SINEPOWER

SP810 Strong Magnet Regulator

Digital Tube Display Parameter Setting and Operation Instructions

Features：

◆ Using 32-bit industrial grade high-speed microprocessor, LED digital tube menu to set parameters;

◆ With powerful magnetic output function, it is stronger than ordinary control method；

◆ Parameters such as strong magnetic voltage/time, excitation voltage/time, demagnetization voltage/time can be adjusted on site;

◆ Inverting function when discharging. Automatically invert the energy on the suction chuck to the grid;

◆ With temporary discharging function, the material can be quickly re-sucked after the material is temporarily discharged;

◆ The control board has functions such as phase loss protection, undercurrent protection, overcurrent protection, and working status indication;

◆ The suction timeout function can be set to prevent suction cup from damaging by false triggering of long-term output voltage;

◆ With power outage magnetic protection output control function；

◆ User can set the constant current mode output control, and the output current won't affected by the grid (in constant current mode);；

◆ The control mode has one-button self-locking or double-key jog control (remote control), and users can switch the selection by themselves；

◆ With automatic phase sequence identify function, there is no phase sequence requirement for the power supply of the control board, no debugging, convenient wiring;

◆ Product with safety design, CE certification, quality assurance, which made it can save your time and maintenance costs;；

◆ Fully automatic SMD process manufacturing, stable and reliable performance, mature application；

◆ Power transformer adopts military grade quality transformer, epoxy resin potting, high quality products tempered by high temperature aging;

◆ The main control chip adopts NXP 32-bit industrial-grade high-performance processor, which has superior computing processing capability and reliable anti-interference ability;；

◆ Passive devices uses Murata and Infineon brands to ensure that key parts of the control panel are not easily damaged;；

◆ The control relay is the Omron brand, and the number of actions is more than 10 times that of domestic brands;；

◆ All output ports and digital input ports are electrically isolated to provide better electromagnetic anti-interference protection.

Working Principle：

After AC voltage AC380V stepped down to AC240V (or AC380V directly input control, no isolation function), achieved DC220V DC voltage by thyristor control board, and then enters the suction cup through the control device. At this time, the suction cup is magnetized and sucked. The suction cup is connected to the reverse voltage to achieve the demagnetization function.

Control process: Strong magnetic for X second when sucking material, then automatically switching into the excitation voltage; Invert for X seconds when discharging and then reversed demagnetization automatically for X seconds.

Technical specification:

◆ Working power：380Vac ±15% 50/60HZ

◆ Main circuit working voltage：220～380Vac ±15% 50/60HZ

◆ Display adjust method：LED digital tube menu setting

◆ Strong magnet voltage adjust range：1～510V

◆ Excitation voltage adjust range：1～510V

◆ Phase drift range：0-176°

Adjustment output resolution：1/4000

Stable accuracy：better than ±1%

◆ Trigger current：≥ 600mA

Trigger capacity：≤ 1000A one-way thyristor

◆ Three phase trigger imbalance：≤ 0.3°

◆ Dielectric strength: 3500 VRMS

◆ Working temperature：-20℃～ 60℃   Relative humidity：≤ 90%RH（no fog）

◆ Dimension：272X166X58mm   Install dimension：253X146mm

◆ Weight：1.5KG

I.   LCD panel operation and mode instructions：
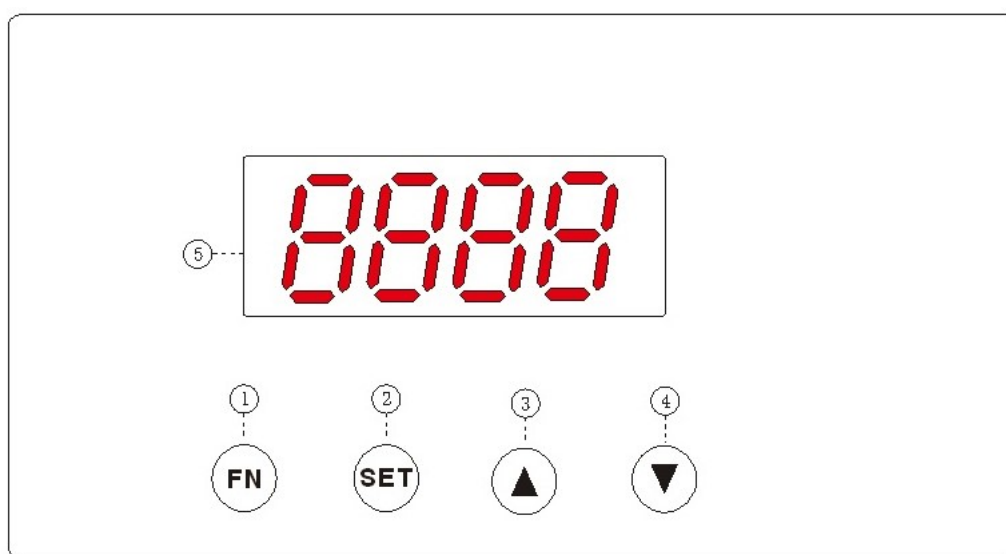
Button	Function
① FN	In running mode, short press it can check working thousands ratio of the present current.
② SET	Press it for 3 seconds into parameter setting mode. When in the setting interface, short press it to change into setting another parameter.
③ ▲	To increase the parameter value when modify.
④ ▼	To decrease the parameter value when modify.
⑤ Display interface	When it shows RUN, the board is in excitation mode. When it shows OFF, the board is in stop mode. When there is a fault, it will alarm.

II. Electromagnet control (excitation and demagnetization):

It is achieved by the external terminal on the control board, connect the button to the position of the ON and COM terminals. When connected, into the excitation running state, when disconnected, demagnetized to discharge the material.

It can also be controlled by two-button jog (i.e. remote control mode). It can be achieved by setting K parameter to K = 0. The factory default is K = 1, self-locking control.

(Please use passive switch, do not use active voltage signal, there is power inside the controller, if the external voltage comes over, it will burn out the interface!!!)

III. Keyboard lock mode:

Press and hold the ▲ and ▼ keys for three seconds to unlock. When the mode is locked, the display window will shows OFF. When the mode is unlocked, it will be displayed as -OFF. The default is in lock mode every time powered on. You need to unlock before entering the menu.

IV. Constant current working setting:

When the setting menu N parameter is set to --, the C parameter voltage value is operated as 220V excitation value. When the N parameter is a number (1-999), the excitation output is operated in constant current mode, and the constant current C parameter is the highest voltage limit value, you can press the FN key during operation to check the present running current display value, and set the constant current value according to this parameter; Please note: the C parameter is the actual voltage value, and the N parameter is the thousand ratio of constant current.

V. Security protection display instructions:

Err1: Phase A missing, the control panel shows Err1 and cuts off the output control;

Err2: Phase B missing, the control panel shows Err2 and cuts off the output control;

Err3: Phase C is missing, the control panel shows Err3 and cuts off the output control;

Err4: Overcurrent alarm indication, the control board shows Err4, and the corresponding relay outputs signal and cuts off the output control.

Err5: Undercurrent alarm indication, the control board shows Err5, the corresponding relay outputs signal and cuts off the output control.

Err6: Overvoltage alarm indication, the control board shows Err6, the corresponding relay outputs signal and cuts off the output control.

Err7: Working timeout alarm indication, the control panel shows Err7, the corresponding relay outputs signal and cuts off the output control. Err7 is displayed when it is in lock control, and it will automatically return to normal after releasing the button.

Err8: The frequency of main circuit power supply is wrong. The control board shows Err8, the frequency has exceed the allowable error range of 50Hz or 60Hz. The corresponding relay outputs the signal and cuts off the output control.

VI. Menu function setting operation (unlock before setting):

In the normal display mode, press the SET button for more than three seconds, the control panel enters the parameter setting mode, the function parameter value display flashes, press ▲ or ▼ key to modify the current parameter value, short press SET key to switch into the setting of next parameter. The control panel automatically saves the current value and automatically executes the parameter action according to the settled value next time it is run again.

Main menu setting mode display code and description:

Parameter	Default	Unit	Remark
A X：strong excitation voltage setting	290	Vdc	X is the number from 0～510.
b X：Strong excitation working time setting	3	Second	X is the number from 0～30.
C X：Excitation working voltage setting	220	Vdc	X is the number from 0～510.
d X：Inverter angle setting	120	Second	X is the number from 1～180.
E X：Inverter time setting	0.8	Second	X is the number from 0.1～5.0. Default is within 1.8m,if the electron magnet is bigger in size or larger in power, the related value should be bigger as well.
F X：Demagnetization voltage setting	230	Vdc	X is the number from 0～510. When add a 3 Ω potentiometer to both side of the demagnetization voltage, the voltage parameter should set to 23V. Voltage of both side are 170V when demagnetize.
G X：Demagnetization working time setting	1.0	Second	X is the number from 0.1～5.0.
H X：Phase parameter setting	0	--	X is the number from -260～260. Pls don't adjust it in random, and consult our technical engineer when you need to adjust.
I X：Load over current setting	--	%	X is the number from 10～999, -- is default as cancel the over current protection, and the over current value as set in thousand ratio. 1000=100%, 100% is related the maximum range of the current sensor.
J X： Load under current setting	--	%	X is the number from 10～999,-- is default as cancel the under current protection, and the value is set in thousand ratio. 1000=100%, 100% is related to the maximum range of the current sensor.
K X： Start and stop methods setting	1	--	X is the number from 0～1, 0 is 2 button jog control, 1 is single button self-locking control.
L X： Working time setting	30	Minute	X is the number from 5～120. It is necessary to prevent the electromagnet from long time working damage. -- is default as cancel the running time limitation, it will keep working while running.
n X：Constant current setting	--	%	X is the number from 0～999. Uses thousand ratio, 1000=100%, 100% is related to maximum range of the current sensor; when current is 0, it shows --, and will cancel the constant running.
O X：Positive and negative conversion time setting	0.6	Second	X is the number from 0.0～5.0.

VII. Control panel terminal definition：
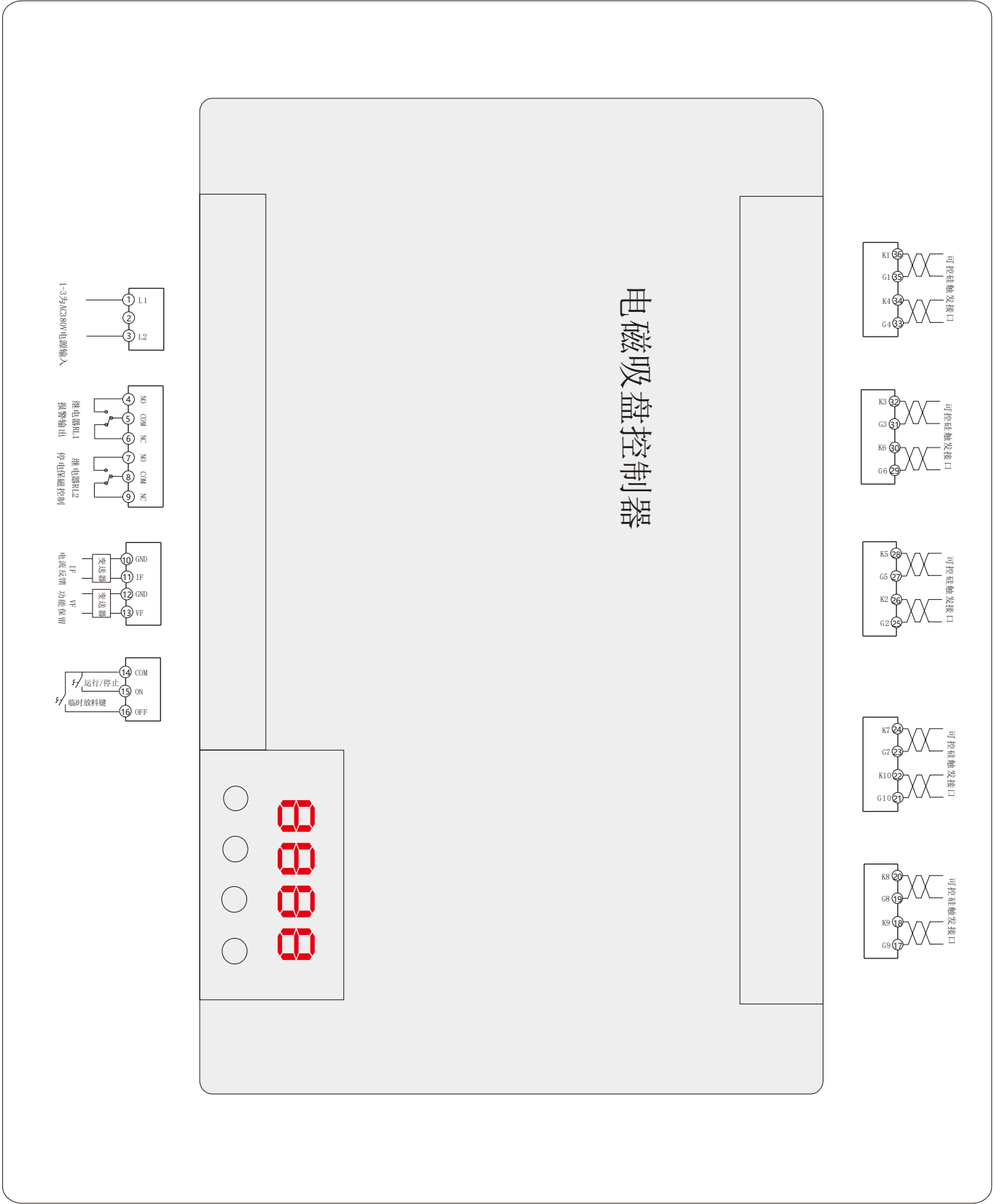
Numbers count from left to right, left side, up to down are 1 – 16; right side, down to up are 17 – 36.

- 1, 2, 3: Control board working power input terminal, 1 and 3 are for 380Vac power supply, 2 is empty.
- 4, 5, 6: Fault relay output terminals.
- 7, 8, 9: Magnetizing relay output terminals, pull-in when there is power, disconnect when there is no power or phase loss.
- 10, 11: Current feedback input signal terminal, factory default shunt is 0-75mV, please express in advance before your order if you need other signals.
- 12, 13: Voltage feedback input signal terminal, factory default is DC0-5V, please express in advance before your order if you need other signals.
- 14, 15, 16: Common COM, start and stop control. Short-circuit the 14 and 16 to act excitation operation, stop running when disconnected, please refer to the second part for other usages. (Please use passive switch, do not use active voltage signal, there is power inside the controller, if the external voltage comes over, it will burn out the interface!!!)
- 17, 18, 19, 20: W-phase thyristor control trigger, demagnetization control.
- 21, 22, 23, 24: U-phase thyristor control trigger, demagnetization control.
- 25, 26, 27, 28: W phase thyristor control trigger, excitation control.
- 29, 30, 31, 32: V-phase thyristor control trigger, excitation control.
- 33, 34, 35, 36: U-phase thyristor control trigger, excitation control.

VIII. Main circuit and control circuit wiring diagram:

The wiring diagram below is a schematic diagram of the main circuit, the trigger terminal of the control board and the thyristor when the electromagnet non-contact rectification control board is combined with other components. In the process of wiring the control panel trigger terminal and the thyristor, it should be noted that the position between the cathode (K) and the gate (G) is one-to-one correspondence, and the misconnection and reverse connection should be avoid, otherwise a short-circuit may happen to burn or damage control board.

Note: 1. Transformers, circuit breakers, contactors, fast-acting, thyristors, etc. need to be purchased by users.

2. Hall voltage sensor, Hall current sensor, transformer, shunt need to be purchased by the user.

3. The thyristor RC over-pressure absorption component is an optional accessory (sold by our company, and need to be purchased additionally).

Wiring diagram (With transformer to reduce voltage)