CLASS 5830
REACTIVAR™ Power Factor Capacitors
AV4000/AV5000 STANDARD AUTOMATIC BANKS

The new Square D REACTIVAR AV4000 & AV5000 standard Automatic Power Factor Correction banks offer unsurpassed safety, ease of operation and performance.

- Modular construction; free standing “MCC style” enclosures up to 350 kVAR per section facilitate future expansion.
- Standard offering available up to 1900kVAR, 600V main lugs or main breaker.
- New dry capacitor element design provides no risk of fluid leakage, no environmental pollution and no need for drip pans.
- Patented HQ protection system in each capacitor element employs an internal, non-replaceable 100kA fuse to safely remove the element from service at end of life.
- Blown fuse indicators are standard.
- Finger-safe dead-front fuse holders, power and control wiring for added safety.
- Capacitor rated contactors are designed specifically for the switching of capacitive currents.
- Patented capacitor pre-charge circuit reduces switching transients, negating the need for air-core reactors.
- State-of-the-art microprocessor controller offers automatic C/K ratio selection, CT polarity retrieval, phase rotation retrieval and more.
- LCD display on controller displays actual PF, alarms, number of steps energized and much more.
- Available in Type 1/12 indoor and 3R outdoor enclosure types.
- Controls are viewable through a safety window.
- Attractive finish: Units are constructed with removable steel panels over a welded steel frame. Indoor units are finished in a medium-blue textured paint finish. ASA 49 and 61 available upon request. Outdoor units are painted ASA 61 as standard.
- Split core control CT included as standard (please state size at time of entering order).
- Built to CSA and UL Standards.

The AV4000 and AV5000 standard Automatic Power Factor Correction banks are ideally suited for centralized power factor correction in applications where plant loading is constantly changing, resulting in the need for varying amounts of reactive power. An advanced microprocessor-based reactive power controller measures plant power factor via a single remote CT (included), and switches capacitor modules in and out of service to maintain a user-selected target power factor.

SQUARE D

GROUPE SCHNEIDER

Federal Pioneer ■ Merlin Gerin ■ Modicon ■ Square D ■ Telemecanique

A body of evidence to support the best:

The new Square D REACTIVAR AV4000 and AV5000 automatic capacitor systems draw on Groupe Schneider's world-wide expertise in capacitor technology:

- The new Square D Varlogic power factor controller is designed to offer unsurpassed functionality, reliability and simplicity of use.
- Merlin Gerin Varplus M capacitors offer proven reliability and unsurpassed safety.
- Telemecanique LC1D.K contactors are specifically designed for the purpose of capacitor switching.
- Finished units are constructed with finger-safe terminals, all copper bus, power and control wiring, field modularity and an attractive, ergonomic design.

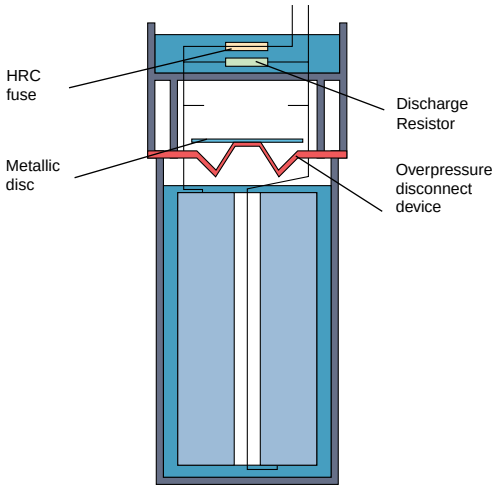
In addition to superior quality, reliability and ease of operation, we offer a commitment to customer service, application engineering and after sales support. In fewer words, we offer the quality and support that you've come to expect from Square D.

Advanced controller offers user-friendly interface:

With its ergonomic design, the new Square D Varlogic power factor controller offers sophisticated electronic interface to facilitate ease of set-up, installation and control.

New advanced features make commissioning and operation simple:

- Automatic C/K ratio selection.
- Automatic CT polarity retrieval.
- Automatic phase rotation polarity detection.
- Manual operation with automatic return.
- Automatic no-voltage release and automatic staged reconnection
- Alarm relay and indication for: low power factor, hunting, abnormal PF, leading PF, frequency not detected, overcurrent, overvoltage, overtemperature, excessive voltage THD, capacitor overload and loss of capacitance.
- Integral alphanumeric LCD display with graphical symbols includes display of: power factor, steps energized, step reconnection delay, real and reactive currents, voltage THD, alarm codes and more.



Heavy duty performance and unsurpassed safety

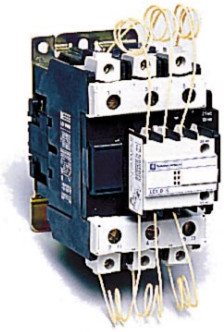
Merlin Gerin Varplus M capacitors have a unique patented design that has been in service for over 10 years on several million elements around the world. Advances in materials and design provide reliability, safety and longevity unsurpassed in the industry:

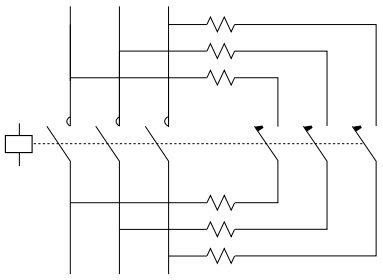
- The HQ (High Quality) protection system provides protection against two types of end-of-life faults: High current faults are protected by an HRC cartridge fuse, low current faults are protected by a combination of the overpressure disconnect device and the HRC fuse.
- The self-healing metalized polypropylene film elements require no gas or liquid impregnation meaning they are completely environmentally safe.
- H Type cells used as standard are designed for the rigors of today's harmonic rich networks: Elements for 480V networks are rated 590V +10% overvoltage; Elements for 600 V networks are rated 690V +10% overvoltage.
- The unique cell design encapsulates the elements in a polyphenylene plastic housing mounted on a moulded polycarbonate plastic base. The plastic materials virtually eliminate the chances of ground faults originating from the cells. Furthermore, the design of the cells leads to better heat dissipation resulting in cooler operation and longer life.

Task-specific Contactors:

Telemecanique LC1D.K contactors were designed specifically for the demands of capacitor switching. Standard NEMA or IEC contactors must be de-rated for capacitive switching. In addition to proven reliability, the LC1D.K contactor provides safety and durability for the entire bank:

- 100% rated for capacitor switching.
- A patented resistive pre-charge circuit operates from an auxiliary set of contacts to pre-charge the capacitor element just prior to main contact closure. This circuit reduces damaging switching transients more effectively than air core reactors. Reducing switching transients lessens the chance of disrupting sensitive equipment such as variable frequency drives. Furthermore, the reduced inrush current helps to extend the life of the capacitor elements.
- Extra NC auxiliary contact supplied as standard.





Modular construction with safety in mind:

The Varlogic controller is flush mounted on a hinged plate which provides protection and access to a heavy duty control transformer with dual primary HRC fusing, single time-delay secondary fusing and a UL/CSA listed Class “A” resettable ground fault protection breaker.

Capacitor blocks are mounted on a modular plate and wired to HRC dead-front fuse holders and Telemecanique LC1D.K contactors. The entire assembly can be installed in minutes, facilitating cost effective future expansion. AV4000 units are constructed with up to 200 kVAR. AV5000 systems are constructed with up to 350 kVAR per “MCC style” section. For larger AV5000 systems, additional sections are added. Standard cubicle features includes:

- Finger-safe power and control wiring.
- Dead-front fuse holders with built-in blown fuse indicators, standard.
- All silver flashed copper bussing (AV5000) and all copper power and control wiring (AV4000 and AV5000).
- Lockable two-point flush-mount door latching.
- Cubicles are finished in an attractive medium blue textured polyester paint. The textured paint finish resists dents and scratches and the standard blue color sets the equipment apart (ASA 49 & 61 grey available). Outdoor units are painted ASA 61 as standard.

The benefits are clear:

- Compact design means valuable space savings.
- Modular construction means easy expandability.
- Finger-safe terminals provide safety.
- Removable side panels offer ease of service and maintenance.
- Attractive finish sets the equipment apart.

AV5000 Series◆ Main Lugs or Main Breaker 240 Volt✕ 3 Phase/60Hz Type 1 Enclosure ✣

kVAR Rating■	Steps	kVAR per Step■	Main Lugs		Standard Lugs Provided ■	Main Breaker		Standard Lugs Provided ■	Recommended Minimum Size Protection Rating✳ @240V		Recommended Minimum Cable Ampacity
240V	(Qty x kVAR)	kVAR	Catalogue No.●	Encl.▼	(Qty x AWG)	Catalogue No.●	Encl.▼	(Qty x AWG)	Fuse	Brkr/Trip	135% Rated Current (Amps)
50	2x25	25	AV005025AV2N5N	2	2x1/0-2x350 MCM	BV005025AV2N1N	2	1x#4-1x250 MCM	200	250/200	163
75	3x25	25	AV007525AV2N5N	2	2x1/0-2x350 MCM	BV007525AV2N4N	2	3x2/0-3x300 MCM	300	400/300	245
100	4x25	25	AV010025AV2N5N	2	2x1/0-2x350 MCM	BV010025AV2N4N	2	3x2/0-3x300 MCM	400	400/400	326
125	5x25	25	AV012525AV2N5N	2	2x1/0-2x350 MCM	BV012525AV2N4N	2	3x2/0-3x300 MCM	500	800/500	407
150	6x25	25	AV015025AV2N5N	2	2x1/0-2x350 MCM	BV015025AV2N5N	3	2x1/0-2x350 MCM	600	800/600	489
175	1x25,3x50	25	AV017525CV2N6N	2	2x1/0-2x500 MCM	BV017525CV2N6N	3	2x1/0-2x500 MCM	700	800/700	570
200	2x25,3x50	25	AV020025BV2N7N	3	3x1/0-3x500 MCM	BV020025BV2N6N	3	2x1/0-2x500 MCM	800	800/800	651
225	1x25,4x50	25	AV022525CV2N7N	3	3x1/0-3x500 MCM	BV022525CV2N6N	3	2x1/0-2x500 MCM	900	1200/900	733
250	5x50	50	AV025025AV5N7N	3	3x1/0-3x500 MCM	BV025025AV5N6N	3	2x1/0-2x500 MCM	1000	1200/1000	814
275	1x25,5x50	25	AV027525CV2N7N	3	3x1/0-3x500 MCM	BV027525CV2N7N	3	3x1/0-3x500 MCM	1100	1200/1000	895
300	6x50	50	AV030025AV5N7N	3	3x1/0-3x500 MCM	BV030025AV5N7N	3	3x1/0-3x500 MCM	1200	1200/1200	977

AV5000 Series◆ Main Lugs or Main Breaker 480 Volt 3 Phase/60Hz Type 1 Enclosure ✣

kVAR Rating■	Steps	kVAR per Step■	Main Lugs		Standard Lugs Provided ■	Main Breaker		Standard Lugs Provided ■	Recommended Minimum Size Protection Rating✳ @480V		Recommended Minimum Cable Ampacity
480V	(Qty x kVAR)	kVAR	Catalogue No.●	Encl.▼	(Qty x AWG)	Catalogue No. ●	Encl.▼	(Qty x AWG)	Fuse	Brkr/Trip	135% Rated Current (Amps)
50	2x25	25	AV005045AV2N5N	2	2x1/0-2x350 MCM	BV005045AV2N1N	2	1x#4-1x250 MCM	100	250/90	81
75	1x25,1x50	25	AV007545CV2N5N	2	2x1/0-2x350 MCM	BV007545CV2N1N	2	1x#4-1x250 MCM	150	250/150	122
100	2x25,1x50	25	AV010045BV2N5N	2	2x1/0-2x350 MCM	BV010045BV2N1N	2	1x#4-1x250 MCM	200	250/200	162
125	1x25,2x50	25	AV012545CV2N5N	2	2x1/0-2x350 MCM	BV012545CV2N1N	2	1x#4-1x250 MCM	250	250/225	203
150	3x50	50	AV015045AV5N6N	2	2x1/0-2x500 MCM	BV015045AV5N4N	2	3x2/0-3x300 MCM	300	400/300	243
175	1x25,3x50	25	AV017545CV2N6N	2	2x1/0-2x500 MCM	BV017545CV2N4N	2	3x2/0-3x300 MCM	400	400/350	284
200	4x50	50	AV020045AV5N6N	2	2x1/0-2x500 MCM	BV020045AV5N4N	2	3x2/0-3x300 MCM	400	400/400	324
225	1x25,4x50	25	AV022545CV2N6N	2	2x1/0-2x500 MCM	BV022545CV2N4N	2	3x2/0-3x300 MCM	500	800/500	365
250	5x50	50	AV025045AV5N6N	2	2x1/0-2x500 MCM	BV025045AV5N4N	2	3x2/0-3x300 MCM	500	800/500	405
275	1x25,5x50	25	AV027545CV2N6N	2	2x1/0-2x500 MCM	BV027545CV2N6N	3	2x1/0-2x500 MCM	600	800/500	446
300	6x50	50	AV030045AV5N6N	2	2x1/0-2x500 MCM	BV030045AV5N6N	3	2x1/0-2x500 MCM	600	800/600	486
350	1x50,3x100	50	AV035045CV5N6N	2	2x1/0-2x500 MCM	BV035045CV5N6N	3	2x1/0-2x500 MCM	700	800/700	567
400	2x50,3x100	50	AV040045BV5N6N	3	2x1/0-2x500 MCM	BV040045BV5N6N	3	2x1/0-2x500 MCM	800	800/800	648
450	1x50,4x100	50	AV045045CV5N6N	3	2x1/0-2x500 MCM	BV045045CV5N6N	3	2x1/0-2x500 MCM	900	1200/900	729
500	2x50,4x100	50	AV050045BV5N7N	3	3x1/0-3x500 MCM	BV050045BV5N7N	3	3x1/0-3x500 MCM	1000	1200/900	810
550	1x50,5x100	50	AV055045CV5N7N	3	3x1/0-3x500 MCM	BV055045CV5N7N	3	3x1/0-3x500 MCM	1100	1200/1000	891
600	6x100	100	AV060045AV8N7N	3	3x1/0-3x500 MCM	BV060045AV8N7N	3	3x1/0-3x500 MCM	1200	1200/1200	972

AV5000 Series◆ Main Lugs or Main Breaker 600 Volt 3 Phase/60Hz Type 1 Enclosure ✣

kVAR Rating■	Steps	kVAR per Step■	Main Lugs		Standard Lugs Provided ■	Main Breaker		Standard Lugs Provided ■	Recommended Minimum Size Protection Rating✳ @600V		Recommended Minimum Cable Ampacity
600V	(Qty x kVAR)	kVAR	Catalogue No.●	Encl.▼	(Qty x AWG)	Catalogue No.●	Encl.▼	(Qty x AWG)	Fuse	Brkr/Trip	135% Rated Current (Amps)
50	2x25	25	AV005065AV2N5N	2	2x1/0-2x350 MCM	BV005065AV2N1N	2	1x#4-1x250 MCM	100	250/90	65
75	1x25,1x50	25	AV007565CV2N5N	2	2x1/0-2x350 MCM	BV007565CV2N1N	2	1x#4-1x250 MCM	150	250/125	98
100	2x25,1x50	25	AV010065BV2N5N	2	2x1/0-2x350 MCM	BV010065BV2N1N	2	1x#4-1x250 MCM	200	250/150	130
125	1x25,2x50	25	AV012565CV2N5N	2	2x1/0-2x350 MCM	BV012565CV2N1N	2	1x#4-1x250 MCM	200	250/200	163
150	3x50	50	AV015065AV5N6N	2	2x1/0-2x500 MCM	BV015065AV5N4N	2	3x2/0-3x300 MCM	250	400/225	195
175	1x25,3x50	25	AV017565CV2N6N	2	2x1/0-2x500 MCM	BV017565CV2N4N	2	3x2/0-3x300 MCM	300	400/300	228
200	4x50	50	AV020065AV5N6N	2	2x1/0-2x500 MCM	BV020065AV5N4N	2	3x2/0-3x300 MCM	400	400/300	260
225	1x25,4x50	25	AV022565CV2N6N	2	2x1/0-2x500 MCM	BV022565CV2N4N	2	3x2/0-3x300 MCM	400	400/350	293
250	5x50	50	AV025065AV5N6N	2	2x1/0-2x500 MCM	BV025065AV5N4N	2	3x2/0-3x300 MCM	400	400/400	325
275	1x25,5x50	25	AV027565CV2N6N	2	2x1/0-2x500 MCM	BV027565CV2N6N	3	2x1/0-2x500 MCM	500	400/400	358
300	6x50	50	AV030065AV5N6N	2	2x1/0-2x500 MCM	BV030065AV5N6N	3	2x1/0-2x500 MCM	500	800/500	390
350	1x50,3x100	50	AV035065CV5N6N	2	2x1/0-2x500 MCM	BV035065CV5N6N	3	2x1/0-2x500 MCM	600	800/600	455
400	2x50,3x100	50	AV040065BV5N6N	3	2x1/0-2x500 MCM	BV040065BV5N6N	3	2x1/0-2x500 MCM	700	800/600	520
450	1x50,4x100	50	AV045065CV5N6N	3	2x1/0-2x500 MCM	BV045065CV5N6N	3	2x1/0-2x500 MCM	800	800/700	585
500	2x50,4x100	50	AV050065BV5N7N	3	3x1/0-3x500 MCM	BV050065BV5N7N	3	3x1/0-3x500 MCM	800	800/800	650
550	1x50,5x100	50	AV055065CV5N7N	3	3x1/0-3x500 MCM	BV055065CV5N7N	3	3x1/0-3x500 MCM	900	800/800	715
600	6x100	100	AV060065AV8N7N	3	3x1/0-3x500 MCM	BV060065AV8N7N	3	3x1/0-3x500 MCM	1000	1200/900	780

✕ For 208 Volt applications, the effective kVAR rating at 208 Volts is 0.75 times the kVAR rating at 240 Volts.
◆ A single remote Current Transformer (included) must be located on the bus/cable at the main service entrance terminal compartment. **CT included in price. Specify CT ratio at time of order.**
● Top entry is standard. For bottom entry, consult your nearest Square D/Groupe Schneider sales office.
▼ For dimensions, see next page.
✳ Consult local Electrical Codes for proper sizing of Moulded Case Circuit Breakers and Disconnect Switches.
✣ Type 3R and 12 enclosures available. Consult your nearest Square D/Groupe Schneider sales office.
■ For additional sizes, ratings or options, please consult your nearest Square D/Groupe Schneider sales office.

Compact Design for Smaller Applications.

All the features but two-thirds the size of the AV5000, the AV4000 is ideal for smaller applications. The major difference between the AV4000 and AV5000 is expandability. For applications up to 200 kVAR (main lugs, Type 1 only), where expandability is not a factor, the AV4000 offers all the features of the AV5000 in a more compact, cost effective size.

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AV4000 Series **Main Lugs Only** **480 Volt 3 Phase/60Hz** **Type 1 Enclosure ◆**

kVAR Rating■	Steps	kVAR per Step■	Main Lugs		Standard Lugs Provided ■	Recommended Minimum Size Protection Rating✳ @480V		Recommended Minimum Cable Ampacity
480V	(Qty x kVAR)	kVAR	Catalogue No.●	Encl.▼	(Qty x AWG)	Fuse	Brkr/Trip	135% Rated Current (Amps)
50	2x25	25	AV005044AV2NPN	1	2x#4-2x500 MCM	100	250/90	81
75	1x25,1x50	25	AV007544CV2NPN	1	2x#4-2x500 MCM	150	250/150	122
100	2x25,1x50	25	AV010044BV2NPN	1	2x#4-2x500 MCM	200	250/200	162
125	1x25,2x50	25	AV012544CV2NPN	1	2x#4-2x500 MCM	250	250/225	203
150	2x25,2x50	25	AV015044BV2NPN	1	2x#4-2x500 MCM	300	400/300	243
175	1x25,3x50	25	AV017544CV2NPN	1	2x#4-2x500 MCM	400	400/350	284
200	4x50	50	AV020044AV5NPN	1	2x#4-2x500 MCM	400	400/400	324

AV4000 Series **Main Lugs Only** **600 Volt 3 Phase/60Hz** **Type 1 Enclosure ◆**

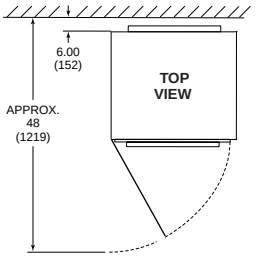
kVAR Rating■	Steps	kVAR per Step■	Main Lugs		Standard Lugs Provided ■	Recommended Minimum Size Protection Rating✳ @600V		Recommended Minimum Cable Ampacity
600V	(Qty x kVAR)	kVAR	Catalogue No.●	Encl.▼	(Qty x AWG)	Fuse	Brkr/Trip	135% Rated Current (Amps)
50	2x25	25	AV005064AV2NPN	1	2x#4-2x500 MCM	100	250/90	65
75	1x25,1x50	25	AV007564CV2NPN	1	2x#4-2x500 MCM	150	250/125	98
100	2x25,1x50	25	AV010064BV2NPN	1	2x#4-2x500 MCM	200	250/150	130
125	1x25,2x50	25	AV012564CV2NPN	1	2x#4-2x500 MCM	200	250/200	163
150	2x25,2x50	25	AV015064BV2NPN	1	2x#4-2x500 MCM	250	400/225	195
175	1x25,3x50	25	AV017564CV2NPN	1	2x#4-2x500 MCM	300	400/300	228
200	4x50	50	AV020064AV5NPN	1	2x#4-2x500 MCM	400	400/300	260

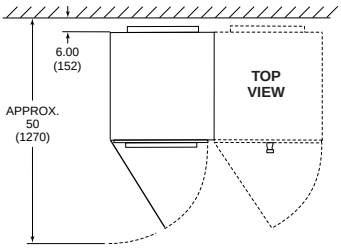
◆ A single remote Current Transformer (included) must be located on the bus/cable at the main service entrance terminal compartment. **CT included in price. Specify CT ratio at time of order.**
● Top entry is standard. For bottom entry, consult your nearest Square D/Groupe Schneider sales office.
▼ For dimensions, see below.
✳ Consult local Electrical Codes for proper sizing of Moulded Case Circuit Breakers and Disconnect Switches.
■ For additional sizes, ratings or options, please consult your nearest Square D/Groupe Schneider sales office.

Dimensions ✘

Type	Encl.	Fig.	Sections	Dimensions "B" (width)	
				IN	(mm)
AV4000	1	1	1	23.5	597
AV5000	2	2	1	23.5	597
	3	2	2	47.0	1194

✘ Dimensions are approximate only. Do not use for construction. For actual dimensions, contact your local Square D/Groupe Schneider sales office.





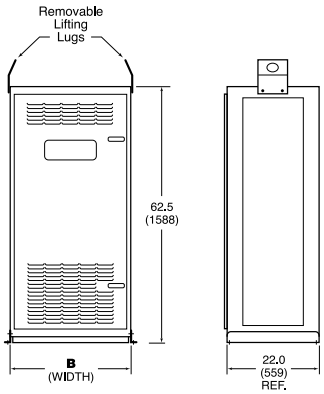


Fig. 1: AV4000 Dimensions

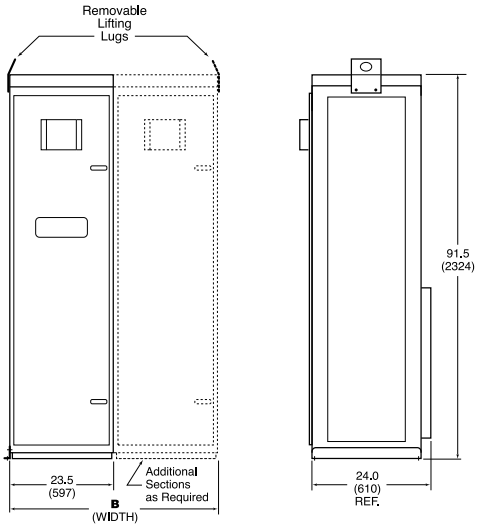


Fig. 2: AV5000 Dimensions

Other products and services:

- ■ REACTIVAR low voltage Fixed Capacitors
- ■ AV6000 Anti-resonant bank for power factor correction in harmonic-rich environments.
- ■ AV7000 Harmonic filters for removal of harmonics
- ■ Active (electronic) filters
- ■ AV8000 and AV9000 Real Time Reactive Compensation banks and filters for highly transient loads.
- ■ Medium voltage fixed and automatic switched banks up to 37 kV
- ■ Medium voltage Real Time Compensation Banks up to 15 kV
- ■ Engineering services such as:
- - Size and rating assistance
- - Harmonic analysis
- - Computer simulations
- - Commissioning
- - Service contracts

Consult your nearest Square D/Groupe Schneider sales office for pricing.

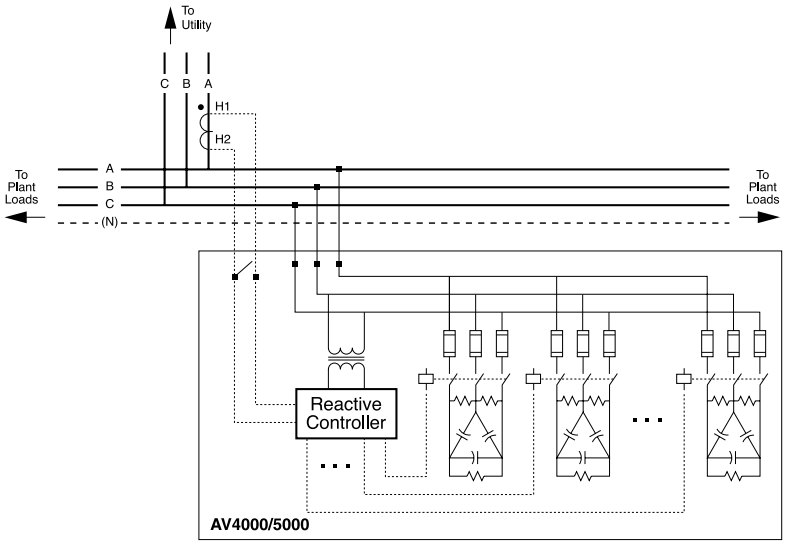
Application Note:

All capacitors are a low impedance path for harmonic currents produced by non-linear loads such as variable frequency drives, motor soft-starters, welders, computers, PLC's, robotics and other electronic equipment. These harmonic currents can be drawn into the capacitor bank causing it to overheat, shortening it's life and possibly preventing proper operation. Furthermore, the resonant circuit formed by shunt capacitors coupled with system inductance's (transformers and motors) can magnify harmonic currents and voltages which can cause nuisance fuse operation and/or damage electrical equipment. Should your electrical system contain any non-linear loads, please contact Square D/Groupe Schneider for application assistance. For applications which require power factor correction in harmonic-rich environments, substitute the AV6000 Anti-resonant automatic capacitor bank. Consult Square D/Groupe Schneider for more information.

Available Options	AV4000	AV5000
Silver flashed copper bus	N/A	■
Copper power and control wiring	■	■
Heavy duty capacitor elements	■	■
Heavy duty control transformer w/ Class A GFI	■	■
Finger safe control & power wiring	■	■
Advanced 12 step controller	■	■
C/W:Digital display incl. power factor meter	■	■
Automatic commissioning incl. auto C/K selection	■	■
Comprehensive alarms	■	■
Blown fuse indicators	■	■
Capacitor soft precharge circuit	■	■
Main lugs	■	■
Main breaker	N/A	O
Top entry	■	■
Bottom or side entry	N/A	O
Precaution blue paint	■	■
ASA 49 or 61 paint	O	O
Type 1 enclosure	■	■
Type 12 & 3R enclosure	N/A	O
Powerlogic circuit monitor	N/A	O
Special control arrangements	N/A	O
Other voltages or frequencies	N/A	O
Other staging ratio's	O	O
Fixed stages	O	O

■ Standard feature
O Available option
N/A Not available

Wiring Diagram



Specifications are subject to change without notice.

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