

S-LX Type Digital integrated power regulator

Operation Instruction

Thanks for purchasing S-LX Type digital integrated power regulator. This manual mainly describes some knowledge and instructions required while using out product. Please read this through carefully for the full understanding of operating procedure. Keep this manual at hand for your reference.

1.Attention

- 1.1 Please do not use the product in palces where explosive or flammable gases may be present.
- 1.2 Please make sure that the load power supply is within the rating and terminal position is correct before supplying power. Or else, the controller would be damage.
- 1.3 Please follow the screw size confirm the terminals Maximum torque.
- 1.4 Disassembling, modifying and repairing the product is forbidden.
- 1.5 Please do not use the product in the following conditions:
 - 1.5.1 Places where temperature fluctuates dramatically.
 - 1.5.2 Places where humidity is high and condensation may occur.
 - 1.5.3 Places where oscillation is drastic.
 - 1.5.4 Places where there is caustic gases and dust.
 - 1.5.5 Places where there is danger of splashing of water, oil or any chemicals.
- 1.6 When wiring , please make sure terminals connect correctly and high-voltage, huge current power line separate from signal communication line to avoid interference .
- 1.7 Please avoid eroding the product by organic liquor, acid, alkali.

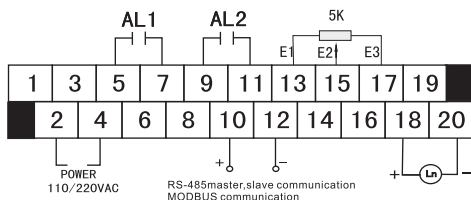
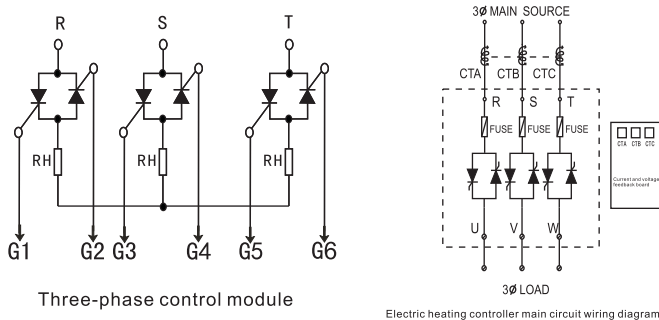
2. Main performance and function

Power voltage: ① Control panel: AC85-265V, 50/60HZ
 ② Main circuit: AC110、220、380、440V(Please use according to the actual specifications)

Ambient temperature: - 10 - 50℃
 Ambient humidity : 0-85%RH
 Display error : ±0.5%FS
 Input signal type: (4-20mA1-5V、0-10V、VR5K)
 Features :
 (1) Optional MODUS communication.
 (2) The maximum phase shift angle at 0° -180°
 (3) With output valve value display.

3. Connection instruction sample

Power regulator main circuit wiring diagram



S-LX Type terminal connection diagram

4. Panel function instruction (Each model)



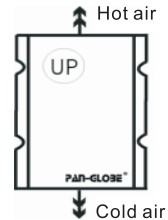
NO	Panel	Instruction
1	PV	Measured values/mode display
2	SV	Set value/ mode; manual lights as the display shows the current valve position
3	MV	Control output display (analog/actual)
4	OUT	Control output indicator
5	AL1	AL 1output indicator
6	MAN	Manual indicator
7	▲	Add key
8	▼	Reduce Key
9	◀	Shift key
10	SET	Circle/ SET key
11	A/M	Automatic/manual select key

5.External and installation dimension

	Ampere	External dimension	Installation dimension	Remark
Single phase	30A、40A、50A	213*140*180	162*133	No fan
	60A、80A、100A、125A	257*140*180	162*133	
	160A、200A、300A	370*220*240	293*185	
Three phase	30A、40A、50A	213*140*180	162*133	No fan
	60A、80A、100A	257*140*180	162*133	
	125A、160A、200A	370*220*240	293*185	
	250A、300A、400A	460*370*260	400*335	

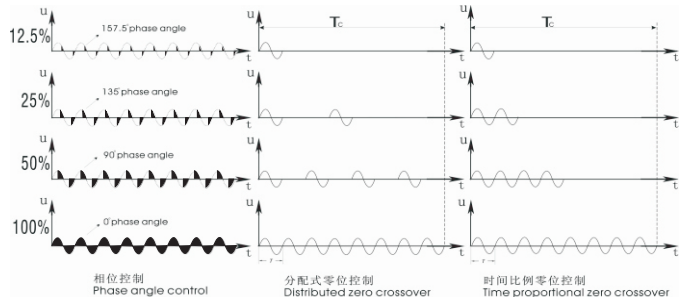
6.Installation instructions

SCR power regulator inside will generate heat, when installation, please follow direction installation (as below picture) which controller shell's letter should upward ,Generally above 60A we will add a fan,let it cooling,the fan under the controller. Please do not install in high temperature or poor ventilation, otherwise ,use it below 70%.



7.Control mode introductions, selection

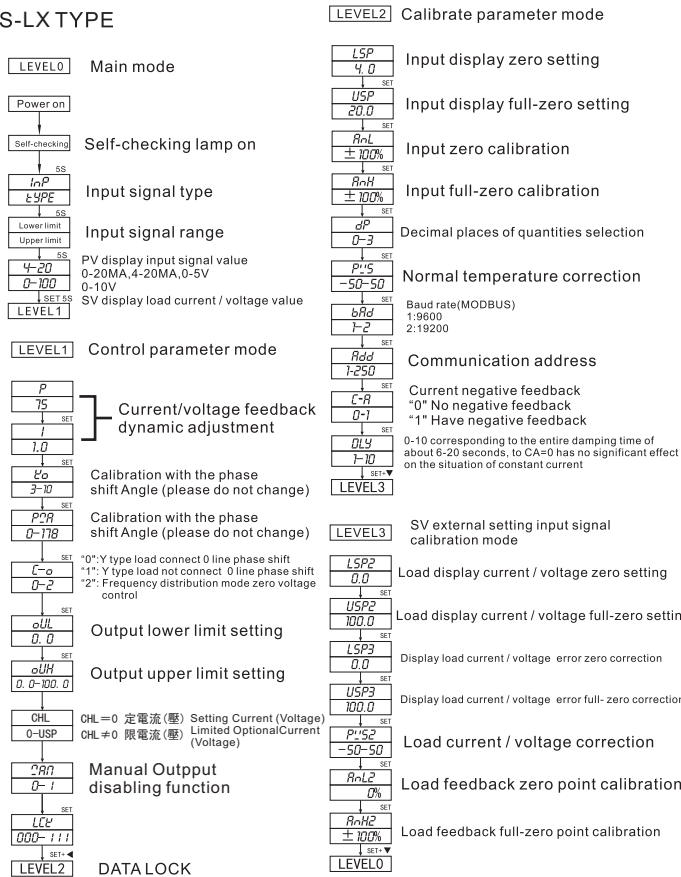
Control mode compare
 Domestic and foreign SCR power regulator products, the control mode is two kinds: phase control (adjustment) and zero control (adjusting power). the comparison between two modes, please reference below chart:



Phase control: role in each ac sine wave, change sine wave each half wave and negative half wave conduction angle to control the size of the voltage.
 Zero control: Within the set period Tc, Tc is usually for one second, trigger signal make the primary loop connect several cyclic wave (a few complete sine wave), and then disconnect several cyclic wave (a few complete sine wave), change in the period of thyristor in setting than column with time, To adjust the load on the average power of the alternating current (ac), can achieve the purpose of adjusting the load power.

8. Manipulation

S-LX TYPE



Request		Response	
Field name	Hexadecimal	Field name	Hexadecimal
Register number Lo	01	CRCLo	B8
CRCLo	05	CRCHi	FA
CRCHi	C8		

2. Function code 10 (write set value UPS = 100.0):

Request		Response	
Field name	Hexadecimal	Field name	Hexadecimal
Stack	01	Stack	01
Function code	10	Function code	10
Start address Hi	00	Start address Hi	00
Start address Lo	08	Start address Lo	08
Register number Hi	00	Register number Hi	00
Register number Lo	01	Register number Lo	01
Byte count	02	CRCLo	80
Register value Hi	03	CRCHi	0B
Register value Lo	E8		
CRCLo	A7		
CRCHi	A6		

9. 3 Parameter address allocation table

Parameter Name	Address		Read/ write Status
	Hexadecimal	Decimal	
MV	00H	0	R/W
PV1 (Setting Current or Input Signal Value)	02H	2	R
SV (In Fact Current / Value)	04H	4	R
LSP	06H	6	R/W
USP	08H	8	R/W
OUL	16H	22	R/W
OUH	18H	24	R/W
P	1AH	26	R/W
I	1BH	28	R/W
AM	80H	128	R/W

Note : 1. Before write MV(threshold value), please write 0x01 to AM to make system as manual status
 2. Parameter of decimal is 1 has 10 times relationship, there is no relationship when decimal is 0
 3. There should be certain time intervals between the writing of parameter commands, whether it's the same address or not, or it may cause an instrument failure. The time interval should be not less than 150 milliseconds.

9. Communication protocol

9.1 Description

- Type: PAN-GLOBE S-TYPE(S-LX) series Intelligent SCR
- Work purpose: Data exchange of S-TYPE(S-LX) series Intelligent SCR upper computer. (S-TYPE(S-LX) series Intelligent SCR only can be questioned and answer as a slave computer.
- Serial transmission mode: RTU
- Communication port: RS485
- Communication media: Shielded twisted pairs
- Communication stacks : 1~255. The upper limit for instrument to be mounted is associated with the load capacity of the Master computer.
- Realized function code: Read holding registers (03)、Write multiple registers (10)
- Entire efficient message of each group can exchange 16 bytes (8 parameters) data.
- Data format: 16 digits offset binary complementary to display; read the data after amplify 10 time; it should send data after amplify 10 times before write; please note transform.
- Serial port parameters:
 - Baud rate : 9600, 19200
 - Start bit : 1
 - Date bit : 8
 - Parity bit : None
 - Stop bit : 1
- Frame testing method: Cyclic redundancy checksum (CRC16)

12. Packet format (Here is N = 2) :

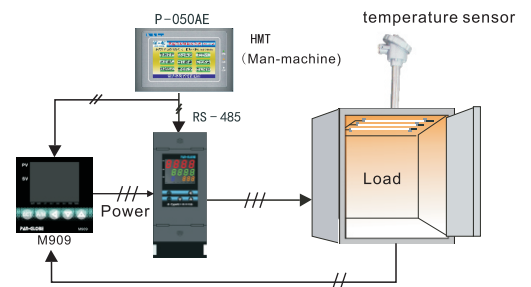
Add	Function	Data	CRC check sum
8-bit	8-bit	N×8 bits	16-bit

9. 2 Example

1. Function code 03 (read set value SV = 100.0)

Request		Response	
Field name	Hexadecimal	Field name	Hexadecimal
Stack	01	Stack	01
Function code	03	Function code	03
Start address Hi	00	Byte count	02
Start address Lo	08	Register value Hi	03
Register number Hi	00	Register value Lo	E8

10. Application



10. 1 Current calculation

S-LX power regulator (phase control mode)

Project case: Electric furnace

Need to keep temperature on 800 °C , and heater (thermal fuse) is nichrome connection, power is 96 KVA, the rated voltage of 380V three-phase power supply, with three-phase S-LX power regulator to build a simple temperature control system.

Model selection method: first determine the S-LX Type power regulator of power supply voltage and voltaic size.

The formula of electric current:

$$\blacktriangle \text{ Three-phase current} = \frac{\text{Total load KVA} \times 1000}{\sqrt{3} \times \text{line voltage}}$$

Because of thermal fuse use star connection, so line voltage is 380V, total load is 95KVA, the calculation of available current is about 144A, we choose 160A SCR controller(add 1.1 times safety coefficient). No need to do feedback constant current control, so this project selection of S-LX power regulator model is S-LX3010-3PC160A-10(Specific models selection need to refer to the S - Type intelligent thyristor catalog.