



AUTOMATIC POWER FACTOR CORRECTION & HARMONIC SOLUTIONS



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Description:

Automatic power factor correction systems are designed to automatically turn power factor correction capacitors on or off to maintain a desired target power factor under varying load conditions on the low voltage distribution systems of industrial, institutional, and commercial facilities.

All automatic banks use metallized self-healing capacitors with pressure-sensitive interrupters.

Applications:

Automatic systems, rather than fixed capacitors, should be applied where any of the following conditions occur:

- Electric utility rates include **KVA demand billing or a power factor penalty clause.**
- **The facility is experiencing KVA capacity problems** causing overheating of system components resulting in increased operating costs and KW usage.
- The facility is not able to maintain a desired power factor window, especially when **extreme fluctuating loads** are present.
- Sustained leading power factor problems are experienced when the **electric distribution system is lightly loaded.**

Benefits

• Simplified Power Factor Capacitor Applications

The automatic power factor correction equipment featured in this catalog monitors the system to maintain the desired target power factor.

Information required to correctly size the equipment to the electrical distribution system is the monthly maximum KVAR required, based on the last twelve months' usage. Additional system information is required if it is believed that harmonics are present.

• Reduced Installation Costs

Automatic equipment eliminates the need to install smaller capacitor units and associated switching devices on the electrical distribution system, thus reducing installation costs.

• Enhanced System Reliability

Ultravar automatic equipment is application-specific to provide many years of trouble-free operation. The design features that ensure a long service life follow.

- Engineered air core inductors significantly reduce capacitor inrush current that can result in contactor failures and misoperation of sensitive electronic equipment. Tests have verified that properly designed air core inductors will substantially reduce contactor wear and capacitor switching transients. In addition, individual capacitor stages can be switched in and out by a non-sequential rotational principle. This means the capacitor stage that was switched off last will not be the first stage to be switched on. Each capacitor stage operates for equal periods of time to ensure even wear.
- The microprocessor-based controller measures the active and reactive currents and calculates the power factor. It automatically switches capacitors as required by plant load to

maintain a desired power factor. Its alphanumeric digital display shows power factor, current and capacitor step status. The controller automatically calculates the correct C/K value and adjusts for CT polarity.

It is equipped with THD, low power factor, hunting and low/over-voltage visual alarms. Steps can be set for automatic, fixed or off, allowing for the most flexibility when applying a switched bank.

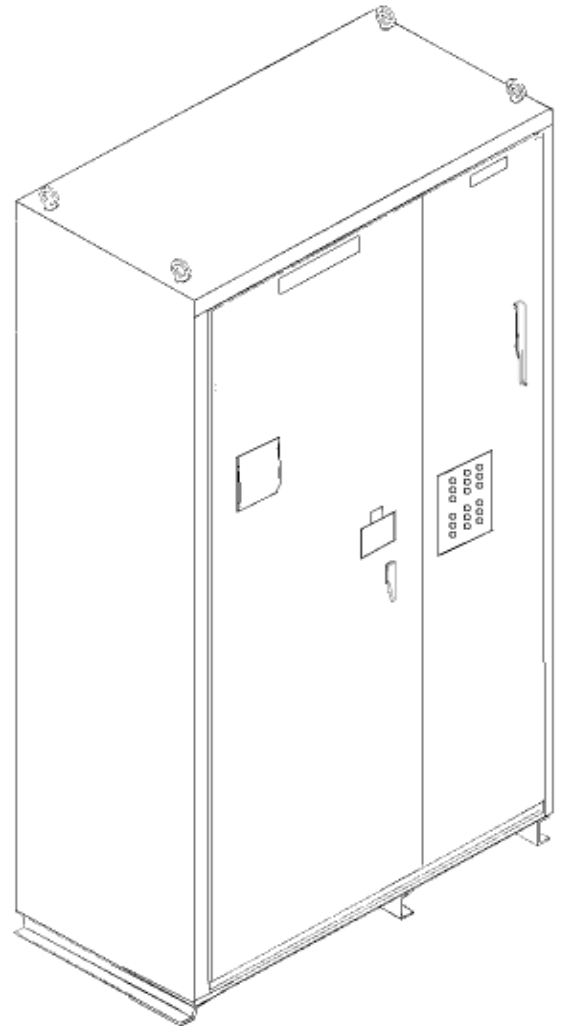
- The power factor controller utilizes switching time delay and loss-of-voltage dropout features. The time delay protects the capacitors from overvoltage by allowing the capacitor discharge network to drain the voltage before the capacitor is reenergized. The loss-of-voltage dropout disconnects all capacitors if a power failure occurs. After power is restored, the automatic equipment will energize the capacitors, one step at a time, until the desired power factor is again achieved.
- 200,000 AIC-rated current-limiting fuses specifically designed for capacitors are utilized, providing additional protection from faults that would have to be cleared by an upstream protective device if each capacitor module did not include current-limiting fusing.
- The equipment is designed to allow the capacitors to be switched in specified KVAR increments. This feature is especially desirable for close control of the reactive load profile when required to maintain the desired power factor window and avoid utility ratchet clauses.
- State-of-the-art, low-loss, self-clearing three-phase capacitors are utilized in every automatic system. Each capacitor cell is protected with a UL-recognized pressure-sensitive device providing additional protection for the system.
- **All capacitors are UL approved.**

ACCU-VAR™ Plus

AVC system • 240 - 480 - 600 volts • 3 phase • 60 Hz

Standard Equipment Features

- Correction to unity power factor, if desired.
- UL and cUL listed.
- NEMA 1 steel cabinet enclosure with ANSI #70 light grey paint suitable for indoor or outdoor applications.
- Dust-tight electrical compartment.
- Dimensions are 48" W x 24"D x 90"H
- Removable lifting eyes.
- Safety door interlock to prevent door from being opened while equipment is energized.
- Microprocessor-based controller with built-in voltage and harmonic alarms provides safe and rapid indication of potential or real failure. Digital display of power factor, current and capacitor step status.
- Manual switching capability.
- External current transformer connections provided.
- 75 KAIC bracing.
- Capacitor stage display.
- Air core inductors to limit inrush currents and transients.
- Industrial duty, UL approved metallized electrode capacitors, employing 200 KAIC current-limiting fuses in all 3 phases.
- Plated copper bus.
- Padlockable door handle.
- Designed to minimize installation time and costs.
- Convection cooling - no fans required.
- Ratings: 300 KVAR maximum at 240 volts
600 KVAR maximum at 480 and 600 volts



Optional Equipment Features

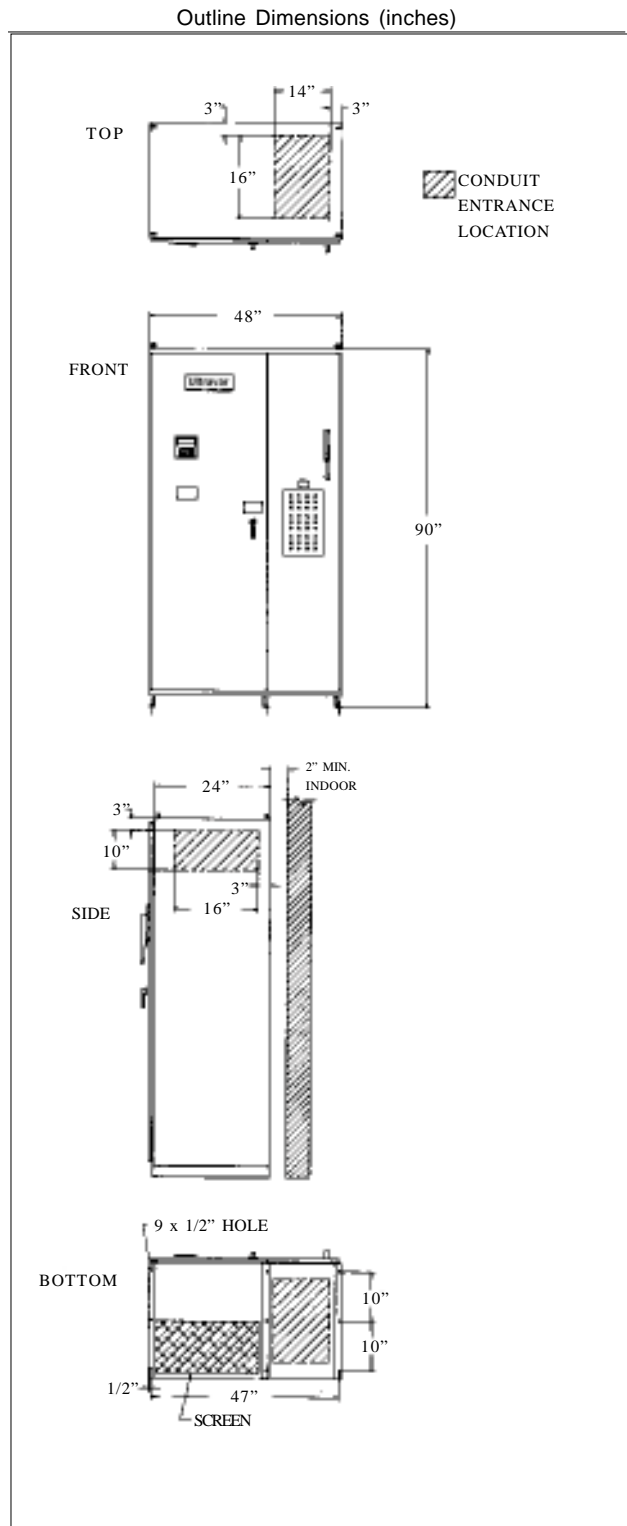
- Blown fuse indicator lights
- Outdoor NEMA 4/12 enclosure
- Split core current transformer
- Molded-case circuit breaker internally mounted with external operator
- UL listed service entrance
- Hand-off auto switches
- 100 KAIC bracing
- Power on/off switch
- Bottom entry



ACCU-VAR™ Plus

AVC system • 240 - 480 - 600 volts • 3 phase • 60 Hz

AVC 240 • 480 • 600 Volts • 3 Phase • 60Hz				
Volts	KVAR	3 Phase Catalog No.	KVAR Per Step	Weight Lbs
240	50	AVC3050D10	10	928
	100	AVC4100D25	25	1050
	125	AVC5125D25	25	1099
	150	AVC6150D25	25	1149
	175	AVC7175D25	25	1198
	200	AVC8200D25	25	1248
	225	AVC9225D25	25	1298
	250	AVC10250D25	25	1347
	300	AVC12300D25	25	1446
480	100	AVC3100F25	25	976
	125	AVC3125F25	25	988
	150	AVC3150F50	50	1000
	175	AVC4175F25	25	1038
	200	AVC4200F50	50	1050
	225	AVC5225F25	25	1085
	250	AVC5250F50	50	1099
	275	AVC6275F25	25	1136
	300	AVC6300F50	50	1149
	325	AVC7325F25	25	1186
	350	AVC7350F50	50	1198
	375	AVC8375F25	25	1235
	400	AVC8400F50	50	1248
	425	AVC9425F25	25	1285
	450	AVC9450F50	50	1298
	475	AVC10475F25	25	1334
	500	AVC10500F50	50	1347
	525	AVC11525F25	25	1384
550	AVC11550F50	50	1397	
575	AVC12575F25	25	1433	
600	AVC12600F50	50	1446	
600	100	AVC3100H20	25	976
	125	AVC3125H25	25	988
	150	AVC3150H50	50	1000
	175	AVC4175H25	25	1038
	200	AVC4200H50	50	1050
	225	AVC5225H25	25	1085
	250	AVC5250H50	50	1099
	275	AVC6275H25	25	1136
	300	AVC6300H50	50	1149
	325	AVC7325H25	25	1186
	350	AVC7350H50	50	1198
	375	AVC8375H25	25	1235
	400	AVC8400H50	50	1248
	425	AVC9425H25	25	1285
	450	AVC9450H50	50	1298
	475	AVC10475H25	25	1334
	500	AVC10500H50	50	1347
	525	AVC11525H25	25	1384
550	AVC11550H50	50	1397	
575	AVC12575H25	25	1433	
600	AVC12600H50	50	1446	



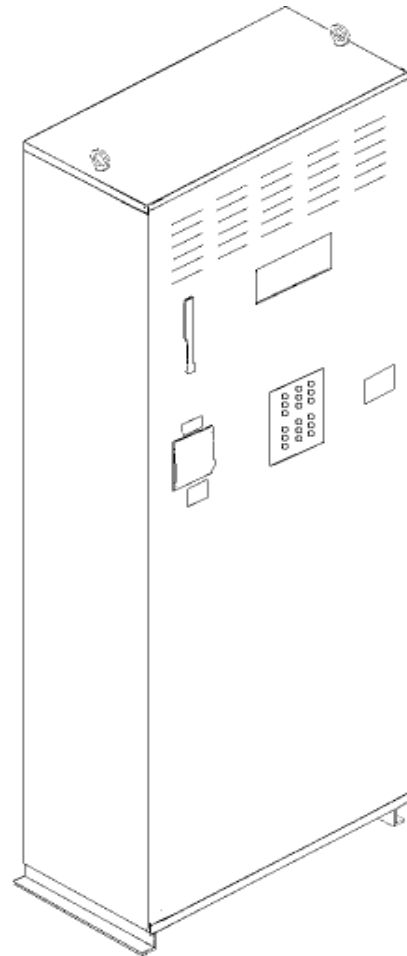
NOTE: For blown fuse indicator lights add "L" to Catalog Number. Refer to Savings & Applications Guide for sizing cables and switches.

ACCU-VAR™ Jr.

AVJ system • 240 - 480 - 600 volts • 3 phase • 60 Hz

Standard Equipment Features

- Correction to unity power factor, if desired.
- UL and cUL listed.
- NEMA 1 12-gauge steel cabinet enclosure with ANSI #70 light grey paint.
- Dimensions are 33" W x 16.25"D x 90"H.
- Removable lifting eyes.
- Safety door interlock to prevent door from being opened while equipment is energized.
- Microprocessor-based controller with built-in voltage and harmonic alarms provides safe and rapid indication of potential or real failure. Digital display of power factor, current, and capacitor step status.
- Manual switching capability.
- External current transformer connections provided.
- 50 KAIC bracing.
- Plated copper bus.
- LED capacitor stage display.
- Air core inductors to limit inrush currents and transients.
- Industrial duty, UL approved metallized dielectric capacitors, less than .2 watts per KVAR losses employing 200 KAIC current limiting fuses in all 3 phases.
- Designed to minimize installation time and costs.
- Top entry only.
- Convection cooling - no fans required.
- Ratings:120 KVAR maximum at 240 volts
300 KVAR maximum at 480 and 600 volts



Optional Equipment Features

- Blown fuse indicator lights
- Split core current transformer
- Hand-off auto switches
- Molded case circuit breaker internally mounted with external operator
- 60" high model also available - 200 KVAR maximum at 480 volts - designated AVM - contact factory (breaker not available).
- Power on/off switch



Demand Line Plus

Demand Line Plus System with Harmonic Suppression Reactors

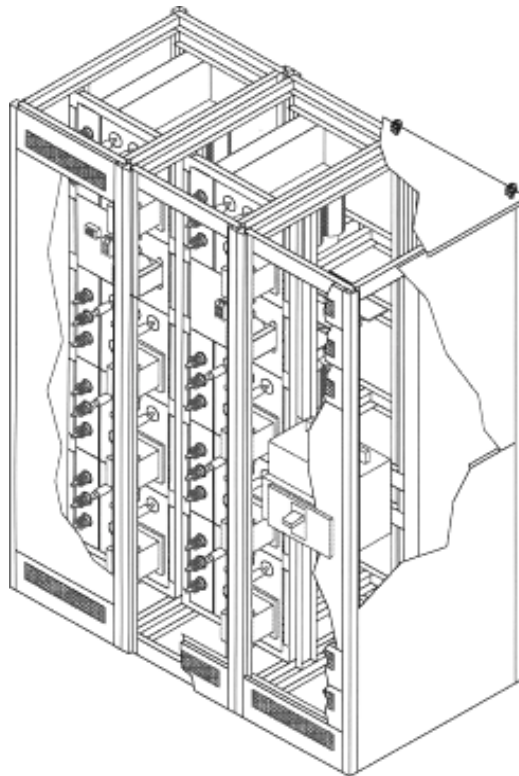
Many of today's power systems require modern solutions to power factor correction. The rapid increase in variable speed drive use and other solid state devices has resulted in severe harmonic loads on power systems. **Ultravar has more than ten years of experience in preventing the occurrence of non-sinusoidal resonance.** Successful integration in tuned L-C networks solves the problem of parallel resonance.

The IDL automatic power factor correction systems with 3-phase harmonic suppression reactors are application-specific. Accordingly, each installation requires specific information to aid Ultravar Application Engineers in designing a system to meet your requirements. This information should include, but not be limited to, KVAR requirements, transformer

size and impedance, KVA_{sc} of the transformer, and a harmonic profile of your system. Load characteristics at the time of the survey and worst case should also be included.

The IDL systems may be configured for the addition of harmonic suppression reactors in the future to meet the imminent needs of your system. This reduces initial investment and provides a ready made retrofit package.

The Demand Line system provides total flexibility in achieving maximum automatic power factor correction. Please contact your Ultravar sales representative for any assistance with your particular power factor correction and harmonic suppression needs.



IDLP System

Demand Line Plus

IDLP System • 240 - 480 - 600 volts • 3 phase • 60 Hz

Demand Line Plus

Designed for systems that require large KVAR ratings with and without harmonic suppression reactors. Readily adapted to meet specific requirements. Easily expanded and easy to retrofit with harmonic suppression reactors.

Demand Line Plus Features

- Designed and built to “match and line up” with motor control centers and switchgear.
- Industrial rated design and specifications.
- Dimensions are 90” H x 36” D and each modular section is 24” W.
- Modular design permits expansion to meet future requirements.
- Correction to unity power factor, if desired.
- NEMA 1 steel cabinet enclosure with ANSI #70 light grey paint-12-gauge frame and 14-gauge panels.
- Removable lifting eyes.
- UL and cUL listed.
- Microprocessor-based controller with built-in voltage, temperature, and harmonic alarms provides safe and rapid indication of potential or real failure. Digital display of power factor, current, and capacitor step status.
- Manual switching capability.
- External current transformer connections provided.
- 75 KAIC bracing.
- Plated copper bus.
- Top entry.
- Capacitor stage display.
- Industrial duty, UL approved metallized electrode capacitors, employing 200 KAIC current-limiting fuses in all 3 phases.
- Air core inductors to limit inrush currents and transients.
- Designed to minimize installation time and costs.
- Door interlock to prevent entry while system is energized.
- Padlockable door handle (Indoor only).
- Convection cooling - no fans required.

IDLP

Optional Equipment Features

- Blown fuse indicator lights
- Outdoor NEMA 3R enclosure.
- Split core current transformer.
- Molded case circuit breaker internally mounted with external operator or system breaker.
- UL listed service entrance, 3 wire only.
- Hand-off auto switches.
- Reverse layout.
- Bottom entry.
- Harmonic suppression equipment.
- Power on/off switch



Demand Line Plus

IDLP System • 240 - 480 - 600 volts • 3 phase • 60 Hz

Volts	IDLP					
	KVAR	Ultravar Catalog No.	KVAR Per Step	Weight (lbs) without reactors	Weight (lbs) with reactors	Enclosure Width (in/mm)
240	100	IDLP4100D255	25	1094	1634	48"/1219mm
	150	IDLP6150D255	25	1223	2033	48"/1219mm
	200	IDLP8200D255	25	1352	2432	72"/1829mm
	225	IDLP9225D255	25	1417	2632	72"/1829mm ¹
	250	IDLP10250D255	25	1481	2831	72"/1829mm ¹
	300	IDLP12300D255	25	1610	3230	96"/2438mm
480/ 600	200	IDLP3200F505	50	686	997	24"/609mm ¹
	250	IDLP3250F505	50	713	1071	24"/609mm ¹
	300	IDLP3300FA05	100	740	1145	24"/609mm ¹
	350	IDLP4350F505	50	1067	1560	48"/1219mm
	400	IDLP4400FA05	100	1094	1634	48"/1219mm
	450	* IDLP5450F505	50	1132	1760	48"/1219mm
	500	* IDLP5500FA05	100	1159	1834	48"/1219mm
	550	* IDLP6550F505	50	1196	1959	48"/1219mm
	600	* IDLP6600FA05	100	1223	2033	48"/1219mm
	650	IDLP7650F505	50	1261	2159	48"/1219mm ¹
	700	* IDLP7700FA05	100	1288	2233	48"/1219mm ¹
	750	IDLP8750F505	50	1615	2648	72"/1829mm
	800	IDLP8800FA05	100	1642	2722	72"/1829mm
	850	IDLP9850F505	50	1680	2848	72"/1829mm
	900	* IDLP9900FA05	100	1707	2922	72"/1829mm ¹
	950	IDLP10950F505	50	1744	3047	72"/1829mm ¹
	1000	* IDLP10A00FA05	100	1771	3121	72"/1829mm ¹
	1100	* IDLP11B00FA05	100	1836	3321	72"/1829mm ²
	1200	IDLP12C00FA05	100	2190	3810	96"/2438mm ³
	1300	* IDLP13D00FA05	100	2255	4010	96"/2438mm ²
1400	* IDLP14E00FA05	100	2319	4209	96"/2438mm ²	
1500	IDLP15F00FA05	100	2674	4699	120"/3048mm ²	

- 1 - Enclosure width increases 24"/609mm w/breaker.
- 2 - Enclosure width increases 32"/813mm w/breaker.

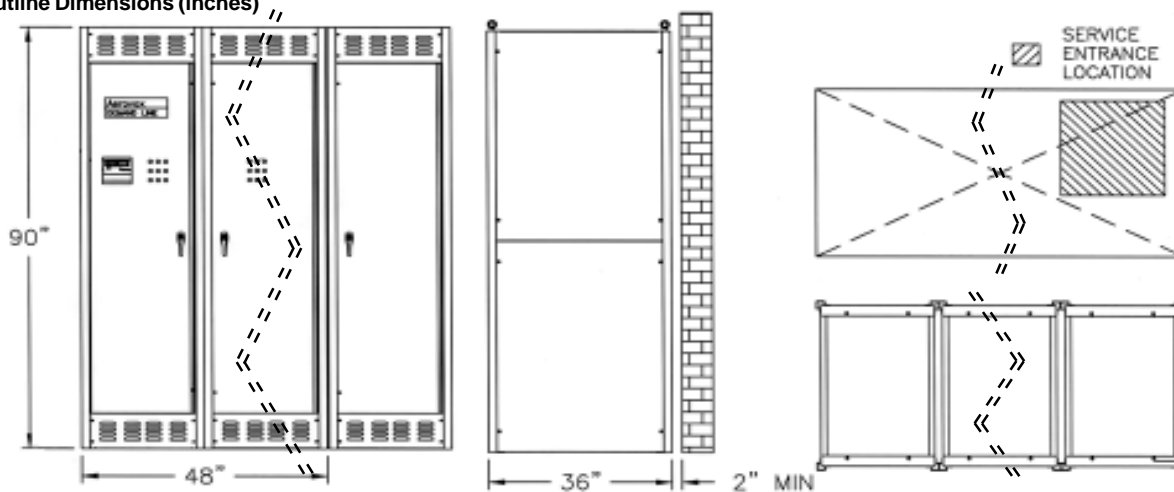
* = Top entry only; consult factory for bottom entry.

Notes: For 600 volts - replace F with H. Consult factory for 240 volt applications.

Larger KVAR sizes available; contact factory for sizes.

50 KVAR steps available 200 to 2400 KVAR - contact factory representative for part numbers and sizes.

Outline Dimensions (inches)



*Ultravar Power Factor Correction
 GE Capacitor and Power Quality Products
 381 Broadway, Fort Edward, New York 12828-1000*

**Automatic Power Factor
 Specification Guide**

Company Name		
Address		
City	State	Zip
Contact	Title	
TEL	FAX	

Description

- UL
- cUL

- ACCU-VAR Plus
- ACCU-VAR Jr.
- Demand Line Plus

Basic Catalog # _____

KVAR _____

Volt _____

Hz _____

KVAR/Step _____

Enclosure

- Indoor
- Outdoor
- Cabinet size _____
- Top Entry
- Bottom Entry
- Reversed Layout
- Other _____

Options

- Blown Fuse Lights
- Circuit Breaker _____ Amps _____ KAIC
- Loss of KVAR
- Hand-Off Auto Switches
- Harmonic Filters (Demand Line Plus series only)
- Service Entry Required, UL only
- Other _____

Current Transformer

- Split Core
- By Others

Ratio _____ :5

Window _____

Contact your local representative.

Represented by:

Ultravar offers other power quality products. For additional information on TVSS, line & load reactors, high voltage capacitor equipment and harmonic solutions, contact your Sales Representative or the address below.

Represented by:

Ultravar™

*GE Capacitor and Power Quality Products
381 Broadway, Ft. Edward, NY 12828*