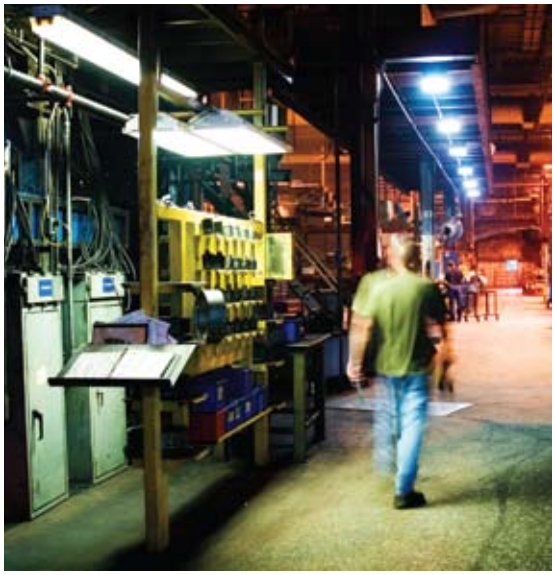
Addressing power quality issues at the medium voltage level benefits large power users.

Square D® ReactiVar® Medium Voltage Automatic Power Factor Correction Banks.

Many industrial facilities place poor power quality at the top of the list of factors responsible for efficiency loss, reduced productivity and lower quality of products. Optimizing your electrical system to keep up with ever-increasing energy demands and rising costs becomes a challenge. However, technologies designed to lower energy costs could cause unexpected power quality effects.

The Square D® ReactiVar® medium voltage automatic power factor correction banks are ideally suited for centralized power factor correction in applications where plant load fluctuates resulting in the need for varying amounts of reactive power. A capital investment in power factor correction and harmonic filtering equipment can result in a healthy return of investment – depending on the utility's demand rate structure, production quality cost due to harmonics and voltage fluctuations in the distribution system.

Power factor correction capacitors supply the reactive power (kVAR) required by inductive loads. By correcting poor power factor ratings, capacitors reduce kVA demand thus off-loading transformers, switchgear and other equipment. The reduced kVA demand results in lower utility bills, cooler equipment operation and longer equipment life.



Typical installations can be found in heavy industrial facilities, including automotive, pulp and paper, steel, petrochemical and mining

Features of the ReactiVar® Power Factor Correction Banks

Schneider Electric provides a full range of power quality solutions to help you improve energy efficiency – without unwanted side effects. For medium voltage systems, you can select the standard (MV5000) or anti-resonant (MV6000) capacitor systems, depending upon the level of harmonic content within the network.

Standard features include:

- Heavy duty formed steel, bolted-frame, multi-bay lineup design
- Available for indoor (Type 1/12) and outdoor (Type 3R) installations
- Voltages from 2.4 kV to 15 kV
- Reactive power ratings through 20 MVAR
- Automatic controls by state-of-the-art Varlogic controller
- Grounding switch and unbalance protection
- Operating temperature of -40°C (-40°F) to +40°C (+104°F)
- Built to applicable NEMA, IEEE, IEC, and CSA standards
- Custom ratings and other options available

Reactivar Metal-enclosed medium voltage capacitor systems

SQUARE D®

by Schneider Electric

Medium Voltage Selection Guide Steps

Applying power factor capacitors used to be straightforward. Today, with the proliferation of harmonic generating loads such as variable frequency drives, soft starters and welders, very careful attention must be paid to the proper application of power factor correction and harmonic filtering equipment. The following guide indicates the information required to properly and efficiently specify and recommend medium voltage compensation systems.

1. Network Information

Each MV capacitor bank project starts with basic information collection with respect to facility and immediate utility network characteristics. Network nominal voltage, operating voltage, frequency and short circuit current availability are necessary data for proper capacitor bank design. Information on power delivery transformer ratings (nominal kVA, impedance), presence of any existing capacitor banks (type and ratings) in the facility or at the utility feeder, and general network topology and operation patterns are necessary. Most of the above information may be available from single line diagrams.

2. Reactive Power Estimation

Greatly depends on the purpose (objective) of the compensation system. Utility bills may provide total reactive power requirements and the target power factor levels. Special applications (i.e. motor starting compensation, highly fluctuating cyclical load compensation) may require special data collection, which is not typically available from general power metering devices.

3. Load Characteristics

Evaluates the load characteristics with respect to harmonic content (both voltage and current). Presence of nonlinear (i.e. harmonic generating) loads such as VFDs, DC drives, welders and/or furnaces internal to the facility in question or in a neighboring facility, which is supplied by the same utility feed, may force special compensation system design requirements to avoid resonance conditions and protect the compensation system from harmonic overloads.

4. Site Information

Specific site information such as installation location, site environmental conditions, required feeder and main protection options are required to finalize the medium voltage compensation system design.

Standard Features and Options for Automatic, Multi-stage Systems*	MV 5000	MV 6000
Silver Flashed Copper Bus	■	■
Copper Power and Control Wiring	■	■
Heavy Duty Capacitor Elements	■	■
Inrush Current Limiting Reactors	■	□
Iron Core De-tuning Reactors	□	■
Control Power Transformer with HV/LV Fusing	■	■
Electrical Time-delay Interlocks	■	■
VarLogic NRC12 Controller	■	■
Fans with Thermostat	■	■
Heaters with Thermostat	■	■
Three-phase Unbalance Protection Relaying on Each Stage	■	■
CT Shorting Block	■	■
Remote Mounted Control Cabinet	■	■
Grounding Switch (each stage)	■	■
Incoming Section with Non-load Break Air Switch	■	■
Main Incoming Current Limiting Fuses	■	■
Incoming Section with Main Draw-out Vacuum Circuit Breaker	■	■
Bottom Cable Entry	■	■
Top Cable Entry	■	■
Type 1 Indoor Enclosure	■	■
Type 3R Outdoor Enclosure	■	■
ASA 70 Gray Paint	■	■
ASA 61 Gray Paint	■	■

■ Standard feature ■ Available option □ Not available

*For fixed systems or custom options, contact Schneider Electric for details.

For more information, call 1-888-SQUARED or visit us at www.Squared-Services.com or www.reactivar.com.

Schneider Electric – North American Operating Division

1415 South Roselle Road
Palatine, IL 60067
Tel: 847-397-2800
Fax: 847-925-7500

This document has been printed on recycled paper.