OPERATING MANUAL

ZXY-6020S Programmable Power Supply

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Contents

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2. Inspecting Package Contents

When you get a new ZXY-6020S Programmable Power Supply, please inspect the instrument as follows:

2.1 Check if there is damage due to transportation

If the package is damaged, please retain them until the instrument and accessories are tested.

2.2 Check package contents

Contents of the case are as bellows, if the content does not match with the packing list or the instrument is damaged, please contact us.

        ZXY-6020S Programmable Power Supply   1pc

        User manual(pdf)   1pc

2.3 Check the machine

If the machine was damaged; did not work properly or failed to pass performance tests, please contact your dealer or our company.

3. Summary

3.1 Brief introduction

ZXY-6020S is single output programmable switch power supply. Its

specification is 60V, 20A, 1200W. It is designed by DC-DC modularization. Small size and high output power. Besides, it is equipped with TTL serial interface, provide a serial communication protocol, support secondary development. We can provide versatile solutions according to your design and test requirements.

3.2 Main function

- Based on BUCK structure of switch power supply technology, the work frequency can reach to150 KHZ
- DC input voltage range: 13V~ 62V, which is suitable for multiple kinds of pre-stage input power supplies
- Combined with the operating buttons and multifunction encoders, it is convenient and easy to use
- High accuracy and high resolution: 10 mV / 10 mA
- Low ripple and low noise
- Indicator light: constant current(CC), constant voltage (CV) and output state (ON)
- LCD1602 display
- Adjust voltage and current by adjustment knob and keys
- Support measuring and displaying output voltage, output current, output power, output electric quantity (AH) and working time
- Intelligent temperature detection, can connect an external DC12V fan,and control its speed in level 5
- The minimum pressure differential is 2V, the module can still work steadily under the circumstance
- With output turn off function key, users can turn on or off   the output flexibly
- 10 groups of parameter settings of M0-M9, which can be conveniently called out at any moment
- Prompt for operation or alarm function of onboard buzzer
- Convenient and simple three-phase charge intelligent control function of storage battery
- With TTL serial communication, and improved communication protocol so

as to be convenient for centralized control

3.3 Technical data

Item	Parameter
Input Voltage	13V～62V
Output Voltage	0～60V
Output Current	0～20A
Output power	0～1200W
Setup resolution of output voltage	10mV
Setup resolution of output current	10mA
Source regulation	CV is less than 0.5% + 10 mV, CC is less than 1% + 5 mA
Load regulation	CV is less than 0.5% + 10 mV CC is less than 1% + 5 mA
Output ripple	< 50mVpp (Input 54 V, 12 V output, current 8A)
Volatility transmission ratio of 100 Hz	< 1/10000
Typical efficiency	88%(Input 54 V, 36 V, output current 8 A)
The display precision of Voltage, Current	10mV, 10mA
Display error of Voltage	±1%+50mV
Display error of Current	±2%+20mA
Response time	< 50ms
Memory operation	10 groups of parameter storage of M0-M9
Protection type	OTP, OVP, OCP, OPP, OAH, OFT
Heat-dissipating method	heat dissipater and fan (optional)
Operating ambient temperature	0～40℃
Storage ambient temperature	-20～70℃

Use ambient	For indoor use , maximum humidity of 80%

3-1 Technical data

4. Instrument Introduction

4.1 Panel Introduction
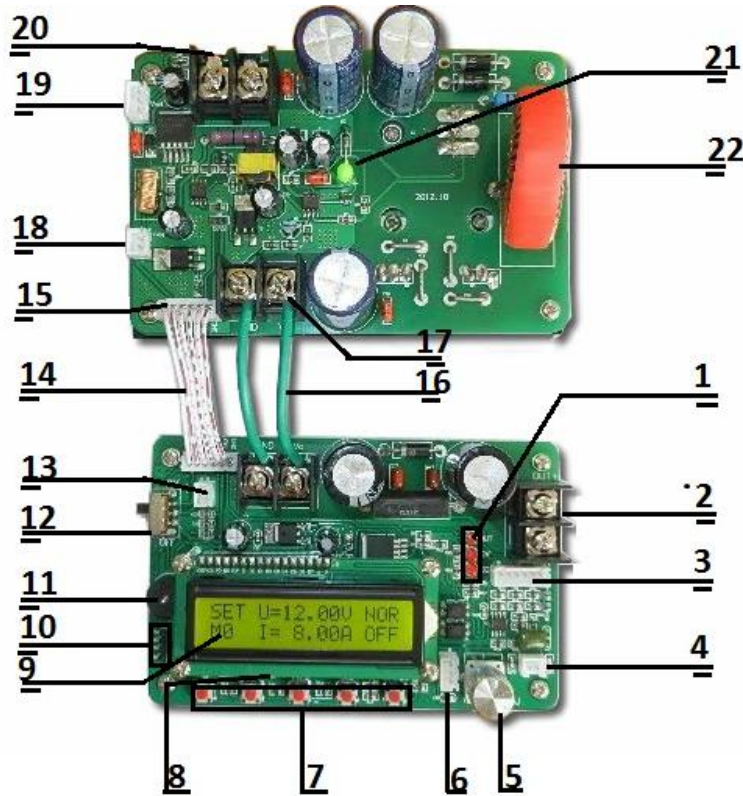
Item	Introduction	Item	Introduction
1	Output state indicator lamp	12	power supply switch
2	DC output	13	expansion interface for power supply switch
3	expansion interface for output	14	connection flat cable
4	voltage detection expansion interface	15	connector wire socket
5	adjusting knob for coder	16	power connector wire
6	expansion interface for coder	17	power connector wire socket
7	Operating key	18	external connection fan interface
8	expansion interface for operating key	19	voltage expansion interface

9	1602LCD	20	DC input
10	Serial communication interface	21	power board indicator lamp
11	Buzzer	22	Filter inductance

4-1 The introduction of the ZXY-6020S

4.2 Introductions for keys

key	Name and function
⬆	page up key, rapidly setting voltage and current values
⬇	page down key, rapidly setting voltage and current values
<>/M	storage/call, cursor moves the key left and right
SEL	option key, setting preferences
OUT/OK	Enter key

4-2 The introduction of the button

5. Operation

This chapter we will introduce the usage of ZXY-6020S in detail.
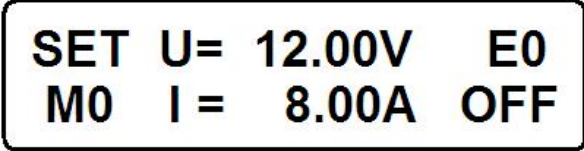
5.1 Quick start guide

Now we will introduce the operation method of the power supply briefly with an example of 24.5V, 5A to ensure that users can grasp a conventional method of the power supply rapidly.

5.1.1 Start

The range of the input voltage is 13 V ~ 62 V, please be sure that the voltage of the pre-stage input power supply is during the range, otherwise, the power supply will not work or damaged. What should be noted is that the power supply is a BUCK power supply, if you want to output 24.5V, make sure the input is more than 26V (Ensure that the pressure differential is greater than 1.5V), then connect the output of a pre-stage power supply to input terminal

behind the machine. Be careful not to pick the wrong positive and negative. After ensuring that the power input is properly connected, you can turn on the power switch, then the screen will light up the voltage and current default interface appears.
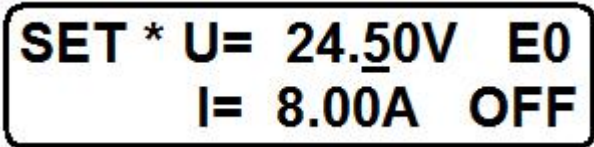
```
SET U= 12.00V   E0
M0  I =  8.00A  OFF
```

M0 indicates that preset value stored in M0 is called in currently, if parameters which were pre-stored in other positions are needed to be called out, "<>" keys can be repeatedly pressed to call the parameters from M1 to M9 out. OFF indicates that the power supply is in off state and E0 indicates that the power supply is normally turned off.

5.1.2 Setting the voltage and current value

Press the "SEL" key, the cursor stays in the value of the voltage, it means that we can set the value now. Rotary encoder, regulate the voltage to 24.00 V, then press the "< >" key, change the cursor position, regulate the voltage value of 24.50V, as shown in the figure below.

```
SET * U= 24.50V   E0
         I= 8.00A  OFF
```

Press the "SEL" key, cursor stays in the value of the current, rotary encoder, regulate the the current to 5.00A. Press the "SEL" key again, the cursor will disappears.

5.1.3 The operation of output state

Connect load, press "OUT" key, the machine will output normally, when the load resistance is larger, the current will less than 5A, the machine is in CV mode, the CV and ON indicator lamps will light.

```
24.53V      3.56A
85.54W   0.05AH  CV
```

Change the load, when the current increase to 5A, the instrument is in constant current (CC)state, at this time the voltage is reduced, the CC and the ON indicator lamps will light.

```
18.86V      5.01A
94.48W   0.28AH   CC
```

Obviously, the power is the product of voltage and current, AH is a cumulative amount, which gradually increase over time.

Under the output state, when the cursor is not displayed, press the" ↓ "key can clear the AH. Press the" ↑" key to switch into the time display, the display of time and temperature sensor are as shown below:

```
18.86V      5.01A          18.86V      5.01A
TIME: 00:10:23  CC          T-SNS:     51
```

5.1.4 Turn off the output

If you don't need to output, you can press "OUT" key to cut off the output.

5.2 Detail operating instructions

This section we will introduce the use method of power supply in detail.

5.2.1 General Introduction

When output is not performed and the cursor is not displayed, press"↑", "↓"key or rotary encoder to switch different function options, as shown below:

Number	Item	Introduction
1	SET U-CAL	Calibrate the voltage measurements
2	SET I-CAL	Calibrate the current measurements
3	SET OTP(E6)	Set over temperature protection value

| 4	SET OVP(E1)	Set over voltage protection value
5	SET OCP(E2)	Set over current protection value
6	SET OPP(E3)	Set over power protection value
7	SET OAH(E4)	Set over AH protection value
8	SET OFFTIME(E5)	Set over time protection value
9	---SAVE DATA！---	Save the parameters
10	Start up：OFF	Set whether open when boot
11	System Recover	Recover the system
12	Sound Enable：ON	Set whether turn on the sound
13	Save Parameter	Save parameters
14	Set Addr. Code	Set the address code
15	Set Baud Rates	Set the baud rate
16	Charge Mode：OFF	Set whether turn on the charge mode

5-1 The introduction of the function

5.2.2 Function 1,2,9 and 11

Function 1 and 2 are the functions to calibrate the voltage and current value. Function 9 is to save the parameters, we have calibrated them before delivery, calibration is not needed under general condition, if necessary, please contact us. If mis-operation, you can use the function 11 to recover, press the OK key to restore factory Settings.

5.2.3 Function 4 and 5

Function 4 and 5 are the functions to set the maximum voltage and current value. The maximum voltage and current of this module are 60V, 20A. If you do not need to set such a big upper limit, for example, the upper limit of voltage and current you need are 30V, 5A, the output will not exceed the set values after the setting.

Function 4:press the "OK" key, then you can set the value of the over voltage protection. As shown below.

```
┌─────────────────────────┐
│  SET OVP VALUE          │
│  OVP=        0.00V       │
└─────────────────────────┘
```
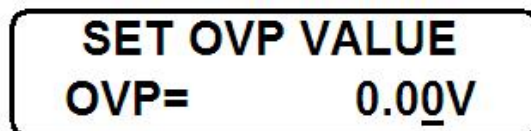
Users can move the position of cursor when pressing the "< >" key, rotate the adjust knob, regulate the voltage to 30.00V.

The setting of the current is similar to the voltage. After the setting, you should save the parameters in M0 according to function 13, then the parameters will be load automatically at boot time.

5.2.4 Function 3

The module has an intelligent temperature detection control function, the temperature detection value is a two digits which can reflect the radiator temperature, it is about 50 at normal temperature of 20℃, when the temperature increase 8 ℃, the figures will reduce by 1. In the function 3, we can check the current radiator temperature detection value and the set value, the default set value is 0, indicating that the temperature control function is not started, when the power is in the output state, fan work, the power supply will not turn off automatically due to the high temperature.

If you want to turn off the output when the radiator temperature is about 100℃ , you can set the OTP = 40 (specific machine may different), therefore, the fan start to work when the temperature is above 20℃, the module will control the speed automatically when the temperature between 20℃ and 60℃, when the temperature is more than 60℃, it will run at full speed. The output will be cut off automatically when the temperature exceed 100℃, then it will send an alarm and the screen display error code E6.

After setting it, you need to use the function 13 to save the parameters in M0 .

5.2.5 Function 6,7 and 8

The three functions are over power protection, over AH protection and overtime protection. They have the similar setting method. Now with the OPP (overpower protection) as a case, we describe the setting method. Enter the

OPP, the screen will display:

```
SET OPP VALUE
OPP=        0.00W
```
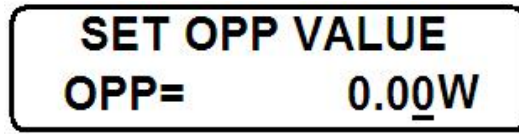
The default setting is 0, indicating that the OPP function is off. You can set non-zero data to start it, for example, set the maximum power of 20W, you can press the "< >" key to select the cursor position, and adjust the knob or press "↑", "↓" key to regulate the OPP value. After setting the output, when the actual output power exceeding 20W, the output will be cut off, then it will send an alarm and the screen will display error code E3.

OAH protection function is mainly used for setting upper limit when charging the battery, the machine will work continuously when it is 0, the OAH protection function will work when it is not 0, when the actual output AH is exceeding the setting value, the output will be cut off, then it will send an alarm and the screen display error code E4.

OFFTIME overtime protection feature allows the power off after a period of work. The machine will work continuously when the OFT=0. Setting a non-zero time, after exceeding the set time, it will cut the output automatically, then send an alarm and an error code E5.

The three functions also need to use function 13 to save parameters in the M0 in order to load at boot time.

5.2.6 Function 10

The module turn off by default, you should press the "OUT" key to output. If you want to output at boot time, you should set the function 10, switch to the "Start up: ON" state, then the module will output automatically at boot time. The functions also need to use function 13 to save parameters in the M0.

5.2.7 Function 12

The default setting of sound is open, if you do not need the voice prompts and alarm operation, you can set the function 12, making the "Sound Enable: OFF".

The functions also need to use function 13 to save parameters in the M0.

5.2.8 Function 13

The parameters described above from 5.2.3 to 5.2.7 will be lost after the shutdown. If you need to save, you need to use the function 13, press "OK" key to save the setting parameters in M0, therefore every operation can automatically load at boot time. This machine has 10 storage positions from M0 to M9, if you need to save parameters in the M1 ~ M9, press the "< >" key to select the store location, then press "OK" key to save. If you need to load the parameters in M1 or others, you can repeatedly press the "< >" key when the machine is not output and the LCD has no cursor .

5.2.9 Function 14 and 15

Function 14 and 15 are the functions to set the address code and communication baud rate, this will be introduced in communication protocol of ZXY-6020S.

5.2.10 Function 16

Since the output of the charging mode is batteries, open the charging mode, power will be charged according to the general three-stage. When the battery is fully charged, it will enters the trickle charge mode automatically after the buzzer sounds, and the charging mode can simultaneously set OTP or OAH and other protect function at the same time .

Now we will use a 48V, 12AH lead-acid battery to explain the process of three-stage charging.

① Setting voltage of 58.5 V, current of 1.8 A, open the charging mode in the function 16 and save the settings in M0.

② Connect the battery, press "OUT" key, because the voltage of the battery is low, it can be seen that the battery is in constant current (CC) mode and the current is 1.8A, which is the first stage.

③ When the voltage increase to 58.5 V, the current starts falling, the system is in constant voltage CV mode, which is the second stage.

④ With continuous charging, the current is gradually reducing, when the current is reduced to 1/10 of set value 1.8A, namely, 180mA, and now the buzzer rings out, the value of the voltage is reduced to 93.75% of original value, namely 54.8V. Under this voltage, the power supply charges the storage battery in trickle charge mode, which is the third stage.

5.2.11 Other important notices

1. M0 is the default storage location, and the module can load the parameters in M0 automatically at boot time.

2. The storage range of each position of this power supply is wide, including voltage and current values, various protection setting values, and whether automatically start on on boot time, sound options and others, which are stored in corresponding storage positions, and all storage positions are independent.

6. Cautions

6.1 Don't exceed the range of the meter, otherwise it will damage the module.

6.2 Connect input and output properly, it is forbid to reverse connection, otherwise it will not measure correctly.

6.3 Operating temperature is from -10 to 50 degrees Celsius, and storage temperature is from -20 to 70 degrees Celsius; make sure the instrument kept dry.

6.4 Do not attempt to disassemble the instrument, destroying the package will void the warranty, this instrument has no user-serviceable parts inside, if it need to be repaired, you can repair it by specifying outlets, or return to the factory for repair.

6.5 Do not move the instrument violently as it is working to avoid irreparable damage to the internal circuitry.

7. Warranty and service

Thank you for purchasing our products. To maximize the use of the new product features, we recommend that you take the following steps:

1 Read safe and efficient use instruction.

2 Read the warranty terms and conditions.

We warrants to the original purchaser that its product and the component parts thereof will be free from defects in workmanship and materials for a period of one year from the data of purchase.

We will repair or replace, at its' option, defective product or component parts. Returned product must be accompanied by proof of the purchase date.

Exclusions: This warranty does not apply in the event of misuse or abuse of product or as a result of unauthorized alternations or reapers. It is void if the serial number is alternated, defaced or removed.