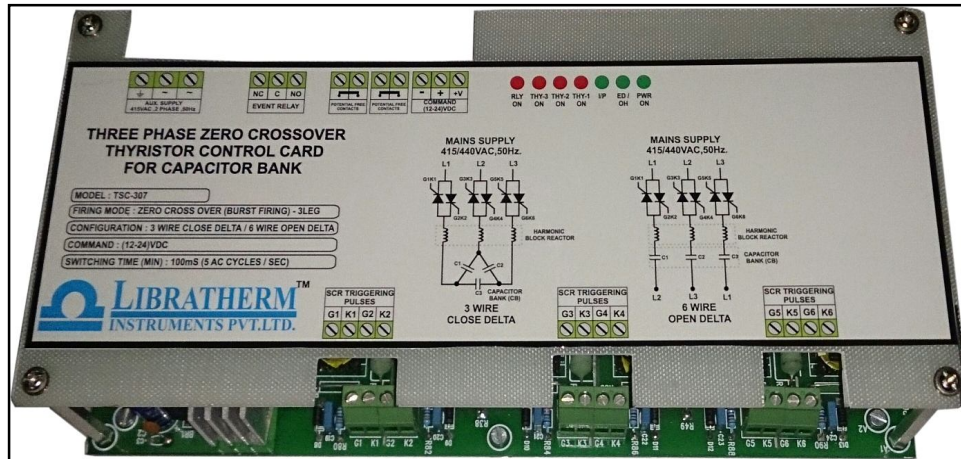


3 phase / 3 leg Zero Cross Over Turn On – Thyristor Switch Card for Capacitor Bank (MODEL: TSC-307)



Description:

Libratherm offers Thyristor Switch Card model **TSC-307**, which has been specially designed for switching power factor correction capacitors in rapid reactive power compensation (up to 10 control commands in one second) in conjunction with fast power factor controllers. This cards generates gate/cathode firing pulses to trigger back to back connected silicon controlled rectifiers (SCRs) or thyristors. The gate/cathode triggering pulses are generated using zero cross over cathodic firing techniques. The 3 sets of gate / cathode pulses (12pusles) are galvanically isolated using the on card ferrite core pulse transformers. Since all three phases are controlled, it is possible to achieve faster switching response compared to 2 leg control.

Each card can simultaneously trigger 3 sets of back to back SCRs or 3 thyristor modules (such as SKKT series of Semikron) to switch 3 phase capacitor banks. TSC-307 accepts control command in the form of relay contact or DC pulse from APFC relay unit. When command is ON, capacitors banks are connected to the power lines and when command is OFF capacitor banks are disconnected.

Each TSC-307 card has the provision to accept 2 external thermostat contacts, which can be used to operate the cooling fan mounted on the heat sinks and to trip the circuit in case of over - heating. On card LED indicates the on/off status of incoming DC power supply, ON/OFF status of capacitor banks and status of heat sink temperature.

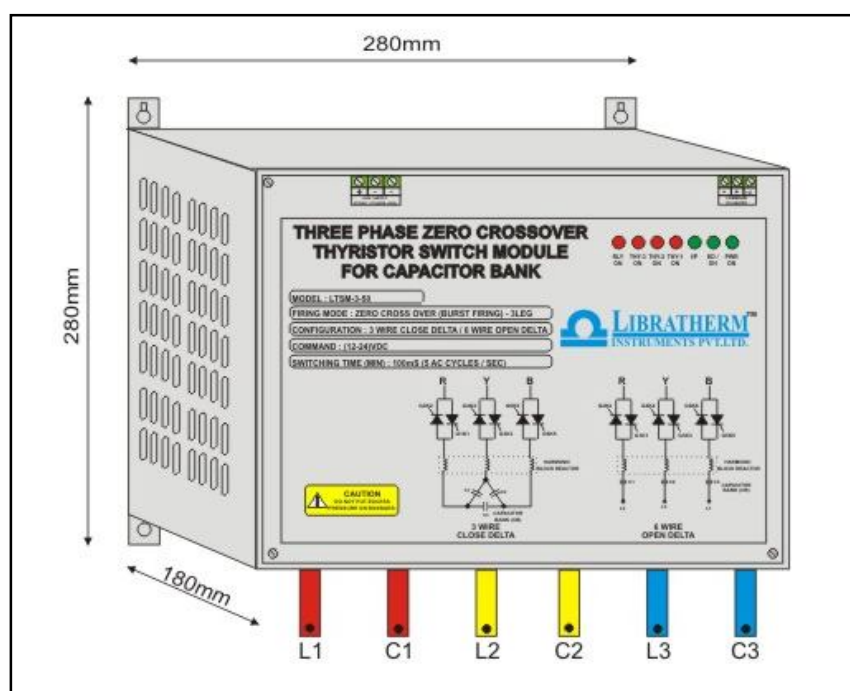
Normally, each of the power factor controllers gives 6 to 12 outputs to select that many capacitor banks of different KVAR depending on the total KVAR demand to maintain the unity power factor. Hence, for each output from APFC it will be required to use 6 to 12 nos. of TSC-307 cards.

The APFC panel builders can use TSC-307 cards as an independent firing card and can wire the SCR modules separately mounted on the heat sink in the panel. The physical isolation of electronic cards and SCR modules makes the overall system safe, reliable and it becomes easy to maintain and service.

Technical Specifications:

Item	Zero cross over SCR Firing Card for 3 phase capacitor bank selection.
Model	TSC-307-S (Stud mounting) and TSC-307-D (DIN rail mounting)
Control Command	12 to 24DC pulse or potential free contact from APFC
Triggering Pulses / Firing Technique	Gate/ Cathode 12 pulses - isolated from the Input – suitable to fire 25A to 500A back to back connected SCRs modules. G1K1+G2K2, G3K3+G4K4 and G5K5+G6K6
Triggering Technique	Guaranteed Zero cross over firing to prevent generation of transients and harmonics during switching action. Firing is automatically synchronized with incoming 3 phase frequency.
Gate Current	Max. 350 mA.
Switching time	Min. 100mS (5 AC cycles @ 50Hz line frequency)
Load Configuration	Single capacitor bank in 3 phase delta configuration or 6 wire open delta configuration or 4 wire single phase star configuration. (Detail wiring diagram as shown below)
Over Temperature Protection	Facility to accept 2 nos. of thermostat input for fan control and trip function.
LED Indications	For Power ON, THY1 ON, THY2 ON, FAN ON, CB ON, Over Temperature.
Aux. Supply Voltage	415VAC (2 phase), 50Hz +/-10%.
Three Phase Line Voltage	110 to 500VAC (Special cards are available for 690/750VAC line supply)
Mounting	Can be easily mounted on the 35 mm DIN rail or on the base plate.
Card Size	250 (l) x 110 (w) x 70 (h) mm. (TSC-307-S) 255 (l) x 115 (w) x 70 (h) mm. (TSC-307-D)

Three phase Thyristor switch module (Proposed ready to use Module LTSM-XX-3):



Application:

Following diagram illustrates – OEM solution for using ZERO CROSS OVER firing card model: TSC-307 for Automatic power factor correction – by selecting the capacitor bank using back to back connected SCRs. One such card will be required for each of the capacitor bank, which can be selected through APFC controller by giving command in the form of relay contacts or DC pulse to this card. TSC-307 cards can be used by APFC panel builders and OEMs. Using this card, one can make their own thyristor switch module for desired KVAR by appropriately choosing SCRs, Heat sinks and RC snubber circuits.

