The ZPU Thyristor System Single phase Power Regulator, designed with full utilization of KONICS semiconductor technology, is available in 10 versions with in the capacity from 10 A to 300(500) A toprovide 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 in clude 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.Apdriers, etc.Requiring precision control of temperature and humidity.

Features

- Zero voltage switching
- Variable time base
- Small compact size
- Led monitors
- Remote control capability

Ordering Codes

MODEL	PHASE	INPUT	VOLT	CASE TYPE	CURRENT	OPTIONS	DESCRIPTION
ZPU							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
				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	Other

SPU 1 1 - 2 - B XXX 1.2

Specifications

• General

· Operating Temperature Range : 0ºC~ 50ºC with Heat sink vertical
Debate linearly above 35ºC for force cooled unitsDebate linearly above 45ºC for naturally cooledunits.

· Storage Temperature Range : -10ºC ~ 70ºC
Protect from direct free sunlight .
Ensure dry, corrosive free environment.

· Humidity : 85% Relative humidity maximum.Relative humidity is temperature dependent,If the ambient temperature falls the relativehumidity will rise and may ultimately causeco ndensation. This should be avoided.

· Atmosphere : Non-flammable, non-condensing.

· Installation altitude : ≤1000M above sea level at rated current.

• 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 : 25,40 Amps For 1Φ A-1-Type Forced -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
25-110Amps 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

· Load type : Resistive only

· Firing Mode : zero-crossing Type- cycle
ON/OFF200ms + 200ms nominal ON +OFF at half power minimum OFF time ~ 83ms minimum ON time ~ 83ms1 ~ 99% maximum output power available

· Input signal : user-selec table by external contact 0~10 VAC by 5kΩ variable resistor 4~20mA

· Protection : Instant over current
Heatsink over-temperature

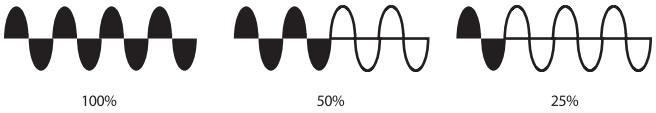
· Alarm : Relay for faults

· Alarm acknowledge : Internal reset switch
External contact

· Ventilation : Natural-air < 55 Amps For A-1-Type
< 70 Amps For A-Type
< 130 Amps For B-and C-Type
Forced-air < 55 Amps For A-1-Type
< 70 Amps For A-Type
< 130 Amps For B-and C-Type 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

· Zero-switching

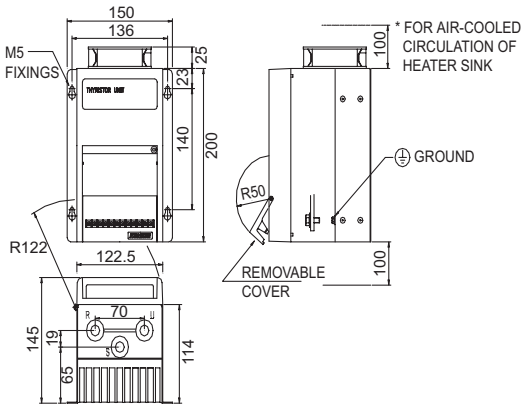


· Special feature of Thyristor power regulator No moving part, without contact, long time use Accurate temperature control by fast answer
· ON-OFF : Complete automation of temperaturecontrol by using suc cessive program controlSmall and lightEasy to operate and high reliability.
· Control type of power 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 me thod 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

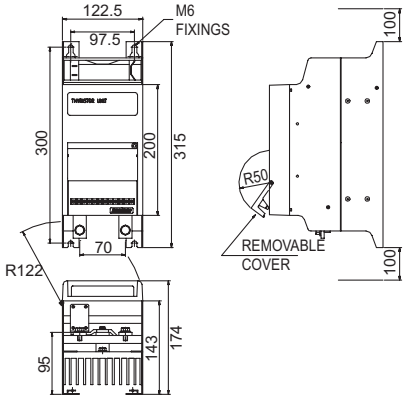
Dimensions

(Unit : mm)

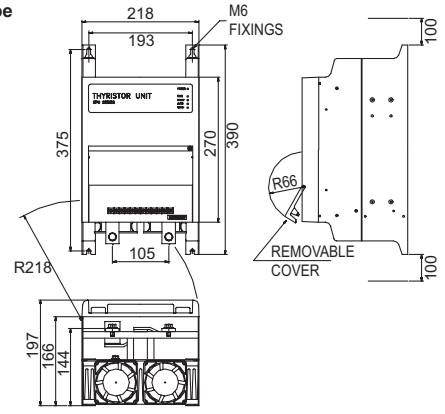
A-1-Type(CE approval product)



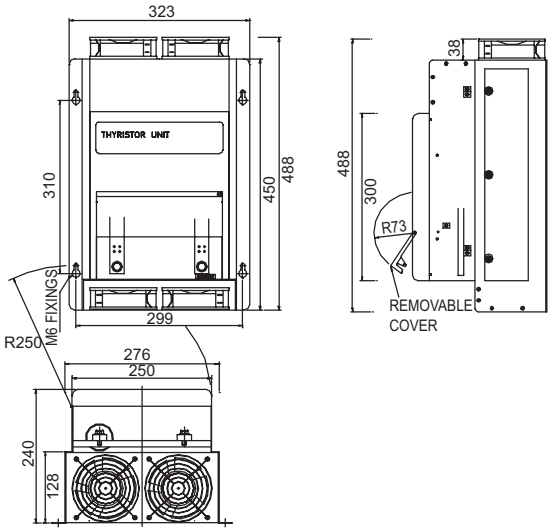
A-Type



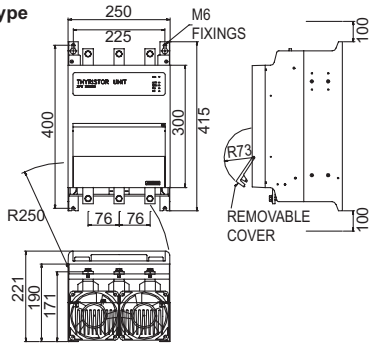
B-Type



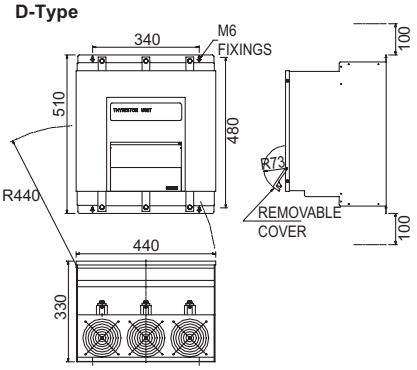
C-1-Type(CE approval product)



C-Type

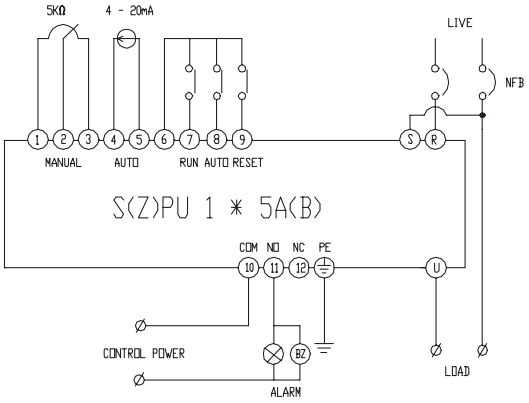


D-Type

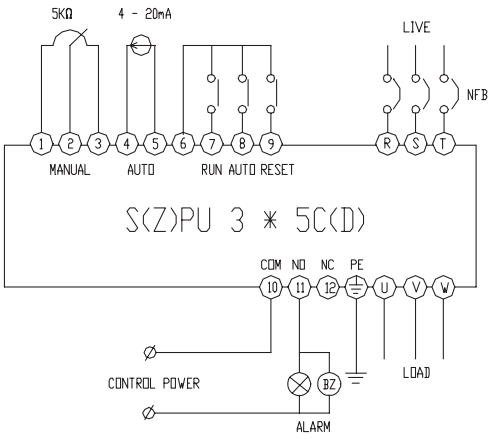


Connections

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.