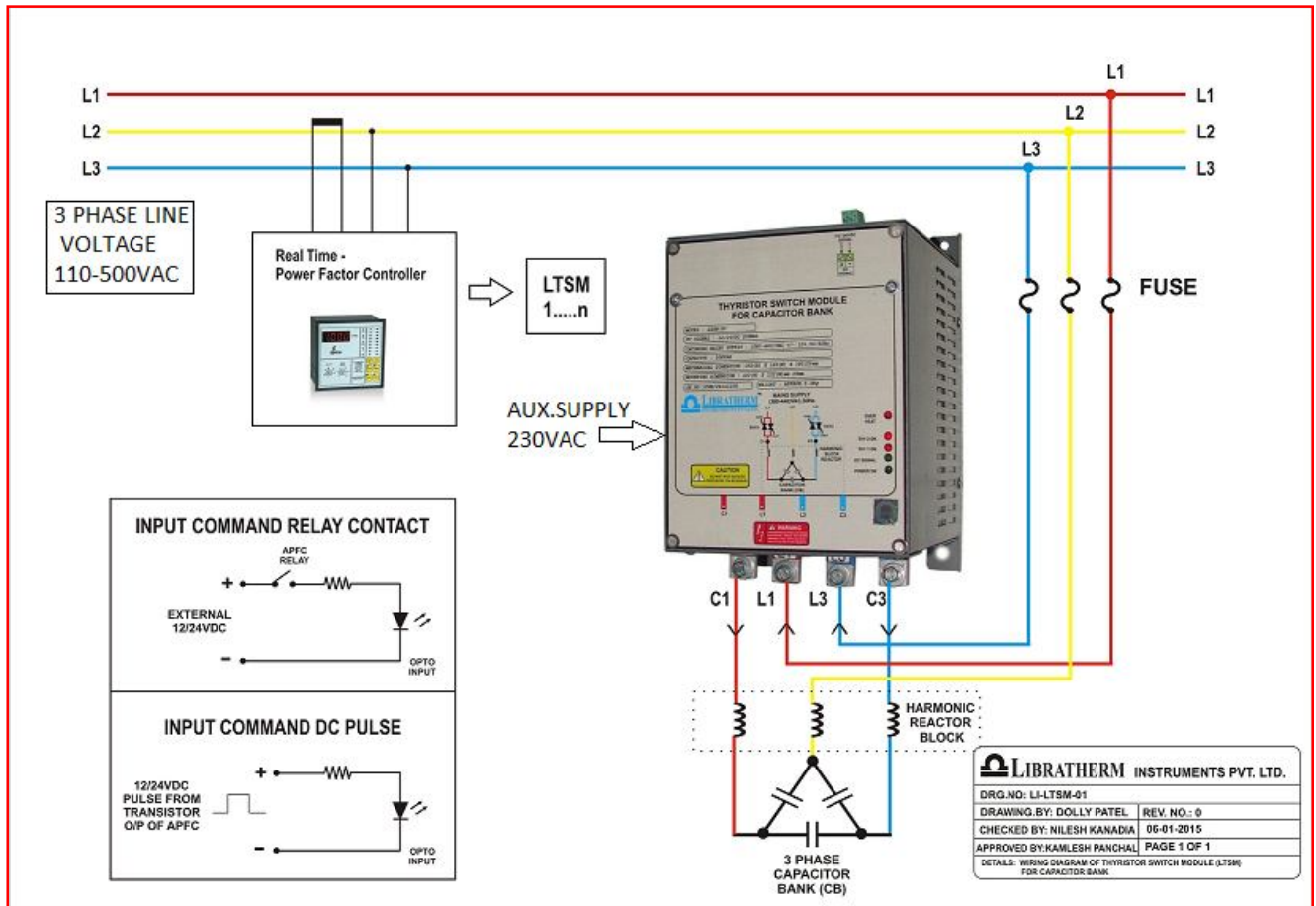


## Libratherm Thyristor Switch Module(LTSM) for Capacitor Bank



**Description:** Libratherm offers Thyristor Switch Module, specially designed for Automatic Power Factor Correction (APFC) applications. In APFC the capacitor banks of suitably rated KVAR are sequentially selected, based on the command from the automatic power factor relay module to maintain the desired power factor (Ratio of KW:KVA) or COS Factor. In conventional method, the number of capacitor banks are selected by switching the contactors connected in series with each capacitor bank. This LTSM module allows the selection of such capacitor banks using thyristors (i.e. Solid state switch). Thyristors being solid state switch, offers many advantages compared to electromechanical contactors.

Libratherm make LTSM modules are available to switch single or 3 phase capacitor banks rated for 5, 10, 15, 25, 50 and 100 KVAR. Zero cross over switching technique is used to turn on and turn off the thyristors connected in series with these capacitor banks. LTSM accepts direct potential free contact command and does not require any external 12 or 24 VDC auxiliary power supply for switching the capacitor banks. This module works on auxiliary supply of 230VAC.

### Advantages of Thyristor switch module over conventional electro-mechanical contactor:

- Since there is no mechanical contacts involved, no arcing and sparking takes place and no audible switching noise is produced.
- Due to zero cross over switching techniques, voltage transients can be controlled within the safe limits.

- c) Using LTSM it is possible to switch the capacitors at 100mS rate, thereby UNITY power factor can be maintained by fast corrections under frequent demand and supply of load variations. Whereas, contactors cannot be switched at the rate of solid state switch.
- d) There are no limitations in number of switching operations for thyristor compared to contactor. Whereas contactors undergo wear and tear over a period.
- e) These LTSM modules are safe to operate under the environment of maximum 70°C @ 90% RH – non-condensing.

These switching modules LTSM are easy to install and come with built in indications for normal function and faults, along with built in protection circuits for fail safe operations.

Generally, each of the real time power factor correction (RPFC – relay module) gives 4 to 12 relay outputs, to select that many capacitor banks to maintain desired power factor and hence it will be required to use that many numbers of LTSM modules of required KVAR ratings.

**LIBRATHERM MAKE STANDARD THYRISTOR SWITCH MODULE**

Sr.No.	Model No.	KVAR of 3 phase Capacitor bank	Size (h x w x d) mm.
1.	LTSM-5	5 KVAR	250 x 160 x 130
2.	LTSM-10	10 KVAR	250 x 160 x 130
3.	LTSM-15	15 KVAR	250 x 160 x 130
4.	LTSM-25	25 KVAR	250 x 160 x 180
5.	LTSM-50	50 KVAR	250 x 160 x 180
6.	LTSM-100	100 KVAR	450 x 355 x 300

Note: Sizes are subject to change due to product upgradation.

**ACTUAL PICTURE**



## Technical Specifications of Thyristor switch module:

Item	Thyristor switch module for capacitor switching
<b>Model</b>	LTSM-XX (Refer above table for models and sizes)
<b>Control Command</b>	12 to 24DC pulse (internally optically isolated) or potential free contact from external APFC relay module.
<b>Firing technique</b>	Guaranteed Zero cross over firing.
<b>Load Configuration</b>	2 leg control – SCR module in series with 2 phase and one phase will be direct to Capacitor bank. (Capacitor bank in 3 wire close delta configuration)
<b>Switching Devices</b>	2 x SCR/SCR module or SCR/Diode Module of suitable current ratings to match KVAR of connected capacitor banks (PIV of 2200V / 1800V from Naina Semiconductor/Semikron)
<b>Switching time</b>	Min. 100mS (5 AC cycles @ 50Hz line frequency)
<b>Re-switching time</b>	Depending on de-tuning factor and discharge resistor across capacitors.
<b>Over Temperature Protection</b>	In case of rise in temperature of the module due to lack of external or forced cooling – SCR firing will be tripped and will cease to fire, till temperature is lower than the preset temperature value of built in Thermistor.
<b>Auxiliary Supply Voltage</b>	230VAC +/-10% @ 50/60Hz or 24VDC (as per user requirement)
<b>LED Indications</b>	For Power ON, THY1 ON, THY2 ON, FAN ON, CB ON, Over Temperature.
<b>Three Phase Line Voltage</b>	110 to 500VAC (Special modules are available for 690/750VAC line supply)
<b>Mounting</b>	LTSM can be mounted inside the panel on base plate using 4 screws
<b>LTSM sizes</b>	As per the above table