

400 kW-  
1600 kW  
400 V



# Enterprise Power Protection

## Symmetra® MW

Fault-Tolerant, Modular,  
Scalable On-Line UPS  
solutions for Facilities,  
Data Centers and other  
Mission-Critical  
Applications



Symmetra® MW 1000 kW

Tested and certified for use with  
InfraStruXure™ Architecture

CERTIFIED  
InfraStruXure

## Adaptability

- Modular design
- Adapt to ever-changing power requirements
- Scalability for changing load requirements
- Top or bottom cable entry as standard
- InfraStruXure approved component

## Availability

- Modular fault-tolerant design
- Predictive failure analysis
- Paralleling features for capacity and redundancy
- Distributed inverter technology for fault containment

## Serviceability

- Self-diagnosing
- Self-testing
- Front access maintenance
- Modular-level repair
- Component-level predictive failure analysis
- Menu-driven repair instructions

## Manageability

- Monitor power attributes for entire management solution
- Automated battery monitoring, management and testing
- Single interface management of multiple products
- A 10" color LCD touch screen
- Configurable display layout
- Menu-driven operating instructions
- Monitor via network and web

## Economy

- Power-factor corrected input
- Full-rated power with kVA equaling kW
- Temperature-compensated battery charging
- State-of-the-art topology

As the first ever fault-tolerant, modular UPS in the 400 kW - 1600 kW power range, the Symmetra® MW product family redefines high-power UPS technology, and includes paralleling features to handle even larger load requirements.

## ADAPTABILITY

**Symmetra® MW solutions offer easy system expansion to meet today's ever-changing power requirements.**

The modular design of the UPS enables system expansion and numerous configuration possibilities.

Modules can be quickly installed and replaced to add system availability in increments of 200 kW.

The line-up and match battery system design addresses space availability via several configuration options: straight line, back-to-back, and multiple location installations.

The Symmetra® MW is certified to work with our new InfraStruXure data center architecture that allows you to pay as you grow. Please visit our website for more details.

## AVAILABILITY

**Symmetra® MW has built-in fault tolerance features that allow it to remain effective even when failures occur.**

The UPS offers fault tolerance, and its modular design incorporates power-sharing technology. Should a module fail, the remaining modules automatically ensure uninterruptible load support. The readily replaceable modules also reduce the Mean Time To Repair (MTTR).

Predictive failure analysis of mission-critical and wear-out components enables timely preventive maintenance.

## SERVICEABILITY

**Symmetra® MW requires minimal maintenance space as it has full front access to all enclosures for easy maintenance of key components .**

The UPS is self-diagnosing and provides automatic, early-warning notification of possible problems.

The modular fault-tolerant design ensures uninterrupted system availability and provides a safe working environment for maintenance personnel. The Battery System has spacious shelving for safe maintenance of batteries.

Battery Breaker Boxes and Side Cars contain slide-in modules for easy access to internal components.

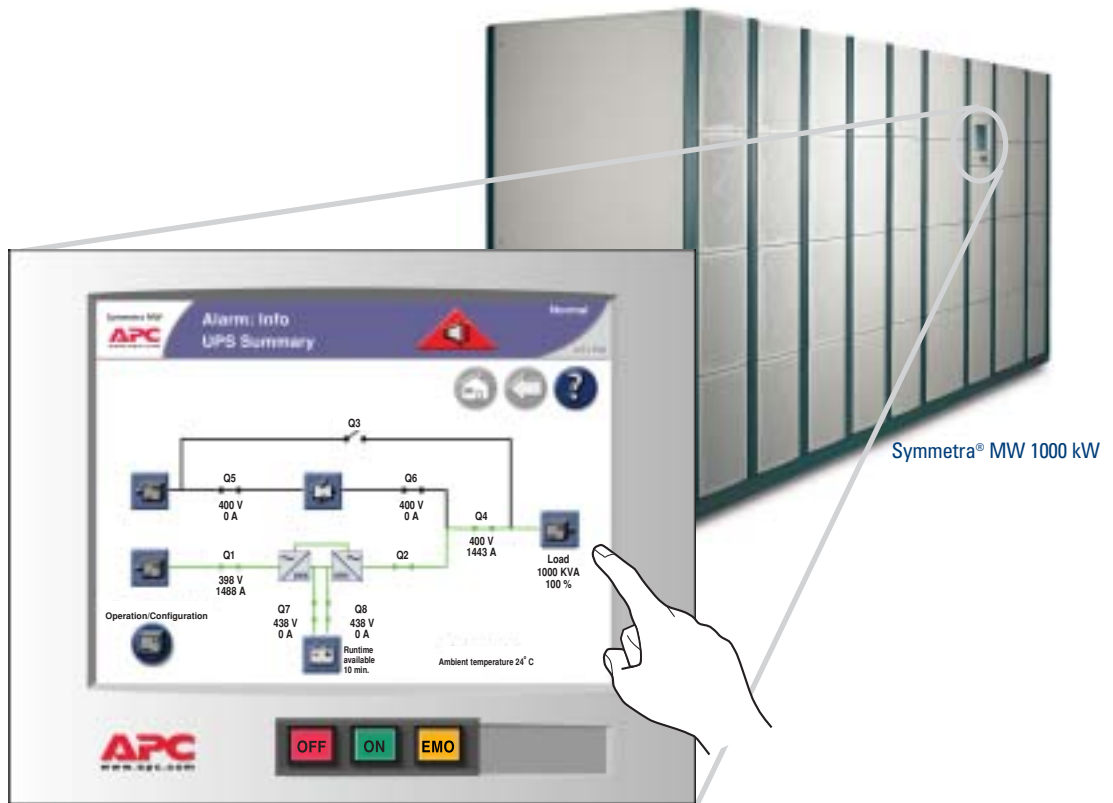


Visit APC at [www.apc.com](http://www.apc.com) for information on the entire Symmetra® MW product family

## MANAGEABILITY

**Symmetra® MW solutions can be monitored from data centers or remote locations. APC Management Software offers full system visibility and easy access to critical data via a 10" color LCD touch screen.**

The UPS provides advanced battery monitoring and temperature-compensated battery charging. Battery related data is continuously updated and compared against pre-programmed data to ensure constant and efficient battery back-up. An early-warning message will be generated in the event of reduced battery capacity. Latest Digital Signal Processing (DSP) ensures high reliability and superior functionality of the UPS system and user interface. Battery system sensors monitor battery fuses and temperature abnormalities. Data is sent in real-time to the UPS, and alarms are automatically generated if a problem is detected.



State-of-the-art LCD touch-screen providing full system visibility and easy access to critical data. The entire system and each individual component are monitored by the latest digital technology offering automatic fault analysis and early-warning problem notification to ensure constant system availability.

## ECONOMY

**Symmetra® MW provides a cost-effective lifecycle.**

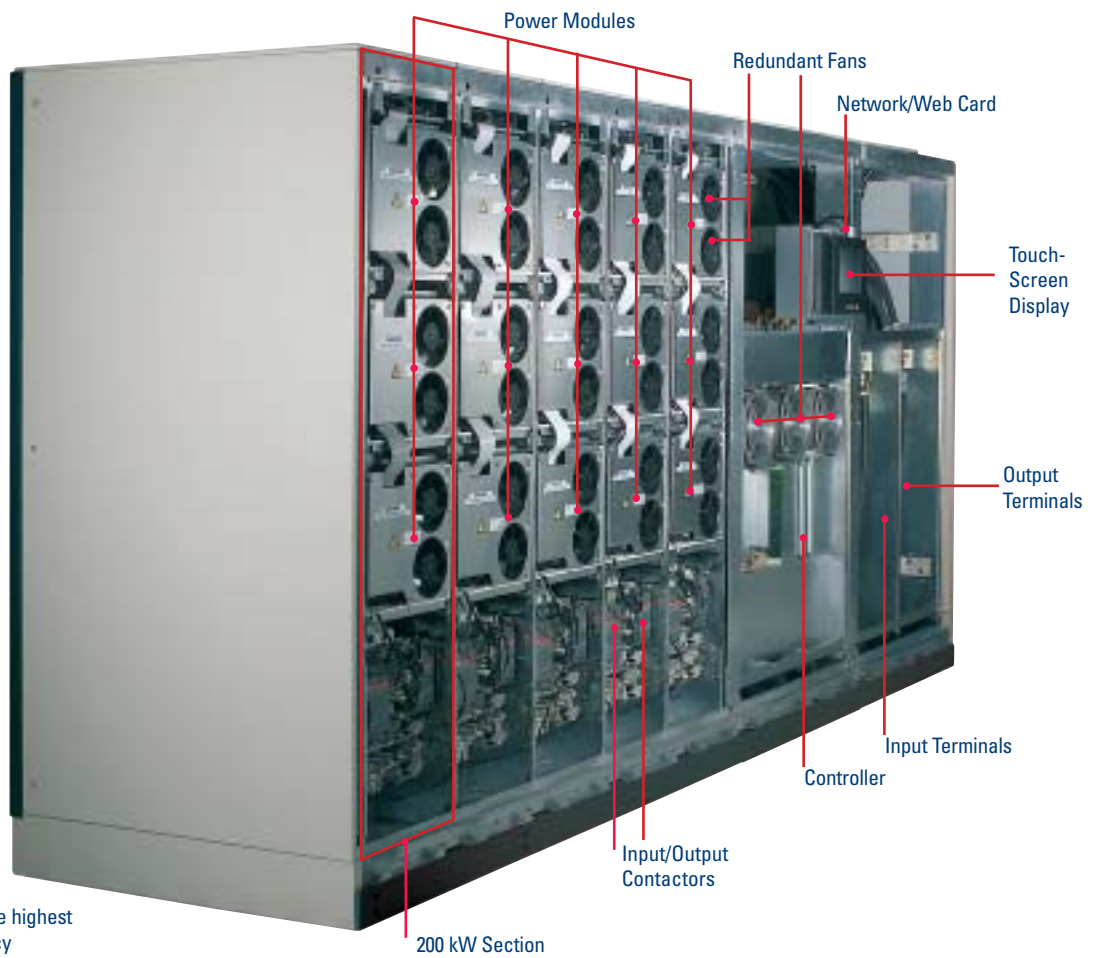
The on-line topology of the UPS combines the highest available efficiency with the lowest available operating costs.

A unique control feature ensures that the power factor is always ~1, regardless of load and utility voltage. This eliminates the need for power factor correction capacitors. The full-rated inverter is a perfect match for today's power-factor corrected computer loads, and eliminates the need for an over-sized UPS.

## Symmetra® MW for High Availability



Easy maintenance with compact slide-in Power Modules for enhanced flexibility and short Mean Time To Repair.



Symmetra® MW offers the highest available on-line efficiency

## External Bypass Static Switch

The Symmetra® MW 800/1000 kW system design includes an External Bypass Static Switch. The External Bypass Static Switch comes in a line-up-and-match Enclosure, which can be installed remotely from or next to the UPS. The External Bypass Static Switch functions as an independent, self diagnosing unit, with a controller and advanced 10" color LCD touch-screen.

**Features include:**

- Fully rated
- Line-up-and-match
- Small footprint
- Redundant fans



1 MW External Bypass Static Switch with panels



1 MW External Bypass Static Switch without panels

## Maintenance Bypass Panel (Optional)



Line-up-and-match products are available from APC Custom Engineering Group as options. The Symmetra® MW Maintenance Bypass Panel (MBP) is equipped with 100% rated circuit breakers for reliable UPS bypass operation. Main features of the MBP include:

- Input/output fuses, current transformers, busbars for connection to the UPS, and termination points for input connections.
- Input/output circuit breakers.
- Output connections to critical load and connections to load bank.
- Circuit breakers for External Bypass Static Switch and termination points for bypass input connections.
- External Bypass Static Switch with built-in controller.

The withstand current of the MBP is 100 kA. The MBP has its own input/output area, so if your installation includes an MBP, the Input/Output Section of the UPS system is not required, thus reducing footprint and cost. An External Bypass Static Switch is incorporated in the MBP. The MBP is bus-connected to the UPS.

# Symmetra® MW Battery System

The Battery System is comprised of Battery Enclosures, Battery Breaker Boxes and Side Cars (optional).

## Battery Enclosures

The modular line-up-and-match design of the Battery Enclosures ensures easy upgrade to additional runtime, and offers great flexibility to fit different space requirements and room layouts. The Battery Enclosures are designed for top or bottom cable entry.



Line-up-and-match battery solution, with a 10-minute back-up for 1 MW of power



Battery Enclosure without panels

## Battery Breaker Boxes

The Battery System requires two battery breakers to connect the battery strings to the UPS. Each battery breaker is housed in its own Enclosure. The first battery breaker provides connectivity to Battery 1 and the second battery breaker connects to Battery 2. Each battery is separately fused for increased availability, and all battery fuses and breakers are monitored. Breakers are equipped with under-voltage release to prevent incorrect operation and battery damage.



Battery Breaker Boxes with panels



Battery Breaker Boxes without panels

## Side Cars (Optional)

Side Cars provide connectivity between several Battery Enclosures and the Battery Breaker Boxes. Side Cars allow extensions to existing battery strings and separate battery strings for increased battery system availability. Side Cars are connected directly to Battery Breaker Boxes.

## Flooded Wet Cell Batteries (Optional)

Flooded Wet Cell solutions are available for individual specifications for normal and extended run-times. Flooded Wet Cells can be used in conjunction with APC's standard and earthquake-resistant battery racks.

## Customer-Engineered Designs for Special Requirements

APC's Custom Engineering Group offers special customer solutions to our customers. A customer-engineered design is typically specified by the customer to satisfy special requirements for performance, flexibility, durability, and cost.



## APC Global Services (AGS)

AGS provides customized service and support solutions to meet the specific application needs, from project concept, through design, installation, commissioning and post-sales support. AGS offers 7 x 24 x 365 on-site services, a program of preventive maintenance and remote monitoring to proactively ensure the highest availability of your system, cutting down the Mean Time To Repair (MTTR) to an absolute minimum.



## Project Definition

APC Applications Engineering designs the layout of your data center to meet initial and future power requirements with focus on maximizing space availability.

## Project Management

APC Project Management handles all aspects of project management, including co-ordination of delivery, installation, and the commissioning of the system.

## Network Integration

APC Global Services integrates APC's IT equipment and software solutions into the system and carry out customized staff training.

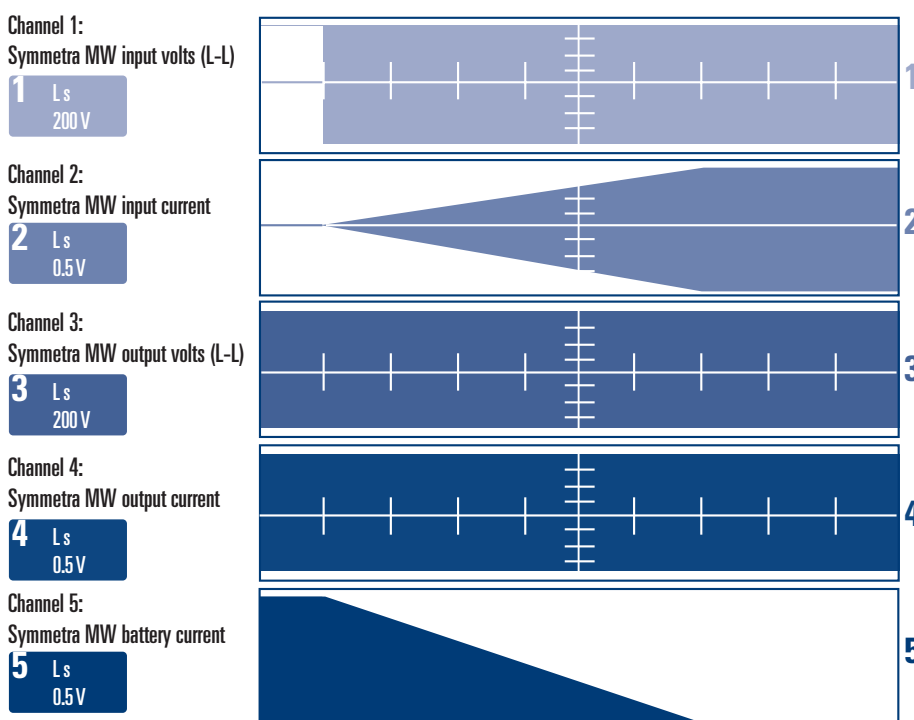
## Customer Satisfaction

Complete customer satisfaction is APC's number one priority, and our service personnel are monitored and graded on their ability to provide prompt and efficient service. All Symmetra® MW customers receive a direct support number to dedicated and specially-trained technical support representatives.

## Test Facility

In APC's test facility in Kolding, Denmark, customers can attend a series of tests, including the Factory Acceptance Test (FAT) procedure, and the generator-friendliness of the UPS system.

The illustration shows a Mains Return (soft start) test, accomplished by removing and re-applying utility input to the Symmetra® MW while supporting a 1000 kW load.



## Mean Time Between Failure and Mean Time To Repair

System reliability, or Mean Time Between Failures (MTBF) directly linked to Mean Time To Repair (MTTR), and assuming on-site availability of spare parts, the Symmetra® MW can typically be repaired within a 20-minute timeframe.



# Specifications

Symmetra® 400 kW - 1600 kW 400 V							
Part No.	SY400K400H	SY600K600H	SY800K800H	SY1000K1000H	SY1200K1200H	SY1400K1400H	SY1600K1600H
<b>Input</b>							
Nominal Input Voltage	3x400/230 V	3x400/230 V	3x400/230 V	3x400/230 V	3x400/230 V	3x400/230 V	3x400/230 V
Nominal Input Current (400V)	595 A	893 A	1191 A	1488 A	1849 A	2156 A	2464 A
<b>General Input Specifications</b>							
Input Wiring	L1, L2, L3, N, PE						
Input Frequency (programmable)	50 Hz, ±0.5-8% (display set-up)						
Input Power Factor	~1						
I THD	<5% at full load						
Max. Short-Circuit Withstand Level ( $I_{cw}$ )	200 kA						
Input Voltage Tolerance Utility Operation	±15%						
Input Voltage Tolerance Bypass	±10% standard ±4, 6, 8, 10% (programmable)						
Backfeed Protection	Built-in backfeed contactor						
<b>Output</b>							
Power Range	400 kW/kVA	600 kW/kVA	800 kW/kVA	1000 kW/kVA	1200 kW/kVA	1400 kW/kVA	1600 kW/kVA
Nominal Output Voltage	3x400/230 V	3x400/230 V	3x400/230 V	3x400/230 V	3x400/230 V	3x400/230 V	3x400/230 V
Nominal Output Current (400V)	577 A	866 A	1155 A	1443 A	1793 A	2091 A	2390 A
Output Voltage Distortion	Max 3% linear load						
Efficiency in Battery Operation	>95%						
Efficiency at Full Load (AC-AC)	97%						
Output Wiring	L1, L2, L3, N, PE						
Load Power Factor	0.9 leading to 0.8 lagging without derating						
Output Frequency	Mains synchronized in normal operation, ± 0.1% Hz free-running						
Overload Capacity Utility Operation	200% for 60 seconds, 125% for 10 minutes						
Overload Capacity Battery Operation	150% for 30 seconds						
V THD	Max 3% linear load, max 5% non-linear load						
Output Voltage Tolerance	Sym. load (0-100%): ±1% static, ±5% after 2 ms and ±1% after 50 ms						
Nominal battery voltage	2*384 V						
End of discharge battery voltage	2*326 V						
Max. battery current at end of discharge	638 A	957 A	1277 A	1596 A	1917 A	2337 A	2556 A
Communication Interface	Web / Network Interface						
Control Panel	Advanced 10" Color LCD Touch-Screen User Interface						
Audible Alarm	Audible and visible alarms prioritized by severity						
Emergency Power Off (EPO)	Yes						
Emergency Module Off (EMO)	Yes						
Indicators and controls	Self diagnosing with surveillance of fuses, fans, batteries, temperatures etc.						
Dimensions (HxWxD) mm	2032x2114x1067	2032x2536x1067	2032x3716x1067	2032x4138x1067	2032x4646x1067	2032x5068x1067	2032x5490x1067
Weights (kg)	2500	3200	4270	5090	6310	7016	7722
Minimum clearance around UPS	Top clearance 500 mm (200 mm in installations with IP21 Drip Cover). Front clearance 1000 mm.						
Color	Grey (NCS 2703-G85Y), Black (NCS S 9000-N)						
Seismic anchoring	Yes						
Seismic zone	No						
Surge	IEC-100-4-5, EN50091-2						
Thermal	Yes						
Short Circuit	Yes						
Safety	IEC60950 3rd edition, EN50091-1-1						
EMC/EMI/RFI	EN50091-2, IEC 62040-3						
Approvals	CE, ISO 9001, ISO 14001						
Altitude (operating)	1000 m = 100% load; 1500 m = 95% load; 2000 m = 91% load; 2500 m = 86% load; 3000 m = 82% load						
Operating Temperature	0-40° C						
Storage Temperature	-15-40° C						
Operating Relative Humidity	0-95% non-condensing						
Storage Relative Humidity	0-95% non-condensing						
Operating Elevation (m)	0-1000 m						
Storage Elevation (m)	0-15,000 m						
Audible noise, nom max. at 1 m from unit (dB(A))	74	74	74	75	75	75	75
Protection Class	IP20 standard, IP21 optional						

Symmetra® MW External Bypass Static Switch				
Part No. (Cable Entry, top/bottom)	SYSWT1000KH (top)/ SYSWB1000KH(bottom)	SYSWT2000KH (top)/ SYSWB2000KH (bottom)	SYSWT3000KH (top)/ SYSWB3000KH (bottom)	SYSWT4000KH (top)/ SYSWB3000KH (bottom)
Power Range (MW/MVA)	1	2	3	4
General Specifications				
Nominal Voltage	3x400/230 V (L1,L2,L3,N,PE)			
Nominal Current (400 V)	1443 A	2887 A	4330 A	5773 A
Tolerance (programmable)	±4%, ±6%, +/-8%, ±10%, standard ±10%			
Frequency (programmable)	50 Hz ±0.5-8% (display setup)			
Max short-circuit withstand level (I <sub>cw</sub> )	200 kA	200 kA	100 kA	100 kA
Overload capacity	125% continuous			
Communication and Management				
Control Panel	Advanced 10" Colour LCD Touch-Screen User Interface			
Audible Alarm	Audible and visible alarms prioritized by severity			
Emergency Power Off (EPO)	Yes			
Emergency Module Off (EMO)	Yes			
Indicators and Controls	Self diagnosing with surveillance of fuses, fans, batteries, temperatures etc.			
Physical				
Dimensions (HxWxD) mm	2032x1016x1067	2032x1016x1067	2032x2114x1067	2032x2114x1067
Minimum clearance around External Bypass Static Switch	Top clearance 500 mm (200 mm in installations with IP21 Drip Cover). Front clearance 1000 mm.			
Color	Grey (NCS 2703-G85Y), Black (NCS S 9000-N)			
Seismic Anchoring	Yes			
Seismic Zone	No			
Weights (kg)	470	620	1240	1240
Surge	IEC-1000-4-5, EN50091-2			
Thermal	Yes			
Short circuit	Yes			
Safety	IEC60950 3rd Edition, EN50091-1-1			
EMC/EMI/RFI	EN50091-2			
Approvals	CE, ISO 9001, ISO 14001			
Audible noise, nom max. at 1 m from unit (dB(A))	71	74	77	77

Part No.	SYMW400KHBB630A**	SYMW600KHBB1000A**
Nominal Current (400 V)	520 A	781 A
Maximum Current (400 V)	613 A	920 A
Nominal Voltage	2* 384 V	2* 384 V
Dimensions (HxWxD) mm	2016x768x628	2016x1160x628
Weights (kg)	143	200
Minimum clearance around Battery Breaker Box	Top clearance 500 mm (200 mm in installations with IP21 Drip Cover). Front clearance 1000 mm.	
Color	Grey (NCS 2703-G85Y), Black (NCS S 9000-N)	
Seismic anchoring	Yes	
Seismic zone	No	
Surge	IEC-1000-4-5, EN50091-2	
Thermal	Yes	
Short circuit	Yes	
Safety	IEC60950 3rd edition, EN50091-1-1-1	
EMC/EMI/RFI	EN50091-2	
Approvals	CE, ISO 9001, ISO 14001	

\* Includes External Bypass Static Switch

\*\* Not standard SKU, should be ordered through Customer Engineering Group

<b>Symmetra® MW Maintenance Bypass Panel (Single)</b>			
Part No.	SYMSBP600KHC1M1/	SYMSBP800KHC1M1/	SYMSBP1000KHC1M1/
Single Module/Dual Module	SYMSBP600KHC2M1	SYMSBP800KHC2M1	SYMSBP1000KHC2M1
Power Range	600 kW	800 kW	1000 kW
Nominal current 400 V	866 A	1152 A	1443 A
<b>General Specifications</b>			
Supply voltage	3x400/230 V		
Input/output wiring	L1, L2, L3, N, PE		
Max. Short-Circuit Withstand Level (I <sub>cw</sub> )	100 kA		
Shunt Trip	24 VDC		
Protection Class	IP20, IP21 optional / IEC60439-1, CE		
<b>Regulatory</b>			
Safety	IEC60439-1, CE		
Approvals	CE, ISO 9001, ISO 14001		

<b>Warranty and Additional Services</b>	
Warranty	Standard one-year parts warranty
Additional Services	Optional Start-up, Preventive Maintenance and Remote Monitoring Service. On-site service with these response times: Best endeavour, Next Business Day, Next Day, or 4-hour

# American Power Conversion – Company Profile

For over 20 years APC has advanced new availability technologies through forward-reaching research and development.

Propelled by real-world experience and a drive towards technological innovation, APC has the experience, scale, global presence, and stability required to respond to emerging IT availability trends.

Our vision is dedicated to products ensuring availability wherever data is created, transmitted or stored.

Our products range from surge suppressors, uninterruptible power supplies (UPS), cabling, connectivity products, precision cooling solutions, DC power systems, and management software to consulting and professional services.

With no long-term debt and a strong financial position, APC supports an active and on-going research and development program.

Over 15 million valued customers worldwide and hundreds of industry-related awards are the result of our ability to solve real-world availability problems.

## APC Availability Science Center

APC Availability Science Center is a research science group dedicated to understanding the theoretical basis of availability science, as it applies to the design and implementation of high availability data centers.



## Symmetra MW – InfraStruXure™ Type C

Open, adaptable and integrated architecture for on-demand network-critical physical infrastructure. InfraStruXure™ closes the gap between advancements in IT technology and its supporting power and cooling requirements. Paralleling the streamlining of IT systems, InfraStruXure™ is power and cooling architecture made up of modular, highly manageable, pre-engineered components, providing a seamless and secure foundation upon which to build your entire IT environment.

InfraStruXure™ fully integrates power, cooling, management and services within a rack-optimized design. With InfraStruXure™ you obtain a reliable and flexible network, extend your investment as you grow, and, reduce both operating costs and the total cost of investment.

Symmetra® MW is certified by ISO9001 (Quality standards), and by ISO14001 (Environmental)



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