

Medium Voltage UPS

5MW to 50MW+
5kV to 36kV





Introduction

MV UPS Series connected power conditioning device

MV UPS is a high-performance, high-efficiency power-conditioning and uninterruptible power supply built on an advanced line-interactive architecture.

It protects critical loads from a broad spectrum of utility voltage events while delivering continuous, clean power.

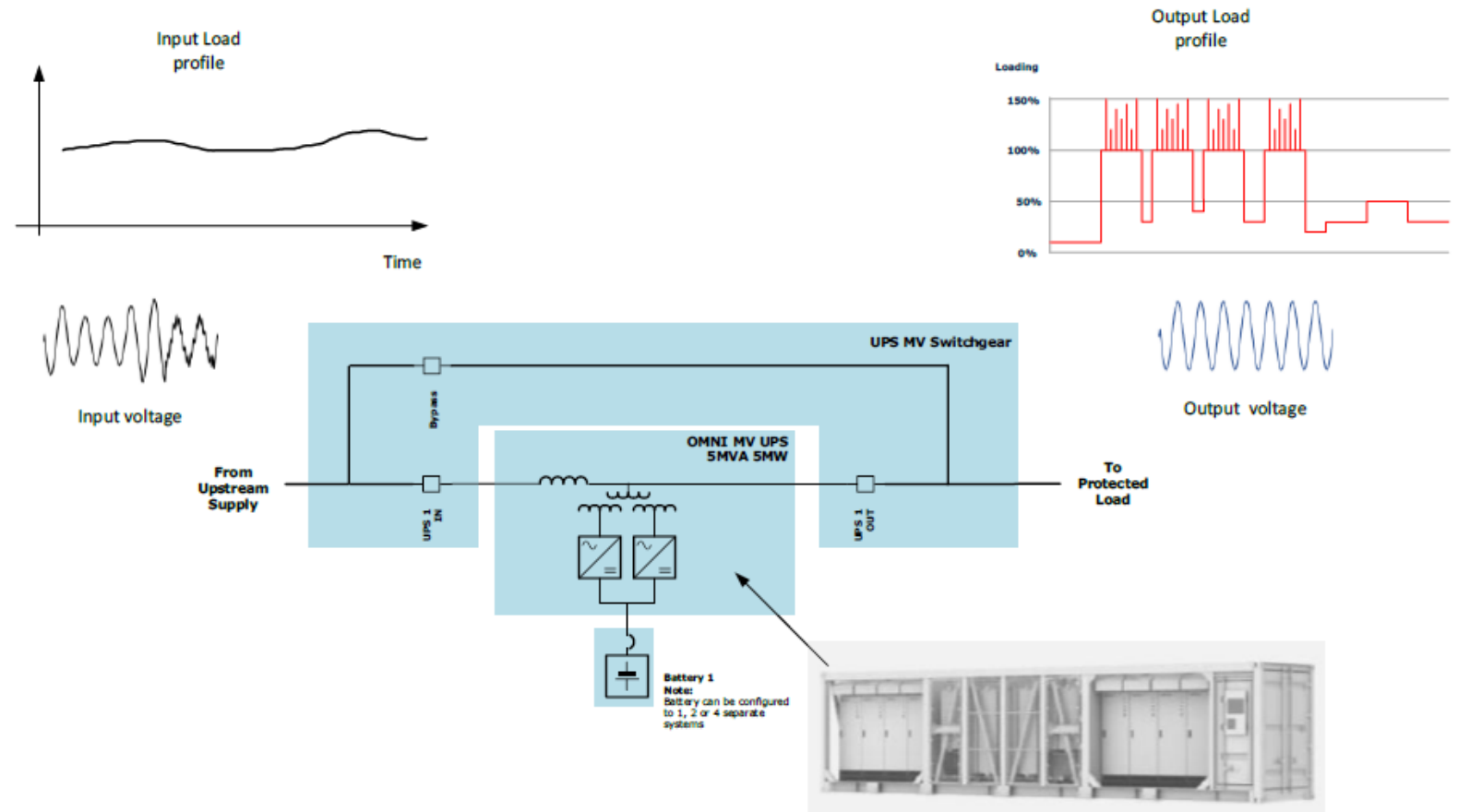


Efficiency	>98%
Fault clearing capability	> 450% of rated current
Dynamic response	Equivalent to LV double-conversion UPS — surpasses the ITIC curve
Input power smoothing	Fully compliant with utility and slow-ramp distributed generation (e.g., gas turbines) dynamic load requirements
Load profile compatibility	Optimized for both industrial and AI data center load profiles
Energy storage autonomy	Scalable from seconds to multiple hours

- Deliver conditioned, stable voltage to downstream solid-state transformers (SST) and/or conventional transformers.
- Buffer AI and industrial load power transients, presenting a smooth, predictable power profile to the upstream grid or distributed generation source.
- Provide seamless bridge power during transitions between grid and distributed generation, eliminating transfer interruptions.
- Deliver ancillary grid services on demand, including compliance with ERCOT large-load voltage ride-through requirements.
- Supply high magnitude fault-clearing current to clear downstream faults and maintain system continuity.

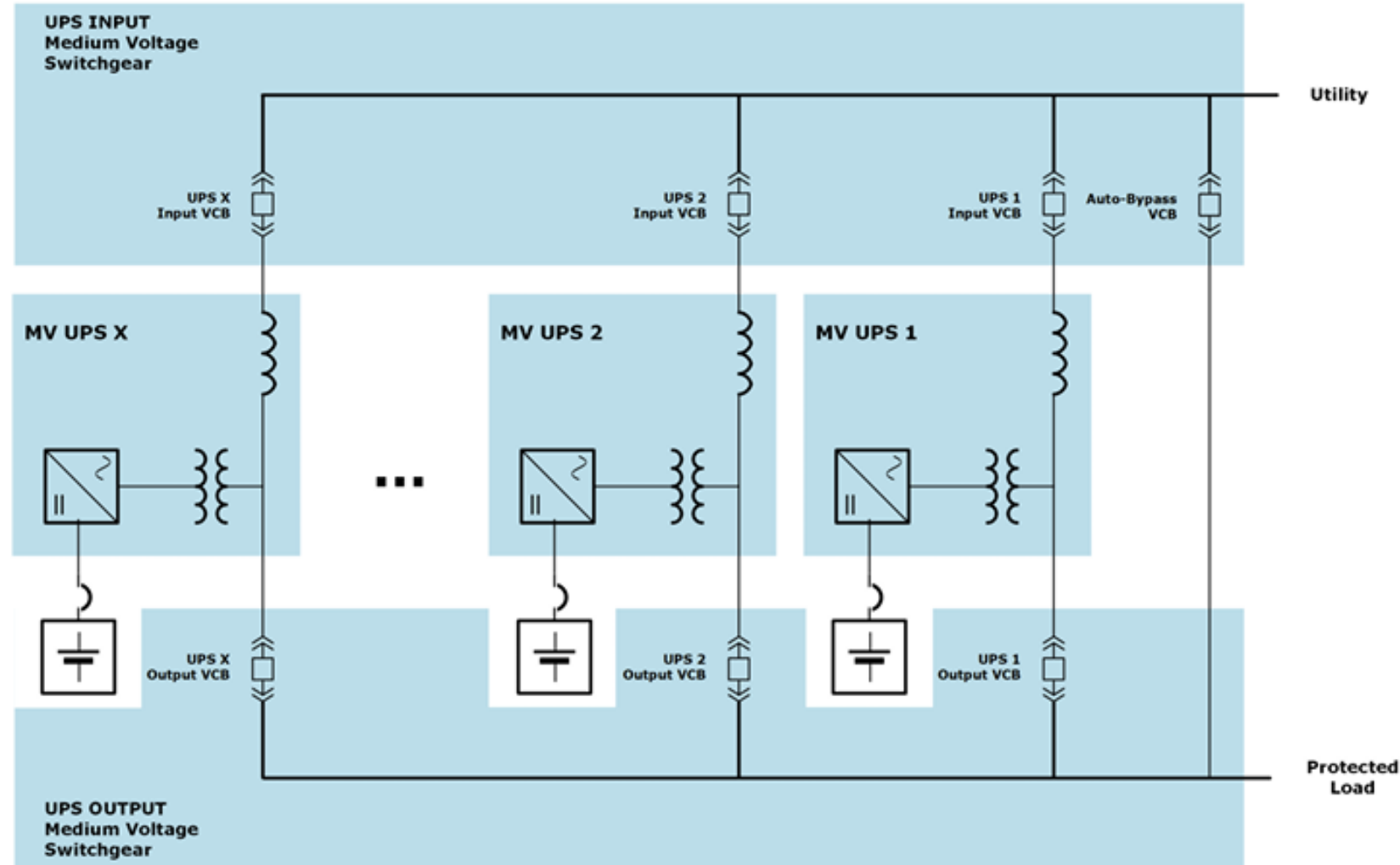
Architecture

- Isolating line reactor decouples the system from the utility grid.
- High-performance power converters continuously condition and filter upstream disturbances without engaging the energy storage.
- Exceptional availability and class-leading efficiency achieved.
- Output voltage quality matches that of leading low-voltage double-conversion UPS systems.
- Compatible with a broad range of modern energy storage technologies including ultracapacitors and LFP batteries.



Parallel and/or Redundant configuration

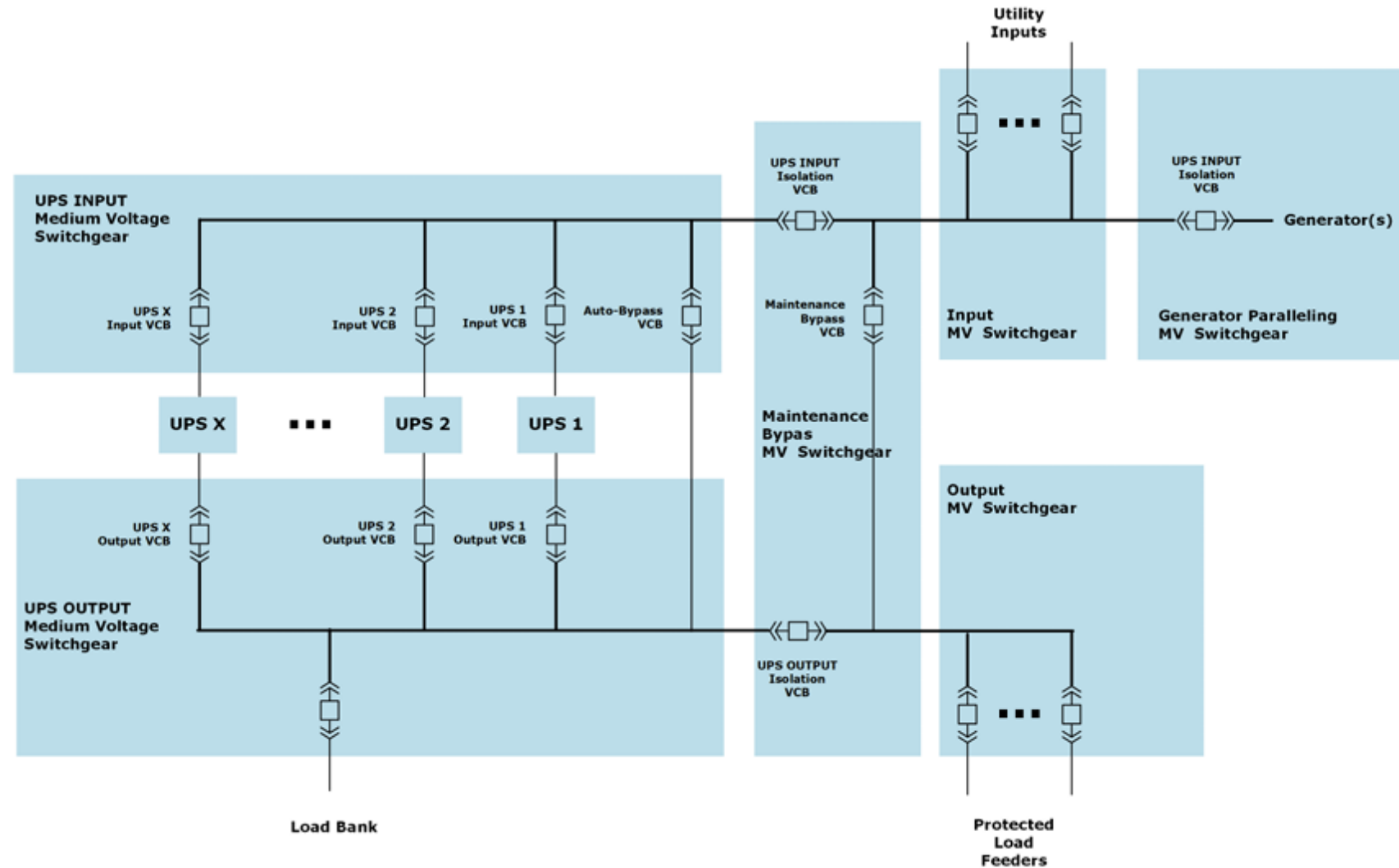
- ✓ Multiple units can be connected in parallel to scale total system capacity beyond 50MW.
- ✓ Natively supports any redundancy tier (from N+1 to full 2N) without requiring additional switchgear or bypass infrastructure.
- ✓ Equally suited to cost-optimized deployments and mission-critical applications demanding the highest levels of availability.



System Configuration

Dedicated Electrification System

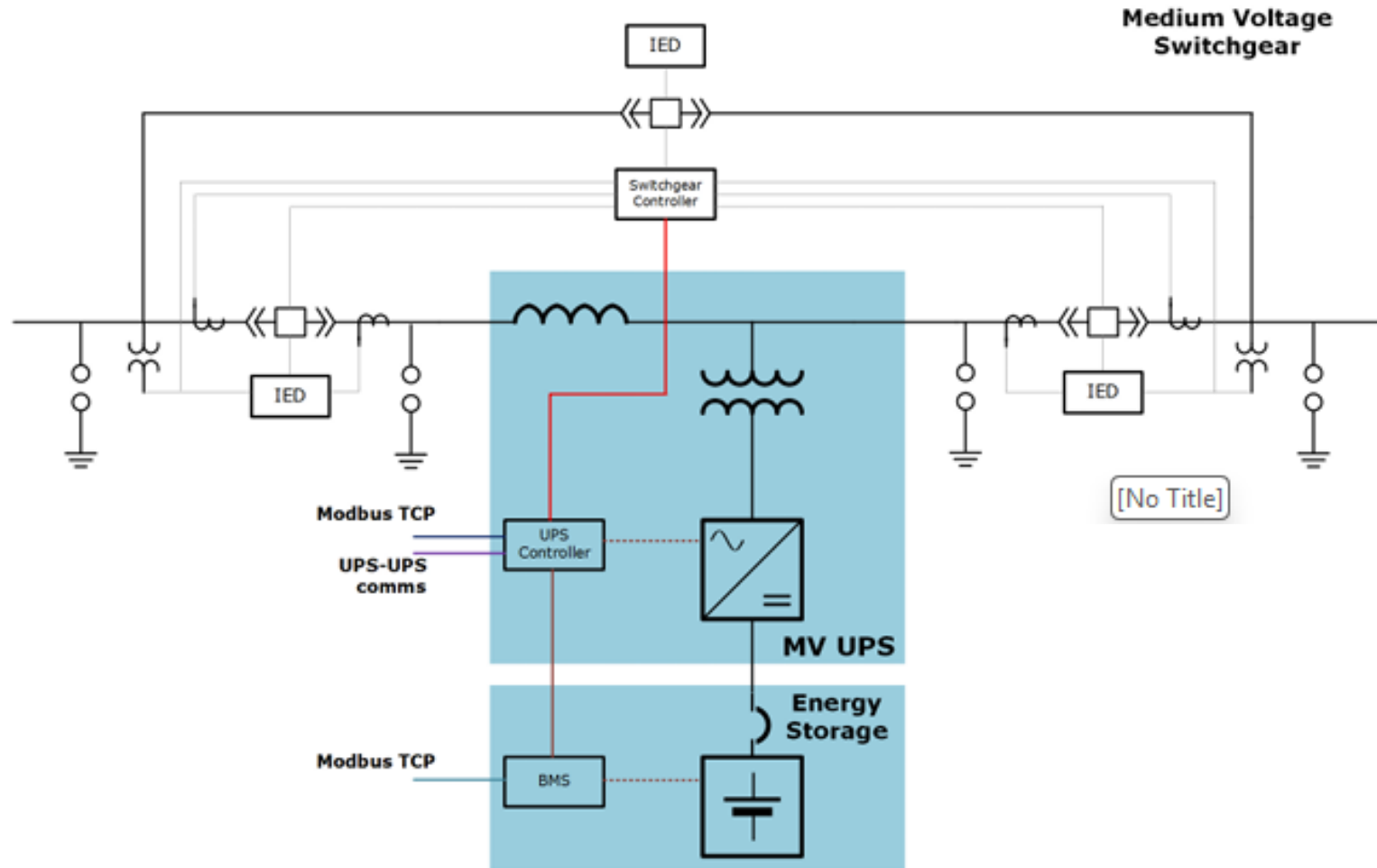
- ✓ Standard MV UPS project built around a core system rated up to 50MW or beyond.
- ✓ Seamlessly integrated with the site's Balance of Plant electrical infrastructure.
- ✓ Can extend further to encompass comprehensive MV generator-parallelising switchgear, enabling fully integrated islanding, generation dispatch and source transfer within a single, cohesive electrical system.



Single 5000kVA system design example

Seamless integration between the UPS and MV switchgear is achieved through a dedicated switchgear controller embedded directly within the switchgear lineup.

The controller continuously acquires real-time data from current and potential transformers and issues coordinated commands to the MV vacuum circuit breakers (VCBs), ensuring that protection and operating sequences are executed in tight synchronization across the entire system.

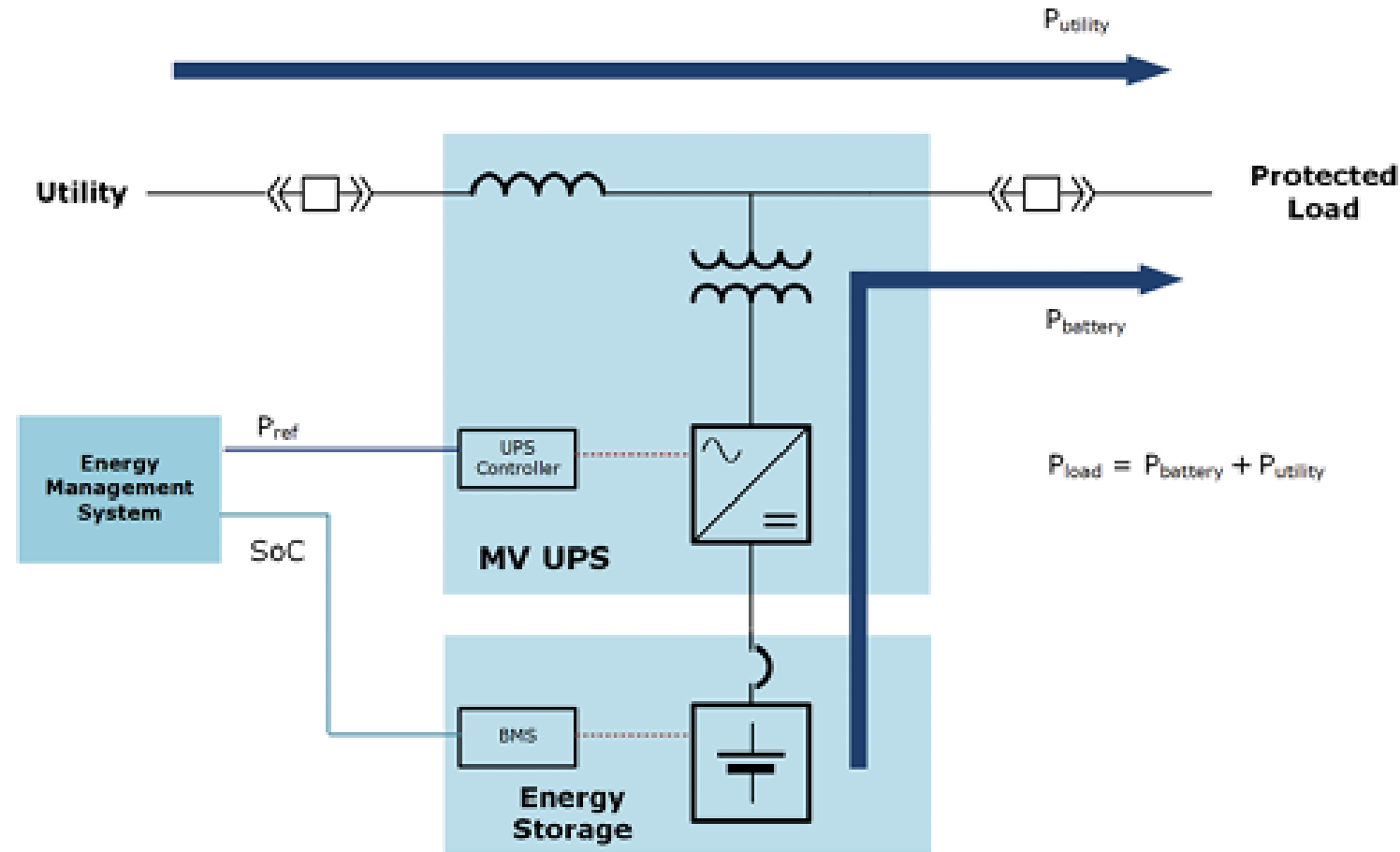


Ancillary Grid Services

The MV UPS integrates seamlessly with external Energy Management Systems (EMS).

The onboard energy storage system can be actively dispatched for peak shaving as well as renewable energy integration support.

These capabilities transform the MV UPS from a purely protective asset into an active, revenue-generating grid resource.



The MV UPS delivers continuously regulated output voltage to the load, independent of upstream utility conditions. It maintains tight output regulation across the full range of load power factors and input voltage disturbances, achieving output quality fully consistent with LV double-conversion UPS standards. The system exceeds ITIC ride-through requirements and provides continuous clean power, all while sustaining the system efficiency in the 98% range.

By presenting a clean, stable and predictable load profile to the utility or distributed generation, the system supports grid-integration requirements and mitigates constraints common in distributed or weak-grid environments.

For shallow voltage sags and swells, the isolating line reactor and converter stage absorb and correct the disturbance entirely, without drawing on the energy storage system. This eliminates unnecessary micro-cycling, preserves battery health and extends service life.

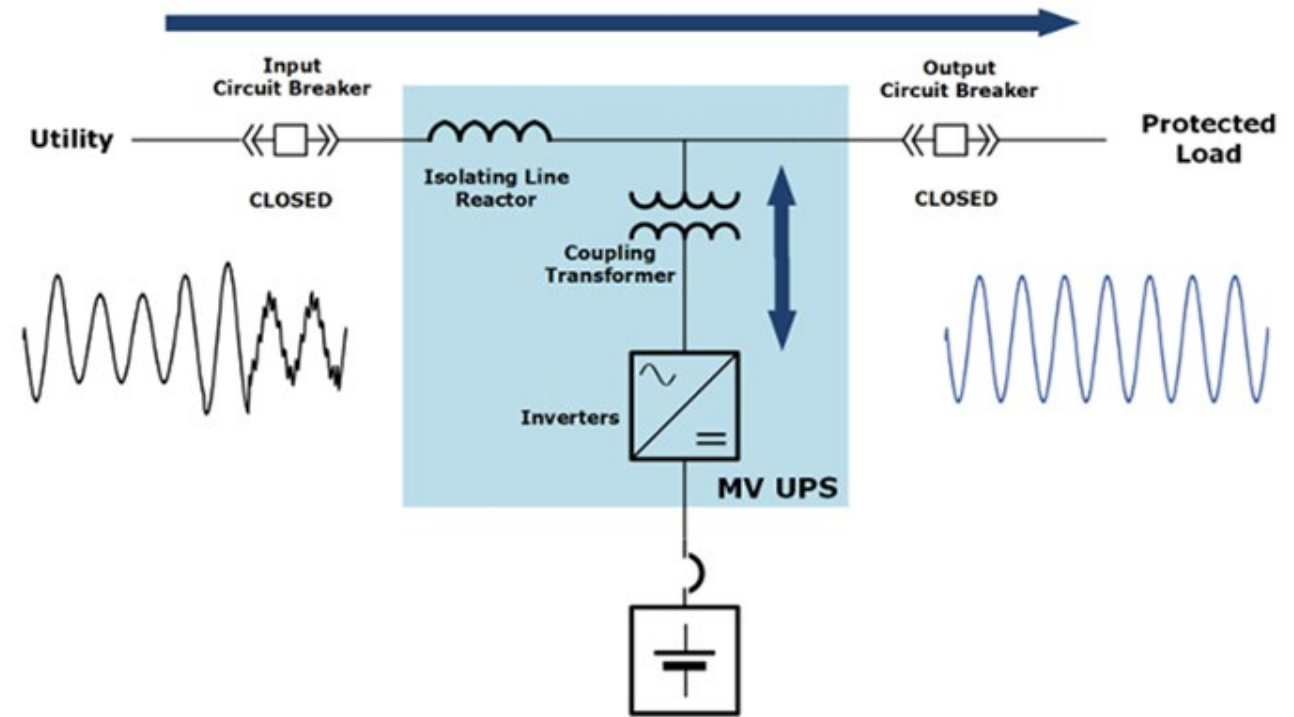
For deep voltage sags or complete supply interruptions, the input breaker opens and the MV UPS transitions seamlessly to stored energy, maintaining uninterrupted, regulated voltage to the protected load with no detectable discontinuity.

Power Conditioning Mode

During power conditioning mode, the power converters actively regulate both real and reactive power flow from the utility to the load, without engaging the energy storage system, eliminating unnecessary cycling and preserving storage capacity for when it matters the most.

Simultaneously, the MV UPS continuously conditions the incoming supply, filtering upstream disturbances before they can propagate to the protected load.

Dynamic reactive-current support is provided in real-time, ensuring stable, high-quality voltage delivery under all load conditions.

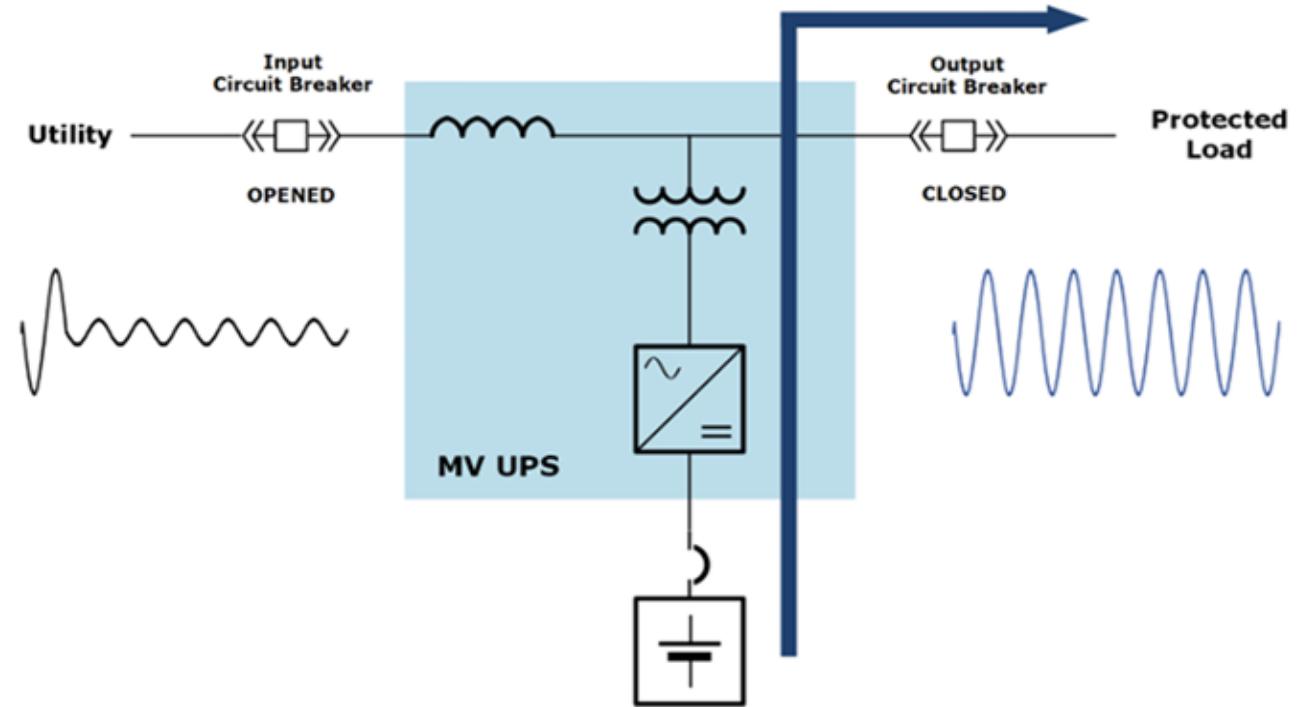


Energy Storage Mode

If the utility power becomes unavailable, the MV UPS immediately opens its input breaker and transitions the load to the energy storage system without interruption, entering energy-storage mode.

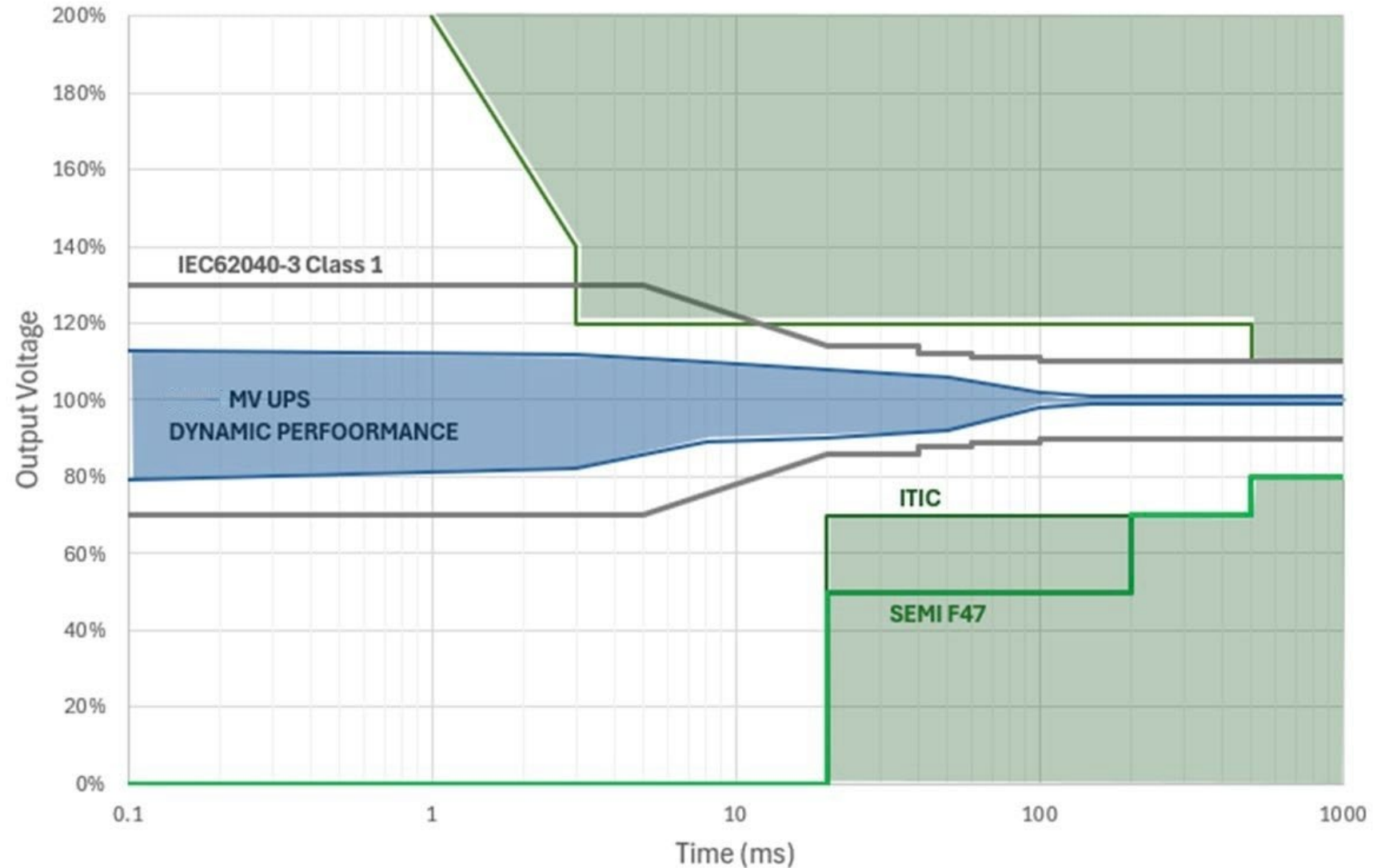
The transfer is seamless and imperceptible to the protected load. Output voltage regulation is maintained continuously throughout.

Stored energy then sustains the critical load for the required ride-through duration, bridging the gap until utility voltage is restored or an alternative source, such as a diesel generator, is brought online, synchronized and ready to assume the load.



Rated Voltage	4.16kV to 34.5kV	Application specific voltage
Rated Power	5MVA, 5MW	Single unit
System Max Rated Power	50MW+	Parallel operation
Performance		
Efficiency	>98%	
Dynamic Output Performance	In line with LV double conversion UPS Surpassing the ITIC requirements	Full online, not transfer time
Architecture	Advanced Line interactive	
Output		
Steady State Voltage Variation	±1%	
Rated Frequency	50Hz or 60Hz	
Frequency Accuracy	±0.1%	ES mode only
Maximum Fault Clearing Current	>450%	

*MV UPS passes ITIC and SemiF47 requirements



Advanced Functionality		
Dynamic load buffering	Adjustable load rate or fully adaptive	Input smoothing of rapidly cycling load profiles on the output
Distributed generation support	Controlled load hand over	Keeping the upstream grid stable
BESS functionality	Yes	External EMS required
Special grid requirements	LVRT and HVRT compatible	ERCOT and other grid requirements
Interface		
System Display	Touchscreen display	
Communication	Ethernet Modbus TCP	
Hardwired Interface	Digital Inputs Relay Outputs	

MV Switchgear		
Type	Air Insulated or Gas Insulated	Manufacturer agnostic
IEDs	As required by UPS and system protection	IED Manufacturer agnostic
Specification	VCBs, PT, CTs, SAs, for the MV UPS portion as per the UPS engineering requirements	

Energy Storage		
Type	LFP, ultracapacitors	Manufacturer agnostic
Autonomy	seconds to hours	Project specific
Rated voltage	< 1500VDC	
Specification	As per the UPS engineering requirements	

System Dimensions		
Single UPS unit, 5MVA, outdoor NEMA3R		
Dimensions (LxWxH)	40' x 8'x 8'	
Weight	25T (55000lbs)	
Single battery system, 5MW, outdoor		
Dimensions (LxWxH)	One or multiple 20'L x 8'W containers	Autonomy and application dependent
MV Switchgear		
Dimensions (LxWxH)	Project dependent Indoor, Outdoor NEMA3R, Outdoor PDC	

Thank You.

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