

IBM 0U Basic Power Distribution Units

IBM System x at-a-glance guide

The IBM® zero-U (0U) Power Distribution Units (PDUs) are the ideal solutions when you need flexible, reliable, easy-to-deploy power distribution with branch circuit protection to minimize downtime. These rack-dense units distribute power to up to 24 outlets. The 0U Power Distribution Units are designed to be installed vertically in the rear channel of an IBM 42U rack, thereby not consuming any horizontal rack space that should be reserved for IT equipment (hence the term 0U).

Figure 1 shows the IBM 0U 12 C19/12 C13 50A 3 Phase PDU installed in an IBM 42U rack. To the right is the IBM 0U 24 C13 30A PDU.



Figure 1. Two of the available IBM 0U Basic Power Distribution Units

Did You Know?

With ever growing power densities in today's rack environments, it is all too easy to add load in the wrong place and trigger an overload event. The IBM 0U PDU offerings can minimize this impact, providing the ability to quickly recover with resettable circuit breakers for each designated bank of receptacles, referred to as *load groups*.

Introduction to PDUs

A power distribution unit (PDU) is a highly reliable, multiple outlet power strip, designed to consolidate line cords within the rack and distribute conditioned power from an uninterruptible power supply (UPS) or utility power to servers and other IT equipment. The PDU efficiently distributes power within the rack and provides fault-tolerant power redundancy for high availability requirements.

There are three types of PDUs available from IBM: basic, monitored, and switched and monitored. The PDUs covered in this document are of the basic type.

- **Basic:** The simplest and most cost-effective power distribution. Available with various outlet configurations and line cord options to support differing systems and load requirements. The PDUs covered in this document are of this type.
- **Monitored (also known as PDU+):** Provides the same benefits as a Basic PDU, but adds additional advanced PDU power monitoring down to the load group. This enables businesses to have a cross-platform rack level power and thermal view for trending analysis to improve power management.
- **Switched and monitored:** These are advanced power management solutions, providing power monitoring at the outlet level, with increased accuracy at low amperages, for more precise views of power consumption down to the individual server level instead of at the consolidated load group. These PDUs also offer individual outlet switching (on/off), which allows for remote power sequencing and helps prevent unintended PDU overloading. Management can be performed by tools such as IBM Systems Director Active Energy Manager™.

Part number information

Table 1 lists the available 0U Basic PDUs.

Table 1. Ordering part numbers and feature codes

Description	Part number
IBM 0U 24 C13 30A PDU	46M4128
IBM 0U 24 C13 32A PDU	46M4131
IBM 0U 24 C13 16A 3 Phase PDU	46M4122
IBM 0U 24 C13 30A 3 Phase PDU	46M4125
IBM 0U 12 C19/12 C13 50A 3 Phase PDU	46M4140
IBM 0U 12 C19/12 C13 32A 3 Phase PDU	46M4143

The part numbers for the IBM 0U Basic Power Distribution Units are included with the following items:

- One power distribution unit
- Mounting brackets for the following racks:
 - Two brackets for an IBM S2 42U Standard Rack cabinet (Types 9307, 9956)
 - Two brackets for an IBM Enterprise Rack cabinet (Types 1410, 9308)
- Miscellaneous hardware kit (for attaching the mounting brackets to the PDU and installing the PDU in a rack cabinet)

Features

IBM 0U Basic PDUs have the following common features:

- 0U rack-dense design with input cable connection, primary outlets, and breakers on one face to improve usability and cable management
- Hardware included to mount in side pocket of rack
- Easily accessible individual breakers per receptacle for high availability environments
- Electronic over-current protection
- High capacity up to 22 kW
- Resettable UL489 rated circuit breakers

The use of PDUs simplifies cable management and increases accessibility. In addition, the button-mount design of these 0U Basic PDUs helps simplify deployment by providing tool-less rear mounting in IBM 9360, 9361, and 9362 model rack cabinets, thereby reducing installation time.

Table 2 compares the power specifications of the IBM 0U Basic PDUs.

Table 2. Specifications (Part 1)







Feature	IBM 0U 24 C13 30A PDU	IBM 0U 24 C13 32A PDU	IBM 0U 24 C13 16A 3-phase PDU	IBM 0U 24 C13 30A 3-phase PDU	IBM 0U 12 C19/12 C13 50A 3-phase PDU	IBM 0U 12 C19/12 C13 32A 3-phase PDU
Part number	46M4128	46M4131	46M4122	46M4125	46M4140	46M4143
Input power						
Number of phases	Single phase input		Three phase input (wye)			
Line cord	Permanently attached line cord, 3 m length (9-ft, 10-in)					
Line cord connector	NEMA L6-30P	IEC-309 P+N+Gnd	IEC-309 P+N+Gnd	NEMA L21-30P	CS8365L 3P+Gnd	IEC-309 3P+N+Gnd
Plug design						
Input voltage	200-208V	220-240V	220-240V / 380-415V	200-208V	200-208V	220-240V / 380-415V
Input current rating	30A (24A in the USA)	32A	16A	30A (24A in the USA)	50A (40A in the USA)	32A
Maximum power rating	6240 VA	7680 VA	4320 VA	18720 VA	31200 VA	22920 VA

Table 2. Specifications (Part 2)

Feature	IBM 0U 24 C13 30A PDU	IBM 0U 24 C13 32A PDU	IBM 0U 24 C13 16A 3-phase PDU	IBM 0U 24 C13 30A 3-phase PDU	IBM 0U 12 C19/12 C13 50A 3-phase PDU	IBM 0U 12 C19/12 C13 32A 3-phase PDU
Output power						
Number of C13 outlets	24	24	24	24	12	12
Number of C19 outlets	0	0	0	0	12	12
Output voltage rating	200-208 V	220-240 V	220-240V	200-208V	200-208V	220-240V
Output current rating	Each outlet: 10 amps (VDE) / 15 amps (UL/CSA)				Each C13 outlet: 10 amps (VDE) / 15 amps (UL/CSA) Each C19 outlet: 16 amps (VDE) / 20 amps (UL/CSA)	
Number of phases	Single phase output					
Circuit breakers	Three double-pole branch rated circuit breakers rated at 20A				Six double-pole branch rated circuit breakers rated at 20A	
Number of load groups	3	3	3	3	3	3
Mechanical and environment						
Physical dimensions DxWxH	3.35 x 1.75 x 35.4 in / 85 x 44 x 900 mm				3.35 x 1.75 x 47.2 in / 85 x 44 x 1200 mm	
Weight	3.8 kg / 8.4 lb	4.5 kg / 9.9 lb	3.8 kg / 8.4 lb	3.7 kg / 8.2 lb	7.7 kg / 17 lb	5.9 kg / 13 lb
Operating temperature	10°C to 55°C (50°F to 122°F)					
Operating humidity	5% - 90% (noncondensing)					

Connectors

The IBM 0U Basic PDUs with only C13 connectors have the components and controls shown in Figure 2.

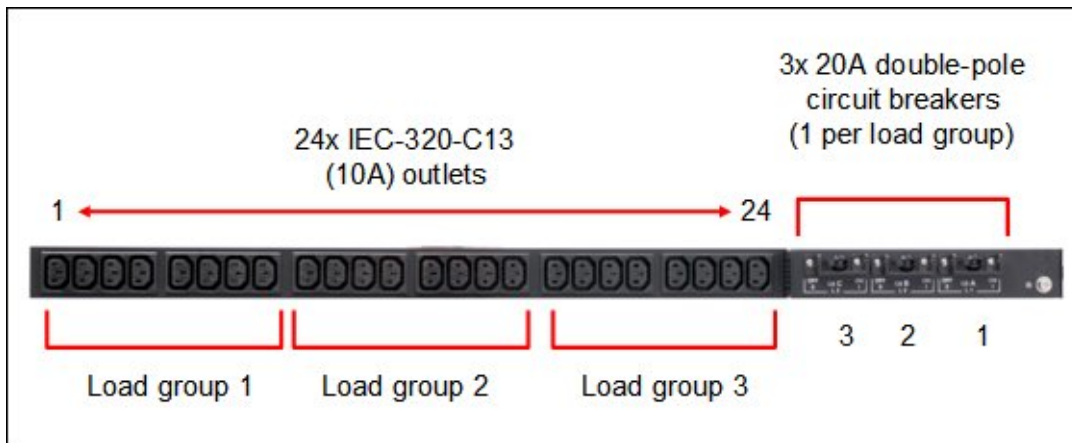


Figure 2. IBM 0U Basic PDUs with C13 connectors

The IBM 0U Basic PDUs with C13 and C19 connectors have the components and controls shown in Figure 3.

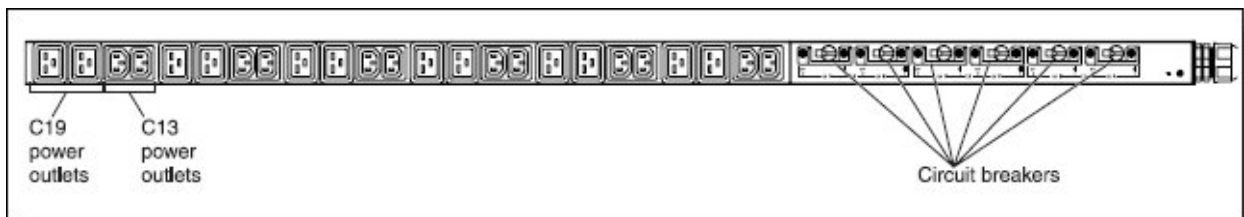


Figure 3. IBM 0U Basic PDUs with C13 and C19 connectors

A close-up of the circuit breakers of the two types of PDUs is shown in Figure 4.

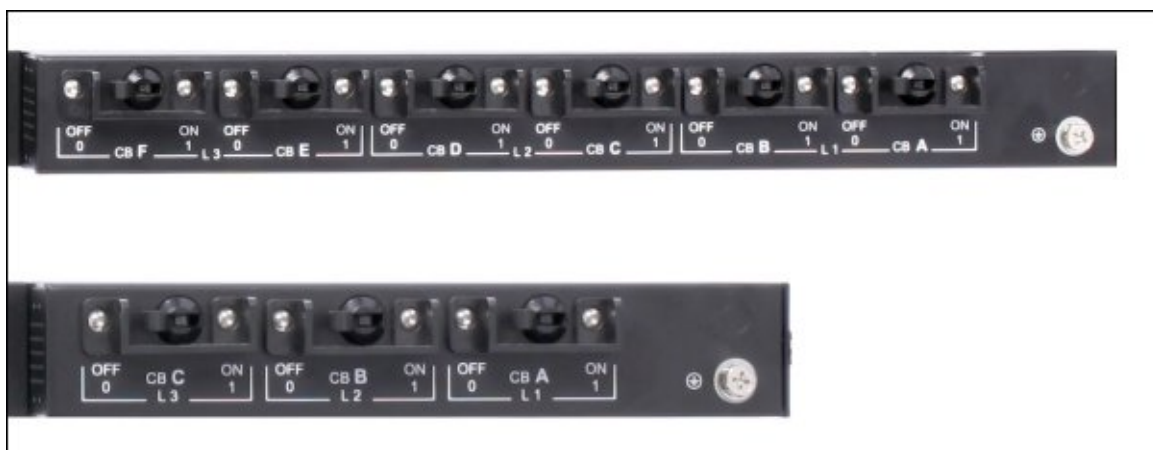


Figure 4. Circuit breakers of the 24 C13 PDU and 12 C19 / 12 C13 PDU

As Figure 4 shows, the PDUs with C13 connectors have three double-pole branch-rated circuit breakers, each rated at 20A. Each circuit breaker is a load group and is associated with eight C13 outlets. The PDUs with C13 and C19 connectors have six double-pole branch-rated circuit breakers each rated at 20A. Each pair of circuit breakers is a load group and is associated with eight C13 outlets.

Warranty

The IBM 0U Basic PDUs are offered with a three-year limited warranty.

Supported rack cabinets

The IBM 0U Basic PDUs can be installed in the following IBM racks:

- IBM S2 42U Standard Rack cabinet (Types 9307, 9956)
- IBM Enterprise Rack cabinet (Types 1410, 9308)
- IBM 42U 1200mm Deep Dynamic Rack (Type 9360)
- IBM 42U 1200mm Deep Static Rack (Type 9361)
- IBM 47U 1200mm Deep Static Rack (Type 9362)

The PDUs are installed vertically in side pockets of the rack. The Deep Dynamic and Deep Static racks support the button-mount design of the PDU and do not require additional hardware. Installation is shown in Figure 5. For the IBM S2 42U Standard Rack and Enterprise Rack, the PDU part numbers include the necessary mounting hardware.

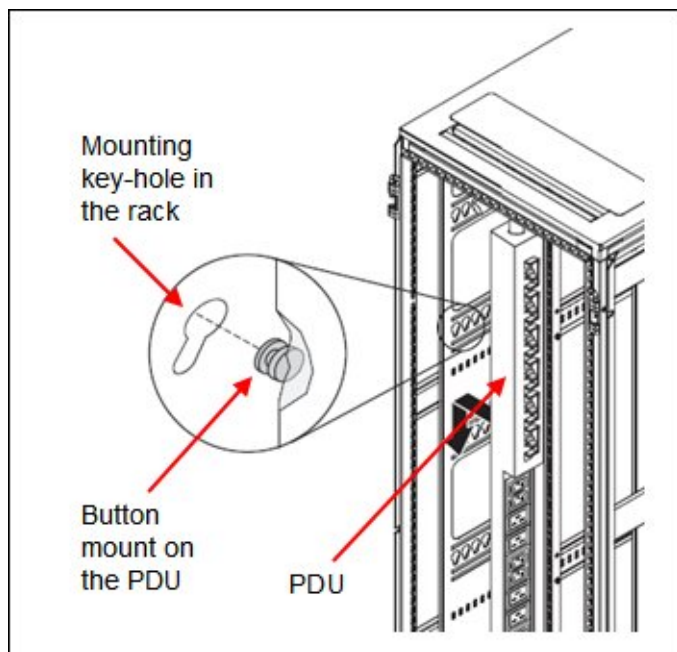


Figure 5. Installing the IBM 0U Basic PDU in a Deep Dynamic or Deep Static rack

Related resources

For more information, see the following resources:

- IBM Rack and power infrastructure portfolio (non-monitored PDUs home page)
<http://ibm.com/systems/x/hardware/options/powerdistribution.html>
- IBM U.S. Announcement letter
<http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS110-208>
- IBM 0U Basic PDUs; Installation and Maintenance Guide
<http://ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-5085549>
- IBM System x® PDU Guide - North America & Japan
<http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP101526>
- IBM System x PDU Guide - International
<http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP101615>
- Power Configurator tool
<http://www.ibm.com/systems/bladecenter/resources/powerconfig.html>
- Configuration and Options Guide (COG) - IBM BladeCenter and System x
<http://ibm.com/support/entry/portal/docdisplay?Indocid=SCOD-3ZVQ5W>

Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service. IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing, IBM Corporation, North Castle Drive, Armonk, NY 10504-1785 U.S.A.

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you. This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk. IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you. Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products. This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurement may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs.

© Copyright International Business Machines Corporation 2011. All rights reserved.

Note to U.S. Government Users Restricted Rights -- Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

This document was created or updated on September 9, 2011.

Send us your comments in one of the following ways:

- Use the online **Contact us** review form found at:
ibm.com/redbooks
- Send your comments in an e-mail to:
redbook@us.ibm.com
- Mail your comments to:
IBM Corporation, International Technical Support Organization
Dept. HYTD Mail Station P099
2455 South Road
Poughkeepsie, NY 12601-5400 U.S.A.

This document is available online at <http://www.ibm.com/redbooks/abstracts/tips0797.html> .

Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. These and other IBM trademarked terms are US registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at <http://www.ibm.com/legal/copytrade.shtml>

The following terms are trademarks of the International Business Machines Corporation in the United States, other countries, or both:

IBM Systems Director Active Energy Manager™
IBM®
Redbooks (logo)®
System x®

The following terms are trademarks of other companies:

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Other company, product, or service names may be trademarks or service marks of others.