Data Center Planning

System x UPS Technical Reference
v2.0.7

TOWER UPS

The compact System x tower UPS delivers continuous, conditioned power to protect your System x or ThinkServer equipment. They provide power protection with increased efficiency and simplified power management. These UPSs are stand-alone tower models.

RACK or TOWER UPS

The compact System x tower UPS delivers continuous, conditioned power to protect your System x or ThinkServer equipment. They provide smart energy management and the highest level of power protection. These UPSs can be stand-alone towers or they can be rack-mounted.

UPS EXTENDED BATTERY MODULE

For applications requiring extended backup times, an external battery module can also be added to the certain models to deliver hours of run time to critical systems during a prolonged power outage.

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2.0.0 – November 11, 2014	Second major release, redesign of document, addition of all new UPSs.
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Table of Contents

Introduction

The Uninterruptible Power Supply (UPS) systems covered in this guide are those that are currently marketed worldwide. The intent of this guide is to provide information needed when planning for UPS installations.

How to Use This Guide

In order to size a UPS properly, the total power requirements of the hardware that will be connected to the UPS needs to be known.

To determine the hardware's overall power requirements, use the System x Power Configurator tool. The System x Power Configurator tool along with the user guide can be downloaded from:
http://www.ibm.com/support/entry/portal/docdisplay?lndocid=LNVO-PWRCONF

Once the total power has been determined, the UPS size can be selected to suit the power capacity of the hardware. Once a suitable size has been determined, the solutions wiring needs to be figured out. This is because (just like PDUs), UPSs have outlet and group limitations. The connecting hardware needs to be wired so as to not exceed the outlet or group rating of the UPS.

Note: The IT appliances and UPS systems need to be wired according to system nameplate rating for compliance with local electrical codes and product support documentation.

In cases where a UPS fits the electrical load of a solution, but the UPS does not have sufficient C13 outlets, DPI Universal Rack PDUs can be used to offer additional C13 outlets.

When wiring the solution using PDUs, the same restrictions apply in that the outlet and group limitations of the UPS and PDUs are not exceeded. Refer to the PDU guides for additional information on PDUs. The PDU guides can be downloaded from:
http://shop.lenovo.com/us/en/systems/server-library/#comboFilters[category]=.Tools

Acronyms

UPS = Uninterruptible Power Supply
EMP = Environmental Monitoring Probe
EBM = Expansion Battery Module
EPOW = Emergency Power Off Warning
MBP = Maintenance Bypass Module
NMC = Network Management Card

Lenovo UPS Portfolio Summary

The following table is a summary of all withdrawn and replacement System x UPSs currently available. The UPSs are available in 2 form factors; tower (T) and rack (R).

Withdrawn Models versus New Models

MTM	Withdrawn Models* (R or T = Rack or Tower)	New MTM	New Models
53961JX	1000VA LCD Tower UPS (100V)	55951AX	Lenovo T1kVA Tower UPS (100-125VAC)
53961KX	1000VA LCD Tower UPS (230V)	55951KX	Lenovo T1kVA Tower UPS (200-240VAC)
53962AX	1500VA LCD Tower UPS (120V)	55952AX	Lenovo T1.5kVA Tower UPS (100-125VAC)
53962JX	1500VA LCD Tower UPS (100V)		
53962KX	1500VA LCD Tower UPS (230V)	55952KX	Lenovo T1.5kVA Tower UPS (200-240VAC)
53951AX	1500VA LCD 2U Rack UPS	55941AX	Lenovo 1.5kVA 2U R or T UPS (100-125VAC)
53951KX	1500VA LCD 2U Rack UPS (230V)	55941KX	Lenovo 1.5kVA 2U R or T UPS (200 240VAC)
53952AX	2200VA LCD 2U Rack UPS (100V/120V)	55942AX	Lenovo 2.2kVA 2U R or T UPS (100-125VAC)
53952KX	2200VA LCD 2U Rack UPS (230V)	55942KX	Lenovo 2.2kVA 2U R or T UPS (200-240VAC)
46M4108	2200VA UPS 2U EBM	55942BX	Lenovo 1.5kVA/2.2kVA 2U R or T EBM
53953AX	3000VA LCD 3U Rack UPS (100V/120V)	55943AX	Lenovo 3kVA 2U R or T UPS (100-125VAC)
53953JX	3000VA LCD 3U Rack UPS (200V/208V)	55943KX	Lenovo 3kVA 2U R or T UPS (200-240VAC)
53953KX	3000VA LCD 3U Rack UPS (230V)		
69Y1982	3000VA UPS 3U EBM	55943BX	Lenovo 3kVA 2U Rack or Tower EBM
24195KX	UPS5000 HV*	55945KX	Lenovo 5kVA 3UR or T UPS (200-240VAC)
53956AX	6000VA LCD 4U Rack UPS (200V/208V)	55946KX	Lenovo 6kVA 3U R or T UPS (200-240VAC)
53956KX	6000VA LCD 4U Rack UPS (230V)		
69Y1984	6000VA UPS 3U EBM	55946BX	Lenovo 5kVA/6kVA 3U R or T EBM
-	-	55948KX	Lenovo RT8kVA 6U R or T UPS (200-240VAC)
53959KX	11000VA LCD 5U Rack UPS	55949KX	Lenovo 11kVA 6U R or T UPS (200-240VAC)
69Y1986	11000VA UPS 3U EBM	55949BX	Lenovo 8kVA/11kVA 3U R or T EBM
-	-	55948PX	Lenovo 8kVA 6U 3:1 Phase R or T UPS (380-415VAC)
21304RX	UPS 10000XHV *already withdrawn	55949PX	Lenovo RT11kVA 6U 3:1 Phase R or T UPS (380-415VAC)

* These models were withdrawn on 2/28/2015.

EBM = Extended Battery Module.

UPS Quick look-up table

The following table lists all available UPSs, their input, and output line cords and if the UPS is shipped standard with a Network Management Card (NMC).

MTM	Description	Input line cord	NMC Std	Output line cord	Page Link
Tower Models					
55951AX	1kVA Tower UPS (110V)	5-15P	No	(8) 5-15R	17
55951KX	1kVA Tower UPS (230V)	Selectable	No	(8) C13	17
55952AX	1.5kVA Tower UPS (110V)	5-15P	No	(8) 5-15R	24
55952KX	1.5kVA Tower UPS (230V)	Selectable	No	(8) C13	24
Rack Mount or Tower Models					
55941AX	1.5kVA R/T UPS (100V/120V)	5-15P	No	(8) 5-15R	31
55941KX	1.5kVA R/T UPS (200V-230V)	Selectable	No	(8) C13	31
55942AX	2.2kVA R/T UPS (100V/120V)	5-20P	No	(8) 5-20R	39
55942KX	2.2kVA R/T UPS (200V -230V)	Selectable	No	(8) C13, (1) C19	39
55942BX	1.5kVA/2.2kVA EBM	N/A	N/A	N/A	95
55943AX	3kVA R/T UPS (100V/120V)	L5-30P	Yes	(6) 5-20R, (1) L5-30R	47
55943KX	3kVA R/T UPS (200V-230V)	Selectable	Yes	(8) C13, (1) C19	47
55943BX	3kVA EBM	N/A	N/A	N/A	95
55945KX	5kVA R/T UPS (200V-230V)	Selectable	Yes	(8) C13, (2) C19	56
55946KX	6kVA R/T UPS (200V-230V)	Hardwired	Yes	(8) C13, (2) C19	64
55946BX	5kVA/6kVA EBM	N/A	N/A	N/A	95
55948KX	8kVA R/T UPS (200V-230V)	Hardwired	Yes	(4) C19	71
55948PX	8kVA 3 ph MBP (200V-230V)	Hardwired	Yes	(4) C19	71
55949KX	11kVA R/T UPS (200V-230V)	Hardwired	Yes	(4) C19	79
55949PX	11kVA 3 ph MBP (200V-230V)	Hardwired	Yes	(4) C19	79
55949BX	8kVA/11KVA EBM	N/A	N/A	N/A	95

For a list of selectable line cords, refer to the Universal Rack PDU/UPS line cords section.

UPS – Tower Summary

The tower UPSs stand up right. If installation in a rack is required, a rack shelf can be ordered.

UPS 1000VA Tower						
Part Number	VA/Watts Rating	Nominal Voltage	Input Connection	Input Freq	Output Connection	Page Link
55951AX	1000VA/770W	100*/120/ 125V	5-15P	60Hz (50Hz)	(8) 5-15R	17
55951KX	1150VA/770W	200**/208**/ 220/230/240V	Selectable	50Hz (60Hz)	(8) C-13	17

* The 1000VA UPS will incur 17% derating at 100V.
** The 1150VA UPS will incur 10% derating at 200V, and 208V.

UPS 1500VA Tower						
Part Number	VA/Watts Rating	Nominal Voltage	Input Connection	Input Freq	Output Connection	Page Link
55952AX	1440VA/ 1100W	100*/120/ 125V	5-15P	60Hz (50Hz)	(8) 5-15R	24
55952KX	1550VA/ 1100W	200**/208**/ 220/230/240V	Selectable	50Hz (60Hz)	(8) C-13	24

* The 1550VA UPS will incur 25% derating at 100V.
** The 1550VA UPS will incur 10% derating at 200V, and 208V.

UPS – Rack Summary

The rack UPSs ship with hardware to mount in a rack. They also ship with hardware to stand upright as a tower. Refer to the Rack and Tower Kit section for additional details.

UPS 1500VA Rack							
Part Number	VA/Watts Rating	Nominal Voltage	Input Connection	Input Freq	Output Connection	Form Factor	Page Link
55941AX	1440VA/ 1440W	100*/120/ 125V	5-15P	60Hz (50Hz)	(8) 5-15R	2U	31
55941KX	1500VA/ 1350W	200/208/ 220/230/ 240V	C14	50Hz (60Hz)	(8) C13	2U	31

* The 1500VA UPS will incur 17% derating at 100V.

UPS 2200VA Rack							
Part Number	VA/Watts Rating	Nominal Voltage	Input Connection	Input Freq	Output Connection	Form Factor	Page Link
55942AX	1950VA/ 1920W	120/100*/ 125V	5-20P	60Hz (50Hz)	(8) 5-20R	2U	39
55942KX	2200VA/ 1980W	200/208/ 220/230/ 240V	C20	50Hz (60Hz)	(8) C13, (1) C19	2U	39

* The 2200VA UPS will incur 32% derating at 100V.

UPS 3000VA Rack							
Part Number	VA/Watts Rating	Nominal Voltage	Input Connection	Input Freq	Output Connection	Form Factor	Page Link
55943AX	3000VA/ 2700W	120/100*/ 125V	L5-30P	60Hz (50Hz)	(6) 5-20R, (1) L5-30R	2U	47
55943KX	3000VA/ 2700W	200/208/ 220/230/ 240V	C20	50Hz (60Hz)	(8) C13, (1) C19	2U	47

* The 3000VA UPS will incur 17% derating at 100V.

UPS 5000VA Rack							
Part Number	VA/Watts Rating	Nominal Voltage	Input Connection	Input Freq	Output Connection	Form Factor	Page Link
55945KX	5000VA/ 4500W	200*/208**/ 220/230/ 240V	UTG/Cord	50Hz (60Hz)	(8) C13, (2) C19	3U	56

* The 5000VA UPS rating at 200V is 4300W.

** The 5000VA UPS rating at 208V is 4500W.

UPS 6000VA Rack							
Part Number	VA/Watts Rating	Nominal Voltage	Input Connection	Input Freq	Output Connection	Form Factor	Page Link
55946KX	6000VA/ 5400W	200/208/ 220/230/ 240V	Hardwired	50Hz (60Hz)	(8) C13, (2) C19, (1) Hardwire Output	3U	64

UPS 8000VA Rack							
Part Number	VA/Watts Rating	Nominal Voltage	Input Connection	Input Freq	Output Connection	Form Factor	Page Link
55948KX	8000VA/ 7200W	230/200/ 208/220/ 240V	Hardwired	50Hz (60Hz)	(4) C19, (1) Hardwire Output	6U	71
55948PX	8000VA/ 7200W	200/208/ 220/230/ 240V	Hardwired	50Hz (60Hz)	(4) C19 (1) Hardwire Output	6U	71

UPS 11000VA Rack							
Part Number	VA/Watts Rating	Nominal Voltage	Input Connection	Input Freq	Output Connection	Form Factor	Page Link
55949KX	11000VA/ 10000W	200*/208*/ 220**/230/ 240V	Hardwired	50Hz (60Hz)	(4) C19, (1) Hardwire Output	6U	79
55949PX	11000VA/ 10000W	200*/208*/ 220**/230/ 240V	Hardwired	50Hz (60Hz)	(4) C19, (1) Hardwire Output	6U	79

* The 11000VA UPS rating at 200V and 208V is 9000W.

** The 11000VA UPS rating at 220V is 9900W.

Installation Manuals

The following links are manuals to each of the UPSs.

Installation and User's Guide – Tower UPS

55951AX – 1kVA Tower UPS (110V)
55951KX – 1kVA Tower UPS (230V)
55952AX – 1.5kVA Tower UPS (110V)
55952KX – 1.5kVA Tower UPS (230V)
http://www.ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5096507

Installation and User's Guide – 2U Rack or Tower UPS

55941AX – 1.5kVA R/T UPS (100V/120V)
55941KX – 1.5kVA R/T UPS (200V-230V)
55942AX – 2.2kVA R/T UPS (100V/120V)
55942KX – 2.2kVA R/T UPS (200V -230V)
55943AX – 3kVA R/T UPS (100V/120V)
55943KX – 3kVA R/T UPS (200V-230V)
http://www.ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5096504

Installation and User's Guide – 3U Rack or Tower UPS

55945KX – 5kVA R/T UPS (200V-230V)
55946KX – 6kVA R/T UPS (200V-230V)
http://www.ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5096505

Installation and User's Guide – 6U Rack or Tower UPS:

55948KX – 8kVA R/T UPS (200V-230V)
55948PX – 8kVA 3 ph UPS (200V-230V)
55949KX – 11kVA R/T UPS (200V-230V)
55949PX – 11kVA 3 ph UPS (200V-230V)
http://www.ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5096506

UPS 1000VA/1150VA Tower

The following section discusses the 1000VA and 1150VA UPSs.

Specifications

The following table represents the specifications for the 55951AX and 55951KX UPSs.

	UPS 1000VA			UPS 1150VA				
Part Number	55951AX			55951KX				
Feature Code	A548			A549				
Country / Region	North America			International				
Form Factor	Tower			Tower				
EBMs Supported	No			No				
EPOW Connection	Yes			Yes				
MBP Required	No			No				
NMC Standard	Optional			Optional				
Power Factor	0.75			0.75				
UPS Topology	Line interactive / High Efficiency / Sinewave output							
Energy Star	Not compliant			Compliant				
Input	100-125V			200-240V				
Line Cord	6ft NEMA 5-15P attached			IEC 320 C14 detachable				
VinAC	100V*/120V/125V			200V**/208**/220V/230V/240V				
Iin (A)	8.8 A @ 100-125V			5.3 A @ 200-240V				
Suggested Circuit Size	15A			10A/12A/16A				
Output	100-125V			200-240V				
Vin (V)	100V	120V	125V	200V	208V	220V	230V	240V
Voltage (VA)	833VA	1000VA	1000VA	1035VA	1035VA	1150VA	1150VA	1150VA
Watts (W)	641W	770W	770W	693W	693W	770W	770W	770W
Iout (A)	8.4A	8.4A	8.4A	5.2A	5.2A	5.3A	5.3A	5.3A
Receptacles	8 x NEMA 5-15R			8 x IEC 320 C13				

* The 1000VA UPS will incur 17% derating at 100V.

** The 1150VA UPS will incur 10% derating at 200V, and 208V.

Front and Back View

The following figures are front and back pictures of the 1000VA UPS with 8 x NEMA 5-15R outlets and a NEMA 5-15P input line cord, and the 1150VA UPS with 8 x IEC 320 C13 outlets and a detachable input line cord.

Figure 1: Back view 55951AX

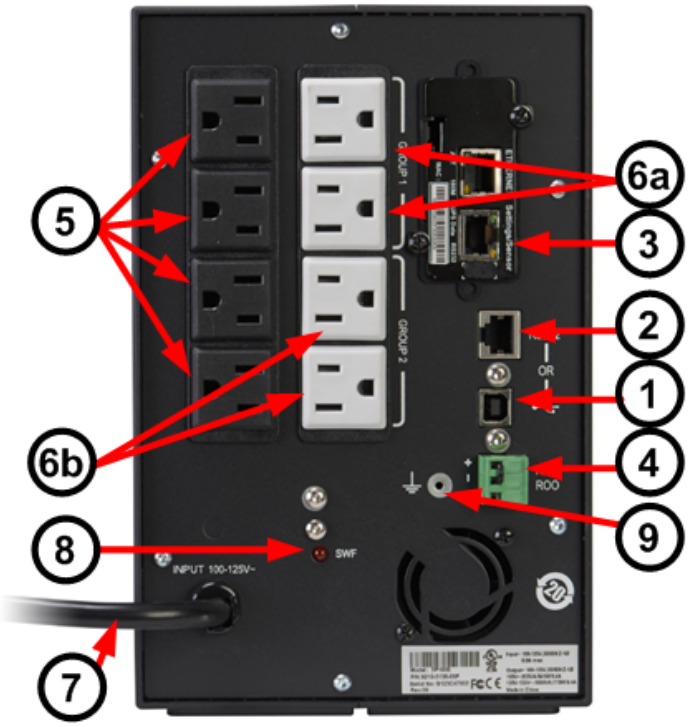
Figure 2: Front view 55951AX and 55951KX

Figure 3: Back view 55951KX

Outlet Diagrams

The following section shows the outlets on the rear of the UPSs.

1000VA UPS (100-125V) – 55951AX



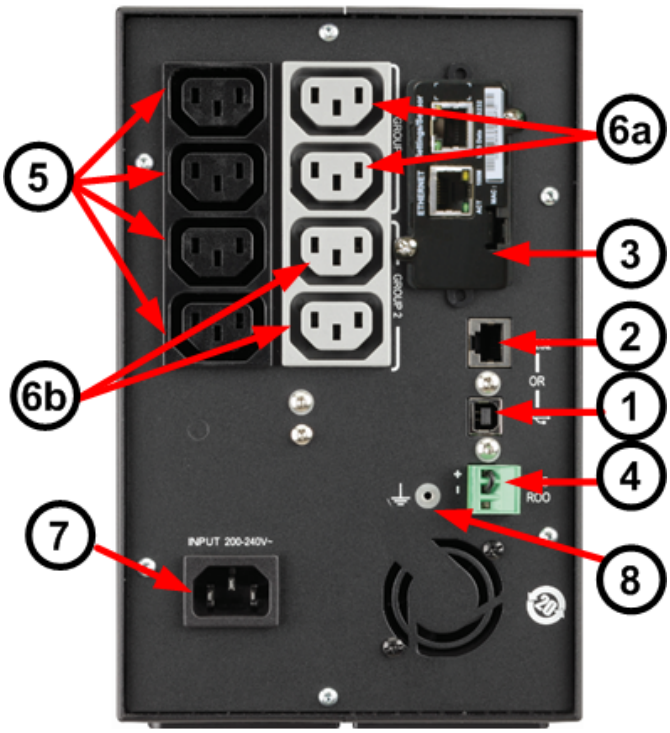
1. USB communication port
2. RS232 communication port
3. Slot for Network Management Card (NMC) installation
4. Connector for remote On / Off (ROO) control or Remote Power Off (RPO) control
5. Outlets for connection of critical equipment (primary outlet group)

6a. Outlet group 1:2: programmable outlets for connection of equipment

6b. Outlet group 2:2: programmable outlets for connection of equipment

7. Attached 6ft (1.8m) input power cord for AC power source (5-15P)
8. LED indicating site wiring fault (SWF) alarm
9. Ground screw

1150VA UPS (200-240V) – 55951KX



1. USB communication port
2. RS232 communication port
3. Slot for Network Management Card(NMC) installation
4. Connector for remote On / Off (ROO) control or Remote Power Off (RPO) control
5. Outlets for connection of critical equipment (primary outlet group)

6a. Outlet group 1:2: programmable outlets for connection of equipment

6b. Outlet group 2:2: programmable outlets for connection of equipment

7. Socket for connection to AC power source
8. Ground screw

Logical Diagrams

The following figure shows the logical layout of the UPS outlets and input line cord. Yellow represents the programmable outlets for non-critical hardware. Blue represents the primary outlets.

55951AX (1000VA/770W)

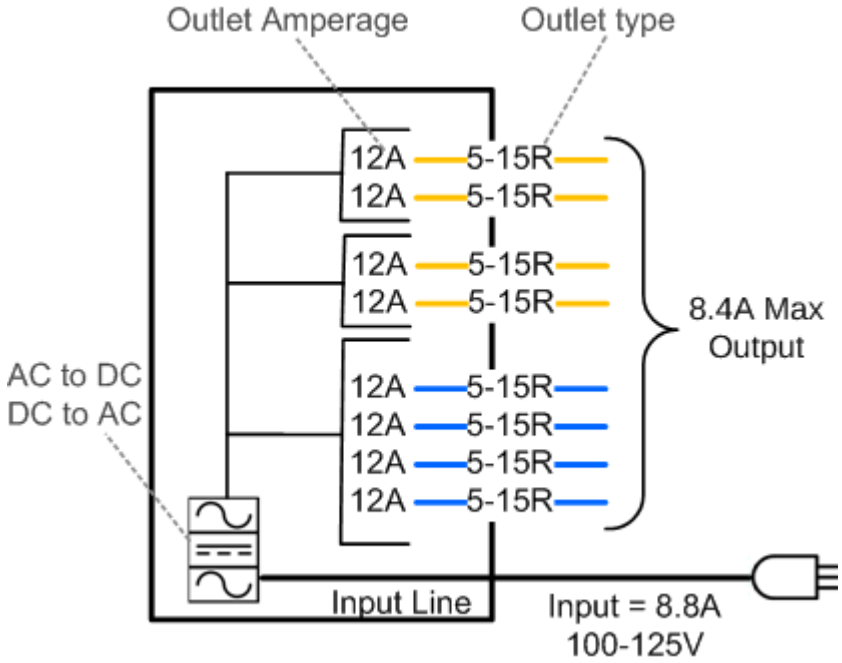


Figure 4: 55951AX logical layout

55951KX (1150VA/770W)

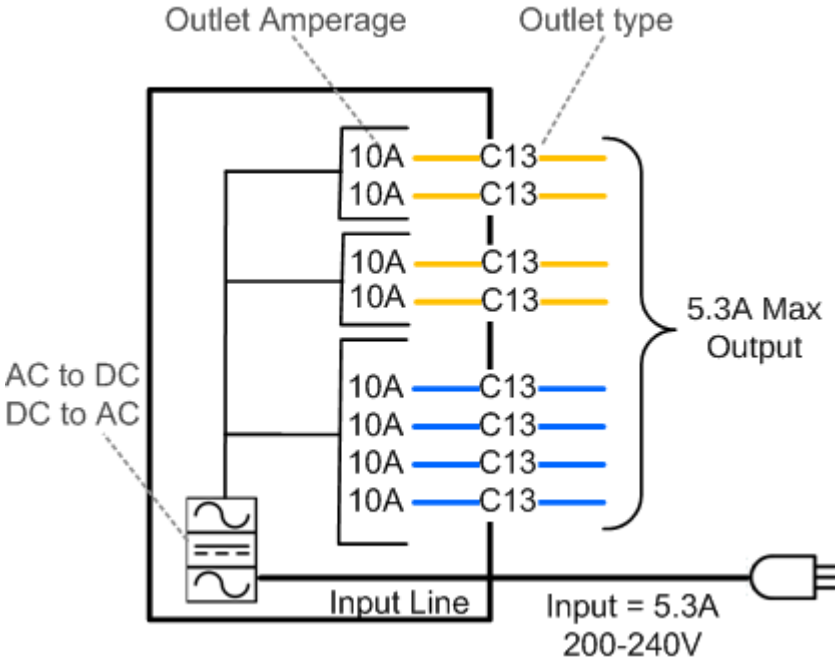


Figure 5: 55951KX logical layout

Line Cords

The 1000VA has an attached line cord. Refer to the North America & Japan 100/120V NEMA 5-15P section for additional details on the line cord.
The 1150VA has a selectable line cord. The following table displays the order-able line cord options for the 1150VA UPS.

1150VA line cord options

These line cords are for 200-240V (55951KX) only. Unless otherwise stated, the length of these line cords is 2.8m.

Part Number	Feature Code	Plug Type (C13 to...)	Country (Region)	Plug picture
39Y7917	6212	CEE7-VII	Europe (E, LA, AP)	105
39Y7918	6213	DK2-5a	Denmark (E)	106
39Y7919	6216	SEV 1011-S24507	Switzerland (E)	107
39Y7920	6218	SI 32	Israel (E, AP)	108
39Y7921	6217	CEI 23-16	Italy (E, LA)	108
39Y7922	6214	SABS 164	South Africa (E, AP)	109
39Y7923	6215	BS 1363/A	United Kingdom (E, AP)	109
39Y7924	6211	AS/NZS 3112	Australia / NZ (ANZ)	110
39Y7925	6219	KSC 8305 KETI	South Korea (GCG, K)	110
39Y7927	6269	IS6538	India (ASEAN, GCG)	112
39Y7928	6210	GB 2099.1	China (GCG)	114
81Y2374	6386	CNS 10917 (125V)	Taiwan (DNL)	113
81Y2375	6317	CNS 10917 (250V)	Taiwan (GCG)	113
39Y7930	6222	IRAM 2073	Argentina (LA)	112
	5472	JIS C-8303 (200V)	Japan (AP)	105
	6314	JIS C-8303 (100V)	Japan (DNL)	105
39Y7929	6223	NBR 6147 (250V)	Brazil (LA)	111
46M2592	A1RF	NEMA 6-15P (250V)	North America (C, LA, U, AP)	103
-	6372	NEMA 6-15P (250V) US	NA (C, LA, U, AP)	103
-	6351	NEMA 6-15P (250V), 1.8m	NA (C, LA, U, AP)	103
-	6313	NEMA 5-15P (125V)	North America (DNL)	103
-	6369	NEMA 5-15P (125V), 1.8m	North America (DNL)	103
-	6377	IEC 309 P+N+G	Denmark/Switz (E)	106

Run times

The following tables display the run times the UPSs will provide at various loads.

55951AX (1000VA/770W)

		Run time (minutes)*
Percentage %	Load (W)	Internal Battery
20%	154	33
30%	231	21
40%	308	15
50%	385	12
60%	462	9
70%	539	8
80%	616	7
90%	693	6
100%	770	5

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

55951KX (1150VA/770W)

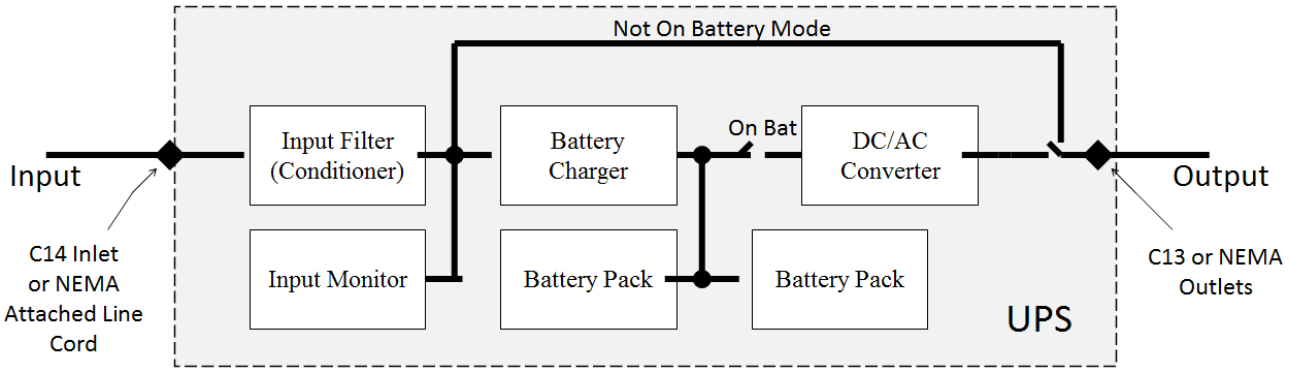
		Run time (minutes)*
Percentage %	Load (W)	Internal Battery
20%	154	33
30%	231	21
40%	308	15
50%	385	11
60%	462	9
70%	539	7
80%	616	6
90%	693	5
100%	770	4

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

Block Diagram

The following figure represents the block diagram for the 1000VA and 1150VA UPS.

Note: This is High Efficiency Mode: Bypass converters when AC is good; switch to battery when AC is bad.



Optional Accessories

The 1500VA UPSs can be ordered with the following optional accessories:

Part Number	FC	Description	Additional information
46M4110	6145	Network Management Card (NMC)	Page 93
46M4113	6146	Environmental Monitoring Probe (EMP)	Page 94

Figure 7: NMC

Figure 6: EMP

UPS 1500VA Tower

The following section discusses the 1500VA 100-125VAC, and 200-240VAC UPSs.

Specifications

The following table represents the specifications for 55952AX and 55952KX UPSs.

	UPS 1500VA			UPS 1500VA				
Part Number	55952AX			55952KX				
Feature Code	A54A			A54C				
Country / Region	North America			International				
Form Factor	Tower			Tower				
EBM Support	No			No				
EPOW Connection	Yes			Yes				
MBP Required	No			No				
NMC Standard	Optional			Optional				
Power Factor	0.76			0.70				
UPS Topology	Line interactive / High Efficiency / Sinewave output							
Energy Star	Compliant			Compliant				
Input	100-125V			200-240V				
Line Cord	6ft NEMA 5-15P attached			IEC 320 C14 detachable				
VinAC	100V*/120V/125V			200V**/208**/220V/230V/240V				
Iin (A)	12 A @ 100-125V			7.1 A @ 200-240V				
Suggested Circuit Size	15A			10A/12A/16A				
Output	100-125V			200-240V				
Vin (V)	100V	120V	125V	200V	208V	220V	230V	240V
Voltage (VA)	1080 VA	1440 VA	1440 VA	1395 VA	1395 VA	1550 VA	1550 VA	1550 VA
Watts (W)	825W	1100W	1100W	990W	990W	1100W	1100W	1100W
Iout (A)	10.8A	12A	12A	7A	7A	7.1A	7.1A	7.1A
Receptacles	8 x NEMA 5-15R			8 x IEC 320 C13				

* The 1500VA UPS will incur 25% derating at 100V.

** The 1500VA UPS will incur 10% derating at 200V, and 208V.

Front and Back View

The following figures are the back view of the 1500VA UPSs with 8 x NEMA 5-15R outlets (55952AX) and 8 x C13 outlets (55952KX).

The 55952AX UPS has an attached 6ft NEMA 5015 line cord. Refer to the North America & Japan 100/120V NEMA 5-15P section for additional details on the plug.

The 55952KX UPS has a selectable line cord based on the country/region it is installed in. Refer to the 1500VA line cord options for additional details on line cord options.

Figure 8: NEMA 5-15R outlets 55952AX

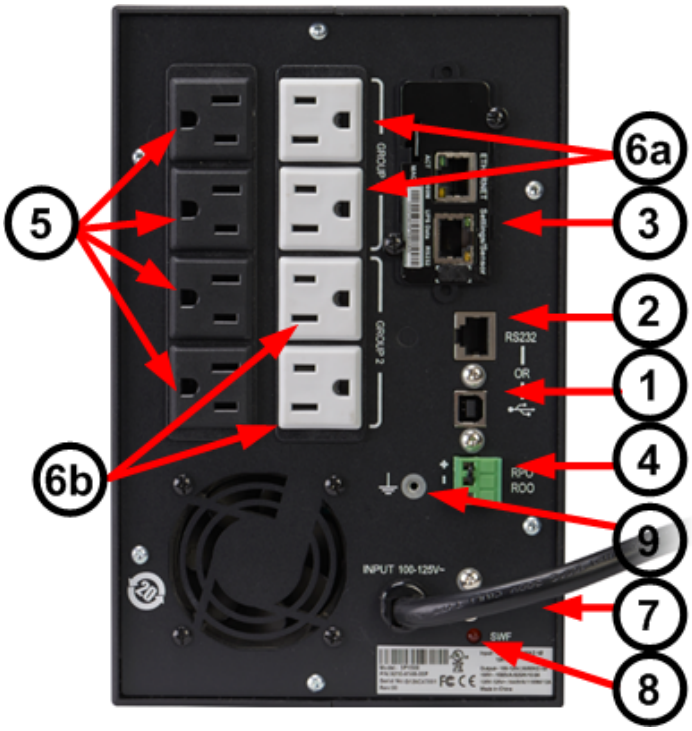
Figure 9: Front view 55952AX and 55952KX

Figure 10: C13 outlets 55952KX

Outlet Diagrams

The following section shows the outlets on the rear of the UPSs.

1500VA UPS (100-125V) - 55952AX



1. USB communication port
2. RS232 communication port
3. Slot for Network Management Card (NMC) installation
4. Connector for remote On / Off (ROO) control or Remote Power Off (RPO) control
5. Outlets for connection of critical equipment (primary outlet group)

6a. Outlet group 1:2: programmable outlets for connection of equipment

6b. Outlet group 2:2: programmable outlets for connection of equipment

7. Attached 6ft (1.8m) input power cord for AC power source (5-15P)
8. LED indicating site wiring fault (SWF) alarm
9. Ground screw

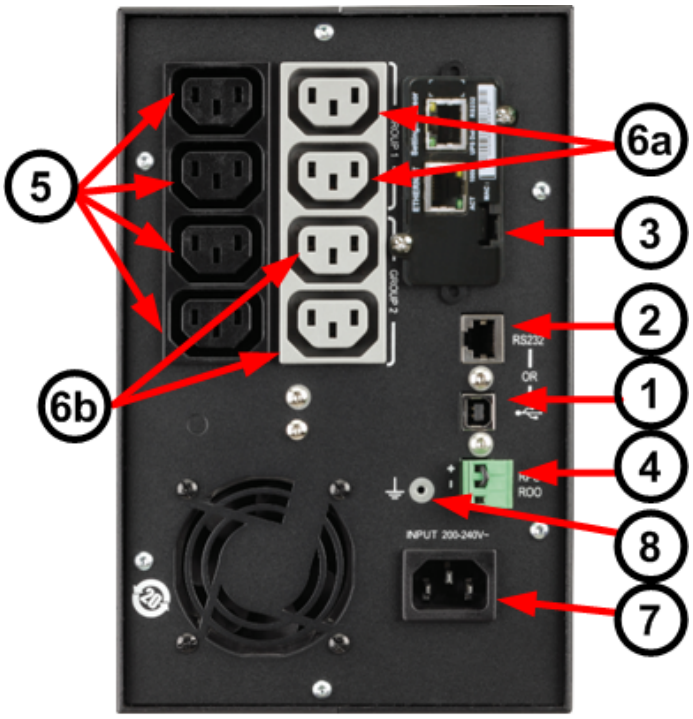
1500VA UPS (200-240V) - 55952KX

1. USB communication port
2. RS232 communication port
3. Slot for Network Management Card (NMC) installation
4. Connector for remote On / Off (ROO) control or Remote Power Off (RPO) control
5. Outlets for connection of critical equipment (primary outlet group)

6a. Outlet group 1: programmable outlets for connection of equipment

6b. Outlet group 2: programmable outlets for connection of equipment

7. Socket for connection to AC power source
8. Ground screw



Logical Diagrams

The following figure shows the logical layout of the UPS outlets and input line cord. Yellow represents the programmable outlets for non-critical hardware. Blue represents the primary outlets.

55952AX (1440VA/1100W)

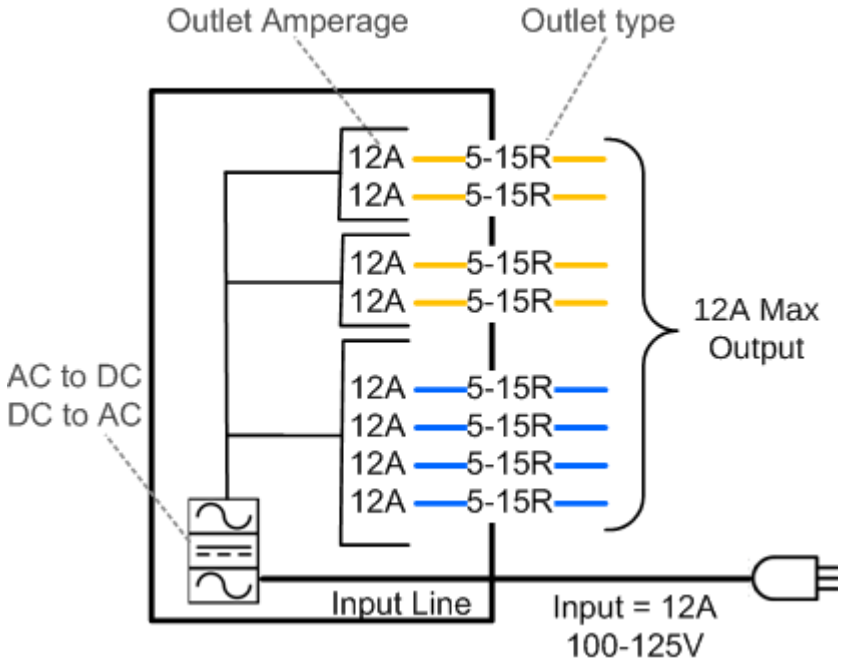


Figure 11: 55952AX logical layout

55952KX (1550VA/1100W)

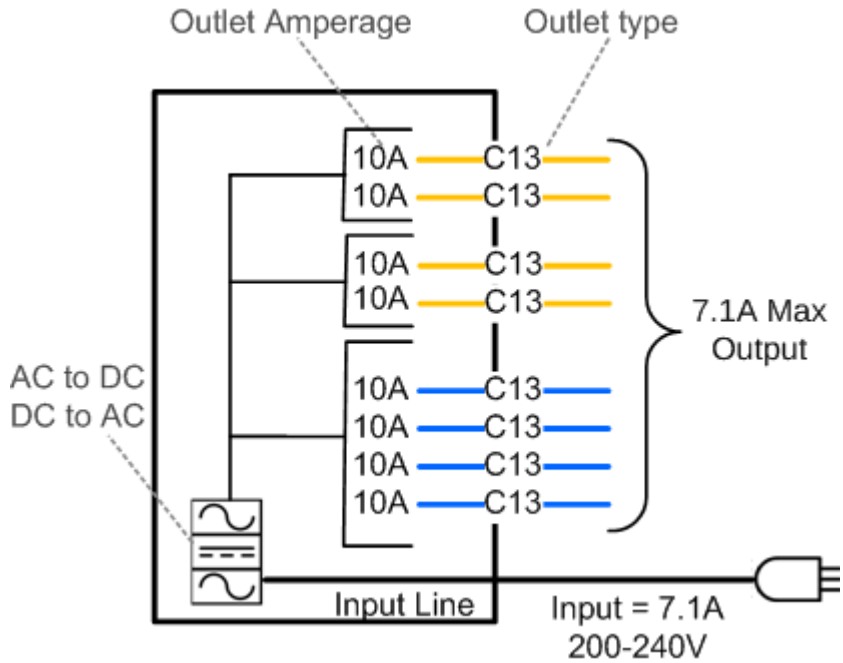


Figure 12: 55952KX logical layout

Line Cords

The 1500VA 100-125V UPS (55952AX) has an attached line cord. Refer to the North America & Japan 100/120V NEMA 5-15P section for additional details on the line cord.

The 1500VA 200-240V UPS (55952KX) has a selectable line cord. The following table displays the orderable line cord options for the 1500VA UPS.

1500VA line cord options

These line cords are for 200-240V (55952KX) only. Unless otherwise stated, the length of these line cords is 2.8m.

Part Number	FC	Plug Type (C13 to...)	Country (Region)	Plug picture
39Y7917	6212	CEE7-VII	Europe (E, LA, AP)	105
39Y7918	6213	DK2-5a	Denmark (E)	106
39Y7919	6216	SEV 1011-S24507	Switzerland (E)	107
39Y7920	6218	SI 32	Israel (E, AP)	108
39Y7921	6217	CEI 23-16	Italy (E, LA)	108
39Y7922	6214	SABS 164	South Africa (E, AP)	109
39Y7923	6215	BS 1363/A	United Kingdom (E, AP)	109
39Y7924	6211	AS/NZS 3112	Australia / NZ (ANZ)	110
39Y7925	6219	KSC 8305 KETI	South Korea (GCG, K)	110
39Y7927	6269	IS6538	India (ASEAN, GCG)	112
39Y7928	6210	GB 2099.1	China (GCG)	114
81Y2374	6386	CNS 10917 (125V)	Taiwan (DNL)	113
81Y2375	6317	CNS 10917 (250V)	Taiwan (GCG)	113
39Y7930	6222	IRAM 2073	Argentina (LA)	112
	5472	JIS C-8303 (200V)	Japan (AP)	105
39Y7929	6223	NBR 6147 (250V)	Brazil (LA)	111
46M2592	A1RF	NEMA 6-15P (250V)	North America (C, LA, U, AP)	103
-	6372	NEMA 6-15P (250V) US	NA (C, LA, U, AP)	103
-	6351	NEMA 6-15P (250V), 1.8m	NA (C, LA, U, AP)	103
-	6313	NEMA 5-15P (125V)	North America (DNL)	103
-	6369	NEMA 5-15P (125V), 1.8m	North America (DNL)	103
-	6377	IEC 309 P+N+G	Denmark/Switz (E)	106

Run times

The following tables display the run times the UPSs will provide at various loads.

55952AX (1440VA/1100W)

		Run time (minutes)*
Percentage %	Load (W)	Internal Battery
20%	220	42
30%	330	25
40%	440	18
50%	550	13
60%	660	11
70%	770	8
80%	880	6
90%	990	5
100%	1100	4

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

55952KX (1550VA/1100W)

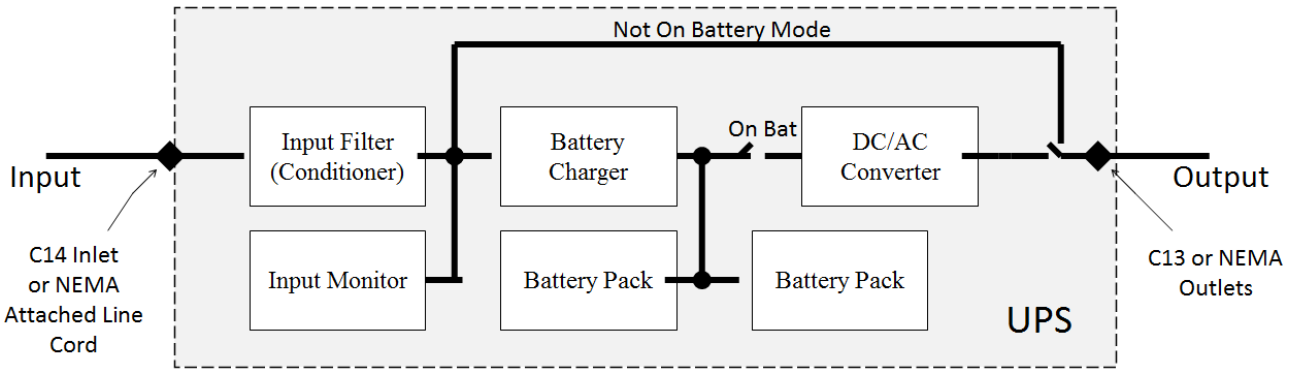
		Run time (minutes)*
Percentage %	Load (W)	Internal Battery
20%	220	42
30%	330	25
40%	440	18
50%	550	13
60%	660	11
70%	770	8
80%	880	6
90%	990	5
100%	1100	4

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

Block Diagram

The following figure represents the block diagram for the 1500VA UPS.

Note: This is High Efficiency Mode: Bypass converters when AC is good; switch to battery when AC is bad.



Optional Accessories

The 1500VA UPSs can be ordered with the following optional accessories:

Part Number	Feature Code	Description	Additional information
46M4110	6145	Network Management Card (NMC)	Page 93
46M4113	6146	Environmental Monitoring Probe (EMP)	Page 94

Figure 14: NMC

Figure 13: EMP

UPS 1500VA Rack

The following section discusses the 1500VA UPS at both 100-125VAC and 200-240VAC. These UPSs ship standard with racking and tower hardware.

Specifications

The following table represents the specifications for 55941AX and 55941KX UPSs.

	UPS 1500VA			UPS 1500VA				
Part Number	55941AX			55941KX				
Feature Code	A53S			A53T				
Country / Region	North America			International				
Form Factor	Rack or Tower			Rack or Tower				
Rack U Space	2U			2U				
EBM Support	Yes (55942BX)			Yes (55942BX)				
EPOW Connection	Yes			Yes				
MBP Required	No			No				
NMC Standard	Optional			Optional				
Power Factor	1			0.70				
UPS Topology	Line interactive / High Efficiency / Sinewave output							
Energy Star	Compliant			Compliant				
Input	100-125V			200-240V				
Line Cord	6ft NEMA 5-15P attached			IEC 320 C14 detachable				
VinAC	100V*/120V/125V			200V/208V/220V/230V/240V				
Iin (A)	12 A @ 100-125V			10 A @ 200-240V				
Suggested Circuit Size	15A			12A/16A				
Output	100-125V			200-240V				
Vin (V)	100V	120V	125V	200V	208V	220V	230V	240V
Voltage (VA)	1200 VA	1440 VA	1440 VA	1550 VA	1550 VA	1550 VA	1550 VA	1550 VA
Watts (W)	1200W	1440W	1440W	1100W	1100W	1100W	1100W	1100W
Iout (A)	12A	12A	11.5A	7.5A	7.3A	6.9A	6.6A	6.3A
Receptacles	8 x NEMA 5-15R			8 x IEC 320 C13				

* The 1500VA UPS will incur 17% derating at 100V.

Front and Back View

The following figures are the front and back view of the 1500VA UPSs with 8xNEMA 5-15R outlets (55941AX) and 8xC13 outlets (55941KX).

The 55941AX UPS has an attached 6ft NEMA 5-15P line cord. Refer to the North America & Japan 100/120V NEMA 5-15P section for additional details on the plug.

The 55941KX UPS has a selectable line cord based on the country/region it is installed in. Refer to the 1500VA line cord options for additional details on line cord options.

Figure 16: NEMA 5-15R outlets 55941AX

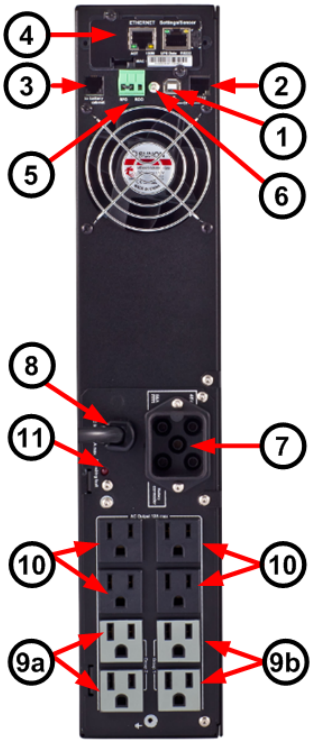
Figure 15: C13 outlets 55941KX

Figure 17: Front view rack

Outlet Diagrams

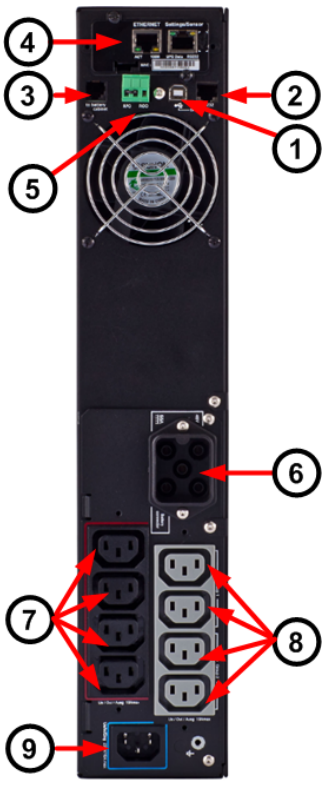
The following section shows the outlets on the rear of the UPSs.

1500VA UPS (100-125V) - 55941AX



1. USB communication port
2. RS232 communication port
3. Connector for automatic recognition of an additional battery pack
4. Slot where UPS Network Management Card (NMC) is installed
5. Connector for Remote On/Off (ROO) control or Remote Power Off (RPO) control
6. LED indicating site wiring fault (SWF) alarm
7. Connector for additional battery pack
8. Attached 8ft (2.5m) input power cord for AC-power source
9a. Outlet Group 1:2: two programmable outlets for connection to equipment
9b. Outlet Group 2:2: two programmable outlets for connection to equipment
10. Primary outlet group: outlets for connection of critical equipment
11. LED indicating site wiring fault (SWF) alarm

1500VA UPS (200-240V) - 55941KX



1. USB communication port
2. RS232 communication port
3. Connector for automatic recognition of an additional battery pack
4. Slot where UPS Network Management Card (NMC) is installed
5. Connector for Remote On/Off (ROO) control or Remote Power Off (RPO) control
6. Connector for battery packs
7. Groups of four outlets for connection of equipment (primary outlet group)
8. Two groups of two programmable outlets for connection of equipment (outlet groups 1 and 2)
9. C14 socket for connection to AC power source

Logical diagrams

The following figure shows the logical layout of the UPS outlets and input line cord. Yellow represents the programmable outlets for non-critical hardware. Blue represents the primary outlets.

55941AX (1440VA/1440W)

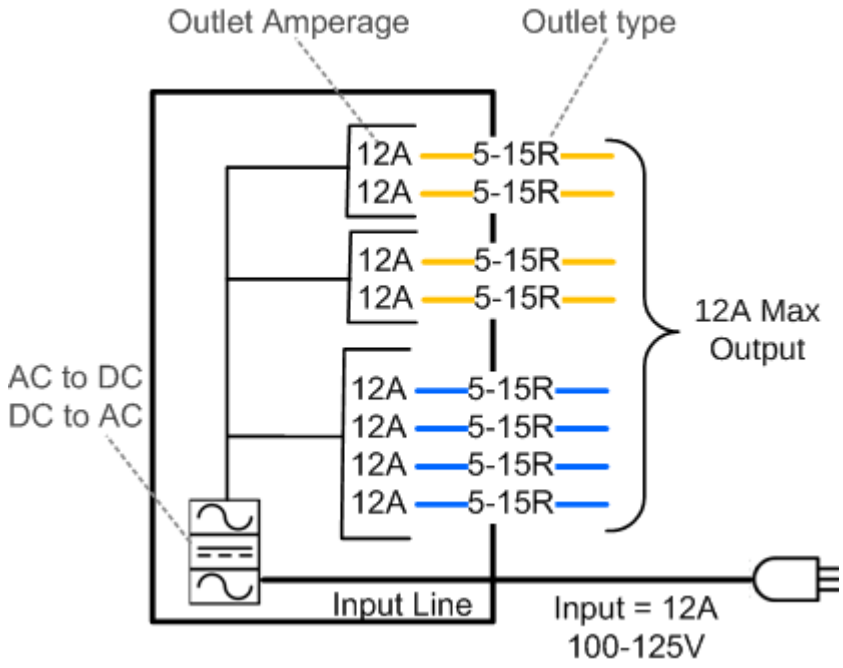


Figure 18: 55941AX logical layout

55941KX (1550VA/1350W)

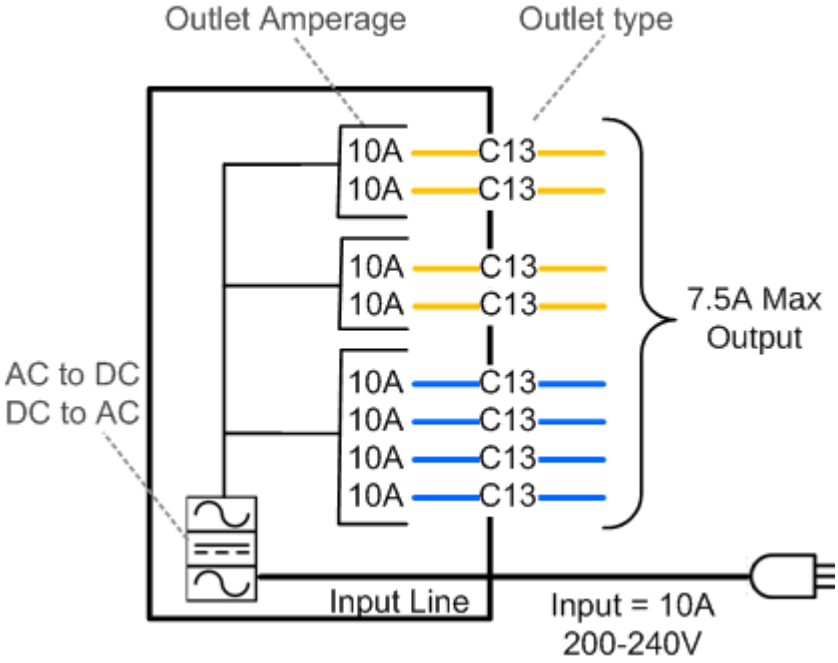


Figure 19: 55941KX logical layout

Line Cords

The 1500VA 100-125V UPS (55941AX) has an attached line cord. Refer to the North America & Japan 100/120V NEMA 5-15P section for additional details on the line cord.

The 1500VA 200-240V UPS (55941KX) has a selectable line cord. The following table displays the orderable line cord options for the 1500VA UPS.

1500VA line cord options

These line cords are for 200-240V (55941KX) only. Unless otherwise stated, the length of these line cords is 4.3m.

Part Number	FC	Plug Type (C13 to...)	Country (Region)	Plug picture
81Y2384	6492	10A/250V C13/ IRAM 2073 4.3m	Argentina (LA)	112
81Y2383	6574	10A/250V C13/ AS/NZS 3112/2000	Australia/NZ (ANZ)	110
81Y2387	6404	10A/250V C13/ NBR 14136	Brazil (LA)	111
81Y2378	6580	10A/250V C13 / GB2099.1	China (GCG)	114
81Y2382	6575	10A/250V C13/SB107-2-DI	Denmark (E)	106
81Y2376	6572	10A/250V C13 / CEE7-VII	Europe (E, AP)	105
81Y2386	6567	10A/250V C13/IS 6538	India (ASEAN)	112
81Y2381	6579	10A/250V C13/ SI 32	Israel (E)	108
81Y2380	6493	10A/250V C13/ CEI 23-16	Italy/Chile (E, AP)	108
81Y2385	6494	12A/250V C13/KSC 8305	S. Korea (K)	110
81Y2379	6576	10A/250V C13/ SANS 164-1	South Africa (E, AP)	109
81Y2390	6578	10A/250V C13/SEV 1011 S24507	Switzerland (E)	107
81Y2389	6531	10A/250V C13/CNS 10917	Taiwan (GCG)	113
	6530	10A/125V C13/75 CNS 10917-3	Taiwan (DNL)	113
81Y2377	6577	10A/250V C13 / BS 1363A	United Kingdom (E, AP)	109
	6335	4.3m, 10A/100V, C13 to JIS C-8303	Japan (DNL)	105

Run times

The following tables display the run times the UPSs will provide at various loads and with additional battery packs. The Extended Battery Module (EBM) for these UPSs is: 55942BX.

55941AX (1440VA/1440W)

		Run time (minutes)*				
Percentage %	Load (W)	Internal Battery	EBM +1	EBM +2	EBM +3	EBM +4
20%	288	39	171	288	405	523
30%	432	23	109	188	266	344
40%	576	16	77	134	191	248
50%	720	11	54	97	140	183
60%	864	7	45	82	119	155
70%	1008	6	37	69	101	133
80%	1152	5	31	58	86	113
90%	1296	4	25	49	72	96
100%	1440	3	21	41	62	82

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

55941KX (1550VA/1350W)

		Run time (minutes)*				
Percentage %	Load (W)	Internal Battery	EBM +1	EBM +2	EBM +3	EBM +4
20%	270	30	158	267	375	483
30%	405	20	105	197	289	380
40%	540	14	77	150	223	296
50%	675	10	74	125	176	227
60%	810	8	61	104	146	189
70%	945	7	48	82	117	151
80%	1080	5	38	68	97	127
90%	1215	4	32	60	88	116
100%	1350	3	25	52	78	105

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

Extended Battery Module (EBM) Connection

The connection for the 1500VA UPS to Extended Battery Module (EBM) is shown below. Up to 4 EBMs can be daisy chained together off 1 UPS.
Refer to the Run times section for details on the additional minutes the EBM(s) will give you at various loads.

Figure 20: 55941AX/EBM

Figure 21: 55941KX/EBM

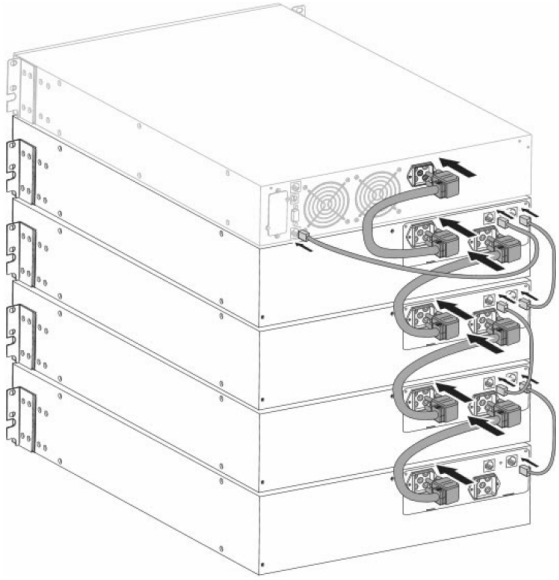


Figure 22: Rack EBM connection

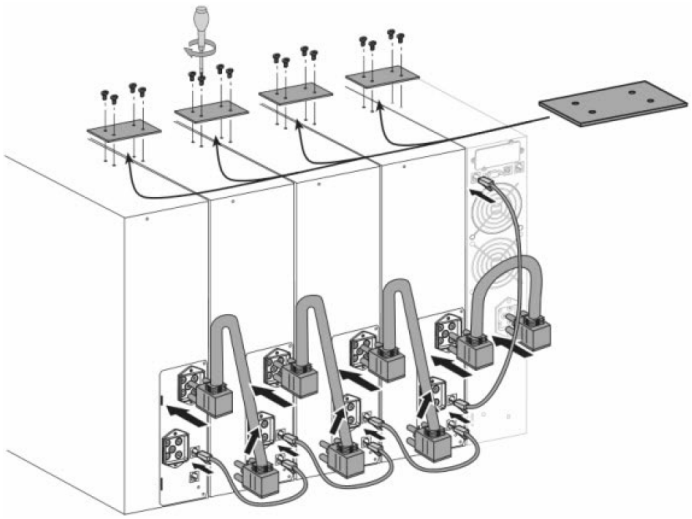
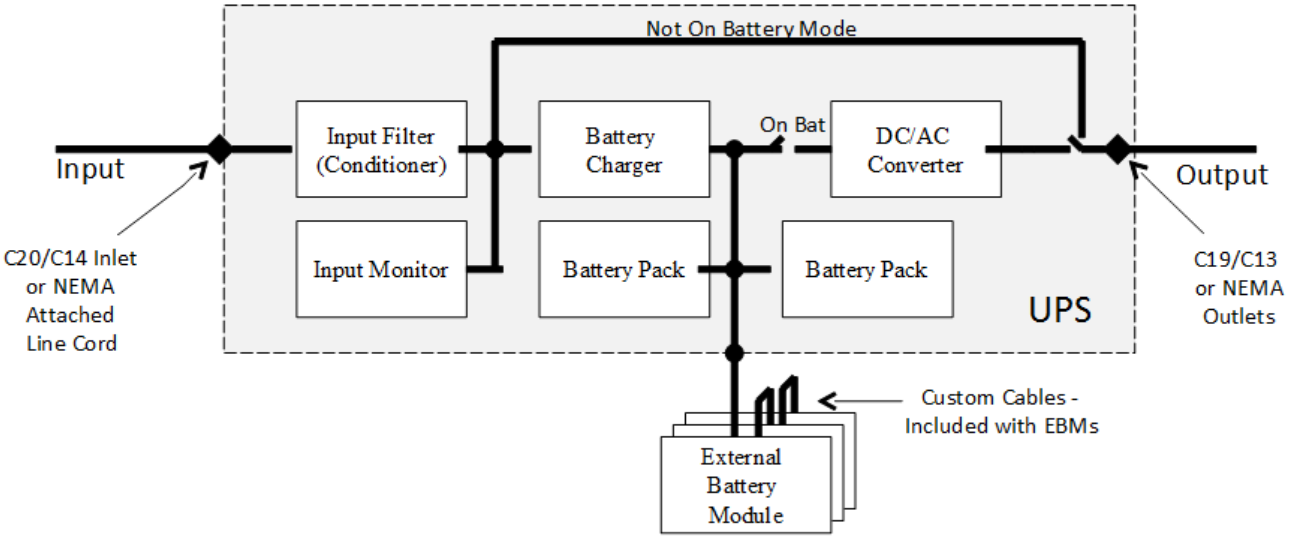


Figure 23: Tower EBM connection

Block Diagram

The following figure represents the block diagram for the 1500VA UPS.
Note: This is High Efficiency Mode: Bypass converters when AC is good; switch to battery when AC is bad.



Optional Accessories

The 1500VA UPSs can be ordered with the following optional accessories:

Part Number	Feature Code	Description	Additional info
46M4110	6145	Network Management Card (NMC)	Page 93
46M4113	6146	Environmental Monitoring Probe (EMP)	Page 94
55942BX	A53Y	Extended Battery Module (EBM) (Max 4)	Page 95

Figure 24: NMC

Figure 25: EMP

Figure 26: Extended Battery Module EBM

UPS 2200VA Rack

The following section discusses the 2200VA UPS at both 100-125VAC, and 200-240VAC. These UPSs ship standard with racking and tower hardware.

Specifications

The following table represents the specifications for 55942AX and 55942KX UPSs.

	UPS 2200VA			UPS 2200VA				
Part Number	55942AX			55942KX				
Feature Code	A53U			A53V				
Country / Region	North America			International				
Form Factor	Rack or Tower			Rack or Tower				
Rack U Space	2U			2U				
EBM Support	Yes (55942BX)			Yes (55942BX)				
EPOW Connection	Yes			Yes				
MBP Required	No			No				
NMC Standard	Optional			Optional				
Power Factor	0.98			0.9				
UPS Topology	Line interactive / High Efficiency / Sinewave output							
Energy Star	Compliant			Compliant				
Input	100-125V			200-240V				
Line Cord	6ft NEMA 5-20P attached			IEC 320 C20 detachable				
VinAC	100V*/120V/125V			200V/208V/220V/230V/240V				
Iin (A)	16 A @ 100-125V			16 A @ 200-240V				
Suggested Circuit Size	20A			16A/20A				
Output	100-125V			200-240V				
Vin (V)	100V	120V	125V	200V	208V	220V	230V	240V
Voltage (VA)	1330 VA	1950 VA	1950V A	1700V A	1980V A	2200 VA	2200 VA	2200 VA
Watts (W)	1300W	1920W	1920W	1530W	1780W	1980W	1980W	1980W
Iout (A)	13.3A	16A	15.6A	8.5A	9.5A	10A	9.6A	9.2A
Receptacles	8 x NEMA 5-20R			8 x IEC 320 C13, 1 x IEC 320 C19				

* The 2200VA UPS will incur 32% derating at 100V.

Front and Back View

The following figures are the front and back view of the 2200VA UPSs with 8xNEMA 5-20R outlets (55942AX) and 8xC13, 1xC19 outlets (55942KX).

The 55942AX UPS has an attached 6ft NEMA 5-20P line cord. Refer to the North America & Japan 100/120V NEMA 5-20P section for additional details on the plug.

The 55942KX UPS has a selectable line cord based on the country/region it is installed in. Refer to the 2200VA line cord options for additional details on line cord options.

Figure 28: NEMA 5-20R outlets 55942AX

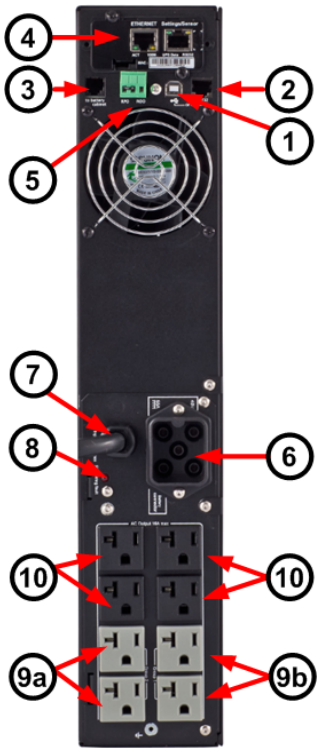
Figure 27: C13 outlets 55942KX

Figure 29: Front view rack

Outlet Diagrams

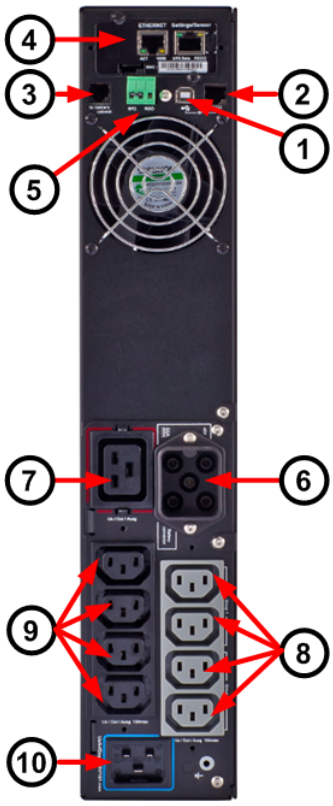
The following section shows the outlets on the rear of the UPSs.

2200VA UPS (100-125V) - 55942AX



1. USB communication port
2. RS232 communication port
3. Connector for automatic recognition of an additional battery pack
4. Slot where UPS Network Management Card (NMC) is installed
5. Connector for Remote On/Off (ROO) control or Remote Power Off (RPO) control
6. Connector for additional battery pack
7. Attached 8ft (2.5m) input power cord for AC-power source
8. LED indicating site wiring fault (SWF) alarm
9a. Outlet Group 1: two programmable outlets for connection to equipment
9b. Outlet Group 2: two programmable outlets for connection to equipment
10. Primary outlet group: outlets for connection of critical equipment

2200VA UPS (200-240V) - 55942KX



1. USB communication port
2. RS232 communication port
3. Connector for automatic recognition of an additional battery pack
4. Slot where UPS Network Management Card (NMC) is installed
5. Connector for Remote On/Off (ROO) control or Remote Power Off (RPO) control
6. Connector for battery packs
7. 16A outlet for connection of equipment (primary outlet group)
8. Two groups of two programmable outlets for connection of equipment (outlet groups 1 and 2)
9. Groups of four outlets for connection of equipment (primary outlet group)
10. Socket for connection to AC power source

Logical diagrams

The following figure shows the logical layout of the UPS outlets and input line cord. Yellow represents the programmable outlets for non-critical hardware. Blue represents the primary outlets.

55952AX (1950VA/1920W)

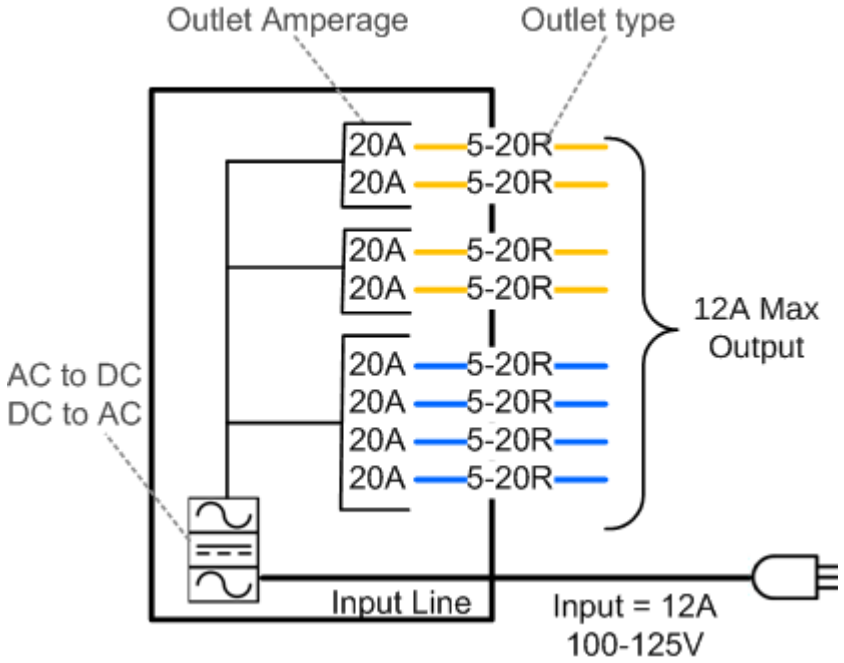


Figure 30: 55952AX logical layout

55952KX (2200VA/1980W)

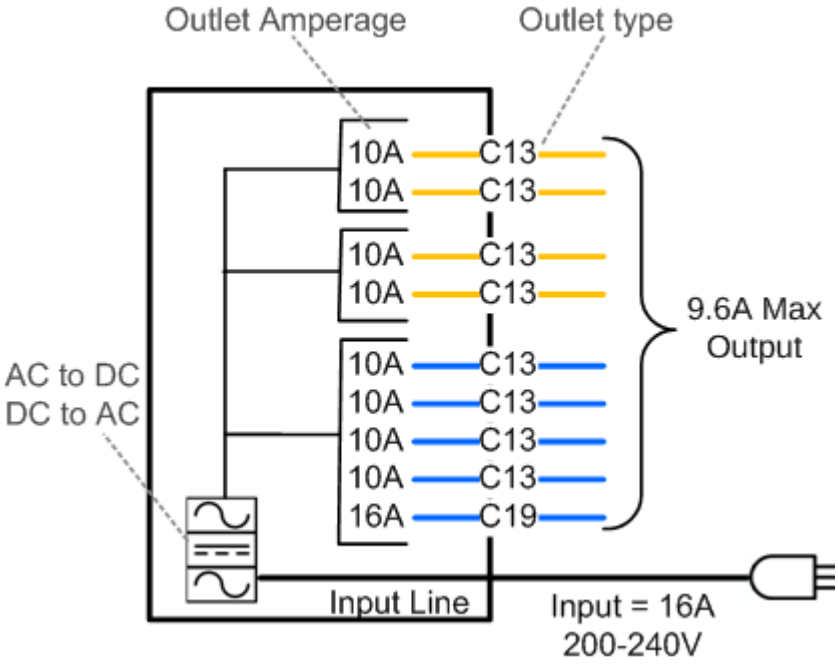


Figure 31: 55952KX logical layout

Line Cords

The 2200VA 100-125V UPS (55952AX) has an attached line cord. Refer to the North America & Japan 100/120V NEMA 5-20P section for additional details on the line cord.
The 2200VA 200-240V UPS (55952KX) has a selectable line cord based on country/region. The following table displays the orderable line cord options for the International UPS.

2200VA line cord options

These line cords are for 200-240V (55952KX) only. Unless otherwise stated, the length of these line cords is 4.3m.

Part Number	FC	Plug Type (C19 to...)	Country (Region)	Plug picture
40K9766	6279	CEE7-VII	Europe (E, AP)	105
40K9767	6278	1363/A w/13A fuse 220-240V	UK (E, AP)	109
40K9769	6283	IEC 309-P+N+G	Denmark / Switzerland (E)	106
40K9771	6282	SI 32	Israel (E)	108
40K9768	6281	CEI 23-16	Italy (E, LA)	108
40K9770	6280	SABS 164	South Africa (E, AP)	109
40K9772	6275	NEMA L6-20P	North America / Japan (C, LA, U, AP)	105
40K9773	6284	AS/NZS 3112	Australia / New Zealand	110
90Y3034	6289	16A/250V KSC 8305	South Korea (K)	110
40K9776	6285	IS6538	India (ASEAN)	112
40K9774	6288	GB 2099.1	China (GCG)	114
	6286	CNS 10917 (125V)	Taiwan (DNL)	113
90Y3035	6287	CNS 10917 (250V)	Taiwan (GCG)	113
40K9775	6277	16A/250V NBR 6147	Brazil (LA)	111
40K9777	6276	IRAM 2073	Argentina (LA)	112
	6290	15A/100V, C19 to JIS C-8303	Japan (DNL)	105
	6291	15A/200V, C19 to JIS C-8303	Japan (J)	105

Run times

The following tables display the run times the UPSs will provide at various loads and with additional battery packs. The Extended Battery Module (EBM) for these UPSs is: 55942BX.

55952AX (1950VA/1920W)

		Run time (minutes)*				
Percentage %	Load (W)	Internal Battery	EBM +1	EBM +2	EBM +3	EBM +4
20%	384	35	137	242	346	451
30%	576	21	83	150	218	286
40%	768	13	57	106	155	203
50%	960	9	40	75	109	143
60%	1152	6	32	59	82	114
70%	1344	5	27	49	66	94
80%	1536	4	22	40	53	78
90%	1728	3	18	34	43	65
100%	1920	3	15	29	36	57

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

55952KX (2200VA/1980W)

		Run time (minutes)*				
Percentage %	Load (W)	Internal Battery	EBM +1	EBM +2	EBM +3	EBM +4
20%	396	29	101	181	261	341
30%	594	16	66	124	182	240
40%	792	10	49	91	132	173
50%	990	7	35	66	97	128
60%	1188	6	30	56	81	106
70%	1386	4	25	45	65	84
80%	1584	3	21	38	54	70
90%	1782	2	19	34	49	64
100%	1980	2	17	30	44	58

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

Extended Battery Module (EBM) Connection

The connection for the 2200VA UPS to Extended Battery Module (EBM) is shown below. Up to 4 EBMs can be daisy chained together off 1 UPS.

Refer to the Run times section for details on the additional minutes the EBM(s) will give you at various loads.

Figure 33: 55952AX/EBM

Figure 32: 55952KX/EBM

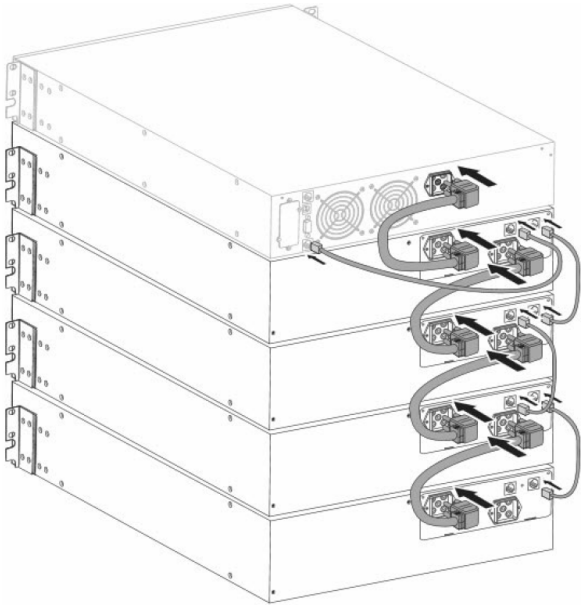


Figure 34: Rack EBM connection

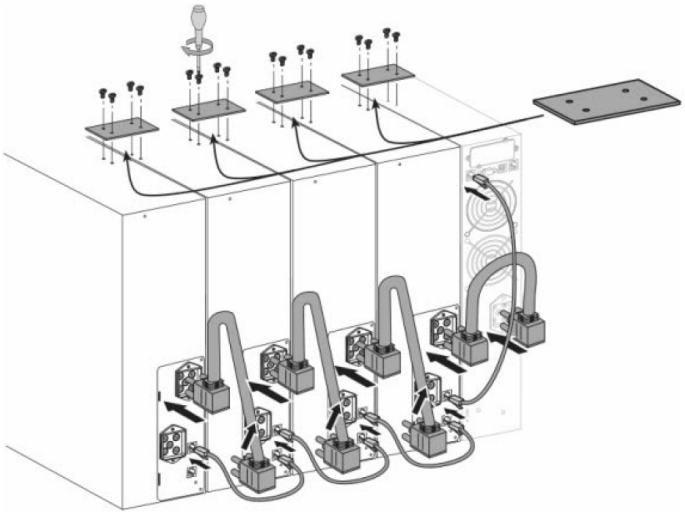
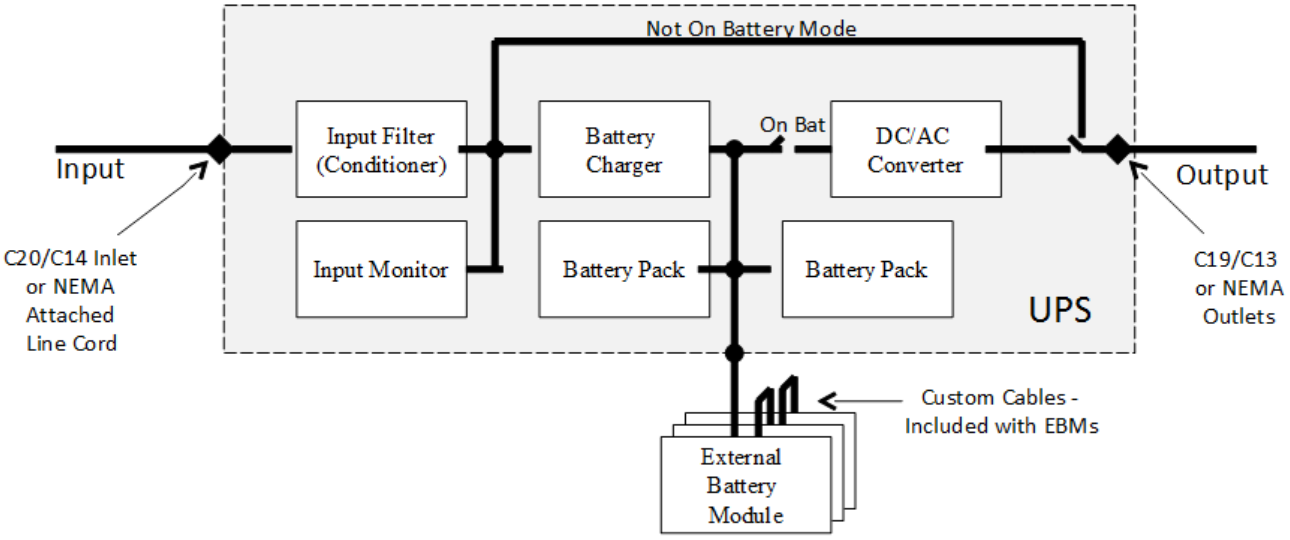


Figure 35: Tower EBM connection

Block Diagram

The following figure represents the block diagram for the 2200VA UPS.
Note: This is High Efficiency Mode: Bypass converters when AC is good; switch to battery when AC is bad.



Optional Accessories

The 2200VA UPSs can be ordered with the following optional accessories:

Part Number	Feature Code	Description	Additional info
46M4110	6145	Network Management Card (NMC)	Page 93
46M4113	6146	Environmental Monitoring Probe (EMP)	Page 94
55942BX	A53Y	Extended Battery Module (EBM) (Max 4)	Page 95

Figure 36: NMC

Figure 37: EMP

Figure 38: Extended Battery Module EBM

UPS 3000VA Rack

The following section discusses the 3000VA UPS at both 100-125VAC, and 200-240VAC. These UPSs ship standard with racking and tower hardware.

Specifications

The following table represents the specifications for 55943AX and 55943KX UPSs.

	UPS 3000VA			UPS 3000VA				
Part Number	55943AX			55943KX				
Feature Code	A53W			A53X				
Country / Region	North America			International				
Form Factor	Rack or Tower			Rack or Tower				
Rack U Space	2U			2U				
EBM Support	Yes (55943BX)			Yes (55943BX)				
EPOW Connection	Yes			Yes				
MBP Required	No			No				
NMC Standard	Optional			Standard				
Power Factor	0.9			0.9				
UPS Topology	Line interactive / High Efficiency / Sinewave output							
Energy Star	Compliant			Compliant				
Input	100-125V			200-240V				
Line Cord	8ft NEMA L5-30P attached			IEC 320 C20 detachable				
VinAC	100V*/120V/125V			200V/208V/220V/230V/240V				
Iin (A)	24 A @ 100-125V			16 A @ 200-240V				
Suggested Circuit	30A			16A/20A				
Output	100-125V			200-240V				
Vin (V)	100V	120V	125V	200V	208V	220V	230V	240V
Voltage (VA)	2400 VA	3000 VA	3000VA	2700VA	3000VA	3000 VA	3000 VA	3000 VA
Watts (W)	2160W	2700W	2700W	2430W	2700W	2700W	2700W	2700W
Iout (A)	24A	25A	24A	13.5A	14.5A	13.7A	13A	12.5A
Receptacles	6 x NEMA 5-20R, 1 x NEMA L5-30R			8 x IEC 320 C13, 1 x IEC 320 C19				

* The 3000VA UPS will incur 17% derating at 100V.

Front and Back View

The following figures are the front and back view of the 3000VA UPSs with 6xNEMA 5-20R, and 1xNEMA L5-30R outlet and (55943AX) and 8xIEC 320 C13, 1xIEC 320 C19 outlet (55943KX).

The 55943AX UPS has an attached 8ft NEMA 5-30P line cord. Refer to the North America & Japan 100/120V NEMA L5-30P section for additional details on the plug.

The 55943KX UPS has a selectable line cord based on the country/region it is installed in. Refer to the 3000VA line cord options for additional details on line cord options.

Figure 40: NEMA 5-20P outlets 55943AX

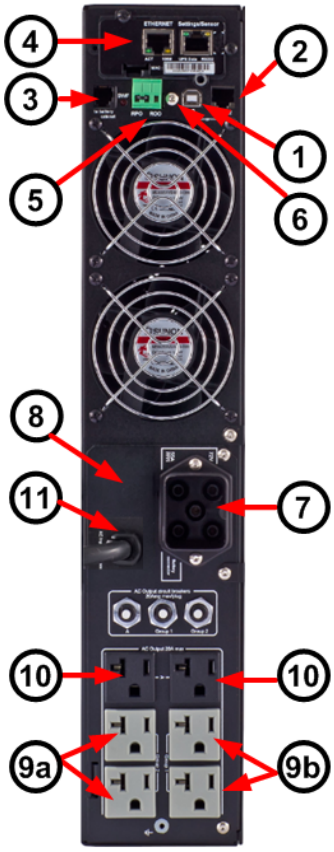
Figure 39: C13 outlets 55943KX

Figure 41: Front view rack

Outlet Diagrams

The following section shows the outlets on the rear of the UPSs.

3000VA UPS (100-125V) - 55943AX



1. USB communication port
2. RS232 communication port
3. Connector for automatic recognition of an additional battery pack
4. Slot where UPS Network Management Card (NMC) is installed
5. Connector for Remote On/Off (ROO) control or Remote Power Off (RPO) control
6. LED indicating site wiring fault (SWF) alarm
7. Connector for additional battery pack
8. 30A outlet (L5-30R) for connection of equipment (for 5PX 3000)

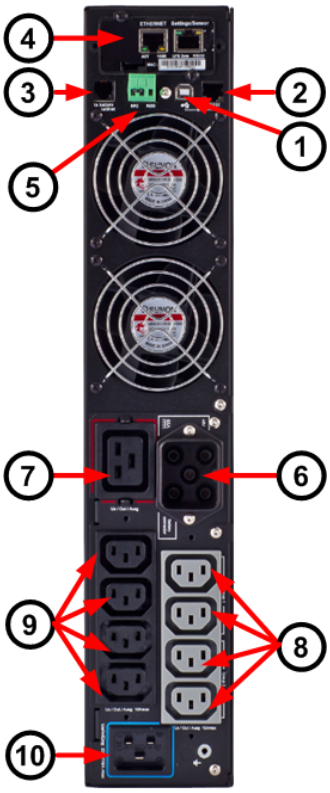
9a. Outlet Group 1: two programmable outlets for connection to equipment

9b. Outlet Group 2: two programmable outlets for connection to equipment

10. Primary outlet group: outlets for connection of critical equipment
11. Attached 8ft (2.5m) input power cord for AC-power source (L5-30P)

3000VA UPS (200-240V) - 55943KX

1. USB communication port
2. RS232 communication port
3. Connector for automatic recognition of an additional battery pack
4. Slot where UPS Network Management Card (NMC) is installed
5. Connector for Remote On/Off (ROO) control or Remote Power Off (RPO) control
6. Connector for battery packs
7. 16A outlet for connection of equipment (primary outlet group)
8. Two groups of two programmable outlets for connection of equipment (outlet groups 1 and 2)
9. Groups of four outlets for connection of equipment (primary outlet group)
10. Socket for connection to AC power source



Logical diagrams

The following figure shows the logical layout of the UPS outlets and input line cord. Yellow represents the programmable outlets for non-critical hardware. Blue represents the primary outlets.

55943AX (3000VA/2700W)

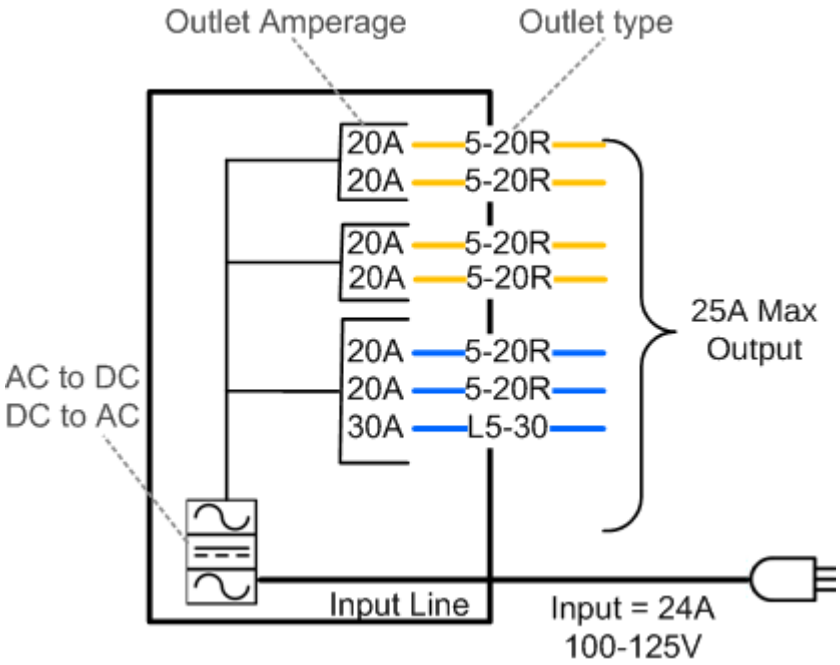


Figure 42: 55943AX logical layout

55943KX (3000VA/2700W)

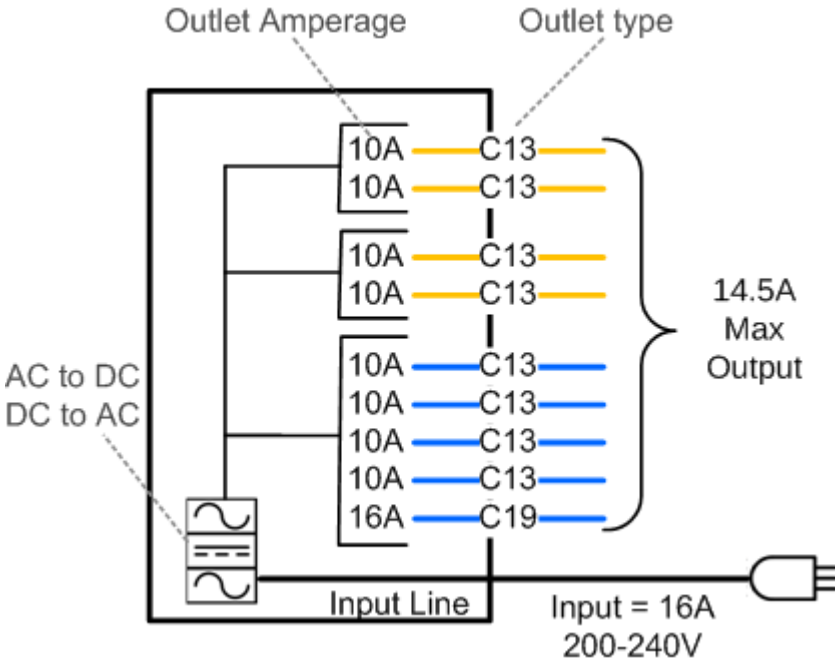


Figure 43: 55943KX logical layout

Line Cords

The 3000VA 100-125V UPS (55943AX) has an attached line cord. Refer to the North America & Japan 100/120V NEMA L5-30P section for additional details on the line cord.

The 3000VA 200-240V UPS (55943KX) has a selectable line cord based on country/region. The following table displays the orderable line cord options for the 3000VA UPS.

3000VA line cord options

These line cords are for 200-240V (55943KX) only. Unless otherwise stated, the length of these line cords is 4.3m.

Part Number	FC	Plug Type (C19 to...)	Country (Region)	Plug picture
40K9766	6279	CEE7-VII	Europe (E, AP)	105
40K9767	6278	1363/A w/13A fuse 220-240V	UK (E, AP)	109
40K9769	6283	IEC 309-P+N+G	Denmark / Switzerland (E)	106
40K9771	6282	SI 32	Israel (E)	108
40K9768	6281	CEI 23-16	Italy (E, LA)	108
40K9770	6280	SABS 164	South Africa (E, AP)	109
40K9772	6275	NEMA L6-20P	North America / Japan (C, LA, U, AP)	105
40K9773	6284	AS/NZS 3112	Australia / New Zealand	110
90Y3034	6289	16A/250V KSC 8305	South Korea (K)	110
40K9776	6285	IS6538	India (ASEAN)	112
40K9774	6288	GB 2099.1	China (GCG)	114
	6286	CNS 10917 (125V)	Taiwan (DNL)	113
90Y3035	6287	CNS 10917 (250V)	Taiwan (GCG)	113
40K9775	6277	16A/250V NBR 6147	Brazil (LA)	111
40K9777	6276	IRAM 2073	Argentina (LA)	112
	6290	15A/100V, C19 to JIS C-8303	Japan (DNL)	105
	6291	15A/200V, C19 to JIS C-8303	Japan (J)	105

Run times

The following tables display the run times the UPSs will provide at various loads and with additional battery packs. The Extended Battery Module (EBM) for these UPSs is: 55943BX.

55943AX (3000VA/2700W)

		Run time (minutes)*				
Percentage %	Load (W)	Internal Battery	EBM +1	EBM +2	EBM +3	EBM +4
10%	270	55	242	416	590	764
20%	540	30	144	247	349	452
30%	810	18	87	151	214	277
40%	1080	13	61	107	153	199
50%	1350	10	41	74	107	140
60%	1620	8	35	64	92	121
70%	1890	7	29	54	78	103
80%	2160	5	25	46	67	88
90%	2430	4	22	40	58	77
100%	2700	4	19	35	52	68

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

55943KX (3000VA/2700W)

		Run time (minutes)*				
Percentage %	Load (W)	Internal Battery	EBM +1	EBM +2	EBM +3	EBM +4
10%	270	65	240	437	636	833
20%	540	33	128	223	320	416
30%	810	21	84	152	218	285
40%	1080	14	59	108	157	205
50%	1350	10	44	80	116	152
60%	1620	8	37	69	100	131
70%	1890	5	31	57	83	110
80%	2160	4	26	49	72	95
90%	2430	3	23	45	66	87
100%	2700	3	21	40	60	79

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

Extended Battery Module (EBM) Connection

The connection for the 3000VA UPS to Extended Battery Module (EBM) is shown below. Up to 4 EBMs can be daisy chained together off 1 UPS.

Refer to the Run times section for details on the additional minutes the EBM(s) will give you at various loads.

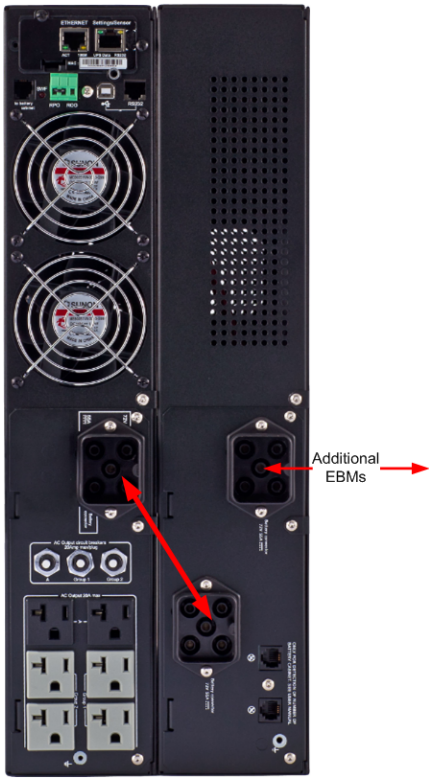


Figure 44: 55943AX/EBM

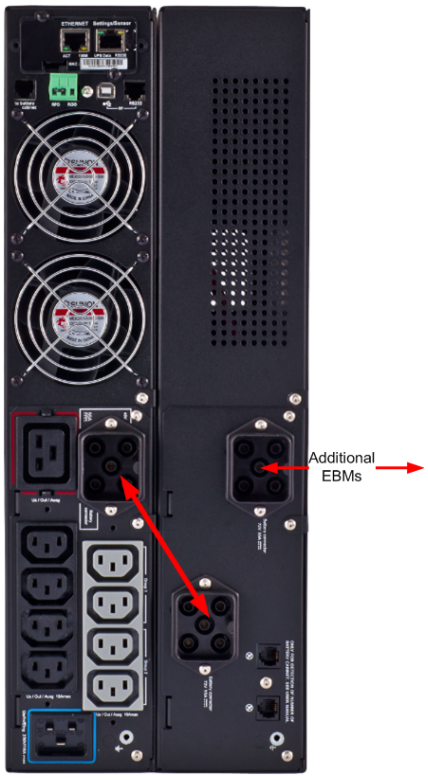


Figure 45: 55943KX/EBM

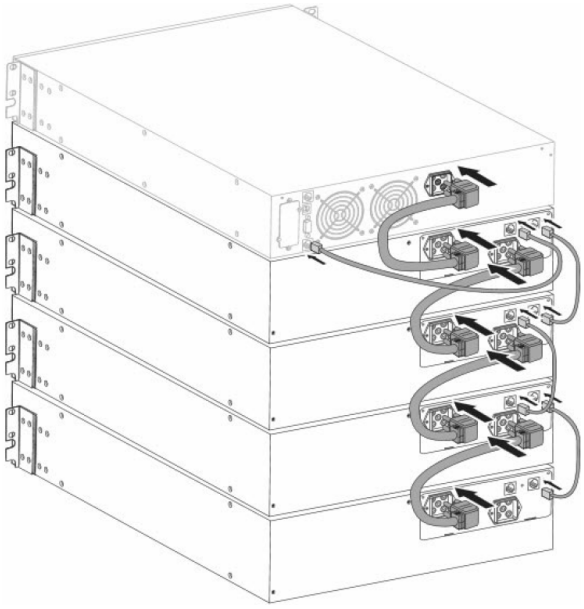


Figure 46: Rack EBM connection

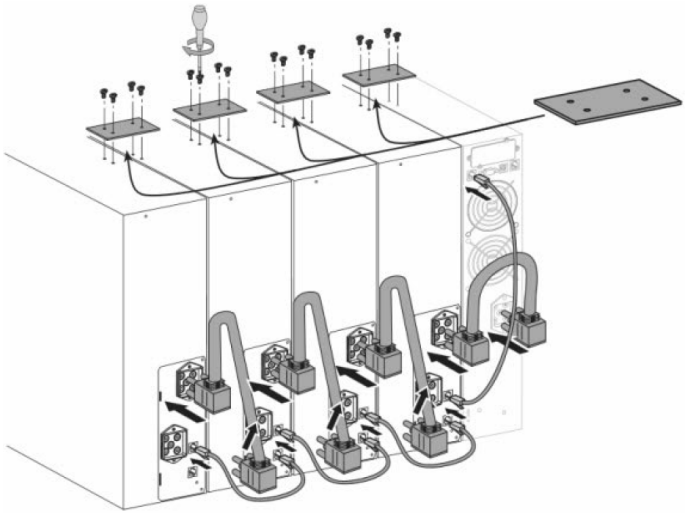
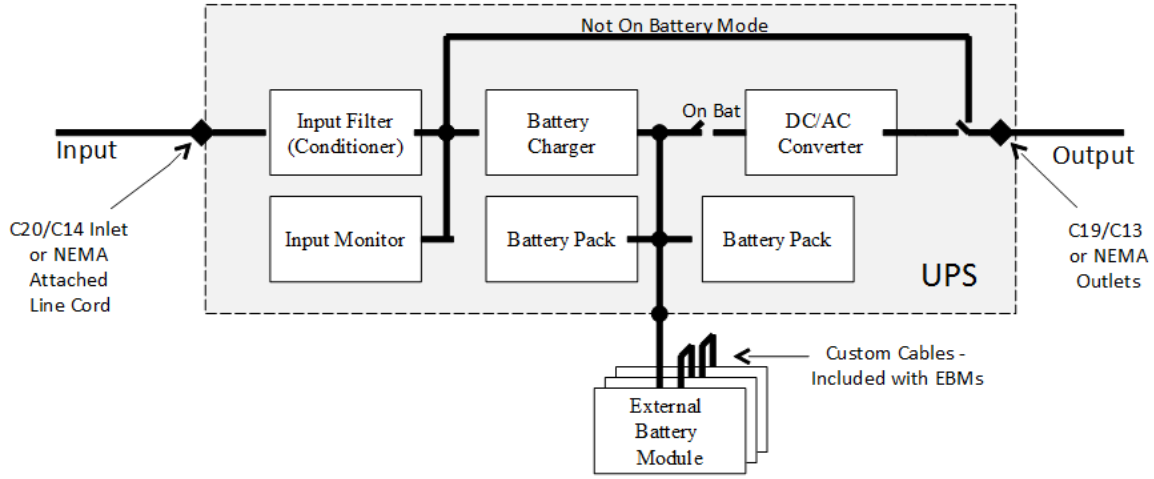


Figure 47: Tower EBM connection

Block Diagram

The following figure represents the block diagram for the 3000VA UPS.

Note: This is High Efficiency Mode: Bypass converters when AC is good; switch to battery when AC is bad.



Optional Accessories

The 3000VA UPSs can be ordered with the following optional accessories:

Part Number	Feature Code	Description	Additional info
46M4113	6146	Environmental Monitoring Probe (EMP)	Page 94
55943BX	A53Z	Extended Battery Module (EBM) (Max 4)	Page 95

Figure 48: EMP

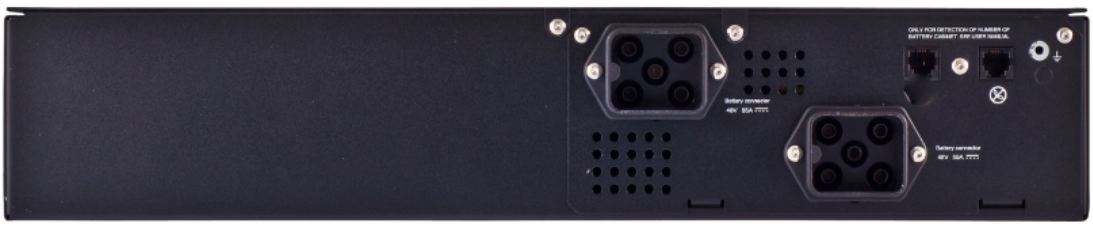


Figure 49: Extended Battery Module EBM

UPS 5000VA Rack

The following section discusses the 55945KX 5000VA UPS at 200-240VAC.
Note: The 5000VA UPS can not run at 100-125VAC. This UPS ship standard with racking hardware to install in a rack. This UPS also ships with hardware to stand upright as a tower. Refer to the Rack and Tower Kit section for additional details.

Specifications

The following table represents the specifications for the 55945KX UPS.

	UPS 5000VA				
Part Number	55945KX				
Feature Code	A540				
Country / Region	International				
Form Factor	Rack or Tower				
Rack U Space	3U				
EBM(s) Supported	Yes (55946BX)				
EPOW Connection	Yes				
MBP Required	No				
NMC Standard	Standard				
Power Factor	0.9				
UPS Topology	Online, Double Conversion				
Energy Star	Compliant				
Input	200-240V				
Line Cord	UTG/Cord				
VinAC	200V/208V/220V/230V/240V				
Iin (A)	24 A @ 200-208V 25A @ 220-240V				
Suggested Circuit Size	30A @ 200-208V 32A @ 220-240V				
Output	200-240V				
Vin (V)	200V	208V	220V	230V	240V
Voltage (VA)	5000VA	5000VA	5000VA	5000VA	5000VA
Watts (W)	4500W	4500W	4500W	4500W	4500W
Iout (A)	25A	24A	22.7A	21.7A	20.8A
Receptacles	8 x IEC 320 C13, 2 x IEC 320 C19				

Front and Back View

The following figures are the front and back view of the 5000VA UPSs with 8xIEC 320 C13, 2xIEC 320 C19 outlets (55945KX).

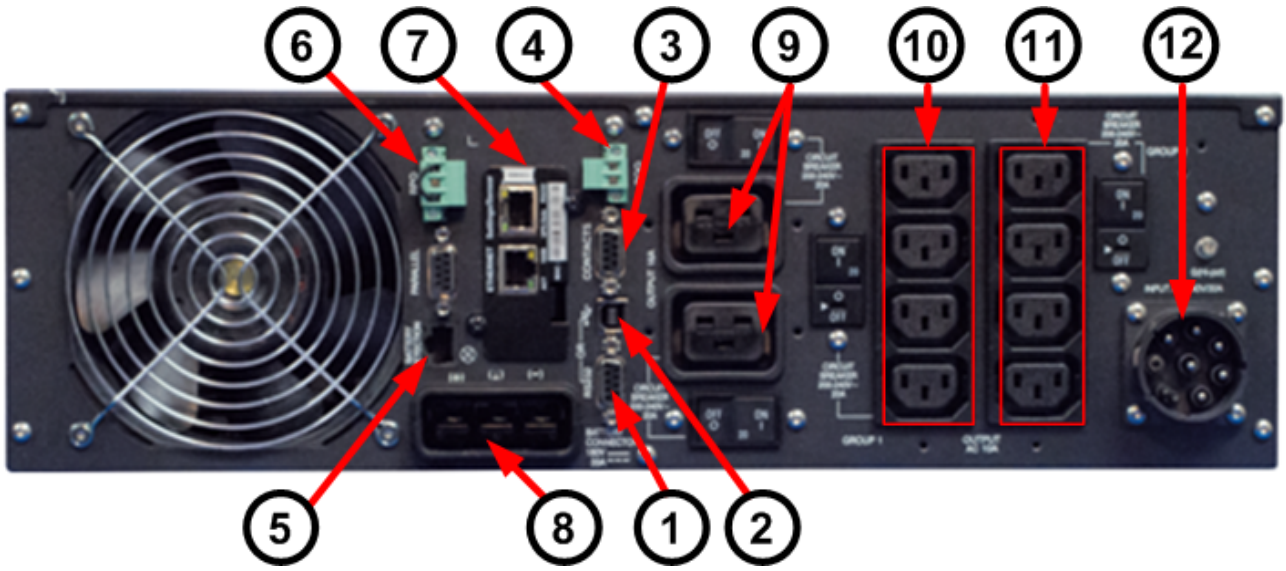
The 55945KX UPS has a selectable line cord based on the country/region it is installed in. Refer to the 5000VA line cord options for additional details on line cord options.

Figure 50: Front view rack

Figure 51: Rear view of the 55945KX

Outlet Diagrams

The following section shows the outlets on the rear of the UPS.



5000VA UPS (200-240V) - 55945KX

1. RS232 communication port
2. USB communication port
3. Dry (relay) contacts communication port
4. Connector for Remote On/Off (ROO) control or Remote Power Off (RPO) control
5. Connector for automatic recognition for an additional battery module
6. Connector for Remote On/Off (ROO) control or Remote Power Off (RPO) control
7. Slot for UPS Network Management Card (NMC)
8. Connector for additional battery modules (EBM)
9. Primary group: 16A outlets for connection of critical equipment
10. Group 1: (4) 10A programmable outlets for connection of equipment
11. Group 2: (4) 10A programmable outlets for connection of equipment
12. UTG Outlet

Logical diagram

The following figure shows the logical layout of the UPS outlets and input line cord.

Yellow and Blue represent the programmable outlets for connection of non-critical devices. Green and Red represent the primary outlets.

55945KX (5000VA/4500W)

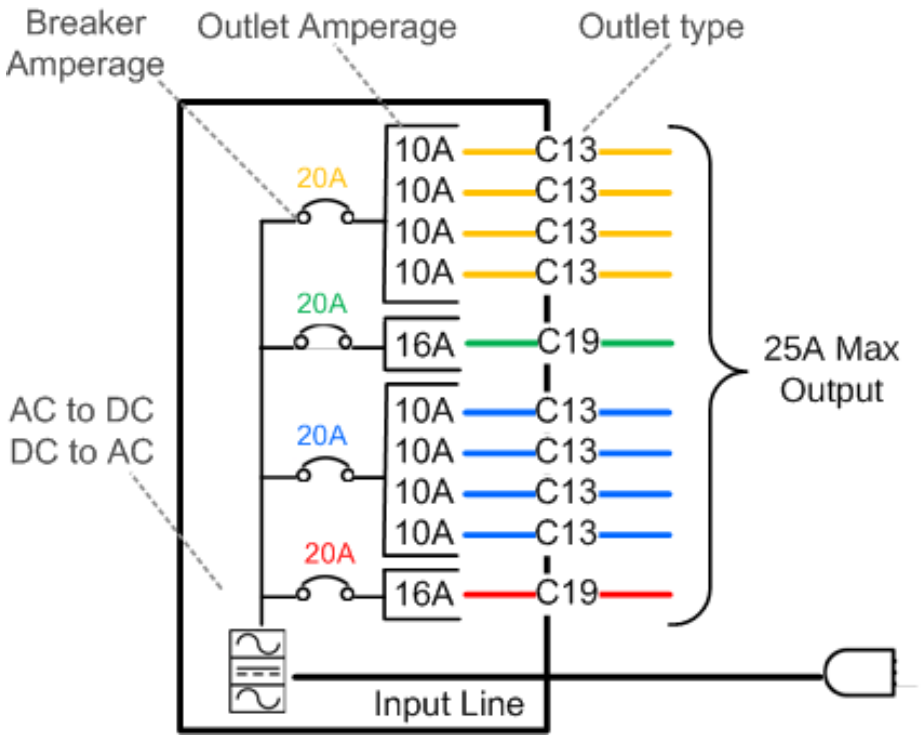


Figure 52: 55945KX logical layout

Line Cords

The 5000VA 200-240V UPS (55945KX) has a selectable line cord based on country/region. The following table displays the orderable line cord options for the 5000VA UPS.

5000VA line cord options

Unless otherwise stated, the length of these line cords is 4.3m

4.3m Line Cord	FC	Plug Type	Country
40K9614	6500	4.3m, 30A/208V, EPDU to NEMA L6-30P (US) Line Cord	US
40K9612	6502	4.3m, 32A/230V, EPDU to IEC 309 P+N+G (non-US) Line Cord	International (non-US)
40K9617	6505	4.3m, 32A/230V, Souriau UTG Female to AS/NZ 3112 (Aus/NZ) Line Cord	Aust/NZ
40K9618	6506	4.3m, 32A/250V, Souriau UTG Female to KSC 8305 (S. Korea) Line Cord	South Korea

Run times

The following tables display the run times the UPSs will provide at various loads and with additional battery packs. The Extended Battery Module (EBM) for these UPSs is: 55946BX. Up to 4 EBMs can be ordered.

55945KX (5000VA/4500W)

		Run time (minutes)*				
Percentage %	Load (W)	Internal Battery	EBM +1	EBM +2	EBM +3	EBM +4
25%	1125	27	103	175	262	377
50%	2250	11	48	88	123	167
75%	3375	5.3	27	53	83	109
100%	4500	3.4	20	38	54	80

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

Extended Battery Module (EBM) Connection

The connection for the 5000VA UPS to Extended Battery Module (EBM) is shown below. Up to 4 EBMs can be daisy chained together off 1 UPS.

Refer to the Run times section for details on the additional minutes the EBM(s) will give you at various loads.

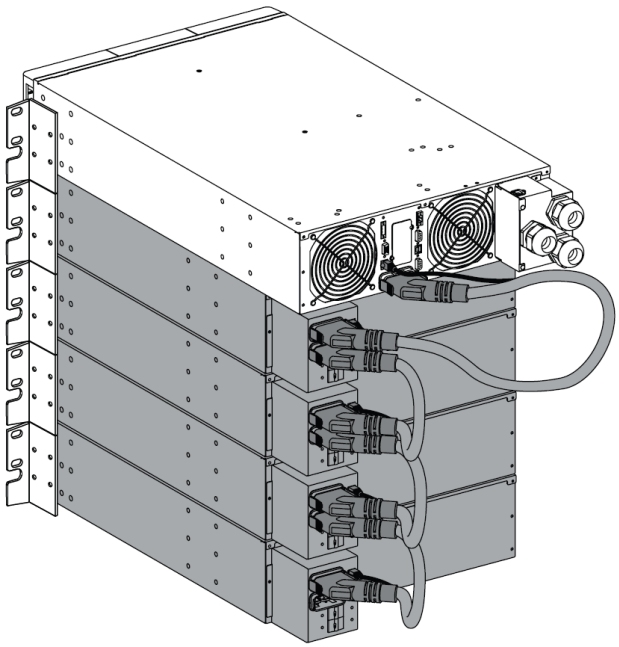


Figure 53: Rack EBM connection example

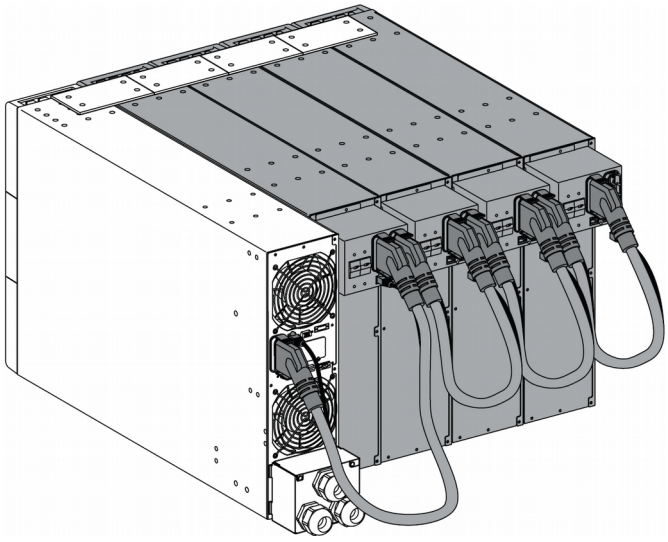
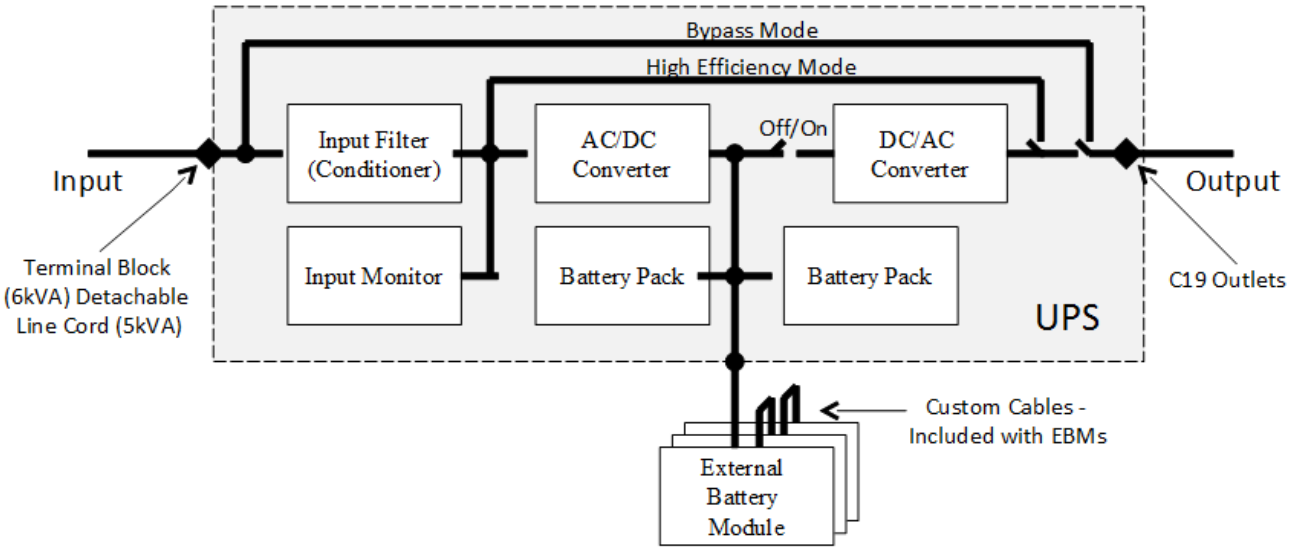


Figure 54: Tower EBM connection example

Block Diagram

The following figure represents the block diagram for the 5000VA UPS.
Note: This is Double Conversion: Converts AC to DC to AC.



Optional Accessories

The 5000VA UPS can be ordered with the following optional accessories:

Part Number	Feature Code	Description	Additional information
46M4113	6146	Environmental Monitoring Probe (EMP)	Page 94
55946BX	A540	Extended Battery Module (EBM) (Max qty 4)	Page 95

Figure 55: EMP

Figure 56: Extended Battery Module EBM

UPS 6000VA Rack

The following section discusses the 55946KX 6000VA UPS at 200-240VAC.
Note: The 6000VA UPS can not run at 100-125VAC.
This UPS ship standard with racking hardware to install in a rack. This UPS also ships with hardware to stand upright as a tower. Refer to the Rack and Tower Kit section for additional details.

Specifications

The following table represents the specifications for the 55946KX UPS.

	UPS 6000VA				
Part Number	55946KX				
Feature Code	A541				
Country / Region	International				
Form Factor	Rack or Tower				
Rack U Space	3U				
EBM Support	Yes (55946BX)				
EPOW Connection	Yes				
MBP Required	No				
NMC Standard	Standard				
Power Factor	0.9				
UPS Topology	Online, Double Conversion				
Energy Star	Compliant				
Input	200-240V				
Line Cord	Hardwired				
VinAC	200V/208V/220V/230V/240V				
Iin (A)	30A @ 200-240V				
Suggested Circuit Size	40A @ 200-208V 32A @ 220-240V				
Output	200-240V				
Vin (V)	200V	208V	220V	230V	240V
Voltage (VA)	6000VA	6000VA	6000VA	6000VA	6000VA
Watts (W)	5400W	5400W	5400W	5400W	5400W
Iout (A)	30A	28.8A	27.3A	26.1A	25A
Receptacles	8 x IEC 320 C13, 2 x IEC 320 C19, 1 Hardwire Out				

Front and Back View

The following figures are the front and back view of the 6000VA UPS with 8xIEC 320 C13, 2xIEC 320 C19 outlets (55946KX).

The 55946KX UPS has a hardwired line cord.

Figure 57: Front view rack

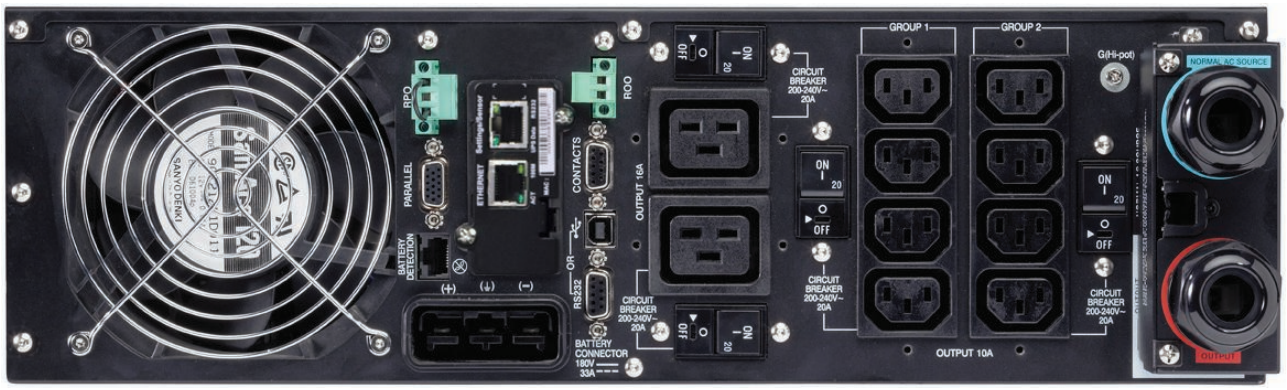
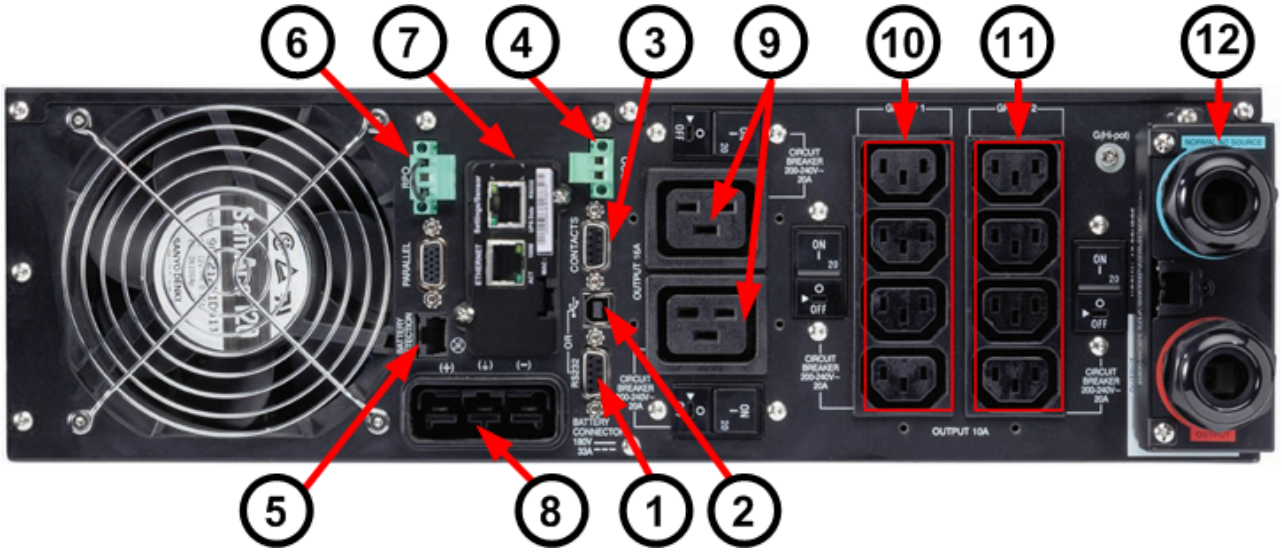


Figure 58: Rear view of the 55945KX

Outlet Diagrams

The following section shows the outlets on the rear of the UPS.



6000VA UPS (200-240V) - 55946KX

1. RS232 communication port
2. USB communication port
3. Dry (relay) contacts communication port
4. Connector for Remote On/Off (ROO) control or Remote Power Off (RPO) control
5. Connector for automatic recognition for an additional battery module
6. Connector for Remote On/Off (ROO) control or Remote Power Off (RPO) control
7. Slot for UPS Network Management Card (NMC)
8. Connector for additional battery modules (EBM)
9. Primary group: 16A outlets for connection of critical equipment
10. Group 1: (4) 10A programmable outlets for connection of equipment
11. Group 2: (4) 10A programmable outlets for connection of equipment
12. Input/Output terminal blocks

Logical diagrams

The following figure shows the logical layout of the UPS outlets and input line cord.

Yellow and Blue represent the programmable outlets for connection of non-critical devices. Green and Red represent the primary outlets.

55946KX (6000VA/5400W)

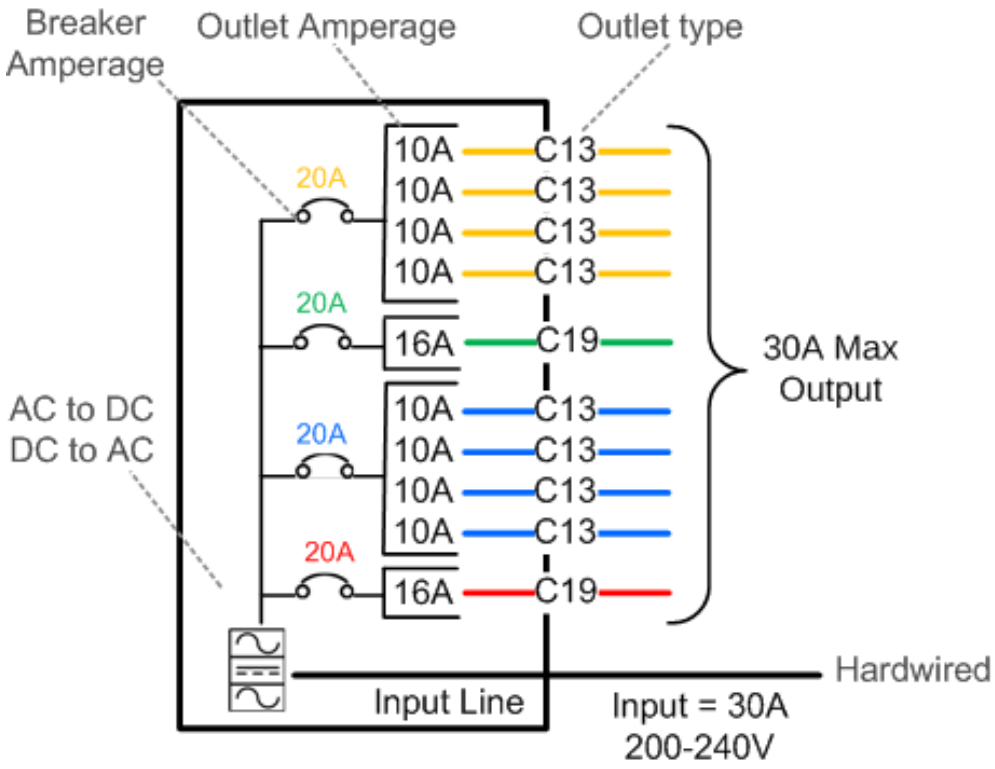


Figure 59: 55946KX logical layout

Line Cords

The 6000VA 200-240V UPS (55946KX) has a hardwired input line cord and cannot be ordered separately.

Run times

The following tables display the run times the UPSs will provide at various loads and with additional battery packs. The Extended Battery Module (EBM) for these UPSs is: 55946BX. Up to 4 EBMs can be ordered.

55946KX (6000VA/5400W)

		Run time (minutes)*				
Percentage %	Load (W)	Internal Battery	EBM +1	EBM +2	EBM +3	EBM +4
25%	1350	22	85	147	214	287
50%	2700	8.5	38	71	104	133
75%	4050	4.5	24	45	62	90
100%	5400	3	16	27	47	58

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

Extended Battery Module (EBM) Connection

The connection for the 6000VA UPS to Extended Battery Module (EBM) is shown below. Up to 4 EBMs can be daisy chained together off 1 UPS.

Refer to the Run times section for details on the additional minutes the EBM(s) will give you at various loads.

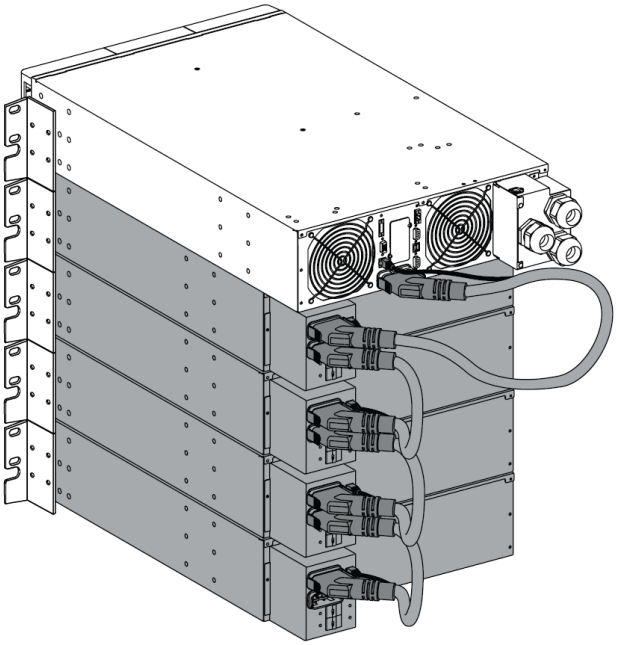


Figure 60: Rack EBM connection example

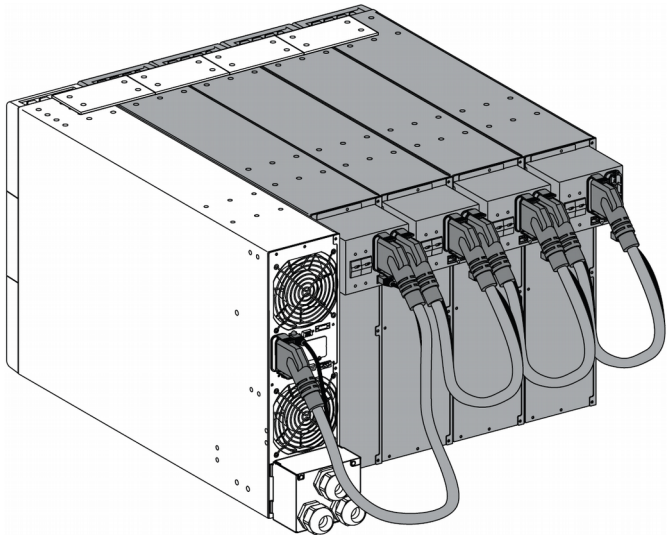
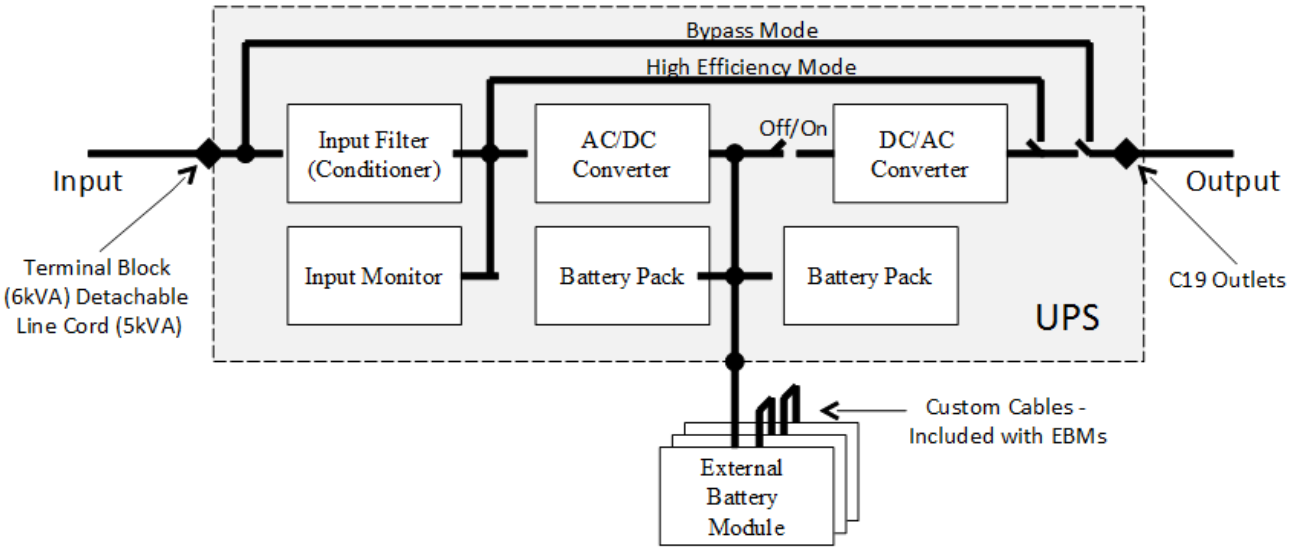


Figure 61: Tower EBM connection example

Block Diagram

The following figure represents the block diagram for the 6000VA UPS.
Note: This is Double Conversion: Converts AC to DC to AC.



Optional Accessories

The 6000VA UPS can be ordered with the following optional accessories:

Part Number	Feature Code	Description	Additional information
46M4113	6146	Environmental Monitoring Probe (EMP)	Page 94
55946BX	A541	Extended Battery Module (EBM) (Max qty 4)	Page 95

Figure 62: EMP

Figure 63: Extended Battery Module EBM

UPS 8000VA Rack

This section discusses the 8000VA UPS at both 200-240VAC, and 380-415VAC.

Specifications

The following table represents the specifications for 55948KX and 55948PX UPSs.

	UPS 8000VA					UPS 8000VA				
Part Number	55948KX					55948PX				
Feature Code	A543					A546				
Country	International					International				
Form Factor	Rack or Tower					Rack or Tower				
Rack U Space	6U					6U				
EBM Support	Yes (55949BX)					Yes (55949BX)				
EPOW Conn	Yes					Yes				
MBP Required	Yes, single phase					Yes, three phase				
NMC Standard	Standard					Standard				
Power Factor	0.9					0.9				
UPS Topology	Online / Double conversion									
Energy Star	Compliant					Compliant				
Input	200-240V					380-415V				
Line Cord	Hardwired					Hardwired				
VinAC	200V/208V/220V/230V/240V					200V/208V/220V/230V/240V				
Iin (A)	40A @ 200-240V					40A @ 200-240V*/ 13.3A @ 380-415V				
Suggested Circuit Size	50A @ 200-208V 40A @ 220-240V					16A @ 380-415V				
Output	200-240V					380-415V				
Vin (V)	200V	208V	220V	230V	240V	200V	208V	220V	230V	240V
Voltage (VA)	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
Watts (W)	7200	7200	7200	7200	7200	7200	7200	7200W	7200	7200
Iout (A)	40A	38.5A	36.4A	34.8A	33.3A	40A	38.5A	36.4A	34.8A	33.3A
Receptacles	4 x IEC 320 C19, 1 Hardwire Out					4 x IEC 320 C19, 1 Hardwire Out				

*These numbers are for the 1-phase bypass input. If the bypass input is not wired separately, the upstream 3-phase circuit breaker must meet this current requirement.

Front and Back View

The following figures are the front and back view of the 8000VA UPSs with EBM and MBP, 4xIEC 320 C19 outlets.

Figure 64: Front view rack

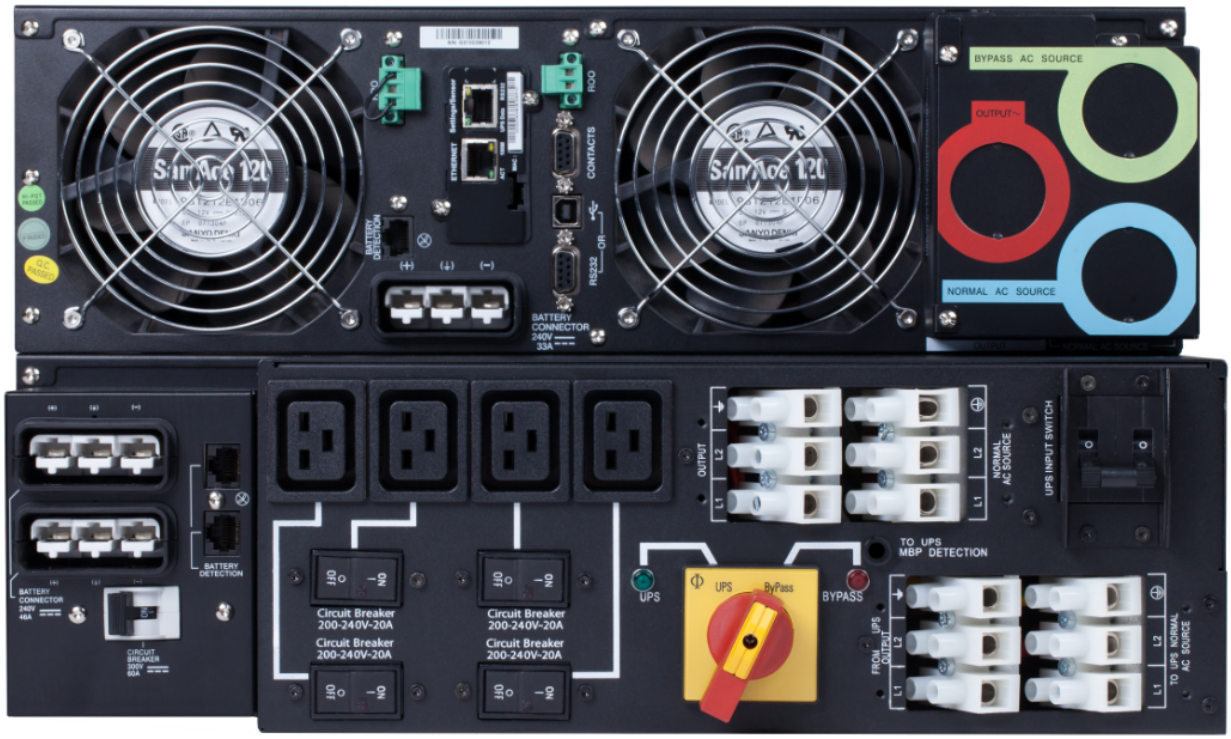
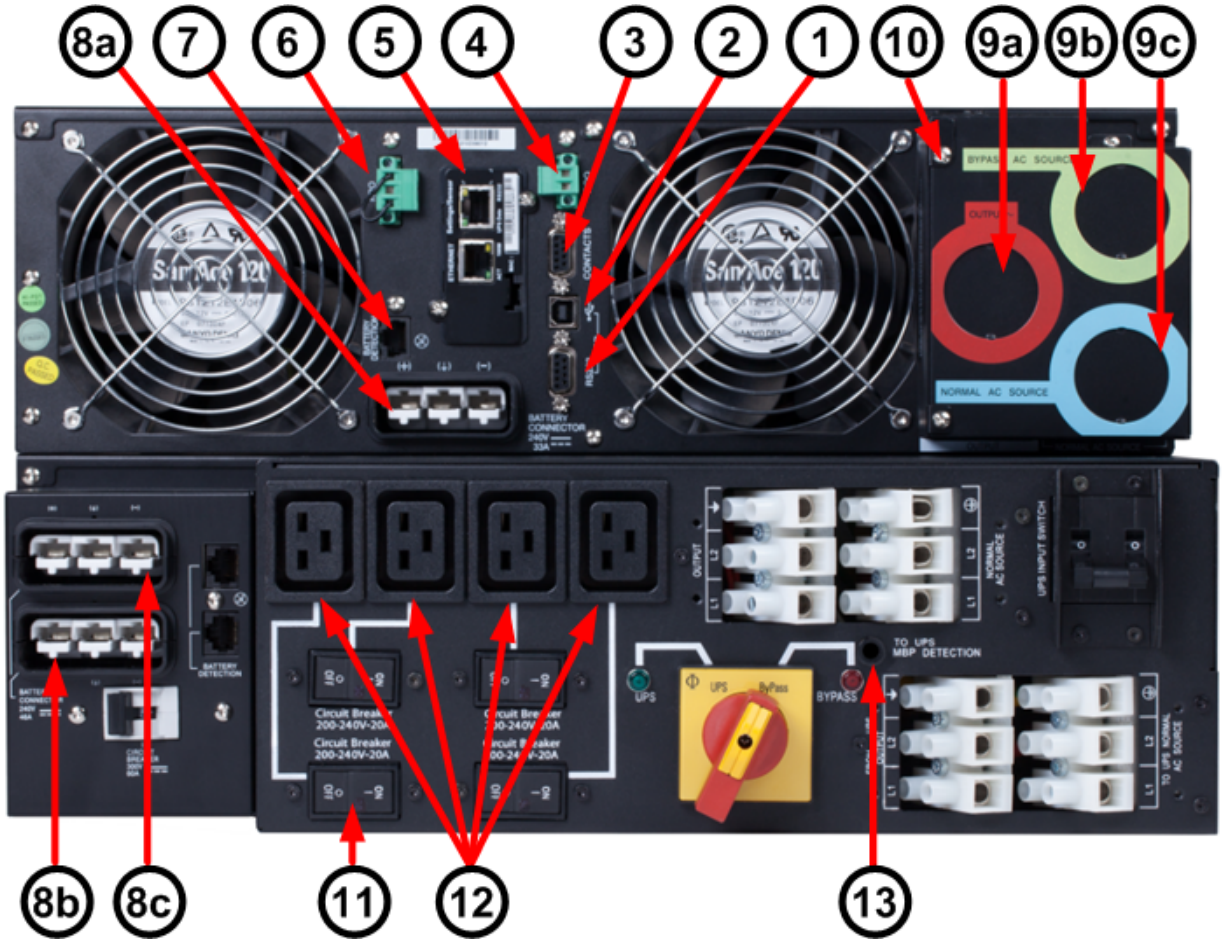


Figure 65: 8000VA UPS rear with MBP and EBM and MBP module

Outlet Diagrams

The following section shows the outlets on the rear of the UPSs/MBP with 4 x C19 outlets.



8000VA UPS (200-240V, 380-415V) - 55948KX and 55948PX

1. RS232 communication port
2. USB communication port
3. Dry (relay) contacts communication port
4. Connector for Remote On/Off (ROO) control
5. Slot where UPS Network Management Card (NMC) is installed
6. Connector for Remote Power Off (RPO) control
7. Connectors for automatic recognition of battery module
8. Connector for battery module power: **a.** Connector EBMs (up to 4) **b.** EBM to EBM connector, **c.** EBM to UPS connector
9. Terminal blocks for AC power input and output: **a.**Output, **b.** Bypass input, **c.** Input
10. Connector for HotSwap detection
11. Circuit breakers
12. 4xGroups: 20A outlets for connection of equipment
13. MBP detection

Logical diagrams

The following figure shows the logical layout of the UPS outlets and input line cord.

55948KX (8000VA/7200W)

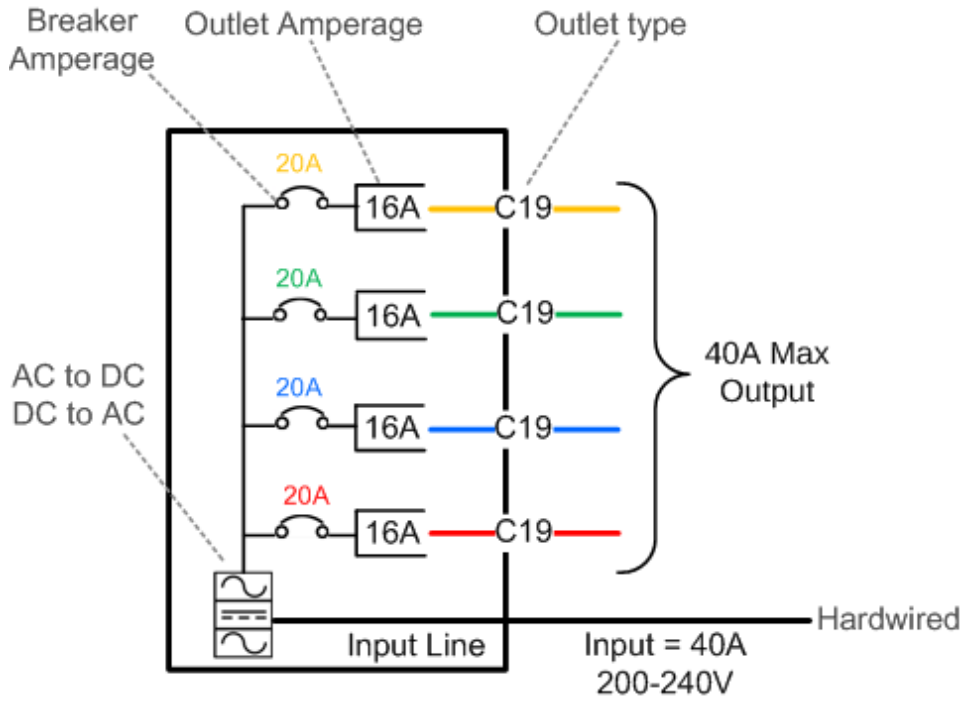


Figure 66: 55948KX logical layout

55948PX (8000VA/7200W)

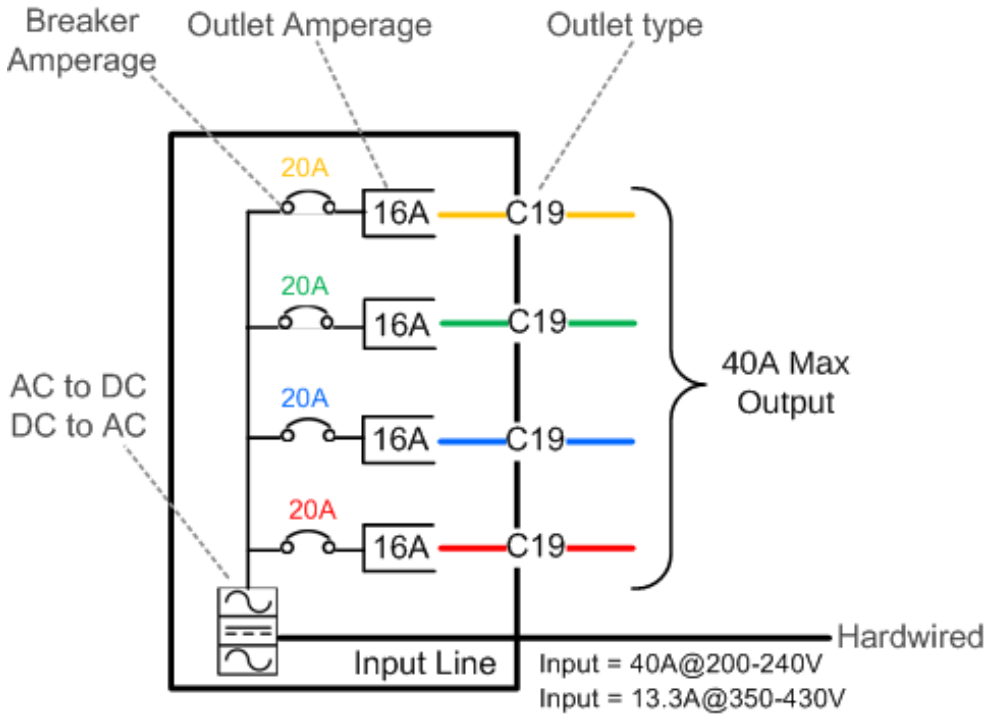


Figure 67: 55948PX logical layout

Line Cords

The 8000VA UPSs have a hardwired input line cord and cannot be ordered separately.

Run times

The following tables display the run times the UPSs will provide at various loads and with additional battery packs. The Extended Battery Module (EBM) for these UPSs is: 55949BX. Up to 4 EBMs can be ordered.

55948KX (8000VA/7200W)

		Run time (minutes)*				
Percentage %	Load (W)	Internal Battery	EBM +1	EBM +2	EBM +3	EBM +4
25%	1800	35	85	140	173	220
50%	3600	16	36	65	86	118
75%	5400	9	23	36	53	72
100%	7200	5	16	27	36	50

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

55948PX (8000VA/7200W)

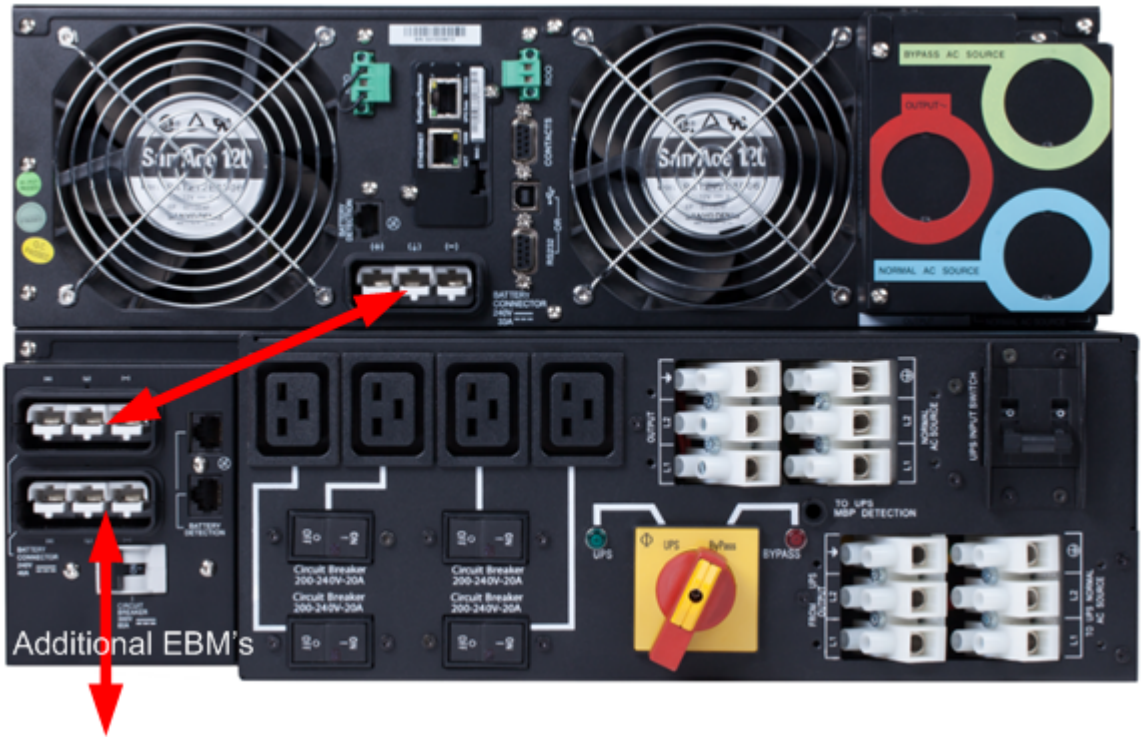
		Run time (minutes)*				
Percentage %	Load (W)	Internal Battery	EBM +1	EBM +2	EBM +3	EBM +4
25%	1800	35	85	140	173	220
50%	3600	16	36	65	86	118
75%	5400	9	23	36	53	72
100%	7200	5	16	27	36	50

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

Extended Battery Module (EBM) Connection

The connection for the 8000VA UPS to Extended Battery Module (EBM) is shown below. Up to 4 EBMs can be daisy chained together off 1 UPS.

Refer to the Run times section for details on the additional minutes the EBM(s) will give you at various loads.



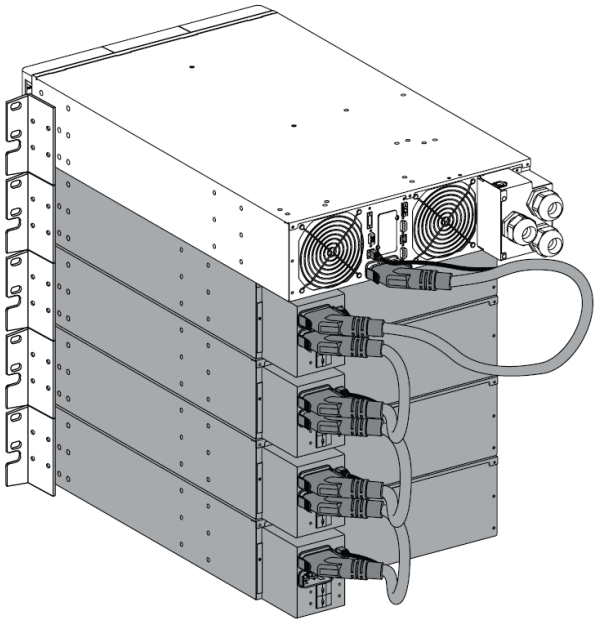


Figure 68: Rack EBM connection example

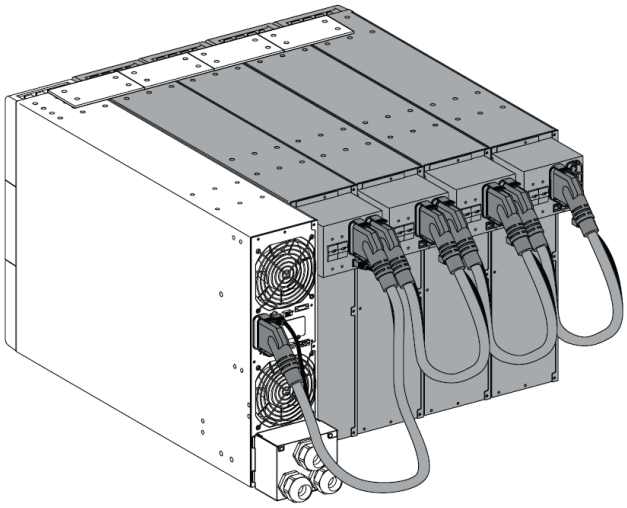
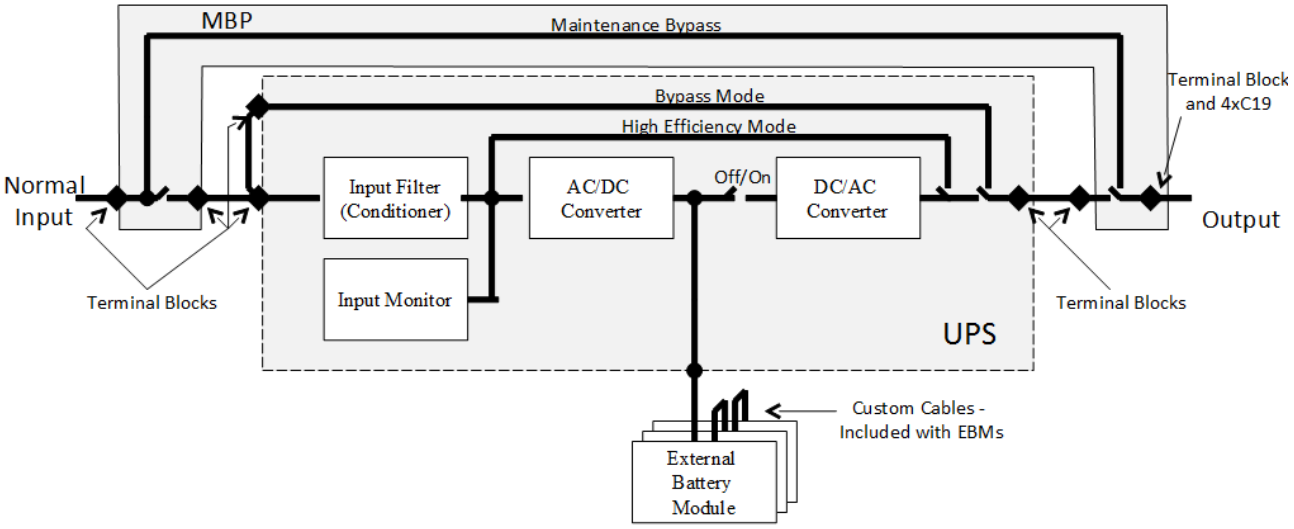


Figure 69: Tower EBM connection example

Block Diagram with Maintenance Bypass Module (MBP)

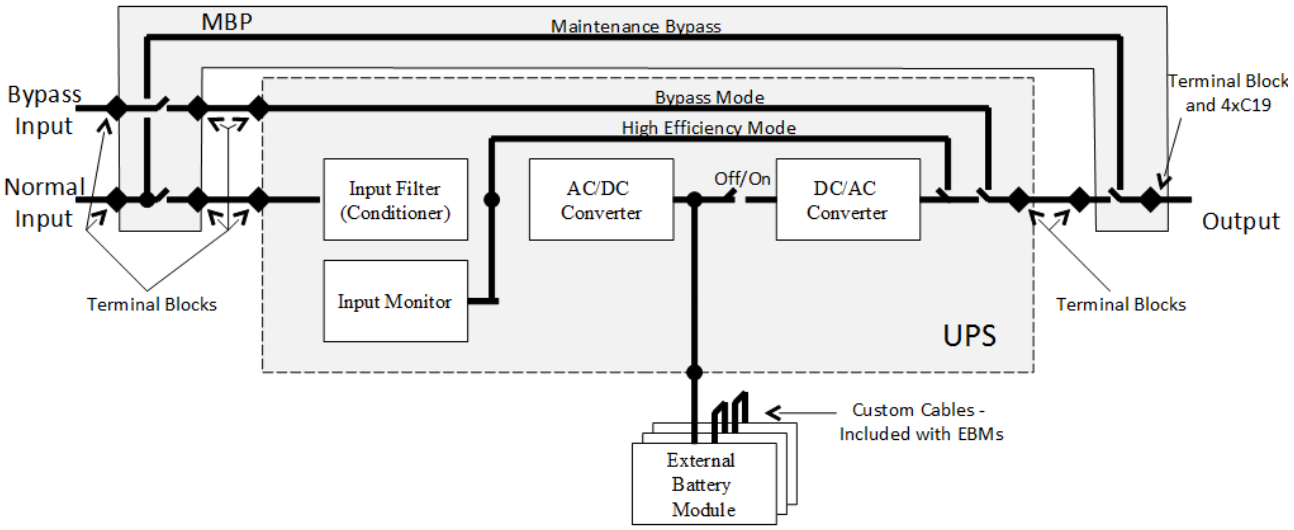
The following figure represents the block diagram for the 8000VA UPS single phase.

Note: This is Double Conversion: Converts AC to DC to AC.



The following figure represents the block diagram for the 8000VA UPS three phase.

Note: This is Double Conversion: Converts AC to DC to AC.



For additional information on the Maintenance Bypass module, refer to the Maintenance Bypass (MBP) section.

Optional Accessories

The 8000VA UPSs can be ordered with the following optional accessories:

Part Number	Feature Code	Description	Additional information
46M4113	6146	Environmental Monitoring Probe (EMP)	Page 94
55949BX	A545	Extended Battery Module (EBM) (Max qty 4)	Page 95

Figure 70: EMP

Figure 71: Extended Battery Module EBM

UPS 11000VA Rack

The following section discusses the 11000VA UPS at both 200-240VAC, and 380-415VAC. These UPSs ship standard with racking and tower hardware.

Specifications

The following table represents the specifications for 55949KX and 55949PX UPSs.

	UPS 11000VA					UPS 11000VA				
Part Number	55949KX					55949PX				
Feature Code	A544					A547				
Country / Region	International					International				
Form Factor	Rack or Tower					Rack or Tower				
Rack U Space	6U					6U				
EBM Support	Yes (55949BX)					Yes (55949BX)				
EPOW Conn	Yes					Yes				
MBP Required	Yes, single phase					Yes, three phase				
NMC Standard	Standard					Standard				
Power Factor	0.9					0.9				
UPS Topology	Online / Double conversion									
Energy Star	Compliant					Compliant				
Input	200-240V					380-415V				
Line Cord	Hardwired					Hardwired				
VinAC	200V/208V/220V/230V/240V					200V/208V/220V/230V/240V				
Iin (A)	50A @ 200-240V					50A @ 200-240V*/16.7A @ 380-415V				
Suggested Circuit Size	70A @ 200-208V 50A @ 220-240V					32A @ 380-415V				
Output	200-240V					380-415V				
Vin (V)	200V	208V	220V	230V	240V	200V	208V	220V	230V	240V
Voltage (VA)	10000	10000	11000	11000	11000	10000	10000	11000	11000	11000
Watts (W)	9000	9000	9900	10000	10000	9000	9000	9900	10000	10000
Iout (A)	50A	48.1A	50A	47.8A	45.8A	50A	48.1A	50A	47.8A	45.8A
Receptacles	4 x IEC 320 C19, 1 Hardwire Out					4 x IEC 320 C19, 1 Hardwire Out				

*These numbers are for the 1-phase bypass input. If the bypass input is not wired separately, the upstream 3-phase circuit breaker must meet this current required.

Front and Back View

The following figures are the front and back view of the11000VA UPS with EBM, and MBP 4xIEC 320 C19 outlets..

The 55949KX and 55949PX have a hardwired line cord.

Figure 72: Front view rack

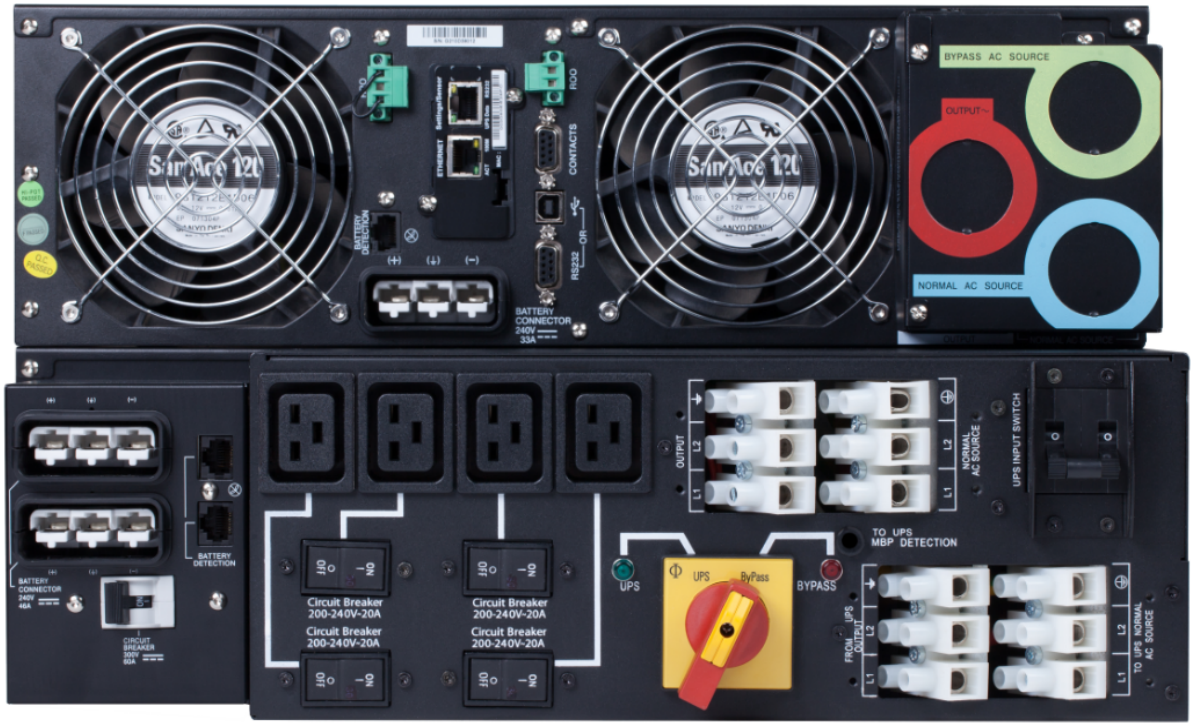
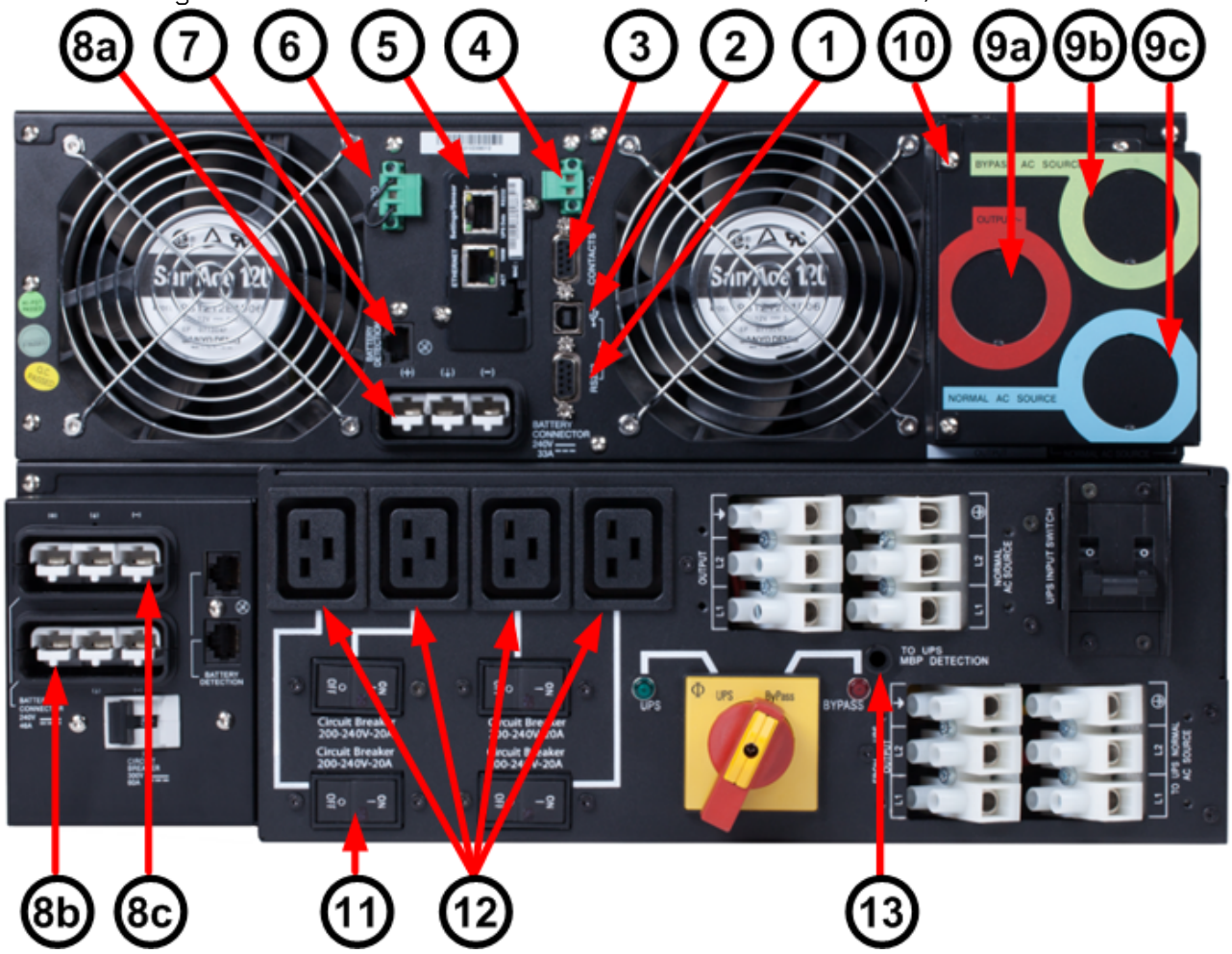


Figure 73: 11000VA UPS rear with EBM and MBP

Outlet Diagrams

The following section shows the outlets on the rear of the UPSs/MBP with EBM.



11000VA UPS (200-240V, 380-415V) - 55949KX and 55949PX

1. RS232 communication port
2. USB communication port
3. Dry (relay) contacts communication port
4. Connector for Remote On/Off (ROO) control
5. Slot where UPS Network Management Card (NMC) is installed
6. Connector for Remote Power Off (RPO) control
7. Connectors for automatic recognition of battery module
8. Connector for battery module power: **a.** Connector EBMs (up to 4) **b.** EBM to EBM connector, **c.** EBM to UPS connector
9. Terminal blocks for AC power input and output: **a.**Output, **b.** Bypass input, **c.** Input
10. Connector for HotSwap MBP detection
11. Circuit breakers
12. 4xGroups: 20A outlets for connection of equipment
13. MBP detection

Logical diagrams

The following figure shows the logical layout of the UPS outlets and input line cord.

55949KX (11000VA/10000W)

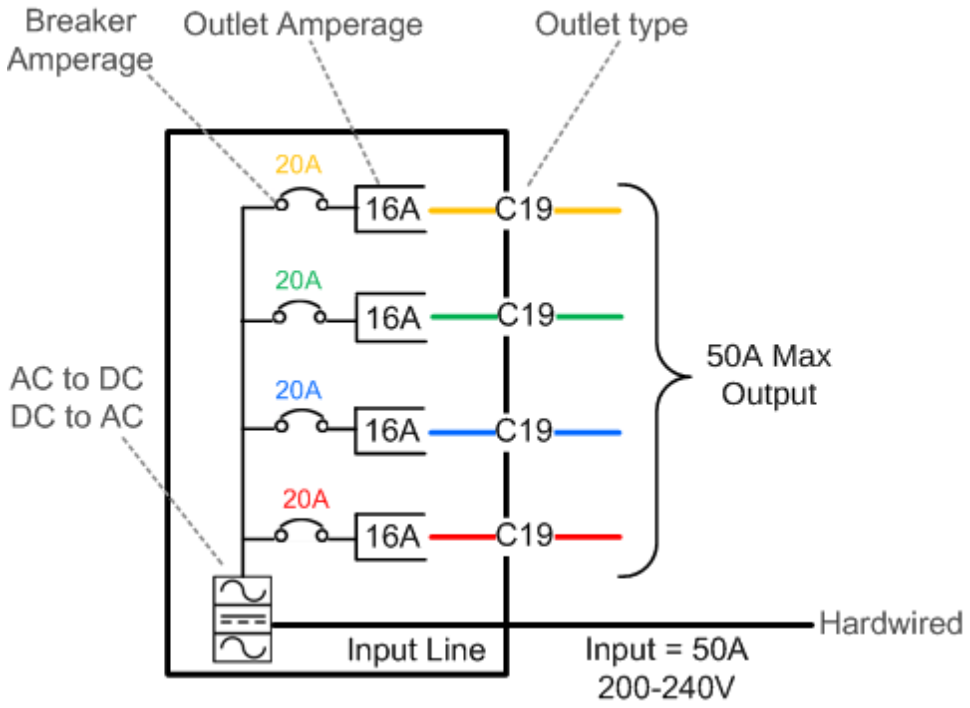


Figure 74: 55949KX logical layout

55949PX (11000VA/10000W)

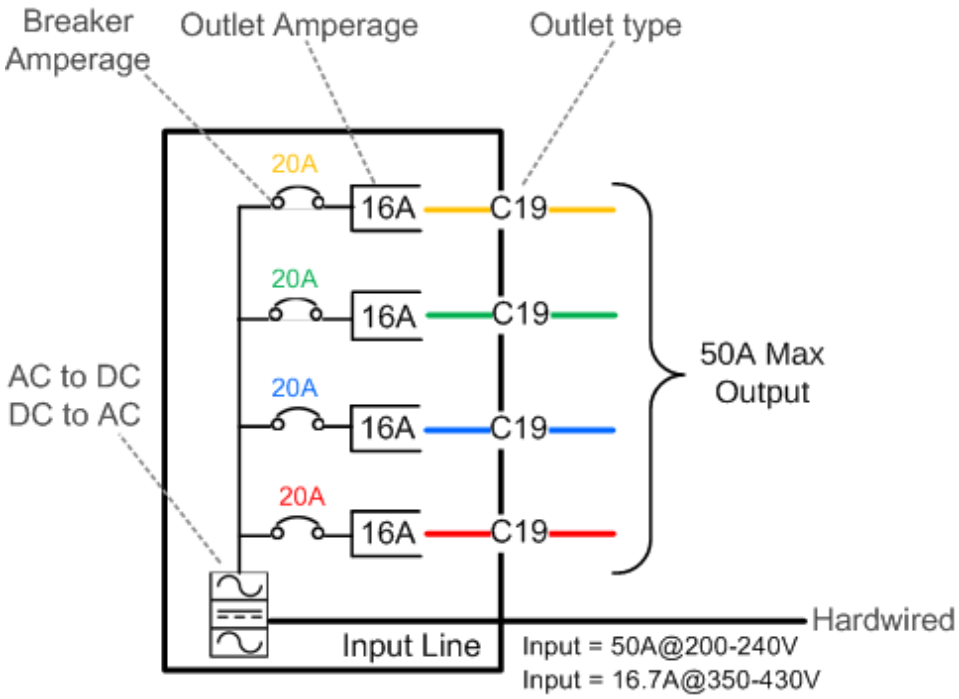


Figure 75: 55949PX logical layout

Line Cords

The 11000VA UPSs have a hardwired input line cord and cannot be ordered separately.

Run times

The following tables display the run times the UPSs will provide at various loads and with additional battery packs. The Extended Battery Module (EBM) for these UPSs is: 55949BX. Up to 4 EBMs can be ordered.

55949KX (11000VA/10000W)

		Run time (minutes)*				
Percentage %	Load (W)	Internal Battery	EBM +1	EBM +2	EBM +3	EBM +4
25%	2500	25	60	97	136	163
50%	5000	10	25	42	61	79
75%	7500	5.5	15	25	37	48
100%	10000	3	10	18	25	34

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

55949PX (11000VA/10000W)

		Run time (minutes)*				
Percentage %	Load (W)	Internal Battery	EBM +1	EBM +2	EBM +3	EBM +4
25%	2500	25	60	97	136	163
50%	5000	10	25	42	61	79
75%	7500	5.5	15	25	37	48
100%	10000	3	10	18	25	34

* Battery backup times are approximate and may vary with equipment, configuration, battery age, temperature, etc.

Extended Battery Module (EBM) Connection

The connection for the 11000VA UPS to Extended Battery Module (EBM) is shown below. Up to 4 EBMs can be daisy chained together off 1 UPS.

Refer to the Run times section for details on the additional minutes the EBM(s) will give you at various loads.

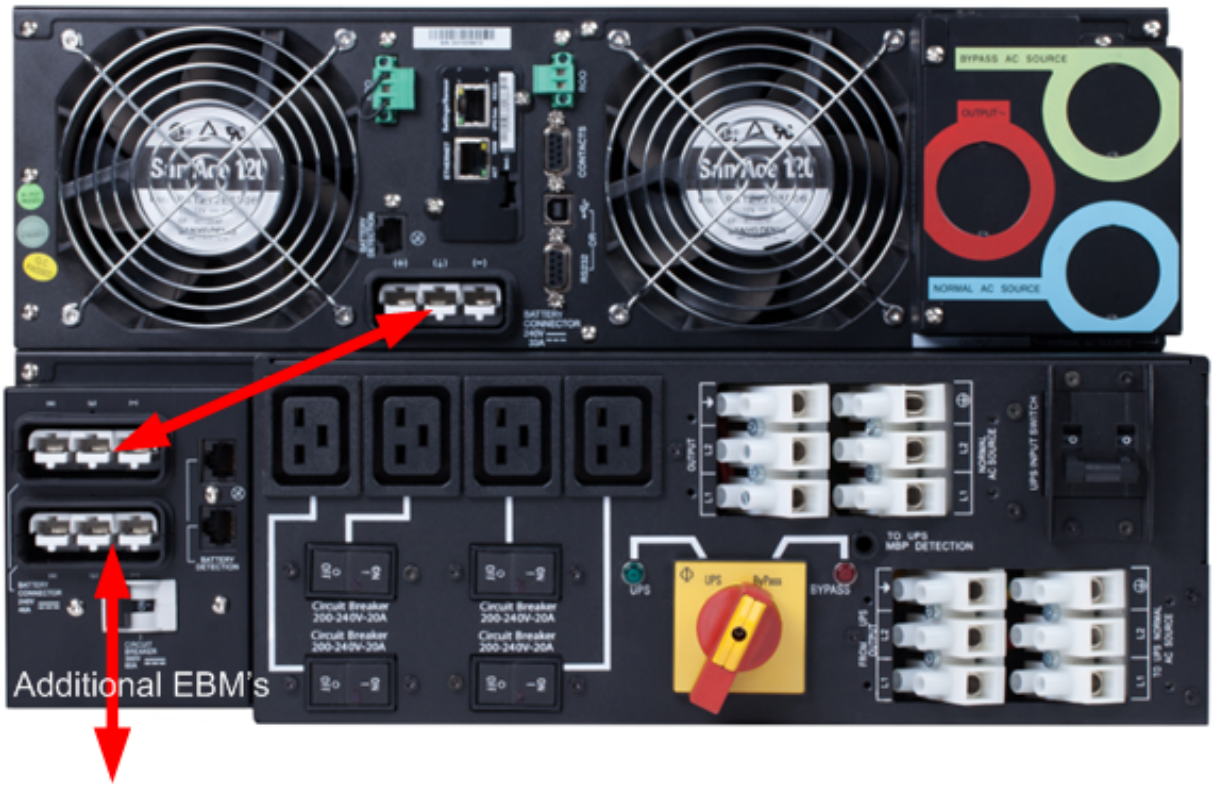


Figure 76: Rack EBM connection example

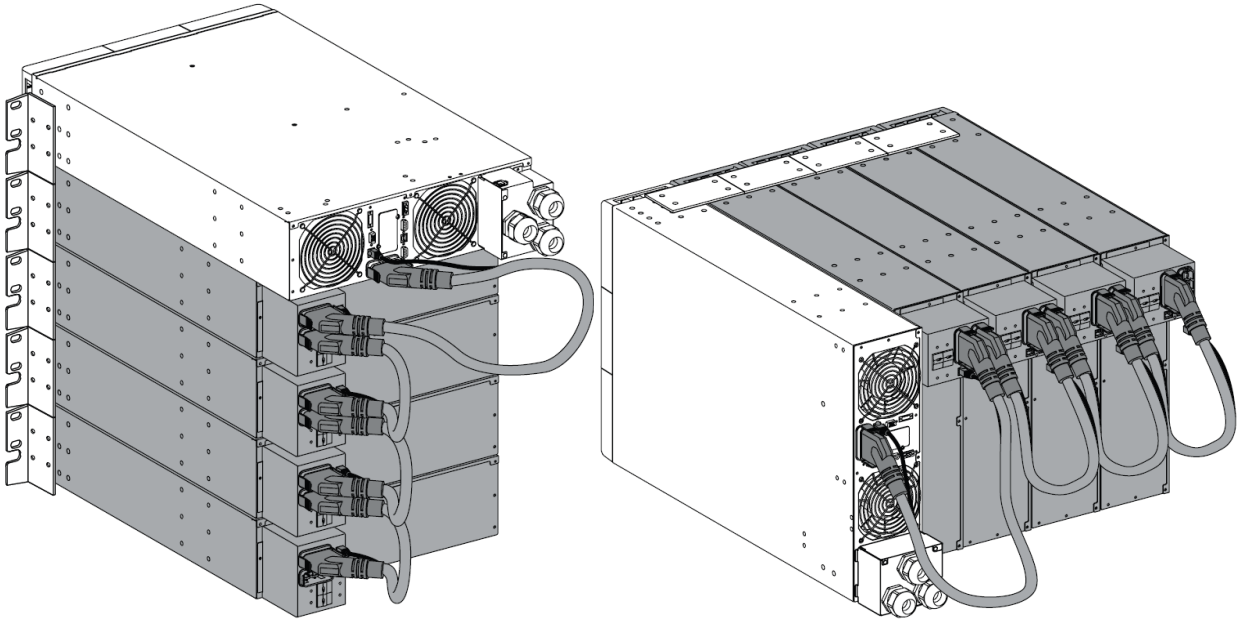
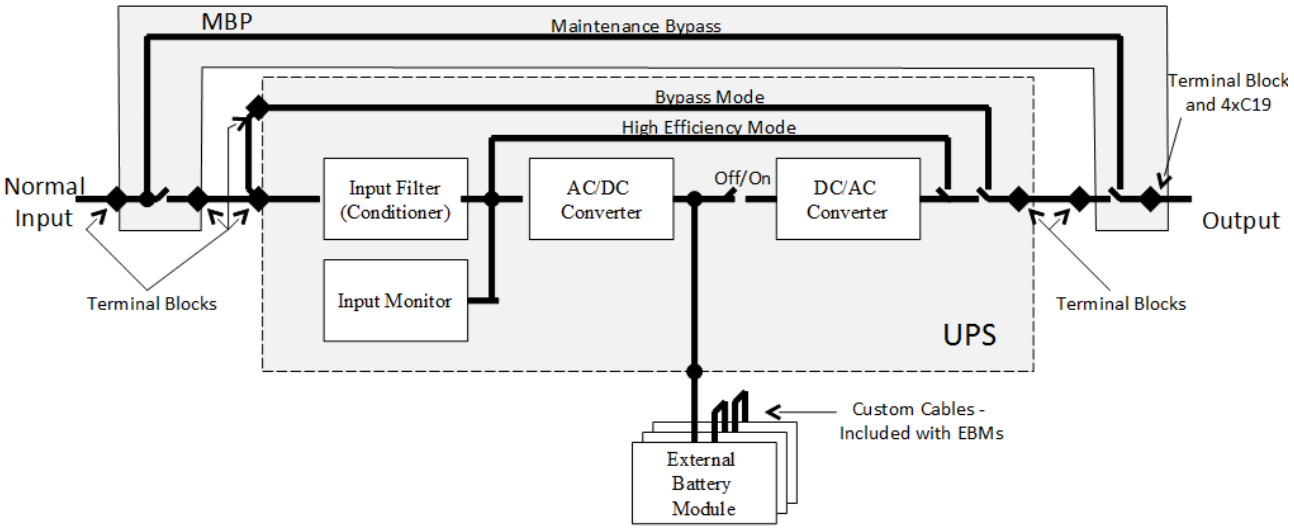


Figure 77: Tower EBM connection example

Block Diagram with Maintenance Bypass Module

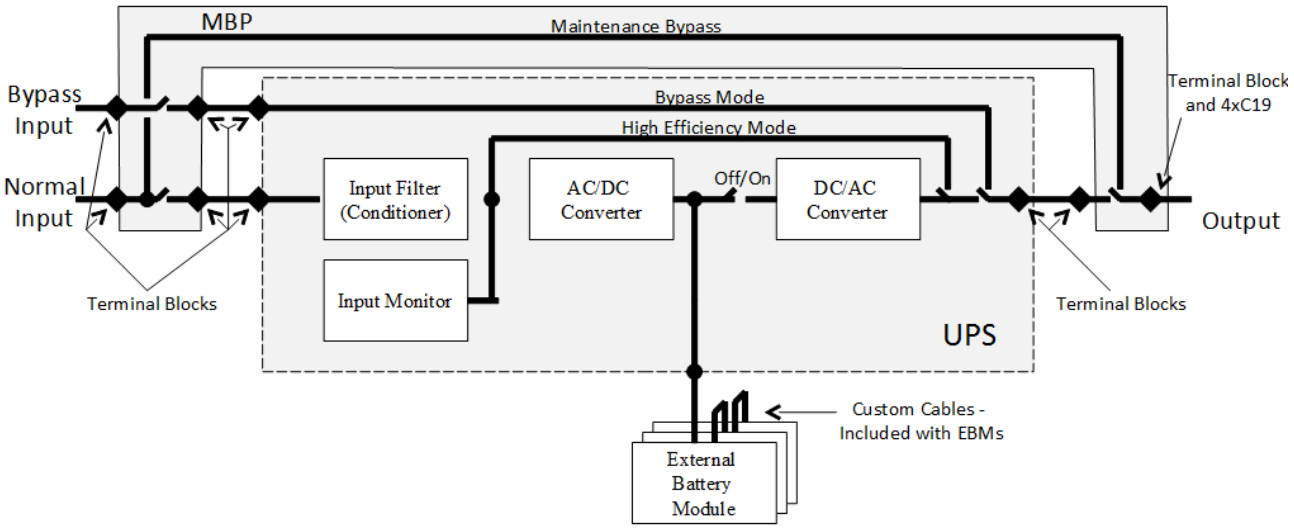
The following figure represents the block diagram for the 11000VA UPS single phase.

Note: This is Double Conversion: Converts AC to DC to AC.



The following figure represents the block diagram for the 11000VA UPS three phase.

Note: This is Double Conversion: Converts AC to DC to AC.



For additional information on the Maintenance Bypass module, refer to the Maintenance Bypass (MBP) section.

Optional Accessories

The 11000VA UPSs can be ordered with the following optional accessories:

Part Number	Feature Code	Description	Additional information
46M4113	6146	Environmental Monitoring Probe (EMP)	Page 94
55949BX	A545	Extended Battery Module (EBM) (Max qty 4)	Page 95

Figure 78: EMP

Figure 79: Extended Battery Module EBM

Load Segments / Programmable Outlets

Load segments are managed groups of receptacles that can be independently turned on or off either through manual or pre-programmed means.

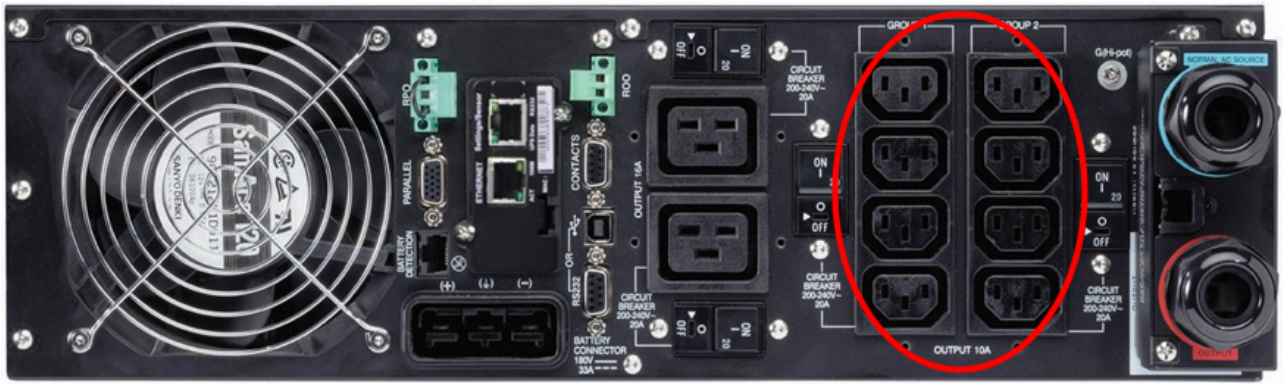
To employ this, it is recommended to connect non critical devices to the programmable outlets on the UPSs and non-critical devices to the primary load groups.

This is because peripheral hardware such as monitors, backup devices, and other non-critical machines can consume valuable battery runtime even though they are not essential.

An example of the color of the programmable outlets for non-critical equipment is shown for the UPS 1000-3000VAs below:

Figure 80: Programmable outlets for non-critical hardware

An example of the programmable outlets on the UPS6000VA is shown below:



Rack and Tower Kit

All rack mountable UPSs ship with hardware for either installing in a rack or standing upright as a tower. The two kits include:

Rack mount kit: (for mounting the UPS in a rack)

- Rack Installation Instructions
- Rail kit for 19-inch enclosures

Note: Because of the weight of the UPS and EBMs, they should not be installed any higher than 5' (1.5m) above the floor. This will allow for easy installation and servicing.

Tower kit: (for standing the UPS upright)

- 2 supports for the upright (tower) position
- Tower stands
- Screwdriver

Note: The front LCD display panel will need to be rotated for the image to display horizontal or vertical to suit the UPSs position. Remove the LCD cover and rotate/angle screen as appropriate.

The following images display an example of an upright rack mountable (1500VA) UPS and a rack mountable (8000VA) UPS with Extended Battery Module:

Weight and Dimensions

This section discusses the weight and dimensions of each UPS and where applicable, Extended Battery Modules (EBM), and Maintenance Bypass Module (MBP).

MTM	Description	Weight lb / kg	Dimensions (in/mm) D x W x H*	Link
Tower UPS 1000VA, 1500VA				
55951AX	1kVA Tower UPS	24.4 / 11.5	13.6 x 5.9 x 9.1 / 345 x 150 x 233	17
55951KX	1kVA Tower UPS	24.4 / 11.5	13.6 x 5.9 x 9.1 / 345 x 150 x 233	17
55952AX	1.5kVA Tower UPS	35.3 / 16.2	17.5 x 5.9 x 9.1 / 445 x 150 x 233	24
55952KX	1.5kVA Tower UPS	35.2 / 16.2	17.5 x 5.9 x 9.1 / 445 x 150 x 233	24

* Dimensions are shown below

MTM	Description	Weight lb / kg	Dimensions (in/mm) D x W x H*	Link
Rack or Tower UPS 1500VA, 2200VA, 3000VA, EBM				
55941AX	1.5kVA R/T UPS	64.70 / 29.36	20.6 x 17.4 x 3.4 / 522 x 441.2 x 86.2	31
55941KX	1.5kVA R/T UPS	64.70 / 29.36	20.6 x 17.4 x 3.4 / 522 x 441.2 x 86.2	31
55942AX	2.2kVA R/T UPS	65.30 / 29.61	20.6 x 17.4 x 3.4 / 522 x 441.2 x 86.2	39
55942KX	2.2kVA R/T UPS	65.30 / 29.61	20.6 x 17.4 x 3.4 / 522 x 441.2 x 86.2	39
55942BX	1.5kVA/2.2kVA EBM	72.30 / 32.80	20.6 x 17.4 x 3.4 / 522 x 441.2 x 86.2	95
55943AX	3kVA R/T UPS	87.20 / 39.54	25.5 x 17.4 x 3.4 / 647 x 441.2 x 86.2	47
55943KX	3kVA R/T UPS	87.20 / 39.54	25.5 x 17.4 x 3.4 / 647 x 441.2 x 86.2	47
55943BX	3kVA EBM	102.3 / 46.39	25.5 x 17.4 x 3.4 / 647 x 441.2 x 86.2	95

* Dimensions are shown below

MTM	Description	Weight lb / kg	Dimensions (in/mm) D x W x H*	Link
Rack or Tower UPS 5000VA, 6000VA, EBM				
55945KX	5kVA R/T UPS	106 / 48	28.4 x 17.3 x 5.1 / 722 x 440 x 130	56
55946KX	6kVA R/T UPS	106 / 48	27 x 17.3 x 5.1 / 685 x 440 x 130	64
55946BX	5kVA/6kVA EBM	150 / 68	25.4 x 17.3 x 5.1 / 645 x 440 x 130	95

* Dimensions are shown below

MTM	Description	Weight lb/kg	Dimensions (in/mm) D x W x H*	Link
Rack or Tower UPS 8000VA, 11000VA, EBM, MBP Individual weights				
55948KX	8kVA R/T UPS	42 / 19	27.6 x 17.3 x 5.1 / 700 x 440 x 130	71
55948PX	8kVA 3 ph UPS	51 / 23	27.6 x 17.3 x 5.1 / 700 x 440 x 130	71
55949KX	11kVA R/T UPS	46 / 21	27.6 x 17.3 x 5.1 / 700 x 440 x 130	79
55949PX	11kVA 3 ph UPS	51 / 23	27.6 x 17.3 x 5.1 / 700 x 440 x 130	79
55949BX	8kVA/11KVA EBM	143 / 65	26.8 x 17.3 x 5.1 / 680 x 440 x 130	95
N/A	8/11kVA 1ph MBP	13.7 / 6.2	8.7 x 13.2 x 5.1 / 220 x 336 x 130	97
N/A	8/11kVA 3ph MBP	12.1 / 5.5	5.2 x 13.2 5.1 / 132 x 336 x 130	97
MTM	Description	Weight lb/kg	Dimensions (in/mm) D x W x H*	Link
Rack or Tower UPS 8000VA, 11000VA, EBM, MBP Combined weight (UPS/EBM/MBP)				
See above	8kVA+EBM+MBP	198.7 / 90.2	27.6 x 17.3 x 10.2 / 700 x 440 x 260	71
See above	8kVA3ph+EBM+ MBP	206.1 / 93.5	27.6 x 17.3 x 10.2 / 700 x 440 x 260	71
See above	11kVA+EBM+MBP	202.7 / 92.2	27.6 x 17.3 x 10.2 / 700 x 440 x 260	79
See above	11kVA3ph+EBM+ MBP	206.1 / 93.5	27.6 x 17.3 x 10.2 / 700 x 440 x 260	79

* Individual dimensions are shown below

UPS Control Panel

The following figures display information on the front panel of the UPSs.

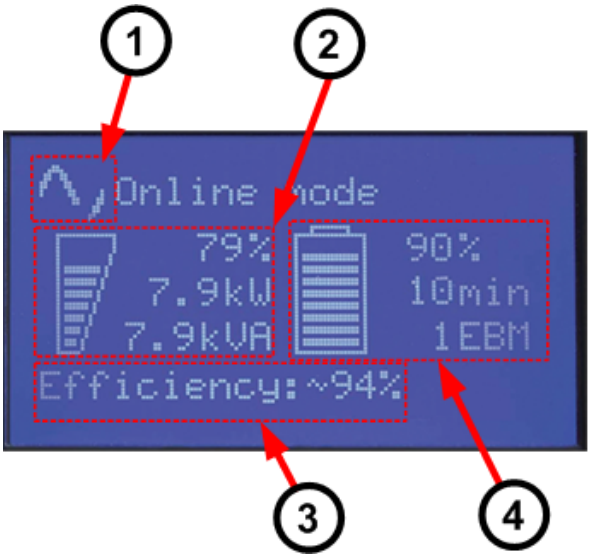
Control panel buttons for the UPSs.

1. Online mode indicator (green)
2. Battery mode indicator (orange)
3. Bypass mode indicator (orange) found only on the 8/11kVA UPSs*
4. Fault indicator (red)
5. Escape
6. Up
7. Down
8. Enter
9. On/Off button

* Bypass mode: For 8/11kVA UPSs, in the event of a UPS overload or internal failure, the UPS powers your equipment directly from utility power. Battery mode is not available and your equipment is not protected; however, the utility power continues to be passively filtered by the UPS.

Control panel screen for the UPS

1. Operation status
2. Load/equipment status
3. Efficiency and load group information
4. Battery status



Network Management Card (NMC)

The Network Management Card (NMC) provides convenient over-the-network UPS remote monitoring and management through a standard web browser.

The NMC is standard on all models except all tower models and the 1500VA and 2200VA rack/tower models.

The NMC for (tower and rack/tower) 1000VA, 1500VA, and 2200VA (100-125V) UPSs is optional and can be ordered with the below:

Part Number	FC	Description
46M4110	6145	Network Management Card (NMC) (Optional for: 55951AX, 55951KX, 55952AX, 55952KX, 55941AX, 55941KX, 55942AX. 55942KX, 55942BX)

If ordered separately for the tower models it needs to be installed in the following location:

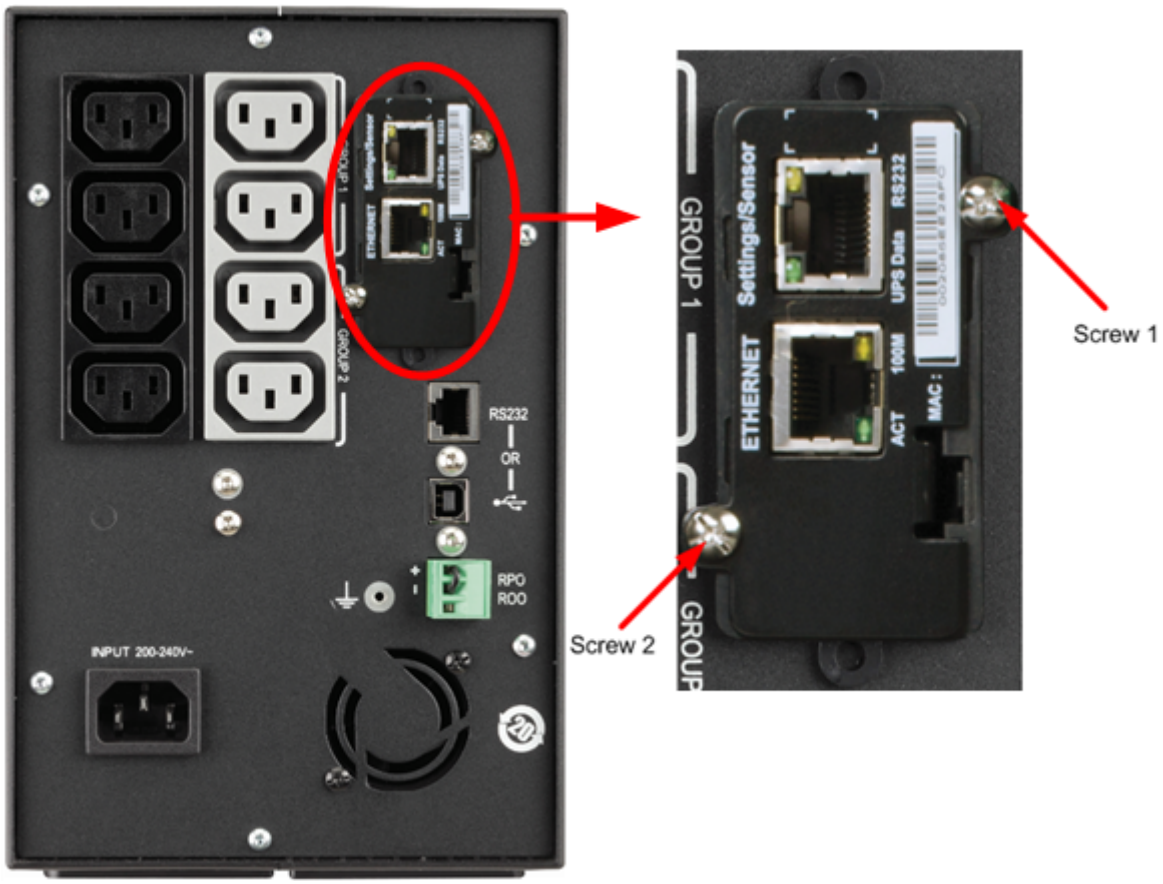


Figure 81: Location of the NMC for tower UPSs

Environmental Monitoring Probe (EMP)

Figure 82 displays the Environmental Monitoring Probe (EMP). No UPS ship standard with the probe, and it needs to be ordered separately.

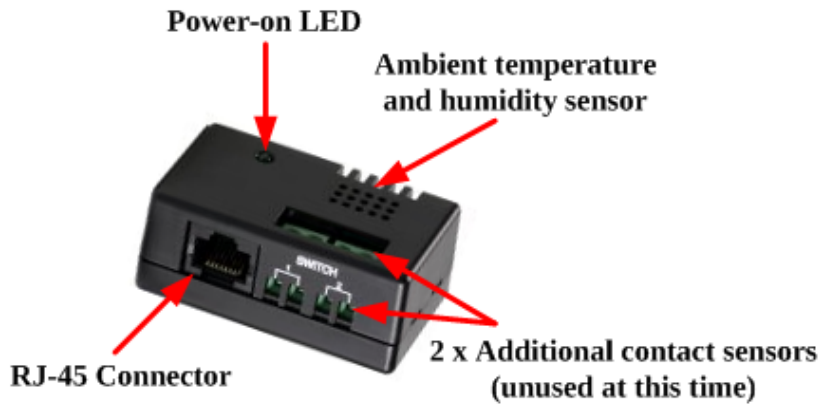


Figure 82: EMP - Environmental Monitoring Probe

The EMPs purpose is to report on local environmental temperature and humidity at its installed location. For example, if the EMP device is installed at the top of a rack, it will report on the temperature and humidity values at that location.

The optional EMP can be ordered with:

Part Number	Feature Code	Description
46M4113	6146	Environmental Monitoring Probe

The device can be installed anywhere on the rack by using either the screws or the self-adhesive hook-and-loop fasteners. Once attached to the rack, connect the CAT5 cable to the UPS or a supported PDU Ethernet connector.

Note: The installation of a Network Management Card (NMC) is required for the EMP to be connected to the device. Refer to the Network Management Card (NMC) section for additional information on the NMC.

Extended Battery Module (EBM)

Custom 40cm (15.7inc) cables ship standard with the EBMs. Up to 4 EBMs can be connected per UPS.

The following table displays the compatibility between the available EBMs and the UPSs.

Support Matrix

	Extended Battery Module (EBM)			
UPS Models	55942BX	55943BX	55946BX	55949BX
55951AX	No	No	No	No
55951KX	No	No	No	No
55952AX	No	No	No	No
55952KX	No	No	No	No
55941AX	Yes	No	No	No
55941KX	Yes	No	No	No
55942AX	Yes	No	No	No
55942KX	Yes	No	No	No
55943AX	No	Yes	No	No
55943KX	No	Yes	No	No
55945KX	No	No	Yes	No
55946KX	No	No	Yes	No
55948KX	No	No	No	Yes
55948PX	No	No	No	Yes
55949KX	No	No	No	Yes
55949PX	No	No	No	Yes

For pictures of the EBMs refer to the following page.

The following images are of the Extended Battery Modules:

55942BX

Figure 83: 55942BX EBM

55943BX

Figure 84: 55943BX EBM

55946BX

Figure 85: 55946BX EBM

55949BX

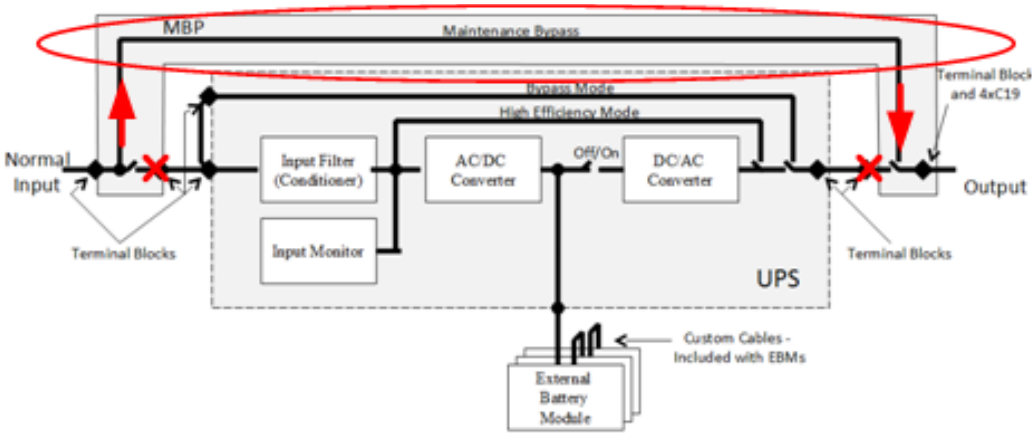
Figure 86: 55949BX EBM

Maintenance Bypass (MBP)

The Maintenance Bypass (MBP) Module is required and ships standard on all 8kVA and 11kVA UPS models.
The 5594-8KX, 8PX, 9KX, and 9PX UPSs consist of three elements -

- Electronics Module,
- Extended Battery Module (EBM) and,
- Maintenance Bypass (MBP).

The MBP is used to bypass the UPS during maintenance or servicing providing wrap-around bypass for UPS service without shutting down the load. An example of this is shown below in the single phase UPS block diagram.



The MBP and the switch for enabling and disabling the Maintenance Bypass mode is shown in Figure 87 for the single phase 8/11kVA UPSs.

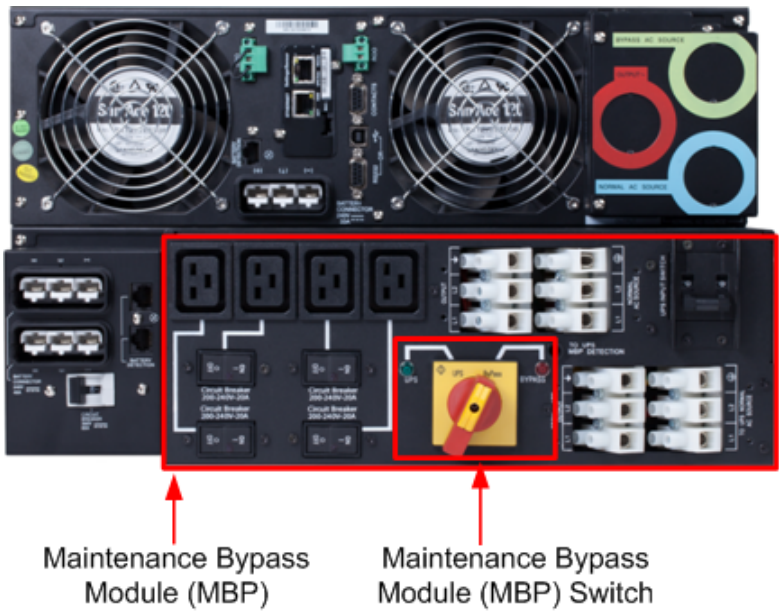


Figure 87: Maintenance Bypass module and switch

MBP Lights

The Maintenance Bypass module (MBP) light indicators are shown in Figure 88.

Figure 88: Maintenance Bypass switch

The lights on the MBP represent the following:

Red on means Load is powered directly from Line (AC power source); the load is unprotected by the UPS.

This light will be on only when the Normal/Bypass switch is in the Bypass position. It is intended as a reminder that the load is not protected during UPS maintenance.

Green on means the UPS output is feeding the MBP (load supplied by UPS)

This light will be on any time the UPS is providing power and is independent of the position of the Normal/Bypass switch. It is intended as an indicator that it is safe to move the Normal/Bypass switch from the Bypass position to the Normal position when UPS maintenance is complete.

MBP Installation

Electronics Module is mounted directly above the Extended Battery Module, and the MBP should be mounted directly behind the Extended Battery Module. Follow the below rules for installing the MBP:

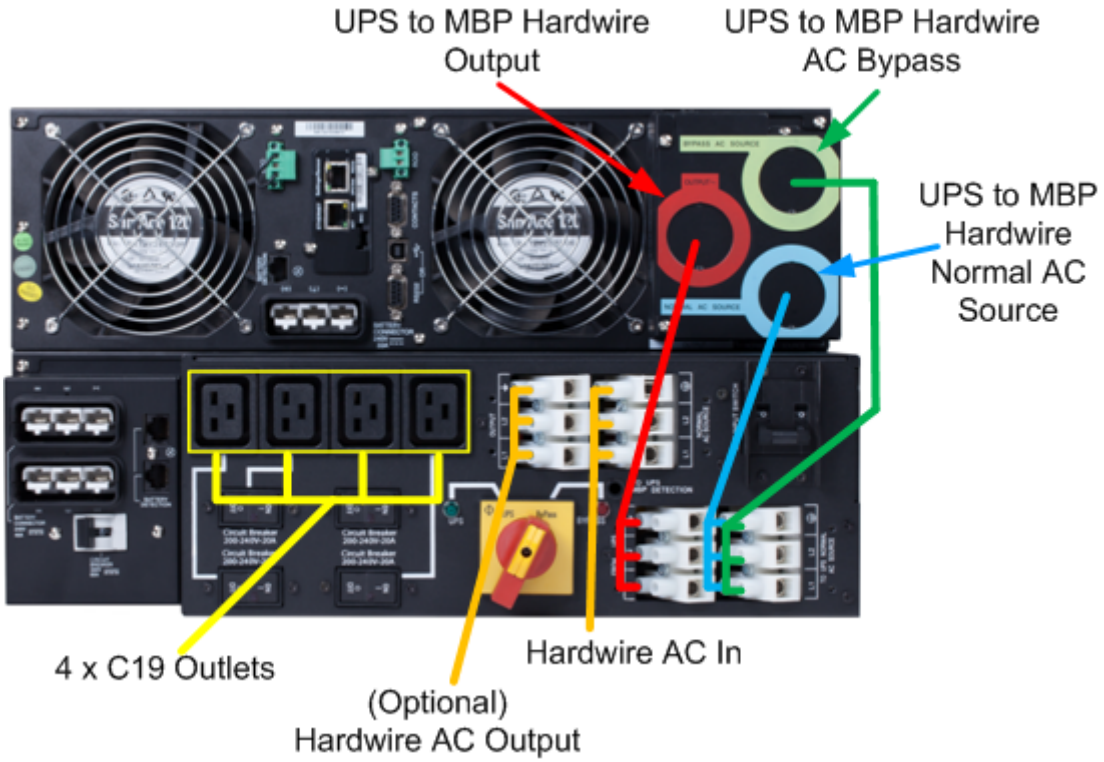
* Mount the MBP behind the EBM. If there are multiple EBMs attached to the UPS, mount it behind the EBM closest to the UPS. The minimum rack depth with UPS/MBP is 900mm (35.4in).

Note: Do not mount the MBP behind the UPS; you will not be able to attach the cables.

* Connect the cables in the conduits to the terminal blocks BEFORE seating the conduits into the collars. This will give you maximum slack in the cables and make connecting to the terminal blocks possible. The conduits can be released from the collars by prying out on the catch tabs on the collars and pulling the conduit.
* Do not pull the cables out of the conduits. The conduit is required for safety and the cables are not so easy to get back into the conduits (personal experience).

Connecting the UPS to the MBP

A diagram displaying the hardwire connections and C19 outlets are displayed below.



Note: The Hardwire output (red) can be used to connect PDUs to provide additional outlets.

Shipment – What's in the box?

This section discusses the items shipped with the UPS, MBP, and EMP.

UPS

Each UPS is shipped in 1 box with the following contents:

Tower

- UPS
- RS232 communication cable
- USB communication cable
- 2 connection cables for the protected equipments (5595-1AX and 5595-2AX models)
- Documentation and software kit

2U Rack 100/120V

- UPS
- Front panel parts
- Mounting kit for 19-inch bays
- UPS Network Management Card (3AX and 3KX only)
- RS232 communication cable
- USB communication cable
- Documentation and software kit
- 2 supports for the upright (tower) position

2U Rack 200/230V

- UPS
- Mounting kit for 19-inch enclosures
- UPS Network Management Card (3AX and 3KX only)
- 2 connection cables for the protected equipment
- 2 cable locking systems
- R232 communication cable
- USB communication cable
- Documentation and software kit

3U Rack

- UPS
- Rail kit for 19-inch enclosures
- Cable gland for Input/Output connection
- UPS Network Management Card
- RS232 communication cable
- USB communication cable
- Screwdriver
- (2) cable lockers for 16A outlets

- (2) cable lockers for 10A outlets
- (2) IEC 10A cables
- Documentation and software kit
- 2 supports for the upright (tower) position

6U Rack

- UPS
- 2 supports for the upright (tower) position
- Rail kit for 19-inch enclosures
- (3) Cable glands for Input/Output connection
- UPS Network Management Card
- RS232 communication cable
- USB communication cable
- Tower stands
- Documentation and software kit
- Screwdriver

Maintenance Bypass (MBP) 1ph

This is for 8kVA/11kVA single phase UPSs only.

- MBP I/O cover
- MBP I/O "UPS connection" cover
- (2) conduits with internal wires for UPS Input/Output connection
- (4) conduit fittings
- Fixation kit for MBP I/O covers (including screws)
- Rack kit for 19-inch enclosures
- Fixation kit for Rack mounting (including square nuts and screws)
- Tower and wall mounting kit (including 2 ears and screws)

Maintenance Bypass (MBP) 3ph

This is for 8kVA/11kVA single phase UPSs only.

- (2) cable glands for UPS Input Bypass connection (optional)
- Rack kit for 19-inch enclosures -- including square nuts and screws
- Tower and Wall mounting kit (including 2 ears and screws)

Extended Battery Module (EBM)

- One Environmental Monitoring Probe (EMP)
- Screws
- Hook-and-loop fasteners
- Tie wrap
- Ethernet cable
- Warranty and Important Notices Flyer
- Environmental Notices CD

Reference

The following section can be used as a reference for the contents in this guide.

Universal Rack PDU/UPS line cords

This section covers all the plugs on each line cord used with the UPSs.

- North America & Japan 100/120V NEMA 5-15P
- North America & Japan 100/120V NEMA 5-20P
- North America & Japan 100/120V NEMA L5-30P
- North America & Japan 200/208V NEMA L6-20P
- Europe CEE7-VII
- Denmark/Switzerland IEC 309 P+N+G
- Denmark DK2-5a
- Switzerland SEV 1011 T23
- Switzerland SEV 1011-S24507
- Italy CEI 23-16
- Israel SI 32
- South Africa SABS 164
- UK BS 1363/A
- Australia/NZ AUS/NZ 3112
- S. Korea KSC 8305
- Brazil NBR 14136
- Brazil NBR 6147
- India IS 6538
- Argentina IRAM 2073
- Taiwan CNS 10917 – 125V
- Taiwan CNS 10917 – 250V
- China GB 2099.1
- IEC320 C19 to C20
- NEMA L6-30
- IEC 309 P+N+G – 32A@220-240V 1ph
- AUS/NZ 3112 32A – 32A@230V 1ph
- KSC 8305 30A – 30A@220V 1ph

North America & Japan 100/120V NEMA 5-15P

Detachable 4.3m, 15A/100-120V, C13 to NEMA 5-15P Line Cord

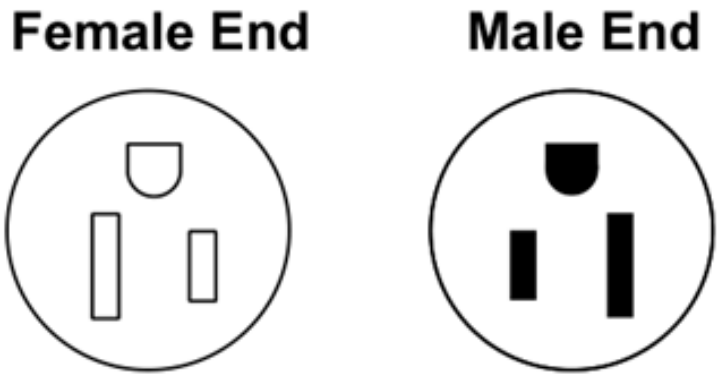


Figure 89: NEMA 5-15P plug

North America & Japan 10A/250V NEMA 6-15P

P/N: 46M2592, Detachable 2.8m, 10A/250V C13 to NEMA 6-15P

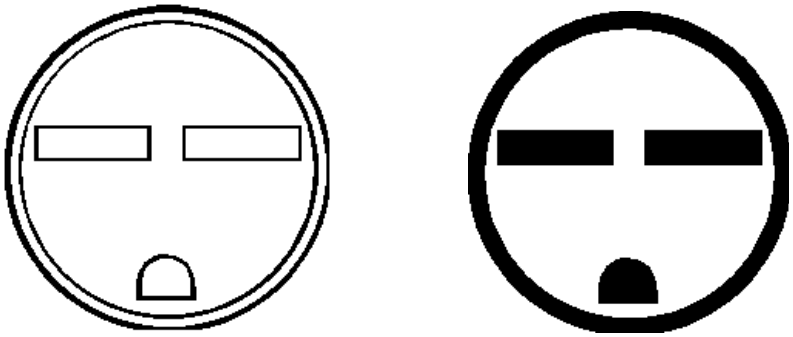


Figure 90: NEMA 6-15P

North America & Japan 100/120V NEMA 5-20P

Detachable 4.3m, 20A/100-120V, NEMA 5-20P Line Cord

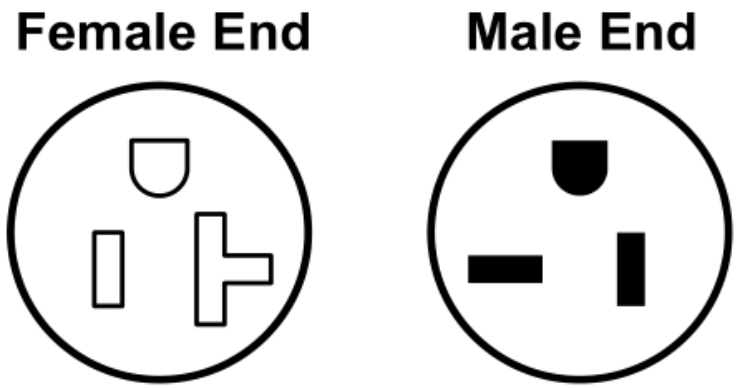


Figure 91: NEMA 5-20P plug

North America & Japan 100/120V NEMA L5-30P

Attached 4.3m, 30A/100-120V, NEMA L5-30P Line Cord

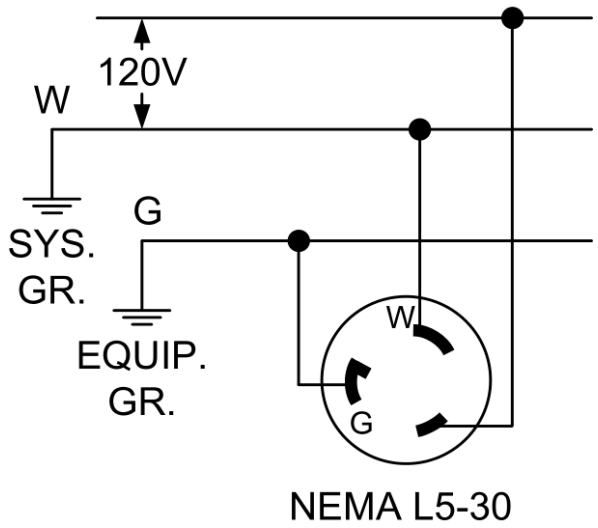


Figure 92: NEMA L5-30P plug

North America & Japan 200/208V NEMA L6-20P

Detachable (P/N: 40K9772) 4.3m, 20A/200-240V, NEMA L6-20P Line Cord

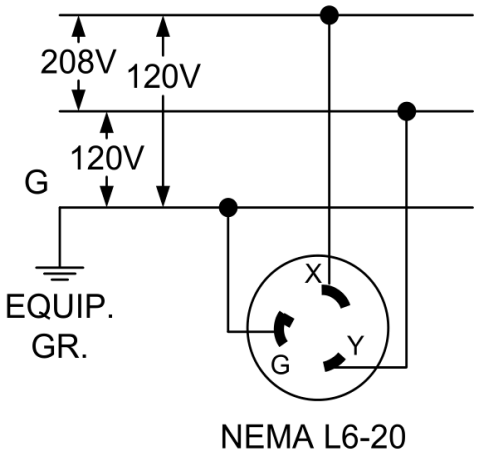


Figure 93: NEMA L6-20P plug

Japan JIS C-8303

P/N: 46M2593, Detachable Japan 10A/100V C13 to JIS C-8303 2.8m line cord

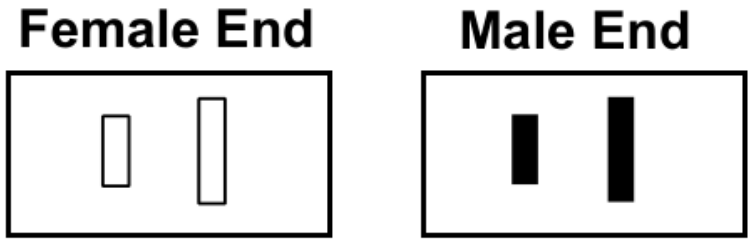


Figure 94: JIS C-8303

Europe CEE7-VII

P/N: 39Y7917 2.8m, 10A/230V, C13 to CEE7-VII (Europe) Line Cord
P/N: 81Y2376 4.3m, 10A/230V, C13 to CEE7-VII (Europe) Line Cord

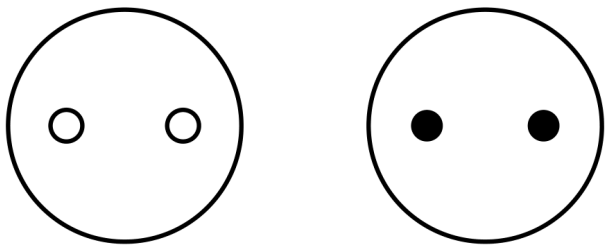


Figure 95: CEE7-VII Europe plug

Denmark/Switzerland IEC 309 P+N+G

P/N: 40K9769 4.3m, 16A/230V, C19 to Denmark IEC 309 P+N+G (Denmark/Switzerland) Line Cord

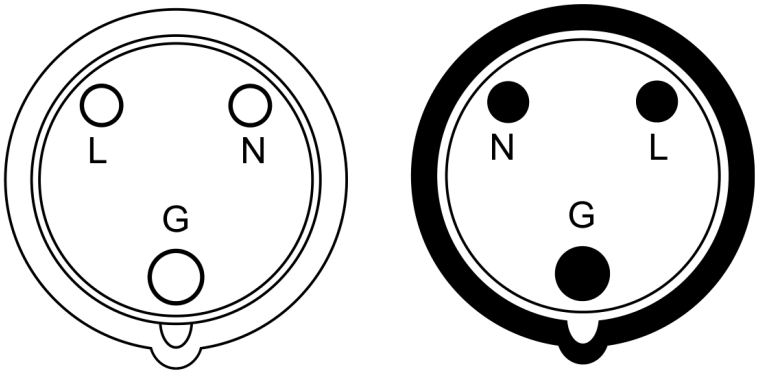


Figure 96: Denmark/Switz. IEC 309 P+N+G plug

Denmark DK2-5a

P/N: 39Y7918 2.8m, 10A/230V, C13 to DK2-5a (Denmark) Line Cord
P/N: 81Y2382 4.3m, 10A/230V, C13 to DK2-5a (Denmark) Line Cord

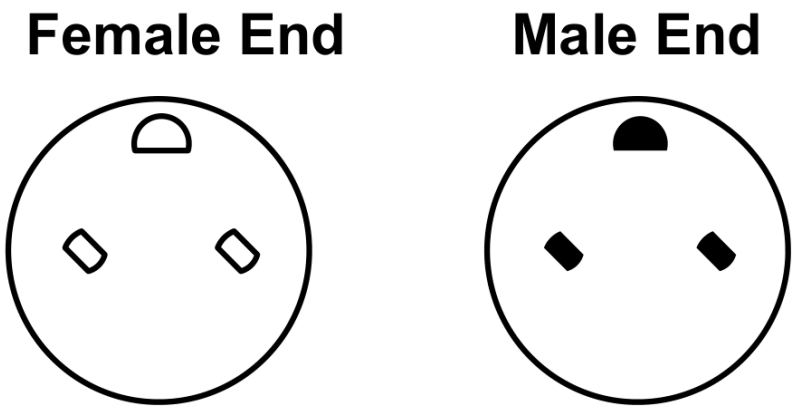


Figure 97: Denmark DK2-5a

Switzerland SEV 1011 T23

P/N: 81Y2391 4.3m, 16A/230V, C19 to SEV 1011 T23 (Switzerland) Line Cord

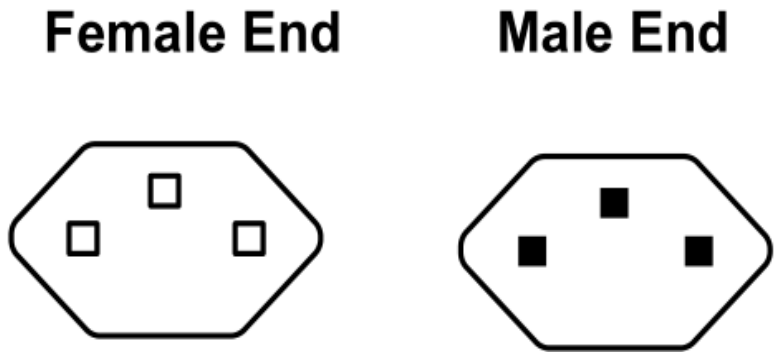


Figure 98: Switzerland SEV 1011 T23

Switzerland SEV 1011-S24507

P/N: 39Y7919 2.8m, 10A/230V, C13 to SEV 1011-S24507 (Switzerland) Line Cord
P/N: 81Y2390 4.3m, 10A/230V, C13 to SEV 1011-S24507 (Switzerland) Line Cord

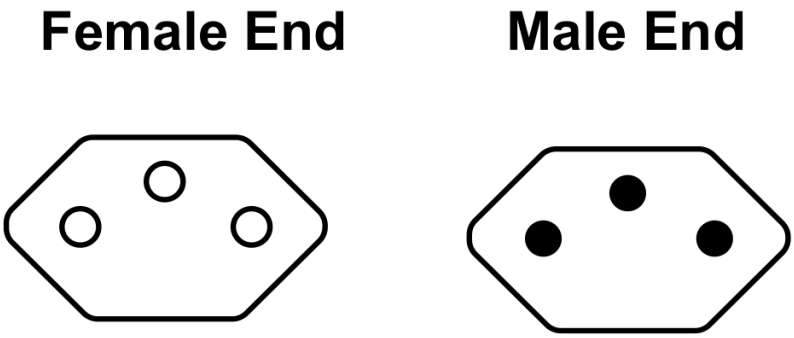


Figure 99: Switzerland SEV 1011-S24507

Italy CEI 23-16

P/N: 39Y7921 2.8m, 10A/230V, C13 to CEI 23-16 (Italy) Line Cord
P/N: 81Y2380 4.3m, 10A/230V, C13 to CEI 23-16 (Italy) Line Cord

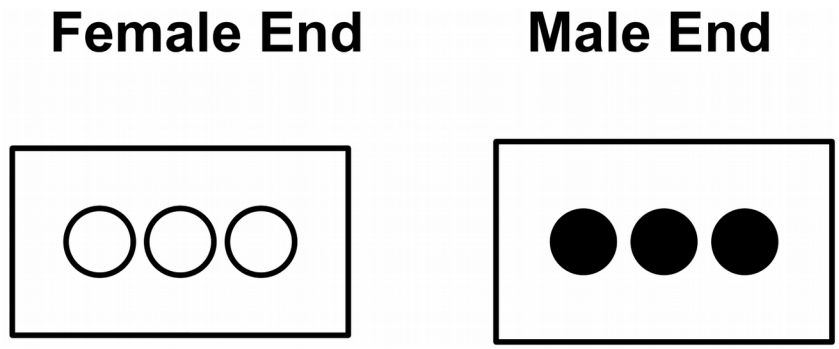


Figure 100: Italy CEI 23-16 plug

Israel SI 32

P/N: 39Y7920 2.8m, 10A/230V, C13 to SI 32 (Israel) Line Cord
P/N: 81Y2381 4.3m, 10A/230V, C13 to SI 32 (Israel) Line Cord

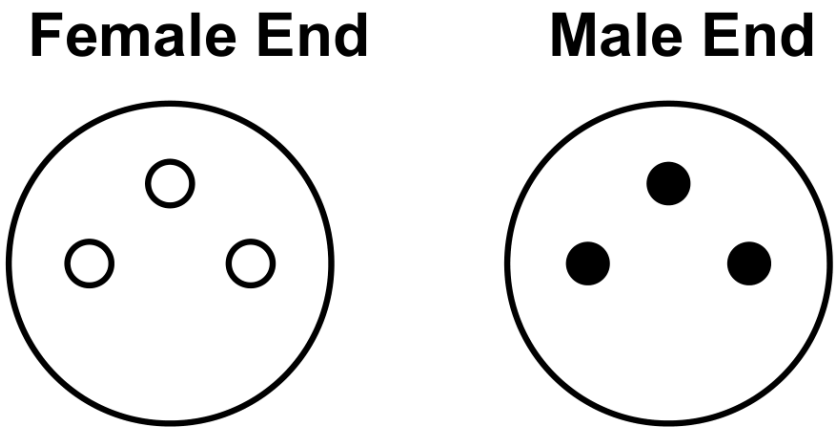


Figure 101: Israel SI 32

South Africa SABS 164

P/N: 39Y7922 2.8m, 10A/230V, C13 to SABS 164 (South Africa) Line Cord
P/N: 81Y2379 4.3m, 10A/230V, C13 to SABS 164 (South Africa) Line Cord

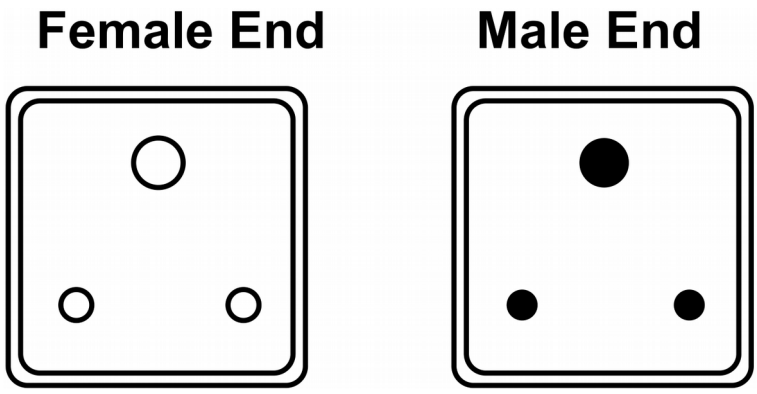


Figure 102: South Africa SABS 164 plug

UK BS 1363/A

P/N: 39Y7923 2.8m, 10A/230V, C13 to BS 1363/A (UK) Line Cord
P/N: 81Y2377 4.3m, 10A/230V, C13 to BS 1363/A (UK) Line Cord

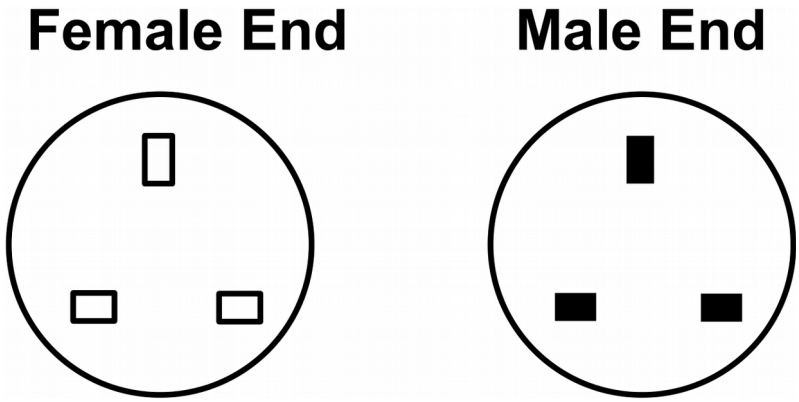


Figure 103: UK BS 1363/A plug

Australia/NZ AUS/NZ 3112

P/N: 39Y7924 2.8m, 10A/230V, C13 to AS/NZS 3112 (Aus/NZ) Line Cord
P/N: 81Y2383 4.3m, 10A/230V, C13 to AS/NZS 3112 (Aus/NZ) Line Cord

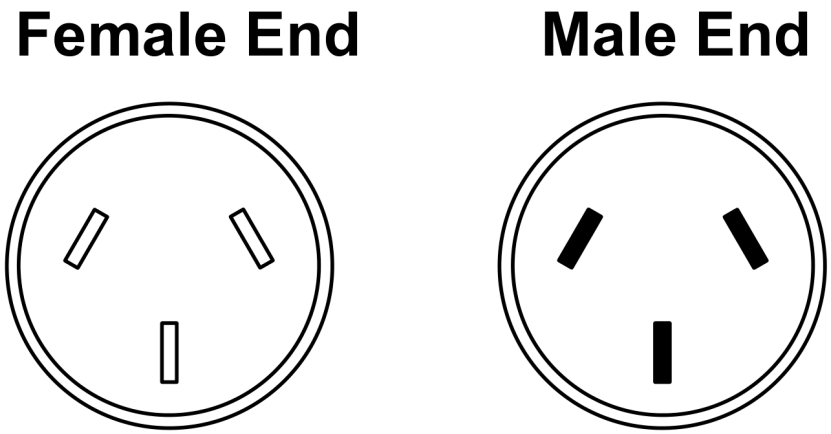


Figure 104: AUS/NZ 3112 Australia/NZ plug

S. Korea KSC 8305

P/N: 39Y7925 2.8m, 10A/220V, C13 to KSC 8305 (S. Korea) Line Cord
P/N: 81Y2385 4.3m, 10A/220V, C13 to KSC 8305 (S. Korea) Line Cord

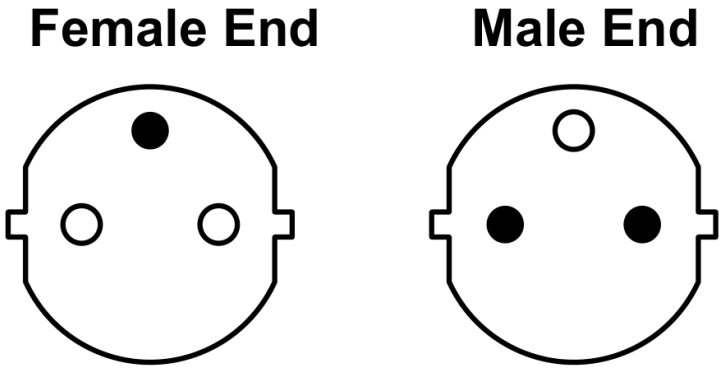


Figure 105: S. Korea KSC 8305

Brazil NBR 14136

P/N: 69Y1989 4.3m, 16A/220-240V, C19 to NBR 14136 (Brazil) Line Cord

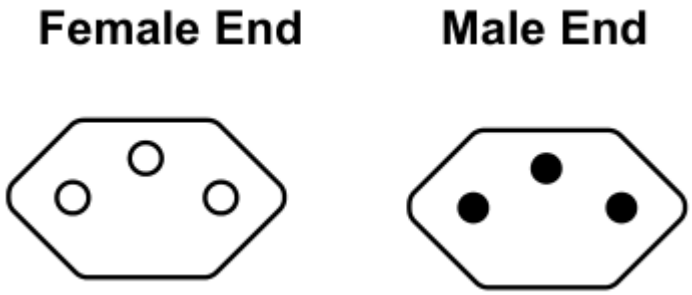


Figure 106: Brazil NBR 14136 plug

Brazil NBR 6147

P/N: 39Y7929 2.8m, 10A/125V, C13 to NBR 6147 (Brazil) Line Cord
P/N: 81Y2387 4.3m, 10A/125V, C13 to NBR 6147 (Brazil) Line Cord

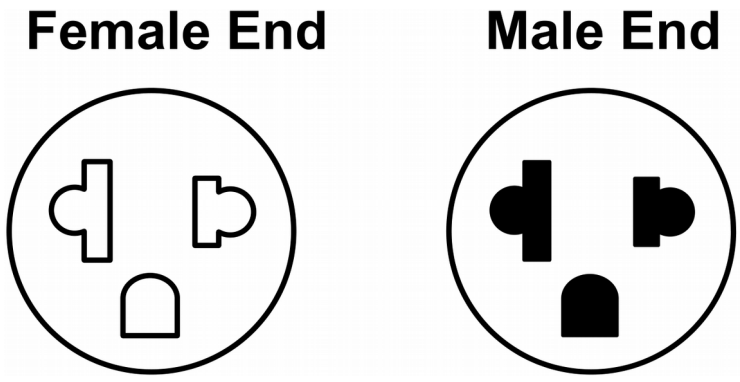


Figure 107: Taiwan CNS 10917 – 250V

India IS 6538

P/N: 39Y7927 2.8m, 10A/240V, C13 to IS6538 (India) Line Cord
P/N: 81Y2386 4.3m, 10A/240V, C13 to IS6538 (India) Line Cord

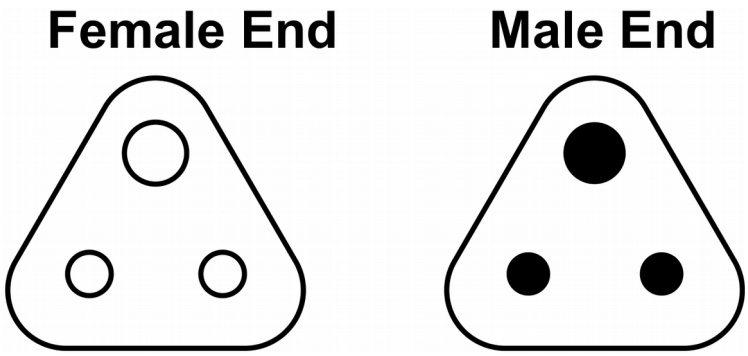


Figure 108: India IS 6538 plug

Argentina IRAM 2073

P/N: 39Y7930 2.8m, 10A/220V, C13 to IRAM 2073 (Argentina) Line Cord
P/N: 81Y2384 4.3m, 10A/220V, C13 to IRAM 2073 (Argentina) Line Cord

Used with:

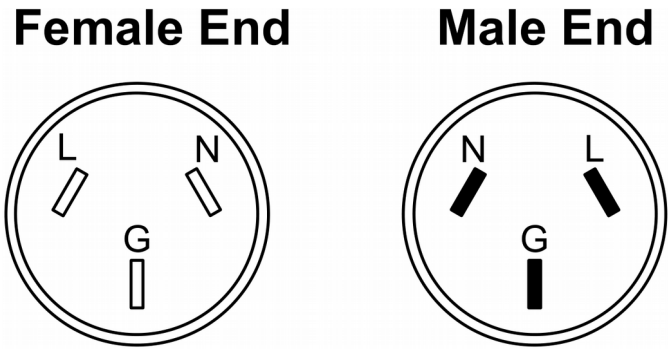


Figure 109: Argentina IRAM 2073 plug

Taiwan CNS 10917 – 125V

P/N: 81Y2374 2.8m, 10A/125V, C13 to CNS 10917 – 125V Line Cord
P/N: 81Y2388 4.3m, 10A/125V, C13 to CNS 10917 – 125V Line Cord

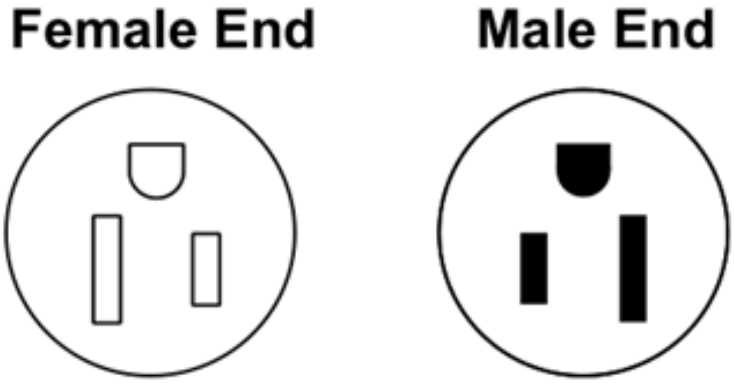


Figure 110: Taiwan CNS 10917 - 125V

Taiwan CNS 10917 – 250V

P/N: 81Y2374 2.8m, 10A/125V, C13 to CNS 10917 – 125V Line Cord
P/N: 81Y2388 4.3m, 10A/125V, C13 to CNS 10917 – 125V Line Cord

Used with:

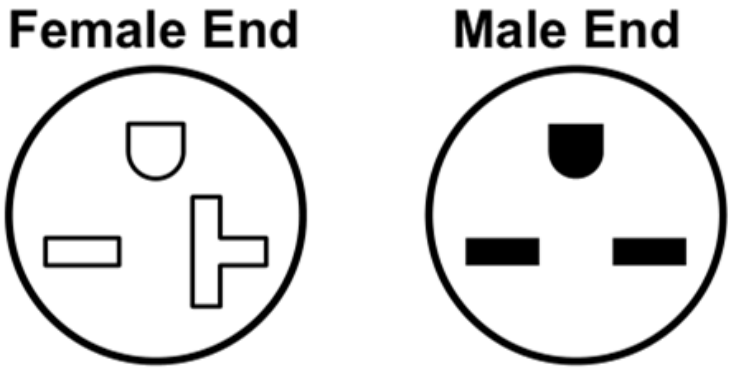


Figure 111: Taiwan CNS 10917 – 250V

China GB 2099.1

P/N: 39Y7928 2.8m, 10A/220V, C13 to GB 2099.1 (China) Line Cord
P/N: 81Y2378 4.3m, 10A/220V, C13 to GB 2099.1 (China) Line Cord

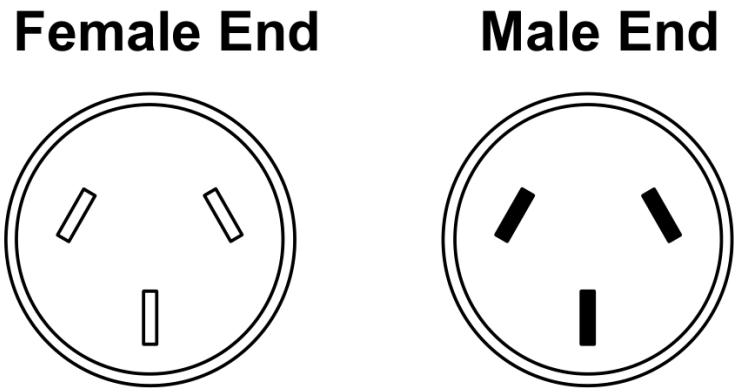


Figure 112: China GB 2099.1

IEC320 C19 to C20

39M5389 – C19 to IEC320 C20 to (2.5m) 16A @ 100-240VAC Single Phase

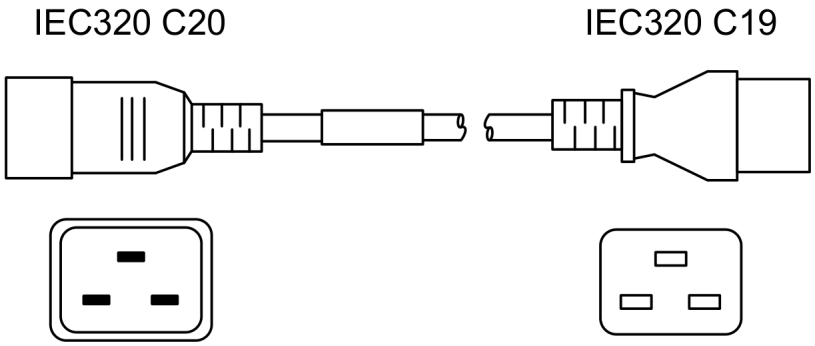
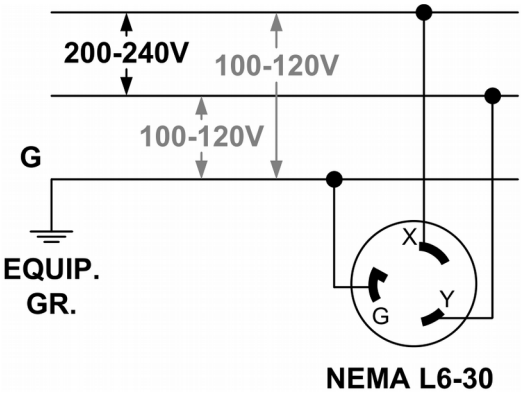


Figure 113: IEC320 C19 to C20 plug

Also available:
39M5388 – C19 to IEC320 C20 to (2.0m) 16A @ 100-250VAC Single Phase

NEMA L6-30

NEMA L6-30P (4.3m) 30A (24A Derated) @ 200V-240V Single Phase

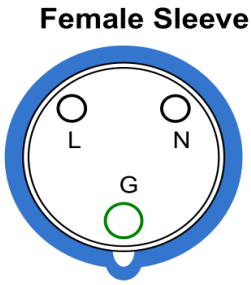


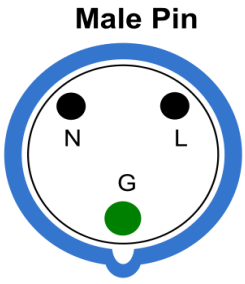
IEC 309 P+N+G – 32A@220-240V 1ph

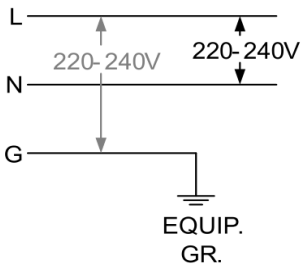
IEC 309 P+N+G (4.3m) - 32A / 220-240V Single Phase

Only a receptacle or a connector is needed to mate with the plug on the PDU input line cord. See section IEC 309 Plug details on page 118 in this document for further details on IEC309.

Matching receptacle listing 332R6W IP-67 HUBBELL, Hubbell receptacle P/N HBL332R6W
Matching connector listing 332C6W IP-67 HUBBELL, Hubbell connector P/N HBL332C6

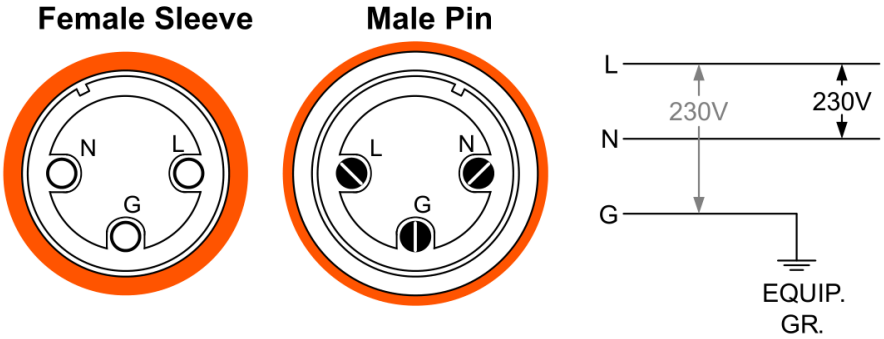






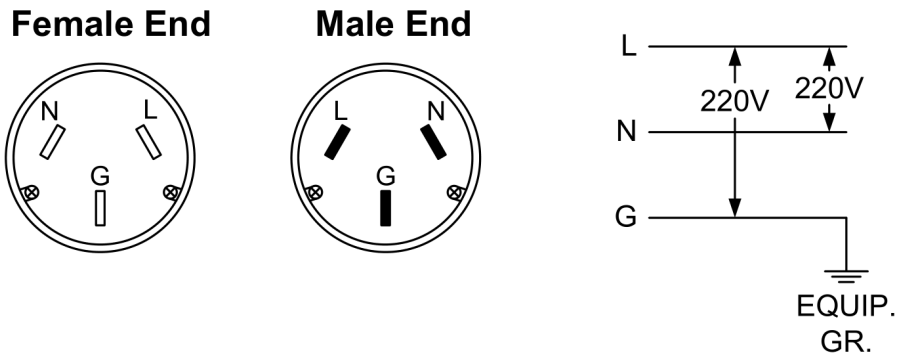
AUS/NZ 3112 32A – 32A@230V 1ph

P+N+G (PDL P/N 56P332) Australia/New Zealand connector



KSC 8305 30A – 30A@220V 1ph

P+N+G (Shin Ju P/N SJ-P3302) Korea connector

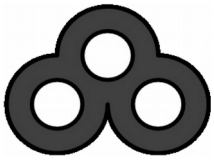
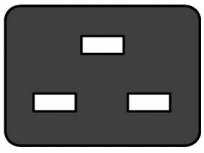


Additional Plug Information

The following section discusses more details on the PDU plugs.

IEC 320 Connectors

The following table displays the plug types for different hardware such as monitors, switches,
servers, high-end servers, power distribution units (PDUs), and Uninterpretable Power Supplies
(UPSs).

Name	Amp Rating (A)	Connector	Usage
C5 – Female C6 – Male	2.5A		Laptop Power Supplies And Other Portable Power Supplies
C7 – Female C8 – Male	2.5A		Laptop Power Supplies And Other Portable Power Supplies
C13 – Female C14 – Male	10A		Desktop Computers, Monitors, Switches, And Servers
C15 – Female C16 – Male	10A		Used In Hot Conditions Since It Is Rated To 1200 C (2480F), Unlike C13/C14 Which Is Rated To 700 C (1580 F)
C19 – Female C20 – Male	16A		16A Blade Chassis, Flex System, High-power Servers, UPSs, PDUs, And Other High Current Equipment. Note: IEC 320 has changed to IEC 60320 IEC 309

Note: IEC 320 has changed to IEC 60320

IEC 309 Plug details

This section discusses the IEC 309 plug.

IEC 309 Plug Sleeve Ratings

The color of the sleeve around a plug indicates its voltage rating. The colors and ratings are listed below.

Color	Voltage Rating
Yellow	100V - 130V
Orange	125V/250V
Blue	200V - 250V
Gray	277V
Red	380V - 480V
Black	500V - 690V

Figure 114: Plug color decoder

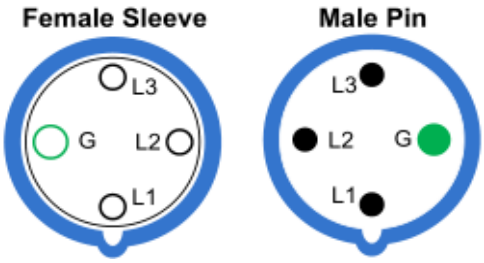
IEC 309 Pin Decode

The following table is a break down of the Hubbell (HBL) part number.
The numbers and letters circled in red below is an example HBL part number: HBL**460R9W**.

4	60	R	9	W
Pin Configuration	**Amperage**	**Device Type**	**Polarization**	**Environmental Rating**
3 - 2 Pole + G 4 - 3 Pole + G 5 – 3 Pole + N + G	20 30 32 60 63 100	P - Plug C - Connector R - Receptacle B - Inlet	Clock Position Of Female Sleeve	W-WATERTIGHT (SCREW CAP & LOCKING RING)

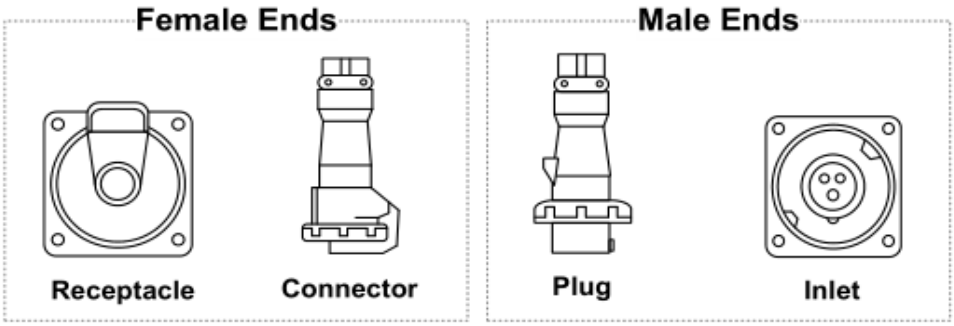
The P/N: HBL**460R9W** plug description is listed below:

HBL**460R9W** = **4** pin (3ph), **60**A, **R**eceptacle, **9** ground (G) clock face pin position, **W**atertight.



Note: The number of pins indicates the phase: **3 pins** = 1ph, **4 pins** = 3ph Δ, and **5 pins** = 3 ph Y

The device types (R, C, P, and B) are pictured below.



Ingress Protection (IP) Decode

Code Letters	First Number	Second Number
Ingress Protection	**Protection Against Ingress of Solid Foreign Objects**	**Protection Against Ingress of Water with Harmful Effects**
IP	0 – No Protection 1 ≥ 50mm Diameter 2 ≥ 12.5mm Diameter 3 ≥ 2.5mm Diameter 4 ≥ 1.0mm Diameter 5 – Dust-Protected 6 – Dust-Tight	0 – No Protection 1 – Vertically Dripping 2 – Dripping At 15° Of Tilt 3 – Spraying Up To 60° Of Tilt 4 – Splashing 5 – Jetting 6 – Power Jetting 7 – Temporary Immersion 8 – Continuous Immersion

First Number: degree of protection for persons against access of hazardous parts inside the enclosure and/or against foreign objects.

Second Number: degree of protection of equipment inside enclosures against damage from ingress of water.

Ingress Protection (IP) is defined in IEC 60529 Standard.

Example: IP67 = Ingress Protection / Dust-Tight / Temporary Immersion

Three Phase Power Calculation Diagrams

The following figures explain three phase power values for various amperage.

60A Three Phase Delta Power Calculations

$$E_{LL} = E_{AC} = E_{BA} = E_{CB} = 208V$$

$$I_L = 60A$$

$$P_{Total} = \sqrt{3} \times E_{LL} \times I_L \times pf$$

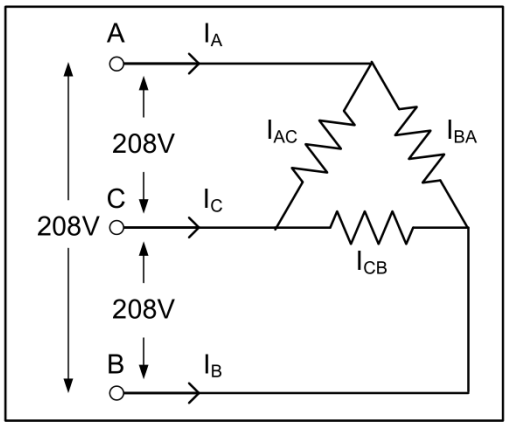
$$= \sqrt{3} \times 208 \times 60 \times 1$$

$$= 21616W$$

$$P_{Derated} = P_{Total} \times 0.8$$

$$= 21616W \times 0.8$$

$$= 17293W$$



$$I_\Phi = I_{AC} = I_{BA} = I_{CB} = \frac{I_L}{\sqrt{3}} = \frac{60}{\sqrt{3}} = 34.64A$$

$$I_{Derated} = I_\Phi \times 0.8 = 34.64 \times 0.8 = 27.7A$$

Variables Defined

I_Φ = Phase Current
I_L = Line Current
E_{LL} = Line to Line Voltage
pf = Power Factor
P = Power In Watts

50A Three Phase Delta Power Calculations

$E_{LL} = 208V$

$I_L = 50A$

$P_{Total} = \sqrt{3} \times E_{LL} \times I_L \times PF$

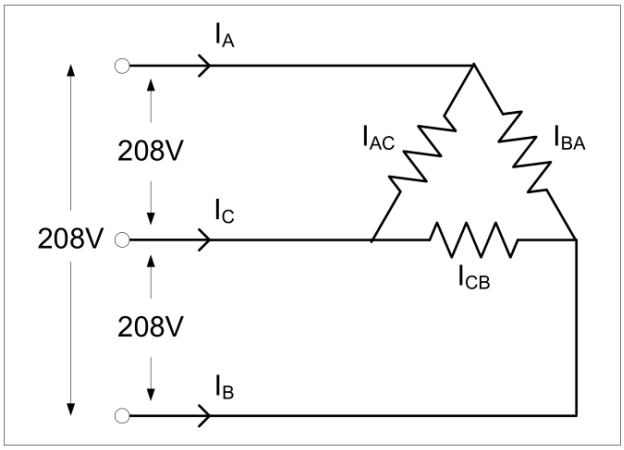
$= \sqrt{3} \times 208 \times 50 \times 1$

$= 18013W$

$P_{Derated} = P_{Total} \times 0.8$

$= 18013W \times 0.8$

$= 14410W$



$$I_{AC} = I_{BA} = I_{CB} = \frac{I_L}{\sqrt{3}} = \frac{50}{\sqrt{3}} = 28.86A$$

$I_{Derated} = I \times 0.8 = 28.86 \times 0.8 = 23.09A$

Variables Defined

I_Φ = Phase Current
I_L = Line Current
E_{LL} = Line to Line Voltage
PF = Power Factor
P = Power In Watts

30A Three Phase Delta Power Calculations

$E_{LL} = E_{AC} = E_{BA} = E_{CB} = 208V$

$I_L = 30A$

$P_{Total} = \sqrt{3} \times E_{LL} \times I_L \times PF$

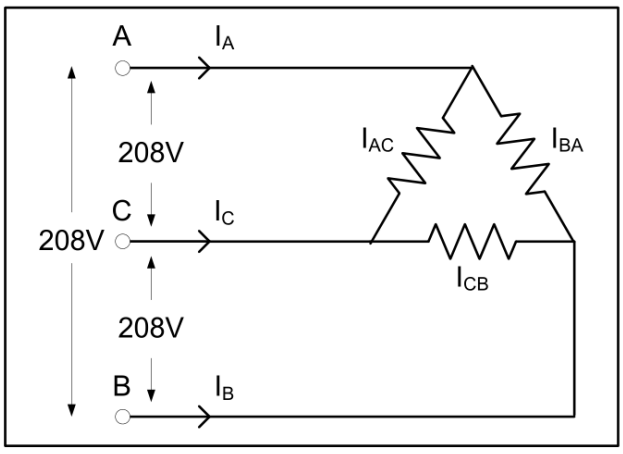
$= \sqrt{3} \times 208 \times 30 \times 1$

$= 10808W$

$P_{Derated} = P_{Total} \times 0.8$

$= 10808W \times 0.8$

$= 8646W$



$$I_\Phi = I_{AC} = I_{BA} = I_{CB} = \frac{I_L}{\sqrt{3}} = \frac{30}{\sqrt{3}} = 17.32A$$

$I_{Derated} = I_\Phi \times 0.8 = 17.32 \times 0.8 = 13.85A$

Variables Defined

I_Φ = Phase Current
I_L = Line Current
E_{LL} = Line to Line Voltage
PF = Power Factor
P = Power In Watts

32A Three Phase Delta Power Calculations

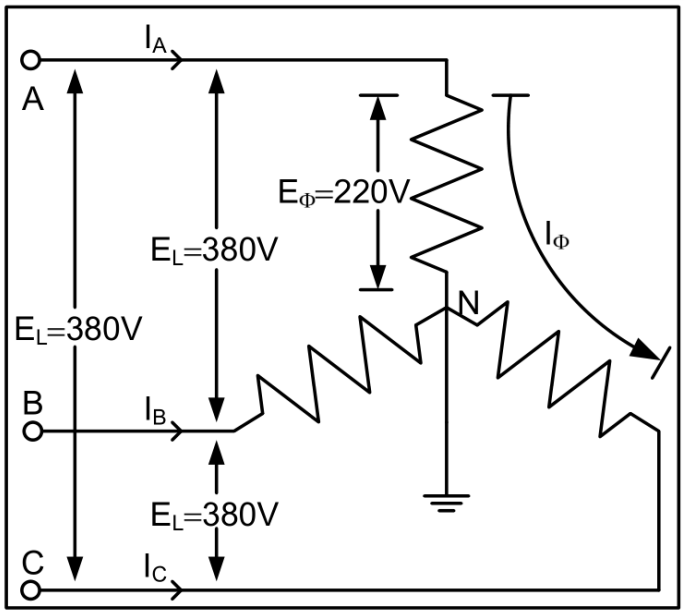
$I_A = I_B = I_C = I_L = I_\Phi = 32A$

$P_\Phi = E_{\Phi Y} \times I_{\Phi Y} \times pf \quad (W)$

$P_{TOTAL} = 3 \times P_\Phi$
$= 3 \times E_L/\sqrt{3} \times I_\Phi \times pf$
$= \sqrt{3} \times E_L \times I_L \times pf$
$= \sqrt{3} \times 380V \times 32A \times 1$
$= 21061W$

$E_{AN} = E_{BN} = E_{CN} = E_\Phi$

$= \frac{E_L}{\sqrt{3}} = \frac{380}{\sqrt{3}} = 220V$



16A Three Phase Delta Power Calculations

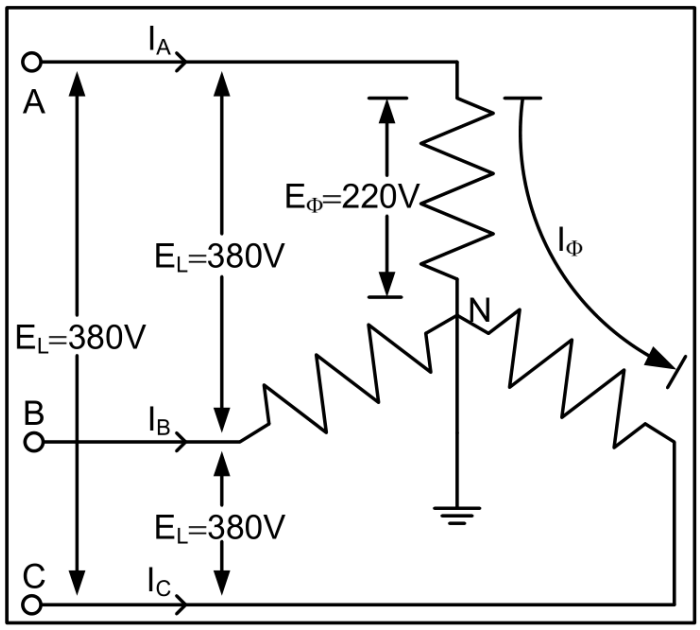
$I_A = I_B = I_C = I_L = I_\Phi = 16A$

$P_\Phi = E_{\Phi Y} \times I_{\Phi Y} \times pf \quad (W)$

$P_{TOTAL} = 3 \times P_\Phi$
$= 3 \times E_L/\sqrt{3} \times I_\Phi \times pf$
$= \sqrt{3} \times E_L \times I_L \times pf$
$= \sqrt{3} \times 380V \times 16A \times 1$
$= 10530W$

$E_{AN} = E_{BN} = E_{CN} = E_\Phi$

$= \frac{E_L}{\sqrt{3}} = \frac{380}{\sqrt{3}} = 220V$



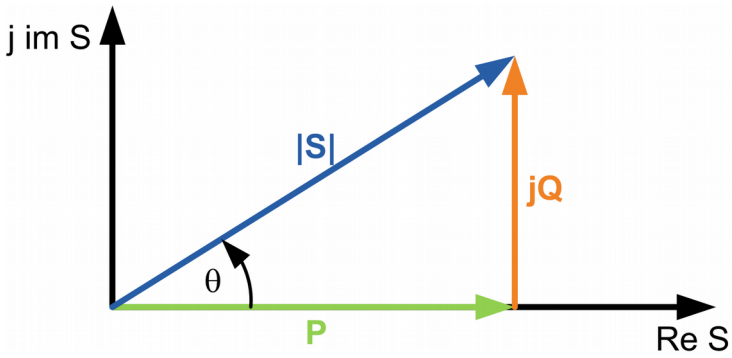
Background on Power Factor (pf) and UPS Sizing

UPS systems typically have two ratings, KVA and Watts. In the past, there has been some confusion over how these numbers should be used for planning purposes. This guide will explain the difference between the two and how each is used in the planning process.

To establish the basis of terminology used in this guide, here are some brief definitions.

- **Apparent Power (S)** – The product of voltage and current in AC circuits. Apparent power includes capacitive or inductive elements and has units of Volt-Ampere or VA.
- **Real Power (P)** – Energy delivered to do useful work (like powering a server). Real power does not include capacitive or inductive elements
- **Reactive Power (Q)** – The peak power in a reactive load. Reactive power is the imaginary part of apparent power and has units of var.
- **Power Factor (pf)** – The ratio between real and apparent power. Power factor ranges between zero and one and is unit less. Power factor can be leading (capacitive) or lagging (inductive).

The relationship between all of these is best understood graphically.



The x axis is the real part of the apparent power and the y axis represents the imaginary part of S. The apparent power by definition is the vector sum of the real and reactive power.

Translating this to terms that most are familiar with, think of a freshly poured glass of beer. When the glass is full it is considered collectively as a beer and is equivalent to apparent power S. This collective beer is made up of liquid beer (real power P) and foam (reactive power Q). The liquid beer (real power P) is what is desired, but you must pay for the foam (reactive power Q) as well. The better the bartender (power supply vendor) the more liquid beer (real power P) and less foam (reactive power Q) you get.

Back to the math, we introduce the concept of power factor. Power factor is a dimensionless number between 0 and 1 and can be calculated through the following relationship.

$$pf = \frac{\text{Real Power}}{\text{Apparent Power}} = \frac{P}{S}$$

Power factor, more importantly power factor correction, is important because loads with low power factor require higher current than loads with a power factor closer to 1. When planning circuits, PDUs, and UPS systems, a higher power factor is desired to minimize the current draw on the infrastructure and maximize power distribution efficiency.

Getting into a little more detail, pf=1 means that all energy supplied in the circuit is consumed by the load, which is purely resistive. As the power factor decreases (pf<1) the circuit is said to have become more reactive. A reactive circuit stores energy in the load for part of the AC cycle which is then returned to the source later in the cycle. At the opposite end, pf=0 means that the energy supplied at one point in the cycle is stored in the load and returned to the source at another point in the cycle.

Today's IT equipment, for the most part, employs some type of power factor correction. This means that the switching power supply units in the IT equipment are designed to appear as resistive devices to the electrical infrastructure with a power factor (pf) of approximately one (pf=1). In reality, the power factor changes with the load on the IT equipment, but under nominal conditions of today's modern IT equipment, the power factor is in the range of 0.96 to 0.99.

When a UPS is rated, two numbers are typically given, KVA and Watts. The KVA and Watts represent the input apparent and real power respectively. Looking at the quotient of the input ratings gives the designed input power factor.

The output of a UPS is restricted to the current limitation of the outlets of the UPS. This limitation can be defined as individual outlet limitations and/or group limitations. The total outlet current limitation of the UPS will be such that the capacity of the UPS will not be exceeded.

Using the tables that accompany each UPS in this guide, one is able to calculate run time by knowing the approximate real-load and number of external battery module(s) (if applicable).

Helpful Links

Power Configurator
http://www.ibm.com/support/entry/portal/docdisplay?lndocid=LNVO-POWINF

Power & cooling technical reference guides
https://www-947.ibm.com/support/entry/portal/docdisplay?lndocid=LNVO-POWINF

Hubbell - Twist Lock Plug/Outlet Catalog (Includes NEMA Outlets)
http://www.hubbellcatalog.com/wiring/catalogpages/section-b.pdf

Hubbell - Pin & Sleeve Plug/Outlet Catalog (Includes IEC309 Outlets)
http://www.hubbellcatalog.com/wiring/catalogpages/section-E.pdf

System x Configuration and Options Guide
http://www.ibm.com/systems/xbc/cog/

System x BladeCenter and System x Reference Sheets
http://www.redbooks.ibm.com/abstracts/redpxref.html

Official System x Visio Stencils
http://www.visiocafe.com/lenovo.htm

APPENDIX

The following section contains the label ratings for all System x hardware.

Label Ratings

This section contains the label ratings for Lenovo systems including Flex System, NeXtScale System, BladeCenter, Top of Rack Switches, System x servers, Storage, iDataPlex, and xSeries Servers.

Label Ratings Explained

The "Rating" is the label rating of the product. It is the absolute worst case power consumption for a
fully configured system or chassis. This means all DIMM slots, CPU sockets, PCI slots, HDD slots etc., are fully populated and are running at maximum capacity assuming the worst case power load across the entire system/chassis. It is calculated on assuming the highest power consuming hardware is installed, for example: 130W CPUs, quad rank DIMMs, 15k HDD spindles etc. It also assumes highest fan speeds.

For these reasons, if a system is running with 95W CPUs for example, it is not realistic to provide the rating number as an accurate guide for the systems power load. Use the System x Power Configurator tool to better define the hardware's power draw. The tool is available for download from:
http://www.ibm.com/support/entry/portal/docdisplay?lndocid=LNVO-PWRCONF

Flex System Enterprise Chassis Label Rating

The following table represents the label rating numbers for the Flex System Enterprise Chassis.

Chassis	Power Supply Wattage	Power Supplies Standard	Power Supplies Max	100-127V Rating	200-240V Rating	240-380V Rating
Flex Enterprise	2100W	2	6	-	11.8A / Supply	-
Flex Enterprise	2500W	2	6	-	13.85A / Supply	-
Flex Enterprise	2500W DC*	2	6	-	-	11.5A / Supply

* This PSU can only be used with the HVDC PDU

NeXtScale System Chassis Label Rating

The following table represents the label rating numbers for the NeXtScale System Chassis.

Chassis	Power Supply Wattage	Power Supplies Standard	Power Supplies Max	100-127V Rating	200-240V Rating
n1200	900W	6	6	6.8A / Supply	5A / Supply
n1200	1300W	2	6	-	6.9A / Supply

BladeCenter System Chassis Label Rating

The following table represents the label rating numbers for the BladeCenter System Chassis.

Chassis	Power Supply Wattage	Power Supplies Standard	Power Supplies Max	100-127V Rating	200-240V Rating
BC-E	2000W	2	4	-	12A / Supply
BC-E	2320W	2	4	-	13.8A / Supply
BC-H	2900W	2	4	-	16A / Supply + 16A / Supply + 5A / Blower = 37A / Connector
BC-H	2980W	2	4	-	16A / Supply + 16A / Supply + 5A / Blower = 37A / Connector
BC-HT	3160W	2	4	-	16A / Supply
BC-T	1300	2	4	-	8A / Supply
BC-S	950W/1450W*	2	4	11.2A/ Supply	8A / Supply

* - 950W is at 100-127V and 1450W is at 200-240V

System x Tower Server Label Rating

The following table represents the label rating numbers for System x Tower Servers.

Server	Power Supply Wattage	Power Supplies		Server Ratings			Redundant @ 100-127V
		Standard	Max	100-127V	200-208V	220-240V	
x3100							
x3100 (4348)	310W	1	1	4.5A	2.25A		-
x3100 M3 (4253)	350W	1	1	4.9A	2.4A		-
x3100 M4 (2582)	300W	1	1	6A	3A		-
x3100 M4 (2582)	350W	1	1	7A	3.5A		-
x3100 M5 (5457)	300W	1	1	4A	3A		-
x3100 M5 (5457)	350W	1	1	4.5A	2.2A		
x3100 M5 (5457)	430W	2	2	5A	2.5A		-
x3105 (4347)	310W	1	1	4.5A	2.25A		-
x3200							
x3200 (4362, 4363)	400W	1	1	5.5A	2.75A		-
x3200 (4362, 4363)	430W	1	2	5.5A	2.75A		Yes
x3200 M2 (4367, 4368)	401W	1	1	5.5A	2.75A		-
x3200 M2 (4367, 4368)	430W	1	2	5.5A	2.75A		Yes
x3200 M2 (9234)	400W	1	1	5.5A	2.75A		-
x3200 M2 (9234)	430W	1	2	5.5A	2.75A		Yes
x3200 M3 (7327, 7328)	401W	1	1	5.5A	2.75A		-
x3200 M3 (7327, 7328)	430W	1	2	5.5A	2.75A		Yes
x3300							
x3300 M4 (7382)	460W	1	1	5.3A	2.6A		-

x3300 M4 (7382)	550W	1	2	6.5A	3.3A		Yes
x3300 M4 (7382)	750W	1	2	8.9A	4.5A		Yes
x3400							
x3400 (7973, 7974)	670W	1	1	5A	2.5A		-
Server	**Power Supply Wattage**	**Power Supplies**		**Server Ratings**			**Redundant @ 100-127V**
		Standard	**Max**	**100-127V**	**200-208V**	**220-240V**	
x3400 (7975, 7976)	835W	1	2	6.5A	3.25A		Yes
x3400 M2 (7836, 7837)	670W	1	1	10A	5A		-
x3400 M2 (7836, 7837)	920W	1	2	10A	5A		Yes
x3400 M3 (7378, 7379)	670W	1	1	10A	5A		-
x3400 M3 (7378, 7379)	920W	1	2	10A	5A		Yes
x3500							
x3500 (7977)	835W	1	2	6.5A	3.25A		Yes
x3500 M2 (7839)	670W	1	2	10A	5A		-
x3500 M2 (7839)	920W	1	2	10A	5A		Yes
x3500 M3 (7380)	670W	1	2	10A	5A		-
x3500 M3 (7380)	920W	1	2	10A	5A		Yes
x3500 M4 (7383)	750W	1	2	8.9A	4.5A		Yes
x3500 M4 (7383)	900W	1	2	10A	5A		Yes

System x Rack Server Label Rating

The following table represents the label rating numbers for System x Rack Servers.

Server	Power Supply Wattage	Power Supplies		Server Ratings			Redundant @ 100-127V
		Standard	Max	100-127V	200-208V	220-240V	
x3250							
x3250 (4364, 4365)	350W	1	1	6A	3A		-
x3250 M2 (4190, 4194)	351W	1	1	4.5A	2.25A		-
x3250 M3 (4251, 4252)	351W	1	1	4.5A	2.25A		-
x3250 M4 (2583)	300W	1	1	6A	3A		-
x3250 M4 (2583)	460W	1	2	5.3A	2.6A		Yes
x3250 M5 (5458)	460W	1	2	5.3A	2.6A		Yes
x3250 M5 (5458)	300W	1	1	6A	3A		-
x3350							
x3350 (4192, 4193)	450W	1	2	4.1A	2A		Yes
x3455							
x3455 (7984)	650W	1	1	6.1A	3.0A		-
x3455 (7940, 7941)	650W	1	1	6.1A	3.0A		-
x3530							
x3530 M4 (7160)	460W	1	2	5.3A	2.6A		Yes
x3530 M4 (7160)	675W	1	2	7.8A	3.8A		Yes
x3550							
x3550 (7879)	670W	1	2	7A	3.5A		Yes
x3550 M2 (7946)	675W	1	2	7.8A	3.8A		Yes
x3550 M3 (7944)	460W	1	2	5.3A	2.6A		Yes
x3550 M4 (7914)	550W	1	2	6.5A	3.3A		Yes

x3550 M4 (7914)	750W	1	2	8.9A	4.5A	Yes
x3550 M3 (7944)	675W	1	2	7.8A	3.8A	Yes
x3620						
x3620 M3 (7376)	460W	1	2	5.3A	2.6A	Yes
Server	**Power Supply Wattage**	**Power Supplies**		**Server Ratings**		**Redundant @ 100-127V**
		Standard	**Max**	**100-127V**	**200-208V**	
x3620 M3 (7376)	675W	1	2	7.8A	3.8A	Yes
x3630						
x3630 M3 (7377)	675W	1	2	7.8A	3.8A	Yes
x3630 M4 (7158)	550W	1	2	6.5A	3.3A	Yes
x3630 M4 (7158)	750W	1	2	8.9A	4.5A	Yes
x3650						
x3650 (7979)	835W	1	2	9.7A	4.85A	Yes
x3650 T (7980)	600W	2	2	6A	3A	Yes
x3650 M2 (7838)	675W	1	2	7.8A	3.8A	Yes
x3650 M2 (7947)	675W	1	2	7.8A	3.8A	Yes
x3650 M3 (7945)	460W	1	2	5.3A	2.6A	Yes
x3650 M3 (7945)	675W	1	2	7.8A	3.8A	Yes
x3650 M4 (7915)	550W	1	2	6.5A	3.3A	Yes
x3650 M4 (7915)	750W	1	2	8.9A	4.5A	Yes
x3650 M4 (7915)	900W	1	2	10A	5A	Yes
x3650 M4 BD (5466)	750W	1	2	8.9A	4.5A	Yes
x3650 M4 BD (5466)	900W	1	2	10A	5A	Yes
x3650 M4 HD (5460)	550W	1	2	6.5A	3.3A	Yes
x3650 M4 HD (5460)	750W	1	2	8.9A	4.5A	Yes
x3650 M4 HD (5460)	900W	1	2	10A	5A	Yes

x3655						
x3655 (7985)	835W	1	2	9.7A	4.85A	Yes
x3690 X5						
x3690 X5 (7147, 7148)	675W	1	1	7.8A	3.8A	Yes
x3690 X5 (7147, 7148)	675W	2	4			
Server Rating				15.6A	7.6A	Yes
Power Supply Rating (per plug)				7.8A	3.8A	Yes
x3750						
x3750 M4 (8722)	900W	1	2	10A	5A	Yes
Server	**Power Supply Wattage**	**Power Supplies**		**Server Ratings**		**Redundant @ 100-127V**
		Standard	**Max**	**100-127V**	**200-208V**	
x3750 M4 (8722)	1400W	1	2	10A	8A	Yes
x3755						
x3755 (8877, 7163)	1500W	1	2	17.6A	8.8A	No
x3755 M3 (7164)	1100W	1	1	12	6.7A	-
x3755 M3 (7164)	1100W	2	3			
Server Rating				19A	11.6A	Yes
Power Supply Rating (per plug)				12A	6.7A	Yes
x3800						
x3800 (8866)	775W	2	3	18.4A	9.2A	Yes
x3850/x3950						
x3850 (8863, 8864)	1300W	1	2	15.75A	7.875A	No
x3950 (8872, 8878)	1300W	2	2	15.75A	7.875A	No
x3850/3950 M2 (7141)	1440W	1	2	17.2AA	8A	No
x3850/3950 M2	1440W	1	2	17.2AA	8A	No

(7233)							
x3850 X5 (7143, 7145)	1975W	2	2	20A	12A	10A	No
x3850 X6 (3837)	900W	2	4	10A	5A		Yes
x3850 X6 (3837)	1400W	2	4	10A	8A		Yes
x3850 X6 DC* (3837)	750W**	2	4	-	-		-

* Input Voltage Range: -48V (-30V to -60V), max input Amps@-36V = 24A

** DC model requires the use of a HVDC PSU

DS Storage Label Rating

The following table represents the label rating numbers for the DS Storage Units.

Storage Device	Power Supply Wattage	100-127V Rating	200-240V Rating
DS3200	515W	3.9A	1.95A
DS3300	515W	3.9A	1.95A
DS3400	515W	3.9A	1.95A
DS3512	385W	3.8A	1.9A
DS3524	330W	3.8A	1.9A
DS4100	390W	3.01A	1.57A
DS4200	390W	4.45A	2.27A
DS4800	390W	5A	2.25A
DS5020	600W	6A	2.5A
DS5100	580W	5.4A	2.25A
DS5300	580W	5.4A	2.25A
DCS 3860	896W	15A	7A

Expansion (EXP) Unit Storage Label Rating

The following table represents the label rating numbers for the Storage Expansion Units.

Storage Device	Power Supply Wattage	100-127V Rating	200-240V Rating
EXP420	600W	4.54A	2.27A
EXP500	390W	3.9A	1.98A
EXP700	390W	3.9A	1.98A
EXP710	390W	3.9A	1.98A
EXP810	600W	4.54A	2.27A
EXP3000	390W	3.9A	1.98A
EXP3500	330W	3.8A	1.9A
EXP5000	580W	5.4A	2.25A
EXP520	600W	6A	2.5A
EXP3800	802W	15A	7A

IBM Storwize Label Rating

The following table represents the label rating numbers for the IBM Storwize Storage Units.

Storage Device	Power Supply Wattage	100-127V Rating	200-240V Rating
Storwize V3500	735W	3.93A	1.96A
Storwize V3700	735W	3.93A	1.96A
Storwize V3700 DC	800W	9.89A	4.89A
Storwize V3700 EXP	735W	3.26A	1.63A
Storwize V3700 DC EXP	800W	7.72A	3.39A
Storwize V7000	580W	8A	3A
Storwize V7000	764W	10A	6A

iDataPlex Chassis Label Rating

The following table represents the label rating numbers for the Storwize Storage Units.

Chassis	Slot Configuration	Power Supply Wattage	Number of Power Supplies		Chassis Rating
			Standard	Max	
2U Flex Chassis (7831, 6385)	2 Planars	900W High Efficiency	1	1	100V – 8.62A 110V – 7.71A 115V – 7.35A 120V – 7.00A 127V – 6.63A 200V – 4.19A 208V – 3.98A 220V – 3.81A 230V – 3.61A 240V – 3.46A
2U Flex Chassis (7831, 6385)	1 Planar with I/O Tray	900W High Efficiency	1	1	100V – 5.90A 110V – 5.28A 115V – 5.01A 120V – 4.83A 127V – 4.61A 200V – 2.93A 208V – 2.83A 220V – 2.68A 230V – 2.57A 240V – 2.47A
2U Flex Chassis (7381, 6385)	1 Planar with Storage Tray	900W High Efficiency	1	1	100V – 5.54A 110V – 4.89 A 115V – 4.67A 120V – 4.44A 127V – 4.20A 200V – 2.67A 208V – 2.56A 220V – 2.43A 230V – 2.33A 240V – 2.24A

Chassis	Slot Configuration	Power Supply Wattage	Number of Power Supplies		Chassis Rating
			Standard	Max	
3U Storage Chassis (7834, 6386)		900W High Efficiency	1	1	100V – 7.61A 110V – 6.90A 115V – 6.52A 120V – 6.28A 127V – 5.90A 200V – 3.73A 208V – 3.59A 220V – 3.37A 230V – 3.24A 240V – 3.13A
2U Flex Chassis (7831, 6385)	2 Planars	Dual 750W Power Supply	2	2	200V – 3.90A 208V – 3.80A 220V – 3.53A 230V – 3.38A 240V – 3.22A
2U Flex Chassis (7831, 6385)	1 Planar with I/O Tray	Dual 750W Power Supply	2	2	200V – 2.37A 208V – 2.27A 220V – 2.15A 230V – 2.05A 240V – 1.97A
2U Flex Chassis (7381, 6385)	1 Planar with Storage Tray	Dual 750W Power Supply	2	2	200V – 2.43A 208V – 2.32A 220V – 2.19A 230V – 2.11A 240V – 1.99A
3U Storage Chassis (7834, 6386)		Dual 750W Power Supply	2	2	200V – 2.89A 208V – 2.76A 220V – 2.61A 230V – 2.51A 240V – 2.39A

System x Top of Rack (ToR) Ethernet Switch Label Rating

The following table represents the label rating numbers for the ToR Ethernet Switches.

Switch	Power Supply Wattage	Power Supplies Standard	Power Supplies Max	100-127V Rating	200-240V Rating	Power Supply Inlet
G7028*	100W	1	1	0.465A	0.253A	IEC320 C14
G7052*	102W	1	1	0.71A	0.37A	IEC320 C14
G8000	150W	2	2	1.5A	0.65A	IEC320 C14
G8052	450W	2	2	2.0A	1.0A	IEC320 C14
G8124 E^^	275W	2	2	3.125A	1.63A	IEC320 C14
G8264 / T	750W	2	2	3.75A	1.875A	IEC320 C14
G8264CS F to R^	550W	2	2	2.28A	1.3A	IEC320 C14
G8264CS R to F^	750W	2	2	3.75A	1.875A	IEC320 C14
G8332 F to R^	550W	2	2	2.28A	1.3A	IEC320 C14
G8332 R to F^	750W	2	2	3.75A	1.875A	IEC320 C14
G8272 F to R, R to F~	460W	2	2	4.1A	2.5A	IEC320 C14
G8296 F to R, R to F`	750W	2	2	3.75A	1.875A	IEC320 C14
G8316 F to R, R to F	450W	2	2	3.125A	1.63A	IEC320 C14
J48E (4273-48E)	320W	1	2	3.75A	2.0A	IEC320 C14
J48E (4273-48E)	600W	1	2	6.75A	3.25A	IEC320 C14
J48E (4273-48E)	930W	1	2	5.5A	4.0A	IEC320 C14
B48Y (4002AY4)	210W	1	2	2.5A	1.2A	IEC320 C14
B24X	300W	1	2	2.5A	1.2A	IEC320 C14

* Redundant power supplied through external power supply (supports up to 4)

^^ DC version is 250W 5.2A@48V DC

^ F = Front, R = Rear

~ Maximum power: 240W

` Maximum power: 420W

xSeries Server Label Rating

The following table represents the label rating numbers for xSeries Servers.

Server	Power Supply Wattage	Power Supplies		Server Ratings			Redundant @ 100-127V
		Standard	Max	100-127V	200-208V	220-240V	
x100	310W	1	1	4.5A	2.25A		-
x206	400W	1	1	5.5A	2.75A		-
x206	430W	1	2	5.5A	2.75A		Yes
x226	530W	1	1	7A	3.5A		-
x226	514W	1	2	7A	3.5A		Yes
x236	670W	1	2	8.93A	4.465A		Yes
x255	370W	2	4	10A	5A		Yes
x260	775W	2	3	18.4A	9.2A		No
x306	350W	1	1	4.3A	2.15A		-
x335	332W	1	1	4A	2A		-
x335	411W	1	1	3.5A	1.75A		-
x336	585W	1	2	5.5A	2.75A		Yes
x346	625W	1	2	8.3A	4.15A		Yes
x366	1300W	1	2	15.75A	7.875A		No
x445	1200W	2	2	9.5A	4.75A		No
x445 16-way	1200W	4	4	19A	9.5A		No
x460	1300W	2	2	15.75A	7.875A		No

Quick Spec Cheat Sheet for System X and ThinkServer

Note: Additional outlets may be required depending on the number of systems requiring UPS support. Refer to the following reference table for the number of outlets on each UPS system.

Reference table:

UPS Tower Models	Outlets
55951AX 1kVA Tower UPS (110V)	(8) 5-15R
55951KX 1kVA Tower UPS (230V)	(8) C13
55952AX 1.5kVA Tower UPS (110V)	(8) 5-15R
55952KX 1.5kVA Tower UPS (230V)	(8) C13
UPS Rack Mount or Tower Models	**Outlets**
55941AX 1.5kVA R/T UPS (100V/120V)	(8) 5-15R
55941KX 1.5kVA R/T UPS (200V-230V)	(8) C13
55942AX 2.2kVA R/T UPS (100V/120V)	(8) 5-20R
55942KX 2.2kVA R/T UPS (200V -230V)	(8) C13, (1) C19
55943AX 3kVA R/T UPS (100V/120V)	(6) 5-20R, (1) L5-30R
55943KX 3kVA R/T UPS (200V-230V)	(8) C13, (1) C19
55945KX 5kVA R/T UPS (200V-230V)	(8) C13, (2) C19
55946KX 6kVA R/T UPS (200V-230V)	(8) C13, (2) C19
55948KX 8kVA R/T UPS (200V-230V)	(4) C19 (optional PDU connection)
55948PX 8kVA 3 ph UPS (200V-230V)	(4) C19 (optional PDU connection)
55949KX 11kVA R/T UPS (200V-230V)	(4) C19 (optional PDU connection)
55949PX 11kVA 3 ph UPS (200V-230V)	(4) C19 (optional PDU connection)

System X Tower

System X Tower			Minimum UPS recommendation	Minimum UPS recommendation	Minimum UPS recommendation
MTM	**Tower**	**PSU Capacity / Qty**	**1-2 Servers**	**3-4 Servers***	**5-6 Servers***
			North America / International	**North America / International**	**North America / International**
2582	**x3100 M4**	300W / 1	55951AX / 55951KX	55952AX / 55952KX	55942AX / 55942KX
		430W / 1	55951AX / 55951KX	55942AX / 55942KX	55943AX / 55943KX
5457	**x3100 M5**	430W / 1	55951AX / 55951KX	55942AX / 55942KX	55943AX / 55943KX
7327	**x3200 M3**	401W / 1	55951AX / 55951KX	55942AX / 55942KX	55943AX / 55943KX
		430W / 1	55951AX / 55951KX	55942AX / 55942KX	55943AX / 55943KX
7328	**x3200 M3**	401W / 2	55951AX / 55951KX	55942AX / 55942KX	55943AX / 55943KX
		430W / 2	55951AX / 55951KX	55942AX / 55942KX	55943AX / 55943KX
7382	**x3300 M4**	460W / 2	55951AX / 55951KX	55942AX / 55942KX	55943AX / 55943KX
		550W / 2	55952AX / 55952KX	55942AX / 55942KX	55945KX
		750W / 2	55952AX / 55952KX	55943AX / 55943KX	55945KX
7379	**x3400 M3**	670W / 2	55952AX / 55952KX	55943AX / 55943KX	55945KX
		920W / 2	55943AX / 55943KX	55945KX	55946KX
7380	**x3500 M3**	920W / 2	55943AX / 55943KX	55945KX	55946KX
7383	**x3500 M4**	750W / 2	55952AX / 55952KX	55943AX / 55943KX	55945KX
		900W / 2	55943AX / 55943KX	55945KX	55946KX
5464	**x3500 M5**	550W / 2	55952AX / 55952KX	55943AX / 55943KX	55945KX
		750W / 2	55952AX / 55952KX	55943AX / 55943KX	55945KX
		900W / 2	55943AX / 55943KX	55945KX	55946KX

System X Rack

UPS Tower Models	Outlets
55951AX 1kVA Tower UPS (110V)	(8) 5-15R
55951KX 1kVA Tower UPS (230V)	(8) C13
55952AX 1.5kVA Tower UPS (110V)	(8) 5-15R
55952KX 1.5kVA Tower UPS (230V)	(8) C13
UPS Rack Mount or Tower Models	**Outlets**
55941AX 1.5kVA R/T UPS (100V/120V)	(8) 5-15R
55941KX 1.5kVA R/T UPS (200V-230V)	(8) C13
55942AX 2.2kVA R/T UPS (100V/120V)	(8) 5-20R
55942KX 2.2kVA R/T UPS (200V -230V)	(8) C13, (1) C19
55943AX 3kVA R/T UPS (100V/120V)	(6) 5-20R, (1) L5-30R
55943KX 3kVA R/T UPS (200V-230V)	(8) C13, (1) C19
55945KX 5kVA R/T UPS (200V-230V)	(8) C13, (2) C19
55946KX 6kVA R/T UPS (200V-230V)	(8) C13, (2) C19
55948KX 8kVA R/T UPS (200V-230V)	(4) C19 (optional PDU connection)
55948PX 8kVA 3 ph UPS (200V-230V)	(4) C19 (optional PDU connection)
55949KX 11kVA R/T UPS (200V-230V)	(4) C19 (optional PDU connection)
55949PX 11kVA 3 ph UPS (200V-230V)	(4) C19 (optional PDU connection)

System X Rack			Minimum UPS recommendation	Minimum UPS recommendation	Minimum UPS recommendation
MTM	**Rack**	**PSU Capacity / Qty**	**1-2 Servers**	**3-4 Servers***	**5-6 Servers***
			North America / International	**North America / International**	**North America / International**
4251	**x3250 M3**	351W / 1	55941AX / 55941KX	55941AX / 55941KX	55942AX / 55942KX
4252	**x3250 M3**	351W / 1	55941AX / 55941KX	55941AX / 55941KX	55942AX / 55942KX
2583	**x3250 M4**	300W / 2	55941AX / 55941KX	55941AX / 55941KX	55942AX / 55942KX
		460W / 2	55941AX / 55941KX	55942AX / 55942KX	55943AX / 55943KX
5458	**x3250 M5**	460W / 2	55941AX / 55941KX	55942AX / 55942KX	55943AX / 55943KX
7160	**x3530 M4**	460W / 2	55941AX / 55941KX	55942AX / 55942KX	55943AX / 55943KX
		675W / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
7944	**x3550 M3**	460W / 2	55941AX / 55941KX	55942AX / 55942KX	55943AX / 55943KX
		675W / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
7914	**x3550 M4**	550W / 2	55941AX / 55941KX	55942AX / 55942KX	55945KX
		750W / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
5463	**x3550 M5**	550W / 2	55941AX / 55941KX	55942AX / 55942KX	55945KX
		750W / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
		900W / 2	55942AX / 55942KX	55945KX	55946KX
7376	**x3620 M3**	460W / 2	55941AX / 55941KX	55942AX / 55942KX	55943AX / 55943KX
		675W / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
7377	**x3630 M3**	675W / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
7158	**x3630 M4**	550W / 2	55941AX / 55941KX	55942AX / 55942KX	55945KX
		750W / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
		900W / 2	55942AX / 55942KX	55945KX	55946KX
7945	**x3650 M3**	460W / 2	55941AX / 55941KX	55942AX / 55942KX	55943AX / 55943KX
		675W / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
7915	**x3650 M4**	550W / 2	55941AX / 55941KX	55942AX / 55942KX	55945KX
		750W / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
		900W / 2	55942AX / 55942KX	55945KX	55946KX
5466	**x3650 M4 BD**	750W / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
		900W / 2	55942AX / 55942KX	55945KX	55946KX
5460	**x3650 M4 HD**	550W / 2	55942AX / 55942KX	55942AX / 55942KX	55945KX
		750W / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
		900W / 2	55942AX / 55942KX	55945KX	55946KX
5462	**x3650 M5**	550W / 2	55942AX / 55942KX	55942AX / 55942KX	55945KX
		750W / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
		900W / 2	55942AX / 55942KX	55945KX	55946KX
7147	**x3690 X5**	675W / 4	55942AX / 55942KX	55945KX	55948KX
8722	**x3750 M4**	900W / 2	55942AX / 55942KX	55945KX	55946KX
		1400W / 2	55943AX / 55943KX	55946KX	55948KX
8752	**x3750 M4**	750W / 2	55942AX / 55942KX	55943AX / 55943KX	55945KX
		900W / 2	55942AX / 55942KX	55945KX	55946KX
		1400W / 2	55943AX / 55943KX	55946KX	55948KX
7164	**x3755 M3**	1100W / 3	55942AX / 55942KX	55945KX	55948KX
7143	**x3850 X5**	1975W / 2	55945KX	55948KX	
3837	**x3850 X6**	900W / 4	55945KX	55948KX	55949KX
		1400W / 4	55945KX	55949KX	

UPS Tower Models	Outlets
55951AX 1kVA Tower UPS (110V)	(8) 5-15R
55951KX 1kVA Tower UPS (230V)	(8) C13
55952AX 1.5kVA Tower UPS (110V)	(8) 5-15R
55952KX 1.5kVA Tower UPS (230V)	(8) C13
UPS Rack Mount or Tower Models	**Outlets**
55941AX 1.5kVA R/T UPS (100V/120V)	(8) 5-15R
55941KX 1.5kVA R/T UPS (200V-230V)	(8) C13
55942AX 2.2kVA R/T UPS (100V/120V)	(8) 5-20R
55942KX 2.2kVA R/T UPS (200V -230V)	(8) C13, (1) C19
55943AX 3kVA R/T UPS (100V/120V)	(6) 5-20R, (1) L5-30R
55943KX 3kVA R/T UPS (200V-230V)	(8) C13, (1) C19
55945KX 5kVA R/T UPS (200V-230V)	(8) C13, (2) C19
55946KX 6kVA R/T UPS (200V-230V)	(8) C13, (2) C19
55948KX 8kVA R/T UPS (200V-230V)	(4) C19 (optional PDU connection)
55948PX 8kVA 3 ph UPS (200V-230V)	(4) C19 (optional PDU connection)

Think Server			Minimum UPS recommendation	Minimum UPS recommendation	Minimum UPS recommendation
MTM		**PSU Capacity / Qty**	**1-2 Servers**	**3-4 Servers***	**5-6 Servers***
			North America / International	**North America / International**	**North America / International**
RS140	ThinkServer	300W / 1	55941AX / 55941KX	55941AX / 55941KX	55942AX / 55942KX
RD340	ThinkServer	550W / 2	55941AX / 55941KX	55942AX / 55942KX	55945KX
RD440	ThinkServer	800W / 2	55942AX / 55942KX	55945KX	55945KX
RD540	ThinkServer	800W / 2	55942AX / 55942KX	55945KX	55945KX
RD640	ThinkServer	800W / 2	55942AX / 55942KX	55945KX	55945KX
RD550	ThinkServer	550W / 2	55941AX / 55941KX	55942AX / 55942KX	55945KX
RD550	ThinkServer	750W / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
RD550	ThinkServer	1100W / 2	55942AX / 55942KX	55945KX	55948KX
RD350	ThinkServer	450W / 2	55941AX / 55941KX	55942AX / 55942KX	55943AX / 55943KX
RD350	ThinkServer	750 / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
RD450	ThinkServer	450 / 2	55941AX / 55941KX	55942AX / 55942KX	55943AX / 55943KX
RD450	ThinkServer	750 / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
RD650	ThinkServer	550 / 2	55941AX / 55941KX	55942AX / 55942KX	55945KX
RD650	ThinkServer	750 / 2	55941AX / 55941KX	55943AX / 55943KX	55945KX
RD650	ThinkServer	1100 / 2	55941AX / 55941KX	55945KX	55948KX
RD650	ThinkServer	1600 / 2	55945KX	55948KX	55949KX

*** May require additional outlets**
Power numbers are based on worse case scenario with N+N PSU redundancy
Use the Power Configurator to plan for power and UPS configuration:
http://shop.lenovo.com/us/en/systems/server-library/#comboFilters[category]=.Tools

Support