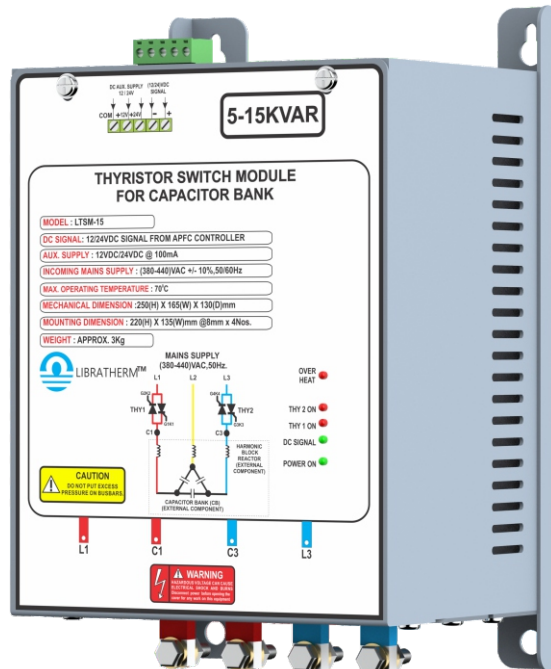
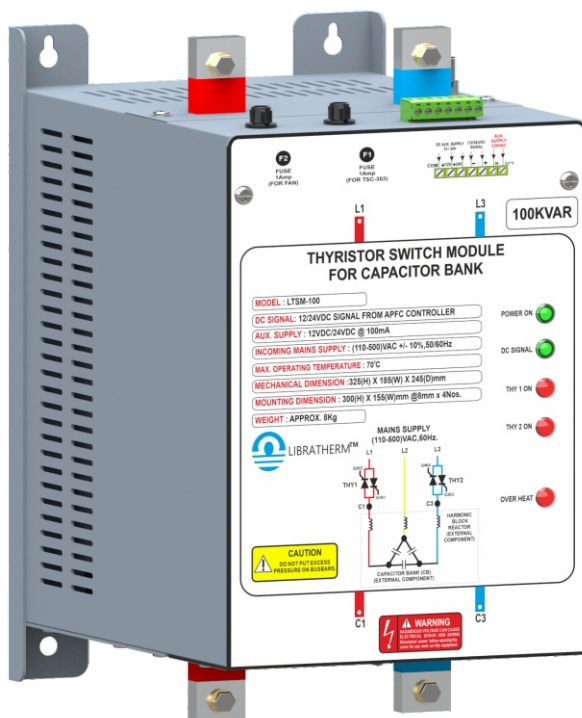


Libratherm Thyristor Switch Module(LTSM) for Capacitor Bank



LTSM

MODEL WISE DESCRIPTION

LIBRATHERM MAKE STANDARD THYRISTOR SWITCH MODULE

Model No.	Cooling	KVAR of 3 phase Capacitor bank	Size (h x w x d) mm.
LTSM-5	NATURAL	5 KVAR	250 x 160 x 130
LTSM-10	NATURAL	10 KVAR	250 x 160 x 130
LTSM-15	NATURAL	15 KVAR	250 x 160 x 130
LTSM-25	NATURAL	25 KVAR	250 x 160 x 180
LTSM-50	NATURAL	50 KVAR	250 x 160 x 180
LTSM-75	FAN COOLED-3"	75 KVAR	305 x 185 x 220
LTSM-100	FAN COOLED-4"	100 KVAR	325 x 185 x 245
LTSM-150	FAN COOLED-6"	150 KVAR	345 x 185 x 285

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

DESCRIPTION

Libratherm offers Thyristor Switch Module, specially designed for Real time Power Factor Correction (RTPFC) applications. RTPFC is designed to compensate the reactive power on real time basis for extremely rapid acquisition of the power factor within the range of 100 - 120 millisecond. Connection and disconnection of the capacitor to and from the network occurs at zero crossing.

In RTPFC the capacitor banks of suitably rated KVAR are randomly / sequentially selected, based on the command from the Real time power factor relay module in order to maintain close to unity power factor (Ratio of KW:KVA) or COS Factor. In conventional APFC method, the number of capacitor banks are selected by switching the contactors connected in series with each capacitor bank – Contactor based switching gives delayed correction and hence difficult to maintain PF close to unity.

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 rapidly turn on and turn off the thyristors connected in series with these capacitor banks. LTSM accepts direct potential free contact command and requires Auxiliary DC supply of 12V or 24V @ 1Amp per LTSM.

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

- a) Since there is no mechanical contacts involved, no arcing and sparking takes place and no audible switching noise is produced
- b) 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.

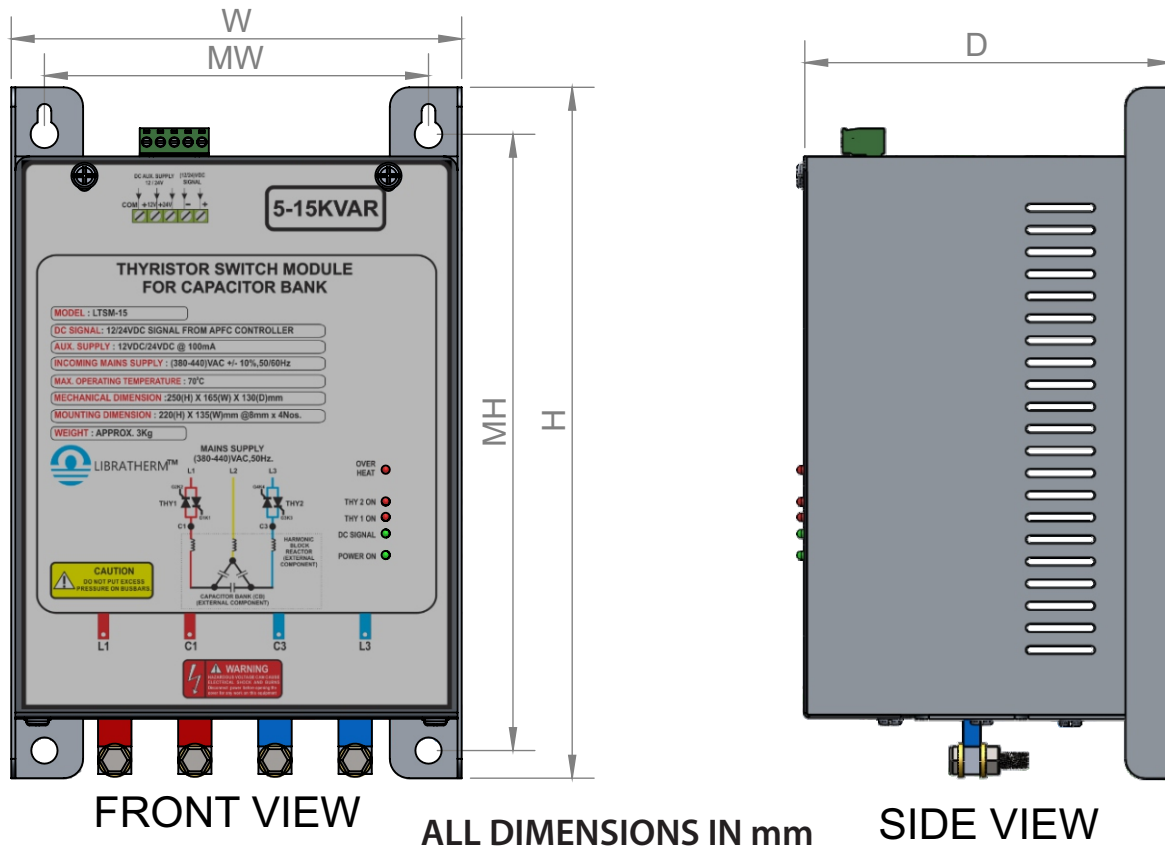
TECHNICAL SPECIFICATION

Item	Thyristor switch module for capacitor switching
Model	LTSM-XX (Refer 1st page for models and sizes)
Control Command	12 to 24VDC pulse (internally optically isolated) or potential free contact from external APFC relay module.
Firing technique	Guaranteed Zero cross over firing.
Load Configuration	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)
Switching Devices	2 x SCR/SCR module or SCR/Diode Module of suitable current ratings to match KVAR of connected capacitor banks - Semicron make.
Switching time	Min. 100mS (5 AC cycles @ 50Hz line frequency)
Re-switching time	Depending on de-tuning factor and discharge resistor across capacitors.
Over Temperature Protection	Auto shut off of Thyristor beyond 90oC of Heat Sink temperature.
Auxiliary Supply Voltage	12 or 24VDC @ 15WATT max. per LTSM. We can provide suitable 12/24VDC SMPS at extra cost based on number of LTSM to be installed on single panel.
LED Indications	For Power ON, THY1 ON, THY2 ON, FAN ON, CB ON, Over Temperature.
Three Phase Line Voltage	110 to 500VAC (Special modules are available for 690/750VAC line supply)
Mounting	LTSM can be mounted inside the panel on base plate using 4 screws
LTSM sizes	As per the 1st page table

ORDERING CODE

Model	Product Description	Part no.
LTSM-5	Thyristor switch module for 5 KVAR capacitor bank	2910
LTSM-10	Thyristor switch module for 10 KVAR capacitor bank	2910
LTSM-15	Thyristor switch module for 15 KVAR capacitor bank	2910
LTSM-25	Thyristor switch module for 25 KVAR capacitor bank	2911
LTSM-50	Thyristor switch module for 50 KVAR capacitor bank	2912
LTSM-75	Thyristor switch module for 75 KVAR capacitor bank	2913
LTSM-100	Thyristor switch module for 100 KVAR capacitor bank	2914
LTSM-150	Thyristor switch module for 150 KVAR capacitor bank	2915

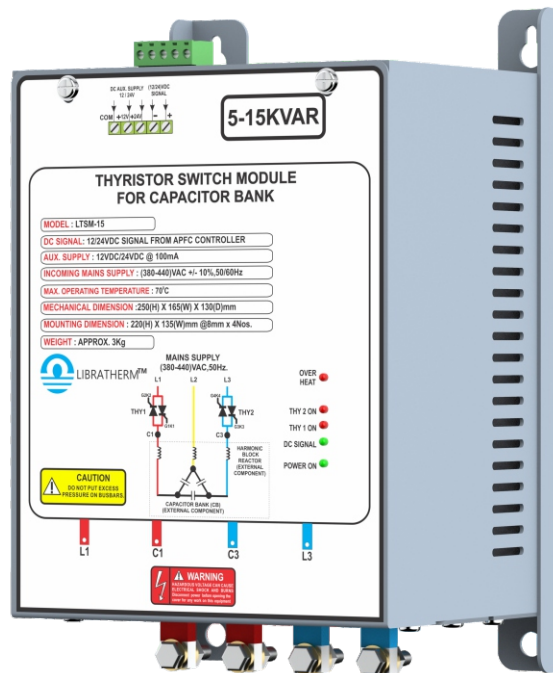
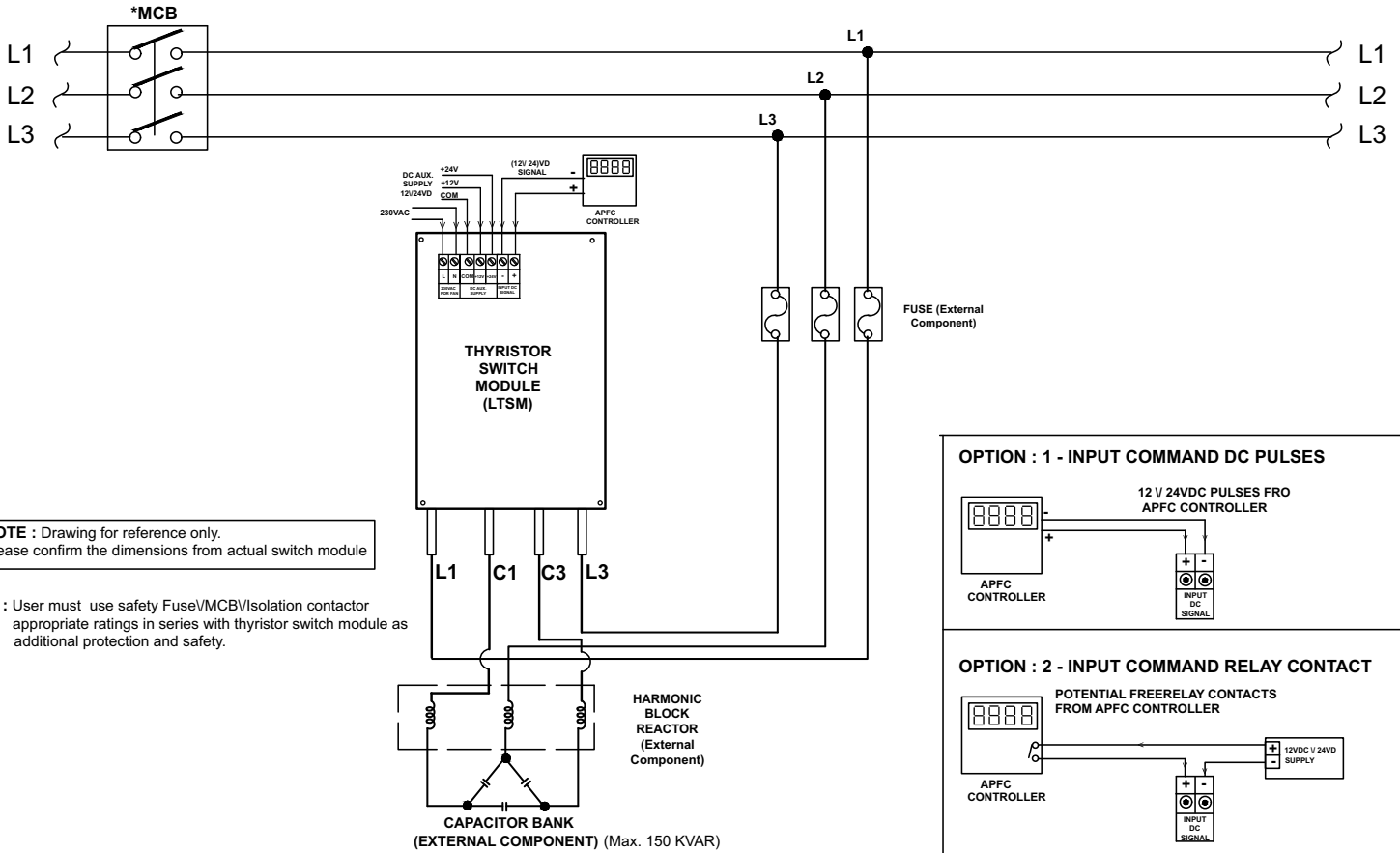
DIMENSIONAL DRAWING



DIMENSIONAL TABLE:-

SR NO.	MODEL NAME	HEIGHT (H)	WIDTH (W)	DEPTH (D)	MOUNTING HEIGHT (MH)	MOUNTING WIDTH (MW)
1	LTSM-5	250	160	130	220	140
2	LTSM-10	250	160	130	220	140
3	LTSM-15	250	160	130	220	140
4	LTSM-25	250	160	180	220	140
5	LTSM-50	250	160	180	220	140
6	LTSM-75	305	185	220	285	155
7	LTSM-100	325	185	245	300	155
8	LTSM-150	345	185	255	315	155

WIRING DIAGRAM FOR LTSM-5, LTSM-10, LTSM-15, LTSM 25 & LTSM 50



WIRING DIAGRAM FOR LTSM-75, LTSM-100 & LTSM-150

