

The SPU Thyristor System Single phase Power Regulator, designed with full utilization of KONICS semiconductor technology, is available in 10 versions within the capacity from 10 A to 300(500) A to provide a wide range for selection as the load condition requires. The standard model operates on 4~20mA control signal but a version to operate on a contact input signal is also available. Principal features include highly reliable and stable operation, gate control circuit and operating function in one-unit with space-saving compact design and minimum wiring requirement, electronic circuit to protect Thyristor from overload, and wired capacity range and optional construction to meet the customer needs. Appliances, etc. Requiring precision control of temperature and humidity.

Features

- Soft-start, soft-stop
- Small compact size
- Led monitors
- Remote control capability

Ordering Codes

MODEL	PHASE	INPUT	VOLT	CASE TYPE	CURRENT	OPTIONS	DESCRIPTION
SPU							Phase-angle
	1						1-Phase
	3						3-Phase
		1					4-20mA
		2					0-10V
		Z					Other
			1				AC110V 60Hz
			2				AC220V 60Hz
			3				AC380V 60Hz
			4				AC440V 60Hz
			Z				Other
				S			82(W)x165(H)x120(D)
				A-1			150(W)x200(H)x145(D)
				A			122.5(W)x300(H)x174(D)
				B			218(W)x390(H)x197(D)
				C-1			324(W)x490(H)x231(D)
				C			250(W)x415(H)x221(D)
				D			340(W)x480(H)x330(D)
					XXX		*XXX = 025~600 Amps ex) 25A = 025, 300A = 300
						0	None
						1	Fuse Fault
						2	50Hz
						3	Slope
						4	Constant Voltage Type
						5	Inductive Load
							* OPTION is possible to duplicate

SPU 1 1 - 2 - B XXX 2.4



Electrical Specifications

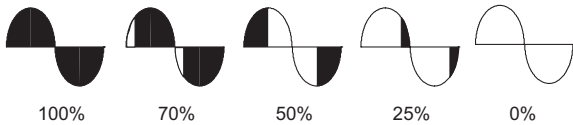
- Line-to-line supply voltage : AC 110/ 115V ±10%
AC 220/ 230V ±10%
AC380V ±10%
AC440V ±10%
- Phase : 1 For S-,A-, A-1-, B- and C-1-Type
3 For C-Type and D-Type
Phase rotation insensitive
- Frequency : 50/60Hz ±10%
- Rated current :
10,15,20,25,30,35,40 Amps For 1Φ S-Type Forced -Air
25,40 Amps For 1Φ A-1-Type Natural -Air
55, 70 Amps For 1Φ A-1-Type Forced -Air
25,40,55 Amps For 1Φ A-Type Natural -Air
70,90,110 Amps For 1Φ A-Type Forced -Air
25-110 Amps For 1Φ B-Type Natural -Air
130,160,200 Amps For 1Φ B-Type Forced -Air
250,300,350 Amps For 1Φ B-Type Forced -Air
400-600 Amps For 1Φ C-1-Type Forced -Air
25-110 Amps For 3Φ C-Type Natural -Air
130-350 Amps For 3Φ C-Type Forced -Air
400-600 Amps For 3Φ D-Type Forced -Air
- External Control voltage : 1Φ AC220/230V ±10% If not specified by order-code
- External Fan Voltage : 1Φ AC220/230V ±10% If not specified by order-code
- Alarm : Relay for faults
- Alarm acknowledge : Internal reset switch
External contact
- Load type : Resistive, Inductive
- Firing Mode : Phase-angle type
0~95% of maximum output power available
- Input signal : User- Selectable by external contact
0~10Vdc by 10K? variable resistor
4~20mA
- Protection : Instant over current
Time-delayed over current

Specifications

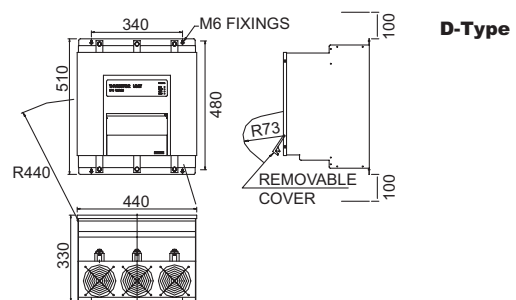
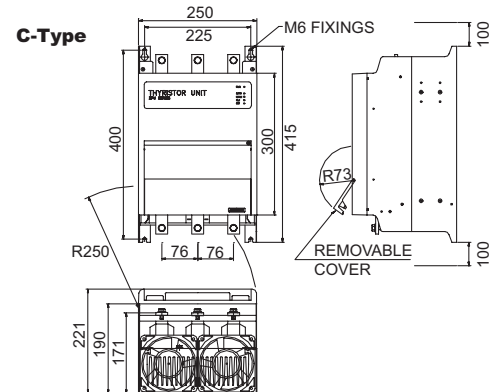
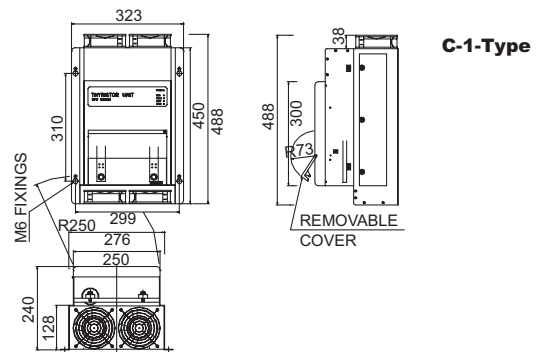
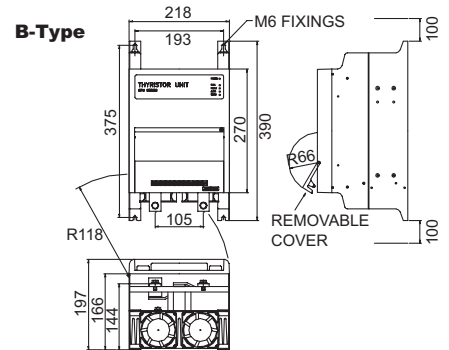
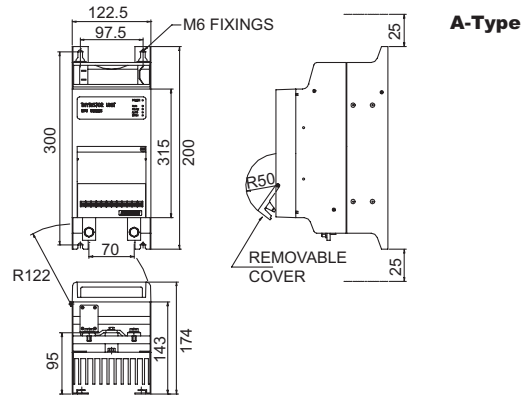
General

- Operating Temperature Range : 0°C~ 50°C with Heat sink vertical
Debate linearly above 35°C for force cooled units
Debate linearly above 45°C for naturally cooled units.
- Storage Temperature Range : -10°C ~ 70°C
Protect from direct free environment.
- Humidity : 85% Relative humidity maximum. Relative humidity is temperature dependent, If the ambient temperature falls the relative humidity will rise and may ultimately cause condensation. This should be avoided.
- Atmosphere : Non-flammable, non-condensing,
- Installation altitude : ≤1000M above sea level at rated current.

- Ventilation : Natural-air < 55 Amps For A-1-Type
< 70 Amps For A-Type
< 130 Amps For B-and C-Type
Forced-air < 40 Amps For S-Type
< 55 Amps For A-1-Type
< 70 Amps For A-Type
< 130 Amps For B-, C-1-,C- and D-Type
- Access : Hinge-up cover fir control circuit terminals andreset switch
Hinge-out Control printed Board with its own independent over
- Option : Fuse failure micro switch
- **CONTROL OUTPUT WAVEFORM**
- Phase control



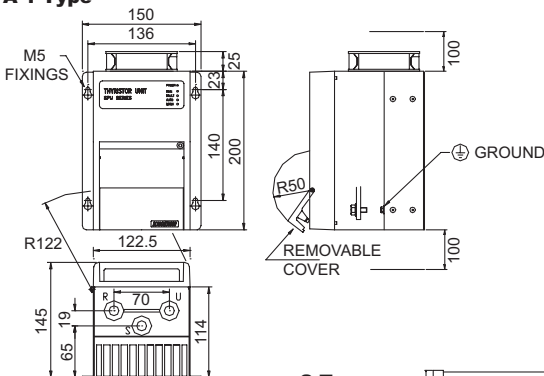
- Special feature of Thyristor power regulator No moving part, without contact, long time use Accurate temperature control by fast answer
- ON-OFF : Complete automation of temperaturecontrol by using successive program controlSmall and lightEasy to operate and high reliability.
- Control type of power regulator Electric heater temperature control is deviled intoON-OFF control type and consecutive control type. Temperature control using Thyristor can use ON-OFF or consecutive control by changing of gatecircuit input signal. Specially for large heat capacitylike electric heater and slow response control object,this method is suitable. According to the form ofelectric The, 2 position ON-OFF control, 3positionON-OFF, ratio ON-OFF control, consecutive ON-OFF type can be used optionally
- Electric Power Control CircuitAc power control method is used for temperaturecontrol for electric heater by virtual value andheating effect of caloric resistance. Generallycurrent control part is divided into Thyristor powercontrol circuit and gate control circuit



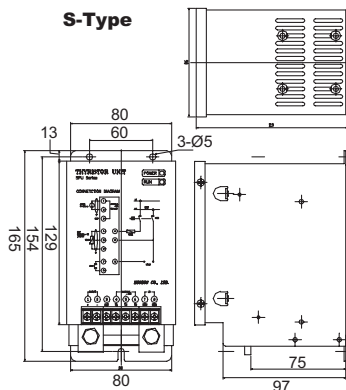
Dimensions

(Unit : mm)

A-1-Type



S-Type

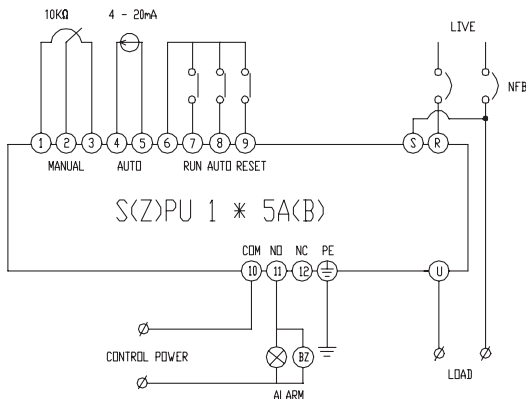


A	Recorders
B	Data Loggers
C	Indicators
D	Converters
E	Controllers
F	Thyristor Units
G	Transmitters
H	Temp. Sensors
I	Thermo Meters
J	Pressure Gauges
K	Others

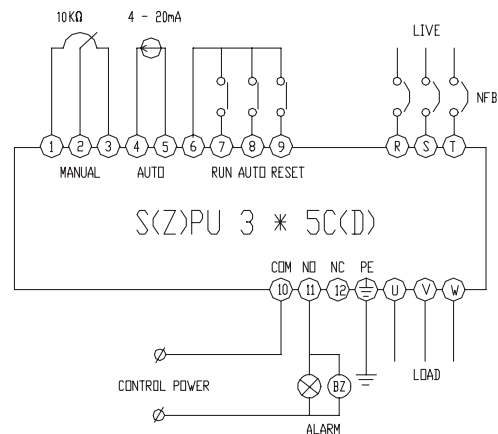
DPU series (1Phase)
DPU series (3Phase)
SPU
ZPU
LM-200/LP100

Connections

1-Phase system



3-Phase system



Functions

• ON-OFF Control

This method which turn on when temperature in heater is lower than SP value is very simple and economical.

However because operating parts locate in both extremes, it can't help temperature cycling.

Forremoving it, there is a method to set Dead Band but the problem is accuracy because in dead band it is hardlycontrol.

But if the cycling is less than allowed temperature, it can be controlled by ON-OFF control.

• Consecutive control

In principle consecutive, control method supply the proportional power of deviation signal to heatingelement in heater.

To develop the accuracy and remove error of proportional(P) control, using integral(I) anddeviation (D) is desirable.

Therefore P.I or P.I.D control is generally used.

• Static voltage (current) control

In general static voltage control is used for independent or total control.

This method is to control the average or virtual value of voltage.

So control unit signal by detecting heater temperature make static voltage control.

Virtual Value control is more desirable than average value control, Because virtual valuedetection for voltage need more high technology, average value control is generally used for control objectneeding low temperature.

• STATIC POWER CONTROL

CS or Molybdenum heating element have defect to make the life of element short.

To solve this matter, static power control is using.

For static power control, virtual value should be detected using by non -liner of synthetic circuits.

Therefore static power control is same with other method but power detector located on front of gate control unit.