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Chapter 1 Overview

1.1. Preface

The company is greatly supported by the national science and technology department. On the base of advanced high-frequency switch power supply technology, the company invented LNDY series high-frequency switch power supply module which can fully satisfy the requirements of modern electric system. The product has been widely used in the DC system and relative equipments of power plant, transformer substation etc. of various voltage degree. The LNDY series high-frequency switch power supply module, has been applied in many fields, such as computer, aviation, instrument, especially in communication.

In the 1990's, The high-frequency switch power supply has been equipped in many country.

1.2. Characteristic of the system

- Modularization design, realize N+1 backup;
- The friendly man-machine interface. Large screen to show, realize man-machine dialogue operate really.
- RS-485 interface, realize "4 remote" function with monitor machine.

1.3. Main characteristic of the module

- High efficiency, Nearly 95%-96%;
- Lightly, 240V/30A fan cooling module only 19kg;
- Little volume, 240V/30A fan cooling module dimension only 410mm×303mm×136mm;
- After the full bridge rectifying circuit rectifies 3-phase AC to DC, then adjusted by reactive PFC, power factor>0.94;
- self-determination mean current circuit can realize the parallel mean current of more than 20 modules by itself without external circuit;
- Function against reverse pour: each module has been added diode against reverse pour at output terminal.
- communication, digital screen, digital, digital calibrate, stable current, fault alarm

1.4. Main function of the module

1) Protection Function

- Output overvoltage protection

To prevent the disastrous accident caused by outputting overvoltage to electric consumers, there is overvoltage protection circuit in the module. After output overvoltage occurs, the module locks up automatically, the relative module fault indication light is on, the faulty module quits work automatically and doesn't affect the normal operation of the entire system. The overvoltage protection point is set when ex-factory, $320V \pm 5V$ is set for rated output 220V machine type, Output current limiting protect

The output current cannot increase infinitely. The maximum value of the output current of each module is limited to the rated output current 105%, in this range, the output current value of the module is continuously adjustable. If the load output of the module, the module will play down the output voltage

- output short-circuit protection

When output short circuit, the module draws the output voltage to 0 immediately, limit the short circuit current below 15%limit current point to protect the module. The module will not be damaged under short circuit state for a long time, and can go back to work automatically after debugging.

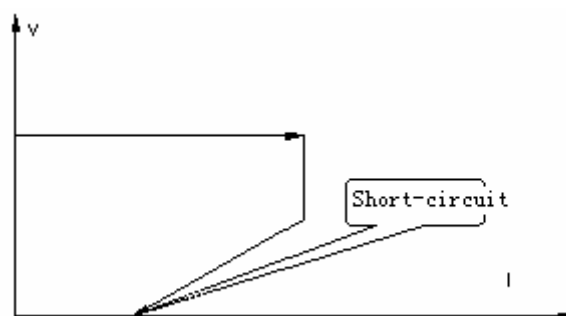


Fig. 1-1 Output Characteristic

- module parallel protection

There is parallel protection circuit in each module to ensure when the faulty module quits the system, the normal work of other modules and the system is not affected.

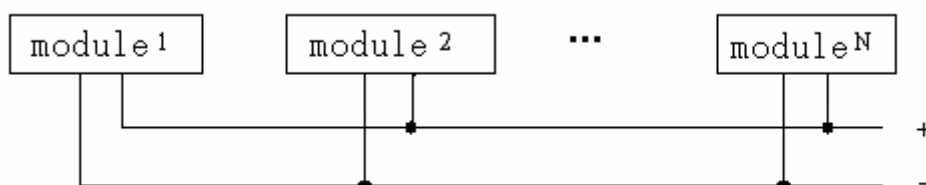


Fig.1-2 output of module parallel

- Over-temperature protection

Over-temperature protection is mainly for protecting large power converters, under normal operating circumstance, the module design leaves enough margin, under special circumstance, when the module detects that the temperature of the radiator is over 85°C , it will shut down automatically to protect itself. When the temperature reduces below 75°C , the module will start up automatically.

- output over-current protection

Because of the limit of the module output power, the output current cannot increase infinitely. The maximum value of the output current of each module is limited to the rated output current $+0.5\text{A}$, in this range, the output current value of the module is continuously adjustable. If overloaded, the module can reduce output voltage automatically to make it not surplus the rated output limit point in order to protect the power components. The overcurrent protection can be resumed automatically.

2) Measure function: Measure performance condition and display by LED, user is easy to know the system performance condition.

3) Fault alarm function :when module is falut, display the fault infomation by LED.

4) Parameter setting function

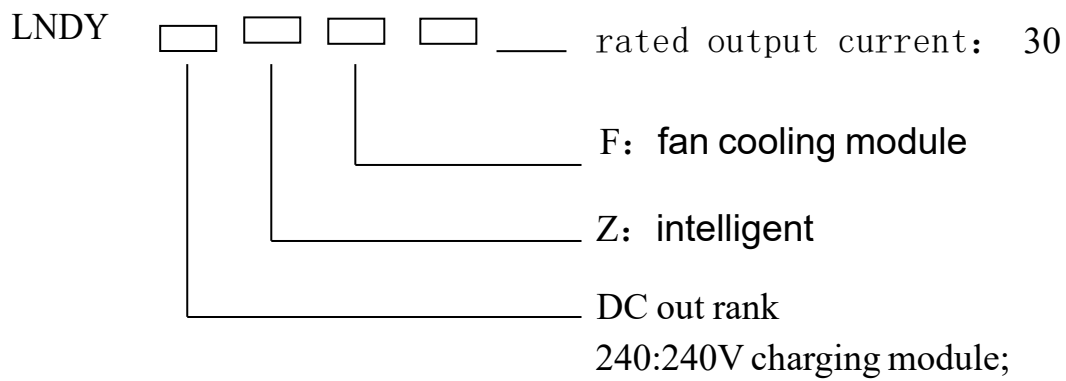
- Set the output voltage of module
- Set current limiting of module
- Charging state control

5) Communication function

Communication with RS-485 interface, realize parameter setting ,collect

performance parameter of module ,control performance state.

1.5. Type nomination



1.6. Technical characteristics

LNDY240ZF30series module characteristic of the module technical index

KGC@VIP.163.COM

module project		LNDY240ZF30 COMKGC@163.COM	
rated output current	A	30	
power	(KW)	9	
weight	(kg)	19	
cooling method		fan cooling	
heat sink temperature rise		$\leq 20^{\circ}\text{C}$	
rang of input AC (VAC)	min	353	
	Typical value	415	
	max	477	
rang of the output voltage (VDC)	min	190	
	Typical value	230	
	max	300	
stable voltage accuracy:		$\pm 0.5\%$	
stable current accuracy:		$\pm 1\%$	
PFC		≥ 0.93	
Efficiency		$\geq 94\%$	
noise (dB)		50	
Storage temperature (°C)	min	-40	
	Typical value	25	
	max	60	
working temperature (°C)	min	-10	
	Typical value	25	
	max	40	
time delay of start-up (s)		3~8	
Wave factor		$\leq 0.2\%$	
Load	100% rated output current		
stepless current limiting technology	The output current cannot increase infinitely. The maximum value of the output current of each module is limited to the rated output current		
Output overvoltage protection function	After output overvoltage occurs, the module locks up automatically		
output short circuit protection	When output short circuit, the module draws the output voltage to 0 immediately		

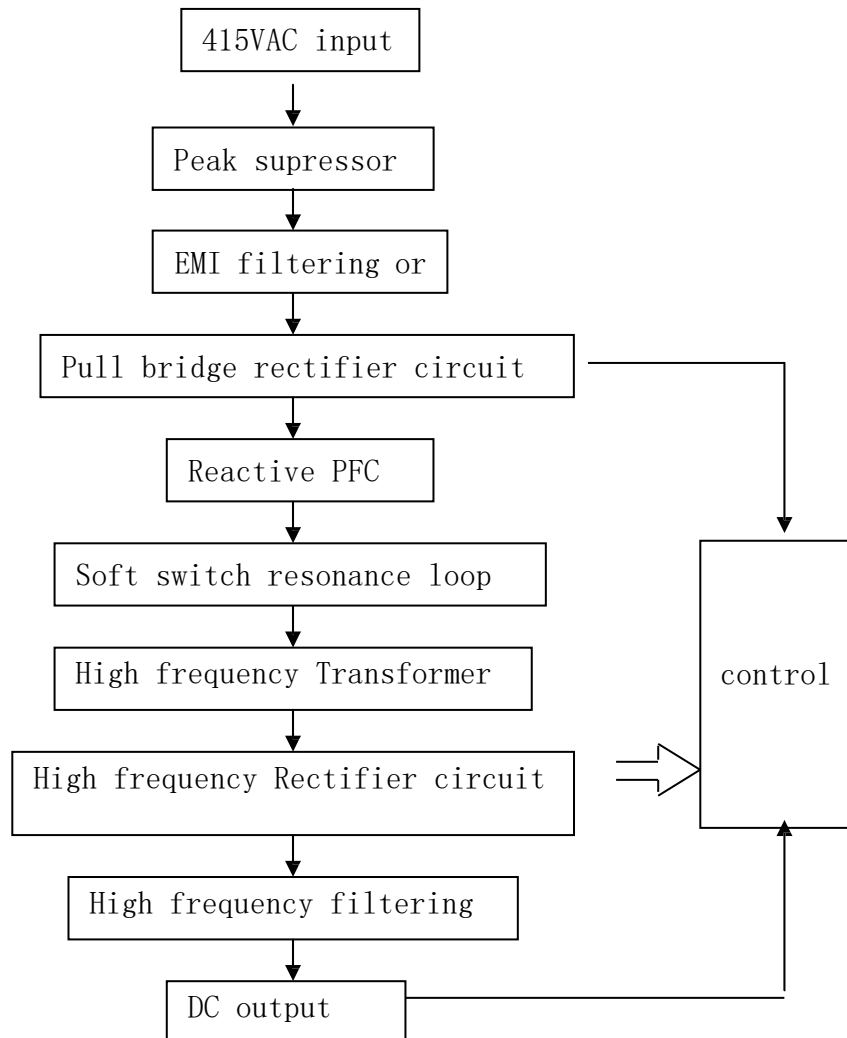
Chapter 2 Operating Condition

- 1、Altitude $\leq 2000\text{m}$;
- 2、Storage temperature: $-40^{\circ}\text{C}\sim+60^{\circ}\text{C}$;surrounding temperature: $-10^{\circ}\text{C} \sim 40^{\circ}\text{C}$;
- 3、Relative humidity: $\leq 96\%$ (operating temperature 25°C) ;
- 4、No conductive and explosive dust, no caustic gas;
- 5、Used in room;

Chapter 3 Module Configuration

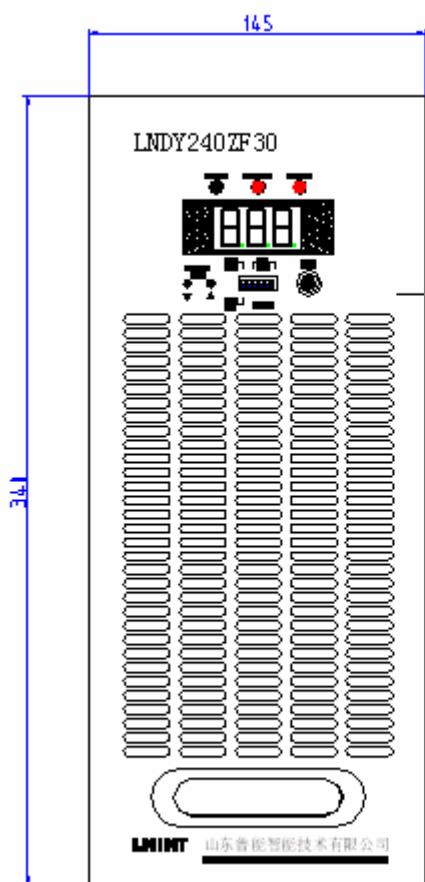
COMKGC@163.COM

3.1. Operating diagram of the charging module

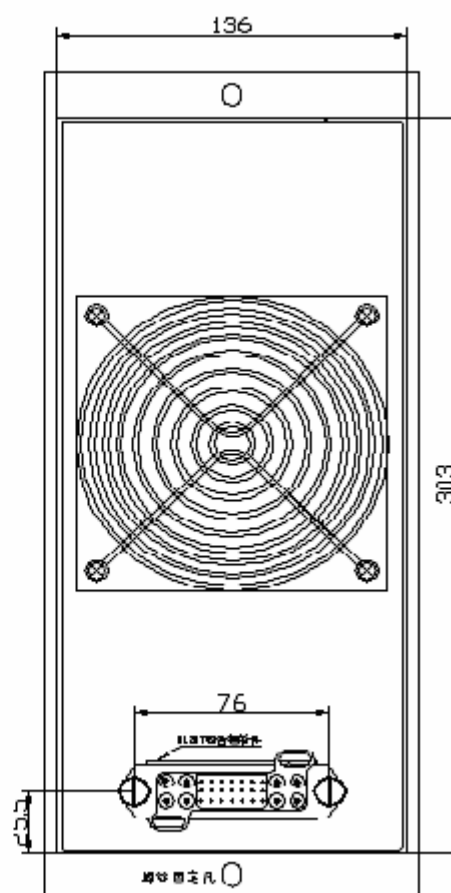


3.2. Dimension

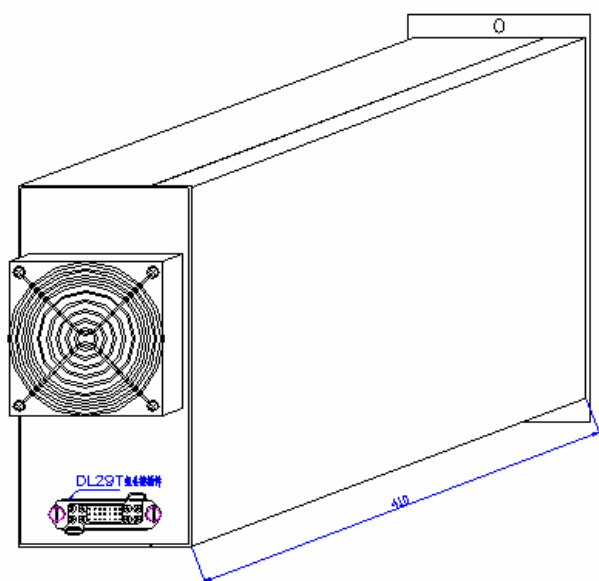
LNDY240ZF30 fan cooling module dimension sketch map



sketch map of the front panel of the module



sketch map of the back of the module

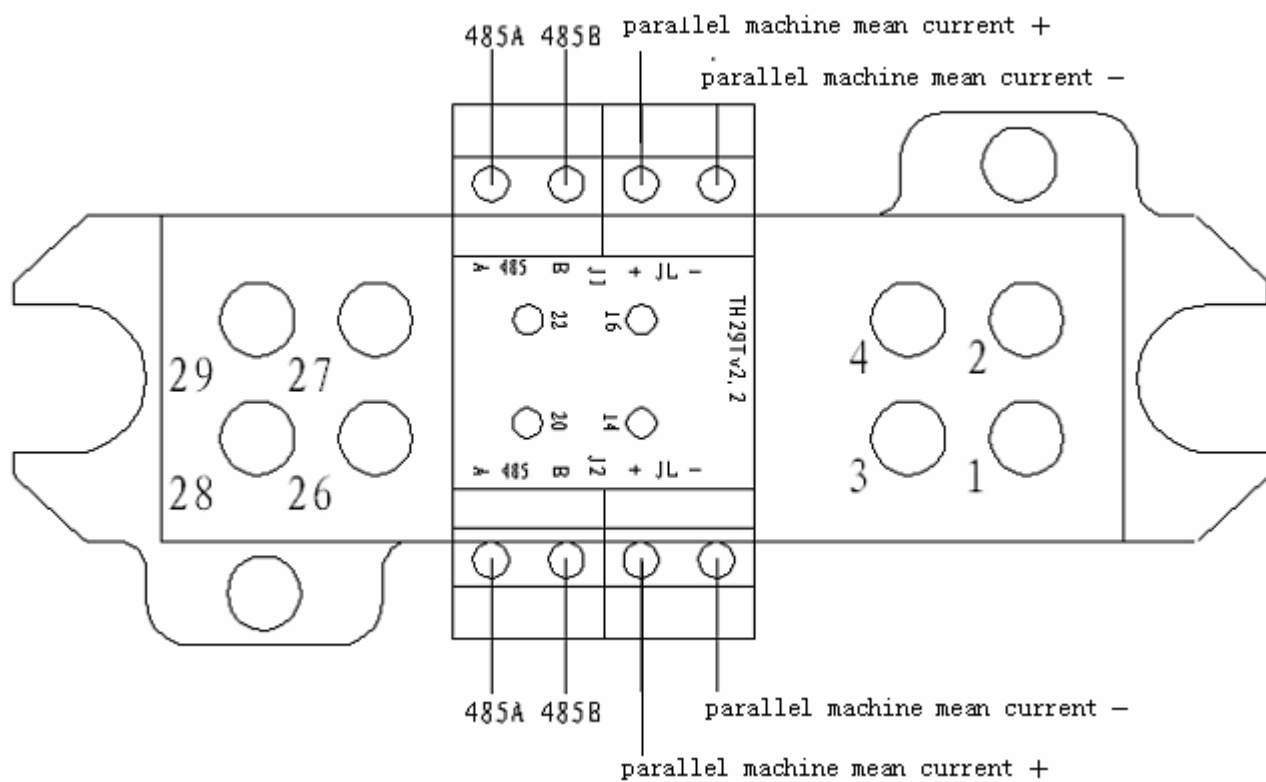


WWW.COKGC.COM

outline drawing of the module

3.3. Installation of module

LNDY240ZF30 the definitions of the plug socket (DL29T) of live line inserting and pulling out are as follows



port	standard	define	function
1、3	12#	DC+	DC output+
2、4	12#	DC-	DC output-
26	12#	G	Input GND
27	12#	A	Input415V
28	12#	B	Inptu415V
29	12#	C	Input 415V

remark: ① No define port is empty



- 1) Our company has prepared integral drawers with connected wires to provide the customers convenience 。
installation sketch map in excursus

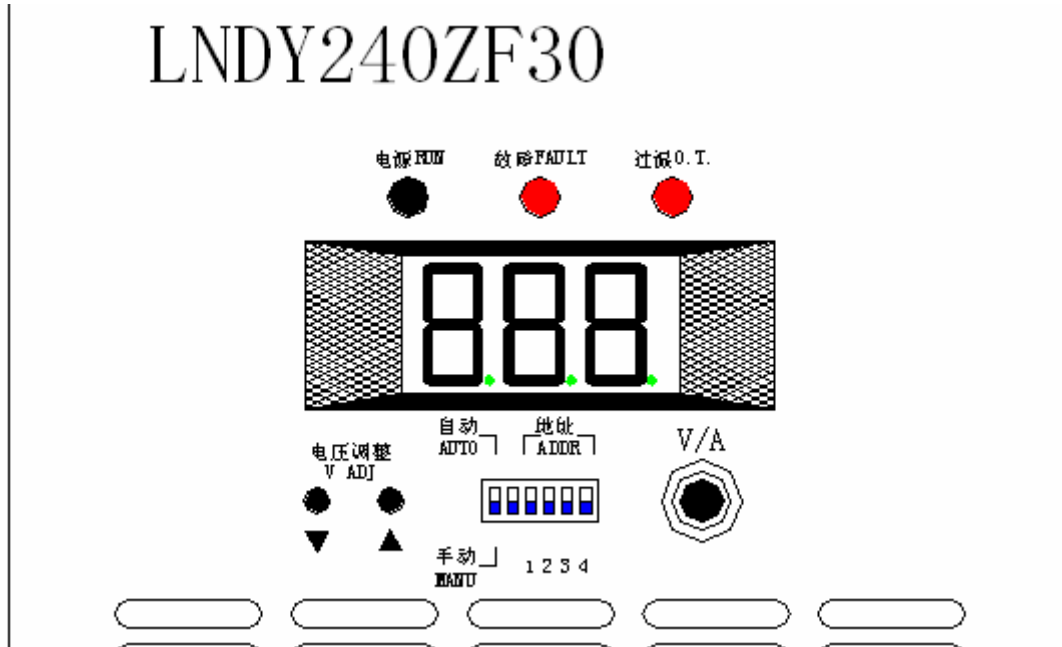
Note:

Dismantling the machine without authorization is forbidden. If there is any damage with the seal, the product will not be exchanged, and all the repair expense should be afforded by the users.

Since the quality of the self cooling is large, please package it separately from the system during delivery. Thank you for your understanding!

Chapter one Module Introduction

The LNDY240ZF30 charging module is widely used in power station, of voltage 35kV to 330kV degree. LNDY240ZF30 charging module works in the model called Natural cooling, with the actual operation of the power system.



Digital display panel

The Digital display panel shows the information of voltage, current, alarm, shutdown. Switching button for display shows the output voltage and current switching. There are 3 digitals can be displayed, the accuracy of voltage is 0.5V, the accuracy of current is 0.2A. When the module alarms, the fault code can be displayed by pushing the switching button. When the module shut down, the shut down code can be displayed by pushing the switching button .

Indication light

There are three indication lights on the module panel, table 1-1 shows the function of them.
table 1-1

Buttons for displaying switch

The Switching button is used to switch what LED displays. If the LED are displaying the output voltage, then you push the button, there will be display output current, if you

Marking instructions	Normal State	Abnormality State	Abnormality Reasons
Power indicator light (green)	on	off	No input voltage resulted in the internal auxiliary power supply module does not work
overtemperature light (red)	off	on	Module internal overheating ;
Fault light (red)	off	on	Module internal fault

push the button again, then it will also display the output voltage. Manual adjusting voltage button

Two buttons embedded in the panel are used to adjust the output voltage in the manual state. The output voltage will at the lower of 1V, when the left button is pushed; also the output voltage will arise 0.50V when you push the right button. You must pay attention to that this button is working only in manual state.

Dial switching

Dial switching are used to select the control module and mailing address. Definition is shown in Figure 1-2

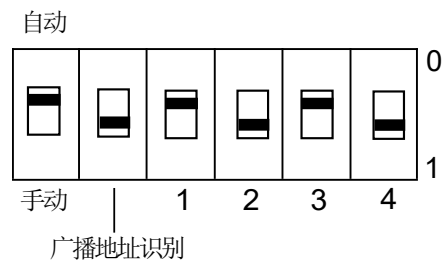


Figure 1-2

1 .Control options code(WWW.COKGC.COM)

The dial switching of the far left is dial-control options, selecting the automatic control or manual control. Control methods for allocation allocated under manual control, as shown in Figure 1-2.

In automatic control mode, the module's output voltage limiting, switching planes are monitored by module control, artificial can not intervene it . If modules for rechargeable batteries to switch on the bus, the general approach should be set up for control.

In manual control mode, the output voltage can be adjusted by the manually button. Module output voltage limiter point and switch control module from machine control, etc. However, the operating parameters can be reported to the Control Module.

If connected to the control bus module, the module will need a single output voltage stability. At this time should be set up for manual module state, the module output voltage surge by manual adjustment buttons, limiting points are all relaxed, about 105%.

Note

Surge button manual recharging module will reach a maximum output voltage 286V. Do not adjust the normal system in the random button. Since different users have different choices and the number of battery, for the sake of safety, Charging module output in the whole factory has been set at the Floating 234V voltage values.

2 .Broadcast address identification code

The left side of Switching dial-second is broadcast address identification code allocated, used to identify the broadcast data packets. Appropriated for the top, a module of Group 1, the broadcast data packet with 255 of 253; appropriated the bottom, a module of the second group, the broadcast data packet with 254 and 255.

3 .Address setting dial

Four of dial switching with the right allocation of broadcast address identification code addresses communications module installed together constitute dial, The mailing address for the

module. Module installed in the mailing address in binary, every allocation of representatives allocated upward binary code 0 appropriated to represent binary 1. One addresses the right to set up most of dial-lowest, the most left one of the highest places. LNDY240ZF30 charging module addresses set up for dial-five. Therefore module addresses the range of 0~31, that is the control module with a serial port to connect the largest number is 32. Module addresses is the only identification signals that charging control module identify others. the same system can not be installed at the same module. To the same modules, control modules to be installed mailing address, which should be the same with communication modules. Control module installed in the module addresses a number of the metric system, 1-2 with the conversion table.

Binary	00000	00001	00010	00011	00100	00101	00110	00111	01000	01001	01010	01011	01100	01101	01110	01111
Metrication	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Binary	10000	10001	10010	10011	10100	10101	10110	10111	11000	11001	11010	11011	11100	11101	11110	11111
Metrication	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

For example : dial installed at the above address indicated on the map (for the black dial position). Said binary 10101, which can be found in Table 21 metric address is Unit 2 module.

2 .Fault Display

Alarm information are displayed in the form of fault code in the LED. Then LED displays the fault code. The voltage will be shown by pushing the switching button. Fault code as shown in Table 1-3.

Table 1-3 COMKGC@163.COM

fault code	E01	E02	E03	E04	E05	E06
Code meaning	Output over voltage	Output over voltage	Output over voltage protection	Output over voltage protection	Overheat protection	Ac input Abnormal

3 . Communication Function

The module can communicate with PC mode in RS485. It can send the output voltage and current, the module protection and alarm information to a host computer, accepting and implementing the control orders issued by the host computer.

Note (WWW. COKGC. COM comkgc@163. com)

When the charging module is in automatic model, there will not be any communication in 4 minutes . The output voltage can be adjusted to the voltage of 234V automatically. Limiting point can be opened all to 105% of current. comkgc@163.com