GY33-0197-00

7133 Models 010, 020, 500, and 600
SSA Disk Subsystems

Additional Power Cabling Information

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SSA Disk Subsystems

Additional Power Cabling Information

First Edition (October 1998)

Contents

About This Supplement

This publication is a supplement to the following books:

- *7133 SSA Disk Subsystems: Service Guide*, SY33-0185-02
- *7133 SSA Disk Subsystem: Operator Guide*, GA33-3259-01
- *7133 Models 010 and 020 SSA Disk Subsystems: Installation Guide*, GA33-3260-02
- *7133 Models 500 and 600 SSA Disk Subsystems: Installation Guide*, GA33-3263-02
- *7133 SSA Disk Subsystems for Open Attachment: Service Guide*, SY33-0191-00
- *7133 SSA Disk Subsystems for Open Attachment: Installation and User's Guide*, SA33-3273-00
- *7133 SSA Disk Subsystems: Additional Installation and Service Information*, 97H0535

It provides additional and revised information to show people who install a 7133 Model 010, 020, 500, or 600 SSA Disk Subsystem alternative ways to connect it to external power outlets.

Keep this supplement with your other books for the 7133.

References to Other Books

In this supplement, the following general terms are used in references to other books, unless it is necessary to refer to a specific book:

- **7133 *Service Guide*** for:
  - *7133 SSA Disk Subsystems: Service Guide*, SY33-0185-02
  - *7133 SSA Disk Subsystems for Open Attachment: Service Guide*, SY33-0191-00
- **7133 *Installation Guide*** for:
  - *7133 Models 010 and 020 SSA Disk Subsystems: Installation Guide*, GA33-3260-02
  - *7133 Models 500 and 600 SSA Disk Subsystems: Installation Guide*, GA33-3263-02
  - *7133 SSA Disk Subsystems for Open Attachment: Installation and User's Guide*, SA33-3273-00

If you are installing the 7133 in a PC Server Rack, you should also refer to:

- *IBM 9306 Model 900 PC Server Rack Enclosure Planning and Installation Guide*, part number 30F6958

Safety Information

Safety Notice

If this 7133 has the High-Availability cabling option installed, the caution label shown below is on each fan-and-power-supply assembly. This label alerts you to the following caution: The part number of the label is 25L5737.

CAUTION:
Unit is powered by multiple ac sources. Disconnect all supply power for complete isolation.

(Translations of this notice are in Appendix L on page 37.)

If you are installing the High-Availability cabling option, ensure that you obtain and attach one of these labels to each fan-and-power-supply assembly.

Notes:

1. All applicable local country electrical safety standards and regulations must be complied with when installing the rack cabling.
2. Do not power a 7133 in one rack from cabling or PDUs in another rack as this can make it difficult to isolate a rack.
3. Do not use three-way cables for 100–110 V High-Availability cabling solutions. See Appendix H on page 28 for further information about this restriction.

Locating Mainline Electrical Power Outlets

For pluggable equipment, mainline electrical power outlets must be installed near the equipment and must be easily accessible. Ensure that suitable outlets are available where rack-mounted 7133s are to be located.

For additional safety, ensure that all external power supplies can be disconnected from a rack within 10 seconds, especially if that rack contains multiple 7133s. Mark each external supply with the identification of its associated rack and 7133.

7133 ac Power Cabling

Some applications require the greatest possible availability of 7133 SSA subsystems. To achieve this, the subsystem must not include any item whose failure alone might make a 7133 disk drive unavailable to the using system. Such an item is known as a *single point of failure*. In the basic power cabling scheme for 7133 units, the power cable is a single point of failure. This document describes alternative ways of connecting power to 7133 subsystems. The cabling diagrams shown are logical diagrams only. They do not accurately show the physical locations or sizes of the various units.

The *7133 Installation Guides* tell you to use the three-way power cable supplied to connect all three fan-and-power-supply assemblies (called PSUs in this document) in a 7133 unit to an outlet on the power distribution unit (PDU) or power distribution board (PDB) for a rack-mounted unit, or to a single external power outlet for deskside models.

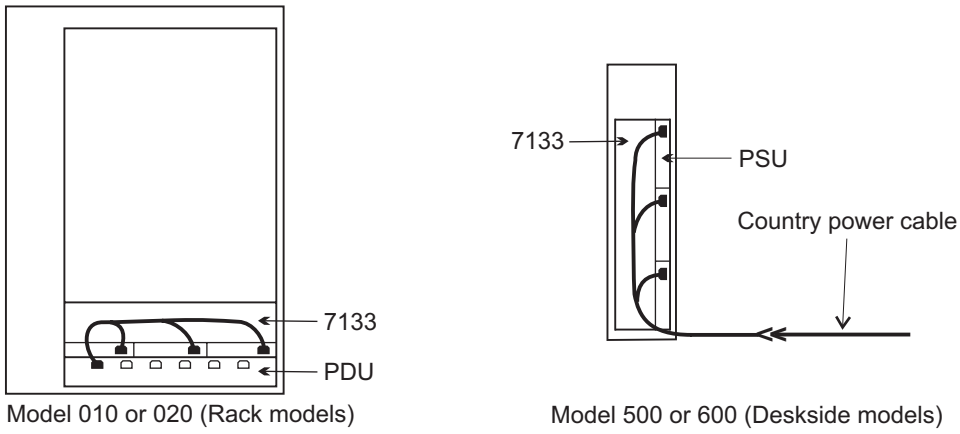


Figure 1. Original Standard Availability Cabling for all 7133 Model Types.

If a 7133 PSU fails, it might cause the circuit breaker protecting the external power outlet to trip and remove power from all three PSUs.

Now, there are alternative approved methods of connecting power to 7133 units; each method increases the availability of the 7133 subsystems by reducing common connections and single points of failure. These methods are discussed in this document.

Figure 2 on page 2 shows standard-availability cabling with a country power cable connecting the three-way power cable directly to an external power outlet. The PDU or PDB single point of failure has been bypassed.

If you use standard availability cabling, ensure that you observe the restrictions that are given in Appendix A on page 12 and Appendix B on page 15.

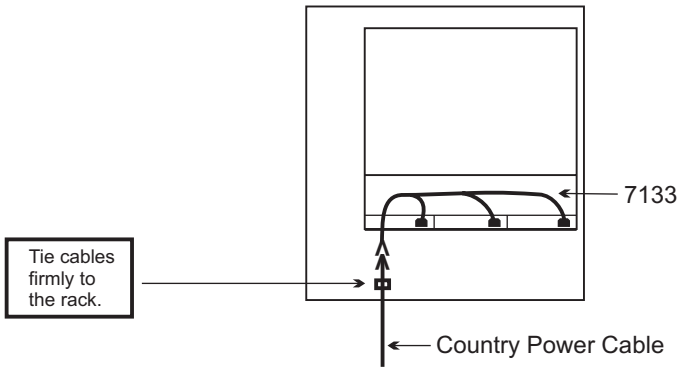


Figure 2. Alternative Cabling for 7133 Rack-Mounted Units.

High-Availability Cabling Method 1

Each PSU is attached directly to the user's power outlet by way of a country power cable.

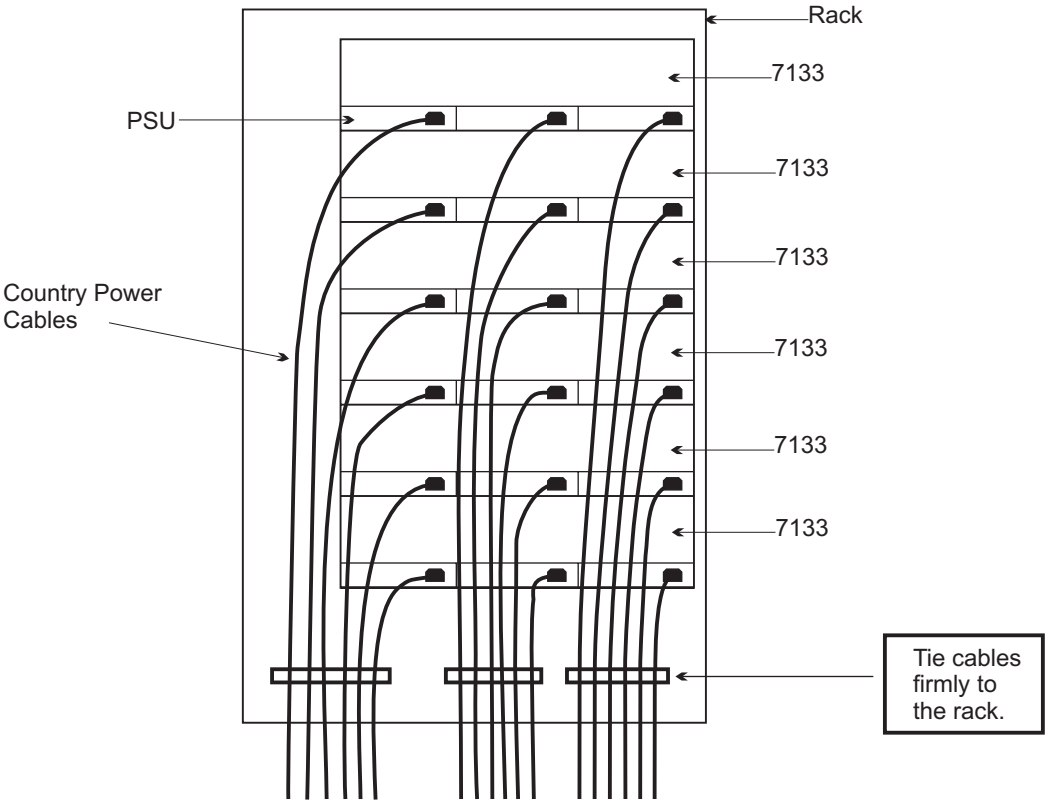


Figure 3. Up to Six 7133 Units in a Rack. Each PSU is powered separately from outside the rack.

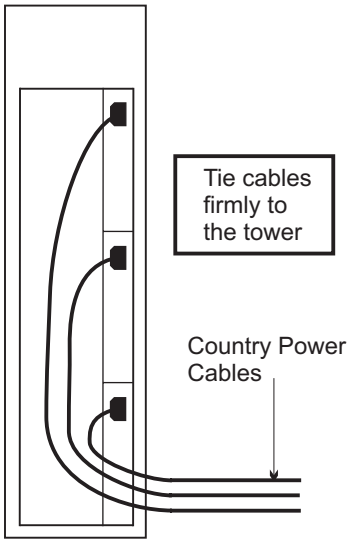


Figure 4. 7133 Deskside Unit. Each PSU is powered separately.

This method can be used for all supply voltages (100–110 V ac or 208–240 V ac) and does not require the use of power distribution units (PDUs or PDBs).

Direct attachment of the country power cables to individual 7133 PSUs can be made both in the rack and in deskside units as shown in Figures 3 and Figure 4 on page 4. Intermediate cables part number 58F3809 (RS/6000 FC 6095) or part number 94G7448 (Netfinity FRU cabling) or other IBM-approved equivalent cables can also be used if the interconnection is made in the rack as shown in Figure 5 on page 5.

This method of cabling has no power restrictions.

Refer to Appendix E on page 21 and Appendix G on page 24 for further information about approved power cables.

Connections between the country power cables and the intermediate power cables shown in Figure 5 on page 5 must be tied firmly to the rack to prevent accidental disconnection.

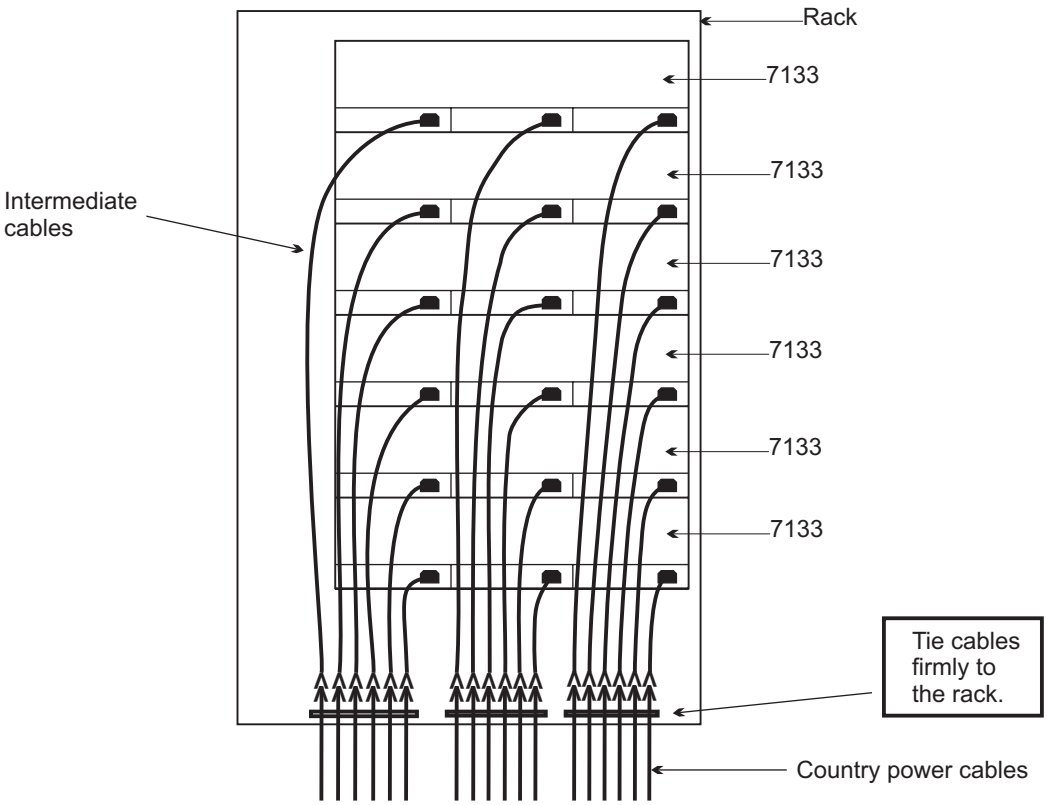


Figure 5. Up to Six 7133 Units in a Rack. Each PSU is powered separately from outside the rack.

Method 1 provides the best method of avoiding a single point of failure when each PSU in a single 7133 is supplied from a separate phase of the supply system.

High-Availability Cabling Method 2

Each PSU is attached to the supply by way of several power distribution units (PDUs). You must have a minimum of three PDUs for high-availability cabling.

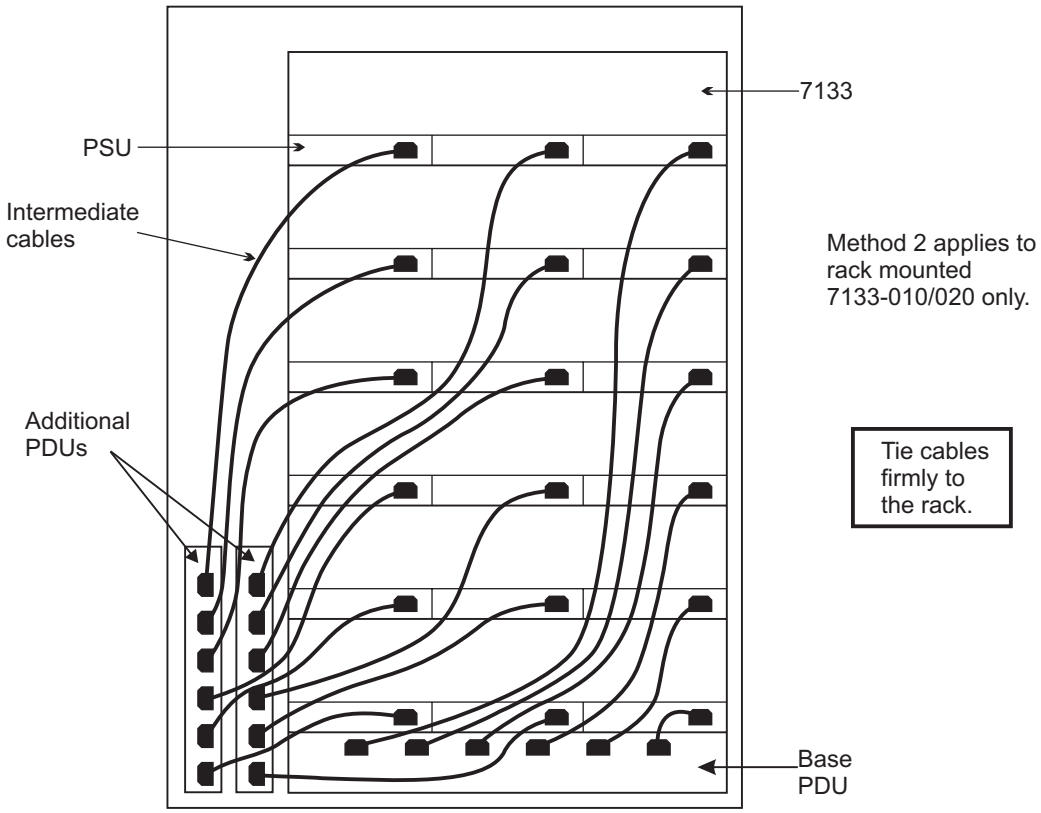


Figure 6. Up to Six 7133 Units in a Rack. Each PSU is powered separately from inside the rack.

This method can be used for rack mounted 7133s that require the additional protection of PDUs. However, this method increases the single point of failure potential over that provided by method 1 but reduces the cabling complexity outside the rack. A minimum of 3 PDUs must be used and each PDU should be connected to a separate supply, preferably on different phases of the supply system. Ensure you do not exceed the PDU current ratings when cabling the rack. The restrictions are greater when using a 100–110 V ac supply.

There are some overall PDU input loading restrictions depending on on the PDU type. See Appendix A on page 12 for further PDU information. See also Appendix C on page 17 for cabling restrictions, Appendix E on page 21 for information about intermediate single cables, and Appendix D on page 20 for information about input current ratings.

Note: Some 100–110 V PDUs use the NEMA5-15R sockets; the corresponding cable should be selected from Appendix E on page 21. Method 2 is the only method suitable for PDUs with NEMA5-15R 100–110 V sockets.

High-Availability Cabling Method 3

Attention

Do not use this method for 100–110 V ac supply systems because the current rating of the three-way cable will be exceeded.

Three-way cables attach 3 PSUs directly to a power outlet with each PSU being in a different 7133. When one or four 7133s are in the rack some connections can be made with single intermediate cables; see Appendix J on page 30. This method uses the existing three-way power cable that is shipped with each 7133. Instead of cabling horizontally with each three-way cable, the cable is used vertically to link PSUs in different 7133 units. This method requires additional intermediate power cables for some configurations and also requires country power cables. See Appendix F on page 23 and Appendix G on page 24 for further information. You should also refer to Appendix I on page 29 for current ratings.

This method increases the risk of single point of failure over that of method 1.

Connections between the country power cables and the intermediate power cables shown in Figure 5 on page 5 must be fastened inside the rack to prevent accidental disconnection.

Do not use method 3 for 100–110 V ac supply systems because the current rating of the three-way cable will be exceeded. See Appendix H on page 28 for further information.

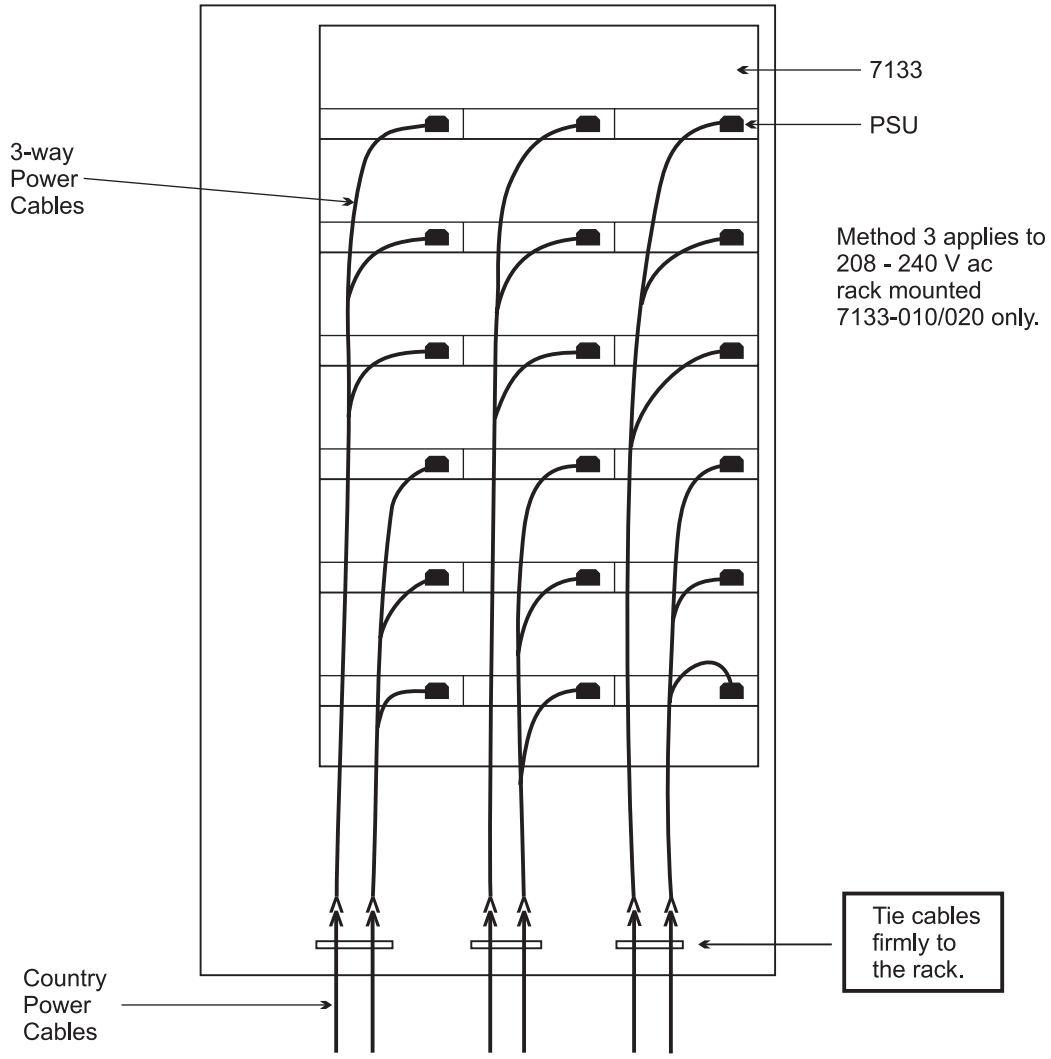


Figure 7. Six 7133 Units in a Rack. PSUs are powered separately from outside the rack through a three-way cable.

High-Availability Cabling Method 4

Attention

Do not use this method for 100–110 V ac supply systems because the current rating of the three-way cable will be exceeded.

Attach 3 PSUs in different 7133s to power distribution units (PDUs).

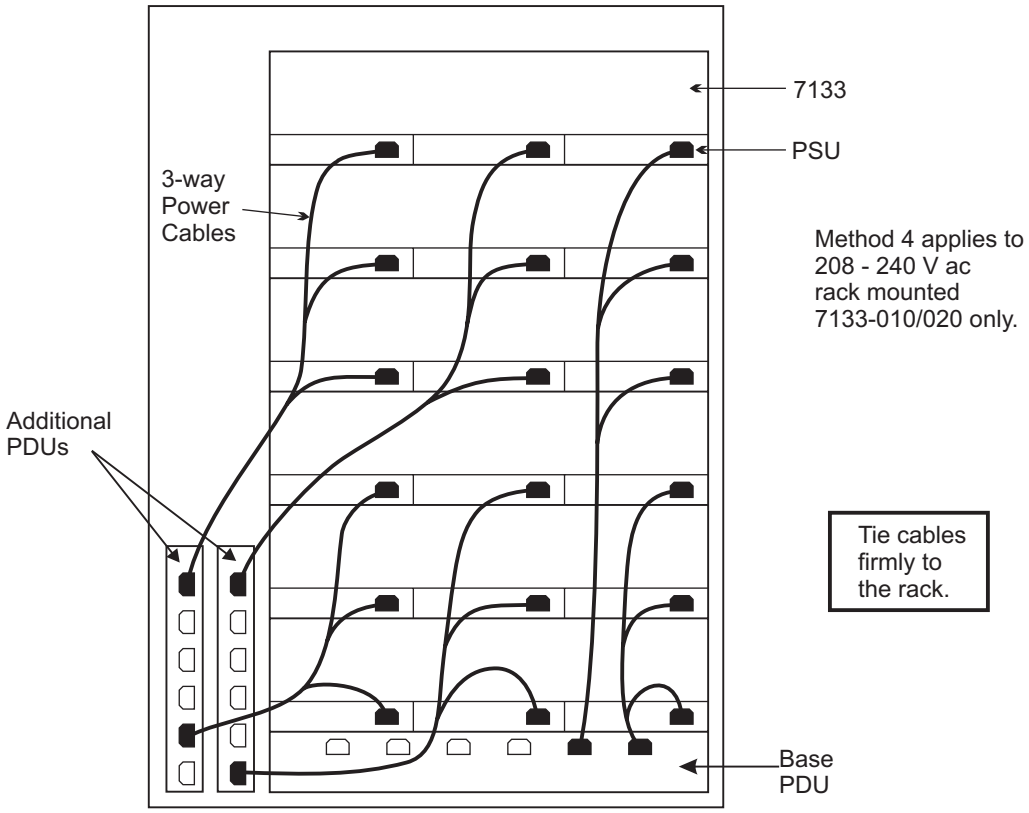


Figure 8. Six 7133 Units in a Rack

This method uses the existing three-way power cable shipped with each 7133 unit to connect to the PDUs. The use of PDUs reduces the number of cables external to the rack but does increase the risk of a single point of failure over methods 1, 2, and 3.

The number of three-way cables that can be connected to each PDU must not exceed the PDU rating. See Appendix A on page 12, Appendix C on page 17, and Appendix I on page 29 for further information.

The minimum number of PDUs required is three and, in the case of single phase PDUs, each PDU should be connected to a separate phase. For other numbers of 7133s in a rack see Appendix K on page 34.

Do not use method 4 for 100–110 V ac supply systems because the current rating of the three-way cable will be exceeded. See Appendix H on page 28 for further information.

Appendix A. PDU, PDB, and UPS Loading Restrictions

Table 1 (Page 1 of 2). Loading Restrictions

PDU/PDB/UPS Type	Rated Voltage	Rated Max. I in	Main CB	Rated Max I out	Outlets	Rated Max. outlet I	Rack Type and Feature Code (FC)
PDU IBM PN 42F6860 FRU 88G0229	200–240	24 A	30 A	23 A	6 x IEC320	8 A	7202-900 FC 9111 7015-R00 FC 6111
PDU IBM PN 12J4101 FRU 12J4472	120	15 A	15 A	12 A	8 x NEMA5-15R	7.5 A	9306-900 Order Number 94G6666
PDU IBM PN 12J5303 FRU 12J4483	200–240	16 A	20 A	16 A	10 x IEC320	10 A	9306-900 Order Number 94G7450
PDB IBM PN 52G6059 FRU 93H6661	200–240	24 A	N/A	22.5 A	6 x IEC320	8 A	7015-R00 and 7015-S00 FC 6171
Compaq PDUC16i-1-NA	200–240	16 A	N/A	16 A	Bank 1 6 x IEC320	10 A	N/A
					Bank 2 6 x IEC320	10 A	N/A
Compaq PDUC30a-1	100–127	24 A	N/A	24 A	Bank 1 6 x NEMA5-15R	15 A	N/A
					Bank 2 6 x NEMA5-15R	15 A	N/A
3 Phase PDU IBM PN 53F3524 FRU 88G0230	250	-	30 A	-	6 x IEC320	8 A	7015-R00 FC 9113
3 Phase PDU (Swiss Type) IBM PN 52G6061 FRU 93H6663	250	(16A)	N/A	-	6 x IEC320	8 A	7015-R00 FC 0174

Table 1 (Page 2 of 2). Loading Restrictions

PDU/PDB/UPS Type	Rated Voltage	Rated Max. I in	Main CB	Rated Max I out	Outlets	Rated Max. outlet I	Rack Type and Feature Code (FC)
2 of 3 Phases PDB IBM PN 52G6060 FRU 93H6662	250	(32A)	N/A	-	6 x IEC320	8 A	7015-R00 FC 6173
PDB 1 Phase IBM PN 40H7141 FRU 93H6660	250	(15A)	N/A	-	3 x IEC320	8 A	7015-R00 FC 9170
3 Phase PDU (Swiss Type) IBM PN 31G9496 FRU 88G0231	250	(32A)	10 A	-	6 x IEC320	8 A	7202-900 FC 9114
1400 RMB UPS IBM PN 94G6674 (US, C, LA) 1400VA–950 W	120	–	15 A	–	6 x NEMA5-15R	–	9306-900 FC N/A
1400 RMiB UPS IBM PN 94G6675 (EMEA, AP) 1400VA–950 W	220–240	–	12 A	–	4 x IEC320 C14	–	9306-900 FC N/A
3000 RMB UPS IBM PN 94G6676 (US, C, LA) 3000VA–2250 W	120	–	40 A	–	8 x NEMA5-15R	–	9306-900 FC N/A
3000 RMiB UPS IBM PN 94G6677 (EMEA, AP) 3000VA–2250 W	220–240	–	20 A	–	8 x IEC320 C14	–	9306-900 FC N/A

Key

Rated Voltage

Rated input voltage range.

Rated Max. I in

Rated maximum input current. Figures in brackets are the maximum current capacity of the input connector.

Main CB

Maximum current capacity of the main circuit breaker on input.

Rated Max. I out

Maximum rated total output current.

Outlets
Number and type of output sockets on the PDU.

Rated Max. outlet I
Maximum rated current for each outlet socket.

N/A Not Applicable.

Notes:

1. The Compaq units are rated for the maximum total output current for each bank of output sockets.
2. Compaq units have a single circuit breaker for each bank of outlet sockets. The other units have a separate circuit breaker for each outlet socket.
3. Uninterruptible Power Supplies (UPSs) may be substituted for PDUs or PDBs in High-Availability power cabling configurations.
4. The table is for guidance only, refer to the PDU, PDB, or UPS documentation for more information.

Appendix B. Standard-Availablity PDU, PDB, and UPS Cabling Restrictions

Attention

Use this table only for standard-availability cabling. Do not use it for high-availability cabling.

Table 2 contains information that is suitable only for standard-availability cabling (that is, when all three PSUs in the 7133 are connected to a **single PDU, PDB, or UPS,** either by way of a three-way power cable, or by way of three separate power cables). The equivalent information for high-availability cabling is given in Table 3 on page 17.

Table 2 (Page 1 of 2). Standard Availability Cabling. Table shows the maximum number of cables that can be used with a PDU, PDB, or UPS in a standard cabling system.

PDU/PDB/UPS Type	Rated Voltage	Outlets	Maximum sockets that can be used:			
			100–110 V		208–240 V	
			Single Cables	Three-way Cables	Single Cables	Three-way Cables
PDU IBM PN 42F6860 FRU 88G0229	200–240	6 x IEC320	N/A	N/A	6	6
PDU IBM PN 12J4101 FRU 12J4472	120	8 x NEMA5-15R	3	1	N/A	N/A
PDU IBM PN 12J5303 FRU 12J4483	200–240	10 x IEC320	N/A	N/A	8	4
PDU IBM PN 52G6059 FRU 93H6661	200–240	6 x IEC320	N/A	N/A	6	6
Compaq PDUC16i-1-NA	200–240	Bank 1 6 x IEC320	N/A	N/A	5	3
		Bank 2 6 x IEC320	N/A	N/A	3	1
Compaq PDUC30a-1	100–127	Bank 1 6 x NEMA5-15R	4	2	N/A	N/A
		Bank 2 6 x NEMA5-15R	2	1	N/A	N/A
3 Phase PDU IBM PN 53F3524 FRU 88G0230	250	6 x IEC320	N/A	N/A	6	6

Table 2 (Page 2 of 2). Standard Availability Cabling. Table shows the maximum number of cables that can be used with a PDU, PDB, or UPS in a standard cabling system.

PDU/PDB/UPS Type	Rated Voltage	Outlets	Maximum sockets that can be used:			
			100–110 V		208–240 V	
			Single Cables	Three-way Cables	Single Cables	Three-way Cables
3 Phase PDU (Swiss Type) IBM PN 52G6061 FRU 93H6663	250	6 x IEC320	N/A	N/A	6	4
2 of 3 Phases PDB IBM PN 52G6060 FRU 93H6662	250	6 x IEC320	N/A	N/A	6	6
PDB 1 Phase IBM PN 40H7141 FRU 93H6660	250	3 x IEC320	N/A	N/A	3	3
3 Phase PDU (Swiss Type) IBM PN 31G9496 FRU 88G0231	250	6 x IEC320	N/A	N/A	5	3
1400 RMB UPS IBM PN 94G6674 (US, C, LA) 1400VA–950 W	120	6 x NEMA5-15R	3	1	N/A	N/A
1400 RMiB UPS IBM PN 94G6675 (EMEA, AP) 1400VA–950 W	220–240	4 x IEC320	N/A	N/A	3	1
3000 RMB UPS IBM PN 94G6676 (US, C, LA) 3000VA–2250 W	120	8 x NEMA5-15R	8	4	N/A	N/A
3000 RMiB UPS IBM PN 94G6677 (EMEA, AP) 3000VA–2250 W	220–240	8 x IEC320 C14	N/A	N/A	8	4

Notes:

1. When using combinations of single and three-way power cables, count the three-way cable as equivalent to three single cables and deduct from the overall number of single cables that can be plugged.
2. Single cables can be either intermediate cables or country power cables.
3. The table is for guidance only, refer to the PDU, PDB, or UPS documentation for more information.

See Appendix D on page 20 for current consumption of the above standard availability cabling system.

Appendix C. High-Availability PDU, PDB, and UPS Cabling Restrictions

Table 3 (Page 1 of 2). Maximum High-Availability Cabling. Table shows the maximum number of cables that can be used with a PDU, PDB, or UPS.

PDU/PDB/UPS Type	Rated Voltage	Outlets	Maximum sockets that can be used:			
			100–110 V		208–240 V	
			Single Cables	Three-way Cables	Single Cables	Three-way Cables
PDU IBM PN 42F6860 FRU 88G0229	200–240	6 x IEC320	N/A	N/A	6	4
PDU IBM PN 12J4101 FRU 12J4472	120	8 x NEMA5-15R	3	N/A	N/A	N/A
PDU IBM PN 12J5303 FRU 12J4483	200–240	10 x IEC320	N/A	N/A	8	2
PDU IBM PN 52G6059 FRU 93H6661	200–240	6 x IEC320	N/A	N/A	6	4
Compaq PDUC16i-1-NA	200–240	Bank 1 6 x IEC320	N/A	N/A	5	1
		Bank 2 6 x IEC320	N/A	N/A	3	1
Compaq PDUC30a-1	100–127	Bank 1 6 x NEMA5-15R	4	N/A	N/A	N/A
		Bank 2 6 x NEMA5-15R	2	N/A	N/A	N/A
3 Phase PDU IBM PN 53F3524 FRU 88G0230	250	6 x IEC320	N/A	N/A	6	4
3 Phase PDU (Swiss Type) IBM PN 52G6061 FRU 93H6663	250	6 x IEC320	N/A	N/A	6	2
2 of 3 Phases PDB IBM PN 52G6060 FRU 93H6662	250	6 x IEC320	N/A	N/A	6	4
PDB 1 Phase IBM PN 40H7141 FRU 93H6660	250	3 x IEC320	N/A	N/A	3	2

Table 3 (Page 2 of 2). Maximum High-Availability Cabling. Table shows the maximum number of cables that can be used with a PDU, PDB, or UPS.

PDU/PDB/UPS Type	Rated Voltage	Outlets	Maximum sockets that can be used:			
			100–110 V		208–240 V	
			Single Cables	Three-way Cables	Single Cables	Three-way Cables
3 Phase PDU (Swiss Type) IBM PN 31G9496 FRU 88G0231	250	6 x IEC320	N/A	N/A	5	1
1400 RMB UPS IBM PN 94G6674 (US, C, LA) 1400VA–950 W	120	6 x NEMA5-15R	3	N/A	N/A	N/A
1400 RMiB UPS IBM PN 94G6675 (EMEA, AP) 1400VA–950 W	220–240	4 x IEC320	N/A	N/A	3	1
3000 RMB UPS IBM PN 94G6676 (US, C, LA) 3000VA–2250 W	120	8 x NEMA5-15R	8	N/A	N/A	N/A
3000 RMiB UPS IBM PN 94G6677 (EMEA, AP) 3000VA–2250 W	220–240	8 x IEC320 C14	N/A	N/A	8	2

Notes:

1. When using combinations of single and three-way power cables, count the three-way cable as equivalent to three single cables and deduct from the overall number of single cables that can be plugged.
2. In Table 3 on page 17 reference is made to single cables. These can be either intermediate cables or country power cables.

Example of maximum number of 7133s connected to a PDU

If you use the IBM part number 12J4101 120 V PDU, only three 7133 units should be connected to each group of three PDUs because of the restricted current capacity of this PDU type. See Figure 9 for an illustration of this rule.

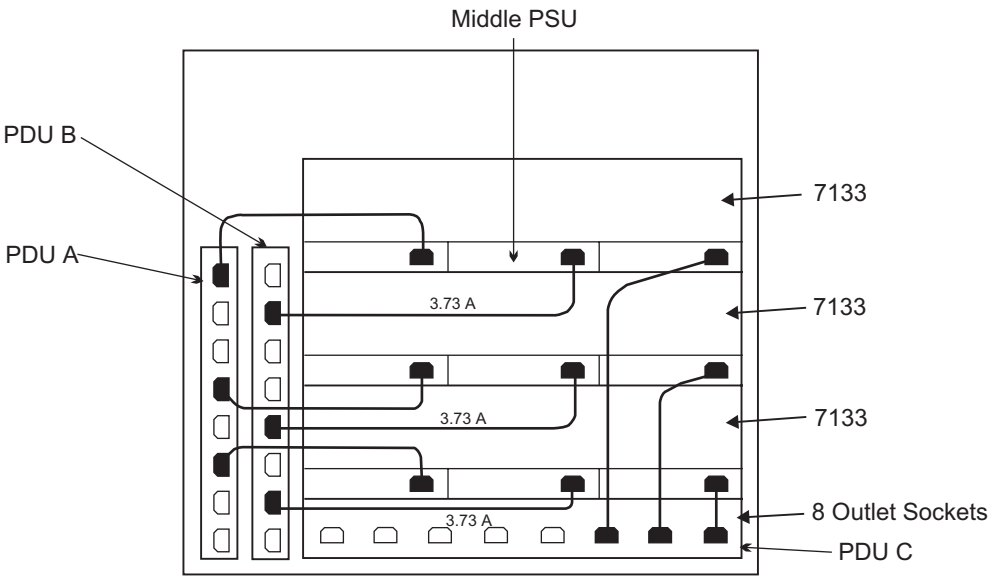


Figure 9. PDU part 12J4101

The maximum current shown (3.73 A) is for the middle PSU under worst case conditions. (The worst case is when only 2 PSUs in a single 7133 are operational during startup. Nominal PSU current is 1.66 A at 100 V ac.)

Appendix D. 7133 Input Current Ratings

A single 7133 that uses standard availability cabling (that is, with all three PSUs in the 7133 connected to the same three-way cable) requires a supply current as shown below. Two values are shown, one for standard operation, and another for maximum demand. Maximum demand occurs at startup.

Supply Voltage	Normal Operation	Maximum Demand
100–110 V ac	5.00 A	6.60 A
208–240 V ac	2.40 A	3.16 A

Note: In the table, the current is measured at the lower value of the voltage range.

7133 Single PSU Operational Currents

In operation, the input current requirements for the middle PSU of a 7133 are:

Single 7133 with:	100–110 V ac	208–240 V ac
3 PSUs operational	1.66 A	0.80 A
2 PSUs operational	3.32 A	1.60 A
2 PSUs operational (startup conditions)	3.73 A	1.78 A

Values shown are for the middle PSU.

Notes:

1. The middle PSU in a 7133 provides power to both the front and the rear eight disk drives.
2. Maximum continuous current is taken by the middle PSU when either the left-hand or the right-hand PSUs are nonoperational in a 7133.
3. Overall maximum is taken by the middle PSU when either the left hand or the right hand PSU is nonoperational during a disk drive startup sequence.
4. If you connect PSUs together, the total current required is the sum of the currents required by the individual PSUs in the connection. Therefore, connecting the middle PSUs of three 7133s together will cause the maximum current consumption for that connection to exceed that required by a single 7133. Care must be taken not to exceed maximum cable and PDU output current ratings when designing High-Availability cabling solutions.

Use the data in Appendix C on page 17, Appendix H on page 28, and Appendix I on page 29 to help generate the best high-availability cabling for your racks of 7133 units.

Appendix E. Intermediate Cables

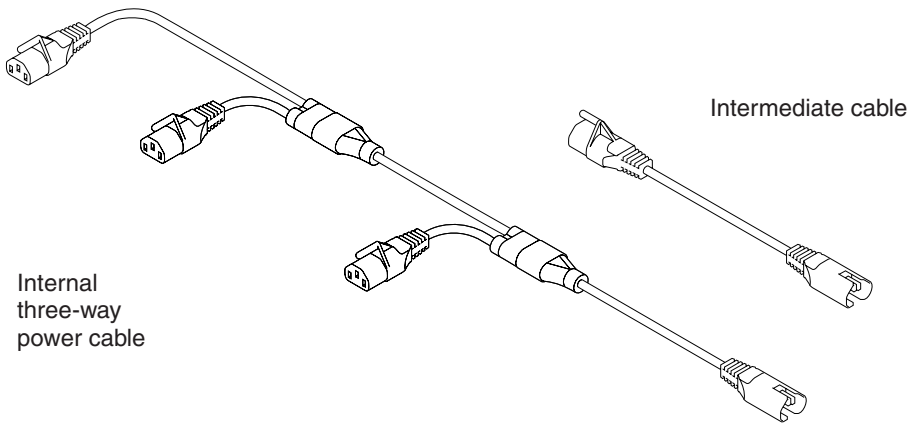


Figure 10. Cable Types

Intermediate Power Cables

Cable	Feature	Part Number	Length	Cable Ends	
Three-way cable	N/A	67G1245 67G1246	500 mm 1800 mm	IEC320-C13x 3	IEC320-C14
RS/6000 intermediate single cable	6095	58F3809	3 meter	IEC320-C13	IEC320-C14
Netfinity power cable		94G7448	3.6 meter	IEC320-C13	IEC320-C14
U.S. Intermediate cable	9800	6952300	2.8 meter	IEC320-C13	NEMA5-15P
U.S. Intermediate cable	9986	6952301	1.8 meter	IEC320-C13	NEMA5-15P

Notes:

1. Feature 6095 is a feature of the 7014-S00 and 7015-R00 racks.
2. The Netfinity cable is for use with the Netfinity 200-240 V PDU.
3. IBM approved alternative intermediate cables may be used.
4. The cables in the above table are approved for an 8 A maximum continuous current except for the U.S. intermediate cables. The U.S. cables are approved for a 10 A maximum continuous current.
5. The 1800 mm three-way cable is recommended for High-Availability cabling of the rack to enable greater cable routing flexibility.

6. The U.S. Intermediate cables are U.S. country power cords that can be used inside a rack to connect the 7133 individual PSUs to rack PDUs that have NEMA5-15R sockets.

Appendix F. Additional Cable Requirements

Ordering Power cables (7133-010/020 only)

For Method 1

Order one country power cable for each 7133 PSU and, if required, a similar number of intermediate power cables.

For Method 2

Order one intermediate power cable for each 7133 PSU in addition to any PDU input power cables. Make sure that the cables ordered have the correct connector to match the PDU sockets.

For Methods 3 and 4

You need to order additional feature codes or parts in addition to the standard parts shipped with each 7133 Model 010 or 020. The following list assumes that you have a rack with three PDUs installed and gives details about the extra parts you need to implement 7133 High-Availability Power Cabling.

Number of 7133 units	Requirements
1	3 x 59H3809 (FC 6095 on the 7014-S00 and 7015-R00 racks) or 94G7448 Netfinity cables
2	1 x 67G1246 (three-way cable, 1800mm long.)
3	No extra cables
4	3 x 59H3809 (FC 6095 on the 7014-S00 and 7015-R00 racks) or 94G7448 Netfinity cables
5	1 x 67G1246 (3-way cable 1800 mm long)
6	No extra cables

In addition you must order the appropriate PDU input cables.

For Method 3

For racks of 7133s using High Availability Power Cabling without a PDU, the above cables must be ordered in addition to the following:

Number of 7133 units	Requirements
1, 2, or 3	3 country power cables
4, 5, or 6	6 country power cables

Appendix G. Country Power Cables

Feature Code (FC) 9800 & 9986 can be ordered for models 7133-010/020 and 7133-500/600 model types.

Power Cables

Country or City	Feature	Part for 7133-500/600 (2.8 meter)
Bahamas Barbados Bermuda Bolivia Canada Colombia Costa Rica Dominican Republic El Salvador Equador Guatemala Guyana Honduras Jamaica Japan Japan (PDS) Korea Mexico Netherlands Antilles Panama Phillipines Saudi Arabia Suriname Taiwan Trinidad United States (except Chicago) Venezuela	9800	6952300
Chicago (1.8 meter only)	9986	6952301

The cable part numbers in the following tables can be used for rack mounted 7133-010/020 models but the feature codes are orderable only for the 7133-500/600 models.

Country or City	**Feature**	**Part for 7133-500/600 (2.8 meter)**
Bahrain (NEO) Brunei China Ghana Hong Kong Iraq Ireland Jordan Kenya Kuwait Malaysia Nigeria Oman (Sult) Qatar Singapore Tanzania Uganda United Arab Emirates United Kingdom Zambia	9825	14F0033
Chile Ethiopia Italy	9830	14F0069
Denmark	9821	13F9997

Country or City	Feature	Part for 7133-500/600 (2.8 meter)
Albania Armenia Austria Belarus Belgium Bosnia Botswana Bulgaria Croatia Czech Republic Egypt Finland France Georgia Germany, West Germany, West (PDS) Greece Hungary Iceland Indonesia Kazakhstan Lebanon FYR Macedonia Moldavia Netherlands Norway Portugal Romania Russia Serbia Slovakia Slovenia Spain Sudan Sweden Turkey Ukraine	9820	13F9979
Israel	9827	14F0087
Switzerland	0828	14F0051
Bangladesh Burma India Pakistan South Africa Sri Lanka	9829	14F0015
Argentina Australia New Zealand	9831	13F9940

Country or City	Feature	Part for 7133-500/600 (2.8 meter)
Uruguay	9834	6952291
Peru Thailand United States (240 volts)	9833	1838574

Appendix H. 100–110 V ac Three-Way Cable Restrictions

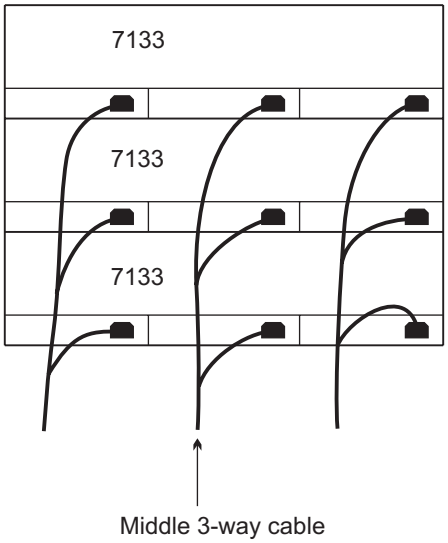


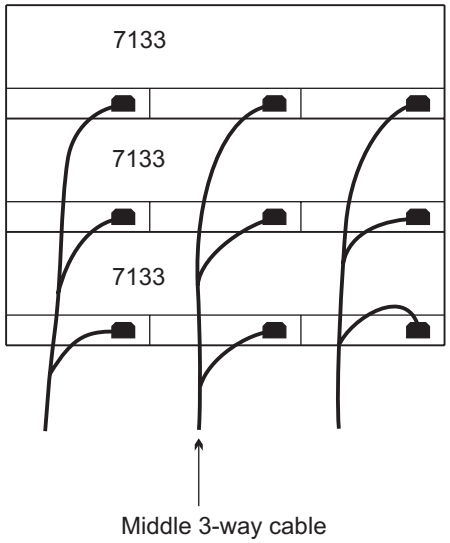
Illustration purposes only
Do not use this configuration
for 100 - 110 V AC operation

Total Current taken by three middle PSUs in a 7133:
Normal continuous (3 x 7133, each with 3 operational PSUs) at 100 V ac = **5 A**
Maximum continuous (3 x 7133, each with 2 operational PSUs) at 100 V ac = **10 A**
Maximum startup (3 x 7133, each with 2 operational PSUs) at 100 V ac = **11.2 A**

Notes:

1. Because the three-way cable (see Appendix E on page 21) is UL continuously rated for 8 A, the above configuration must not be used for 100–110 V ac operation with vertical connections as shown in methods 3 and 4. Instead, individual intermediate or country power cables must be used.
2. The maximum input current is taken by the middle PSU in a 7133 because it supplies power both to the front and the rear 8 disk drives.
3. Maximum continuous current is taken by the middle PSU when either the left hand or the right hand PSUs are nonoperational in a 7133.
4. Overall maximum current is taken by the center PSU when either the left hand or the right hand PSU is nonoperational during a disk drive startup sequence.

Appendix I. 208–240 V ac Three-Way Cable Information



Current taken by three middle PSUs in a 7133:
Normal continuous (3 x 7133, each with 3 operational PSUs) at 208 V ac = **2.4 A**
Maximum continuous (3 x 7133, each with 2 operational PSUs) at 208 V ac = **4.79 A**
Maximum startup (3 x 7133,each with 2 operational PSUs) at 208 V ac = **5.34 A**

Notes:

1. The maximum input current is taken by the middle PSU in a 7133 because it supplies power both to the front and the rear 8 disk drives.
2. Maximum continuous current is taken by the middle PSU when either the left hand or the right hand PSUs are nonoperational.
3. Overall maximum current is taken by the middle PSU when either the left hand or the right hand PSU is nonoperational during a disk drive startup sequence.

Appendix J. Alternative Connections for Method 3

Attention

Do not use this method for 100–110 V ac supply systems because the current rating of the three-way cable will be exceeded.

Connections between the country power cables and the intermediate power cables shown in the following figures must be tied firmly to the rack to prevent accidental disconnection.

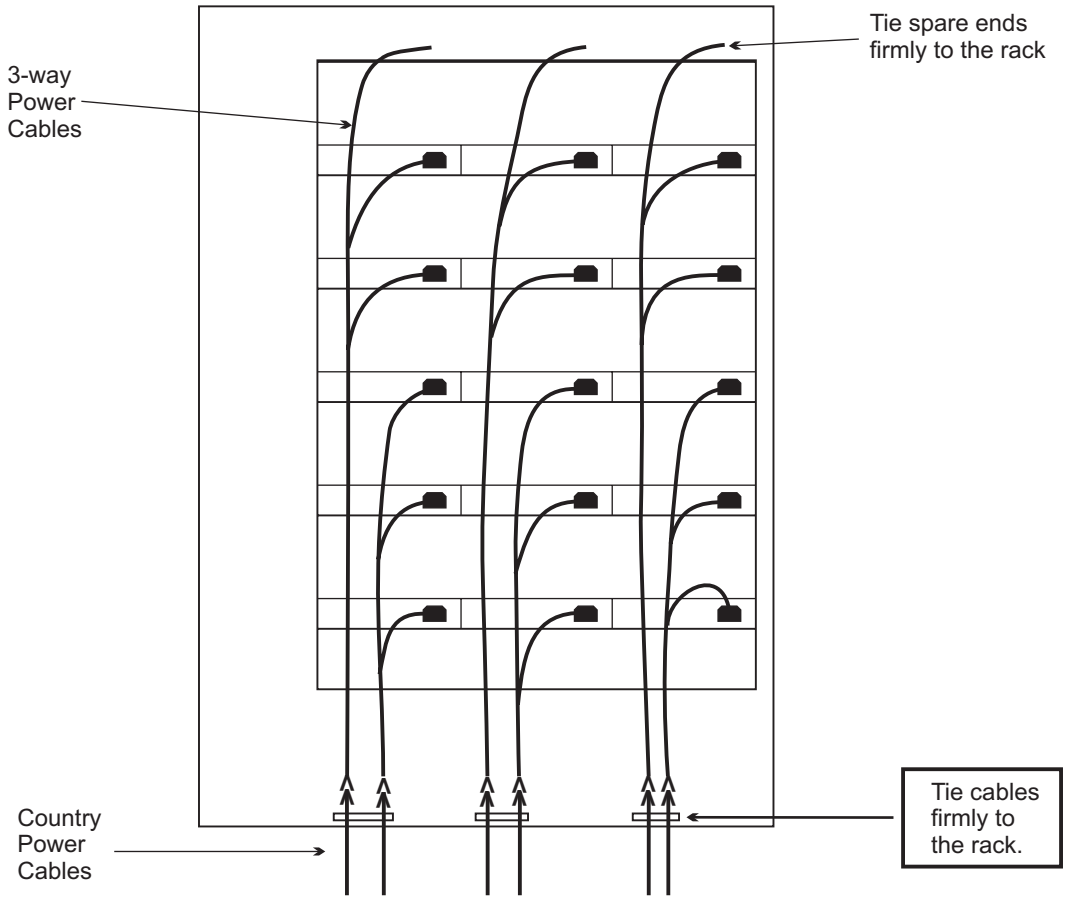


Figure 11. Five 7133 Units in a Rack

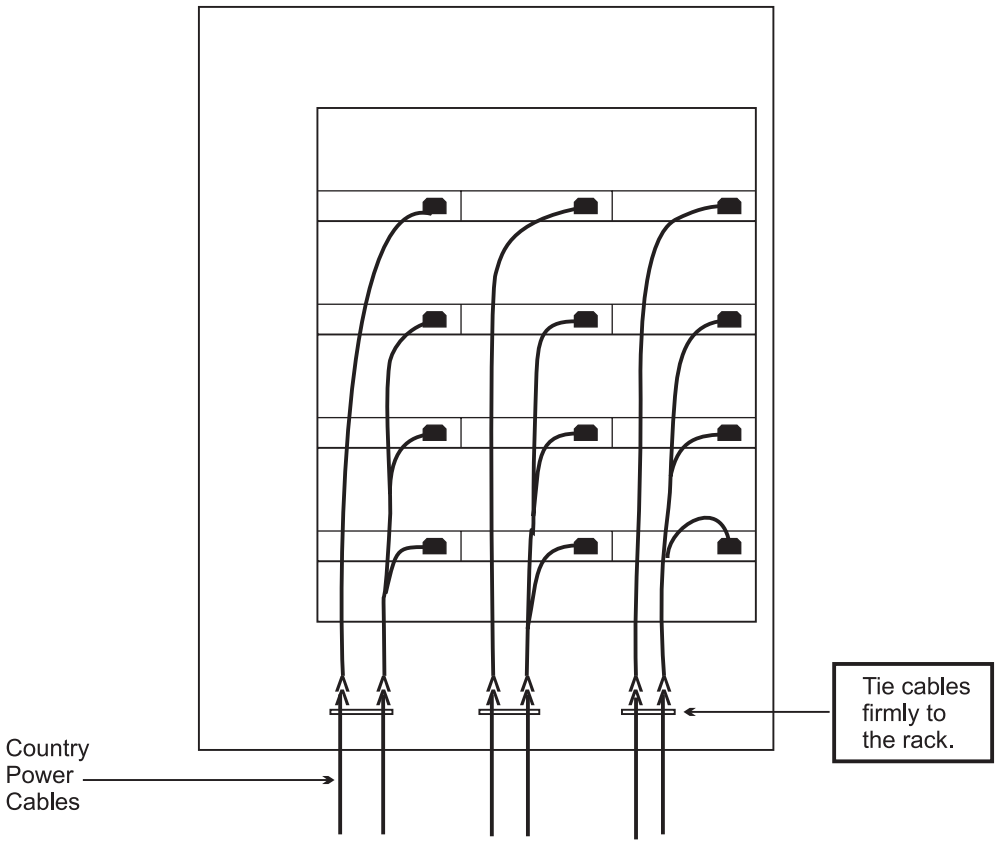


Figure 12. Four 7133 Units in a Rack

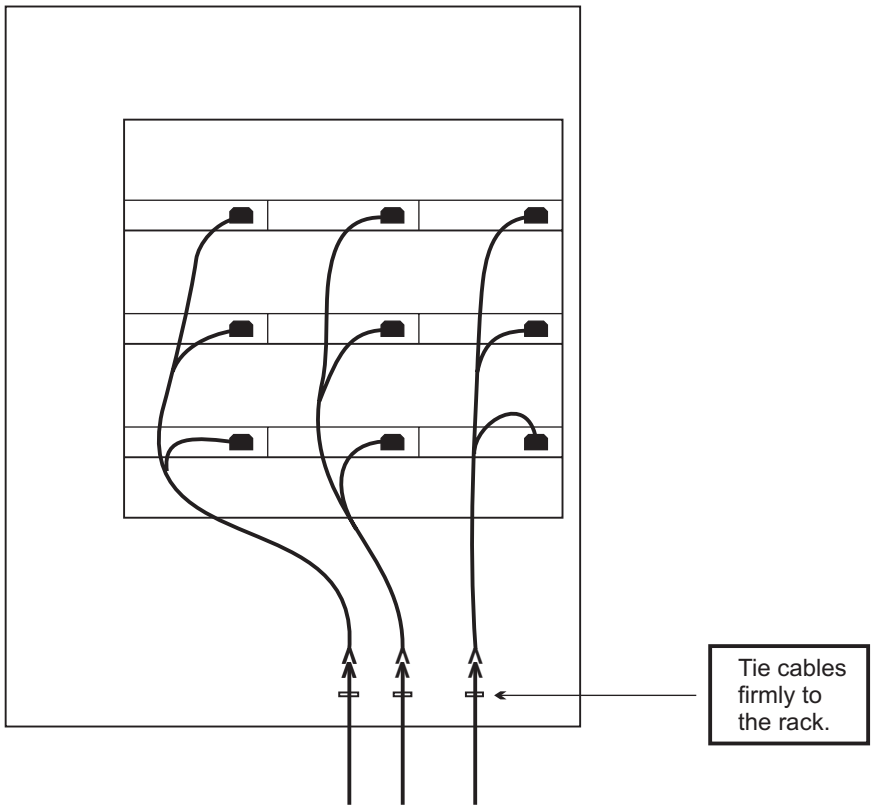


Figure 13. Three 7133 Units in a Rack

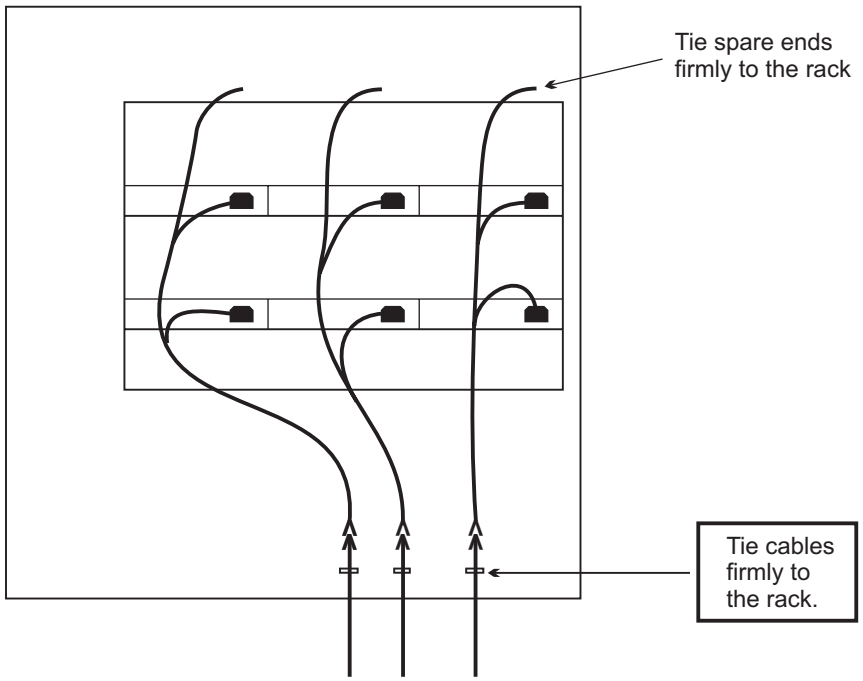


Figure 14. Two 7133 Units in a Rack

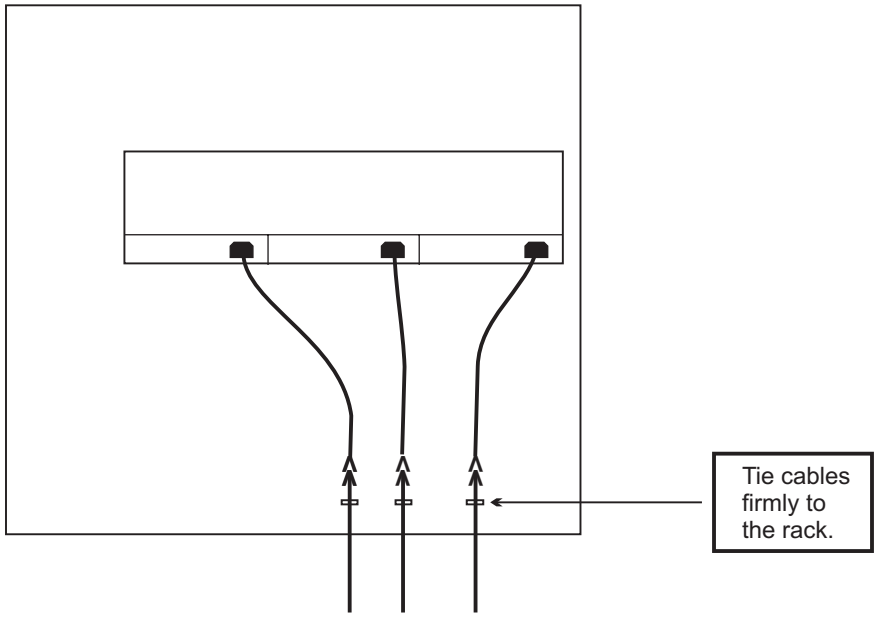


Figure 15. One 7133 Unit in a Rack. For a single 7133 this is identical to method 1.

Appendix K. Alternative Connections for Method 4

Attention

Do not use this method for 100–110 V ac supply systems because the current rating of the three-way cable will be exceeded.

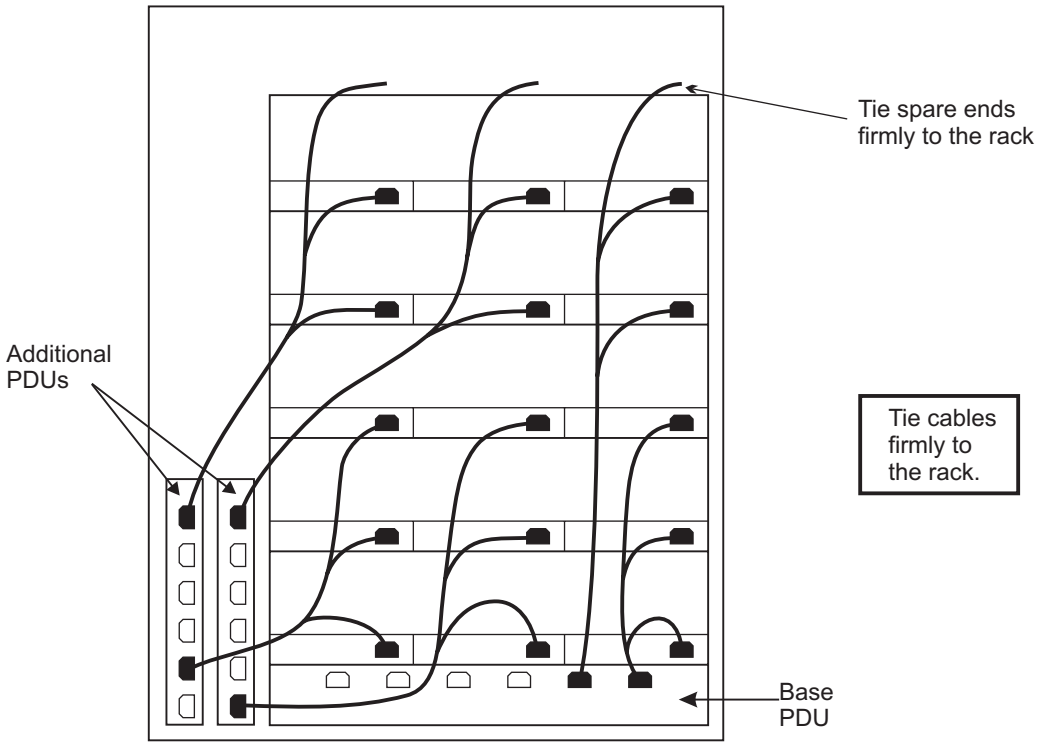


Figure 16. Five 7133 Units in a Rack

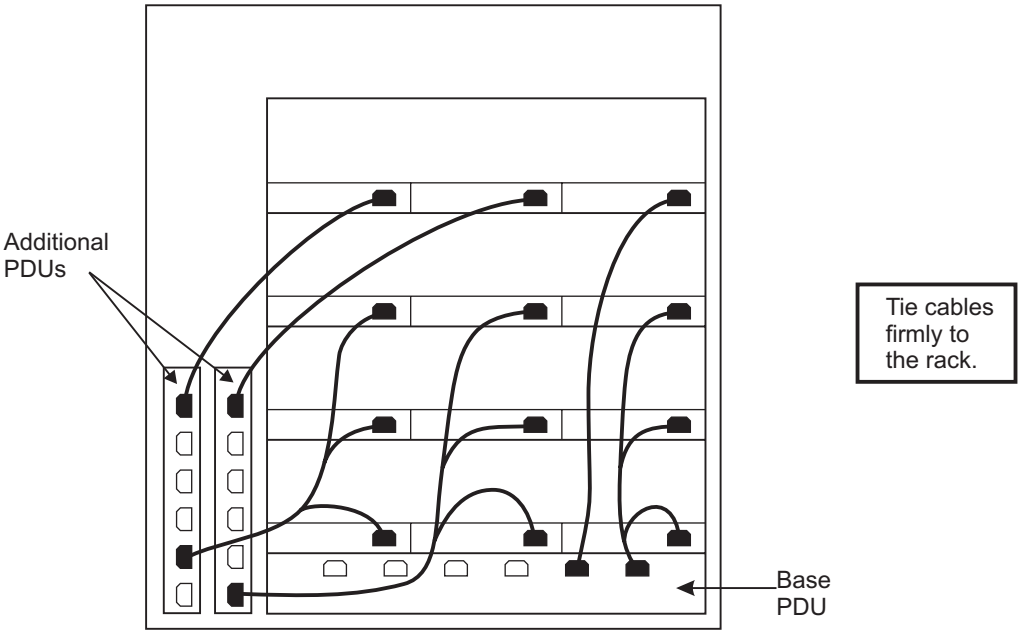


Figure 17. Four 7133 Units in a Rack

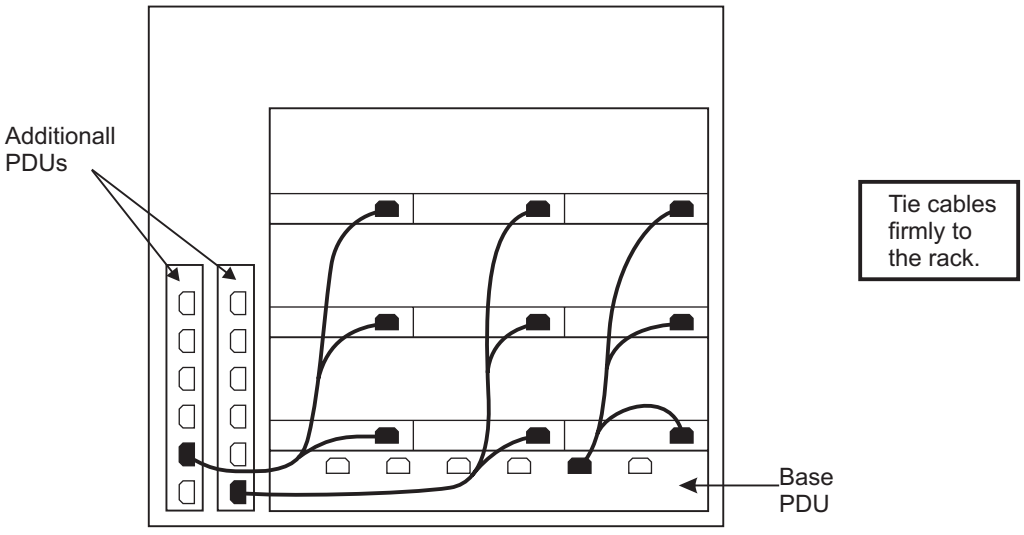


Figure 18. Three 7133 Units in a Rack

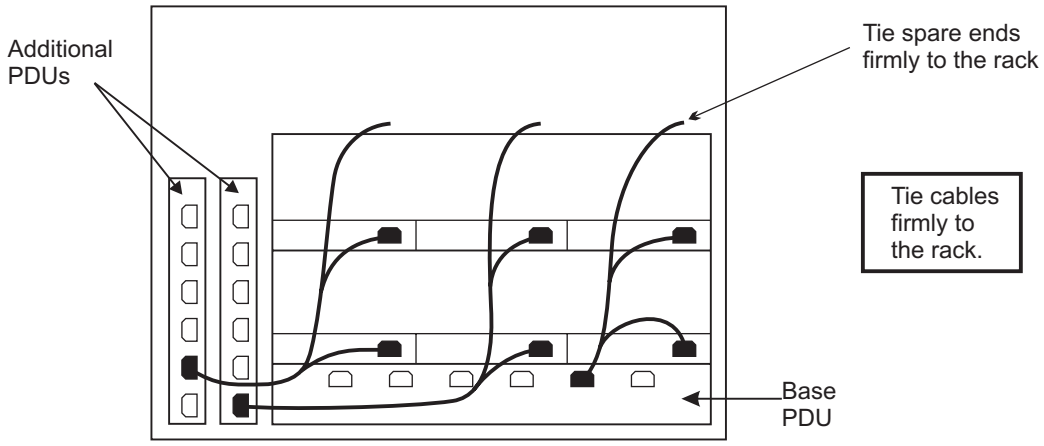


Figure 19. Two 7133 Units in a Rack

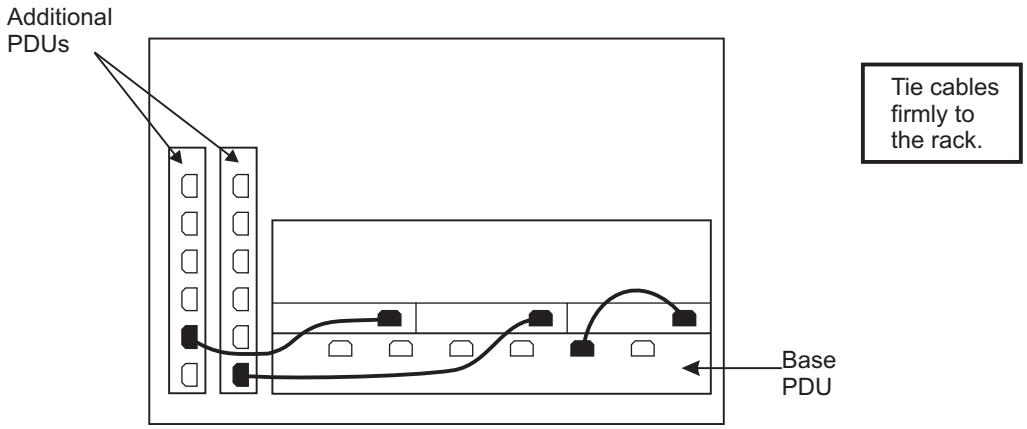


Figure 20. One 7133 Unit in a Rack

Appendix L. Translated Safety Notice

English

CAUTION:
Unit is powered by multiple ac sources. Disconnect all supply power for complete isolation.

Brazil

CAUTION:
A unidade está carregada por fontes múltiplas AC (corrente alternada). Disconecte toda a fonte de alimentação para completar o isolamento.

Chinese Simplified

注意：

本单元由多路 AC 电源供电，请断开所有供电设备以确保完全断电。

Chinese Traditional

注意：

本裝置由多個交流電供應器提供電源。必須切斷所有電源方可完全隔離。

Czech

POZOR:
Jednotka je napájena z několika napájecích zdrojů. Při odpojování jednotky od elektrické sítě vždy odpojte od elektrické sítě všechny napájecí zdroje.

Danish

Pas på!
Enheden får strøm fra flere vekselstrømkilder. Afbryd al strømforsyning for fuldstændig isolation.

Dutch

Waarschuwing:
De eenheid wordt door meerdere AC-voedingseenheden van stroom voorzien. Voor volledige isolatie ontkoppelt u alle voedingseenheden.

Finnish

Varoitus:
Yksikössä on useita virtalähteitä. Katkaise virransyöttö kokonaan kytkemällä irti kaikki virtalähteet.

French

Attention:
L'unité est alimentée par plusieurs sources secteur. Pour une isolation complète, débranchez toutes ces sources d'alimentation.

German

Achtung:
Die Einheit wird aus mehreren Wechselstromquellen versorgt. Alle Netzkabel ziehen, um eine vollständige Trennung des Gerätes vom Netz zu gewährleisten.

Greek

ΠΡΟΣΟΧΗ:
Η μονάδα τροφοδοτείται από περισσότερες από μία πηγές εναλλασσόμενου ρεύματος. Για πλήρη απομόνωση, αποσυνδέστε όλες τις πηγές ρεύματος.

Hebrew

היחידה מופעלת על ידי מקורות מתח מרובים.
יש לנתק את כל אספקת הכוח להשגת בידוד מוחלט.

Hungarian

Figyelem:
A készülék több hálózati csatlakozót használ. Húzza ki az összeset a teljes áramtalanításhoz!

Italian

ATTENZIONE:
Questo dispositivo viene alimentato da più di una sorgente di alimentazione. Per il completo isolamento, scollegare tutte le sorgenti di alimentazione.

Korean

주의:
Unit는 다수의 교류 전원에 물려 있습니다. 완전한 전기 차단을 위하여 모든 공급원을 절체하십시오.

Norwegian

ADVARSEL:
Enheten får strøm fra flere strømkilder. Trekk ut alle nettkabler slik at enheten er fullstendig frakoblet.

Portuguese

CUIDADO:

A unidade é alimentada por múltiplas fontes de corrente alterna. Desconecte todas as fontes de alimentação para garantir um isolamento completo.

Russian

ВНИМАНИЕ:
Устройство подключено к нескольким источникам питания переменного тока. Для полного его отключения отсоедините все источники питания.

Spanish

PRECAUCIÓN:
La unidad se alimenta a través de diversas fuentes. Para un completo aislamiento desconecte todas las fuentes de alimentación.

Swedish

Varning-risk för personskada:
Enheten försörjs av flera kraftaggregat. Koppla ur all kraftförsörjning.

Thai

อุปกรณ์นี้ได้รับพลังงานจากแหล่งพลังงาน AC หลายแหล่ง
กรุณาเลิกติดต่อแหล่งพลังงานทั้งหมดเพื่อความปลอดภัย

Turkish

Dikkat:
Birime birden çok güç kaynağından elektrik sağlanmaktadır. Tam yalıtım için, birimin tüm güç kaynaklarıyla bağlantısını kesin.

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