

Power Solutions for Open Compute and Data Center





Introduction Murata has been developing and manufacturing a range of modular, scalable, high-density, titanium products including AC-DC power supplies and DC-DC converters for various applications for more than 35 years. Recently, Murata has focused efforts on power distribution sub-systems used in the emerging Data Center market. Our latest product offerings include shelf systems compliant with Open Compute V1 and V2 Power Shelf Specifications. While typical OCP Power Shelves only support three-phase AC input, our Power Shelves support Single Phase AC, three-phase AC and HVDC (200-400Vdc) inputs, allowing your organization to achieve a leading edge, power efficient Data Center with either an AC or DC input power architecture.

Key Components

- 21" 10U power shelf
- 19" 10U/2RU power shelf
- 12V, 3kW Titanium Efficiency Power Supply
- 54V, 50V 3.6kW Titanium Efficiency Power Supply
- RMU (Remote Management Unit)
- Battery Backup Solution
- ORV3 support products

Murata's Key Power Shelf Features:

- Up to 15kW/12kW N+1 or N+N output power @12Vout
- Up to 21.6kW N+0 or N+N output power @54vout, 50Vout
- PSU conversion efficiency higher than 96% at 50% of load (80 PLUS Titanium class)
- Available input configurations: Single-phase AC, 3-phase AC & HVDC



Open Compute and Data Center Power Solutions

The OCP power distribution architecture for centralized power supply systems is an ideal solution for applications requiring a high degree of redundancy and expandability. Murata's OCP compliant products provide a total power solution capable of meeting today's and tomorrow's power requirements.

12V Architecture System Components:

Power Supply Unit (PSU), 3,000W:

MWOCP74-3000-A-RM is an 80 PLUS certified Titanium 3,030-Watt, power factor corrected front end power supply unit (PSU) that provides a 12Vdc main output with active current sharing, and a 12Vdc Standby output. Up to six (6) modules can current share in a single shelf, delivering up to 15 kw of N+1 rack level power for use in the OCP open rack.

Features

- ❖ 3,030W output power
- ❖ 12.3V main output and 12.2V standby output
- ❖ 1U height 73.5x550x40mm (2.89"x21.65"x1.57")
- ❖ N+1 redundancy capable
- ❖ Active current sharing on 12V main output, ORing FET isolation
- ❖ Hot-swappable



10U 21" power shelf

MWOCES-211 series of 21" 1 OU power shelves accommodate up to six (6) 3kW power supply units (PSUs), providing up to 15kW total output power configured for N+1 and N+N redundancy.

Features

- ❖ UP to 6 PSUs per shelf
- ❖ High reliability, redundant design
- ❖ OCP V1 and V2 open rack compliant
- ❖ 2 AC inputs to shelf for flexible shelf configurations (N+1, N+N)
- ❖ 2 AC outlets for additional input power to ICT equipment in the rack
- ❖ External communication interface RMU through SNMP
- ❖ Hot-swappable



2RU 19" power shelf

MWOCES-192-M of 19"(convertible to 21") 2 RU power shelves accommodate up to six (6) 3kW. This shelf provides up to 15kW total output power, configured N+1 & N+ N redundancy. Various input configurations are supported and is a low-cost multi-input version of 19" 2RU power shelf.

Features

- ❖ UP to 6 PSUs per shelf
- ❖ High reliability, redundant design
- ❖ OCP V1 and V2 open rack compliant
- ❖ 2 AC inputs to shelf for flexible shelf configurations (N+1, N+N)
- ❖ 6 AC outlets for additional input power to ICT equipment in the rack
- ❖ External communication interface RMU through SNMP
- ❖ Support multi-input configuration
- ❖ Hot swappable



12V Battery Backup Solution:

Murata's 21" OCP and EIA 19" rack mountable battery backup solutions adapt advanced technology to maximize reliability and uptime.

Each 4kW BBU provides up to 150 seconds of hold-up time (Output 3.75kW, BOL, 25deg) and each 21" OCP shelf provides 15kW for up to 150 seconds upon loss of AC power when fully configured with four (4) Battery Backup Unit (BBU) modules.

The Battery Control Unit (BCU) provides advanced control of the power system via the RMU.

Murata's Battery Backup Solution is compact, and light compared with traditional lead acid battery solutions, simplifying maintenance, OPEX and total cost of ownership.

BBU (Type: MWBBU118-4000-A-B)

Features

- ◆ 4kW maximum output power
- ◆ 12V input and output voltage
- ◆ 150 seconds hold-up time at 3.75kW
- ◆ Adjustable charging power
- ◆ Active current sharing on 12V output
- ◆ ORing FET isolation
- ◆ Overvoltage, overcurrent, over temperature protection, and status reporting
- ◆ Hot-swappable



Battery Shelf (Type: MWBBES-212-A)

Features

- ◆ Fits into the 21" OCP rack
- ◆ Up to 16kW total power per shelf (4 BBUs)
- ◆ One Battery Control Unit (BCU) for management of BBUs.
- ◆ Communicates with Murata Power Shelf (MWOC/MWDC series)
- ◆ Parallel connection: Up to three battery shelves; (planned performance, contact Murata for latest developments)



54V Architecture System Components:

3.6kW power supply

MWOC68-3600-D-RM is an 80 PLUS certified Titanium, 3,600-watt front-end power module that provides a 54.5V dc main and 12Vdc standby outputs. Up to six power supply units (PSUs) fit into a 19" shelf and 21" shelf with accessory kit.

Features

- ❖ 3,600W output power
- ❖ 54.5V main output and 12.0V standby output
- ❖ 1U height 68.0×490×40mm (2.68"×19.29"×1.57")
- ❖ N+1 redundancy capable
- ❖ Active current sharing on 54V main output, ORing FET isolation
- ❖ Hot-swappable



10U 19" power shelf

MWOCES-191-M-B of 19" 1 OU power shelves accommodate up to six (6) 3.6kW power supply units (PSUs.) This shelf provides up to 18kW total output power, configured for N+1 and N+N redundancy.

Features

- ❖ UP to 6 PSUs per shelf
- ❖ High reliability, redundant design
- ❖ EIA and OCP V2 open rack compliant
- ❖ 2 AC inputs to shelf for flexible shelf configurations (N+1, N+N)
- ❖ External communication interface RMU through SNMP
- ❖ Support multi-input configuration
- ❖ Hot-swappable



50V Architecture System Components:

3.6kW power supply

MWOCP68-3600-B-RM is an 80 PLUS certified Titanium, 3,600-watt front-end power module that provides a 50.5V dc main and 12Vdc standby outputs. Up to six power supply units (PSUs) fit into a 21" shelf.

Features

- ❖ 3,600W output power
- ❖ 50.5V main output and 12.0V standby output
- ❖ 1U height 68.0×490×40mm (2.68"×19.29"×1.57")
- ❖ N+1 redundancy capable
- ❖ Active current sharing on 50V main output, ORing FET isolation
- ❖ Hot-swappable



10U 21" power shelf

MWOCES-211-P-C of 21" 1 OU power shelves accommodate up to six 3.6kW power supply units (PSUs). This shelf provides up to 21.6kW total output power, configured for N+1 and N+N redundancy.

Features

- ❖ UP to 6 PSUs per shelf
- ❖ High reliability, redundant design
- ❖ Supports OCP(V3) systems
- ❖ 2 AC inputs to shelf for flexible shelf configurations (N+1, N+N)
- ❖ External communication interface RMU through SNMP
- ❖ Support multi-input configuration
- ❖ Hot-swappable



10U 19" power shelf

MWOCES-191-P-C of 19" 1 OU power shelves accommodate up to six (6) 3.6kW power supply units (PSUs.). This shelf provides up to 21.6kW total output power, configured for N+1 and N+N redundancy. (Under development)

Features

- Up to six PSUs per shelf
- High reliability, redundant design
- Adaptable to 19" EIA rack
- Supports OCP(V3) systems
- Two AC inputs to shelf for flexible shelf configurations (N+1, N+N)
- External communication interface RMU through SNMP
- Support multi-input configuration
- Hot-swappable

Immersion cooling System Components:

MWOCES-213-P-C-L is a 54kW, 21" 3OU, OCP V3 based power shelf specialized for liquid immersion cooling that provides a delivery system for up to fifteen 68mm, 1OU Power Supplies (PSU), and three Remote Management Unit (RMU), intended for 50.5V/54.5V power distribution architectures. (Under development)

Features

- Up to 15 PSUs per shelf
- High reliability, redundant design
- Supports OCP(V3) systems
- Three AC inputs to shelf for flexible shelf configurations (N+1, N+N)
- External communication interface RMU through SNMP
- Support multi-input configuration
- Hot-swappable

48V Battery Backup Solution:

Murata's 21" OCP rack mountable battery backup solutions adapt advanced technology to maximize reliability and uptime. Each 3kW BBU provides up to four minutes of hold-up time and each 21" OCP shelf provides 18kW for up to 240 seconds upon loss of AC power when fully configured with six BBU modules.

The Battery Control Unit (BCU) provides advanced control of the power system via the RMU.

Murata's Battery Backup Solution is compact, and light compared with traditional lead acid battery solutions, simplifying maintenance, OPEX and total cost of ownership. (Under development)

BBU (Type: MWBBU078-3000-B-B)

Features

- ❖ 3kW maximum output power
- ❖ 48V input and output voltage
- ❖ 240 seconds hold-up time @100% Load
- ❖ Adjustable charging power
- ❖ Active current sharing on 48V output
- ❖ ORing FET isolation
- ❖ Overvoltage, overcurrent, over temperature protection, and status reporting
- ❖ Hot-swappable

Battery shelf (Type : MWBBES-212-B)

Features

- ❖ Fits into the 21" OCP rack
- ❖ Supports OCP(V3) systems
- ❖ Up to 18kW total power per shelf (6 BBUs)
- ❖ One Battery Control Unit (BCU) for management of BBUs.
- ❖ Communicates with Murata Power Shelf

Remote Management Unit (RMU):

MWOC-RMU-2 is a Remote Management Unit compatible with MWOCES/MWDCEs series OCP power shelves and provides monitor and control capability between the host system and any PSU(s) / peripheral equipment installed in the shelves using PMBus™. Communication with the host system via Ethernet by SNMP ensures effective communication and reporting for datacenter applications.

Features

- ❖ Communicates internally via PMBus™.
- ❖ Communicates externally via SNMP.
- ❖ LED status indicators
- ❖ Two RJ45 connectors
 - Port 1 Ethernet (100BASE-TX)
 - Port 2 Serial console (RS-232C)
- ❖ Hot-swappable



MWOC-RMU-3 is latest model of RMU.

The basic functionality is continue from RMU-2, but there is new support for 1000BASE-T and Redfish.

(Under development)

Features

- ❖ Communicates internally via PMBus™.
- ❖ Communicates externally via SNMP.
- ❖ LED status indicators
- ❖ Two RJ45 connectors
 - Port 1 Ethernet (1000BASE-T)
 - Port 2 Serial console (RS-232C)
- ❖ Available for REDFISH
- ❖ Hot-swappable



Accessories:

Murata offers accessories necessary for configuring a centralized power supply system.

▀ Installation KIT

Shelves are designed to industry-standard widths of 19 inch (482.6mm) and 21 inch (533.4mm). Each kit provides required brackets and assembly hardware for specific rack installations.



▀ AC power cable

Provide the electrical connection between the Data Center Power Distribution System and the MWOCES/MWDCES series power shelves.



▀ Blanking panel

Provides an attractive and convenient option for covering/blanking unused shelf openings for each unit slot in the power shelf and Battery shelf.



Configuration Examples

■ **12V Architecture**

MWOCES-192-A



Features

- Should ATS function no longer be needed, delete by using a bypass unit (MWOC-ATS-3)
- Fits within the 21-inch rack (SPZ and DPZ) using installation kit
- Total output power: 3kW ~ 15kW (N+1)

Configuration Example and required quantity

Application: Three-Phase Delta input, installed in ORV2 single power zone rack

Related products	Description	9kW (N+1) without ATS
MWOCES-192-A	Power shelf (Delta input)	1
MWOC74-3000-A-RM	PSU	4
MWOC74-B	PSU-Blanking panel	2
MWOC-ATS-3	ATS-Bypass (Delta input)	1
MWOC-ATS-B	ATS-Blanking panel	1
MWOC-RMU-2	Remote management unit	1
MWOC-KIT-6	Installation KIT (V2 SPZ)	1
MWOC-PCA-4-3-1	AC power cable	1
TOTAL HEIGHT		2U

MWOCES-192-A + Battery backup



Features

- Hold-up time : 150sec at 15kW, four units, 25 deg C, BOL
- Up to three BBU shelves can be connected in parallel to extend hold-up time (planned performance)
- The system can be made even more robust by adding a BBU

Configuration Example and Required Quantity

Application: Three-Phase Delta input, installed in ORV2 single power zone rack

Related products	Description	15kW (N+1) without ATS 150 seconds backup	15kW (N+1) without ATS 550 seconds backup
MWOCES-192-A	Power shelf (Delta input)	1	1
MWOC74-3000-A-RM	PSU	6	6
MWOC74-B	PSU-Blanking panel		
MWOC-ATS-3	ATS-Bypass (Delta input)	1	1
MWOC-ATS-B	ATS-Blanking panel	1	1
MWOC-RMU-2	Remote management unit	1	1
MWOC-KIT-6	Installation KIT (V2 SPZ)	1	1
MWOC-PCA-4-3-1	AC power cable	2	2
MWBBES-212-A	Battery shelf	1	2
MWBBU118-4000-A-B	BBU	4	8
MWBBU118-B	BBU-Blanking panel		
MWBB-BCU-1	Battery control unit	1	1
MWBB-BCU-B	BCU-Blanking panel		1
MWBB-KIT-2	Installation KIT	1	1
MWBB-KIT-3	Installation KIT (expand)		1
TOTAL HEIGHT		4U	6U

(Continued)
Configuration Examples

MWOCES-192-M



Features

- Supports multi-input configuration; any input can be used
- Fits within the 21-inch rack (both SPZ and DPZ) using installation kit
- Total output power: 3kW ~ 15kW (N+1)
- Equipped with six C13 2.5A / AC outlet

Configuration Example and Required Quantity

Application: Three-Phase Delta input; installed in ORV2 Single power zone rack

Related products	Description	9kW (N+1)	15kW (N+1)
MWOCES-192-M	Power shelf	1	1
MWOC74-3000-A-RM	PSU	4	6
MWOC74-B	PSU-Blanking panel	2	
MWOC-RMU-2	Remote management unit	1	1
MWOC-KIT-26	Installation KIT (V2 SPZ)	1	1
MWOC-PCA-151D-4-3	AC power cable	1	1
TOTAL HEIGHT		2U	2U

MWOCES-192-M + Battery backup



Features

- Hold-up time : 150sec at 15kW, 4units, 25 deg C, BOL
- Up to three BBU shelves can be connected in parallel to extend the hold-up time (planned performance)

Configuration Example and Required Quantity

Application: Three-Phase Delta input; installed in ORV2 Single power zone rack

Related products	Description	15kW (N+1) 150 seconds backup	15kW (N+1) 550 seconds backup
MWOCES-192-M	Power shelf	1	1
MWOC74-3000-A-RM	PSU	6	6
MWOC74-B	PSU-Blanking panel		
MWOC-RMU-2	Remote management unit	1	1
MWOC-KIT-26	Installation KIT (V2 SPZ)	1	1
MWOC-PCA-151D-4-3	AC power cable	1	1
MWBBES-212-A	Battery shelf	1	2
MWBBSU118-4000-A-B	BBU	4	8
MWBBSU118-B	BBU-Blanking panel		
MWBB-BCU-1	Battery Control Unit	1	1
MWBB-BCU-B	BCU-Blanking panel		
MWBB-KIT-2	Installation KIT	1	1
MWBB-KIT-3	Installation KIT (expand)		1
TOTAL HEIGHT		4U	6U

(Continued)
Configuration Examples

MWDCES-191- Series



Features

- Supports single phase input (191-C) and HVDC input (191-D)
- 19-inch width fits within the EIA, ESA standard racks
- Total output power: 3kW ~ 12kW(N+1)
- Best configuration for deployments in 19-inch racks that do not require < 12kW output power

Configuration Example and Required Quantity

Application: Single-Phase Input; installed in 19-inch rack

Related products	Description	9kW (N+1)	12kW (N+1)
MWDCES-191-C	Power shelf	1	1
MWOC74-3000-A-RM	PSU	4	5
MWOC74-B	PSU-Blanking panel	1	
MWOC-RMU-2	Remote management unit	1	1
MWDC-KIT-12	Installation KIT (EIA)	1	1
MWOC-PCA-7-3-5	AC power cable	1	1
TOTAL HEIGHT		1U	1U

MWDCES-191- Series + Battery Backup



Features

- Optimal solution for 19-inch power system for deployments requiring Battery Backup system
- Hold-up time: 150sec at 11.25kW, three units, 25 deg C, BOL
- Up to three BBU shelves can be connected in parallel to extend the hold-up time (planned performance)

Configuration Example and Required Quantity

Application: Single-Phase Input; installed in 19-inch rack

Related products	Description	7kW (N+1) 170 seconds backup	7kW (N+1) 570 seconds backup
MWDCES-191-C	Power shelf	1	1
MWOC74-3000-A-RM	PSU	5	5
MWOC74-B	PSU-Blanking panel		
MWOC-RMU-2	Remote management unit	1	1
MWDC-KIT-12	Installation KIT (EIA)	1	1
MWOC-PCA-7-3-5	AC power cable	1	1
MWBBS-192-A	Battery shelf	1	2
MWBBSU118-4000-A-B	BBU	2	4
MWBBSU118-B	BBU-Blanking panel	1	2
MWBBS-BCU-1	Battery control unit	1	1
MWBBS-BCU-B	BCU-Blanking panel		1
MWBBS-KIT-6	Installation KIT	1	1
MWBBS-KIT-3	Installation KIT (expand)		1
TOTAL HEIGHT		3U	5U

(Continued)
Configuration Examples

MWOCES-211 Series



Features

- Can be deployed in both single and dual power zone racks
- MWOCES-211-F and -G can be conveniently installed into rack without installation kit
- Total output power: 3kW ~ 15kW (N+1)
- Streamlined, low-profile, 10U height

Configuration Example and Required Quantity

Application: Three-Phase Wye Input; installed in ORV2 Single power zone rack

Related products	Description	12kW (N+1)	15kW (N+1)
MWOCES-211-G	Power shelf	1	1
MWOCP74-3000-A-RM	PSU	5	6
MWOCP74-B	PSU-Blanking panel	1	
MWOC-RMU-2	Remote management unit	1	1
MWOC-KIT-8	Installation KIT (V2 SPZ)	1	1
MWOC-PCA-5-3-6	AC power cable	2	2
TOTAL HEIGHT		10U	10U

MWOCES-211 Series + Battery backup



Features

- Can be deployed in SPZ and DPZ
- Streamlined, low-profile, 10U height
- Capable of delivering the impressive high output power of MWOCES-192, without the ATS function
- Hold-up time(BOL) : 150sec at 15kW, 4units, 25 deg C, BOL
- Up to three (3) BBU shelves can be connected in parallel for increased hold-up time (planned performance)


Configuration Example and Required Quantity

Application: Three-Phase Wye Input; installed in ORV2 Single power zone rack


Related products	Description	15kW(N+1) 150 seconds backup	15kW (N+1) 550 seconds backup
MWOCES-211-G	Power shelf	1	1
MWOCP74-3000-A-RM	PSU	6	6
MWOCP74-B	PSU-Blanking panel		
MWOC-RMU-2	Remote management unit	1	1
MWOC-KIT-8	Installation KIT (V2 SPZ)		
MWOC-KIT-23	Installation KIT	1	1
MWOC-PCA-5-3-6	AC power cable	2	2
MWBBS-212-A	Battery shelf	1	2
MWBBSU118-4000-A-B	BBU	4	8
MWBBSU118-B	BBU-Blanking panel		
MWBBS-BCU-1	Battery control unit	1	1
MWBBS-BCU-B	BCU-Blanking panel		1
MWBBS-KIT-8	Installation KIT	1	1
MWBBS-KIT-3	Installation KIT (expand)		1
TOTAL HEIGHT		30U	50U

(Continued)
Configuration Examples

54V Architecture

MWOCS-191-M-B	Configuration Example and required quantity			
	Application: Three-Phase Wye Input; installed in ORV2 Single power zone rack.			
Features <ul style="list-style-type: none">• Total output power: 3.6kW ~ 18kW (N+1)• Can be deployed in ORV2, SPZ and EIA rack types• Supports multi-input configuration; any input can be used	Related products	Description	10.8kW(N+1)	18kW(N+1)
	MWOCS-191-M-B	Power shelf	1	1
	MWOCP68-3600-D-RM	PSU	4	6
	MWOCP68-B	PSU-Blanking panel	2	
	MWOC-RMU-2	Remote management unit	1	1
	MWOC-KIT-21	Installation KIT (V2 SPZ)	1	1
	MWOC-PCA-7-3-6	AC power cable	2	2
	TOTAL HEIGHT		10U	10U

50V Architecture

MWOCS-211-P-C	Configuration Example and Required Quantity																												
	<p>Application: Three-Phase Wye Input; installed in ORV3 rack.</p> <table><tr><th>Related products</th><th>Description</th><th>10.8kW(N+1)</th><th>21.6kW(N+0)</th></tr><tr><td>MWOCS-211-P-C</td><td>Power shelf</td><td>1</td><td>1</td></tr><tr><td>MWOCP68-3600-B-RM</td><td>PSU</td><td>4</td><td>6</td></tr><tr><td>MWOCP68-B</td><td>PSU-Blanking panel</td><td>2</td><td></td></tr><tr><td>MWOC-RMU-2</td><td>Remote management unit</td><td>1</td><td>1</td></tr><tr><td>MWOC-PCA-231W-6-3</td><td>AC power cable</td><td>2</td><td>2</td></tr><tr><td colspan="2">TOTAL HEIGHT</td><td>10U</td><td>10U</td></tr></table>	Related products	Description	10.8kW(N+1)	21.6kW(N+0)	MWOCS-211-P-C	Power shelf	1	1	MWOCP68-3600-B-RM	PSU	4	6	MWOCP68-B	PSU-Blanking panel	2		MWOC-RMU-2	Remote management unit	1	1	MWOC-PCA-231W-6-3	AC power cable	2	2	TOTAL HEIGHT		10U	10U
Related products	Description	10.8kW(N+1)	21.6kW(N+0)																										
MWOCS-211-P-C	Power shelf	1	1																										
MWOCP68-3600-B-RM	PSU	4	6																										
MWOCP68-B	PSU-Blanking panel	2																											
MWOC-RMU-2	Remote management unit	1	1																										
MWOC-PCA-231W-6-3	AC power cable	2	2																										
TOTAL HEIGHT		10U	10U																										
<h3>Features</h3> <ul style="list-style-type: none">• Total output power: 3.6kW ~ 21.6kW (N+0)• Can be deployed in ORV3 rack• Supports multi-input configuration; any input can be used																													

Product Map (Power System)

Category	Order P/N	Output		Height	AC Input Voltage [Vac]		DC Input Voltage [Vdc]	
		V[V]	Power [KW]		min	max	min	max
Power Supply Unit	MWOC-P74-3000-A-RM	12.3	3	1U	90	300	192	400
	MWOC-P68-3600-D-RM	54.5	3.6	1U	180	305	192	400
	MWOC-P68-3600-B-RM	50	3.6	1U	180	305	192	400

Category	Order P/N	Open Rack			19" Rack	Height	Outlet Qty	BBU connection	Input Configuration			Redundancy	Output		Applicable PSU
		V1	V2	V3					3 Phase	Single Phase	HVDC		V [V]	Power [KW]	
21" Empty Shelf	MWOCES-211-F ^{※2}		●			10U	2	No	Wye	●		N+1/N+N	12.3	15 (N+1)	MWOC-P74-3000-A-RM
	MWOCES-211-G	●	●			10U	2	Yes	Wye	●		N+1/N+N	12.3	15 (N+1)	MWOC-P74-3000-A-RM
	MWOCES-211-P-C			●		10U	0	Yes	Wye/Delta	●		N+1/N+N	50/54.5	21.6(N+0)	MWOC-P68-3600-X ^{※3} -RM
19" Empty Shelf	MWDCES-191-C				●	1U	2	Yes	Wye/Delta	●		N+1	12.3	12 (N+1)	MWOC-P74-3000-A-RM
	MWDCES-191-D ^{※1}				●	1U	0	Yes			●	N+1	12.3	12 (N+1)	MWOC-P74-3000-A-RM
	MWOCES-192-A	●	●		●	2U	6	Yes	Delta			N+1	12.3	15 (N+1)	MWOC-P74-3000-A-RM
	MWOCES-192-M	●	●		●	2U	6	Yes	Wye/Delta	●		N+1/N+N	12.3	15 (N+1)	MWOC-P74-3000-A-RM
	MWOCES-191-M-B		●		●	10U ^{※3}	0	Yes	Wye/Delta	●		N+1/N+N	50/54.5	18 (N+1)	MWOC-P68-3600-B-RM

※1 Planned future product. Contact Murata for the latest details

※2 MWOCES-211-F can be installed into Nitto (Nitto Kogyo) rack directly, Installation KIT is not required. MWOCES-211-F can be installed into TDI rack directly, Installation KIT is not required

※3 Please pay attention to the height when placing the MWOCES-191-M-B in a 19-inch rack.

Category	Order P/N	Product Description	Applicable Shelf
Remote Management Unit	MWOC-RMU-2	Remote Management Unit(100BASE-TX)	All Power shelves
	MWOC-RMU-3 ^{※1}	Remote Management Unit(1000BASE-T)	All Power shelves
ATS Bypass	MWOC-ATS-3	Bypass Unit	MWOCES-192-A
Blanking Panels	MWOC-ATS-B	Blanking panel for MWOCES-192-A ATS slot	MWOCES-192-A
	MWOC-RMU-B ^{※1}	Blanking panel for MWOC-RMU series	All Power shelves
	MWOC-P74-B	Blanking panel for MWOC-P74 series	Other than MWOCES-211-P-C and MWOCES-191-M-B
	MWOC-P68-B	Blanking panel for MWOC-P68 series	MWOCES-211-P-C and MWOCES-191-M-B

Category	Order P/N	Product Description	Open Rack			19" rack	Applicable Shelf			
			Rittal		TDI		MWOCES 211	MWOCES 192	MWDCES 191	MWOCES 191
			V1	V2	V2					
Installation Kit	MWOC-KIT-6	Side Angle adjuster(2pc), Link Bus Bar (1pair) Tray(1pc)		SPZ				A		
	MWOC-KIT-7	Side Angle adjuster(2pc), Link Bus Bar (1pair) Tray(1pc)		DPZ				A		
	MWOC-KIT-8	Link Bus bar(1 pair) Tray(1pc)		SPZ			G			
	MWOC-KIT-9	Link Bus bar(1 pair) Tray(1pc)		DPZ			G			
	MWOC-KIT-20	Side Angle adjuster(2pc), Link 3 Bus Bar (1pair)	DPZ					A		
	MWOC-KIT-21	Side Angle adjuster(2pc), Link Bus Bar (1pair) Tray(1pc)		SPZ						-M-B
	MWOC-KIT-23	Tray(1pc)		SPZ/DPZ			G			
	MWOC-KIT-26	Side Angle adjuster(2pc), Link Bus Bar (1pair) Tray(1pc)		SPZ				A,M		
	MWOC-KIT-27	Side Angle adjuster(2pc), Link Bus Bar (1pair) Tray(1pc)		DPZ				A,M		
	MWOC-KIT-29 ^{※1}	Side Angle adjuster(2pc), Link Bus Bar (1pair) Tray(1pc)			SPZ			A,M		
	MWOC-KIT-30 ^{※1}	Side Angle adjuster(2pc), Link Bus Bar (1pair) Tray(1pc)			DPZ			A,M		
	MWOC-KIT-37 ^{※1}	Link Bus bar(1 pair)				●		M		
	MWDC-KIT-12	Side Rail (4pc)				●			C	-M-B

※1 Planned future product. Contact Murata for the latest details

Category	Order P/N
Input Cable	Please see the AC power configuration page

Category	Order P/N	Product Description
Expansion Cable	MWOC-KIT-C1	Expansion cable that connects three power shelves in parallel and has a current adjustment function.
	MWOC-KIT-C2	Expansion cable that connects two power shelves in parallel and has a current adjustment function.

Product Map (Battery Backup)

Category	Order P/N	Open Rack			19" Rack	Height	Charge		Discharge	
		V1	V2	V3			V [V]	Power [kW]	V [V]	Power [kW]
21" Empty Shelf	MWBES-212-A		●			2U	12.3	3.74	12.3	16
19" Empty Shelf	MWBES-192-A ^{※1}				●	2U	12.3	2.8	12.3	12

^{※1} Planned future product. Contact Murata for the latest details

Category	Order P/N	Charge		Discharge		Height
		V [V]	Power [kW]	V [V]	Power [kW]	
Battery Backup Unit	MWBBU118-4000-A-B ^{※1}	12.3	0.804	12.3	4	2U


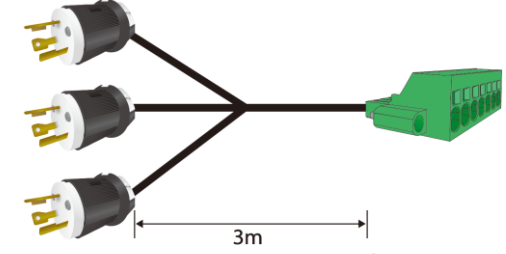


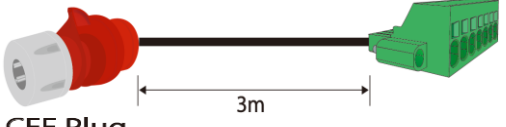


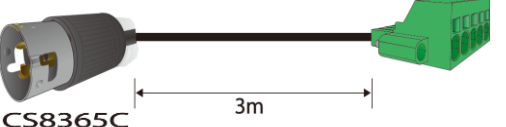


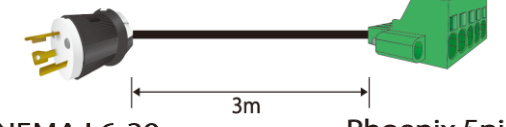



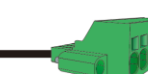




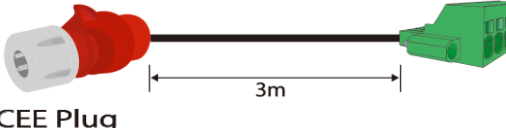
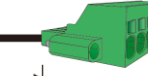
Category	Order P/N	Product Description	Applicable Shelf (BBU)
Battery Control Unit	MWBB-BCU-1	Battery Control Unit for MWBBU series	All Battery shelves
Blanking Panels	MWBBU118-B	Blanking panel for MWBBU118-4000-A-B	All Battery shelves
	MWBB-BCU-B	Blanking panel for MWBB-BCU-1	All Battery shelves

Category	Order P/N	Product Description	Open Rack (21")			19" rack	Combination of power shelf and battery shelf
			Rittal		TDI		
			V1	V2	V2		
Installation KI	MWBB-KIT-2	Main link busbar, Side Rail(Rittal SPZ rack) , Communication Cable		SPZ/DPZ			MWOCES-192 with MWBBES-212-A
	MWBB-KIT-3	Sub link bus bar, Extension communication cable		SPZ		●	All combination
	MWBB-KIT-4 ^{※1}	Main link busbar, Side Rail(EIA19", ESA), Communication Cable				●	MWOCES-192 with MWBBES-192-A
	MWBB-KIT-5	Main link busbar, Communication Cable, (Rittal SPZ rack)		SPZ			MWOCES-211-G with MWBBES-212-A
	MWBB-KIT-6 ^{※1}	Main link busbar, Side Rail(EIA19", ESA), Communication Cable				●	MWDCES-191 with WMBBES-192-A
	MWBB-KIT-8	Main link busbar, Communication Cable, (Rittal DPZ rack)		DPZ			MWOCES-211-G with MWBBES-212-A


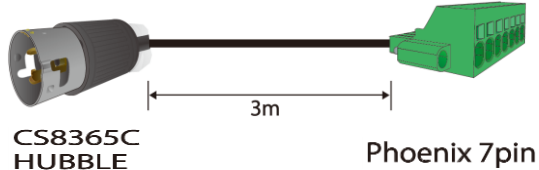

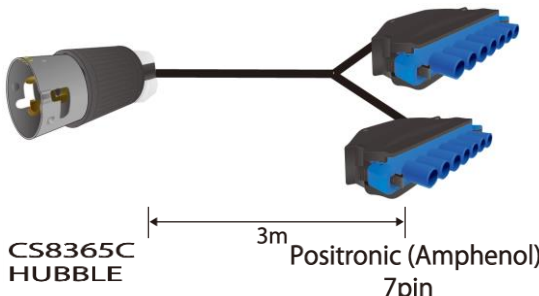

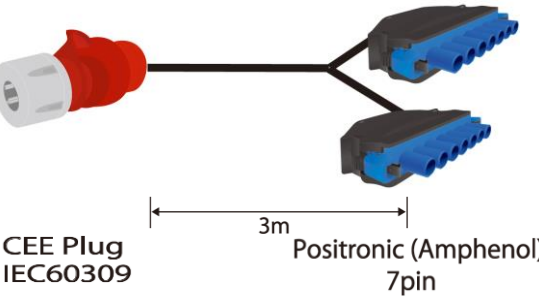

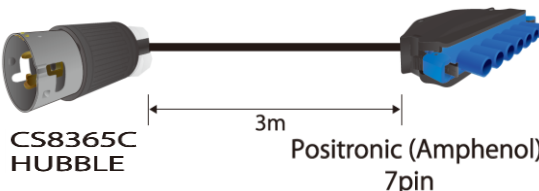

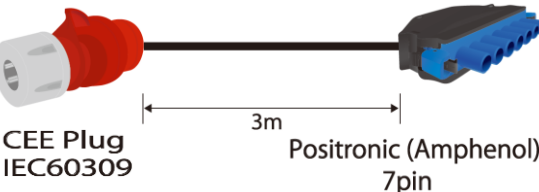

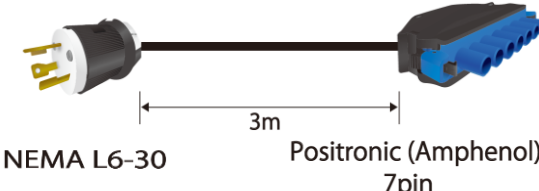
^{※1} Planned future product. Contact Murata for the latest details

Input Cable Configuration

ORDERING GUIDE

Order Number	Applicable shelf	Input Cfg	Max. Curt. (A)	Plug Cfg.	Facility Side Plug	Equipment Side Connector	Weight (kg)
MWOC-PCA-7-3-5	MWDCES-191-C MWOCES-191-M-B	Single Phase	30		 NEMA L6-30	 Phoenix 7pin	5.0
MWOC-PCA-7-3-6	MWDCES-191-C MWOCES-191-M-B	3 Phase Wye	32		 CEE Plug IEC60309	 Phoenix 7pin	1.9
MWOC-PCA-4-3-1	MWOCES-192-A	3 Phase Delta	50		 CS8365C HUBBLE	 Phoenix 5pin	3.0
MWOC-PCA-3-3-2	MWOCES-211-F,-G	Single Phase	30		 NEMA L6-30	 Phoenix 5pin	1.8
MWOC-PCA-3-4-7A	MWOCES-211- F,-G	Single Phase	30		 NEMA L6-30	 Phoenix 5pin	4.7
MWOC-PCA-3-4-7B	MWOCES-211-F,-G	Single Phase	30		 NEMA L6-30	 Phoenix 5pin	4.7
MWOC-PCA-5-3-6	MWOCES-211-F, -G	3 Phase Wye	32		 CEE Plug IEC60309	 Phoenix 5pin	1.9

ORDERING GUIDE

Order Number	Applicable Shelf	Input Cfg	Max. Curt(A)	Plug Cfg.	Facility Side Plug	Equipment Side Connector	Weight (kg)
MWOC-PCA-151D-2-3	MWOCES-191-M-B	3 Phase Delta	50		 CS8365C HUBBLE Phoenix 7pin	2.0	
MWOC-PCA-151D-4-3	MWOCES-192-M, MWOCES-211-P-C	3 Phase Delta	50		 CS8365C HUBBLE Positronic (Amphenol) 7pin	3.3	
MWOC-PCA-231W-4-3	MWOCES-192-M, MWOCES-211-P-C	3 Phase Wye	32		 CEE Plug IEC60309 Positronic (Amphenol) 7pin	2.6	
MWOC-PCA-151D-6-3	MWOCES-192-M, MWOCES-211-P-C	3 Phase Delta	50		 CS8365C HUBBLE Positronic (Amphenol) 7pin	2.6	
MWOC-PCA-231W-6-3	MWOCES-192-M, MWOCES-211-P-C	3 Phase Wye	32		 CEE Plug IEC60309 Positronic (Amphenol) 7pin	2.0	
MWOC-PCA-331S-6-3	MWOCES-192-M, MWOCES-211-P-C	Single Phase	30		 NEMA L6-30 Positronic (Amphenol) 7pin	2.0	

Global locations

For details, visit www.murata.com



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