



# Dynamic Volt-Amp Reactive (D-VAR®) Compensation Solution

## Modular solution to regulate voltage and power factor at key grid locations

AMSC's interconnection & reactive power compensation solutions ensure high network performance and stability. AMSC's D-VAR® (Dynamic Volt-Amp Reactive) system is a powerful, cost-effective way to provide continuous voltage regulation, improve voltage stability, meet interconnection requirements and dynamically provide grid support where it's needed.

### High-speed response to voltage disturbances

D-VAR systems stabilize and regulate voltage and power factor on T&D networks and at industrial operations. The system detects and rapidly compensates for voltage disturbances by injecting leading or lagging reactive power at key points on transmission and distribution grids. Each D-VAR solution is tailored to meet specific customer requirements and accommodates changing grid conditions.

### Proven solution to stabilize voltage

D-VAR systems are proven worldwide to address a range of voltage stability issues and increase the power transfer capacity of utility networks. They are a valuable asset in helping the grid realize its full power transfer capability.

### Modular, scalable, compact and flexible

D-VAR systems are highly modular and scalable by design. This allows utilities to install properly sized systems in the most effective power grid locations, staging the installation as desired, and quickly augmenting capability as demands increase. Each unit is compact to accommodate areas with restricted space availability. The D-VAR control system is highly flexible and customizable to allow the solution to address a wide variety of problems under a broad range of system conditions.

### Meeting utility interconnection requirements

With D-VAR systems, wind and solar generation plants can meet utility interconnection requirements, including low voltage ride-through (LVRT) and high voltage ride-through (HVRT) regulation and power factor correction. The systems help reduce stress on, and extend the life of, wind turbine gearboxes, switches and other components by mitigating transient voltage events and by soft switching capacitors and reactor banks with proprietary and patented technology.



- Improves grid reliability by regulating and stabilizing voltage
- Delivers superior transient response
- Generates and absorbs VARs dynamically for smooth power regulation
- Modular construction allows quick deployment and future flexibility
- More compact and less costly to install than competing devices
- Low power losses compared with competing devices
- D-VAR systems are modular and compact and accommodate areas with restricted space availability
- Capable of supplying steady state negative sequence current injection to mitigate voltage unbalance





Example of a 4 MVAR D-VAR system, which is 20 feet long by 11 feet wide. D-VAR systems are modular and compact and accommodate areas with restricted space availability.



Example of a 8 MVAR D-VAR system, which is 30 feet long by 11 feet wide

The D-VAR system:  
modular and compact,  
accommodating areas with  
limited space availability.

**SPECIFICATIONS**

Connection:	Medium voltage (up to 46 kV)
Frequency:	50 or 60 Hz
Continuous Rating:	±2.0 to 100s of MVARs
Transient Overload Rating:	3 time continuous for up to 2 seconds (application-specific)
Response Time:	Sub-cycle
Inverter:	IGBT, 4 kHz switching frequency, rated at 1 MVAR, continuous duty
Output:	Independent phase control
Harmonics:	Per IEEE 519
System Monitoring:	Digital recording of system action, multiple inputs, alarms and warning signals
Ambient Temperature:	-50°C to +50°C
Other:	Mobile configuration for quick deployment Minimal on-site installation Compact installation for minimal footprint Remote monitoring Environmentally benign Ambient air cooling Robust operation during low voltage conditions Steady state negative sequence current injection to mitigate voltage unbalance

**PRODUCT APPLICATIONS**

Reactive Compensation	Transmission and distribution systems
Steady-State Voltage Regulation	Radial or otherwise weak distribution systems, wind or solar power generation plants, industrial facilities Voltage unbalance correction
Increasing Grid Capacity	Transmission systems
Reduce Reliability Must Run Generation	Transmission and distribution systems
Voltage Sag Mitigation and LVRT	Large and small industrial facilities, motor starting, wind and solar power generation plant integration

**AMSC's support in solution planning**

AMSC's Network Planning & Applications Group has decades of experience in transmission and distribution planning. We can analyze your system by performing studies for low voltage, voltage stability, transfer capacity and power quality problems. We'll work with you to develop the most cost-efficient and effective solution for short- and long-term results.