

Symmetra MW Product Introduction



Concept, Design & Philosophy



Symmetra MW[®]

Modular, fault-tolerant power protection for large facilities, data centers and mission-critical applications



Think big, think scalable – introducing the world's first modular Megawatt UPS

Symmetra MW

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APC
Legendary Reliability™

Symmetra MW Unique Features

- **Modular Design**
- **Scalability**
- **N+1 Redundancy**
- **Fault Tolerant Inverter Coordination**
- **Servicability**

All of these features combine to produce higher levels of reliability and availability.

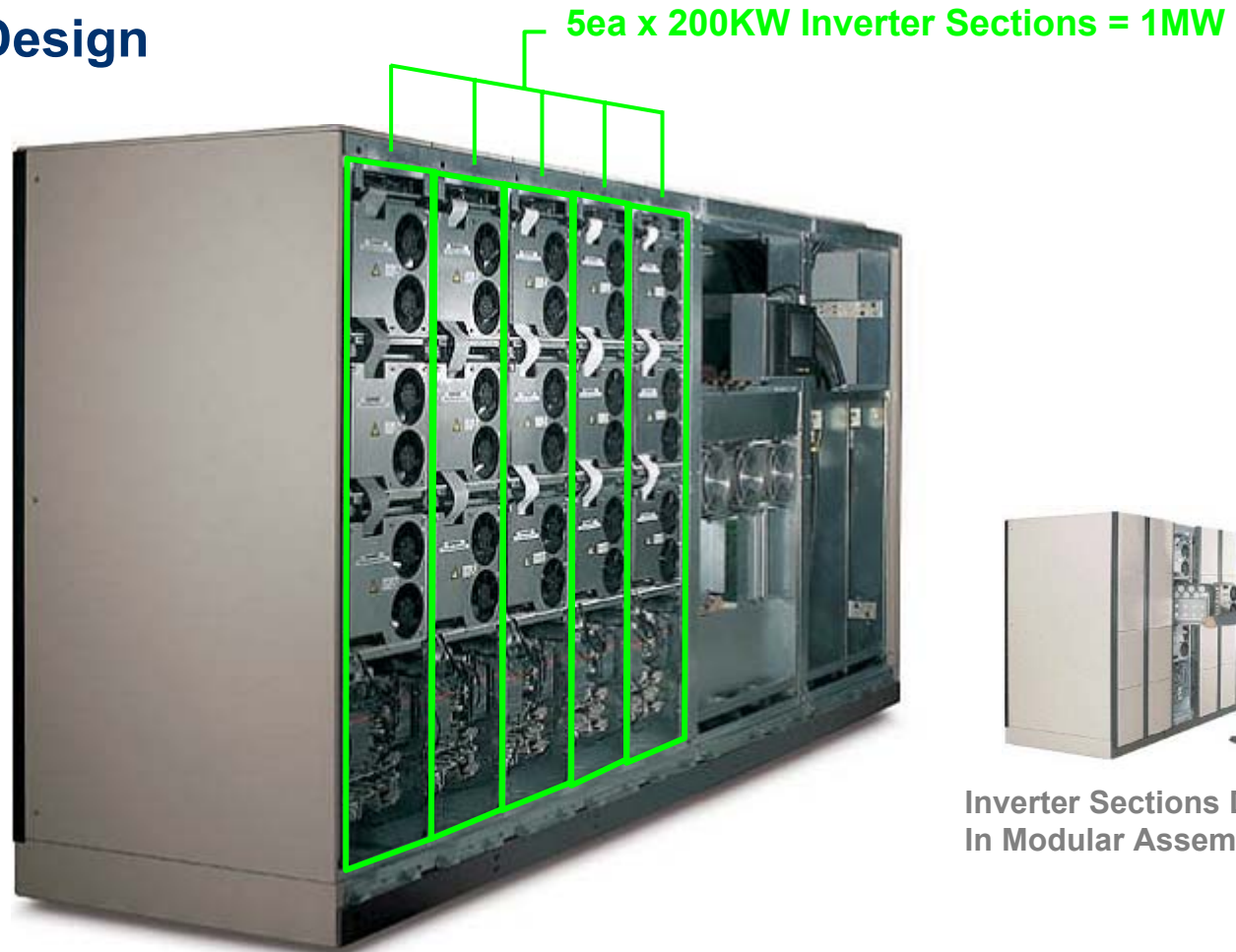
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- **Modular Design**



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Symmetra MW Unique Features

- **Scalability**

1ea x 200KW Inverter Sections = 200KW



Symmetra MW Unique Features

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Symmetra MW Unique Features

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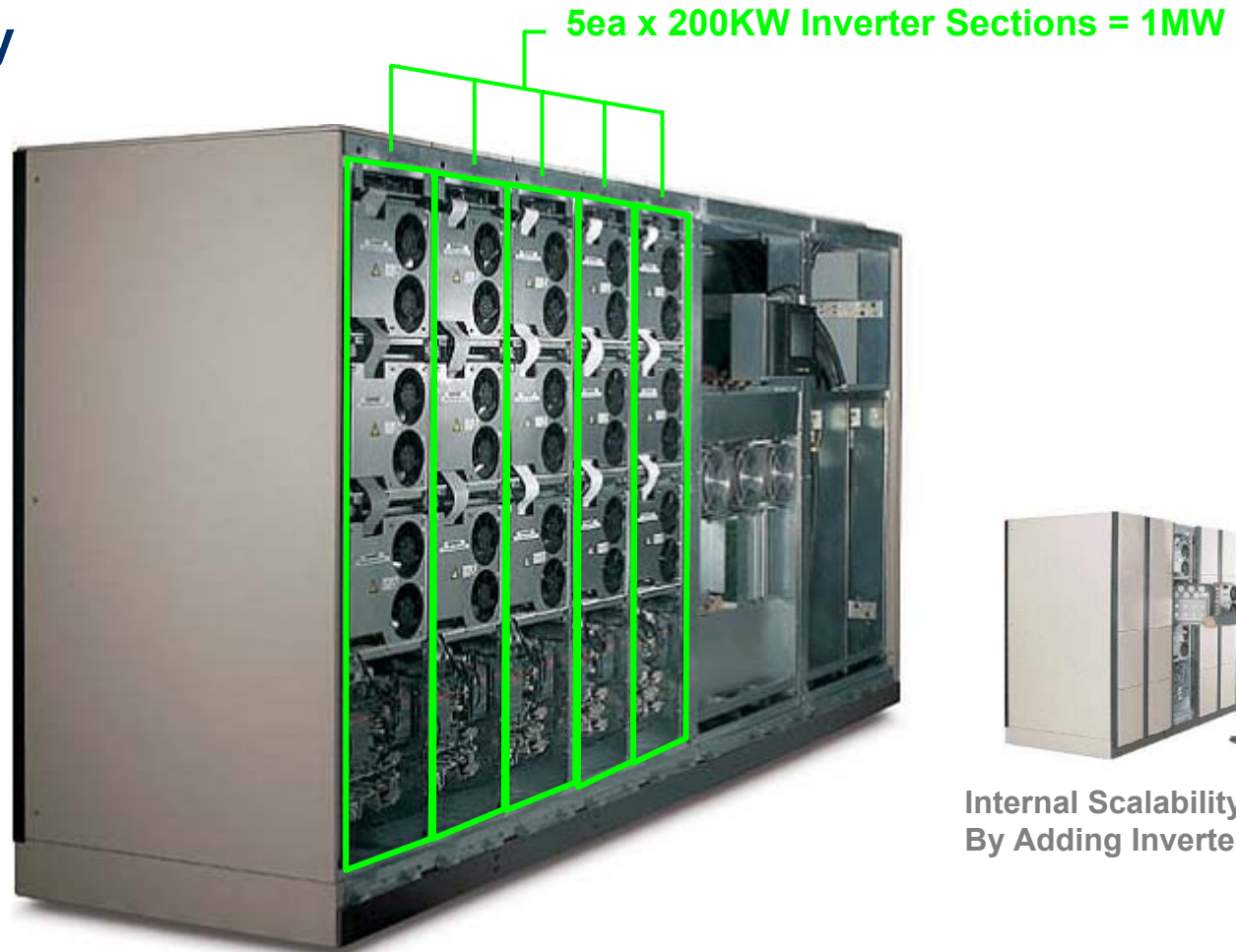
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Symmetra MW Unique Features

- **N+1 Redundancy**

1ea x 200KW Inverter Sections = 200KW **N+0**



Symmetra MW Unique Features

- **N+1 Redundancy**

2ea x 200KW Inverter Sections = 200KW N+1



Symmetra MW Unique Features

- **N+1 Redundancy**

3ea x 200KW Inverter Sections = 400KW N+1



Symmetra MW Unique Features

- **N+1 Redundancy**

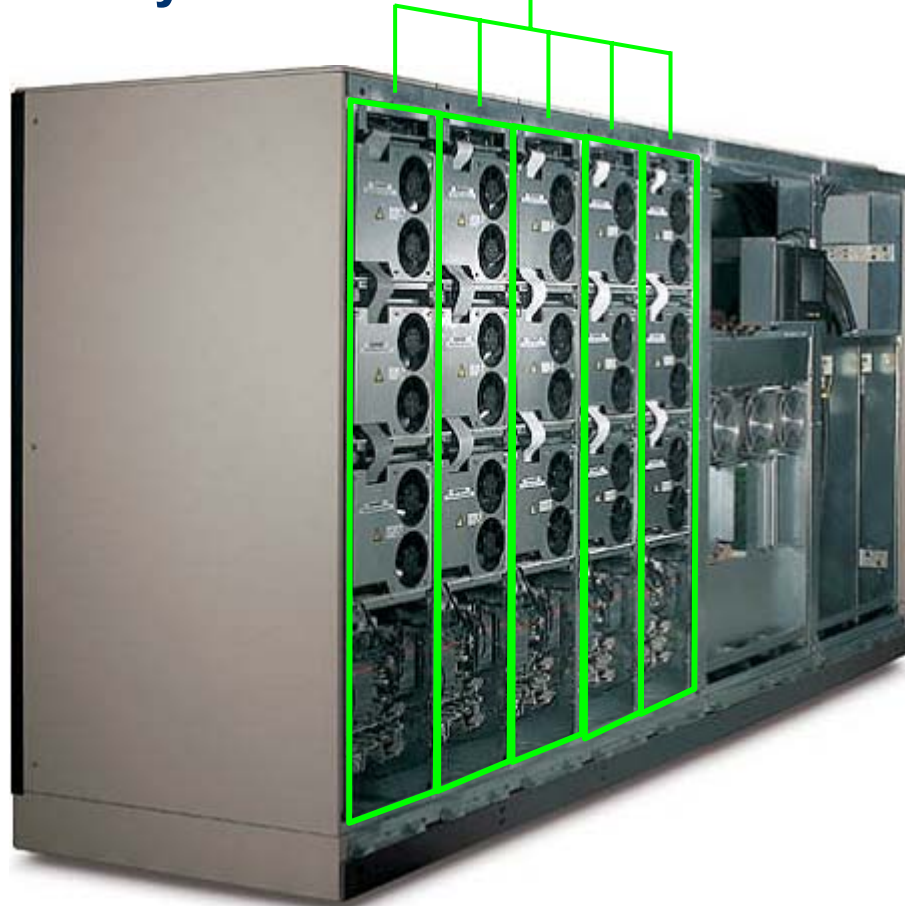
4ea x 200KW Inverter Sections = 600KW N+1



Symmetra MW Unique Features

- **N+1 Redundancy**

5ea x 200KW Inverter Sections = 800KW N+1



Symmetra MW Unique Features

- N+1 Redundancy



**Symmetra MW Can Also Be Paralleled With Unlike Unit Sizes.
This Is Naturally Inherent To The Design.**

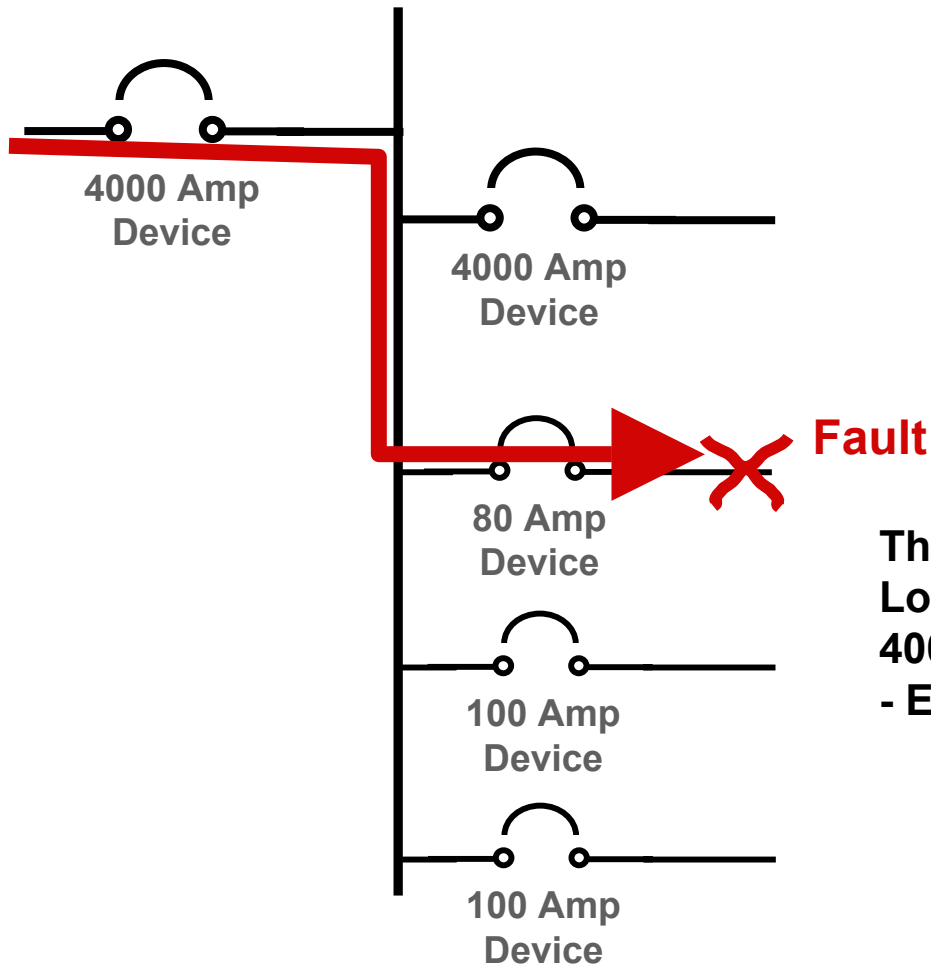
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Symmetra MW Unique Features

Basic Circuit Breaker/Fuse Coordination Issue:

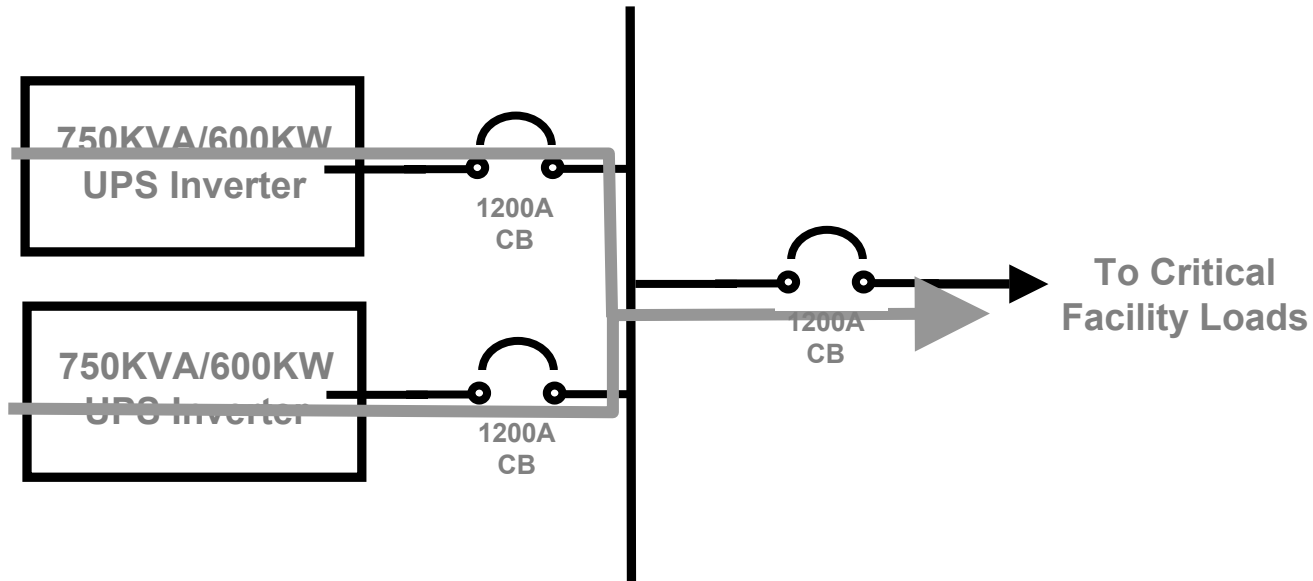


**The 80 Amp Device Will Clear
Long Before The Upstream
4000 Amp Device Does.
- Easy, Reliable Coordination -**

Symmetra MW Unique Features

Similar Issues Apply To Selective Tripping of Equivalent Size
Parallel Redundant Inverters:

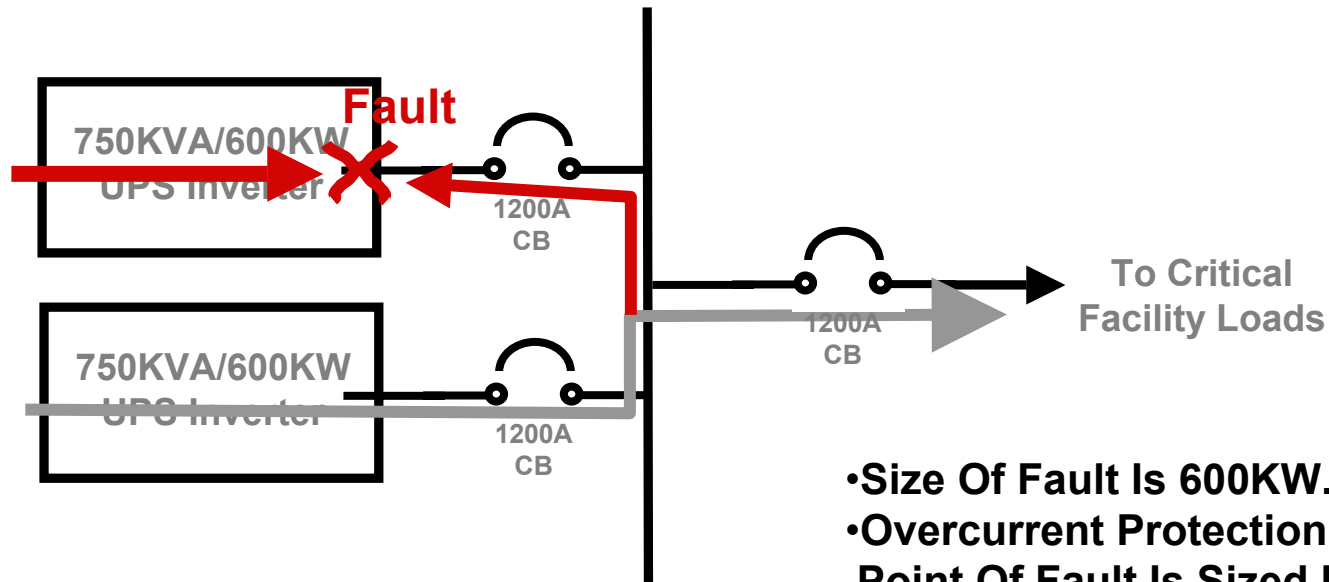
600KW
Redundant
System



Symmetra MW Unique Features

Similar Issues Apply To Selective Tripping of Equivalent Size Parallel Redundant Inverters:

600KW
Redundant
System



- Size Of Fault Is 600KW.
- Overcurrent Protection At Point Of Fault Is Sized For A 600KW Block.
- Size Of Surviving Inverter Capacity Is Also Only 600KW.
- A 1:1 Ratio.

Symmetra MW Unique Features

- Fault Tolerant Inverter Coordination

3ea x 1-Phase 66.7KW
Power Modules =
200KW



Symmetra MW Unique Features

- Fault Tolerant Inverter Coordination

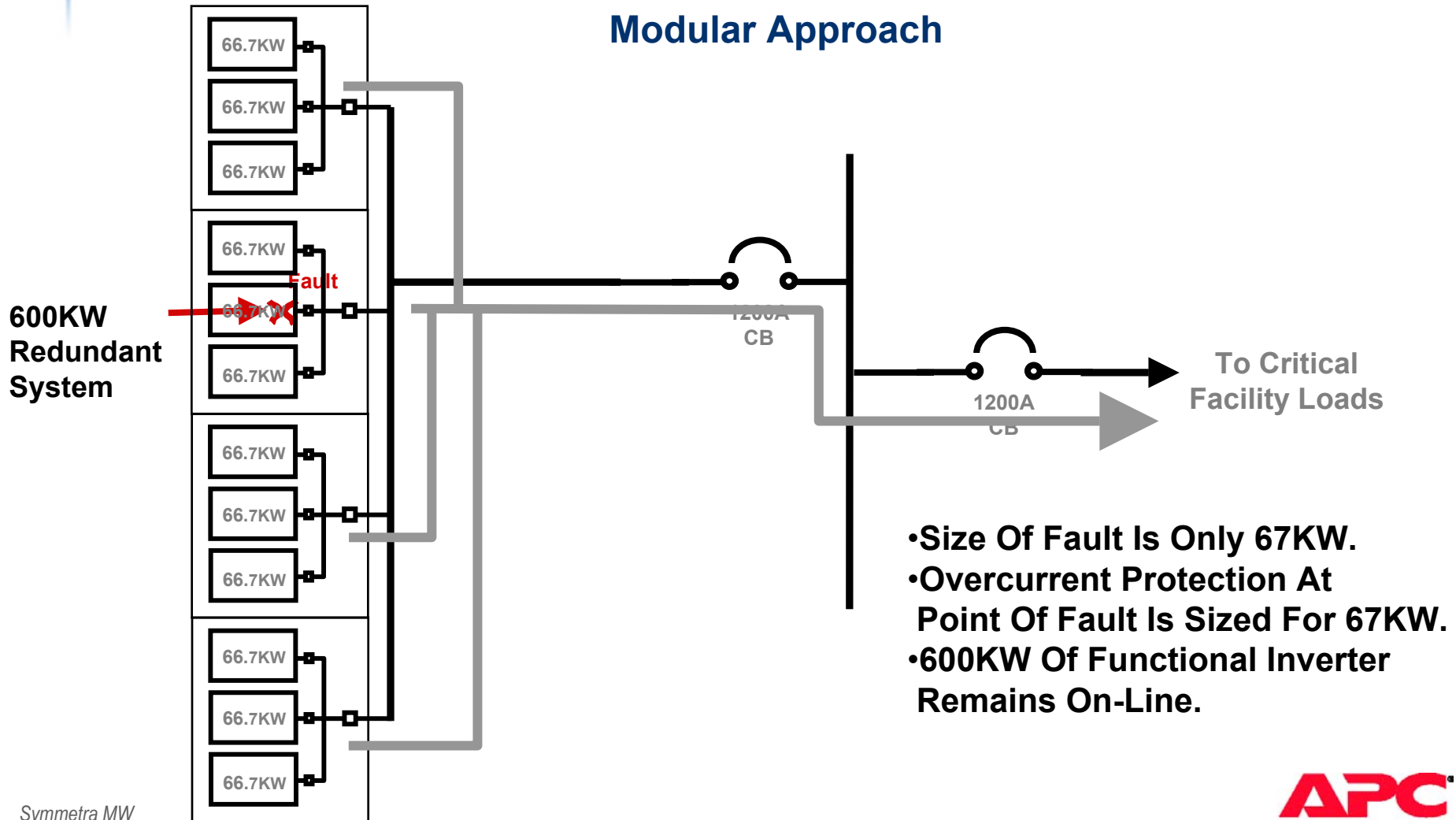
3ea x 1-Phase 66.7KW
Power Modules =
200KW



Each Power Module
Is Both Physically
And Electrically Isolated
By Design.

Symmetra MW Unique Features

This Issue Is Greatly Simplified With The Symmetra MW's Modular Approach



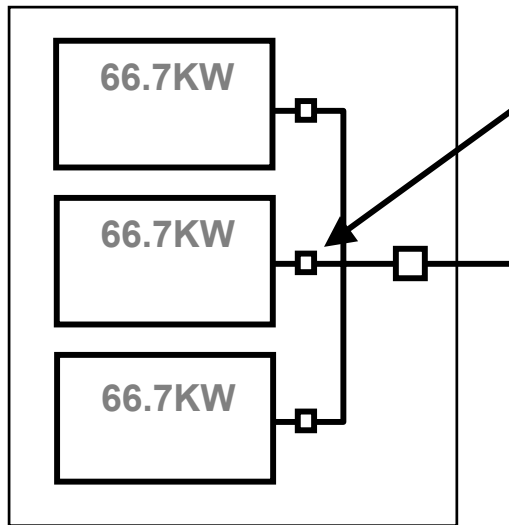
600KW
Redundant
System

- Size Of Fault Is Only 67KW.
- Overcurrent Protection At Point Of Fault Is Sized For 67KW.
- 600KW Of Functional Inverter Remains On-Line.

Symmetra MW Unique Features

This Issue Is Greatly Simplified With The Symmetra MW's
Modular Approach

200KW Inverter Section



More Importantly, The Individual 67KW
Power Modules Are Each Selectively Fused.
The Coordination Between This Fuse And The
200KW Inverter Section Fuse Is Straightforward
And Is 100% Predictable.

The Smaller Fuse Will Always Clear First.

Symmetra MW Inverter Section

200kW power sections

Consists of 3 1-phase power modules, a common 3-phase delta transformer and a common 3-phase power module controller (PMC)

Slide in/out power modules

For ease of service. A unique crane that allows the module to be changed by a single person ships with the UPS

Separate input/output fusing and Contactors

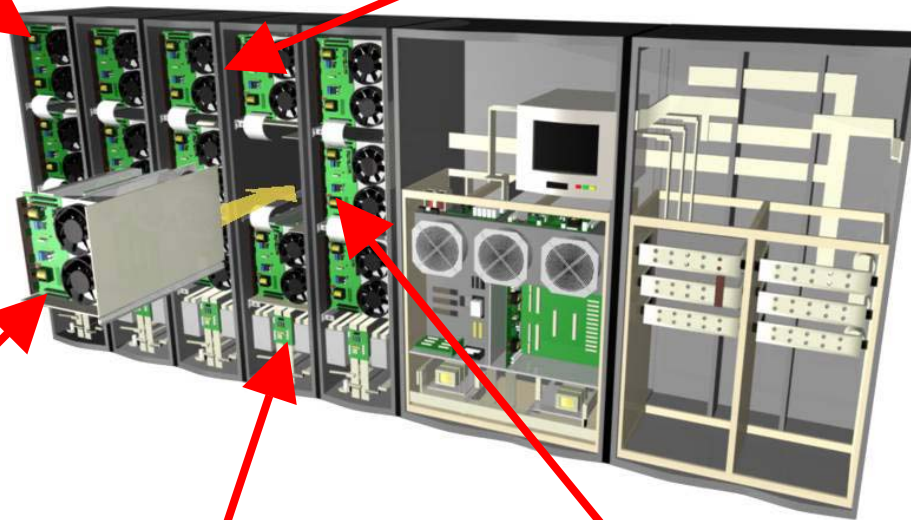
To ensure that a faulty section can be isolated

Fault containment

The inverter sections are separated by steel plates

Redundant power supplies

For increased availability of the inverter section



Symmetra MW Unique Features

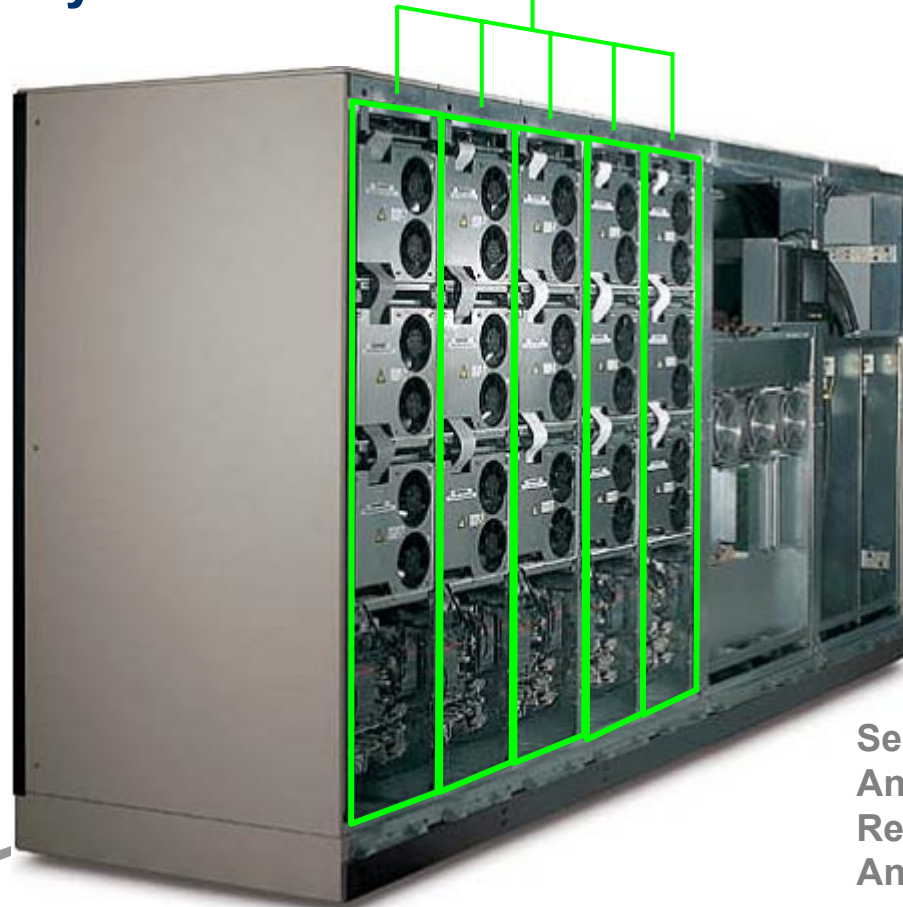
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Symmetra MW Unique Features

- **Serviceability**

5ea x 200KW Inverter Sections = 1MW



Self Diagnostic Functions
And Module Level Repair
Result in A Lower MTTR
And Higher System Availability.

Symmetra MW Product Design Benefits



High Efficiency

Up to 97% efficiency at full load provides reduced heat dissipation and energy costs

Inverter Section

Load-sharing 200 kW power modules provide the flexibility to scale power capacity and adds N+1 capability

Front Access Maintenance

All parts are accessible from the front for ease of maintenance

Input/Output Section

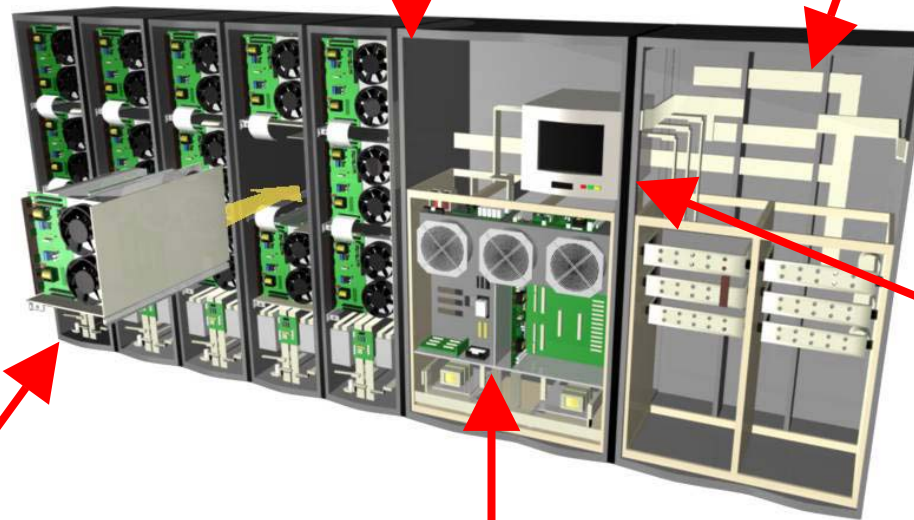
Spacious cable section for ease of installation. Top or bottom, left or right side cable entry.

Control Section: LCD Touch-screen

Configurable touch-screen with network interface offers easy access to all critical UPS and ancillary equipment data.

Control Section: Static Bypass Switch

The built-in static bypass switch (400 and 600kW models) provides for safe transfer to an alternate source without interrupting the supply to the load



Symmetra MW Input/Output Section

Cable first in rough environments

The modular concept allows for the Input/Output section to be installed first, in order to avoid dust, humidity etc that could affect critical electronic components.



Top or bottom cable entry

Both options are available for ease of installation and shorter cable lengths

Cable Entry Section

For easy fitting of cables, the Input/Output Section has been made spacious

Right or left positioning

For increased adaptability the Input/Output Section can be positioned either to the left or the right of the Inverter Section, whichever fits the application best

Symmetra MW Unique Features

Summary:

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Symmetra MW Unique Features

For The Next Presentation When We Have More Than 8 Minutes:

- **Highly Efficient Design - 97%**
- **Output Capacity Rating Is 1.0 - KW = KVA**
- **Power Factor Corrected Input - ~ 1.0**
- **Distributed, Fault Tolerant Controls**
- **Advanced Diagnostics and Control Interface**

All of these features combine to produce higher levels of reliability and availability.

Symmetra MW



- Questions ?



