

# Detuned Automatic Power Factor Capacitor Bank

SERIES **FT100**

**Do you need power factor correction?** Gentec's automatic capacitor bank will take care of it for you.

**Harmonics?** Our FT100 detuned capacitor bank is made for harmonics rich environment. Your bank will be protected no matter what.



## ADVANTAGES OF THE GENTEC'S SOLUTION

- Rugged design with over 30 year of on field operation
- High end HMI touchscreen with energy monitoring capability
- Thin plated bus bar instead of cheaper fuse block to achieve greater mechanical strength and lower hot spot possibility
- High quality capacitor and reactor specifically design for harmonic rich environment
- Application specific contactor and fuse

## PRINCIPLE OF OPERATION

In systems where harmonics are present, power factor correction should be done by means of detuned filters. These consist of capacitors and reactors connected in series, and are capable of compensating reactive power at fundamental frequency without amplifying the harmonics.

Capacitor capacitance and network inductance may form a parallel resonant circuit where harmonic currents may reach as high as 20 times the normal level. Should the tuned frequency of the resonant circuit match an existing harmonic frequency, the current distortion caused by resonance leads to further voltage distortion. This is why power factor correction can be affected by harmonic network content.

## TECHNICAL APPLICATION

If harmonic filters are being considered only for the purpose of power factor correction, then a detuned filter bank is the best choice. This filter will do little for removing any harmonic distortion present on the system but will allow the installation of a large capacitor bank without any adverse system interactions. Detuned filter banks are less costly and are more reliable than partially detuned and tuned filter banks. The anti-resonant frequency should be considered to assure that it does not fall near the 3rd harmonic.

When the resonant frequency of the series resonant filter circuit is tuned to a frequency lower than the harmonic occurring in the system, the filter circuit is termed as detuned filter. The harmonics that would mostly be generated are 5th, 7th, 11th and 13th and so on. The lowest harmonic frequency which would occur in the system is the fifth harmonic i.e. 300 Hz. If the series resonant circuit is tuned to a frequency of 246 Hz, then at all the harmonic frequencies the filter acts as an inductive component and the possibility of resonance at the fifth harmonic is eliminated.

The impedance offered to the 5th harmonic signal is less than the capacitor alone. This means that the series resonant filter will absorb the 5th harmonic to a certain extent.

The reactor to capacitance ratio  $p(\%)$  reflects the ratio of reactor reactance to capacitor reactance at fundamental frequency. The resonant frequency of the series resonant filter circuit is indicated indirectly by  $p$ .

## KEY FEATURES

### PROGRAMMABLE CONTROLLER

FT100 capacitor bank are provided with the most up to date power factor controller on the market.

- Advanced control sequence
- Real time clock to track and logs alarms and events,
- Modbus connectivity
- Individual phase measurement and energy calculation
- Touch screen interface with color display

### DESIGN SPECIFIC COMPONENTS

Capacitor used in our detuned bank are design specifically to work in pair with the reactor. This ensure that tuning frequency will be precisely reached and that capacitor kVAR value will be exactly what it is supposed to be. Reactors, contactors and fuses are also designed specifically for this type of application.

### BUS BAR CONNECTIONS

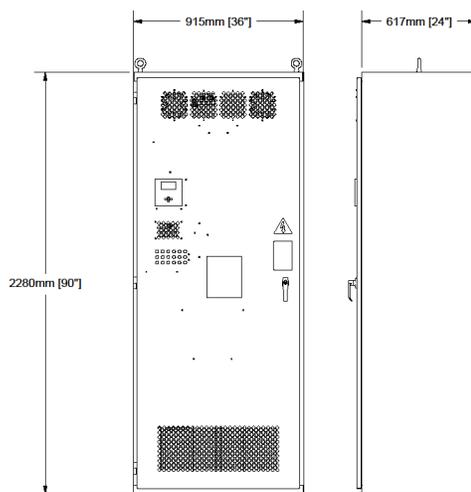
Gentec's design incorporate bus bar connectivity instead of terminal and fuses block. This mean higher quality, cleaner assembly and less possibility of having electrical hot spots.

## SPECIFICATIONS

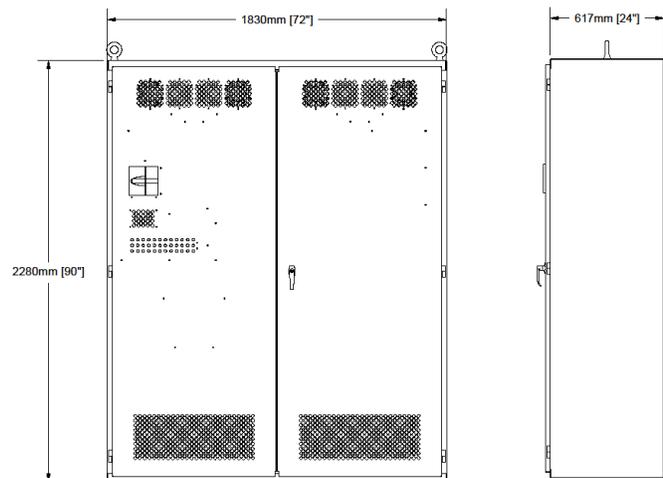
MAIN SPECIFICATIONS	FT100
AC voltage inputs	600 or 480 VAC
kVAR output	50 to 1200 kVAR
Capacitor steps	Up to 12
Internal wiring	Tew 90°C
Bus bar bracing (SCCR rating)	65kA
Step fuse type	HRC 200kA (Capacitor specific)
Cable entry	From top
Interface	Touch screen HMI with color display
Communication	Modbus TCP
Dust protection	Dust filter changeable from the outside of the enclosure (*when equipped with)
Enclosure paint	ASA61 Grey
Enclosure size	4 steps: 90"x36"x24" 8 steps: 90"x72"x24" <i>*One of each is used when 12 steps are required</i>
Certification	CSA 22.2 certified as per requirement from CSA 22.2 No 14-10, CSA 22.2 No 190 and UL Std 508A.

Optional items	
Connectivity	Modbus RTU, BACnet/IP
Incoming protection	Main circuit breaker, fused or non-fused disconnect switch
Control circuit protection	Resettable Class A ground fault breaker
Internal wiring	Tew 105°C
Blown fuse indication	Door mounbted LED indicators with push to test button
Nema rating	Available in NEMA1, NEMA12, NEMA3R and NEMA12 <i>*Sprinkler proof models available</i>

### PHYSICAL LAYOUT AND DIMENSIONS – 4 STEPS BANK



### PHYSICAL LAYOUT AND DIMENSIONS – 8 STEPS BANK



MODEL NUMBER						
Base model	System voltage (V)	Reactive power (kVAR)	Step quantity	Nema type	Incoming protection	Blown fuse indicator
FT100	600 480	50 to 1200	1 à 12	1, 12, 3R, 4X	Circuit breaker = B Switch disconnect = SD Fused switch disconnect = FD	Without = - With = BFI
Example: FT100-600-800-8-3R-FD-BFI						

Since 1959, Gentec is specialized in custom cutting edge technology electronic and electrical products development. Our sustained effort to exceed utility requirements is one of the reasons why our ingenious and robust solutions are renowned around the world. We are constantly looking for getting ahead in the electrical industry trend.

**Gentec is the perfect partner for you!**



## CONTACT INFORMATION

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