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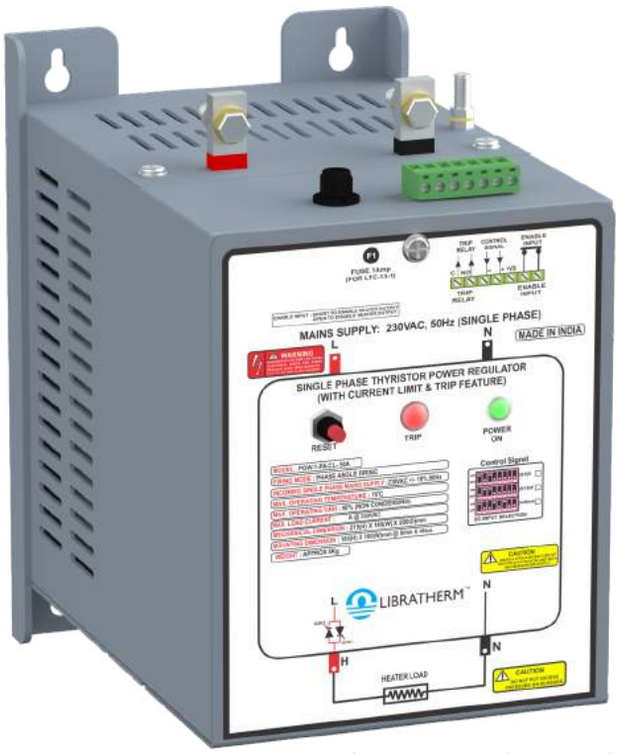
# Single Phase Thyristor Power Regulators for Resistive and Inductive loads




## POW-1-PA-CL

## MODEL WISE DESCRIPTION

| Sr. no. | Model | Product Description |
|---|---|---|
| 1 | POW-1-PA-CL | Single Phase SCR Power Regulator for single phase heater with current control & over load protection. |
| 2 | POW-1-DCR-CL | Single Phase SCR based DC Power Rectifier with Shunt feedback |

## FEATURES

- 25 Amps to 460 Amps capacity (5KW to 120KW).
- 1 phase DC rectifier configuration
- Auto / Manual operation.
- Accepts (4-20)mA / (0-5)VDC / (0-10)VDC control input (user selectable)
- Soft start and step less smooth control.
- Adjustable current control and over load trip feature.
- Isolated heat sink for safety.
- Simple and Modular design for easy servicing of firing cards and thyristors.

## APPLICATION

Thyristor Power Controller has a varied application and can be used with heating elements like nichrome, Canthal, Super Canthal, Silicon Carbide, Molybdenum, Infra-Red, step up or step down transformer etc. where precise and accurate power and temperature control is required. There is a significant electrical power savings with respect to conventional contactor type temperature control system. Thyristors have many direct and indirect advantages compared to electro - mechanical contactor. Ideally suitable for resistive, transformer, inductive or heating loads like Silicone Carbide and Molybdenum which exhibits significant changes of resistance with increase in temperature.

## Description of Thyristor Power Regulators

Libratherm offers ready to use SCR power controller for electrical heating loads ranging from 5 KW/Single phase to 360KW/3-phase. This power regulator module comprises suitable triggering card model LTC-12 or LTC-13 or LTC-15 or LTC-18, suitably rated back to back connected SCR modules (with electrically isolated base, mounted on the heat sink, input and output clip-on type heavy duty connectors or Aluminum/Copper bus bars, semiconductor fuses and thermal cutouts. The entire assembly is mounted on MS powder coated enclosure, which in turn can be easily mounted inside the closed control panel as desired. Complete ready to use control panel with suitable PID / Program temperature controller can also be supplied as per the user's specifications and requirement. For DC rectified output the assembly remains the same, except the SCRs are connected in bridge configurations as shown above in the diagram.

## Technical Specifications

| | |
|---|---|
| Available Ratings | 5KW Single phase to 120KW Single phase |
| Available Configuration | Single phase, Two phase, Three phase (3 or 4 wire star and 3 or 6 wire delta) or DC rectifier configuration. |
| Control Action | Phase angle control (self-synchronized) |
| Control Signal | (4-20)mA / (0-5)VDC / (0-10)VDC / Potentiometer – user selectable |
| Output | 0 to 240VAC or 0 to 415V/440AC variable voltage proportional to the control signal.<br>0 to 200VDC, 0 to 400VDC, 0 to 560VDC rectified output proportional to control signal. |
| DI DO control | a) Potential free contact input (DI) to remotely start/stop the Thyristor<br>b) Potential free contact output (DO1) to indicate status of Thyristor ON or OFF.<br>c) Potential free contact output (DO2) to indicate Over Load condition (Trip Contact) .<br>Available only with all the models marked CL |
| Smooth Control | Adjustable Ramp Up and Ramp Down Time for soft increase and decrease of output voltage. (Settable in the range of 2 to 20 seconds) |
| Current Control | Using on card Current Limit and Over Load Trip settings.<br>Available only with all the models marked CL |
| Settings | For adjusting voltage and current per phase using ON card presets |
| Load Type | Suitable for both resistive and inductive / transformer load |
| Aux. Supply Voltage | 240VAC +/- 10%, 50/60 Hz |

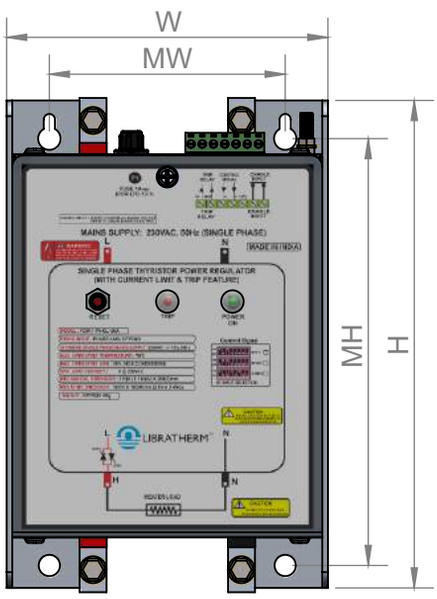
| | |
|---|---|
| Available Models | As given in the above table (Under Model wise description) |
| Other accessories provided with each Thyristor power regulator/rectifier | a) RC snubber / MOV across the SCRs to protect against voltage transients dv/dot<br>b) Thermal cut out switch on the heat sink – to protect thyristors against overheating.<br>c) Cooling fan on heat sinks for all Thyristor regulators.<br>d) Heavy duty input/output terminals or Copper or Aluminum Bus bars or supply and heater Connections. |
| Size | As per the Thyristor Ordering Information table given below. |
| Mounting | Thyristor power regulators can be mounted on the base plate of the control panel using 4 screws/bolts. |

## ORDERING CODE

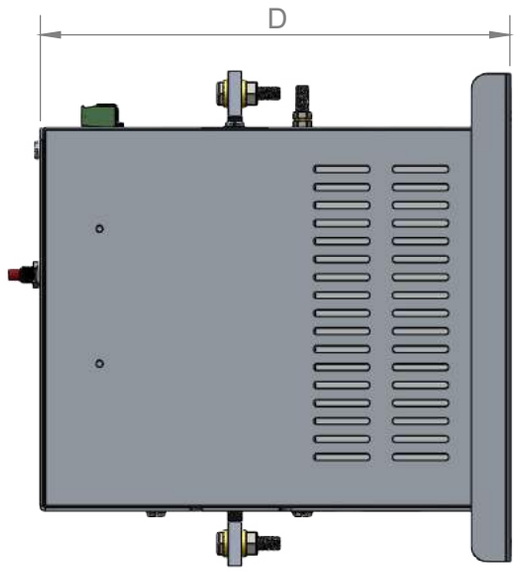
| Sr. no. | POW-1 | MEDIUM AND HIGH RATINGS SINGLE PHASE THYRISTORS (5KW TO 120KW) | Size (h x w x d) | PART NO. |
|---|---|---|---|---|
| 1 | POW-1-PA-CL-25A (5KW) | Single phase thyristor power regulator - suitable for max. 5KW @ 240VAC with current control and over load protection (PANEL MOUNT) | 220 x 140 x 205 | 2601-1 |
| 2 | POW-1-PA-CL-50A (12KW) | Single phase thyristor power regulator - suitable for max. 12KW @ 240VAC with current control and over load protection (PANEL MOUNT) | 220 x 140 x 205 | 2601-2 |
| 3 | POW-1-PA-CL-100A (24KW) | Single phase thyristor power regulator - suitable for max. 24KW @ 240VAC with current control & over load protection (PANEL MOUNT) | 220 x 140 x 205 | 2601-3 |
| 4 | POW-1-PA-CL-150A (36KW) | Single phase thyristor power regulator - suitable for max. 36KW @ 240VAC with current control & over load protection (PANEL MOUNT) | 325 X 185 X240 | 2601-4 |
| 5 | POW-1-PA-200A-CL (48KW) | Single phase thyristor power regulator - suitable for max. 48KW @ 240VAC with current control & over load protection (PANEL MOUNT) | 325 X 185 X 245 | 2601-5 |
| 5 | POW-1-PA-250A-CL (60KW) | Single phase thyristor power regulator - suitable for max. 60KW @ 240VAC with current control & over load protection (PANEL MOUNT) | 325 X 185 X 245 | 2601-6 |
| 6 | POW-1-PA-300A-CL (72KW) | Single phase thyristor power regulator - suitable for max. 72KW @ 240VAC with current control & over load protection (PANEL MOUNT) | 325 X 185 X 245 | 2601-7 |
| 7 | POW-1-PA-400A-CL (96KW) | Single phase thyristor power regulator - suitable for max. 96KW @ 240VAC with current control and over load protection (PANEL MOUNT) | 385 X 200 X 245 | 2601-8 |
| 8 | POW-1-PA-500A-CL (120KW) | Single phase thyristor power regulator - suitable for max. 120KW @ 240VAC with current control and over load protection (PANEL MOUNT) | 385 X 200 X 245 | 2601-9 |

# POW-1-PA-CL

## DIMENSIONAL DIAGRAM:-




FRONT VIEW



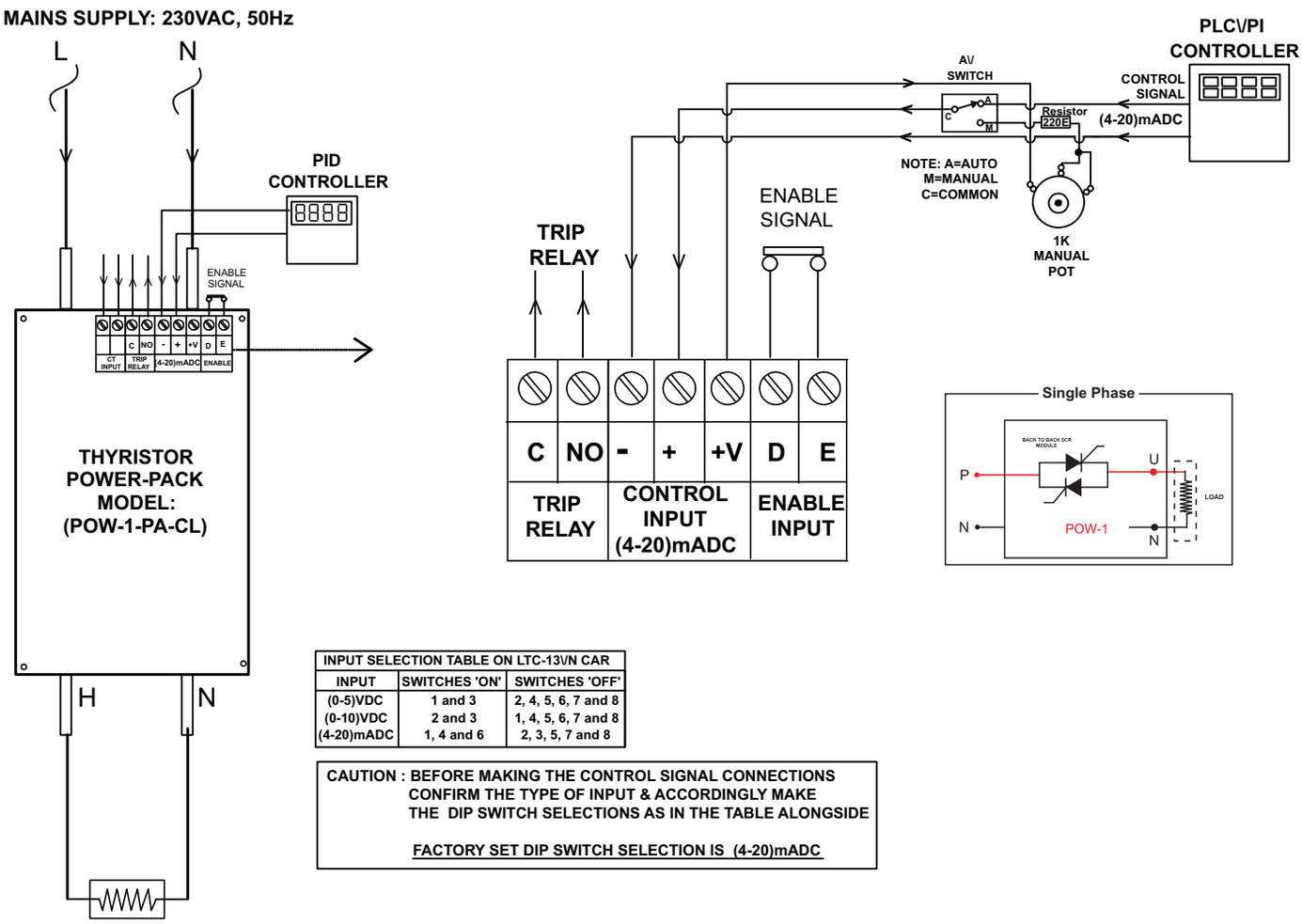

SIDE VIEW

## DESCRIPTION TABLE

| SR NO. | MODEL NAME | HEIGHT (H) | WIDTH (W) | DEPTH (D) | MOUNTING HOLE HEIGHT (MH) | MOUNTING HOLE WIDTH (MW) |
|---|---|---|---|---|---|---|
| 1 | POW-1-PA-CL-25A | 220 | 140 | 205 | 190 | 110 |
| 2 | POW-1-PA-CL-50A | 220 | 140 | 205 | 190 | 110 |
| 3 | POW-1-PA-CL-100A | 220 | 140 | 205 | 190 | 110 |
| 4 | POW-1-PA-CL-150A | 325 | 185 | 245 | 300 | 155 |
| 5 | POW-1-PA-CL-200A | 325 | 185 | 245 | 300 | 155 |
| 6 | POW-1-PA-CL-250A | 325 | 185 | 245 | 300 | 155 |
| 7 | POW-1-PA-CL-300A | 325 | 185 | 245 | 360 | 155 |
| 8 | POW-1-PA-CL-400A | 385 | 200 | 245 | 360 | 170 |
| 9 | POW-1-PA-CL-500A | 385 | 200 | 245 | 360 | 170 |

Note: Dimensions and specifications are subjected to change during product upgradation.

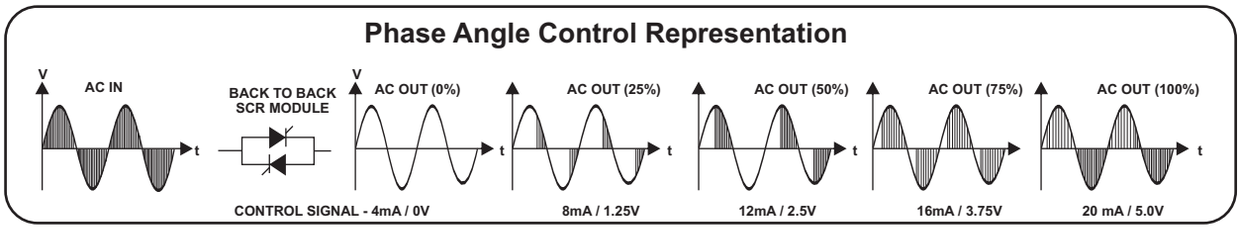
# WIRING DIAGRAM




| INPUT SELECTION TABLE ON LTC-13\N CAR | | |
|---|---|---|
| INPUT | SWITCHES 'ON' | SWITCHES 'OFF' |
| (0-5)VDC | 1 and 3 | 2, 4, 5, 6, 7 and 8 |
| (0-10)VDC | 2 and 3 | 1, 4, 5, 6, 7 and 8 |
| (4-20)mADC | 1, 4 and 6 | 2, 3, 5, 7 and 8 |

**CAUTION : BEFORE MAKING THE CONTROL SIGNAL CONNECTIONS CONFIRM THE TYPE OF INPUT & ACCORDINGLY MAKE THE DIP SWITCH SELECTIONS AS IN THE TABLE ALONGSIDE**

**FACTORY SET DIP SWITCH SELECTION IS (4-20)mADC**




# VARIOUS LOAD CONFIGURATION