

# WaveStar® TFA Static Transfer Switch

High-Availability Seamless Power Transfers  
in a True Front Access Enclosure



## WaveStar® TFA Static Transfer Switch

The WaveStar® TFA Static Transfer Switch maximizes the availability and reliability of power for mission critical loads through the automatic seamless transfer from two independent power inputs in an innovative True Front Access Enclosure.

### Key Features:

- 250A – 1000A Digital Static Transfer Switch
- Industry Leading Patented Transfer Algorithms
- 100% Rated Fuseless Design
- Compartmentalized True Front Access Enclosure
- Triple Internal Redundancy
- Dual Redundant Operator Interfaces
- Real Time Waveform Capture
- Hot Swap Control Logic Replacement
- Line-and-Match with PDI Power Distribution Units
- Communications and Intelligent Power Monitoring for Downstream BCMS
- Adaptable Service Entrances



## 250A – 1000A Digital Static Transfer Switch

The WaveStar<sup>®</sup> TFA Static Transfer Switch is available in:

Amperage	Voltage	22 kAIC	65 kAIC	100 kAIC
<b>250A</b> <b>400A</b> <b>600A</b> <b>800A</b> <b>1000A</b>	208V	Standard	Optional	Optional
	380V	Standard	Optional	Optional
	400V	Standard	Optional	Optional
	415V	Standard	Optional	Optional
	450V	Standard	Optional	Optional
	480V	Standard	Optional	Optional
	575V	Standard	Optional	Not Available
	600V	Standard	Optional	Not Available

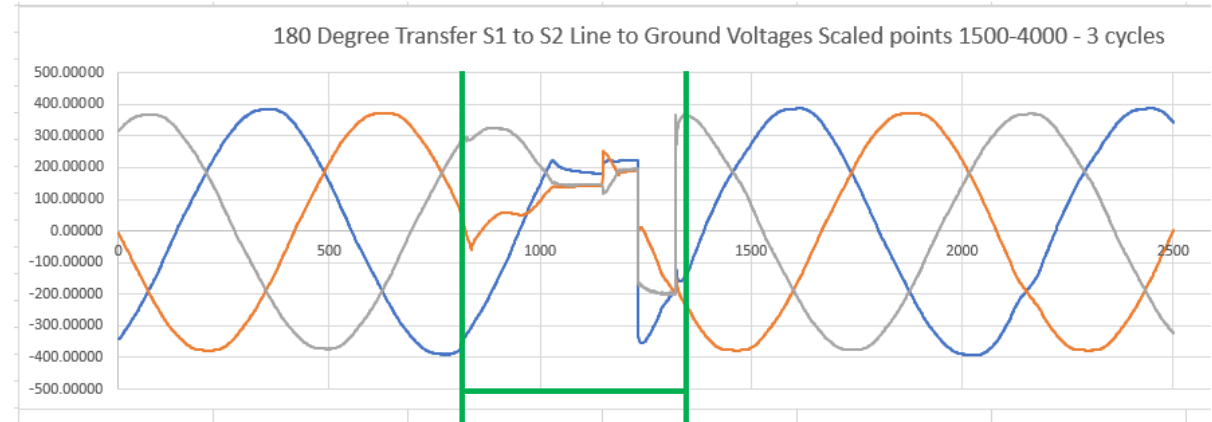


# Industry Leading Patented Transfer Algorithms

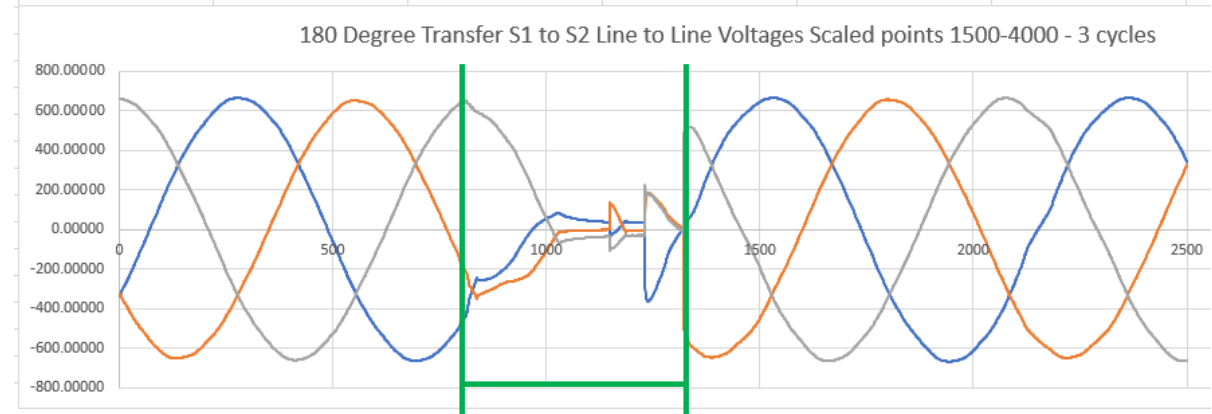
The patented VSS (Volt Second Synchronization) switching algorithm achieves automatic switching times as fast as  $\leq 1/2$  cycle to  $\leq 3/4$  (including sense time) with in-rush current typically  $\leq 1X$  unit rating.

Minimizing in-rush is a key hallmark of the VSS transfer algorithm as in-rush currents can degrade power quality, overload upstream UPSs and potentially trip upstream circuit breakers. These in-rush currents can also damage transformers as they can hit the short circuit rating value with such force degrading performance and lifespan of the magnetics.

PDI's in-house magnetics engineering and manufacturing enable us to tune and harden our transformer designs for longevity and performance which ultimately equates to overall system performance.



**10.3ms total transfer time**



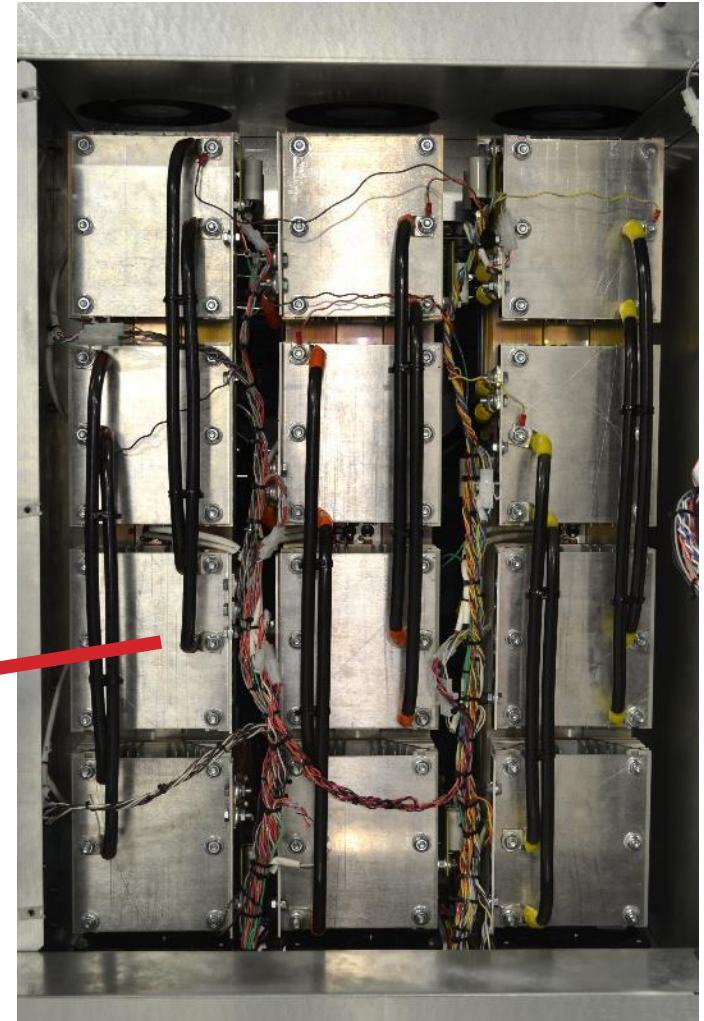
**9.84ms total transfer time**

## 100% Rated Fuseless Design

Fuses aren't needed because of the high short circuit current rating of the Hockey Puck Style SCRs (thyristors).

These robust SCRs on all sizes of the WaveStar<sup>®</sup> TFA Static Transfer Switch simplify coordination of protection devices and increases reliability.

Hockey Puck SCRs with  
Front Access Heat Sinks



# Compartmentalized True Front Access Enclosure

## Compartments:

- Power Semiconductors (SCRs)
- Molded Case Switches
- Power Connections
- Controls
- Fans (Upper and Lower)
- Operator Interfaces
- Communications Connections

The True Front Access Enclosure allows installation, maintenance, service and IR scanning to be completed from the front of the enclosure, minimizing square footage requirements, decreasing contractor installation time and increasing worker safety during maintenance.



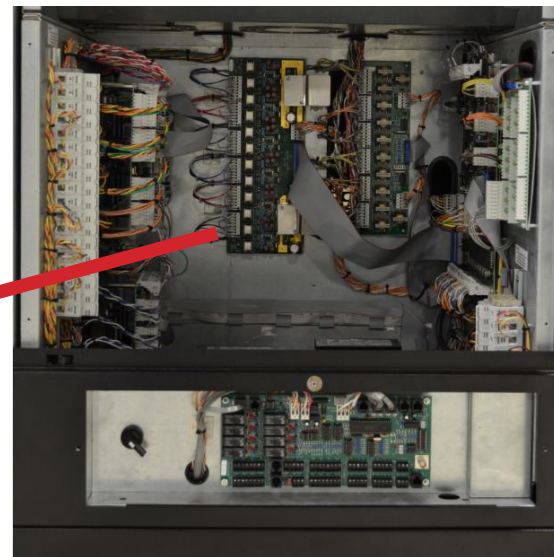
# Triple Internal Redundancy

True triple internal redundancy provides the ultimate in power system reliability.

This is achieved by:

- Fail-safe Dual Redundant Operator Interface
- Triple Redundant Logic
- Triple Redundant Power Supplies
- Dual Redundant Gate Drivers for SCRs
- Two Gate Drivers for each SCR

Triple Redundant Controls



Redundant Operator Interface



## Dual Redundant Operator Interfaces

The primary interface of the WaveStar® TFA STS is the 10.4" Touchscreen display. The interface is separated into distinct areas including a dynamic one-line mimic, control, alarm notification, operator login, status and settings. This simplified approach minimizes operator error, reduces training time and increases operational effectiveness.

In the event of a touchscreen display failure the WaveStar® STS can be operated via the Redundant Operator Interface (ROI). The class leading functionality of the ROI enables the operator to select Mode of Operation and Source (1 or 2) enabling continuous operation, maximize uptime and when combined with triple redundancy, provides an industry leading calculated 2 million hour Mean Time Between Failure (MTBF).





## Real Time Waveform Capture

Waveforms can be captured and displayed in real-time on the 10.4" touchscreen display and exported for analysis.

In the event of a power loss the WaveStar® TFA Static Transfer Switch will continue to monitor the source for up to 10 seconds and capture alarms, power data and waveforms. A total of 25 waveforms can be stored with a first-in first out storage protocol.

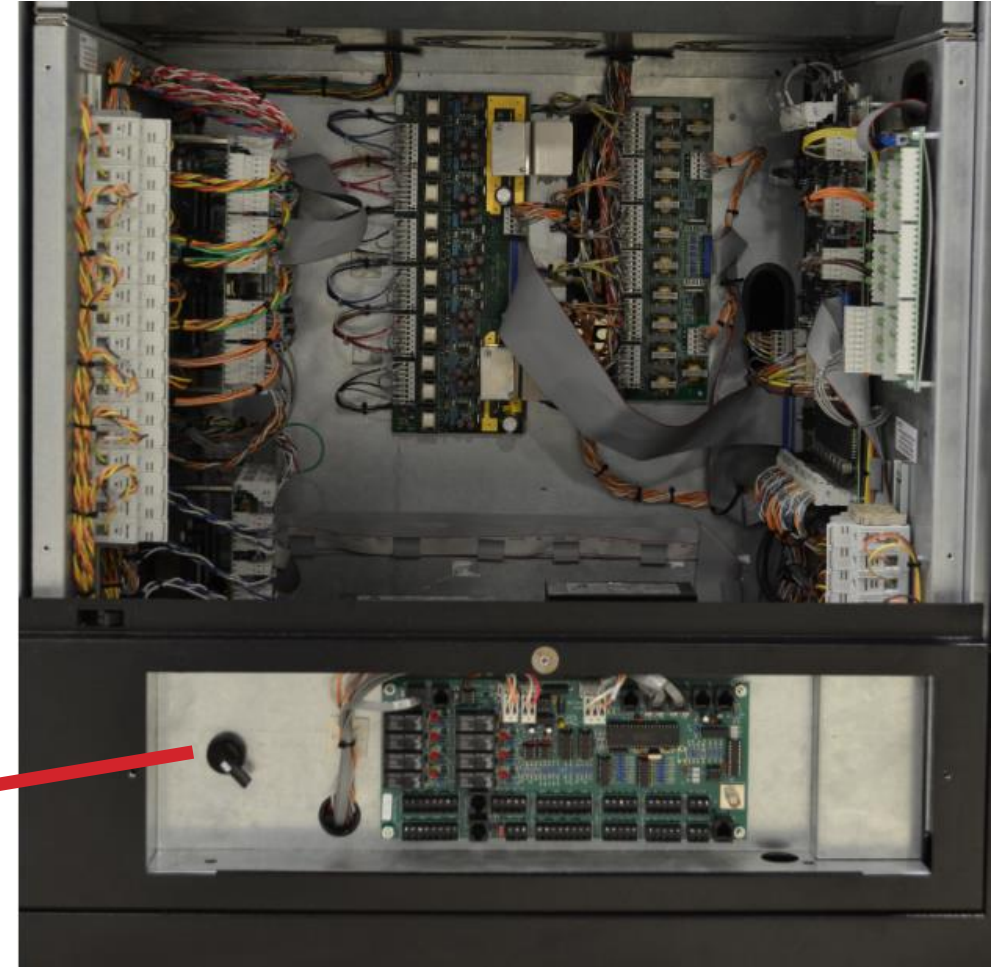


## Hot Swap Control Logic Replacement

Printed circuit boards and other controls logic components can be replaced while maintaining the critical load.

This hot swap capability extends to the 10.4" display by engaging the Redundant Operator Interface (ROI) without losing the ability to control the STS while under maintenance.

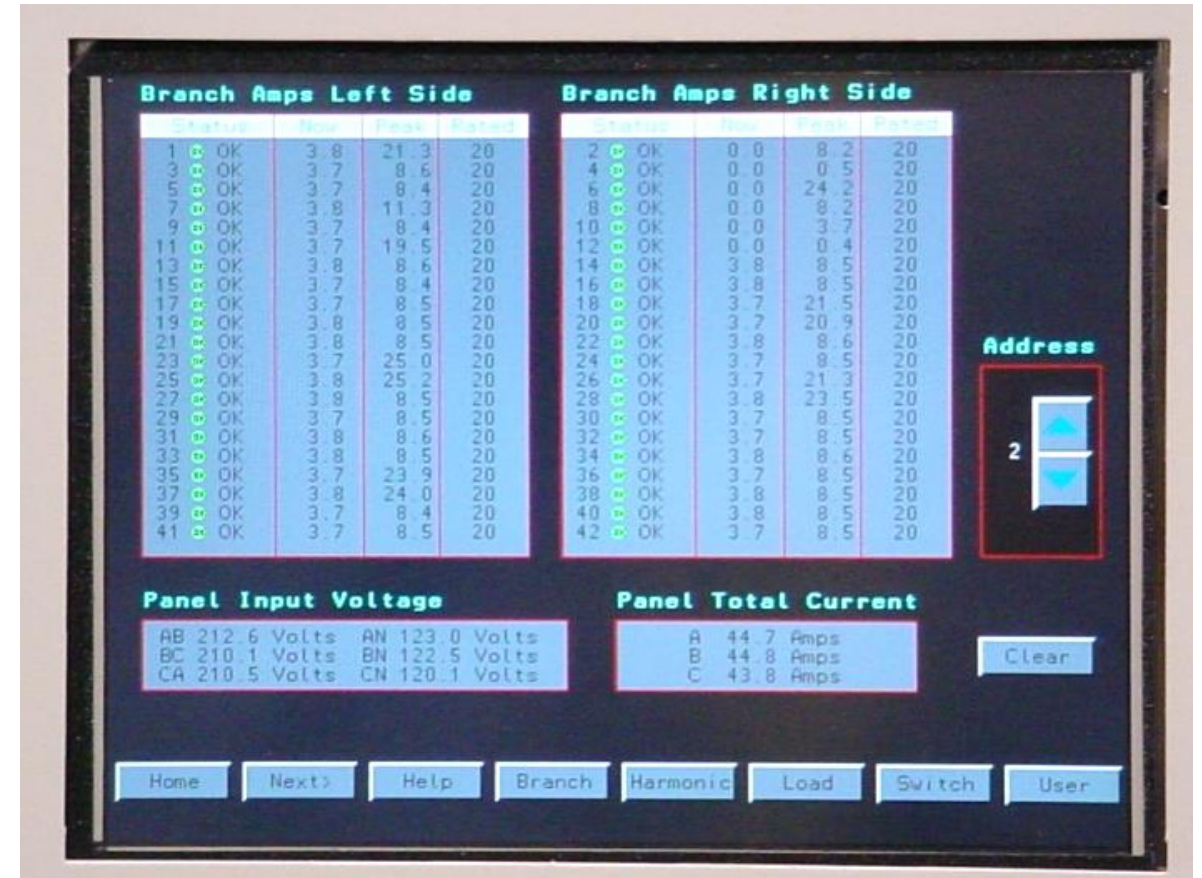
Maintenance Bypass Switch



## Communications and Intelligent Power Monitoring for Downstream BCMS

Status, alarm and power data can be communicated via Modbus<sup>®</sup> TCP/IP, Modbus<sup>®</sup> RTU and SNMP protocols.

Primary or Secondary Systems PDU downstream branch circuit power data can also be integrated through the WaveStar<sup>®</sup> TFA STS. This integrated approach simplifies system architecture and minimizes the number of communications connections to your critical power architecture.

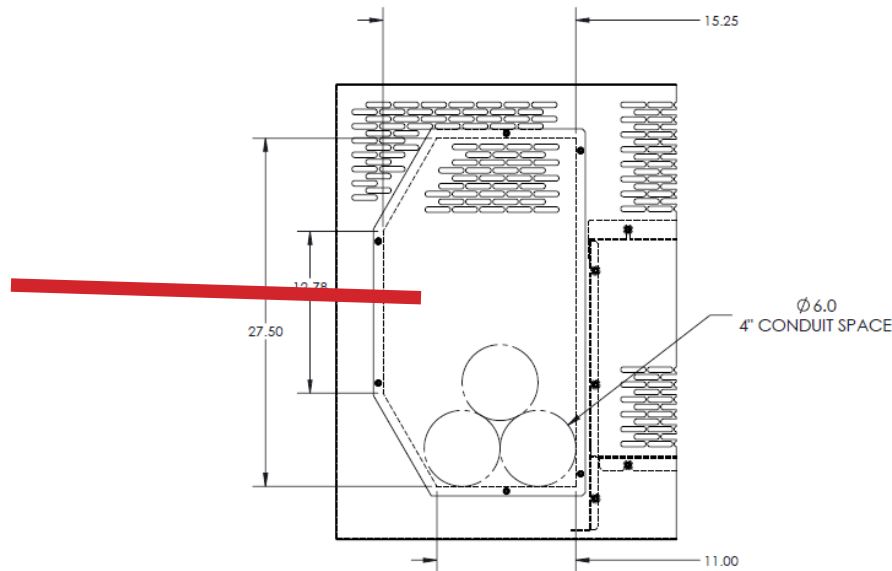


## Adaptable Service Entrances

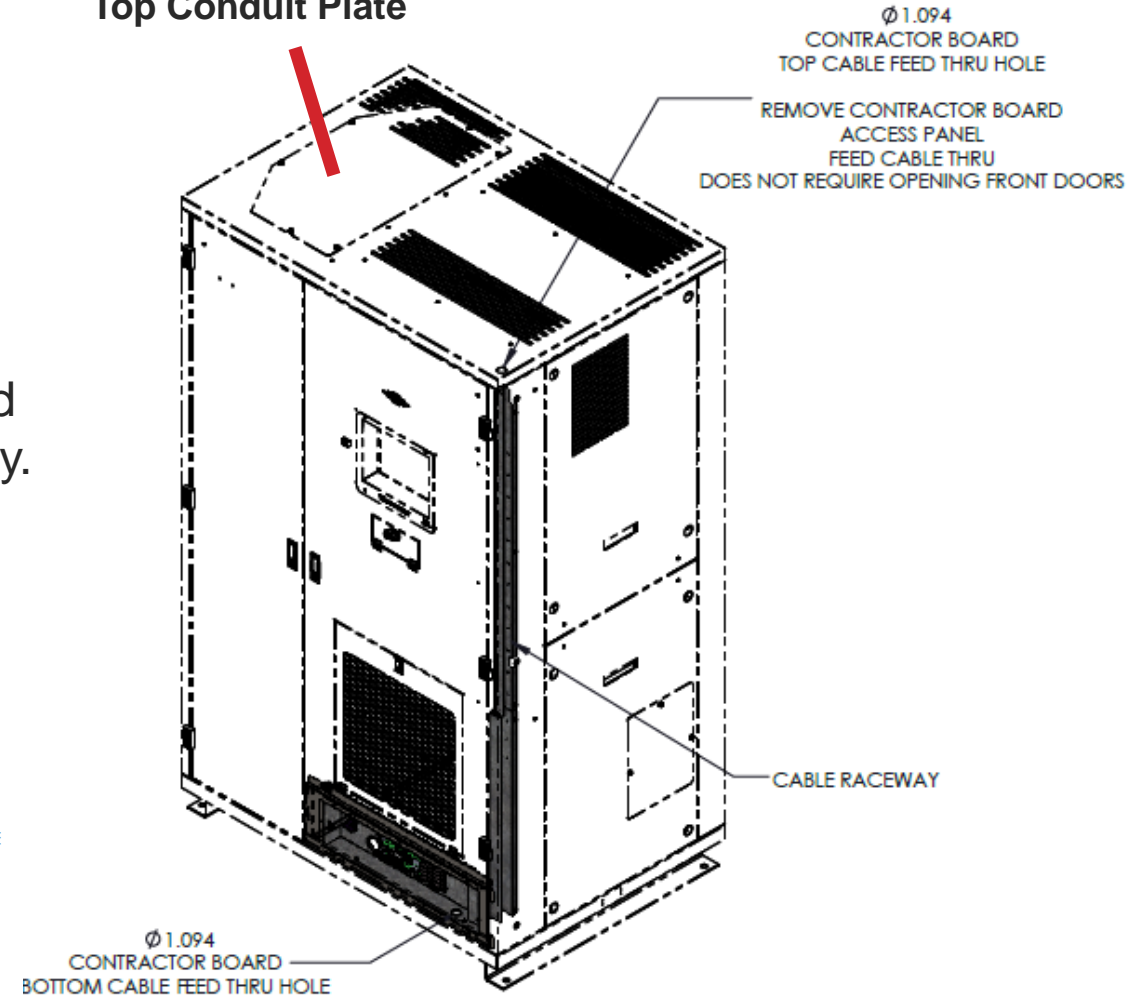
Every data center is different, hence determining service entrances for input/output power connections and communications for building management systems (BMS) can vary from site to site as well as unit to unit.

The WaveStar® TFA Static Transfer Switch was engineered to be both Top/Bottom Entry/Exit for the ultimate in flexibility.

**Top & Bottom  
Conduit Plate  
are Mirrored**



Top Conduit Plate



## Summary - WaveStar® TFA Static Transfer Switch

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