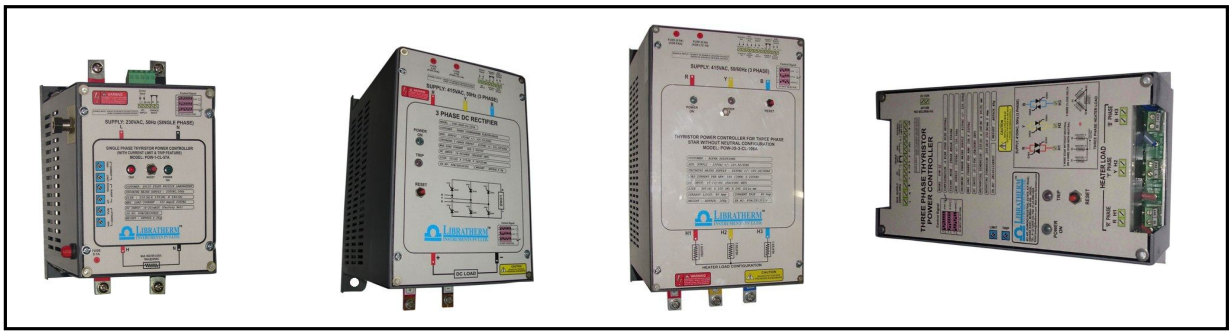
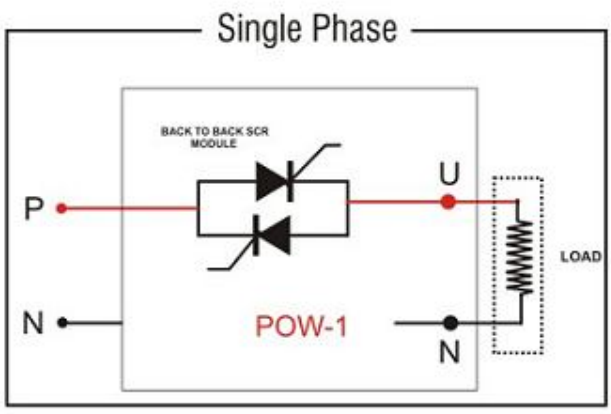
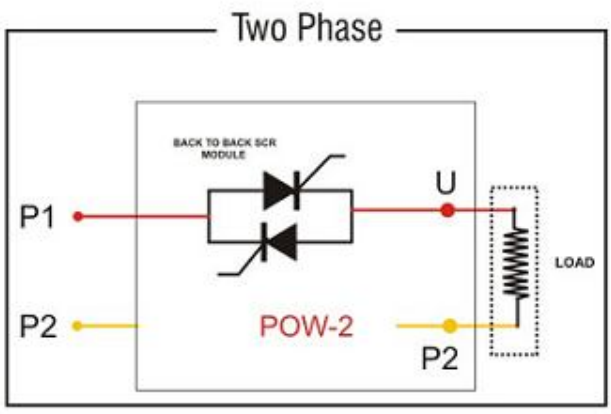
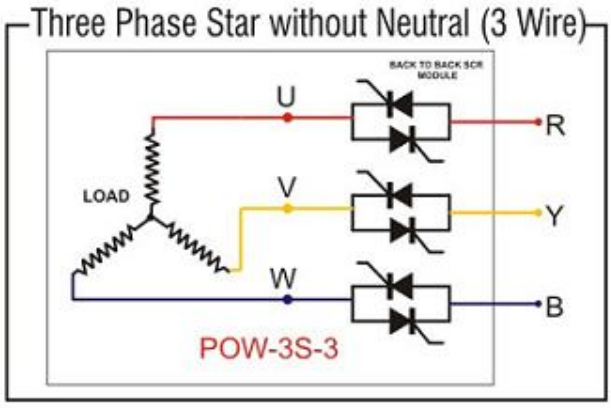
Thyristor Power Controllers for Resistive and Inductive loads

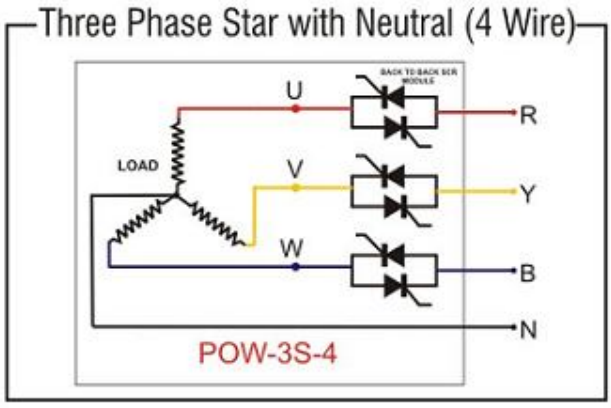
(Product Code 21.3)

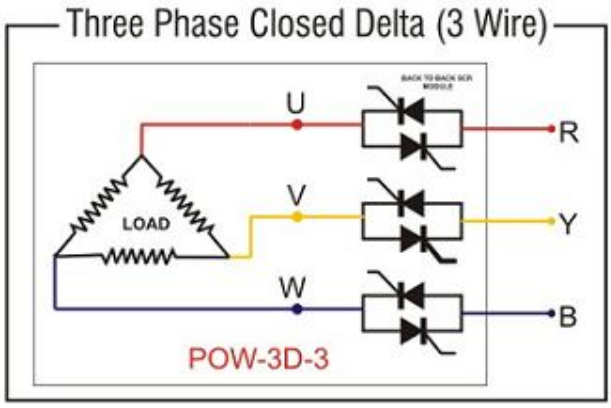


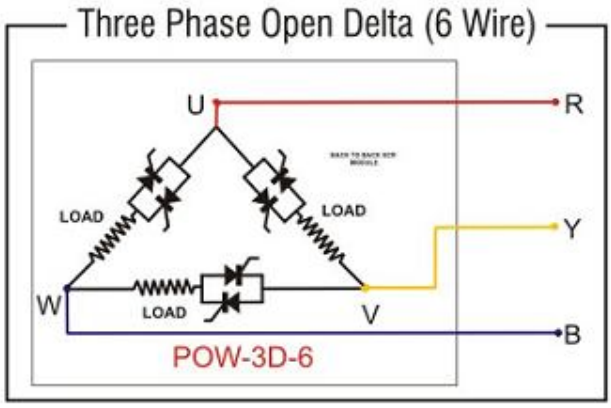


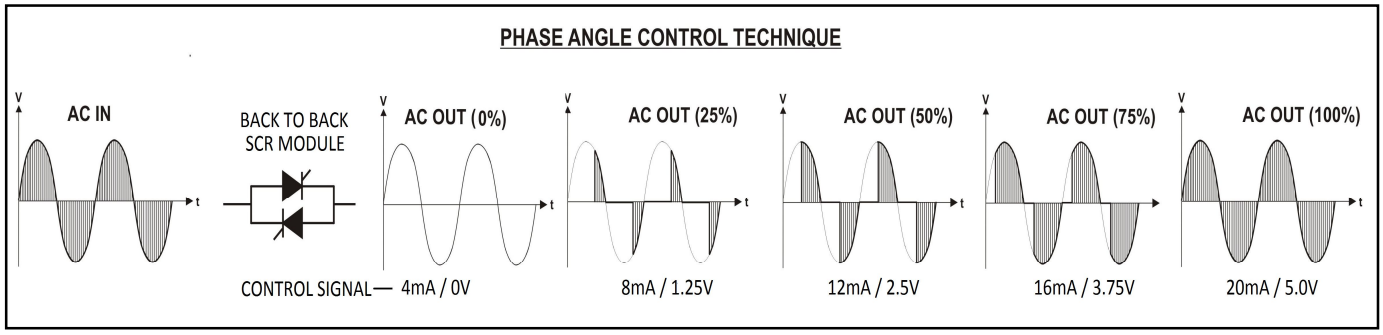












Model Wise Descriptions:

Sr. No	Model	Product Description
21.3.1	**POW-1**	Single Phase SCR Power Controller for single phase heaters
21.3.2	**POW-1-CL**	Single Phase SCR Power Controller for single phase heaters with current limit and current trip features.
21.3.3	**POW-2**	Two Phase SCR Power Controller for two phase heaters
21.3.4	**POW-2-CL**	Two Phase SCR Power Controller for 2 phase heaters - with current limit and current trip features.
21.3.5	**POW-3S-4**	Three Phase SCR Power Controller – suitable for 3 phase heaters connected in 4 wire **Star** with neutral configuration.
21.3.6	**POW-3S-3**	Three Phase SCR Power Controller – suitable for 3 phase heaters connected in 3 wire **Star** without neutral configuration.
21.3.7	**POW-3S-4 - CL**	Three Phase SCR Power Controller – suitable for 3 phase heaters connected in 4 wire **Star** with neutral configuration with current limit and current trip features.
21.3.8	**POW-3S-3 -CL**	Three Phase SCR Power Controller – suitable for 3 phase heaters connected in 3 wire **Star** without neutral configuration with current limit and current trip features.
21.3.9	**POW-3D-6**	Three Phase SCR Power Controller – suitable for 3 phase heaters connected in open **Delta** 6 wire configuration
21.3.10	**POW-3D-6 -CL**	Three Phase SCR Power Controller – suitable for 3 phase heaters connected in open **Delta** 6 wire configuration with current limit and current trip features.
21.3.11	**POW-3D-3**	Three Phase SCR Power Controller – suitable for 3 phase heaters connected in close **Delta** 3 wire configuration
21.3.12	**POW-3D-3- CL**	Three Phase SCR Power Controller – suitable for 3 phase heaters connected in close **Delta** 3 wire configuration with current limit and current trip features.

Note: 1) For single phase heaters for 4 to 8 KW – our low cost model LTC-16 can be considered.
2) For three phase heaters for 9 to 12 KW – out low cost model POW-12 can be considered.
3) For physical dimension of specific model, please contact us for mechanical drawing and mounting Dimension.

Features:

- 5 Amps to 500 Amps capacity (1KW to 360KW).
- Single phase / 2 phase / 3 phase versions.
- Suitable for 3 or 4 wire star configuration / 3 or 6 wire delta 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 power and current limit.
- Isolated heat sink for safety.
- Simple and Modular design for easy servicing of firing cards and thyristors.
- Ideally suitable for resistive, transformer, inductive or heating loads like Silicone Carbide and Molybdenum which exhibits significant changes of resistance with increase in temperature.

Applications:

Thyristor Power Controller has a varied application and can be used with heating elements like nichrome, Kanthal, Super Kanthal, Silicon Carbide, Molybdenum, Infra Red, 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.

Description of Thyristor Power Controller:

Libratherm offers ready to use SCR power controller for electrical heating loads ranging from 3 KW/Single phase to 360KW/3-phase. This power controller module comprises of 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 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.

Technical Specifications:

Available Ratings	1KW Single phase to 360KW Three phase
Available Configuration	Single phase, Two phase, Three phase (3 or 4 wire star and 3 or 6 wire delta)
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 415VAC variable voltage proportional to the control signal.
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 Trip settings. (LTC-13 and LTC-18)
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 power controller	a) RC snubber / MOV across the SCRs to protect against voltage transients dv/dt b) Thermal cut out switch on the heat sink – to protect thyristors against overheating. c) Cooling fan on heat sinks for all power controllers. d) Heavy duty input/output terminals or Copper or Aluminum Bus bars for supply and heater Connections.
Size (Power Controller)	As per Std. (Sizes can be given on request – based on the model)
Mounting	Power controller can be mounted on the base plate of the control panel

KW (Kilowatt) wise selection table for Resistive/Inductive loads:

Load Current per phase to Neutral or Phase1 to Phase 2 AMPS(Max)	POW-1 @240VAC Single Phase	POW-2 @ 415VAC Two Phase	POW-3S-4 POW-3S-3 POW-3D-3 (star/delta) @415VAC Three Phase	POW-3D-6 (open delta) @415VAC Three Phase
25A (SKKT 27)	**1 - 5 KW** (POW1.1)	**3 - 10 KW** (POW2.1)	**3 - 17 KW** (POW3.1)	**3 - 30 KW** (POW6.1)
50A (SKKT 57)	**6 - 12 KW** (POW1.2)	**11- 21 KW** (POW2.2)	**18 - 36 KW** (POW3.2)	**31 - 63 KW** (POW6.2)
95A (SKKT 106)	**13 – 23 KW** (POW1.3)	**22 - 40KW** (POW2.3)	**37 - 68 KW** (POW3.3)	**64 - 120 KW** (POW6.3)
146A (SKKT 162)	**24 – 35 KW** (POW1.4)	**41 - 60 KW** (POW2.4)	**69 – 104 KW`** (POW3.4)	**121 – 180 KW** (POW6.4)
246A (SKKT 273)	**36 - 59 KW** (POW1.5)	**61 – 102 KW** (POW2.5)	**105 - 176 KW** (POW3.5)	**181 - 306 KW** (POW6.5)
297A (SKKT 330)	**60 - 71 KW** (POW1.6)	**103 - 123 KW** (POW2.6)	**177 - 213 KW** (POW3.6)	**307 - 363 KW** (POW6.6)
516A (SKKT 573)	**72-124 KW** (POW1.7)	**124 - 214 KW** (POW2.7)	**214 - 370 KW** (POW3.7)	**364 - 642 KW** (POW6.7)

To get the quote or to place the order – please specify the item code given in the bracket in the above table or refer ordering information given below.

- User can select the required power controller – either by actual current through the heaters or by KW of the heaters.
- Single phase, two phase or three phase selection can be done by selecting appropriate model based on the desired configuration, from the table given above.
- If the heaters are designed at different voltage other than 240VAC or 415VAC, still the selection can be made, based on the actual current flowing through the heaters at the desired voltage level.
- For inductive / transformer load, the desired KW can be selected as per the requirement.
- User must use suitable ratings of MCB or MCCB in series with the thyristors.

Ordering Information:

MODEL	A- ITEM CODE
POW-1 **POW-1-CL**	POW1.1 to POW1.7
POW-2 **POW-2-CL**	POW2.1 to POW2.7
POW-3S-4 **POW-3S-3**	POW3.1 to POW3.7
POW-3S-4-CL **POW-3S-3-CL**	POW3.1 to POW3.7
POW-3D-6 **POW-3D-3**	POW6.1 to POW6.7
POW-3D-6-CL **POW-3D-3-CL**	POW6.1 to POW6.7

Examples:

MODEL	A- ITEM CODE
POW-1	POW1.2
POW-2-CL	POW2.4
POW-3S	POW3.2
POW-3D-3 -CL	POW3.6
POW-6D	POW6.3

Example	Ordering Code	Description
1	POW-1-POW1.2	This is single phase AC power controller suitable for 6 to 12 KW heater load @ 240VAC
2	POW-2-CL-POW2.4	This is two phase AC power controller with current control and overload protection suitable for 41 to 60KW heater load @ 2 phase 415VAC.
3	POW-3S-POW3.2	This is three phase AC power controller suitable for 3 wire or 4 wire configuration of 41 to 60KW heater load @ 3 phase 415VAC.
4	POW-3D-3-CL-POW3.6	This is three phase AC power controller with current control and overload protection suitable for 3 wire close delta configuration of 177 to 213KW heater load @ 3 phase 415VAC.
4	POW-6D-POW6.3	This is three phase AC power controller suitable for 6 wire open delta configuration of 64 to 120KW heater load @ 3 phase 415VAC.

Technical specifications are subject to change and revision, due to product up gradation.