

C1000 Series Automatic Cap Bank Metal Enclosed - Medium Voltage



Capacitors Assemblies “Fixed / Auto”

Medium Voltage

5, 15, 25 and 35 kV Class

Customized to your specifications



Metal Enclosed

- Industrial Assemblies
- Utility Assemblies
- Pad Mount Assemblies
- Custom Designed

The Reactive Power Solution

Gentec Capacitor **C1000** Assemblies provide automatic control of main bus power factor, reduce demand on substation transformers, improve main bus voltage and eliminate poor power factor rate penalties.

Compact and versatile, Gentec capacitor assemblies are specifically designed to meet the stringent reliability requirements of the main plant substation and distribution system. They also offer improved economy, ease of maintenance and simplified operation.

Additionally, Gentec assemblies can be customized to meet your specifications. Gentec provides the most compact and cost effective capacitor assemblies available.

Each assembly is a complete power factor correction unit, completely factory tested and assembled prior to shipment. The unit is shipped ready for installation and start-up requiring the user to simply set it in place connect the incoming line, control voltage and CT signal circuits and adjust the settings to the power factor controller.

TECHNICAL DATA - C1000 Series

Rated Voltage / Phase	5 kV to 25 kV / 3 phases
Rated Frequency	50 Hz or 60 Hz
Rated Power	20 to 12000 kVAR
Power Factor Controller	12 steps N12 or NC12
Insulation Level	60-95-125 kV BIL
Power Losses	0.5 w/kVAR
Continuous Overvoltage	110 %
Continuous Overcurrent	135 %
Mounting Type	Floor Mounting Bracket
Enclosure Type	Indoor and outdoor
Temperature Class	-40 °C to 55 °C
o Average 24h:	+ 45 °C
Color	ASA 61 (Light Grey)
Construction Standard	UL, CSA, IEC

Standard Components

Gentec **C1000** provides the following items as standard components on all 5 to 25 kV Capacitor Assemblies.

Power Capacitors

Gentec utilizes single-phase, with single or double bushing power capacitors of welded stainless steel construction with non-PCB dielectric fluid with internal discharge resistors. The capacitors are mounted directly behind hinged access doors for complete visual inspection. The capacitor mounting frame allows individual capacitors to be removed easily, without disturbing adjacent units, by simply removing the lower bolted access panel and tilting the capacitors forward.

Individual Capacitor Fuses

The capacitors can be individually protected by non-expulsion, capacitor-rated, current limiting fuses with blown fuse pop-up indicators. The individual capacitor fuses are firmly mounted directly to the top of the capacitor bushings (capacitors with internal fuse design are also available with no fuses configuration).

Oil or Vacuum Contactor

The 5 kV assemblies use a 5 kV, 200 & 400 A continuous (thermal), 60kV BIL, 3-Pole, electrically-operated switches rated for capacitor switching duty.

The 15 and 25 kV assemblies use 3, 15 kV, 200 A continuous 95 and 125 kV BIL, single pole electrically-operated vacuum switches and motor operated for oil type. All are rated for capacitor switching duty.

The oil or vacuum contactors are located directly behind a hinged access door to allow for inspection. The vacuum contactors can be accessed or uncounted by removing the contactor mounting bolts and the bolted upper access panel.

On occasion, the vacuum contactors in 15 kV assemblies may be replaced with three, 15 kV, single-phase oil switches if space is available.

Note: Maximum symmetrical short circuit current must be known. Current limiting fuses may be necessary to protect the vacuum contactor from high short circuit currents in excess of 6 kA.

Group Fuses

When required (with external fuse capacitor design), the group fuses provided are the current limiting, non-expulsion, clip-style type which can provide overall short circuit protection for the entire capacitor bank. Located behind the hinged access doors of the incoming section, the group fuses serve as a means of isolating the entire bank (as well as increasing the contactor fault close rating to 55 kA on 5 kV capacitor assemblies).

Damping reactor

When required, inrush limiting inductors are provided to limit the high frequency inrush current resulting from energization of the capacitor step under back-to-back switching conditions.

Main Bus

Used in multiple step banks to feed the individual enclosure modules from the incoming line section. The main bus is insulated has full round-edges, electrical-grade copper bar with 60 kV BIL at 5 kV and 95 kV BIL at 15 kV support insulators.

Ground Bus

All capacitors assemblies are furnished with a ¼" x 2", round-edge, electrical grade copper bus extending the length of the bank with provisions for the user ground lug attachments inside both end modules.

Ground Switch

A ground switch is provided as a convenient means to ensure that all stored energy has been discharged from the capacitors while providing maximum safety. The manually operated ground switch, with padlock able handle is key interlocked with the incoming line disconnect and compartment doors to ensure proper sequence of operation.

Enclosures

The Gentec **C1000** Series Enclosures provide a long-lasting corrosion and weather resistant finish with an aesthetic appearance.

The enclosures are easily and readily accessible by simply removing front and rear or by opening the front and rear access doors. Door stops limit door swing to 130° and prevent accidental closure.

The enclosure provides housing ruggedness, durability and an attractive appearance, with minimal maintenance through the use of #11-gauge formed sheet steel. The enclosures are welded construction.

While there are numerous colors from which to choose, standard colors are ANSI No. 61-Light Gray for indoor assemblies and ANSI No. 24-Dark Gray for outdoors units. The 4-inch structural steel base is painted with a paint to prevent corrosion.

The enclosures are equipped with four (4) removable lifting lugs.

Other features include:

- Hardware which cannot be removed externally
- Three-point latching on all doors with single or double door entry
- Baffled vent panels (outdoor units only) which provide protection against forced entry of foreign objects, weather elements or wildlife
- Optional pent ahead bolts for additional access restriction
- Provides adequate space for numerous component configurations

Available Options:

Gentec will customize standard capacitor assemblies to fit your specifications.

The following is a list of available options for Capacitor Assemblies.

Incoming Line Options

- Bottom or top cable entry
- Bus pad, lugs or cable terminators

- Roof bushing entry (requires special enclosure)
- Bushing wells
- Bank disconnect, 3 single-pole hook-stick
- Bank disconnect, group-operated
- Bank fuse, disconnect and non-disconnect style mounting
- Control / potential transformer (with primary CLF)
- Current transformer

Enclosure Options

- External NEMA-rated control cabinet
- Auxiliary control section (part of main enclosure)
- Remote control cabinet mounting
- Vented panels
- Vent fans
- Key interlock scheme

Control Options

- VAR sensing control (hand-off-auto)
- Manual control (on-off)
- Solid-state power factor control
- Voltage or current control
- Control cabinet lights and receptacles
- Blown fuse alarm system
- Programmable controller
- Custom micro-processor control

Harmonic Filter Systems

Custom engineered harmonic filter systems are available to assure a constant level of power quality. Incorporating reactors in series with capacitors will detune or lower the frequency of resonance, assuring efficient capacitor operation.

Power factor correction capacitors may be subject to overloading (blown fuse) or failure, due to excessive current and voltage, created by harmonics.

A reliable, cost effective solution is to install a harmonic filter system.

- Application Engineered
- Iron Core and Air Core Reactors
- Large Inrush Requirements

Industrial Capacitor Assemblies

When economy of space is a prime concern, Gentec offers Capacitors Assemblies from 5 kV through 25 kV.

The unique Industrial Cap configuration provides a more compact design with multiple step banks. The assembly does not require rear access and can be installed on or next to a wall.

Utilizing the same components as standard assemblies, Industrial Capacitors units provide automatic power factor correction for 3 phase, 3 or 4 wire, resistance-grounded, grounded, ungrounded, 60 Hz systems.

Each assembly is manufactured in strict accordance with applicable ANSI, IEEE, and NEMA standards. All capacitors are completely built and tested prior to shipment.

Space Saver Capacitor assemblies are completely metal enclosed with durable, 11-ga. steel housings. A hinged access door provides front access to all components. Corrosion and tamper resistant construction with 3-point latching system and pad lockable handles insure safety and security in all indoor and outdoor applications.

Industrial Cap units are available in "fixed" kVAR manual switching and automatic switching (multi-step) configurations.



Vertical Stack Capacitor Assemblies (Utility)

For constant large capacitance requirements, offers Vertical Stack Capacitor Assemblies.

The vertical capacitor configuration reduces metal enclosed unit sizes to a minimum while allowing for higher system ratings with single bank mega VAR capacity.

Corrosion and weather resistant 11-ga. formed sheet steel enclosure provides durable protection for all components. Tamper resistant construction with 3-point latching system with padlockable handles is standard to minimize unauthorized entry. Key interlock systems provide additional operator safety... Hinged front panel provides easy access to all components for maintenance or inspection.

Each assembly is factory built and tested before actual installation on site. Applicable ANSI, IEEE, and NEMA standards are followed in the design, manufacture and testing of the capacitor assembly.

Vertical Stack units may include circuit breakers, special reactors, relay arrangements, and unique design construction, depending on the utility requirements. Vertical Stack Capacitor Assemblies are generally customized to meet you specific requirements and are available from 5 kV through 25 kV for indoor and outdoor applications.



Reactive Power	C1000 Series					Option (s) **				Fig #
	Basic Part. #	System Voltage	Reactive kvar	No step	Step / Kvar	Type 1, 12, 3R	Protection Device	Blown Fuse Ind.	System Interlock	
Kvar	+ -->	Suffix	Suffix	Suffix	Suffix	Suffix	Suffix	Suffix	Suffix	
1200	C1000	4160	1200	1	1200	1	B	BFI	KK	1
4800	C1000	12470	4800	8	600	1	B	BFI	KK	2
6000	C1000	13200	6000	3	2000	1	B	BFI	KK	2
9000	C1000	13800	9000			1	B	BFI	KK	2
12000	C1000	25000	12000			1	B	BFI	KK	2
***	C1000	***	***	***	***	**	**	**	**	***
No ...	1	2	3	4	5	6	7	8	9	
	C1000	4160	2400	4	600	1	B	BFI	KK	

*** Contact Factory OTHERS configuration are available on request (No cost extra)

1	C1000 Series for Standard HV Automatic Power Factor Correction
2	
3	Total Reactive Power ___ Kvar
4	
5	Increment of ___ Kvar / step
6	
7	Option : B : Breaker LB : Loadbreak Switch G : Ground Switch
8	
9	

Model NC12



VAR Controller

