



UNITED POWER

Series MC: Power Distribution Modules
for Mission Critical Applications

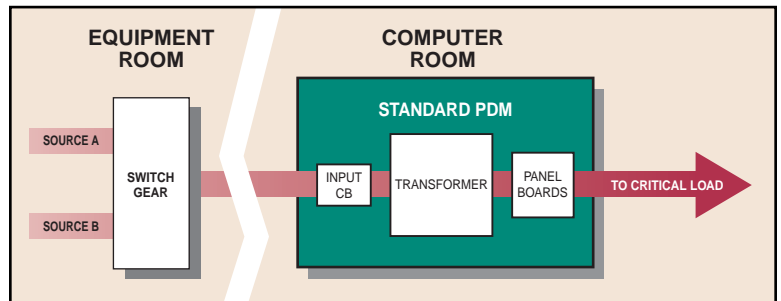
Series MC PDMs

Complete Your Power System Design With Mission Critical Series Power Distribution Modules

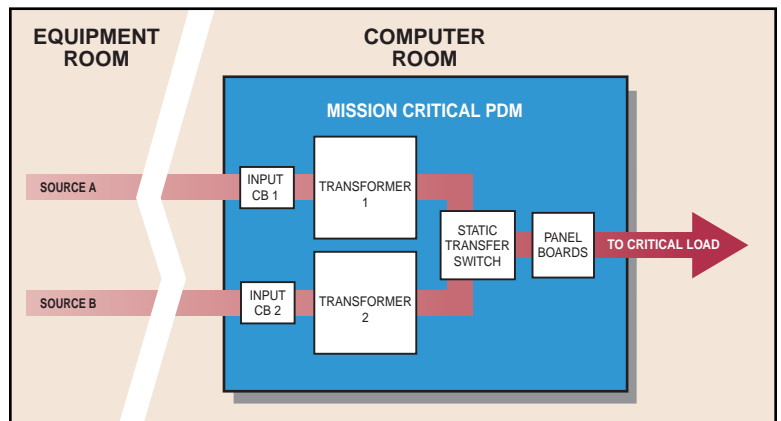
United Power's Mission Critical Power Distribution Modules (PDMs) allow you to extend the redundancy of your critical power system from the service entrance to the output distribution circuits feeding your critical load. By extending your system's redundancy, Series MC PDMs ensure that you receive maximum benefit from the investment you already have in your critical power system. Dual utility feeds, redundant back-up engine generators and sophisticated UPS systems should feed a power distribution unit that increases the system's overall reliability and flexibility.

Until now, virtually all computer power distribution units featured a single main circuit breaker and one high isolation transformer feeding multiple panelboards for distribution of the protected power to the critical loads. However, Series MC PDMs bring redundancy to the *point of use* level by introducing dual input circuit breakers, dual transformers and a static transfer switch, depending on the Series MC platform you choose.

Series MC distribution units are custom-engineered to maximize the strengths of your entire critical power system. We offer four basic pre-engineered "platforms," each of which may be custom-tailored to meet the requirements of your specific application.



In the past, system redundancy often stopped before the power distribution unit. Each load was fed from a PDM with a single input breaker and a single high isolation transformer.



*Now, the Series MC PDM brings system redundancy to the *point of use* level by introducing dual input circuit breakers, dual transformers and static transfer switches.*

Series MC PDMs complement your power system design, allowing you to:

- **Improve power reliability**
 - Superior designs and quality components
- **Improve power availability**
 - Redundancy for maximum protection
- **Improve system maintainability**
 - Routine service with no downtime required

Innovation in design has made United Power a technological leader in the critical power industry. Our Series MC PDMs are engineered to provide



advanced solutions for critical power environments by maximizing system reliability and allowing system maintenance and repair without downtime.

Mission Critical Power Distribution Is The Innovative Solution To Our Customers' Needs

Series MC PDMs were born in the search for an advanced solution to a difficult problem. In a critical power environment, downtime can mean the loss of thousands of dollars per second for your company. In listening to our customers, we heard consultants and facility managers from such mission critical environments repeat two major concerns:

- How can we maximize reliability of our critical power system from the utility source to the load?
- How can we maintain and repair the entire critical power system, including the PDM, without downtime?

Drawing on our experience and knowledge in power distribution products, United Power combined the

latest technology and innovative design strategies to develop the Series MC PDMs. The result is an extremely flexible power distribution unit that can be easily modified to work with any critical power system, regardless of configuration! Today, Series MC systems are engineered to protect some of the most prestigious sites in the country — from major financial data centers to high-tech manufacturing processes.

United Power Products Are Born Of Experience And Innovation

United Power personnel have been designing and manufacturing power conditioning and distribution equipment for critical power environments for nearly 20 years. Our broad product line includes:

- Dual Feed & Static Switch PDMs
- Power Distribution Systems
- UL Listed Power Distribution Cables
- Transient Voltage Surge Suppression
- K-Rated, Isolation & Phase Shift Transformers
- Rotary & Static Power Conditioning Systems
- Single-Phase UPS (4-18 kVA)
- Single-Phase Central Lighting Inverters

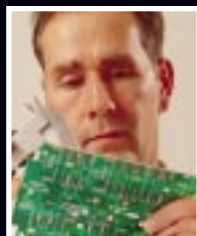
United Power's innovation in power equipment design is recognized by a growing customer list of more than 3,000 corporate, industrial and government sites. We have the technology and experience necessary to serve the most demanding customer requirements.



MC-3 PDM

United Power Series MC PDMs are custom-engineered to complement your critical power applications.

Quality is a promise and a priority at United Power. Series MC PDMs are manufactured to demanding quality control standards. In addition,



all our products meet stringent UL standards. We pledge to provide every customer superior service and knowledgeable engineering support.

Series MC-1 and MC-2

Series MC PDMs Offer Cost Effective Internal Redundancy And Make-Before-Break Transfers

United Power's MC-1 and MC-2 systems provide cost-effective solutions to those Mission Critical applications where the user wants to optimize power availability and system maintainability. A permissive signal from the upstream power sources verifies synchronization and allows the user to initiate a "make-before-break" transfer from one side of the system to the other. This transfer may be made by manual operation of the main input circuit breakers or through push-button controls when our automatic control configuration has been selected. With either configuration, our advanced control logic prevents the possibility of operator error. The make-before-break transfer allows the user to perform system maintenance without downtime to the critical load. Redundant PDM input circuit breakers and transformers dramatically reduce recovery time in the event of an equipment failure (MC-2).

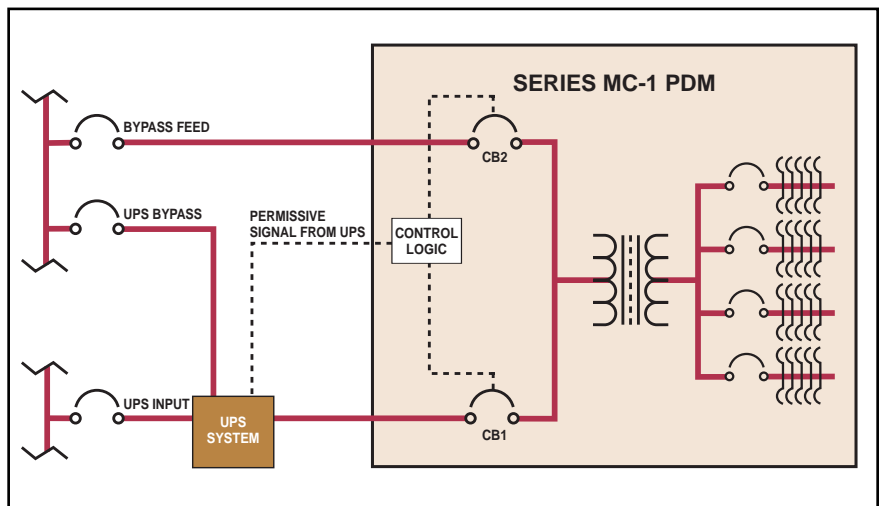
MC-1 — Flexible System Bypass

United Power MC-1 systems are the first step in maximizing the benefits of bringing redundancy into the PDM. The MC-1 is the least expensive member of our Mission Critical PDM product line and provides the user with a second main input circuit breaker protective device. This design is often used as an economical maintenance bypass to accommodate the output of one UPS and its synchronized bypass source. This integrates the system bypass function into the PDM rather than into expensive external bypass switchgear.

MC-1 main input breakers are electrically interlocked for safe manual operation. They may also be automatically operated for those sites where push-button controls are desired. All MC-1 systems feature the use of United Power's advanced control logic to ensure proper operation of the two main input circuit breakers.



MC PDMs improve system availability and maintainability



The above one-line diagram illustrates an MC-1 PDM used for power distribution and UPS system bypass functions.

Data processing facilities know that loss of power means lost data that can result in the loss of millions of dollars per minute. United Power fully understands the complex requirements of

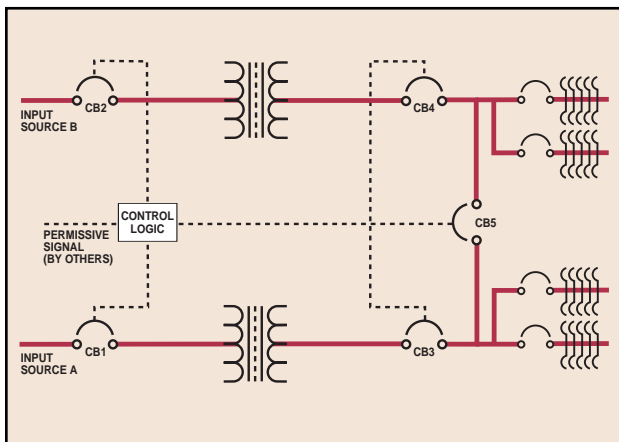


critical power loads. We designed our Series MC PDMs to be the intelligent solution for providing the most reliable and maintainable power distribution system offered today.

MC-2 — Dual Transformers For Maximum Protection And Maintainability

United Power MC-2 systems extend the redundancy in your power distribution unit beyond the main input breakers by including a second impedance-matched transformer for maximum maintainability and protection against potential single points of failure. The MC-2 load may be transferred from one side of the unit to the other in a “make-before-break” manner. This allows system maintenance without downtime, an essential feature of a mission critical site. To complete the design, all MC-2 systems include output breakers in our two-device, classic three-device “tie”, or our unique four-device “criss-cross” configuration.

The MC-2 output breakers are available with either manual or automatic (push-button) operation based on your personal preference. Simply provide United Power a permissive signal that confirms that the two inputs of the PDM are fed from synchronized sources and make-before-break operation is allowed. The controls within the MC-2 do the rest to ensure safe and reliable operation of this advanced distribution system.



Our MC-2 three breaker “tie” configuration allows you to place 100% of the load onto either side of the PDM for system maintenance without downtime. During normal operation, each transformer supports no more than 50% of the load.

MC-1 and MC-2 Features

Feature	MC-1	MC-2
System kVA Range 75-300kVA	S	S
System Voltages Input: 480V 3 phase, Output: 208/120V 3 phase	S	S
Input: 208V 3 phase, Output: 208/120V 3 phase	O	O
Other international voltage & frequency combinations	O	O
Load Transfer Control <i>(select one below)</i>		
Padlocks on breakers	S	N/A
Electrically interlocked breakers	S	S
Motor operated breakers	S	S
Input Circuit Breakers Dual input circuit breakers	S	S
Lightning Arrestor/Surge Suppressor High energy surge protection on the transformer primary	O	O
Isolation Transformers		
K-13 rated	S	S
K-20 rated	O	O
Dual impedance matched transformers	N/A	S
Harmonic mitigating transformers	O	N/A
Output Circuit Breakers <i>(select one below)</i>		
Two breaker output bus	N/A	S
Three “tie” breaker output bus	N/A	S
Four “Criss Cross” breaker output bus	N/A	S
Transient Voltage Surge Suppression		
One stage (L-N) @ 80,000 Amps total	O	O
Two stage (L-N & N-G) @ 160,000 Amps total	O	O
Three stage (L-N, N-G & L-G) @ 240,000 Amps total	O	O
Focus Microprocessor Controlled Monitoring		
True RMS voltage, current, kVA, demand, alarming, etc.	S	S
Three phase sag/surge transient, THD monitor	O	O
Distribution Panelboards		
Two through eight 42-pole panelboards available	S	S
225 amp secondary main breaker feeding each panelboard	S	S
Subfeed Distribution Breakers Up to four 225A 3-pole breakers in lieu of a panelboard	O	O
S = Standard O = Optional N/A = Not Available		

The chart above illustrates standard and optional features of the MC-1 and MC-2 systems to help you determine which Mission Critical configuration most closely meets your requirements.

The telecommunications industry is a mission critical environment ensuring continuous communication through such facilities as remote cellular switching stations and long distance call routing



centers. United Power Series MC PDMs extend the redundancy of critical power systems in the telecommunications industry, helping to provide the continuous service expected and required.

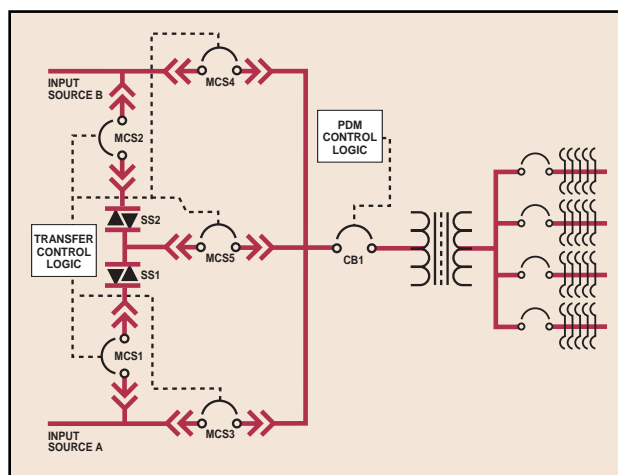
Series MC-3 and MC-4

Series MC PDMs Offer Static Transfer Switch Technology For Transparent Switching Between Sources

The MC-3 and MC-4 feature advanced static transfer switch (STS) technology complete with on-board diagnostics that monitor each of the two input sources for any abnormal characteristics. In the event of a power problem, the STS provides the ability to transfer from the preferred power source to the alternate power source within four milliseconds (less than one-quarter cycle). By integrating the ultra-fast STS into the power distribution unit, we increase the reliability and flexibility of your entire critical power system. Other features such as redundant circuit breakers and isolation transformers have made these systems the choice of mission critical environments across the country.

MC-3 — Input-Positioned STS

Model MC-3 is the first “platform” within the Mission Critical product line to feature a static transfer switch (STS). The 100% rated STS is positioned on the input of the system’s isolation transformer. In popular 480 Vac input, 120/208 Vac output applications, we position the STS at a higher operating voltage to reduce the size and cost associated with the switch. Our “line up and match” cabinetry provides a clean look for the data center, clean room or other high-tech environment. Focus Level III microprocessor monitoring is standard on all MC-3 units and a mimic panel is provided to show the critical power path of the system.



United Power MC-3 systems feature an input-positioned STS, providing 4mS switching between two different sources.



A static transfer switch integrated into the PDM increases system reliability and flexibility.

MC-4 PDM

Process control environments require mission critical power distribution to ensure consistent performance and accurate control in production and manufacturing. From process flow controls

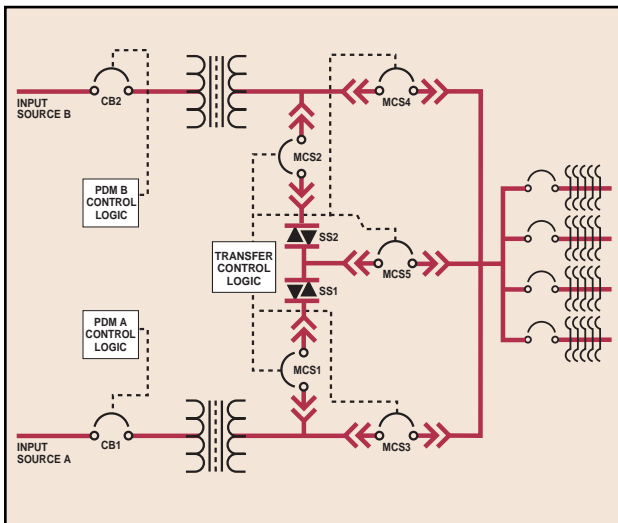


to robotics, United Power MC PDMs provide both reliable and maintainable power distribution technology for today’s sophisticated manufacturing processes.

MC-4 — Output-Positioned STS On Dual Transformers

United Power's MC-4 is the ultimate power distribution system and is currently supporting some of the nation's most critical data processing facilities. In the MC-4, we have combined the attributes of the STS with dual high isolation transformers to optimize the redundant characteristics of the system. As a result, the MC-4 provides increased reliability, maintainability, and availability of conditioned power for your critical load. Perhaps this is why so many of our customers have chosen this PDM configuration.

The MC-4 boasts flexibility not found in other distribution systems. For clients with a high concentration of "dual corded" loads, we can feed "dual corded" loads directly from the output of the isolation transformers and feed "single corded" loads from the STS output. This will typically reduce the necessary ampere rating of the STS while optimizing reliability and cost.



Two main breakers, two impedance-matched transformers, and a five-device STS are combined to create the ultimate Mission Critical PDM.

MC-3 and MC-4 Features

Feature	MC-3	MC-4
System kVA Range 75-300kVA	S	S
System Voltages Input: 480V 3 phase, Output: 208/120V 3 phase Input: 208V 3 phase, Output: 208/120V 3 phase Other international voltage & frequency combinations	S O O	S O O
Static Transfer Switch (STS) STS on transformer primary STS on transformer secondary Five switch STS bypass circuit Six switch STS bypass circuit	S N/A S O	N/A S S O
Transformer Input Breakers Single circuit breaker (for single transformer systems) Two circuit breakers (for dual transformer systems)	S O	N/A S
Lightning Arrestor/Surge Suppressor High energy surge protection on the transformer primary	O	O
Isolation Transformers K-13 rated K-20 rated Dual impedance matched transformers Harmonic mitigating transformers	S O O O	S O S N/A
Transient Voltage Surge Suppression One stage (L-N) @ 80,000 Amps total Two stage (L-N & N-G) @ 160,000 Amps total Three stage (L-N, N-G & L-G) @ 240,000 Amps total	O O O	O O O
Focus Microprocessor Controlled Monitoring True RMS voltage, current, kVA, demand, alarming, etc. Three phase sag/surge transient, THD monitor	S O	S O
Distribution Panelboards Two through eight 42-pole panelboards available 225 amp secondary main breaker feeding each panelboard Panelboards for "Dual Corded" loads	S S N/A	S S O
Subfeed Distribution Breakers Up to four 225A 3-pole breakers in lieu of a panelboard	O	O
S = Standard O = Optional N/A = Not Available		

The chart above illustrates standard and optional features of the MC-3 and MC-4 systems to help you determine which Mission Critical configuration most closely meets your requirements.

Semi-conductor fabrication relies on robotic systems to ensure efficiency and reliability in production. Microprocessor-controlled machine tools provide absolute repeatability and require mission



critical power distribution to ensure quality products. United Power's Series MC PDMs can be custom-engineered to meet the power distribution requirements of any manufacturing need.

Series MC PDMs
General Specifications

kVA

75-300 kVA, 3-phase

Input

Dual feed compatible
 3-phase, 3 wire plus ground
 208, 480 or 600 Vac, 60 Hz

Output

3-phase, 4 wire plus ground
 208/120 Vac, 60 Hz

Transformer

K-13, K-20 optional
 Double shielded
 Copper windings
 Compensation taps:
 2 @ 2.5% above nominal
 4 @ 2.5% below nominal

Ground

Single point per FIPS PUB 94

Static Transfer Switch (MC-3 & MC-4)

100% rated for continuous duty
 100% non-linear load capability
 1/4 cycle transfer time
 Wrap around maintenance bypass

Distribution

225A, 42-pole panels
 Main CB protection per panel
 Plug-in or bolt-on branch CBs
 Sub-feed breakers available (>100A)

Metering (True RMS)

Input voltage and output voltage
 Phase A, B, C, neutral and grd current
 kVA, kW, kWh
 Frequency
 Percent load
 Power factor
 Sag/surge/transient/THD (optional)

Alarming

High voltage
 Low voltage
 High current
 Phase loss
 Ground fault
 Phase rotation
 Transformer high temperature
 Transformer shutdown
 Summary alarm

Annunciation

80-character LCD display
 Alarm horn
 Acknowledge pushbutton
 Illuminated EPO pushbutton
 Power flow mimic panel (MC2-4)

Physical Specifications: Series MC PDMs (480 Vac Input, 60 Hz)

Model No.	kVA	Panelboards	Width (In)*	Depth (In)	Height (In)	Weight (Lb)
MC-1	75	4	43.5	34	69	1,250
	100	4	43.5	34	69	1,360
	125	4	43.5	34	69	1,520
	150	4	43.5	34	69	1,630
	200	4	43.5	34	69	1,900
	225	4	43.5	34	69	2,010
	300	4	53	34	69	2,780
MC-2	75	4	98	34	69	2,350
	100	4	98	34	69	2,570
	125	4	98	34	69	2,890
	150	4	98	34	69	3,110
	200	4	98	34	69	3,650
	225	4	98	34	69	3,870
	300	6	117	34	69	5,310
MC-3	75	4	109.5	34	69	2,450
	100	4	109.5	34	69	2,560
	125	4	109.5	34	69	2,720
	150	4	109.5	34	69	2,830
	200	4	109.5	34	69	3,100
	225	4	109.5	34	69	3,210
	300	4	109.5	34	69	3,950
MC-4	75	4	129	34	69	3,140
	100	4	129	34	69	3,360
	125	4	129	34	69	3,680
	150	4	129	34	69	4,200
	200	4	129	34	69	4,580
	225	4	129	34	69	4,800
	300	6	149	34	69	6,700

Consult factory for MC PDM systems requiring other voltage configurations.

* United Power offers a wide variety of output distribution options. Width dimension is subject to change based on different output distribution configurations.

* All dimensions are for systems requiring front access only for routine field service. Width dimension may be reduced when rear clearance is available. Consult factory for applications assistance and custom AutoCAD drawing generation for your custom MC PDM.

UL478 (PDM) and 1008 (STS) Listed • NEMA • NEC • ANSI • IEEE • FIPS 94



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