

# PQ-IVR™ Power Quality Industrial Voltage Restorer

## Benefits

- Protects industrial facilities from momentary voltage sags and swells
- Protects against one-, two- and three-phase voltage sags up to 60% in depth
- Utilizes proprietary, four quadrant, IGBT inverters that have had millions of hours of reliable operation.
- Provides at least two seconds of ride-through at full power
- Shunt connected, no risk to critical load

Every year, billions of dollars in revenue are lost due to momentary power quality problems. The slightest variations in voltage can cause hours of downtime, resulting in lost product and the need for recalibration of equipment. The industrial power quality solutions offered by American Superconductor™ (AMSC™) provide large industrial customers a superior way to mitigate disruptive power quality problems. Each PQ-IVR system can detect power quality problems within milliseconds, and counteract them before they turn into costly productivity problems. PQ-IVR systems incorporate the latest PowerModule™ power electronic converters and can be configured to meet a wide range of customer requirements and help industrial facilities realize their full profit potential.



The PQ-IVR device instantaneously injects precise amounts of reactive power into a network.

PQ-IVR systems are shunt connected voltage protection solutions for large industrial facilities. The PQ-IVR system is designed to provide facility-wide protection against voltage swells and sags up to 60% of nominal voltage. Unlike series connected devices, the sag rebuild of PQ-IVR systems is not load dependent, meaning additional load can be added to the plant without impacting the effectiveness of the PQ-IVR solution. Also, PQ-IVR systems do not shut down (“go into bypass mode”) when they detect a voltage dip that originates within the industrial facility itself or exceeds the rebuild design limits of the PQ-IVR. The PQ-IVR sag rebuild depends primarily on the fault current of the system. AMSC’s system engineers will work with you to find the optimum low cost solution for any industrial application.

## Operational Description

Like AMSC’s D-VAR® product, PQ-IVR systems utilize AMSC’s proprietary PowerModule inverter technology. Each system contains four-quadrant, IGBT inverters that are stacked to handle the output demands of the system. Each PowerModule building block operates independently thereby improving reliability.

With short lead times, quick payback and minimal impact on facility operations and infrastructure, PQ-IVR systems provide a cost effective solution that allows industrial facilities to operate smoothly and efficiently.

## Specifications

### Power Ratings

Load Voltages: 400 V to 46 kV

Frequency: 50 or 60 Hz

Unit Output: 2 - 100 MVAR reactive

Response and Rebuild Time: Approx. 1.5 cycles

System Efficiency: >99%

### Power Electronics

Inverter: IGBT, 4-quadrant

Rating: 4 MVA modules with 2 second overload rating of 2.67 times continuous

Output: 480V, combined 3 $\phi$  control (independent 1 $\phi$  control)

### Monitoring

Control Monitor: Subcycle monitoring of customer voltage

System Monitor: Interface to customer SCADA, remote monitoring optional

### Installation Dimensions and Configuration

Inverter enclosure size is 8' x 8' x 8' per 4 MVA module

