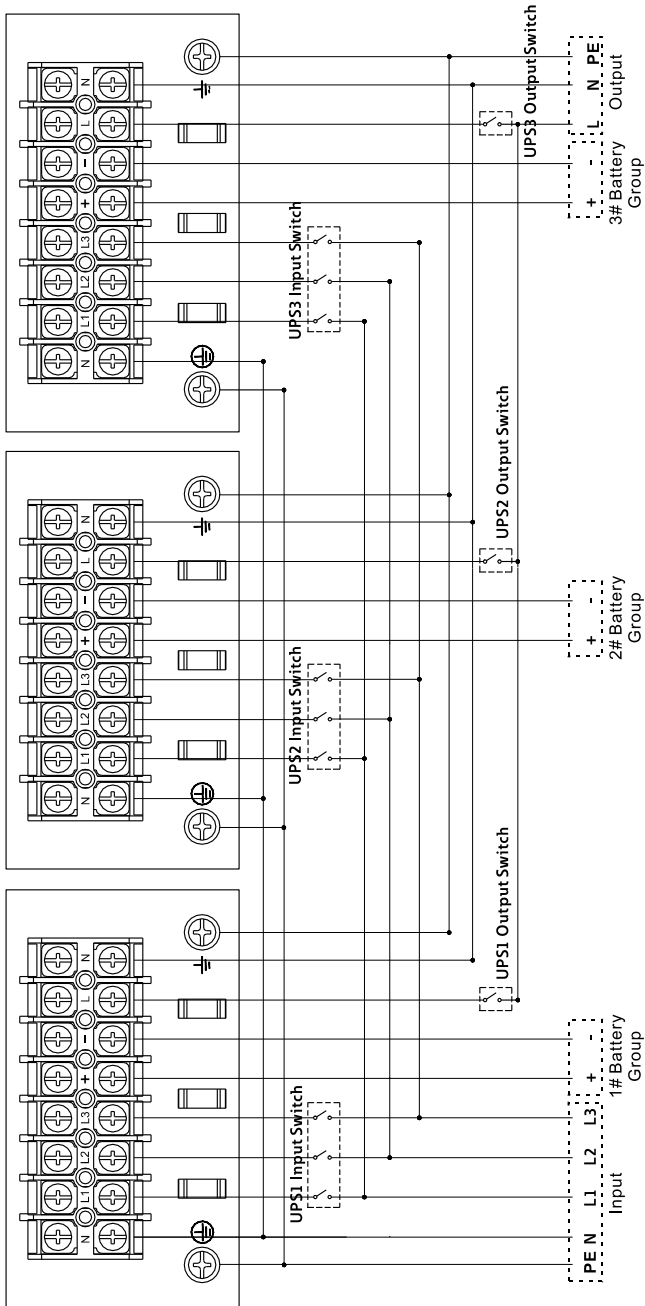
4) Each parallel UPS need an independent battery pack.



DX 6K/10K CN



DX 6K/10K CNXL




DX 10K CNXL 3:1



3. Parallel UPS Advantage

This method increase UPS reliability with redundancy structure, 2 paralleled UPS share the load. When one UPS failure, the other support the load. That the 1/2 redundancy.

4. Operation Introduction

- 1) Normal operation need to follow operation guide for single UPS.
- 2) Turn on parallel UPS:

Turn on UPS with power normal: After main power connection done, long press  button for one UPS and all the paralleled UPS will go to Online mode

Turn on UPS without main power: Short press each UPS  button to make each UPS power on, then long press one UPS  button and all the paralleled UPS will go to Battery mode

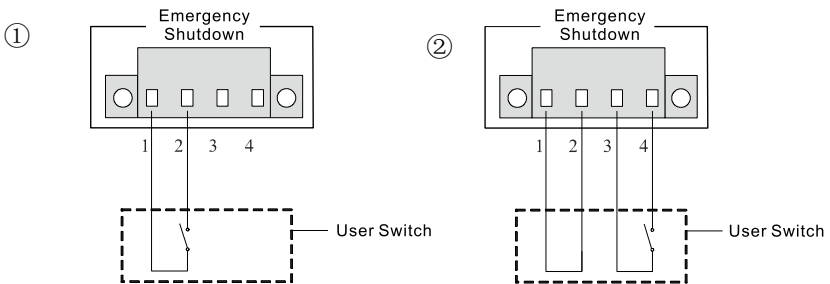
 Note:

Long press means press for more than 1 second;

Short press means press for less than 1 second;

2.7 EPO(Optional)

EPO(Emergent Power Off), it is a green connector lays on the UPS rear panel, we can shutdown UPS via remove EPO connector in the event of emergency. The EPO wire connect diagram see below.



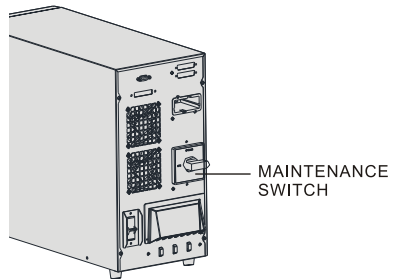
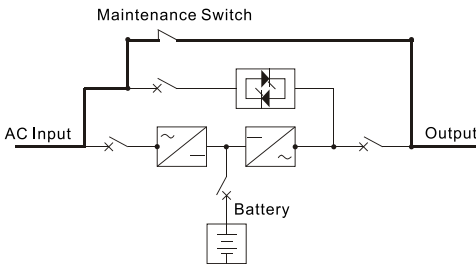
Pin 1 closed to pin 2, UPS shutdown immediately.
Pin 3 and pin 4 float.

Pin 1 and Pin2 always connect.
When pin3 and pin4 disconnect, UPS shutdown immediately.

*More detail and further information for EPO, please refer to the EPO manual

2.8 Maintenance switch(Optional)

After verify no hazards, service person can begin to maintain UPS without interrupting power supply to your equipment. No matter UPS work in online mode, battery mode or bypass mode, UPS internal electrical part is present hazards high voltage. Maintenance switch can help service person to maintain UPS in online mode, make sure UPS continue to provide power to your equipment in bypass mode and the safety of service person during maintenance.

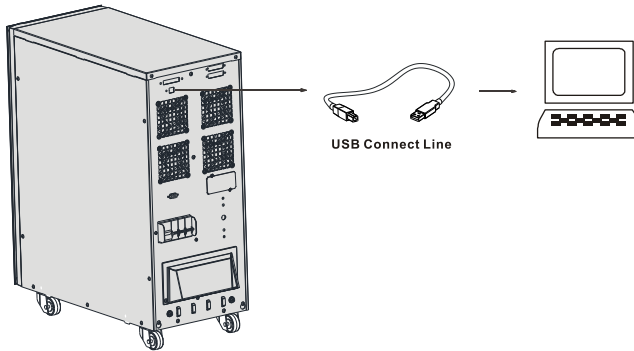


*The more detail and further information for maintenance switch installation can refer to the maintenance switch manual.

2.9 USB Port(Optional)

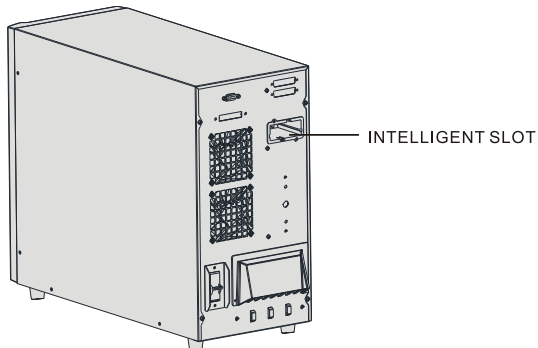
USB Port function is optional, user by it from the UPS dealer, and ask Service person to provide installation. Before installation, it is imperative to cut off all the UPS power input, bypass input battery and turn off output switch. After connect UPS and computer by USB cable,you can use computer monitor UPS status by remote control.

* you can install the USB driver by CD or download it from EATON web site for free.



2.10 Connectivity Cards(Optional)

Connectivity cards is an optional accessory for UPS, Connectivity cards allow the UPS communicate in a variety networking environment and with different types of devices. User can select AS400 card, NMC card, CMC card, USB port +RS232, the service person will provide installation. Before installation, UPS must be turned off.



AS400 card: It owns isolated dry contact relay outputs for UPS status: such as Mains/Utility failure, Battery low, UPS alarm/OK, or on Bypass and so on. More detail about the interface definitions please read the AS400 user manual.

NMC card: NMC (Network Management Card) allows the UPS to communicate in a variety of networking environments and with different types of devices. NMC achieves a remote management for the UPS

through internet/intranet. Please contact your local dealer for further information. More detail please read the NMC user manual .

CMC card: It provides connection to Modbus protocol with standard RS485 signal. More detail please check the CMC user manual.

USB+RS232 card: To establish communication between the UPS and a computer by use an appropriate communication cable to monitor UPS.

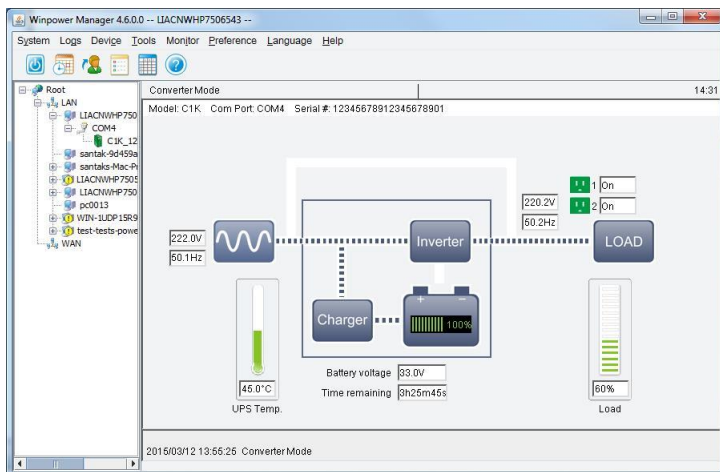
 **Note:**

The UPS dealer offer monitor, installation and further information please refer the card user manual.If require WinPower sofare and AS400, NMC, CMC, USB+RS232.Any detail and further information, please contact STANK service center.

2.11 Software

Free Software Download – WinPower

WinPower is brand new UPS monitoring software, which provides user-friendly interface to monitor and control your UPS. This unique software provides safely auto shutdown for multi-computer systems while power failure. With this software, users can monitor and control any UPS on the same LAN no matter how far from the UPSs.



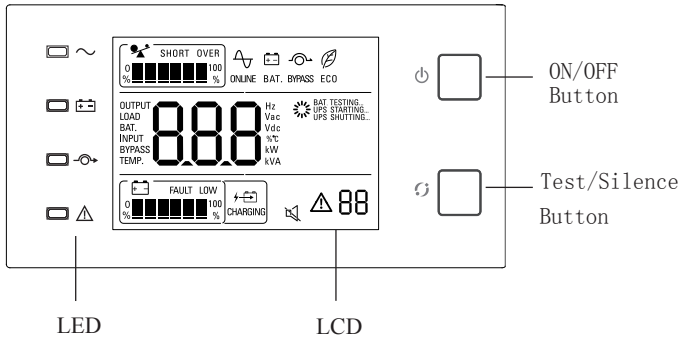
Installation procedure:

1. Go to the website:
<http://powerquality.eaton.com.cn>
2. Choose the operation system you need and follow the instruction described on the website to download the software.

When your computer restarts, the WinPower software will appear as a green plug icon located in the system tray, near the clock.

3. Control & Display Panel

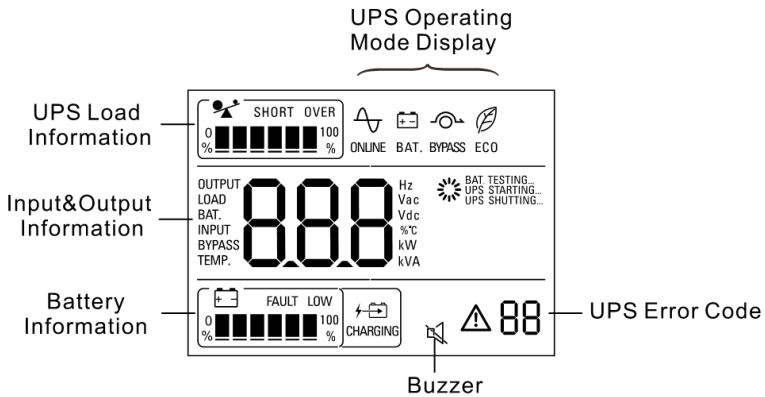
Control & Display panel is in the front of UPS, the panel includes 2 buttons, 4 LED indicators and 1 LCD screen.



- 1) On/Off button : Turn on/off UPS.
- 2) Function button
 - Mute (Press the button continuously for 2 to 10 seconds when buzzer beep for bypass-mode or battery-mode, buzzer will be muted; Press the button continuously more than 10 seconds when buzzer beep for alarm, buzzer will be muted; repetition Repeated operation will cancel previous operation);
 - Battery self-test (Press the button continuously for 2 to 10 seconds when UPS in Online mode);
 - Quick press the button to switch display meters.
- 3) LED Indicator: There are 4 LED: Normal indicator, battery indicator, bypass indicator and fault indicator.

Indicator	Behavior	Description
Online	Light	UPS operates normally, power module supply power for load.
	Off	Load powered by bypass (Not ECO-mode), or UPS no output.
Battery	Light	Battery supply power for load, Online LED also lighted.
	Blink per second	Charger or battery being abnormally.
Bypass	Light	UPS works in ECO-mode (Online LED also lighted), or load powered by bypass.
	Blink per second	Bypass being abnormally.
Fault	Light	UPS in fault-mode, UPS will keep powering for load when no EPO signal or short-circuit fault.

4) LCD Panel

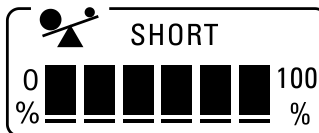


(1) Load information.

- Load display as percentages. Following table shows the load display specification.

Grid Quantity (from left to right)	Actual Load
Level 1	0% - 15%
Level 2	16% - 35%
Level 3	36% - 55%
Level 4	56% - 75%
Level 5	76% - 95%
Level 6	≥96%

- SHORT icon will be displayed as bellow when UPS output is short-circuited:



- OVER icon will be displayed in load information board when UPS works in over-load state:



(2) UPS meters

The following information will be display in LCD panel: Input voltage, input frequency, output voltage, output frequency, battery voltage, and load meters. Quick press the button to switch display categories, items within the same category will be switched automatically.

Category	Items		
Output	Voltage	Frequency	-
Load	Active power(W)	Apparent power(VA)	Percent
Battery	Voltage	Capacity	Cells number
Input	Voltage	3-Phase Frequency	--
Bypass	Voltage	Frequency	--

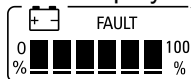
(3) Battery information: display battery capacity level in present(%).

Grid Quantity (from left to right)	Capacity level
1	0%-15%
2	16%-35%
3	36%-55%
4	56%-75%
5	76%-95%
6	≥96%

●When battery voltage is low, LOW icon will display as below:





●When battery fault, FAULT icon will display as below:



If charger is normal working, CHARGING icon will light up.



(4) Buzzer:

when buzzer beeps and  icon display, it indicates UPS abnormal or fault alarm. Press  can end buzzer beeping(silence mode).

(5) Fault/Alarm display:

UPS abnormal, fault or alarm indication information need to deal with, below icon light up.







Lightened circularly: alarm information.



Lightened constantly: critical fault.

(6) UPS working mode display:

Icon	Information description
	UPS is working in online mode.
	UPS is charging battery.
	UPS is working in bypass mode.
	UPS is working in ECO mode.

4. Operation

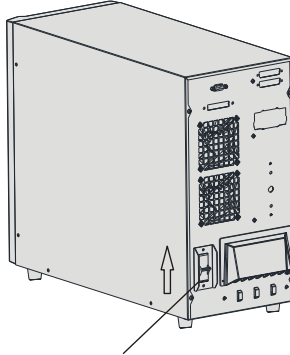
4.1 Turn on UPS

 Note:

Battery is fully charged after manufacture, but energy may be loss after transportation and storage. Suggest charge the battery for 12 hours or more before using, to ensure enough backup time.

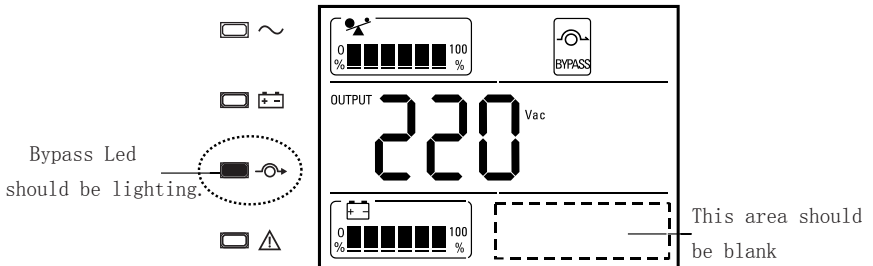
Prepare to turn on

- 1) Connect main power and close battery switch, then turn bypass protect switch to “ON” side. If the battery cell numbers displayed in the LCD is different from actual, please call the EATON service hotline or contract the distributor.



Input Breaker

- 2) Turn input protect switch to “ON” side, check the information displayed in the LCD. If any alarm or fault information display in marked area, please call the EATON service hotline or contract the distributor.



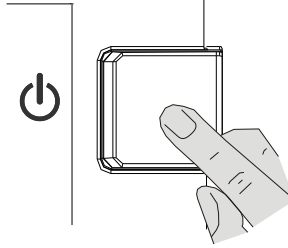


Note: Please turn off all the switch before maintenance.

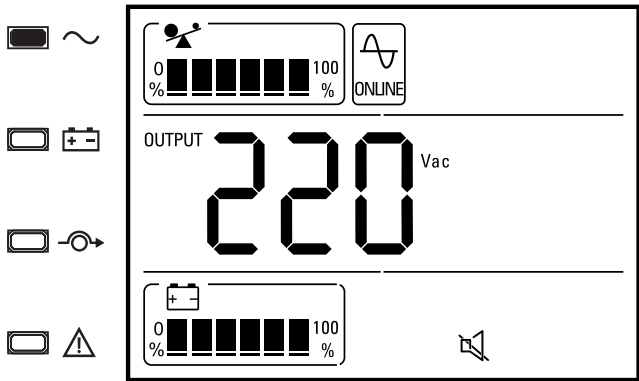
UPS turn on operation: turn on by main power and turn on by DC (without main power).

Turning On UPS With Mains

- Press On/Off button continuously longer than 1 second, UPS will turn on. System self-test will be carried out when UPS turn on.



- UPS turn to Online mode after self-test. Indicator and LCD display as following: Online LED lighted, no fault displayed.



(Online mode)

Indicator description:

Indicator light: indicator off:

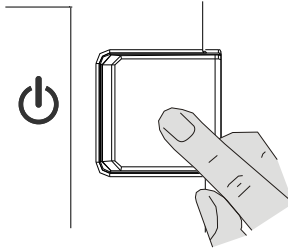


Note: UPS will turn to battery mode when main power abnormal.

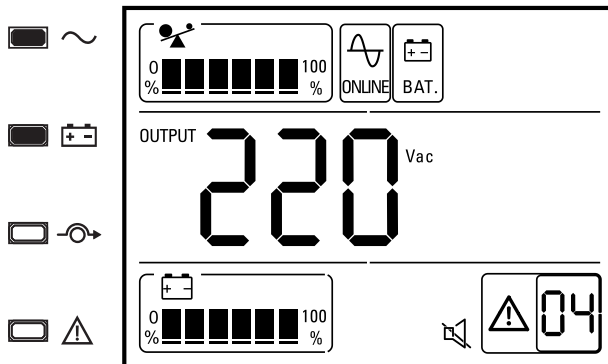
- UPS supply power for load, “charging” icon indicated that inner charger is charging the battery.

Turning On Without Mains (cold start)

- Press On/Off button continuously longer than 1 second, UPS will turn on. System self-test will be carried out when UPS turn on.



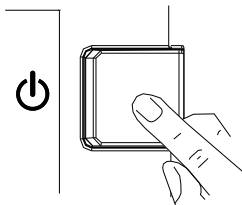
- UPS turn to battery-mode after self-test. Both Online LED and battery LED lighted. Load powered by battery.



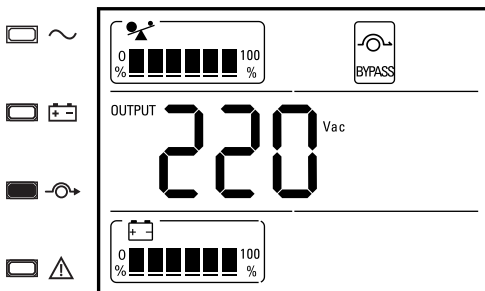
- Buzzer beep once every 4 seconds to indicate user than UPS is working on battery-mode. Buzzer can be muted when function button pressed more than 2 seconds.
- 04 and 08 warning code will alternate displayed on the bottom right corner of LCD, because of lack of main power.

4.2 Turn off

- Press On/Off button continuously longer than 1 second, UPS will be turned off.



- UPS supply power by bypass after turn off. Indicator and LCD display as following: Online LED lighted, no fault displayed:





- Bypass LED light and buzzer beep once every 2 seconds to indicate that UPS work on bypass-mode. Buzzer can be mute when function button pressed longer than 2 seconds
- UPS without output when main power input switch, bypass protect switch and battery switch is open.

5. Maintenance

- This series UPS only requires minimal maintenance. The battery used for standard models are value regulated sealed lead-acid maintenance free battery. These models require minimal repairs. The only requirement is to charge the UPS regularly in order to maximize the expected life of the battery. When being connected to the mains power, whether the UPS is turned on or not, the UPS keeps charging the batteries and also offers the protective function of overcharging and over-discharging.
- The UPS should be charged once every 4 to 6 months if it has not been used for a long time.
- If the battery is found not in good condition, replacement should be made. Battery replacement should be performed by qualified person
- Replace batteries with the same quantity and same type of batteries.
- Do not replace the battery individually. All the batteries should be replaced at the same time following the instructions of the battery supplier.
- Normally, the batteries should be charged and discharged once every 4 to 6 months. Charging should begin after the UPS shuts down automatically in the course of discharging, the standard charging time for the standard UPS should be at least 12 hours.
- In the regions of hot climates, the battery should be charged and discharged every 2 months. The standard charging time should be at least 12 hours.
- If UPS is intend to be used in a no-people environment for a long time, need to inspect whether battery is normal in circularly to avoid battery damage caused by over-discharge.

6. Trouble shooting

If the UPS system does not operate correctly, check the operating status on the LCD display. And please attempt to solve the problem using the table below.

Event Name	Warning Icon 	Fault Code 	Possible cause	Remedy
UPS fail to start	--	--	Press ON/OFF button Less 0.5s.	Press ON/OFF button more than 1s.
		0A/0b	UPS do not connect to battery or battery low voltage.	Connect UPS to battery and turn on battery switch. If battery low voltage, charge battery via external charger.
UPS No output	Light constantly	22	Overload	Check the loads and remove some non-critical loads. Check whether some loads are failed.
		23	Overheating	1)Check if the air intake and air outtake is blocked; 2) The ambient temperature is too high
		10	Output short	Remove all the loads. Turn off the UPS. Check whether the output of UPS and loads is short circuit. Make sure the short circuit is removed, and the UPS has no internal faults before turning on again.

Fail to transfer to online mode	Light circularly	31	Phase and neutral conductor at input of UPS system are reversed	Rotate mains power socket by 180° or connect UPS system.
		04/06/07	Input voltage/frequency/earth connection abnormal	Check whether input voltage/frequency is abnormal, or earth connect correctly.
Battery LED indicator light circularly	--	0b	Battery voltage is low	When audible alarm sounding every second, battery is almost empty.
Emergency supply period shorter than nominal value			Batteries not fully charged	Charge the batteries until the Batteries are fully charged
			Output overload	Check the loads and remove some non-critical loads. Check whether some loads are failed.
			Battery defect	Change the batteries or consult your dealer.
Bypass LED indicator light circularly	Light circularly	08	Bypass abnormal	Check whether bypass switch is turn to ON position.

