



APFCR

Automatic Power Factor Correction Relays

The APFCR controls the automatic system for correction of the power factor. It is a KVAR based controller which controls up to 16 capacitor banks optimally to achieve near unity power factor and also measures/calculates various electrical parameters. APFCR is meant for use in three phase four wire electrical systems based on single phase sensing. The main features of the APFCR are:

Measurement

Need voltage input from any phase & neutral. Need a CT input from the mains as well as from Capacitor Bank (for VAR mode operation) APFCR displays Volt, Amps, three phase KVAR, Need KVAR, THD & up to 7th Individual harmonics for Voltage & Current.

Ease of installation

CT primary of Mains as well as Capacitor and target PF are site programmable. APFCR has an auto sense feature, which sense the sizes of the capacitor banks connected on each stage automatically with capacitor CT. No need to program bank sizes manually.

Low current operation

In FIFO/SFIFO control, operation requires 1% to 5% of the main load based on programming mode configuration.

Control Action

APFCR supports setting of target PF on lag as well lead side for all Type of Control action. Out of all supported control action, VAR is intelligent control action. Target PF value is just used to calculate the capacitive VAR required to be added/removed to achieve the desired PF. e.g. If the target PF is unity, means that the target VAR in the system is zero. If system KVAR is 200 lagging, then the controller needs to add 200 KVAR of capacitor banks to reach zero VAR.

The calculation of the reactive power in the system is done by taking instantaneous samples of all voltage and current waveforms, in all four quadrants. These values are then subjected to DSP techniques to add a frequency independent 90 phase shift to current samples. The product of these voltage and current samples then generate signed VAR value.

VAR controller then takes into calculation the prevailing system KVAR, the prevailing bank KVAR and the bank sizes of each stage, and then switches ON/OFF the combination which is closest to the needed VAR. This assumes a balanced loading of the electrical system. For unbalanced load conditions, ACCUVAR model is re-commended.



TRINITY ENERGY SYSTEMS PVT LTD

386, Savli G.I.D.C. Industrial Estate, Nr. Manjusar, At & Po: Alindra, Tal.: Savli, Dist. Vadodara - 391775 Gujarat, INDIA
Phone: +91-922 800 4452/53/54, Email: info@trinityenergy.co.in | www.trinityenergy.co.in

TECHNICAL SPECIFICATION

Parameter		
Type	Name	Statistics
INPUT	Supply	One Phase and Neutral of 3P4W system
	Voltage	Direct Voltage Input: Up to 300V L-N Burden: 0.5 VA
	Current	Secondary Current Input : 5A or 1A (To be specified at the time of Ordering) CT Ratio : Site Selectable Range of Reading : 5-8000A Burden : <1.0VA Overload : 5A CT = 6A RMS Continuous 1A CT = 1.2A RMS Continuous
	Auxiliary Power Supply	Self Powered from mains. Wide operating voltage SMPS : 80VAC - 300VAC, 45-55Hz
OUTPUT	Relay	Switching Voltage : Max. 250 VAC Switching Power : Max. 1000W Expected Mechanical Life : >10 X 10 ⁶ switching operations Expected Electrical Life : >4 X 10 ⁶ switching operations @(Load=200VAC, Cosφ=0.5)
MEASUREMENT	True RMS Basic Parameters	Voltage
		Accuracy : 0.5% of Reading
		Current
		Accuracy : 0.25% of Reading
MISCELLANEOUS	Dimensions	Capacitor Current
		CT Ratio : Site Selectable Accuracy : 1.0% of Reading
		Power Factor
		Accuracy : 1.0% of Reading (IPFI ≥ 0.5) Range of Reading : 0.05 to 1.00 Lag/ Lead
MISCELLANEOUS	Dimensions	Bezel
		144 X 144 mm
		Panel Cutout
		138 X 138 mm
		Depth of installation
		55 mm
MISCELLANEOUS	Dimensions	Operating temp
		10°C to 50° C
		Weight
		0.730 Kgs (Approx.)
MISCELLANEOUS	Dimensions	Min. Operating Current
		1% or 5% of Main CT Primary in FIFO/SFIFO mode

CONNECTION DIAGRAM

