COUGAR 2.0 - 800/50 Modular UPS

User Manual

2018 V2.0

CONTENTS

INTRODUCTION

Thank you for choosing our product.

The manufacturer is particularly specialized in the development and producing of Uninterruptible Power Supply (UPS). These UPS system are high quality products, carefully designed to meet the highest performance standards.

ATTENTION

This manual contains instructions concerning the installation, operation and debugging of those. Please read the manual carefully before proceeding to the installation, which must be carried out by trained personnel. This manual contains essential information regarding the operation of the equipment;And must therefore be kept in a safe place and consulted before operating the UPS.

SAFETY

The first connection to be made must be the connection between the ground lead and the PE terminal.

All maintenance operations inside the UPS must be carried out only by trained personnel.

The battery must only be changed by qualified personnel when necessary. Batteries that have been removed must be taken to a specialized disposal and recycling center. The batteries are classified as toxic waste by law.

After disconnecting the mains (AC) and battery (DC) supplies, authorized service personal must wait at least 10 minutes for capacitors bleed off before attempting to gain internal access of the UPS.

CE marking and TLC certification

The UPS carries the CE mark and TLC mark, if used in accordance with the procedures described in this manual, complies with the EN50091-2:UPS—EMC requirement，EMC 89/336, 92/31 and 93／68 ECC directives.

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1. STORAGE

If the UPS is not to be installed immediately it must be stored with the original packaging and protected from moisture weather. The area used to install the equipment must have the following characteristics:

- temprature : -25°C to 60°C
- Relative humidity: ≤93%, non-condensing

The recommended storage temperature is between: 10°C to 30°C

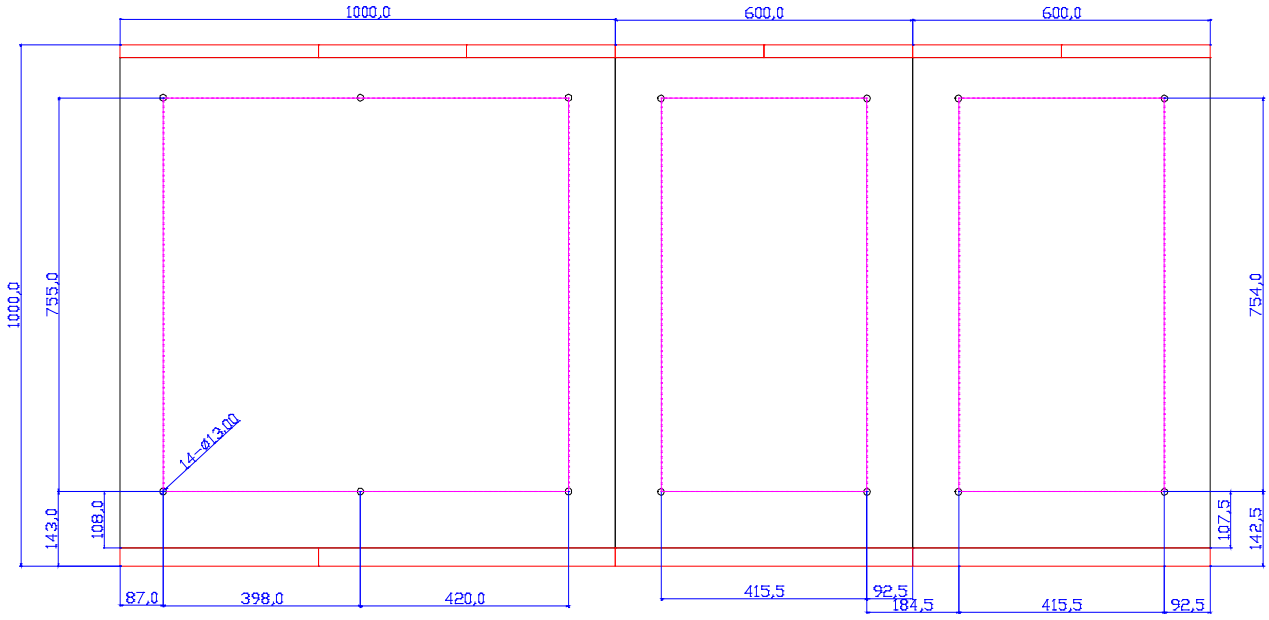
2. INSTALLATION ROOM

The UPS is designed for indoor installation. The following points should be observed when choosing the place of installation:

- Ensure that the floor is level.
- Avoid sites that are too narrow as this may impede normal operations.
- Avoid positioning in sites and direct sunlight or hot air.
- Ensure that the ambient temperature, with the UPS operating, remain between: -5°C to 40°C
- Keeping the installation room clear and dry. Avoid moisture weather and poisoning materials
- The UPS is heavy. Select a room sturdy enough to handle the weight.

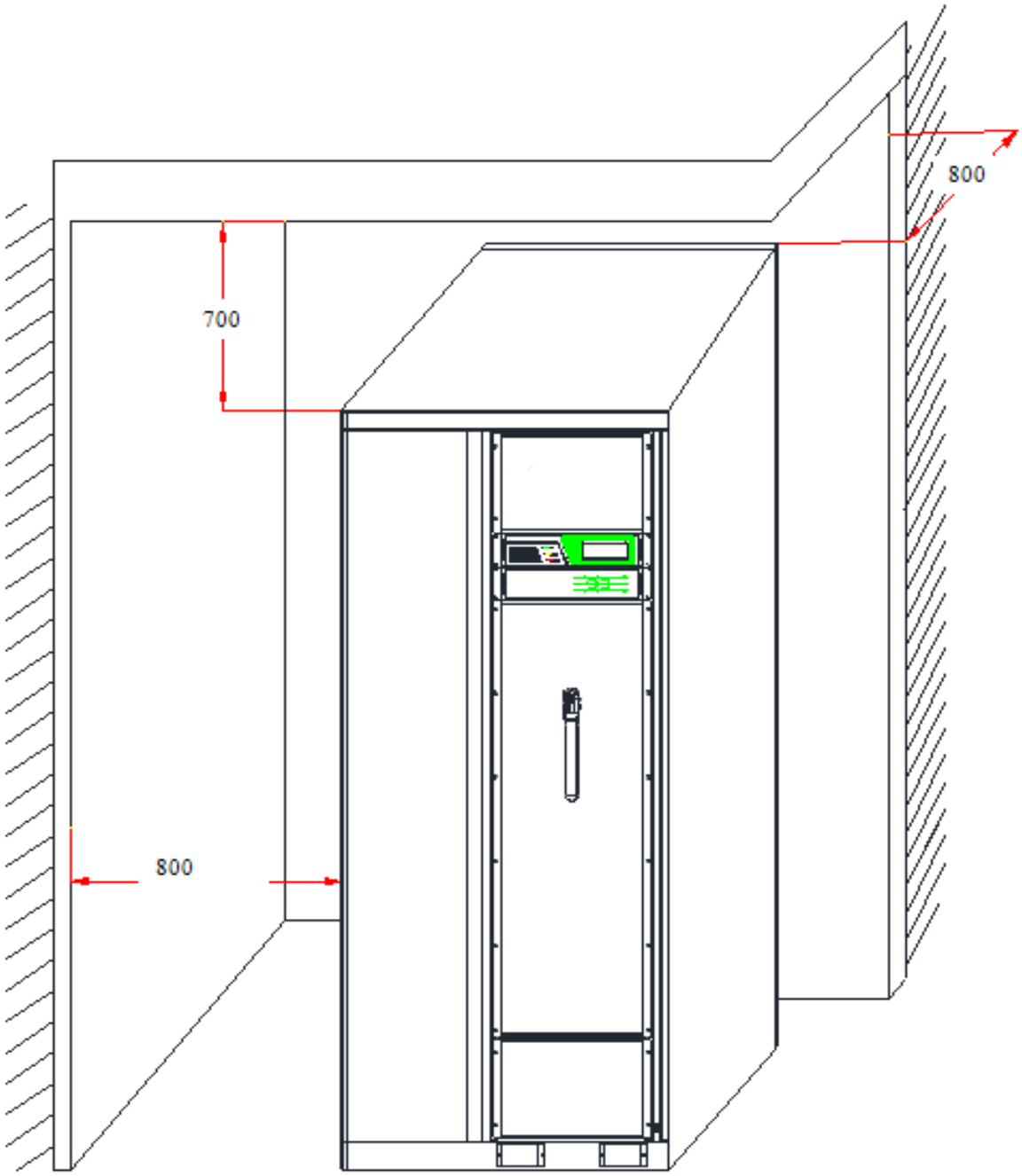
3. POSITION

As shown in the following figure, hammer expansion bolts into the groundwork, place the chassis in a stable position and fasten the bolts (unit: mm).



The following should be considered when placing the UPS:

- A space of at least one meter must be kept in both front and behind of the equipment for starting- up/ shutdown operations and any maintenance operation that may required
- Leave a minimum distance of 700mm between the top of the UPS and the ceiling of the room, to enable adequate circulation of the air distinguish the system



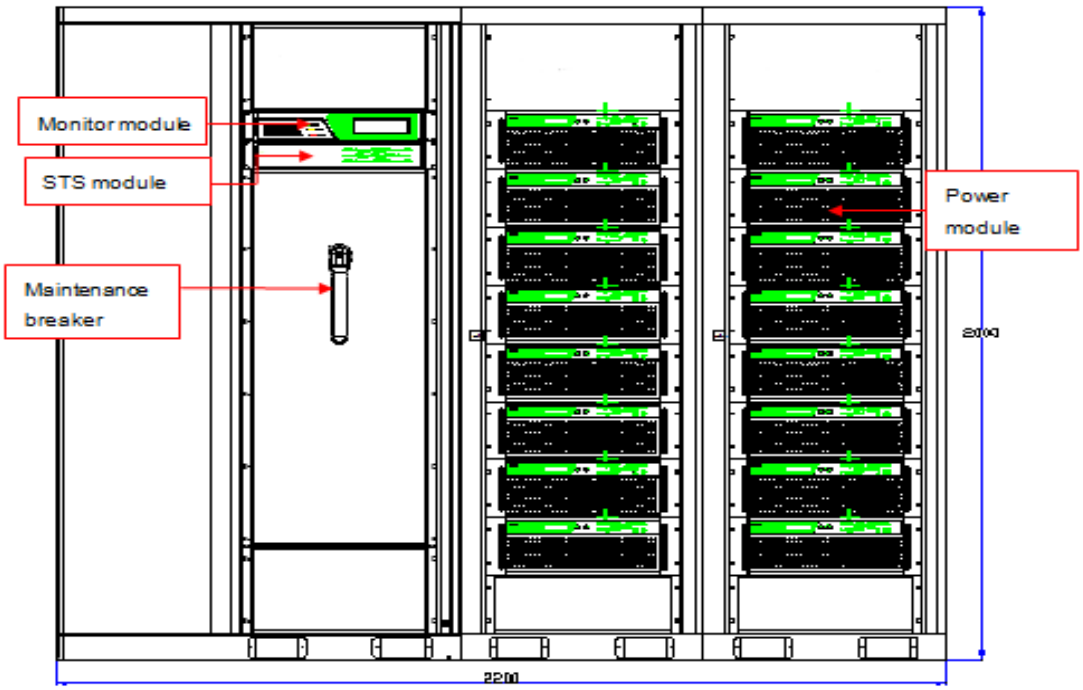
Note: This cabinet can be paralleled, so the side distance is not required

Avoid blocking of air pass tunnel

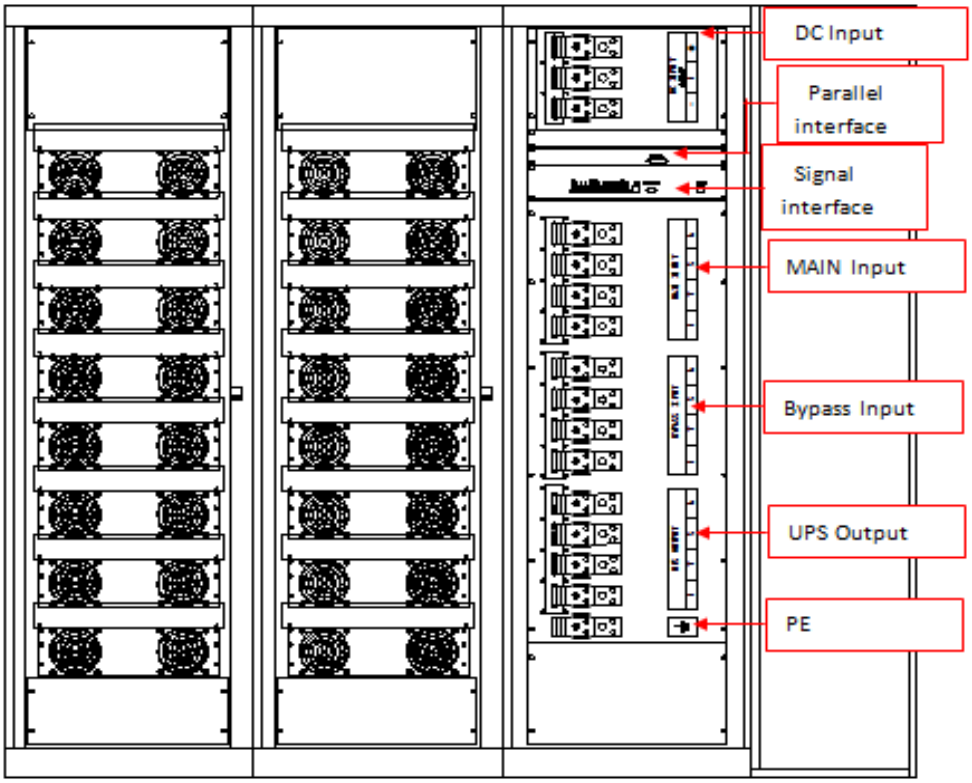
4. SYSTEM INTRODUCTION

The system has a modular structure consisting of the cabinet, STS module, monitor module and 1 to 10 power modules.

Front view



Back view

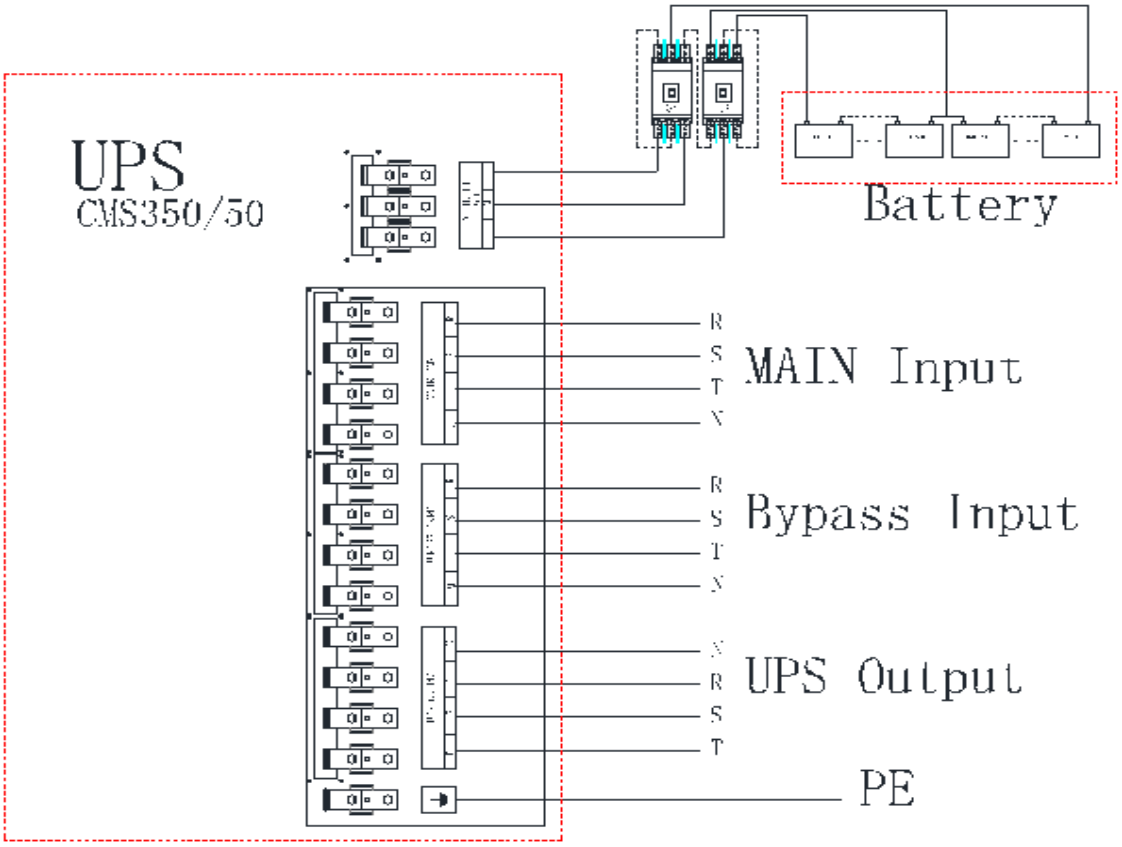


5. INSTALLATION AND CONNECTION

5.1 Install the UPS system

Since the cabinet and the other components of the UPS system are packaged separately, the first step is installing the UPS system. Install the components in the order of monitor module, STS module, and power modules from top to bottom. Put the device into relevant position and fix it with screws.

5.2 Mains, load and battery connection



Note: MAIN INPUT、BYPASS INPUT、UPS OUTPUT cables should be connected with relevant breaker

If the UPS system is three phases in and single phase out, the bypass and output connection is single phase (three phases parallel and come to single phase)

Grounding and Neutral cables connects with PE and N bar

The batteries and UPS system must be connected through external fuses or breakers

5.3 Connection table

System type		Cougar 2.0 - 800/50	
Maximum power of the UPS		800KVA	
Input/output voltage		380V/400V/415V	
MAIN INPUT	Rated current(A)	1515	
	Dimension of cable advised (mm^2)	(70～120)*N	(120～240)*N
	Screw to fix the cable(mm)	M10	M16
BYPASS INPUT	Rated current(A)	1212	
	Dimension of cable advised (mm^2)	(70～120)*N	(120～240)*N
	Screw to fix the cable(mm)	M10	M16
OUTPUT	Rated current(A)	1212	
	Dimension of cable advised (mm^2)	(70～120)*N	(120～240)*N
	Screw to fix the cable(mm)	M10	M16
BATTERY	Battery capacity(AH)	1044	
	Dimension of cable advised (mm^2)	(70～120)*N	(120～240)*N
	Screw to fix the cable(mm)	M10	M16
N	Dimension of cable advised (mm^2)	(70～120)*N	(120～240)*N
	Screw to fix the cable(mm)	M10	M16
PE	Dimension of cable advised (mm^2)	(70～120)*N	(120～240)*N
	Screw to fix the cable(mm)	M10	M16

Note:

1) When wiring on input and output, please be aware that there are 2 kinds of screws which are not available to use in same time.

M10 for 8 cables; M16 for 4 cables.

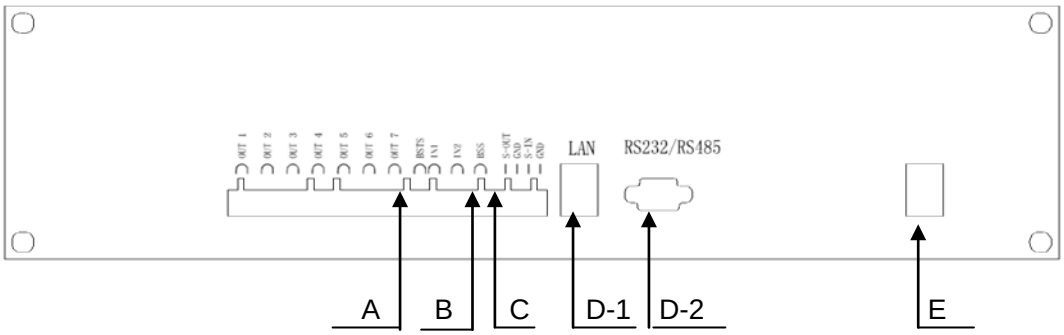
2) N is the number of cables; Specific diameter is up to actual load, the proposed per square line current carrying capacity <2.5A ~ 3A.

3) Generally diameter of PE is half of AC or above. If less than $16mm^2$, use $16mm^2$

4) External Breaker: 1.5 times rated current or above.

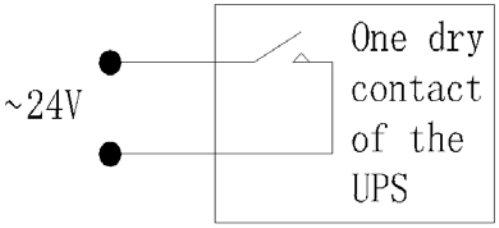
5.4 Remote control and signals

Following is the signal interfaces of the modular UPS system.

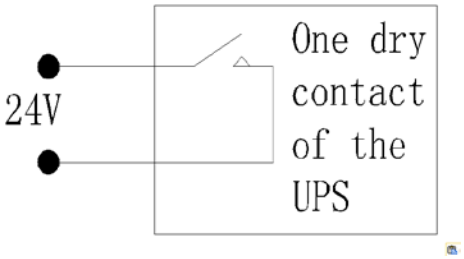


A: output no resource dry contacts, with pairs. The non-resource dry contact is directed by the relay and works the following two modes.

Input AC:



Input DC:



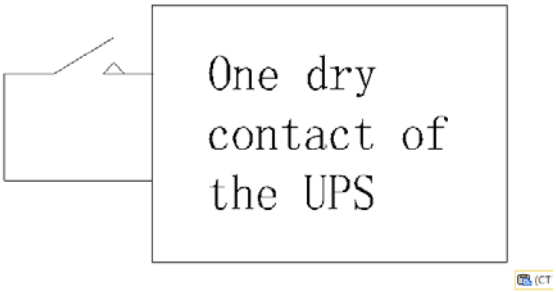
Note: AC input: 24V, 0.5A maximum; DC input: 24V maximum.

（1）Dry contact (BSTS) is defined as “Battery trip”， “NORMAL OPEN”； cannot be changed。

Function：used to control the battery breakers trip.

（2）user could setup dry contact definition through monitor module. See 7. Monitor module display and setup for details.

B: input resource dry contacts, with pairs. Open circuit between the two nodes indicates normal signal and short circuit indicates alarm signal.



（1）Dry contact (BSS) is defined as “BATSWITCH OFF”, ”SHORT ACTION” cannot be changed.

Function: used to control the battery switch state.

（2）user could setup dry contact definition through monitor module. See 7. Monitor module display and setup for details.

C: Synchronizing signal, with pairs.

S-OUT, GND: Synchronizing output signal; S-IN, GND: Synchronizing input signal.

When two or more UPS parallel, connect “S-OUT, GND” of first UPS with “S-ZN, GND” of second UPS, and system output of second UPS will track system output of first UPS, and so on. System will run in

synchronized mode.

D: communication interfaces (single choice)

D-1 is standard LAN interface. The LAN communication interface is configured as below:

1. Connect the system to computer using twisted pair wire, or connects to computer through switch and using conducting wire.

2. Set IP address of the computer as "192.168.16.XXX". Inspect whether there is IP address conflict, whether they are in the same LAN and whether the gateway and subnet mask are correct.

3. Use Ping command to inspect whether equipment are correctly connected. Default address of the system is "192.168.16.254".

4. Type in "192.168.16.254" in the address bar of IE, open the following network equipment configuration page:

- "IP address": IP address of MWT equipment.
- "Subnet mask": subnet mask of MWT equipment in the LAN.
- "Gateway address": please fill in 0.0.0.0 if there is no gateway.
- "Work mode": there are two options: SERVER and CLIENT. Use the option to configure MWT equipment to server or client mode. The default configuration is SERVER mode.
- "TCP/UDP": use the option to configure transmission protocol. There are two options: TCP and UDP. The default configuration is TCP.
- "Local port": the local port of the equipment must be configured if the user prefers that the equipment work in SERVER mode so that the client can connect to the server through the port. The default port number is 6000. If the equipment is configured as client, the option can be ignored.
- "Remote port": the remote port of the equipment must be configured if the user prefers that the equipment work in CLIENT mode so that the equipment can connect to the remote server through the port. The default port number is 6000. If the equipment is configured as server, the option can be ignored.
- "Remote IP address": IP address of the remote server. The address must be configured if the user prefers that the equipment work in CLIENT mode so that the equipment can access the remote server through the port. The default address is 192.168.16.252.

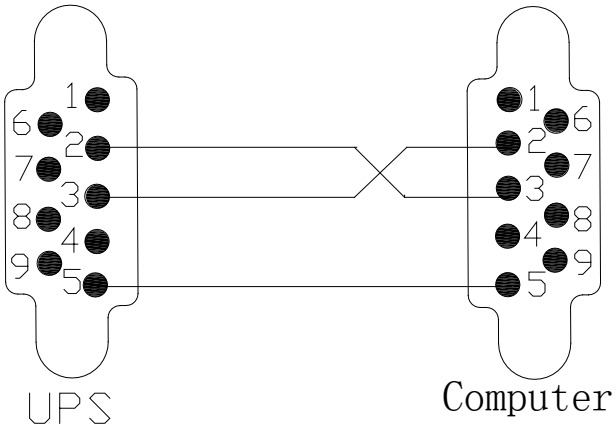
- If the equipment is configured as server, the option can be ignored.
- Baud rate": optional baud rates for serial port communication are: 2400, 4800, 9600, 19200, 38400, 56000 and 115200. The default rate is 9600.
- "Check bit": options include NONE, ODD and EVEN. The default configuration is NONE.
- "Data bit": number of data bits in communication. The MWT serial port server supports data communication of 8, 7 and 6 bits. The default configuration is 8 bits.
- "Stop bit": options include 1 and 2. The default configuration is 1.
- "Stream control": options include NONE, DTR/DSR and RTS/DTS. The default configuration is NONE.

When all parameters are configured, click "Submit" button. A message "DONE, please reload the page with new IP address!" Will appear if the configuration is done successfully, and the equipment will be reset automatically to upload new configuration parameters. At this point, the equipment has been operating in the work mode that the user specifies.

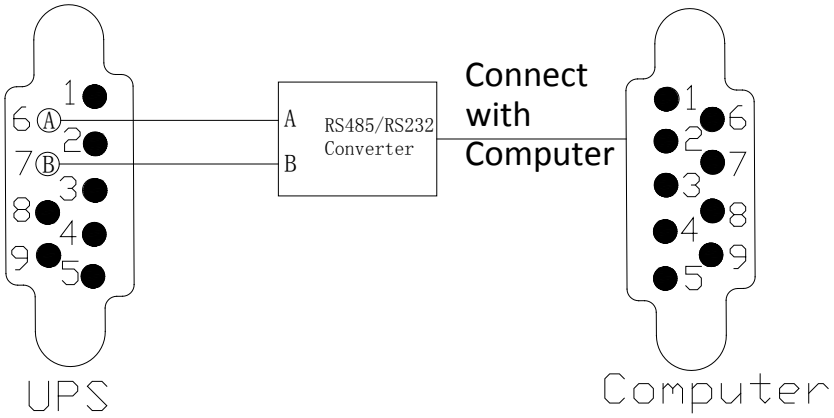
The user name is Admin and the initial code is Admin888.

For more information, refers to the UPS management software.

D-2 is RS232/485 interface. Only three pins of the standard 9-pin interface are used, i.e. pin 2, 3 and 5 for receiving, sending and grounding of the system respectively.



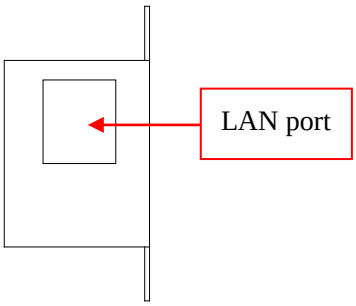
RS485: only two pins are used, pin 6 and pin 7. Defined pin 6 as A, pin 7 as B. Connected them with RS485/RS232 converter, then connected to computer. Check below diagram for reference.



E is a standard LAN port:

there is a temperature sensor (marking the "Temperature sensor"). Connect the LAN port and temperature sensor by a straight-through cable. The system can capture the temperature of the battery workshop, and the monitor module can display it. (See 9.display function of the monitor module →4.SYSTEM menu →battery information page).

Side view of temperature sensor:



6. DESCRIPTION OF THE SYSTEM COMPONENTS

6.1 COU-STS module

In modular UPS, the COU-STS module is used mainly for fast switch between inverter output and AC bypass power supply to ensure reliable power supply.

The COU-STS module receives two groups of AC input and chooses one group for output. When working on line, it connects inverter output of the power module to the system output. If the power module fails to provide sufficient voltage in a certain period of time, the COU-STS module will switch to the bypass power supply immediately.

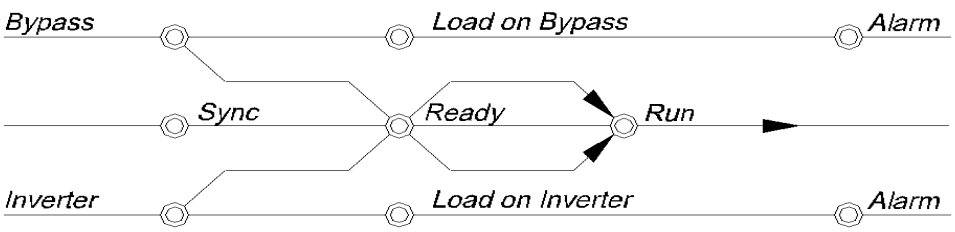
Using hybrid control technology, the COU-STS module is a highly efficient AC switch that consists of parallel high-speed semiconductor (controllable silicon) and electromagnetic contactor. It solves the switch time problem and enhances shock resistant ability and short circuit protection ability of the COU-STS module, thus significantly improving reliability and stability of the system.

The COU-STS module features self-test, interlock, system over voltage and under voltage protection, instant power failure protection, as well as output overload and short circuit protection functions.

With UART communication function, the COU-STS module can communicate with the system's monitor and other modules, sending and receiving operation instructions and all kinds of alarming information.

The panel of COU-STS module:

COUGAR 2.0 - STS



Lights on the COU-STS module:

- “Bypass” is bypass status indicator. It turns on when the bypass supply is normal
- “Load on Bypass” is bypass output status indicator
- “Alarm” is bypass alarm status indicator. It turns on when the bypass supply is wrong or disappear
- “Sync” is sync status indicator. It turns on when the inverter sync with the bypass “Ready” is switch prepare status indicator

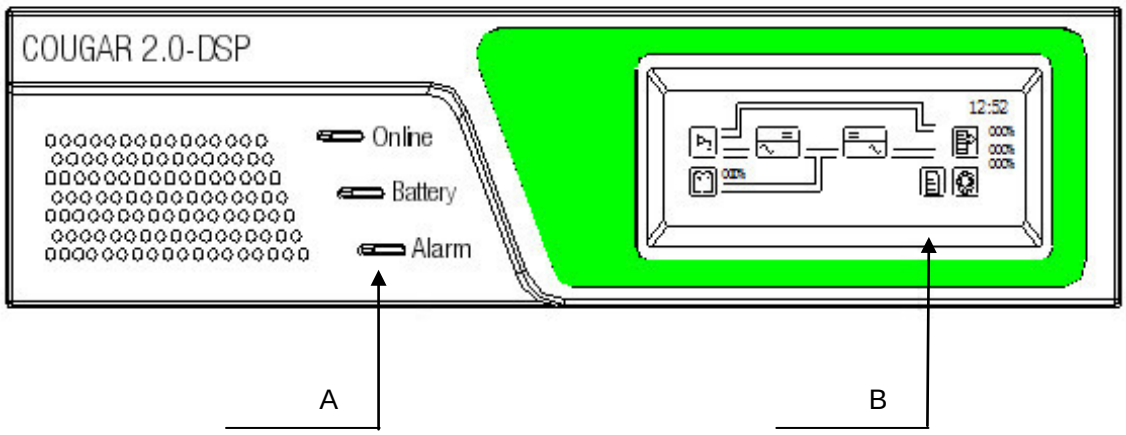
- “Run” is operation status indicator
- “Inverter” is inverter status indicator. It turns on when the inverter runs.
- “Load on Inverter” is inverter output status indicator.
- “Alarm” is inverter alarm status indicator. It turns on when the inverter is wrong.

6.2 monitor module

The monitor module locates in the upper part of the chassis. Through the display and operation panel, users can learn the system's working status and query parameters and various alarm messages conveniently. After the system is installed, all operations on the system can be performed through the operation panel of the monitor module.

The monitor module consists of three areas: indicator light area, display area and operational key area. The indicator light area uses different states of the LIGHT to provide simple system status information to users. The LCD display area offers detailight system status information to users. The operational key area links users' instructions with the system through nine keys. When users press the operational keys, the LCD display will show corresponding information.

Monitor module panel



i. A is state lights zone and 3 special function keys.

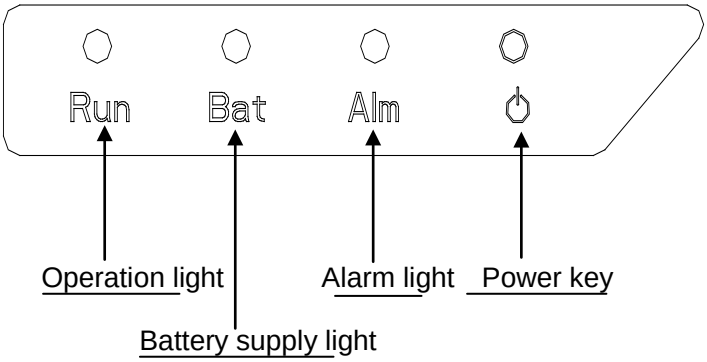
State lights:

1. “Online” is inverter state light. When on, inverter is normal
2. “Battery” is battery state light. When on, system is supplied by battery
3. “Alarm” is alarm light. When on, there is alarm in the system

ii. B is display area:

Please refer to "9.Display of monitor module" for display introduction.

6.3 Power Module



- Operation status indication: the indicator light keeps flashing when the module is initiating. It is on after the module starts to output power normally. When the module is not working, the light will be off;
- Battery power supply indicator: the light is on when the module works with DC power supply. It is off when the module works normally with three-phase power supply;
- Alarming light: the light is on when exception occurs of the module (over voltage or under voltage of AC input, over voltage or under voltage of inverter output, overload, and DC exception). It is off when the module system operates normally;
- Power button: power button of a single module.

7. START-UP PROCEDURE AND SYSTEM SET-UP

7.1 Start-up procedure

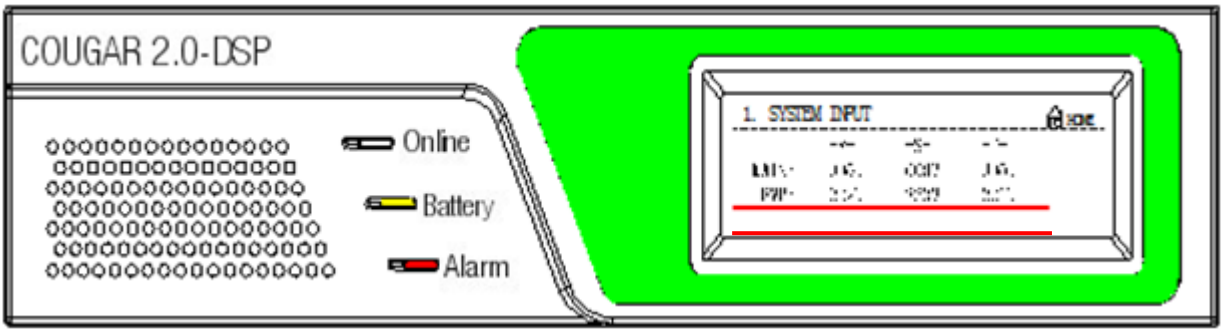
1) preliminary operation

Check all of the screws and cables. Ensure the input breaker; output breaker and battery breaker are open.

2) close bypass input breaker

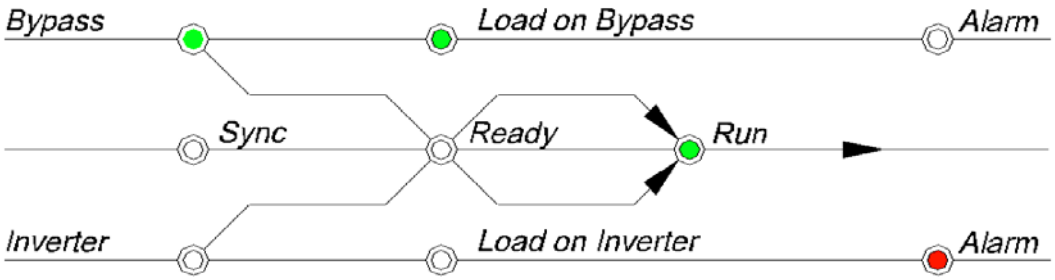
Around 50secs later, STS and Monitor module work normally, system is powered by BYPASS input, system output voltage is BYPASS voltage.

Touch “ ” ICON on “GENERAL INFORMATION” page, check current bypass voltage. Status diagram as below,



“Bypass”(bypass state light), “Load on Bypass” on COU-STS are on; “Run” light flicker; “Alarm”(Inverter alarm) is on. Status diagram as below,

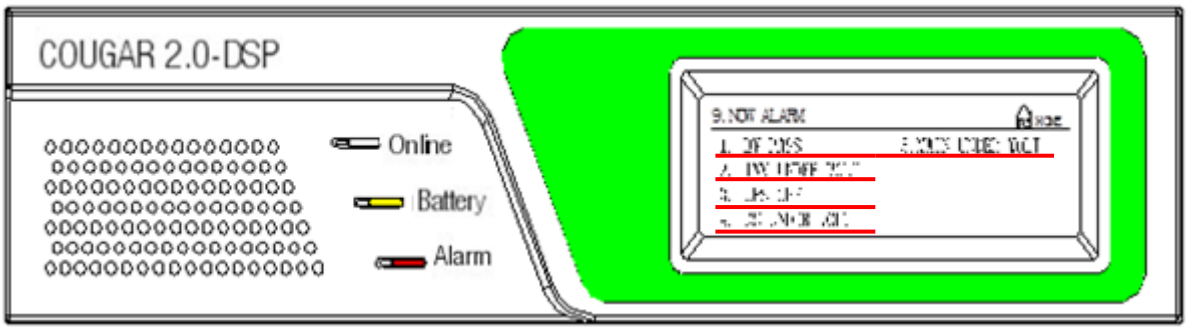
COUGAR 2.0 - STS



Note: “Run” will keep on flicker when COU-STS works normally.

Alarm light on monitor module and buzzer keeps on, please touch “ ” → “ ” ICON to check current alarm.

Status diagram as below,



Note:

BY-PASS: Bypass input.

INV UNDER VOLT: the reason is no Inverter power module, no output and system is on bypass mode;

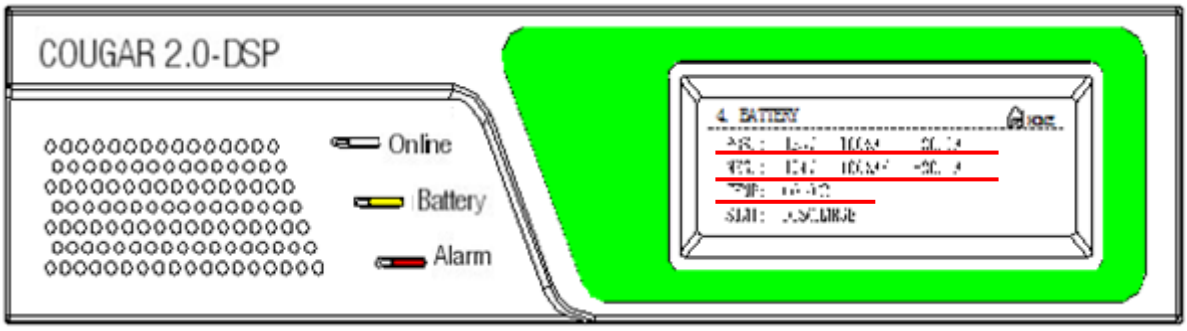
UPS OFF: the reason is no mains input;

DC UNDER VOLT the reason is no DC input;

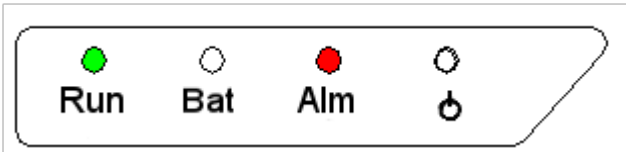
Mains UNDER VOLT: the reason is no mains input.

3) close DC input breaker

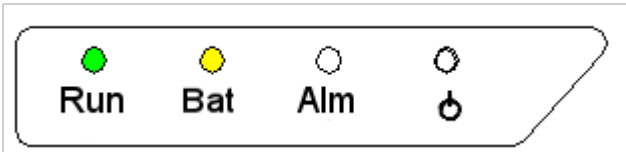
Touch "[icon]"ICON on "GENERAL INFORMATION" page to check DC status. Diagram as below,



"Run" light of Power module flickers, alarm is on which means that power module is on startup state. Diagram as below,

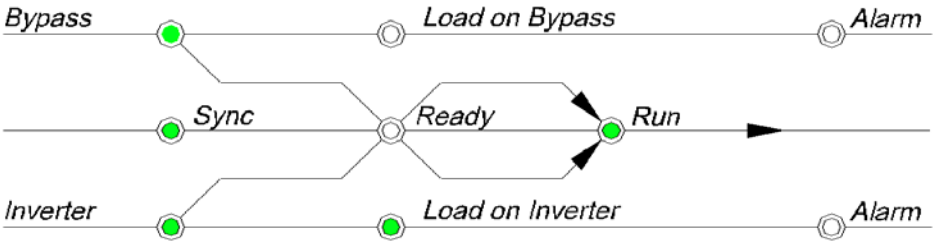


Around 50secs later, "Run" light keeps on, power module works normally. Diagram as below,



"Bypass", "Load on Inverter" and "Sync" on COU-STS are on; "Run" flickers, "Inverter" is on. Diagram as below,

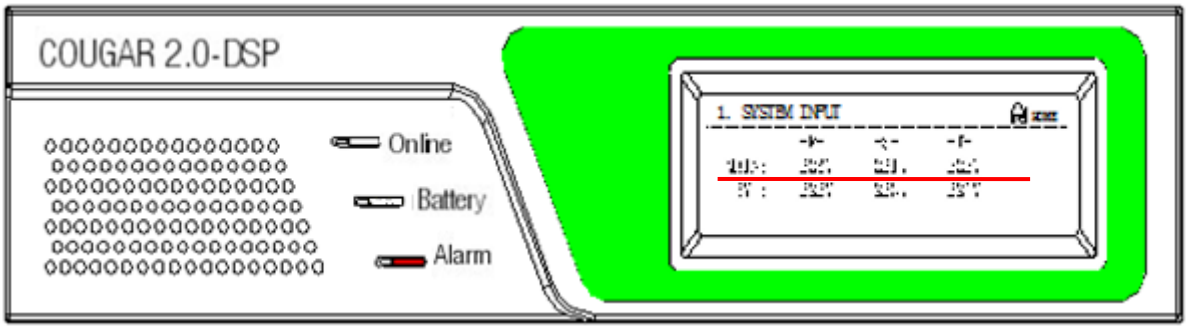
COUGAR 2.0 - STS



At the moment, system output voltage is still inverter voltage, and System output from Inverter.

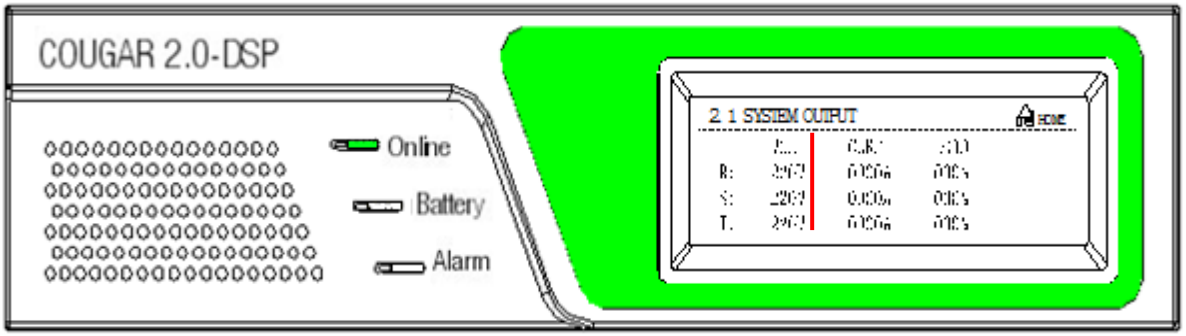
4) close mains input breaker

"Battery" light on Monitor module is off. Touch "" on "GENERAL INFORMATION" page to check current Mains voltage. Status diagram as below,



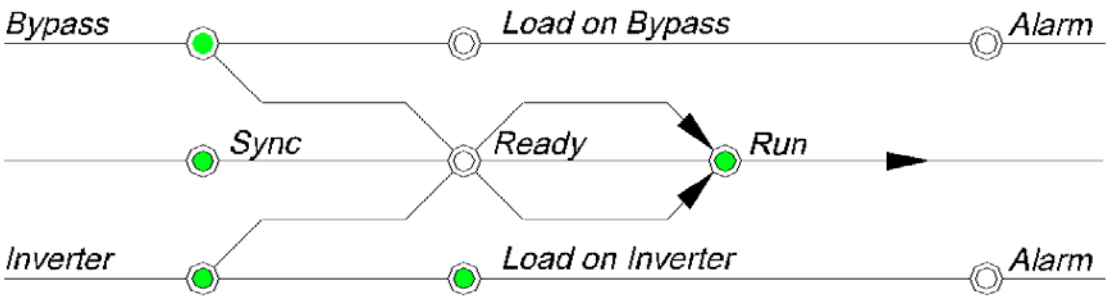
At the moment, system output voltage is inverter voltage.

Touch ""on "GENERAL INFORMATION" page to check output status page. Diagram as below,



COU-STS Status as below,

COUGAR 2.0 - STS



5) Detection of the phase sequence

Check the voltage difference of the output terminal and input terminal of the same phase with the multimeter. If the voltage difference is bigger than 300V, open all of the breakers (follow the order of bypass input breaker, mains input breaker, battery input breaker) and adjust the input lines.

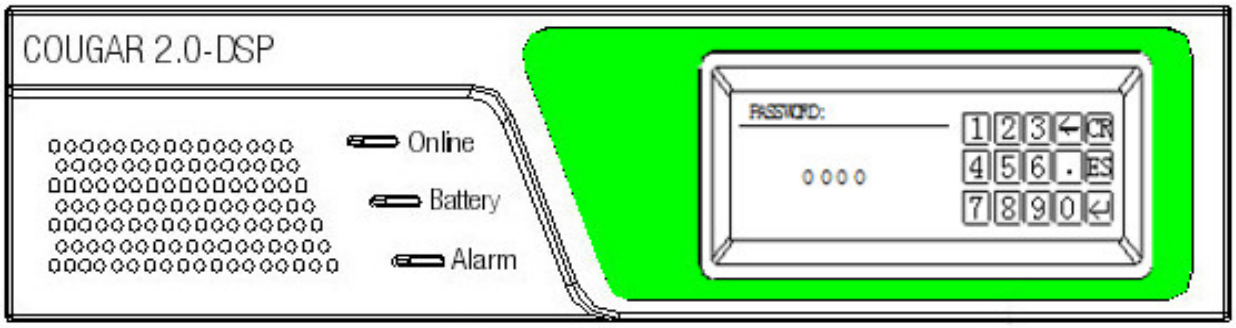
6) Close the output breaker

This is the end of start-up procedure.

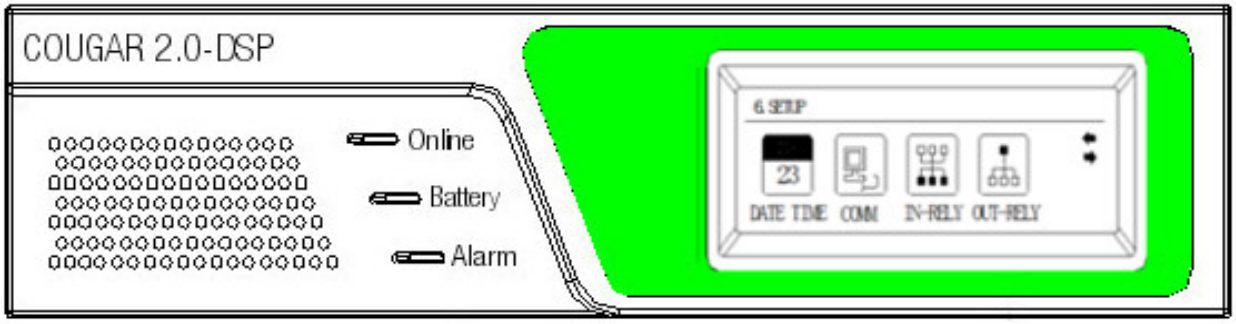
7.2 Set-up

Through control module, users can set up the system parameters.

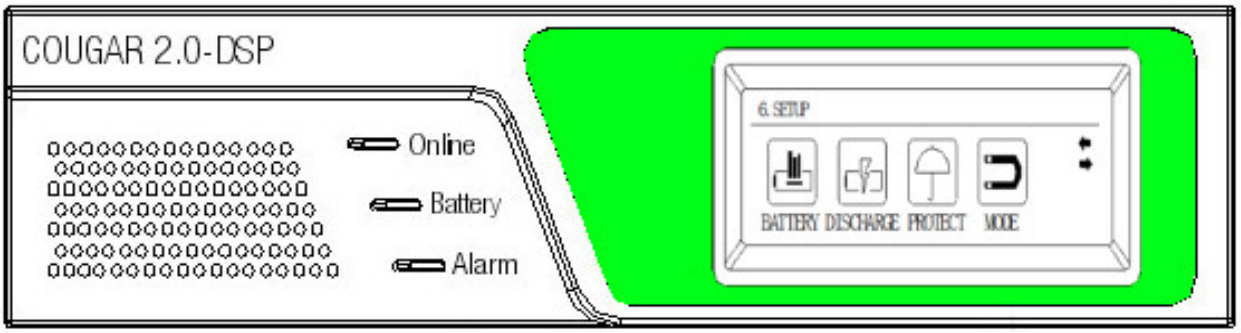
In “GENERAL INFORMATION” page, press “Ent”, come to password input page (Default password is 0000)



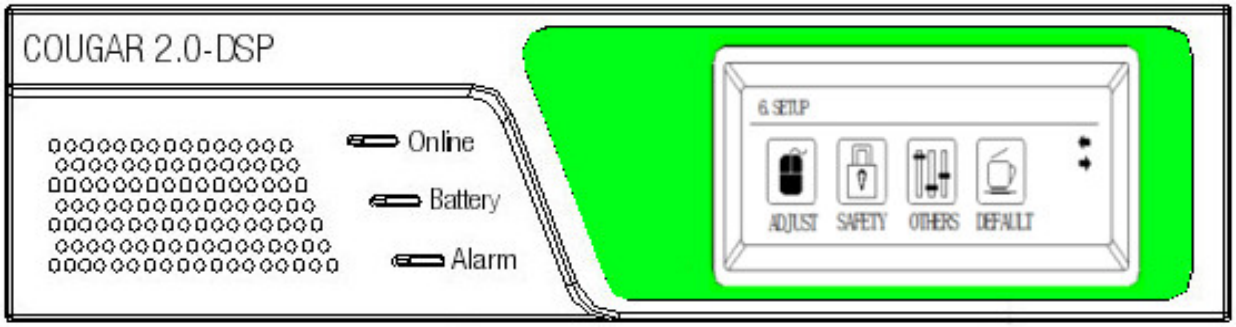
First page



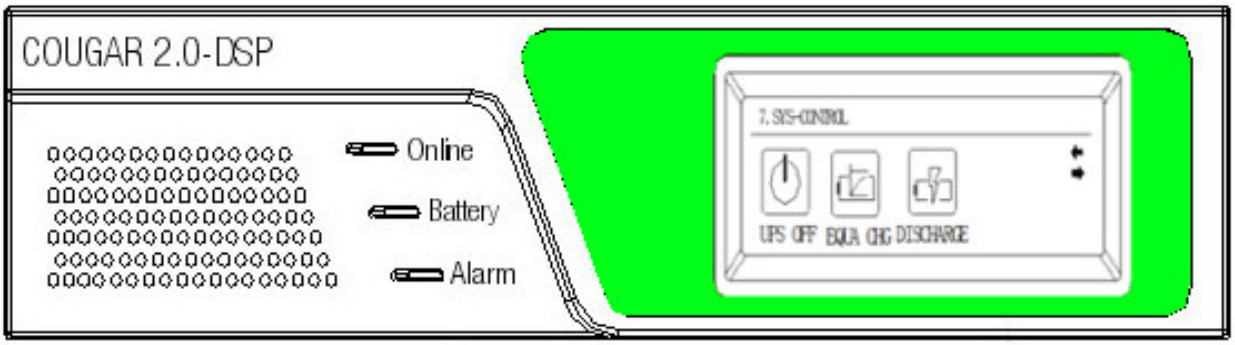
Second page



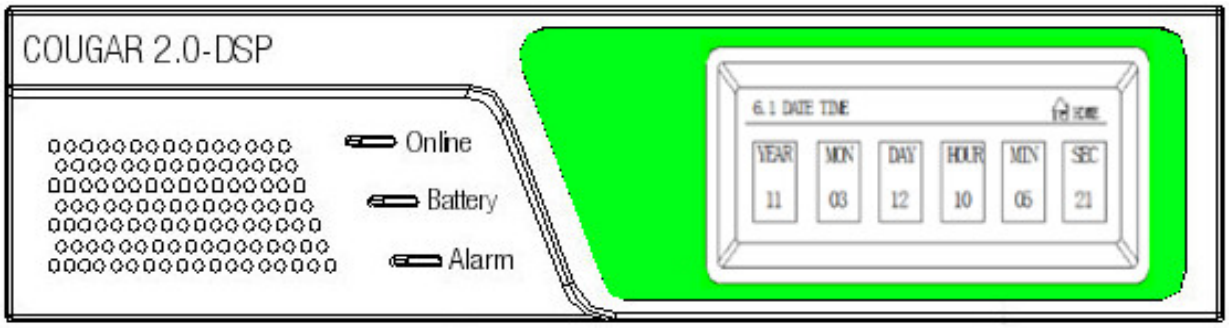
Third page



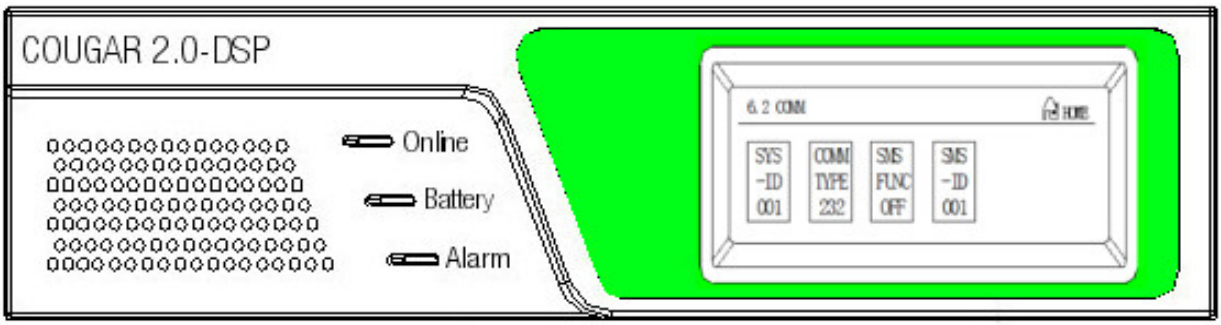
Fourth page



1) Click “DATE TIME”, come to the time setup page. Setup relevant item and press “Ent”



2) Click “COMM”, come to communication page.



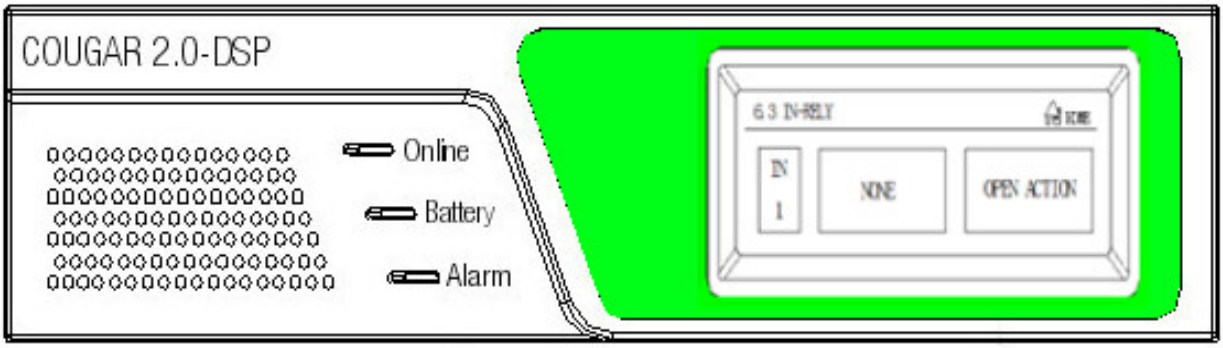
“SYS-ID”---------- system address. Default value is 1，ranging from 1 to 254;

“COMM TYPE”----------include:RS232、RS485、LAN，Default value is RS232

“SMS FUNC”----------use the SMS function or not. Default is OFF.

“SMS -ID”----------SMS card IP address. Default value is 1，ranging from 1 to 10;

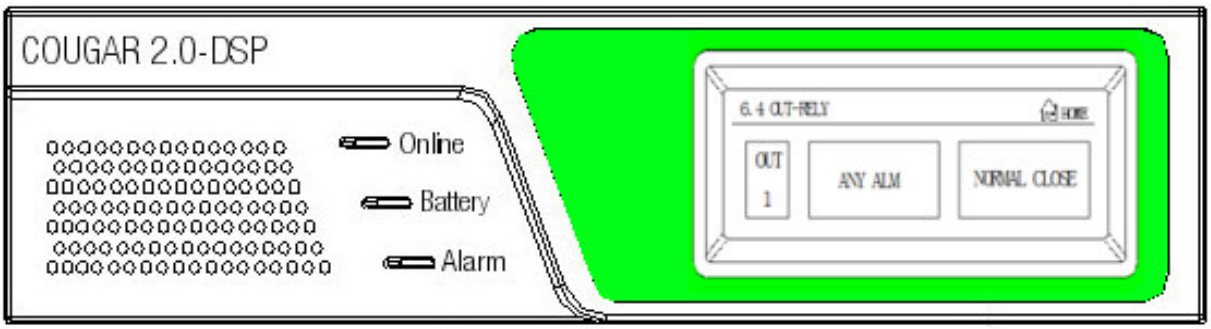
3) Click “IN-RELY”, come to input dry contact setup page. Setup relevant item and press “Ent”



IN X----------include: UPS OFF、BATT CHARGE、NONE; Dry contact definition could be setup by user. Default is NONE.

SHORT ACTION/OPEN ACTION: set dry contact normal statue. Default is SHORT ACTION.

4) Click “OUT-RELY”, come to output dry contact setup page. Setup relevant item and press “Ent”



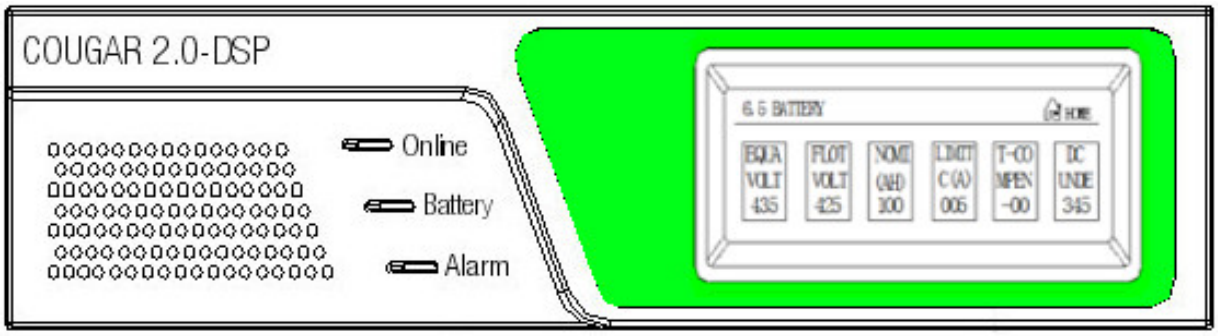
OUT X----------include: mains under voltage, mains over voltage, bypass over voltage, bypass under voltage, invert over voltage, invert under voltage, DC over voltage, DC under voltage,

bypass supply, over load, general alarm, module alarm; Dry contact definition could be setup by user.

NORMAL CLOSE/NORMAL OPEN: set dry contact normal statue.

Dry contact	Default
OUT 1	Mains under voltage
OUT 2	Bypass under voltage
OUT 3	Invert under voltage
OUT 4	Dc under voltage
OUT 5	Over load
OUT 6	Bypass supply
OUT 7	General alarm
OUT 1 statue	NORMAL OPEN
OUT 2 statue	NORMAL OPEN
OUT 3 statue	NORMAL OPEN
OUT 4 statue	NORMAL OPEN
OUT 5statue	NORMAL OPEN
OUT 6 statue	NORMAL OPEN
OUT 7 statue	NORMAL OPEN

5) Click “BATTERY”, come to battery management setup page. Setup relevant item and press “Ent”



“EQUA VOLT”----------setup battery equal charge voltage

system default value is 438V, effective range 360V ~ 440V;

“FLOA VOLT”---------- setup battery float charge voltage

system default value is 432V, effective range 360V ~ 440V;

“NOMI(AH)”---------- setup battery rated capacity

default value is 100AH, effective range 10 ~ 2000;

“LIMITC(A)”---------- setup auto transfer current between equal and float charge

default value is 5A, effective range 1 ~ 200;

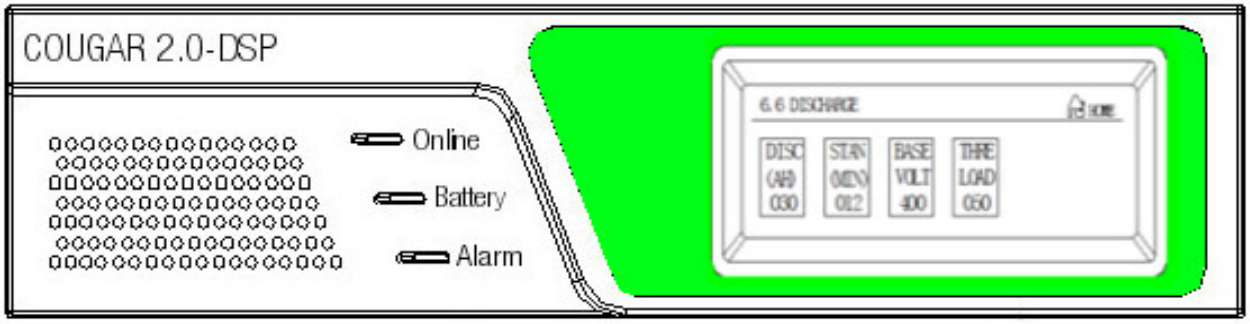
"T-COMPEN"---------- setup compensate temperature

default value is 0, effective range 0 ~ 9;

"DC UNDE"----------setup DC under voltage value

system default value is 345V, effective range is 320 ~ 360;

6) Click "DISCHARGE", come to battery discharge setup page. Setup relevant item and press "Ent"



"DISC(AH)"---------- maximum discharge AH

default value is 30, effective range 1 ~ 100;

"STAN(MIN)"---------- maximum discharge HR

default value is 12, effective range 1 ~ 240;

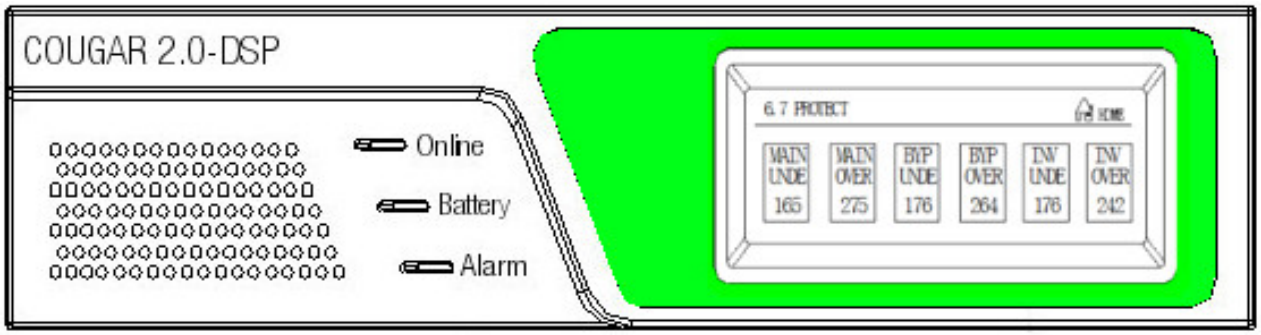
"BASE VOLT"---------- basic discharge voltage

default value is 400, effective range 380 ~ 425;

"THRE LOAD"---------- load percentage of battery discharge

default value is 50, effective range 1 ~ 99;

7) Click "PROTECT", come to system protection setup page. Setup relevant item and press "Ent"



"MAIN UNDE"---------- setup mains under voltage value

System default value is 176, effective range is 165 ~ 220;

"MAIN OVER"---------- setup mains over voltage value

System default value is 264, effective range is 220 ~ 275;

"BYP UNDE"---------- setup bypass under voltage value

System default value is 176, effective range is 154 ~ 220;

"BYP OVER"---------- setup bypass over voltage value

System default value is 264, effective range is 220 ~ 288;

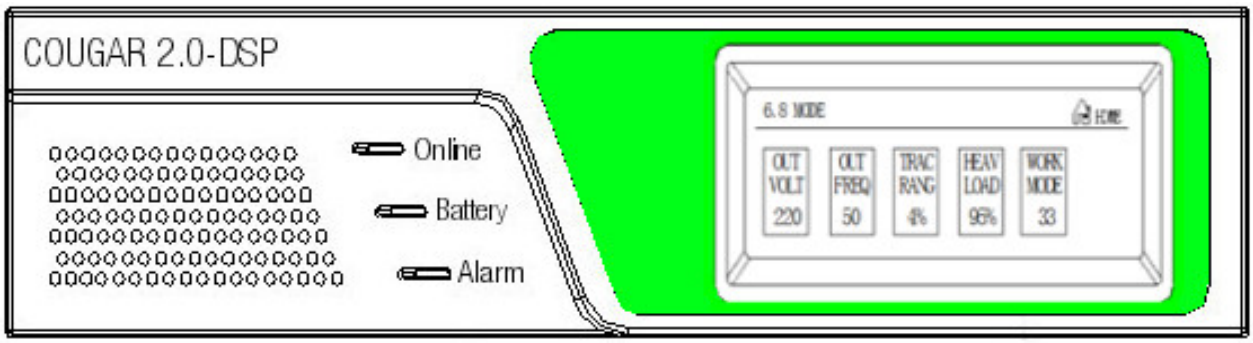
"INV UNDE"---------- setup inverter under voltage value

System default value is 176, effective range is 165 ~ 220;

"INV OVER"---------- setup inverter over voltage value

System default value is 242，effective range is 220 ~ 276;

8) Click "MODE", come to operation mode setup page. Setup relevant item and press "Ent"



"OUT VOLT"----------setup output voltage

system default value is 220, effective range is 210 ~ 253;

"OUT FREQ"---------- setup output frequency, include 50Hz、60Hz;

system default value is 50Hz;

"TRAC RANG"---------- setup frequency trace range

system default value is 4%, effective range is 1 ~ 4;

"HEAV LOAD"---------- setup forewarning load value

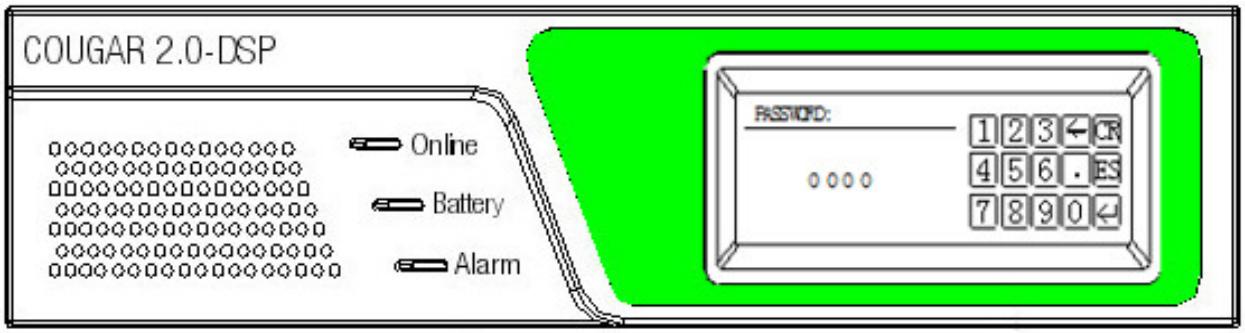
System default value is 95%, effective range is 10% ~ 99%;

"WORK MODE"---------- setup operation mod, include 33、31、13、11;

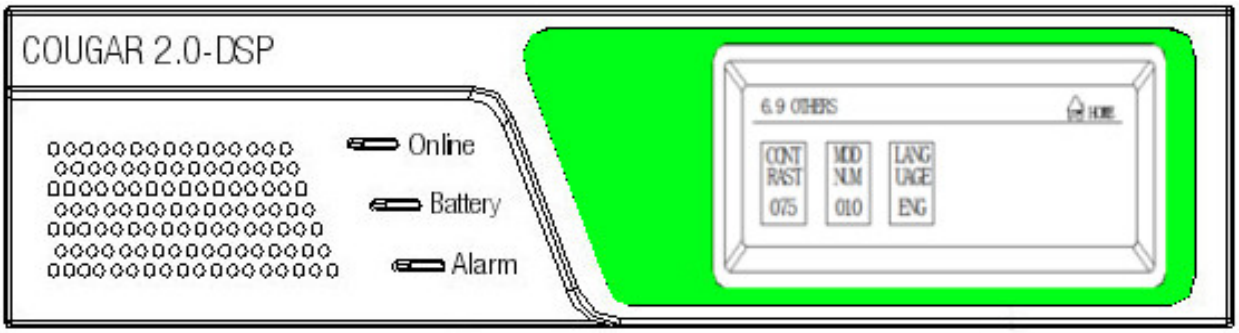
system default value is 33;

9) Click "ADJUST", come to adjust setup page. Setup relevant item and press "Ent"

10) Click "SAFETY", come to safety setup page. Setup relevant item and press "Ent"



11) Click "OTHERS", come to others setup page. Setup relevant item and press "Ent"

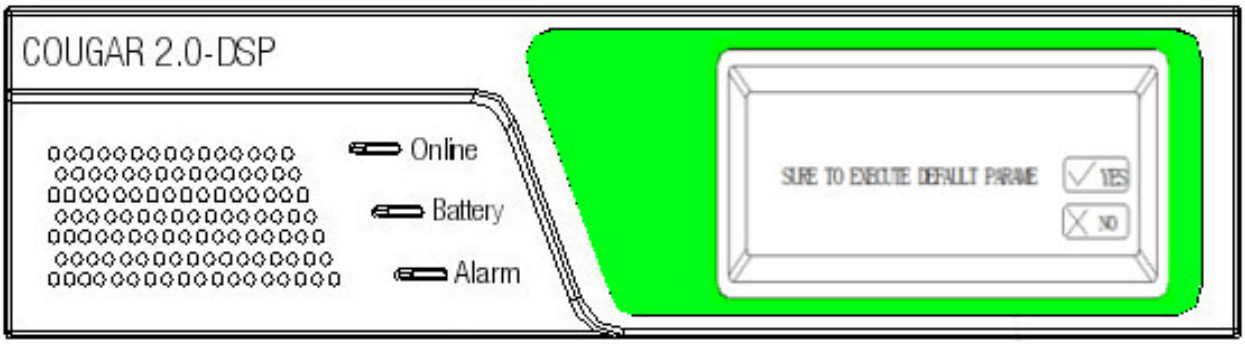


"CONTRAST"---------- -LCD contract; default value is 75

"MOD NUM"----------max module quantity; default value is 8

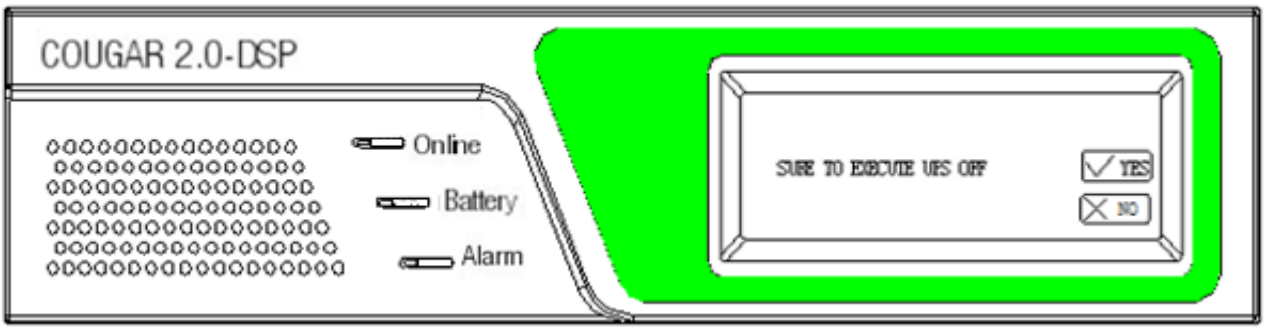
"LANGUAGE"----------language: English

12) Click "DEFAULT ", come to setup page. To make the corresponding selection.

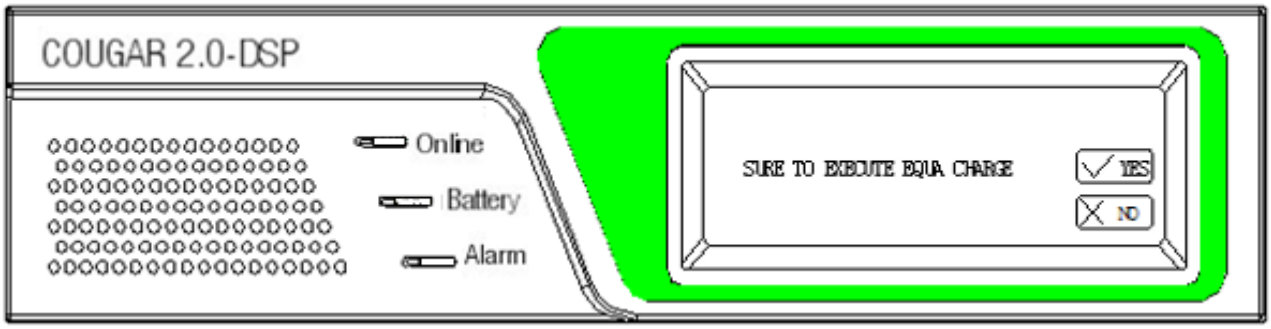


Note: Click "YES", mode page "OUT VOLT""OUT FREQ ""WORK MODE" according to user requirements setting will not charge. Other settings page parameters restore default parameters.

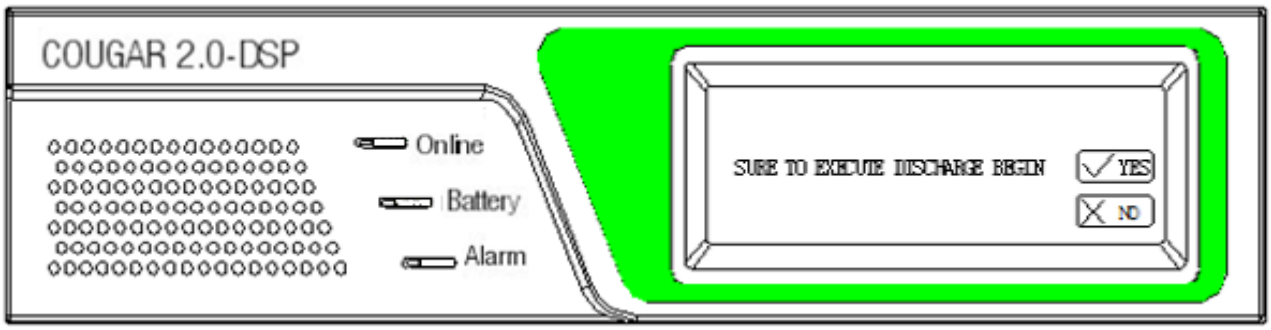
13) Click "UPS OFF ", come to UPS OFF setup page. To make the corresponding selection.



14) Click “EQUA CHG”, come to equal charge setup page. To make the corresponding selection



15) Click “DISCHARGE”, come to discharge setup page. To make the corresponding selection.



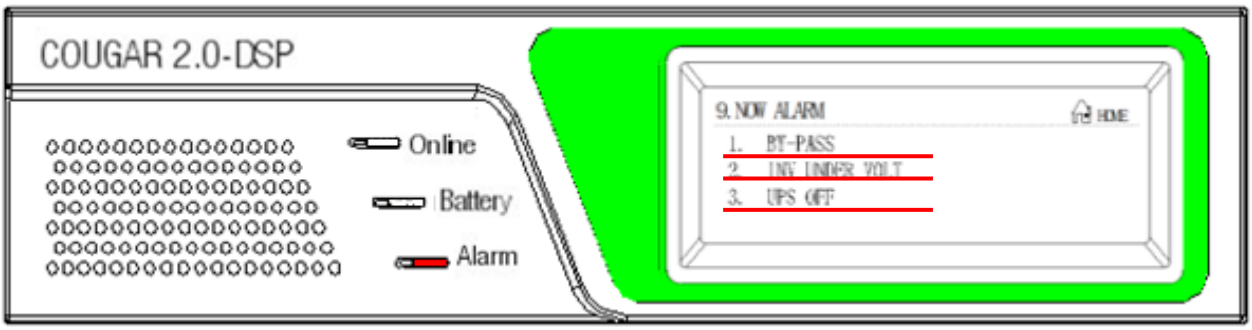
8. SYSTEM SHUT DOWN PROCEDURE

1) Open the output breaker (no power supply to the load)

2) Touch “”ICON in “GENERAL INFORMATION” page, go into Parameter Setting Page, choose “UPS OFF”, go ahead with “YES”, System shut down.

If Bypass voltage is in normal range, system transfers to bypass output, and turn off all power modules. Alarm light on power module keeps on. Diagram as below,

Alarm on Monitor module keeps on, and buzzer calls. Touch” ”→” ”ICON to check current alarm. Diagram as below,



Note:

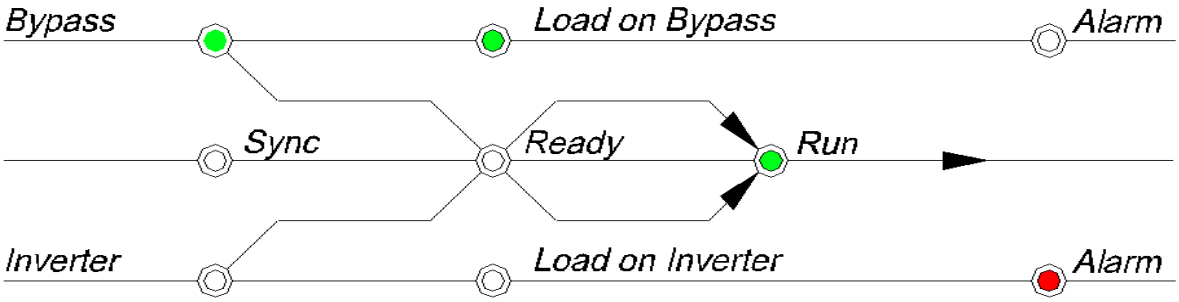
BY-PASS: the reason is Inverter under voltage and transfer to BYPASS.

INV UNDER VOLT: the reason is system output is from BYPASS.

UPS OFF: Manual operation.

“Inverter” indicator light on STS goes off. Diagram as below,

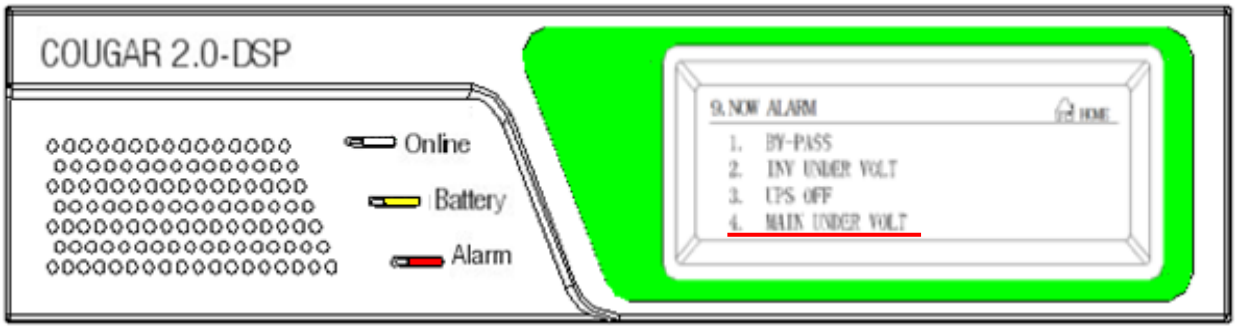
COUGAR 2.0 - STS



System powered by BYPASS, OUTPUT is bypass voltage.

3) Open mains input breaker

Check input status page, the mains input voltage is 0, and there is corresponding alarm records. Diagram as below,

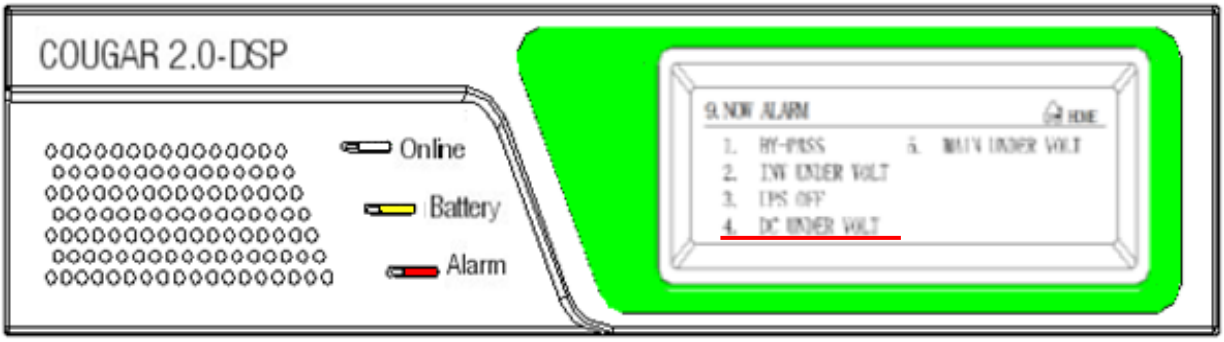


Note: MAIN UNDER VOLT: the reason is no MAINS INPUT.

At the moment, indicator lights on STS no change.

4) Open DC input breaker

DC input voltage is 0, and there is corresponding alarm records. Diagram as below,



Note: DC UNDER VOLT: the reason is dc input breaker is open

At the moment, indicator lights on STS no change.

5) Open bypass input breaker

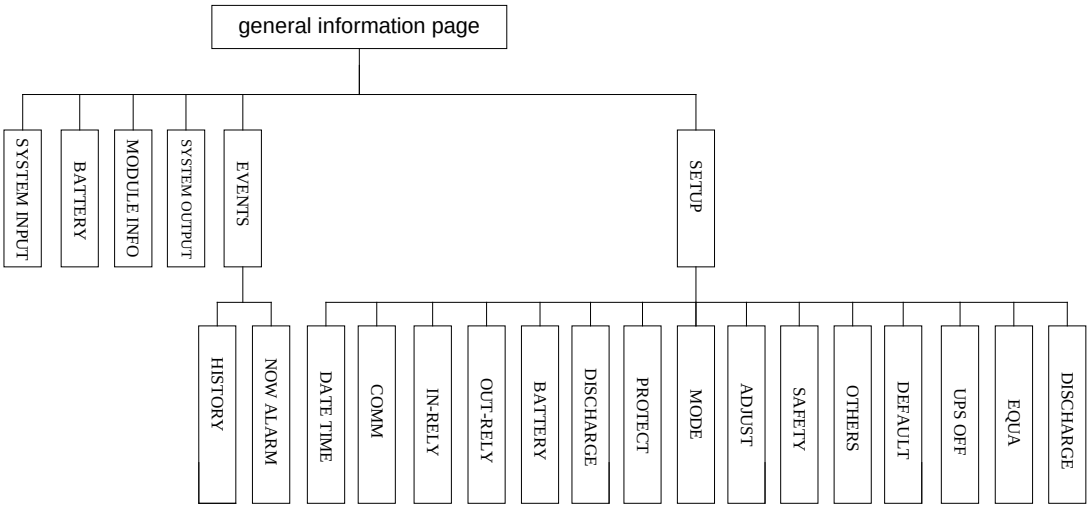
System completely shut down.

Shut down operation END.

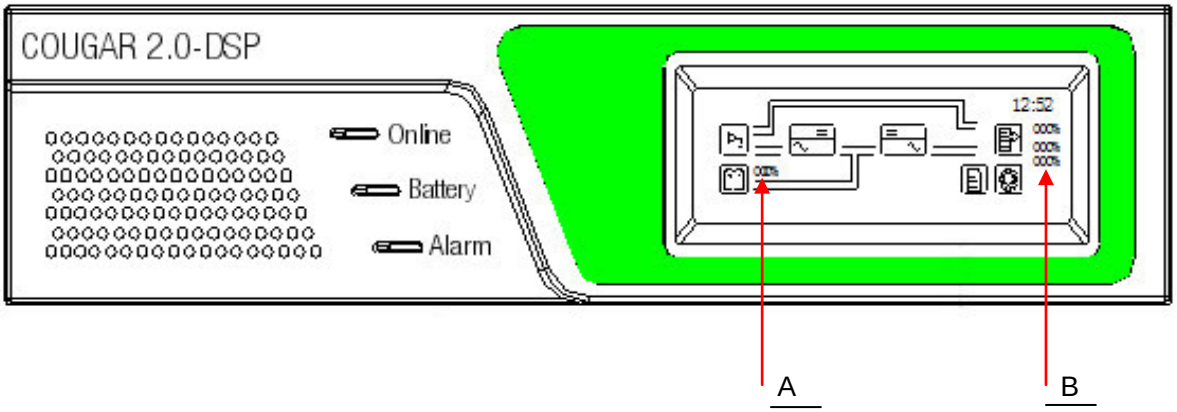
9. DISPLAY FUNCTION OF MONITOR MODULE

The display interface can be divided into to sections: general information screen and detailight information screen. Press Return button in the general information screen to see detailight information screen. If there is no operation for a long period of time, the display will return to the general information screen.

9.1 Displaying pages diagram of the monitor module



9.2 The main menu page

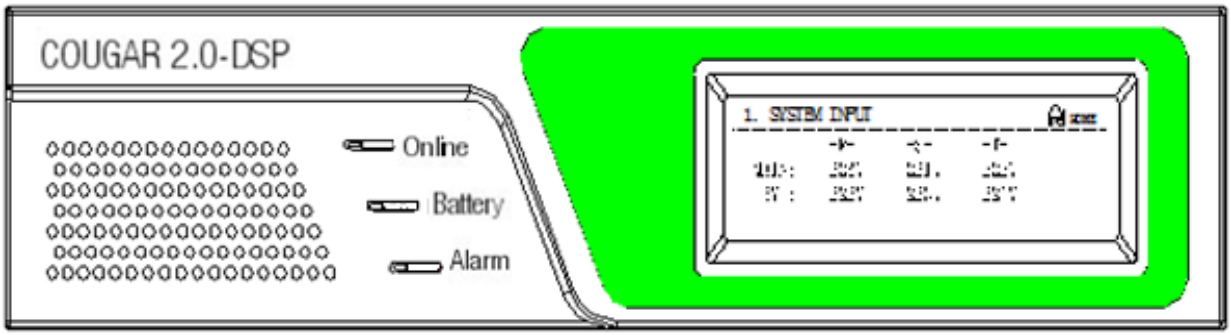


Introductions

- "":system input information; when flash, system input is abnormal.
- "":system battery information; when flash, battery is abnormal.;"A" is battery capacity percentage.
- "/":module information; when flash, module is abnormal.
- "":system output information; when flash, system input is abnormal."B" is load percentage。
- ""system index setup ;
- "" event record 。

9.3 System input information page

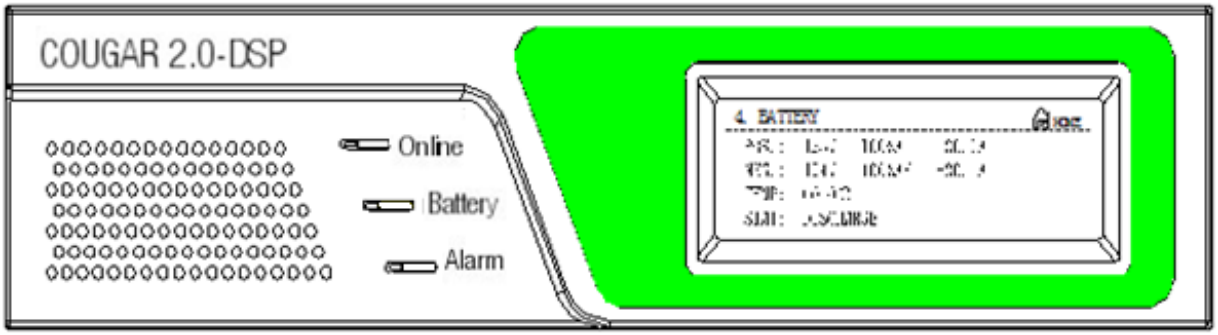
Click “”, and come to system input information page.



Note: It displays current system input AC and bypass three phase voltage

9.4 System battery information page

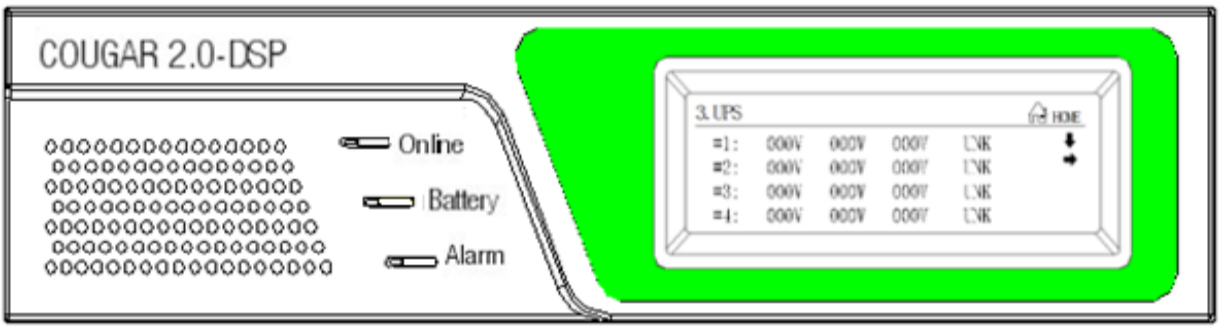
Click “ ”, and come to system battery information page.



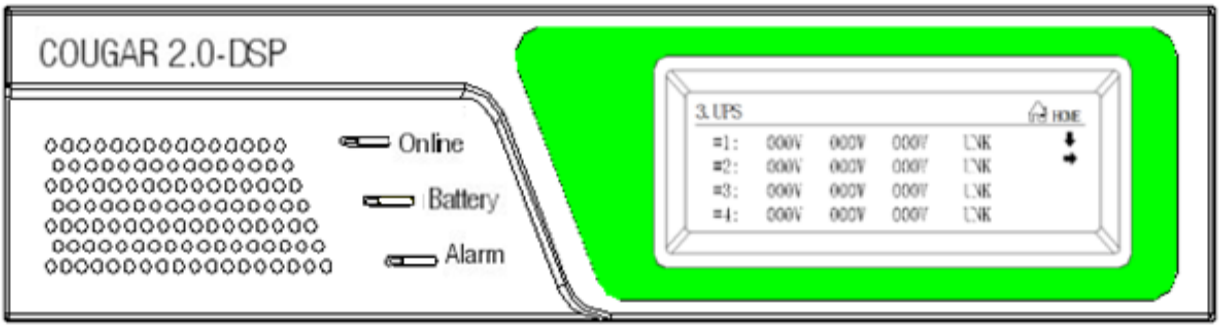
Note: this page displays the DC charger, discharge voltage and current, and the battery capacity, battery operation temperature

9.5 Module information page

Click “ ”or “ ”, and come to module information page. Module output voltage:

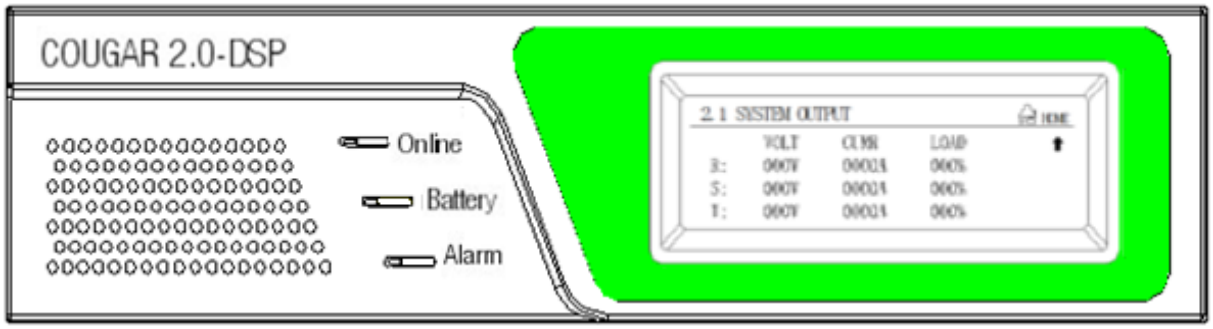


Note: click “ ” / “ ”to see module voltage and current. Module output current :



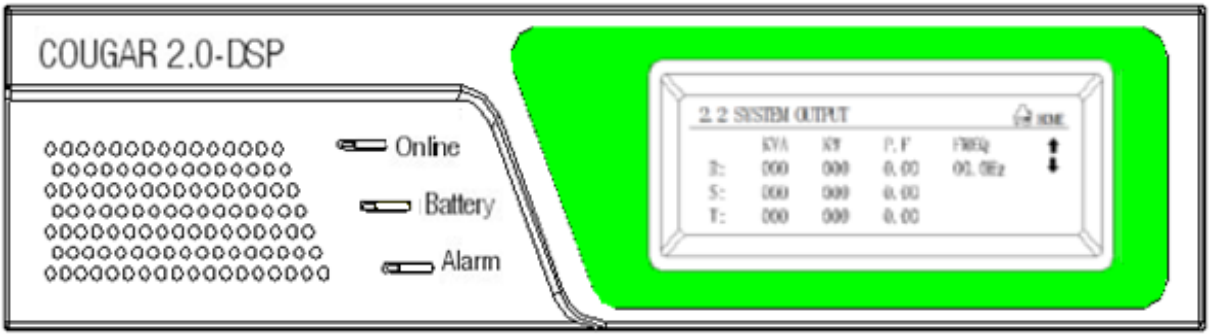
9.6 System output information

Click “ ”, and come to system output information, include five pages

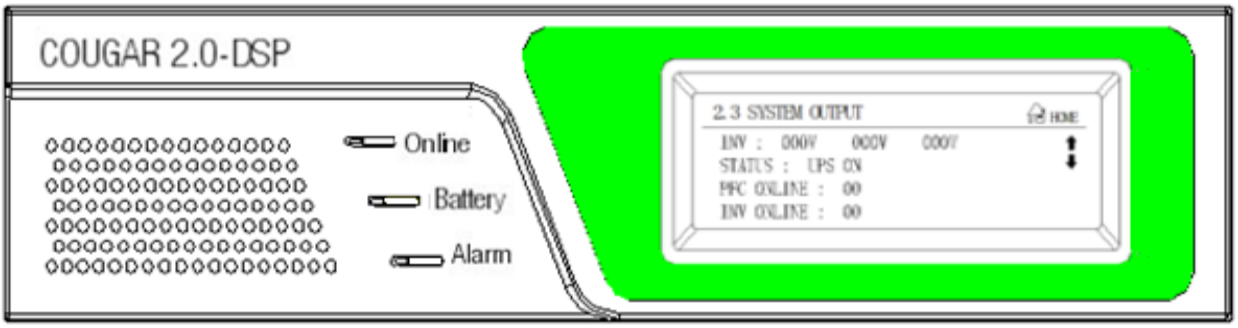


It displays current system voltage, current and load percentage

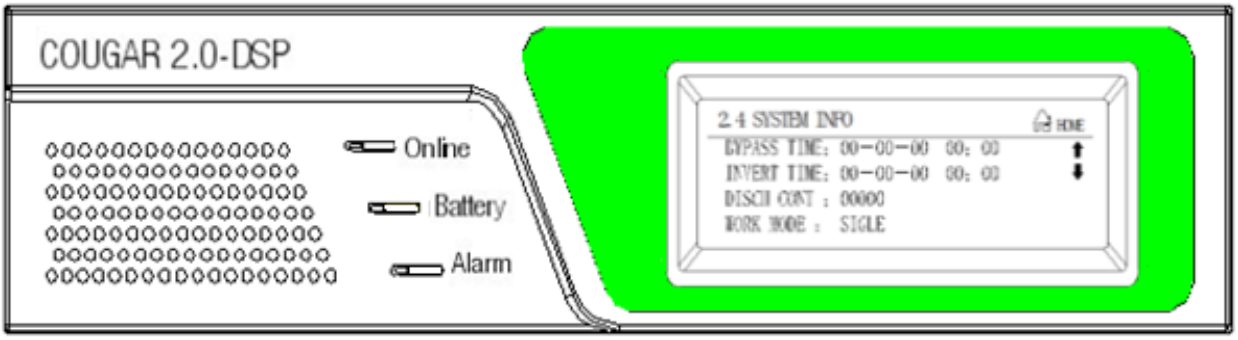
Second page



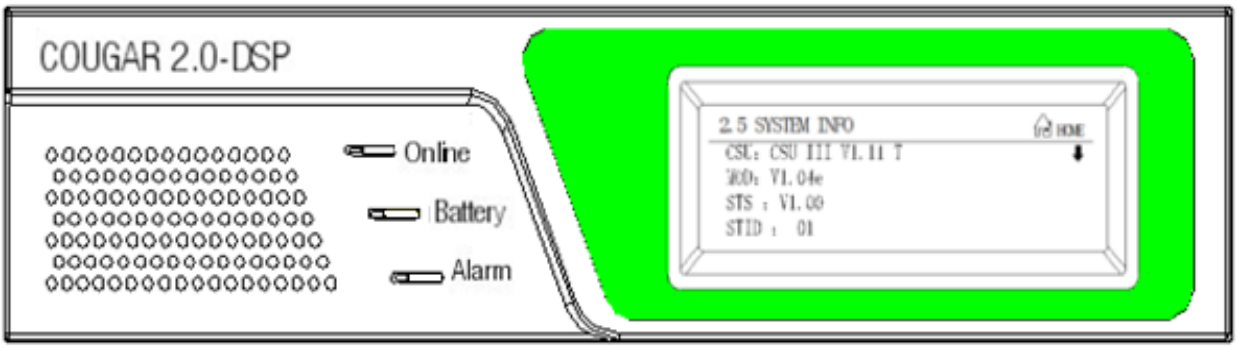
Third page :



Four page:

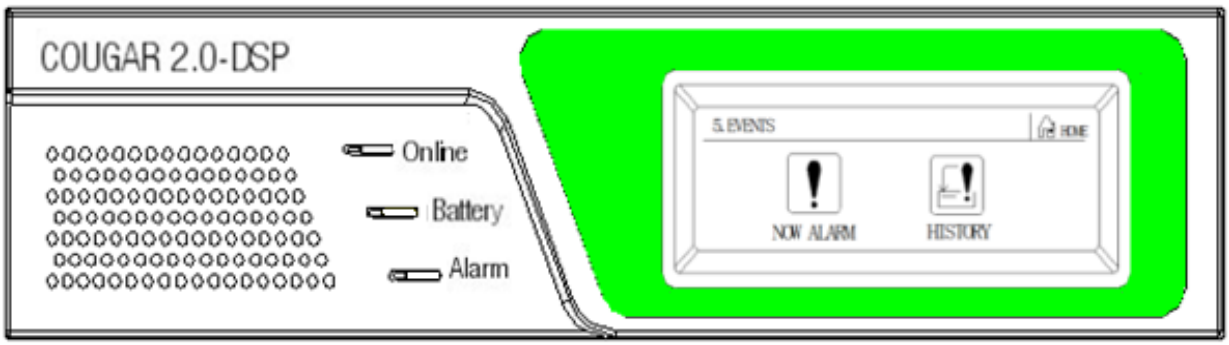


Five page:



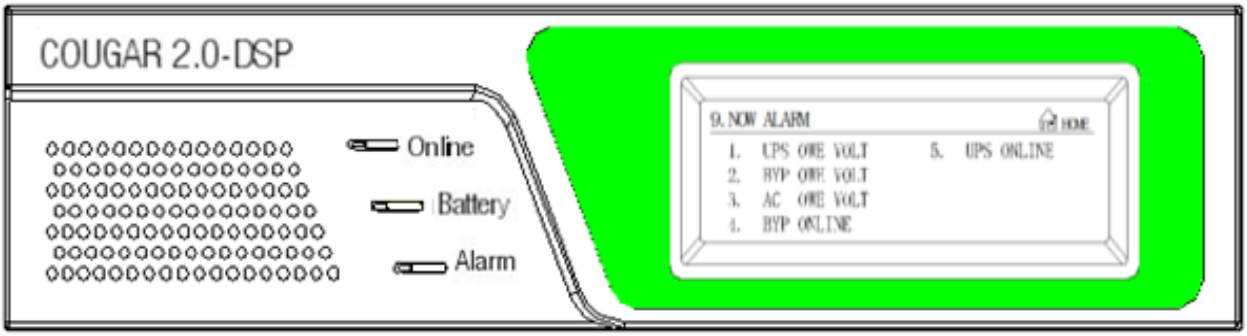
9.7 Event record page

Click“”and come to event record page



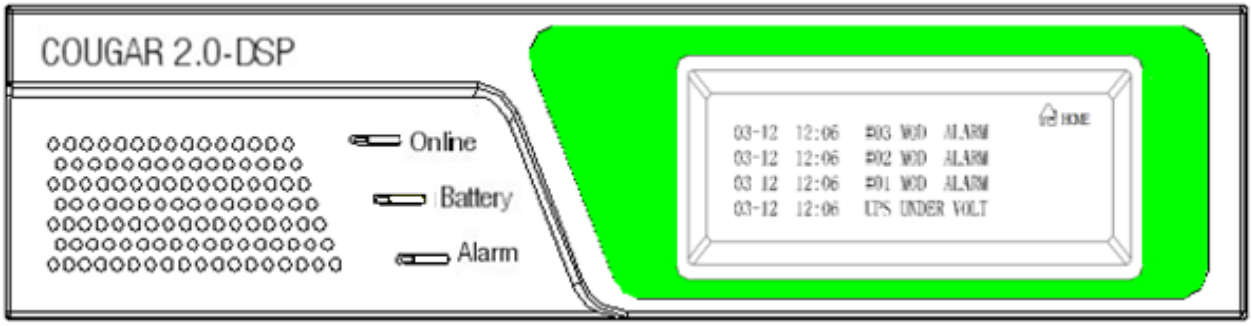
9.7.1 current alarm page

Click“”and see system current alarm information。



9.7.2 history record page

Click “”and come to current history record page.



ALL EVENTS MEANING:

	Failure handling
INV UNDER VOLT	1. check the 3-phase voltage of the module through the monitor module

INV OVER VOLT	2. check in states of the module
DC ABNORMAL	1. Check the DC voltage from the main menu 2. Check if DC input and output breaker is closed. 3. Check the DC voltage of positive and negative terminal up-side 4. Check the DC voltage of positive and negative terminal down-side
DC OVER VOLT	
DC UNDER VOLT	
OVER LOAD	Check the R, S, T output current on the LOAD menu.
BYP UNDER VOLT	1. check that the bypass input breaker is closed 2. Check the three-phase voltage on the bypass input breaker up-side. 3. Check the three-phase voltage on the bypass input terminal up-side. 4. Check the three-phase voltage on the AC input terminal down-side.
BYP OVER VOLT	1. Check the three-phase voltage on the bypass input breaker up-side. 2. Check the three-phase voltage on the bypass input terminal up-side. 3. Check the three-phase voltage on the bypass input terminal down-side.
MAIN UNDER VOLT	1. check that the AC input breaker is closed 2. Check the three-phase voltage on the AC input breaker up-side. 3. Check the three-phase voltage on UPS AC input terminal up-side. 4. Check the three-phase voltage on UPS AC input terminal down-side.
MAIN OVER VOLT	1. Check the three-phase voltage on the AC input breaker up-side. 2. Check the three-phase voltage on UPS AC input terminal up-side. 3. Check the three-phase voltage on UPS AC input terminal down-side.
OUT OVER VOLT	1. Check UPS output breaker up-side three-phase voltage 2. Check UPS output terminals up-side three-phase voltage 3. Check UPS output terminals down-side three-phase voltage
OUT UNDER VOLT	1. Check whether UPS output breaker is on 2. Check UPS output breaker up-side three-phase voltage 3. Check UPS output terminals up-side three-phase voltage 4. Check UPS output terminals down-side three-phase voltage
SPD FAILURE	1. Check SPD signal connection cable 2. Check SPD itself
OUT PHASE	Check all input and output power cable phases
NO REDUNDANCY	Check whether system is overload or not
HEAVY LOAD	
CONNECTION ERR	1. Check STS is online or not 2. Check system parallel signal connection cable
CAPA UNMATCH	The number of Online power module of 2 system is not equal, check whether there is failed power module.
MOD OK	No need of taking measures
OP REJECTED	
UPS ON	
ON-LINE	
DC RESTORED	
BYP RESTORED	

INV RESTORED	
MAIN RESTORED	
MOD RESTORED	
OUT RESTORED	
DISCHARGE END	
DISCHARGE BEGIN	
SAFE LOAD	
BAT SWITCH ON	
BAT SWITCH OFF	
MANUAL BYPASS	
FLOAT CHARGE	
EQUA CHARGE	
IN PHASE	
MODE MATCH	
AUTO SWITCH	
CONNECTION OK	
OUT BREAK	
STS OK	
CAPA MATCH	
MOD ALARM	See the following note
UPS OFF	
BY－PASS STS ALARM MODE UNMATCH	

Power Module Alarm (MOD ALARM) Failure Code meaning:

Failure Code	Meaning
8000	R OVER LOAD
8001	S OVER LOAD
8002	T OVER LOAD
8003	FAN ERR
8004	OVER-TEMP
8005	RECTIFIER FAULT
8006	ANMATCH TYPE
0001	COMMAND OFF
0002	MANUAL OFF
0004	OVER-TEMP OFF
0010	ERROR OFF
0020	INVERTER FAULT
0040	OVER LOAD
0100	STARTUP FAIL
0200	LOSE SIGNAL FAIL

NOT INSERTED	NOT INSERTED

UPS OFF code:

Failure Code	Meaning
0001	DC+ UNDER VOLTAGE
0002	DC+ OVER VOLTAGE
0003	DC- UNDER VOLTAGE
0004	DC- OVER VOLTAGE
0005	DC+ DEVIATION LARGE
0006	DC- DEVIATION LARGE
0007	OUTPUT SHORT
0008	SYSTEM SHUN DOWN
0011	PARALLEL CONNECTION CABLE DISCONNECTED
0012	CONFIGURATION DIFFERENT BETWEEN LOCAL SYSTEM AND OTHERS
0013	SINGLE SYSTEM MODE WITH PARALLEL CABLE
0014	STS ADDRESS OVERLAP

BYPASS code:

Failure Code	Meaning
0002	MANUAL OPERATION
0003	SYNCHRONIZED TRANFER TO BYPASS
0004	INVERT R UNDER VOLTAGE
0005	INVERT S UNDER VOLTAGE
0006	INVERT T UNDER VOLTAGE
0007	INVERT R OVER VOLTAGE
0008	INVERT S OVER VOLTAGE
0009	INVERT T OVER VOLTAGE
0010	OVERLOAD, TRANSFER TO BYPASS
0011	MIAN SHORT
0012	OUTPUT R UNDER VOLTAGE
0013	OUTPUT S UNDER VOLTAGE
0014	OUTPUT T UNDER VOLTAGE
0015	OUTPUT R OVER VOLTAGE
0016	OUTPUT S OVER VOLTAGE
0017	OUTPUT T OVER VOLTAGE

COU-STS Alarm code:

Failure Code	Meaning
0100	Auxiliary power supply failight
1000	Input fuse failight

MODE UNMATCH :

Failure Code	Meaning

0001	Output phase-setting wrong
0002	Configuration different between local system and others
0040	Single system mode with parallel cable
0080	STS address overlap

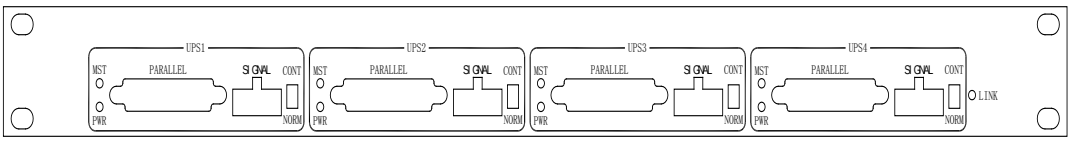
9.8 Index setup page

Click “  ”, and come to index setup page.

10. System Parallel (Optional)

10.1 Parallel Control Module (COU-Parallel)

Parallel operation is realized by COU-Parallel. COU-Parallel is able to parallel 4 UPS.



PARALLEL: Parallel interface

SIGNAL: Output breaker auxiliary contact signal

Dial switch: Put to NORM, when parallel interface connected and STS is online. Otherwise, put to CONT.

MST: The light will be on, when local system be the master. Or, off.

PWL: When parallel interface of COU-Parallel connected with system, light on, otherwise, off.

LINK: STS of paralleled UPS online, Dial Switch of paralleled UPS on NORM, Dial Switch on CONT which corresponded Parallel interface do not connect UPS or corresponded UPS’s STS offline, in this case, LINK light will be on. Otherwise, off.

e.g. There are 4 parallel interfaces, we definite the interfaces as Parallel-UPS1, Parallel-UPS2, Parallel-UPS3, Parallel-UPS4.

When we used COU-Parallel for 2 UPS; LINK light will be on, only when Parallel-UPS1 & Parallel-UPS2 connected with UPS, STS of UPS1 & UPS2 online, Dial switch of Parallel-UPS1 & Parallel-UPS2 on NORM, Dial switch of Parallel-UPS3 & Parallel-UPS4 on CONT.

Note:

If LINK light is off, UPS send out alarm and stop transfer, even output is abnormal. That’s means UPS parallel operation, we should make sure LINK light is on. If LINK light is off or there is abnormal

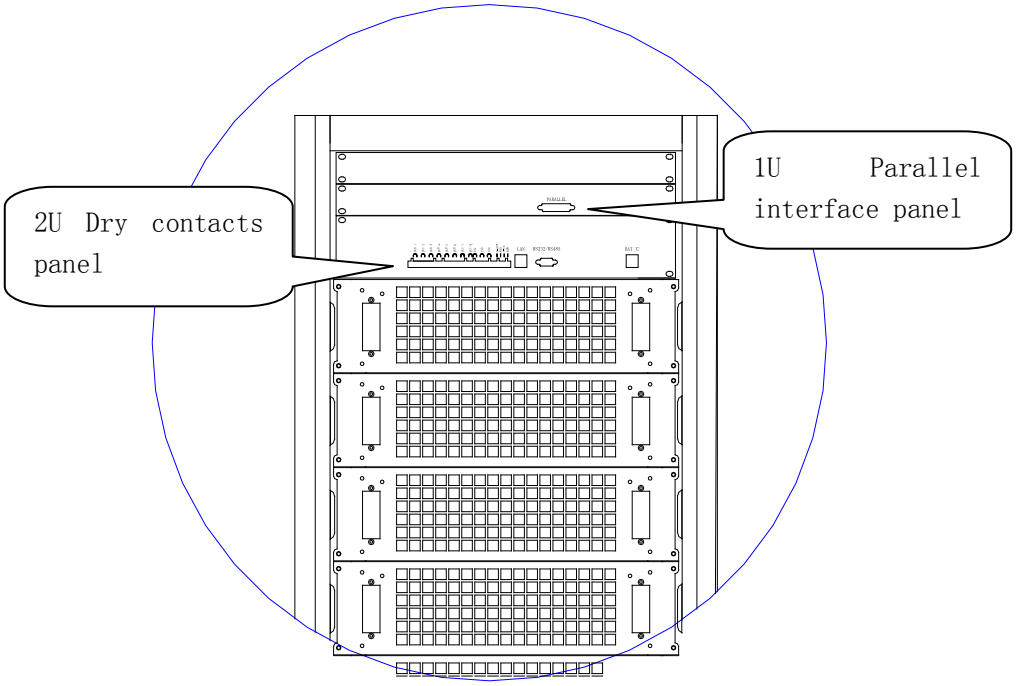
connection, please check parallel connection cable and Dial switch.

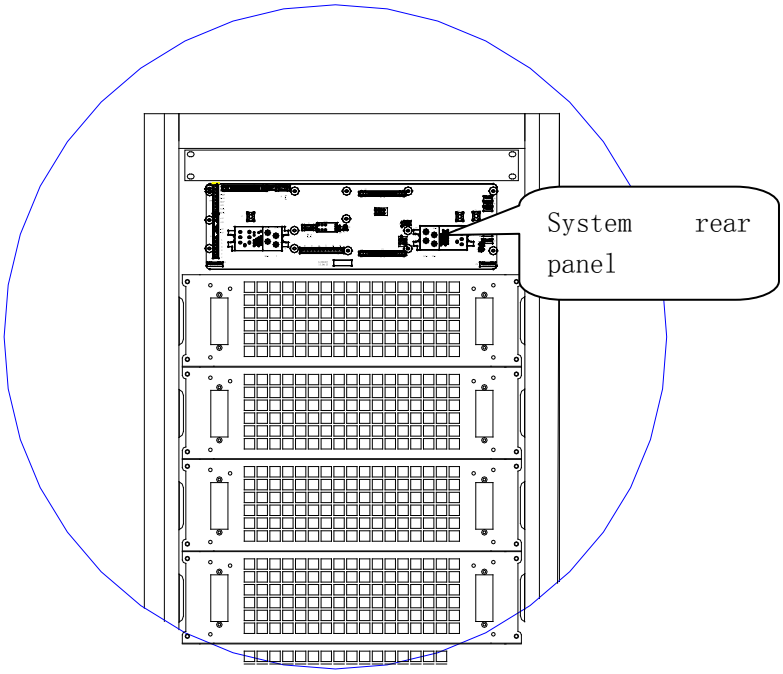
Dimension(w*d*h)mm: 482*150*44

10.2 Parallel installation

10.2.1 Parallel setting

1) Move “1U Parallel interface panel” and “2U Dry contacts panel”, then we could see and check “System rear panel”.





2) Remove the short-circuit line on “2P Green-terminal”, put the “2P Dial SW1” to “OFF”. Diagram as below,

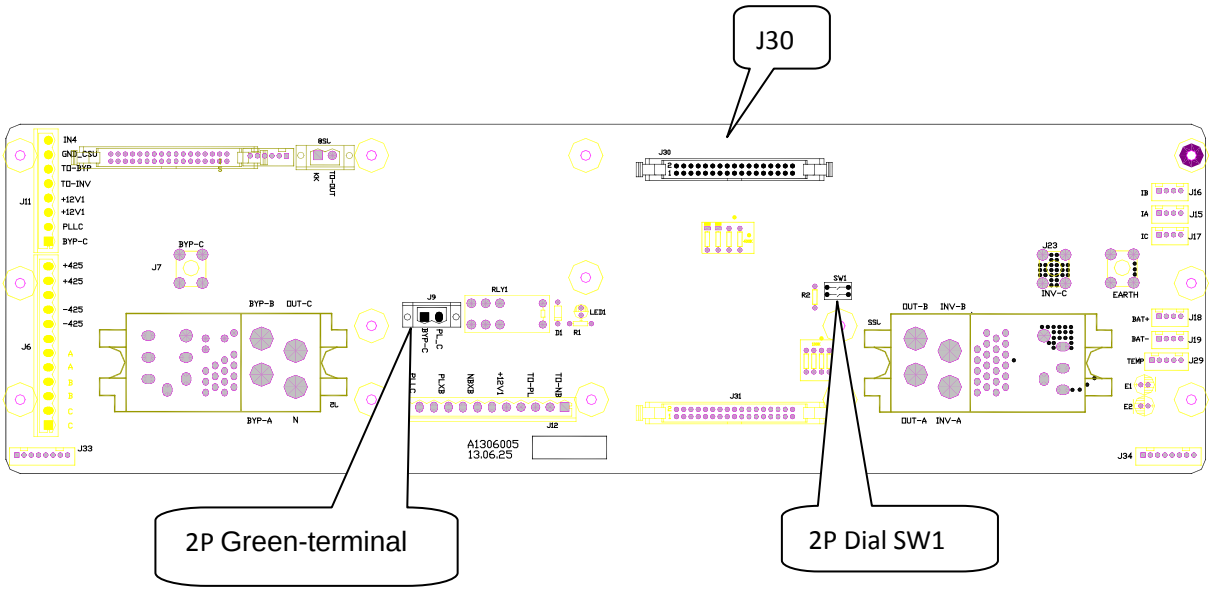
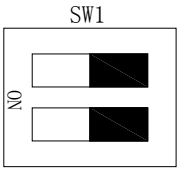


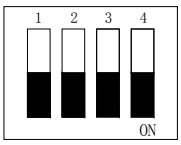
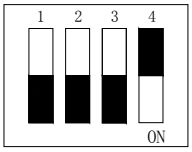
Diagram of “OFF” status of “2P Dial SW1”,



3) Set COU-STS on Parallel Mode

Note: Just need to change the fourth position of Dial switch to achieve Parallel Mode.

Details as below,

Dial Status	Fourth position	System Mode
	ON	Single System Mode
	OFF	Parallel Mode

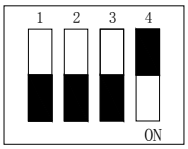
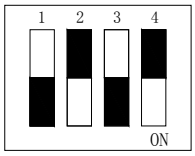
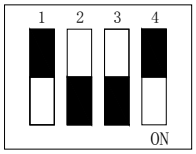
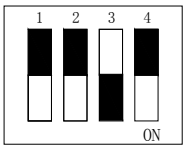
4) Set ID for Cougar 2.0 - STS

Set ID for Cougar 2.0-STS to make sure there is no overlap on ID. Each STS ID is Corresponding to the connected COU-Parallel.

If there is overlap on ID, then first started UPS run, the later started UPS failed.

Note: Just need to set the first position and second position of Dial switch.

Details as below,

Dial Status	First position	Second position	ID
	ON	ON	01
	ON	OFF	02
	OFF	ON	03
	OFF	OFF	04

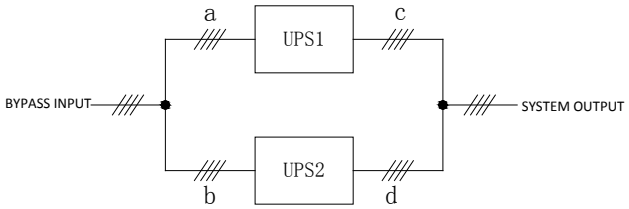
10.2.2 Input and Output Cable Connection

1) In order to get nice current sharing control when system on bypass output, below is required,

The length of bypass input cable of each UPS should be equal.

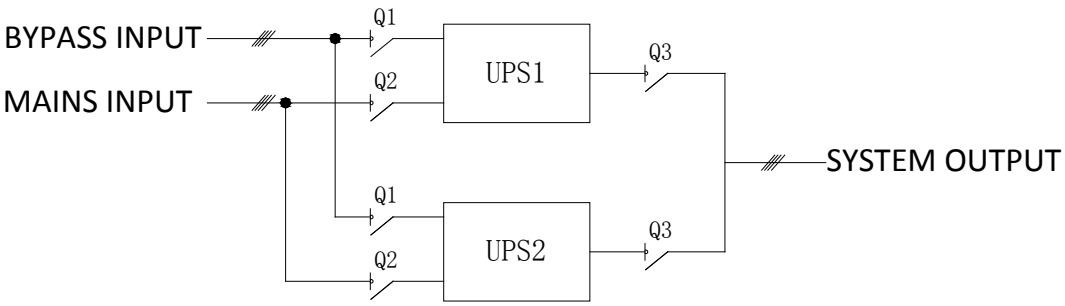
The length of output cable of each UPS should be equal.

Bypass input cable: a=b; output cable: c=d.



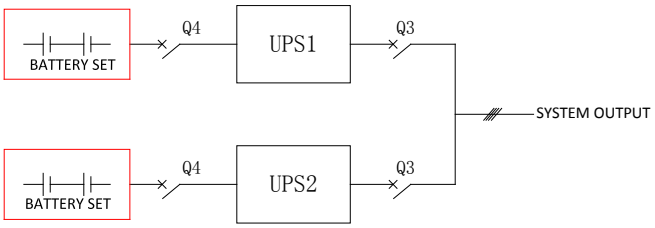
2) In order to exit one UPS from parallel operation and do not disturb other UPS, there should be breakers for MAINS INPUT, BYPASS INPUT, SYSTEM OUTPUT of each UPS.

And it must be a pair of passive normally open auxiliary contacts. The auxiliary contact should be enough insulation against Main contacts and other auxiliary contacts.



10.2.3 Battery Set Connection

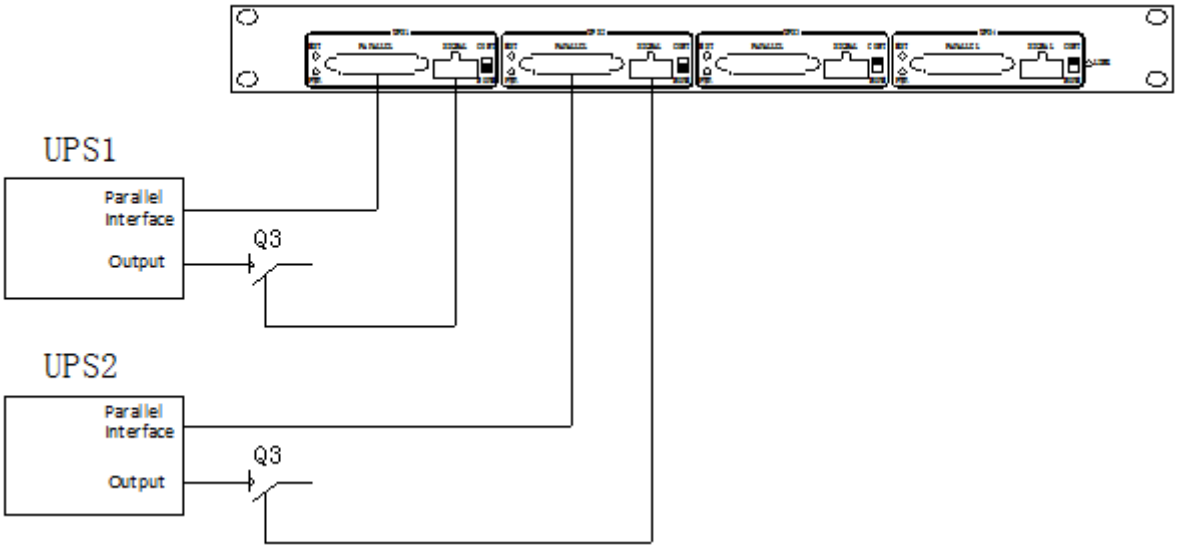
Each UPS required separated Battery Set, there must be a battery breaker before connected to parallel operation. Each UPS manage its own Battery Set. “Battery Management” parameters of each battery should be set separately.



10.2.4 Signal Connection

1) Connect “PARALLEL” interface on system to “PARALLEL” interface on COU-Parallel
2) Connect Q3(output breaker auxiliary contact) on System to “SIGNAL” interface of COU-Parallel
3) Put the Dial switch of which connected with system to NORM, others to CONT.

COU-Parallel



10.3 First Startup

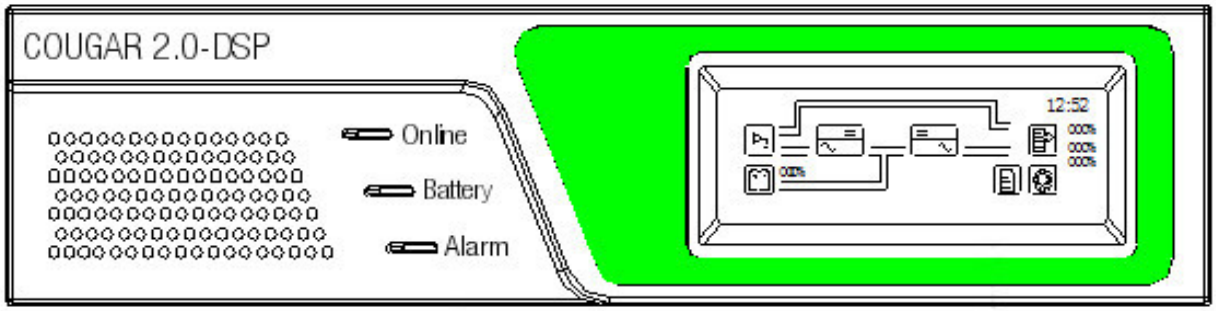
1) Check all breakers including UPS internal and external, make sure all breakers are open.

2) Check all input and output cables, make sure phases are right and no short circuit.

3) Close all UPS external bypass and internal bypass Breakers in turn, output on bypass. Check all system operation mode and COU-STS ID via Monitor module, make sure system works in parallel mode and no COU-STS ID overlap and connected with corresponding parallel interface on COU-Parallel. If not, reset Dial switch of COU-STS.

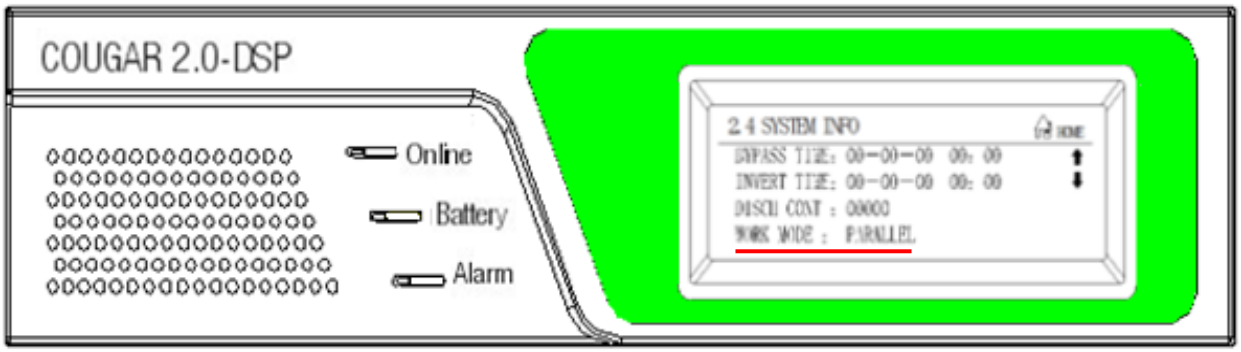
Check system operation mode and COU-STS ID as follow step.

GENERAL INFORMATION PAGE:



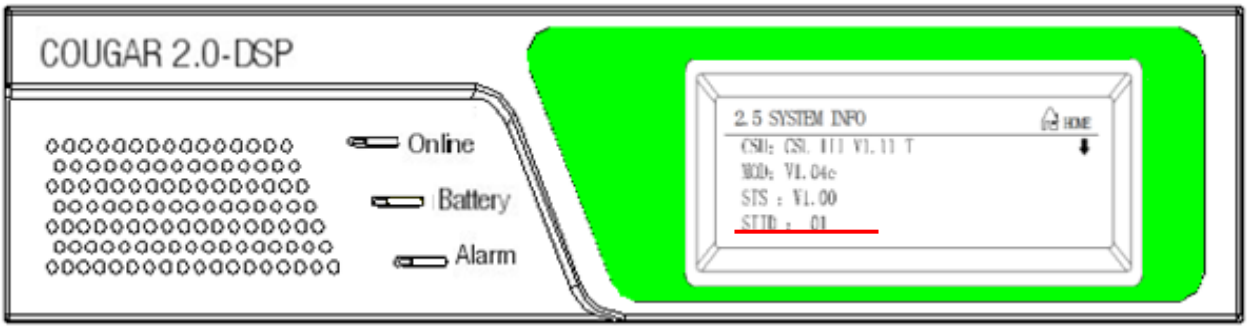
Touch "[icon]"ICON, enter to SYSTEM OUTPUT INFORMATION page. There are 5 pages information. Move the page according to tips" ⬆".

Fourth page as below,



Note: Check System operation mode, parallel mode or single system mode.

Fifth page as below,



Note: Check COU-STS ID.

4) Open UPS output breaker, measure same-phase voltage difference between UPS external output switch input terminal, make sure it is within 5V. If not, check cable connection.

5) Open UPS MAINS INPUT breaker and BATTERY breaker, power on the power module. UPS will transfer to Inverter at same time, once power modules runs normally. Then measure same-phase

voltage difference between UPS external output breaker input terminal, make sure it is within 5V. If not, check parallel signal cable connection.

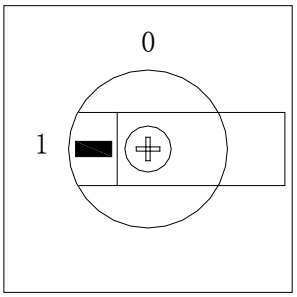
6) Open UPS output breakers in turn from larger ID UPS. Meantime, check whether MST light of COU-Parallel is right. If not, check auxiliary contact signal of UPS external output breaker.

Note: Parallel system in parallel mode and all output breakers are closed, the minimum ID UPS will be the Master, and corresponding MST light on.

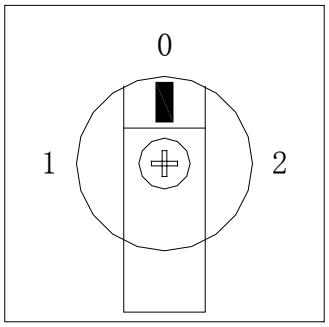
7) Check current sharing status of all power module, when all UPS external output switch are on.

8) Manual Bypass Switch Testing: Turn one UPS manual bypass switch, all UPS transfer to bypass at the same time. Turn back to normal, all UPS delay transferred to Inverter simultaneously. Test every UPS in parallel system.

Bypass mode:



Normal mode(Inverter mode):



9) open all UPS MAINS INPUT BREAKER to test as Mains failed, make sure all UPS could work in Battery Mode. Then close all MAINS INPUT BREAKER.

10) Close LOAD BREAKER. Then check current sharing status of each UPS and its power modules.

10.4 Add in and EXIT UPS in Parallel Mode

In order to supply safe, stable and reliable power, Parallel UPS make it available to add in or EXIT UPS in parallel system.

10.4.1 Add in

1) Connect all cables as required.

2) close UPS BYPASS INPUT BREAKERS. Check system operation mode and its COU-STS ID, when Monitor module and COU-STS module start up.

Note: If other UPS works in BYPASS, the new added one should delay transferred to BYPASS. If others

works in INVERTER, then the new added one will keep on output break state.

3) Put the corresponding Dial Switch to NORM, make sure “LINK” light is on, meanwhile check UPS history records, there should be a record as “CONNECTION OK”.

4) Parameter setting. Make sure it’s same as other UPS.

5) close UPS MAINS INPUT and BATTERY Breaker. If others in INVERTER mode, delay transfer system to inverter output after all power modules on.

6) Close UPS OUTPUT BREAKER, measure same-phase voltage difference between UPS external output breaker input terminal, make sure it is within 5V.

7) Close UPS external output breaker, parallel UPS. Check current sharing status between UPS and power modules.

10.4.2 EXIT

1) Break off UPS external output breakers

2) Shut down the UPS which need to be moved off via Monitor

3) open MAINS, BATTERY, and OUTPUT BREAKERS

4) Disconnect parallel signal cable. Put corresponding Dial Switch to CONT, make sure LINK light is still on, meanwhile check other UPS history record, there should be alarm as “CONNECTION OK””.

10.5 Alarm Handle in Parallel Mode

	Failure code	Failure handling
NO REDUNDANCY	NONE	1. If there is only one UPS, no other UPS work. 2. Overload or not No redundancy calculation method: Default: A=load, B= capacity of all parallel UPS – capacity of the maximum of all parallel UPS. If A ＞ B, no redundancy.
CONNECTION ERR	NONE	1. Check whether COU-STS is online. 2. Check system parallel signal cable connection. 3. Check Dial Switch
CAPA UNMATCH	NONE	The number of online power module is not equal, go and check if there is power module failure.
MODE UNMATCH	0002: output voltage, frequency, operation mode difference	Check system setting

	0040: Single system mode of Cougar 2.0 - STS in parallel system	Check dial switch of COU-STS
	0080: Cougar 2.0-STS ID overlap	Check dial switch of COU-STS
	Others, please check “EVENT RECORDS” PAGE	
UPS OFF	0011: Parallel cable disconnect	Check Parallel signal cable. Failure handle, then manual start up.
	0012: output voltage, frequency, operation mode difference	Check “MODE UNMATCH” for reference.
	0013: Single system mode of Cougar 2.0 - STS in parallel system	
	0014: STS ID overlap	
	Others, please check “EVENT RECORDS” PAGE	

10.6 Notes in Parallel Mode

10.6.1 Parameter setting

User could set UPS parameters as requirement, but UPS should be set separately.

Note: “output frequency” and “Operation Mode” should be set under parallel state. “output voltage” could be set when system start, but every UPS should be set.

UPS operation should according to its own parameters.

ATTENTION: Parameters setting of All Parallel UPS should stay the same.

10.6.2 System Manual Shut Down

1) Two or more UPS works in Parallel system, and keep on INVERTER. If one of them (definite as UPS1) is manual shut down, power module of UPS1 power off, UPS break output, EXIT from Parallel system.

In this case, if overload in parallel system, All UPS transfer to BYPASS at the same time, including UPS1.

2) If one UPS work on INVERTER, all power module of UPS power off and system transfer to BYPASS, when system is manual shut down.

10.6.3 Signal Cable

Do not disconnect signal cable, when UPS works in Parallel mode. Otherwise, system shut down.

10.6.4 LINK light

Keep LINK light on COU-Parallel be on, and no Alarm as “ CONNECTION OK”, when in Parallel mode. Otherwise, system do not do any transfer.

11. TECHNICAL SPECIFICATION

11.1 Specification of the UPS system

General specifications

System type	Cougar 2.0 - 800/50
Maximum power	800KVA
Cable eatery	3/1, 3/3, 1/3, 1/1
Circuit	online
Output wave	Sine wave
Dimension(W*D*H mm)	2200×1000×2000

AC input

Mains input	Input rated voltage	380V/220V	400V/230V	415V/240V
	Input voltage range	165V～275V(single phase voltage)285V～475V(three phase voltage)		
	Input mode	Three-phase four-line+ grounding line/ one phase two-line+ grounding line		
	Input frequency	50Hz±5Hz	60Hz±5Hz	
	Input power factor	≥0.99		
	THDI	<3%		
	Power woke-in	> 60sec		
Battery input	Rated input voltage	±384V		
	input voltage	345V～445V		

AC output

Output voltage	380V/220V	400V/230V	415V/240V
Output mode	Three phase or single phase		
UPS power factor	0.9		
Voltage distortion	Linear load ≤3%，non-linear load≤5%		
Output frequency	If the input mains is within 50Hz/60Hz±4%, the output frequency follows the mains frequency and the phase error is within 3 degree; if the mains is out of limits or the system is in battery supply, the output frequency is 50Hz/60Hz±0.2%.		
Peak factor	3 ： 1		
Overall efficiency	≥95%(mains supply)≥98%(battery supply)		
Current equalize accuracy	≤5%		
Transfer from mains to battery supply	0ms		
Transfer from bypass to inverter supply	<1ms		

Dynamic response of instant variation	Load variation between 0%～100% or 100%～0%, voltage variation ≤2%
Unbalanced load	Bear 100% unbalanced load

Others

Acoustic noise(1m)	≤55DB
Display	240x64 LCD
Electromagnetic compatibility	EN 62040-2:2006
Applicable safety standards.	EN 62040-2:2006 ; IEC 60950-1:2001

11.2 Specification of the power module

Input

Mains input	Input rated voltage	380V/220V, 400V/230V, 415V/240V	
	Input voltage range	165V～275V(single phase voltage)285V～475V(three phase voltage)	
	Input mode	Three-phase four-line+ grounding line/ one phase two-line+ grounding line	
	Input frequency	50Hz±5Hz	60Hz±5Hz
	Input power factor	≥0.99	
	efficiency	≥95%(mains supply)≥98%(battery supply)	
DC input	Rated input voltage	±384V	
	input voltage tolerance	345V～445V	

Output

Module type	CouM50
Module capacity	50KVA
power factor	0.9
output mode	Three-phase four-line+ grounding line/ one phase two-line+ grounding line
Output voltage (3 phase / 1 phase)	380V/220V, 400V/230V, 415V/240V
Output frequency	If the input mains is within 50Hz/60Hz±4%, the output frequency follows the mains frequency and the phase error is within 3 degree; if the mains is out of limits or the system is in battery supply, the output frequency is 50Hz/60Hz±0.2%.
Voltage distortion	Linear load ≤3%，non-linear load≤5%
Peak factor	3:1
Dynamic response of instant variation	Load variation between 0%～100% or 100%～0%, voltage variation ≤2%

Acoustic noise(1m)	≤55dB
Temperature coeffient(1/°C)	≤±0.2‰

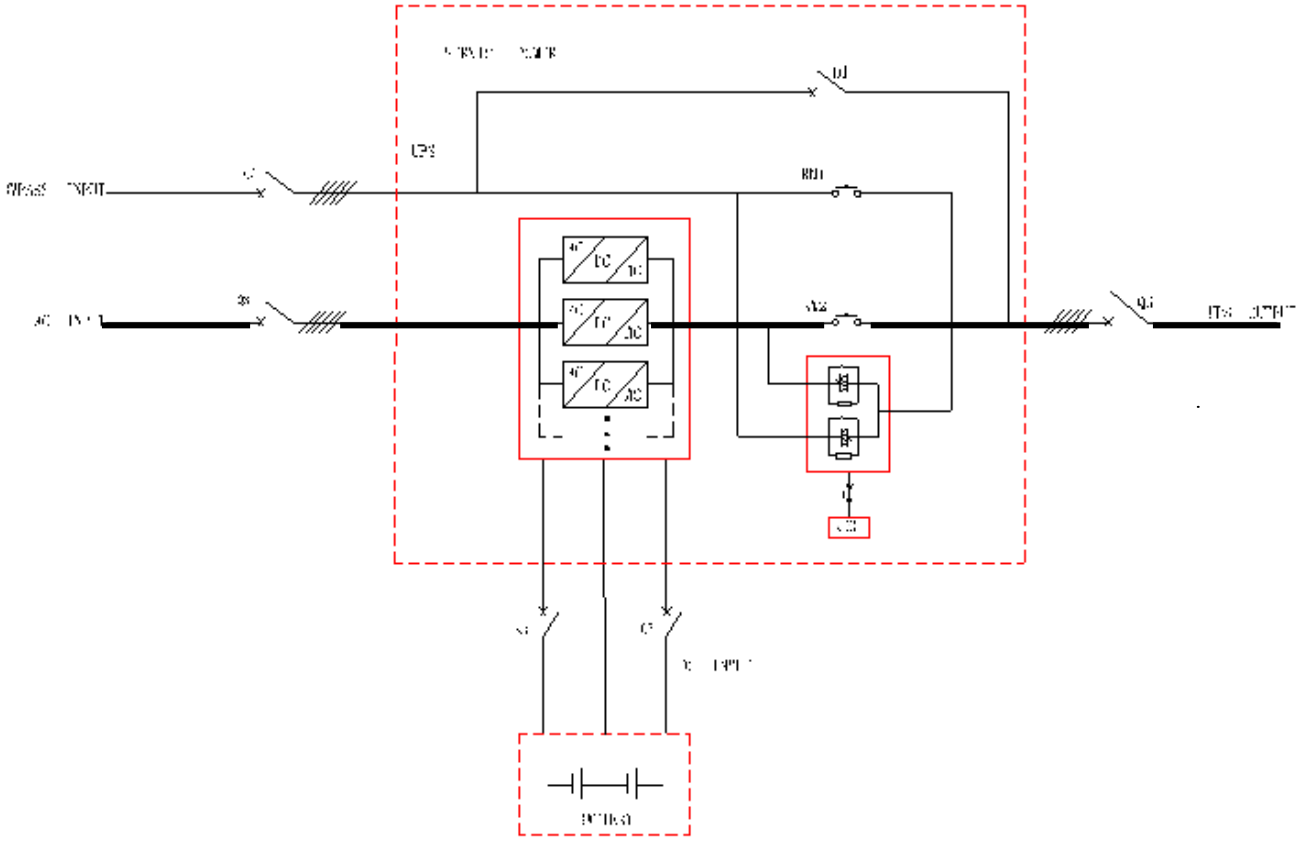
- Invert output over voltage alarming: when the invert output voltage＞inverter over voltage limits(default voltage is 242V, the module will shut down the machine automatically and the alarm light will stay on.
- Invert output under voltage alarming: when the invert output voltage＜inverter under voltage limits(default voltage is 176V, the module will shut down the machine automatically and the alarm light will stay on.
- Over current alarming: if the load is higher than 110％ of the rated power , the alarm light turn on.

Note: the alarm light is on in the above situations.

12. MODE OF OPERATION

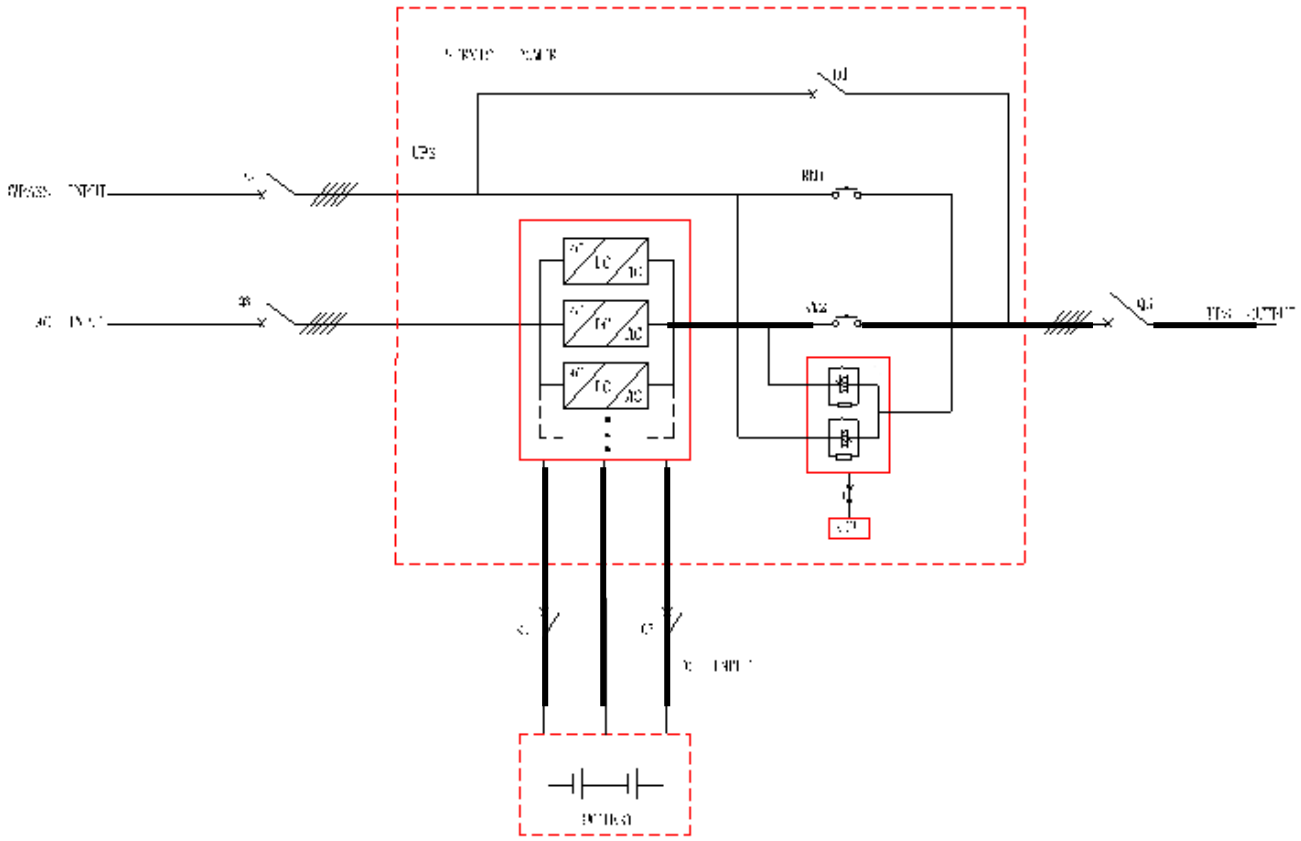
12.1 Normal operation mode

The normal operation refers to the mains (AC input) operation mode. Close the Q2 breaker, AC/DC change, system outputs. AC input supply the load and system functions normally.



12.2 Battery operation mode(un-stable mode)

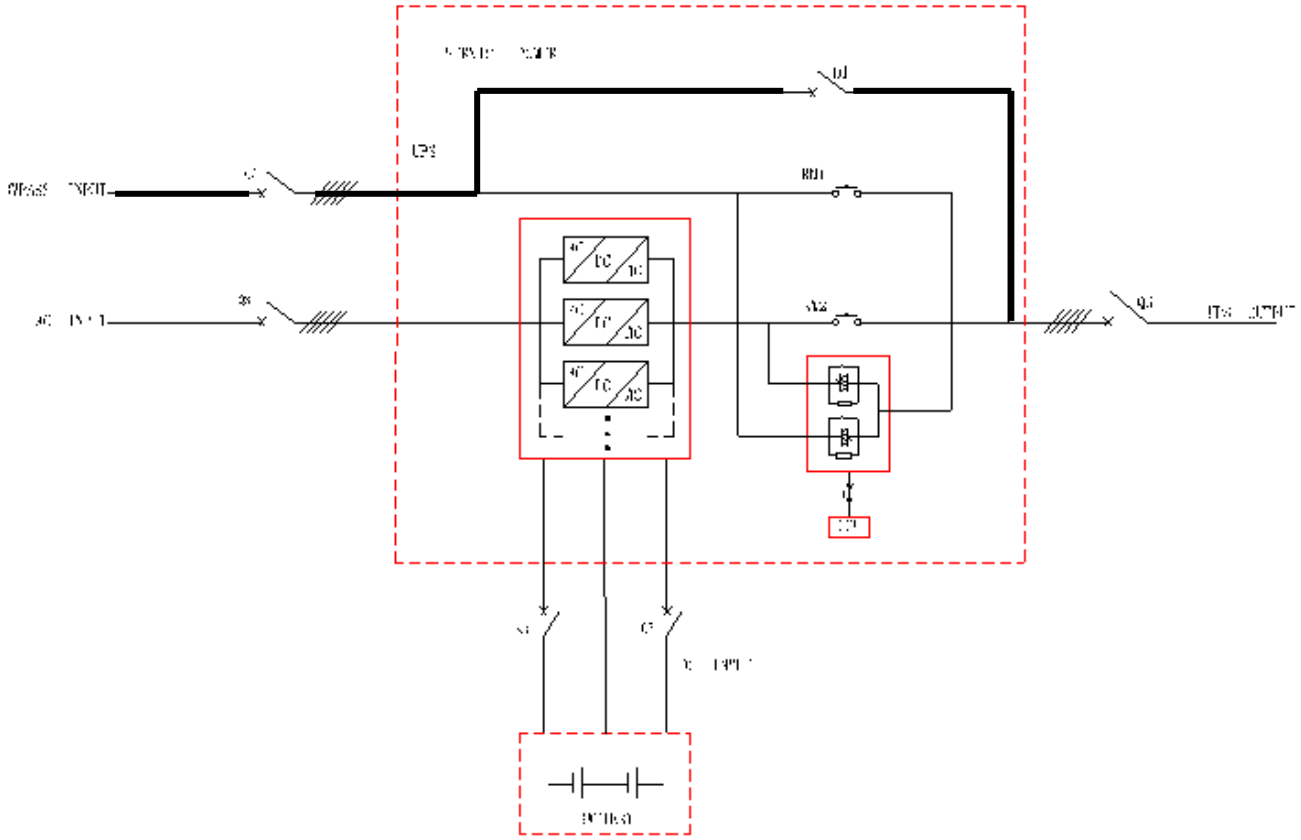
Battery operation mode is the system no AC input mode. Close the Q4, Q5 breaker, DC/AC change, system outputs. Bypass input supply the load and system functions normally



12.3 maintenance bypass operation mode

The user could have external maintenance bypass breaker (Q6 in following diagram), which must have the same phase order with the bypass supply. Turn the manual bypass breaker SA , and the system is on bypass supply. Then close Q6. The load is supplied by SERVICE POWER and the system exit running

The user could have external maintenance bypass breaker (Q6 in following diagram), which must have the same phase order with the bypass supply. Turn the manual bypass breaker SA , and the system is on bypass supply. Then close Q6. The load is supplied by SERVICE POWER and the system exit running

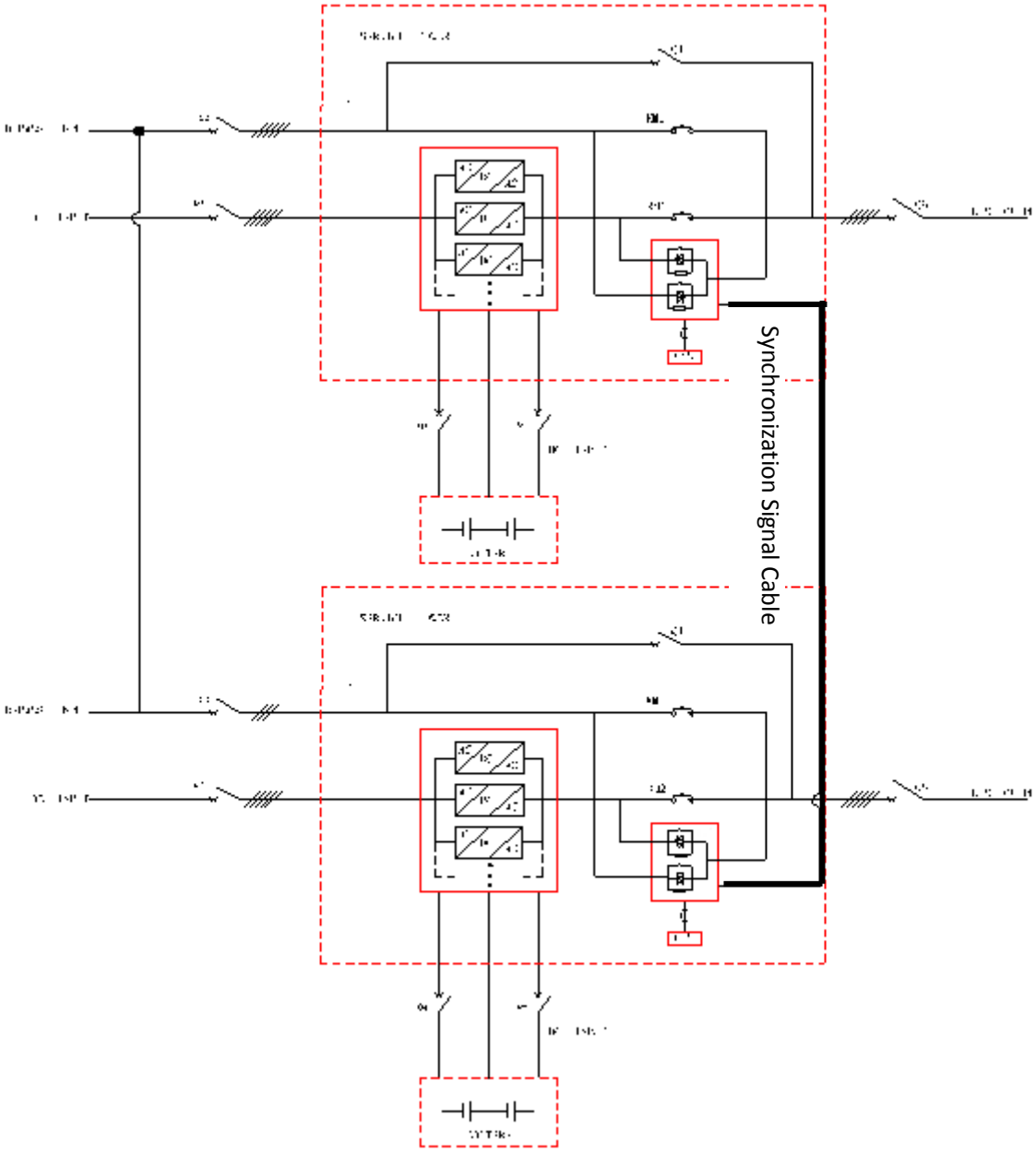


12.4 Synchronization Mode

When two or more UPS operation, in order to make system output synchronize, we could let system work in synchronization mode.

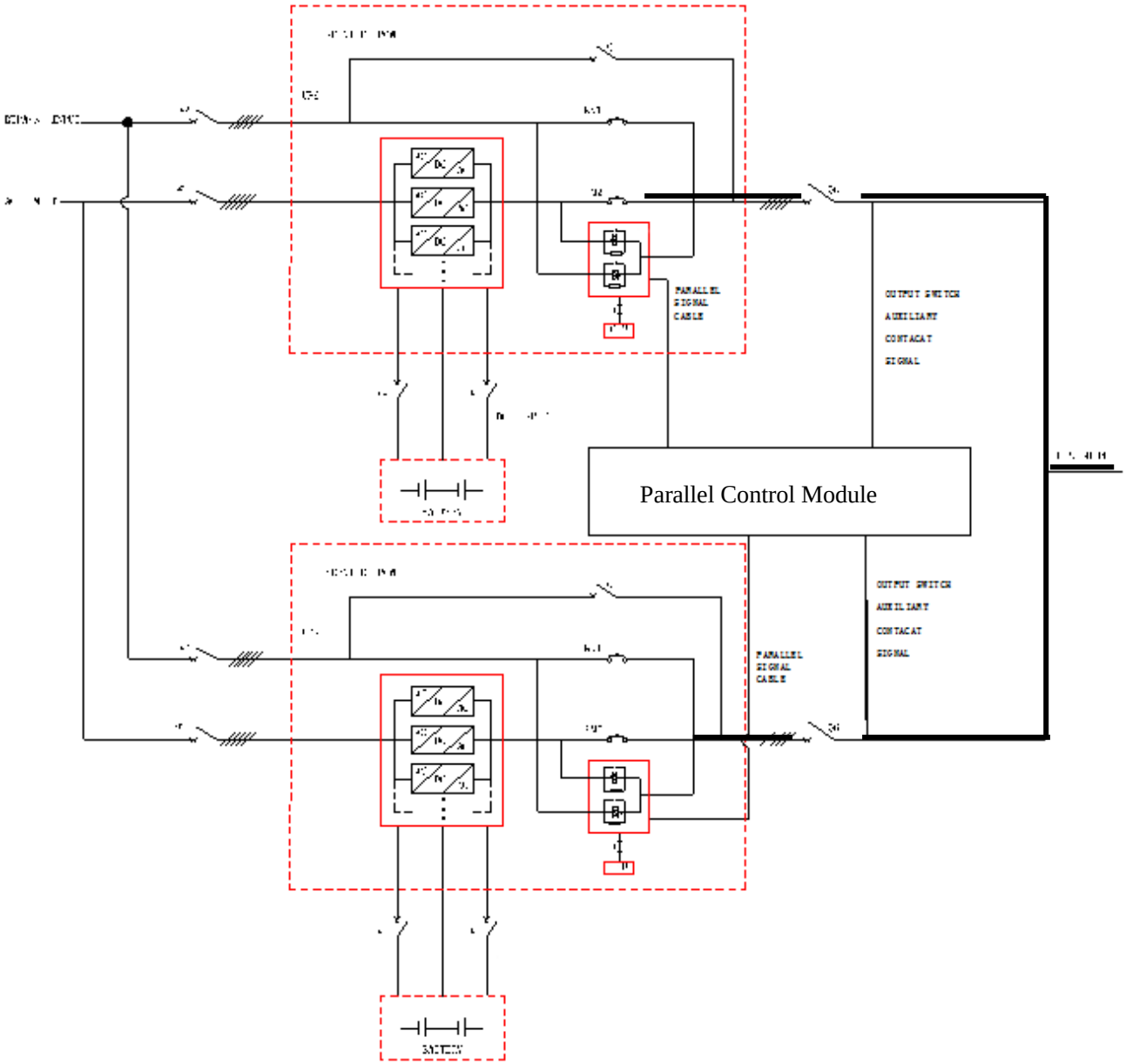
Connect synchronization output signal of the first UPS to synchronization output signal of second UPS, then the second UPS output will track first UPS, then two UPS output phase is synchronized, and so on. Two UPS work in synchronization mode.

Note: Two UPS should use same BYPASS INPUT. If not, it may be not synchronized in phase, when second UPS track the first UPS.



12.5 Parallel Mode

When two or more UPS operation in parallel mode, in order to realize AC output parallel operation, below is required, 1) there should be breakers for MAINS INPUT, BYPASS INPUT, SYSTEM OUTPUT of each UPS. 2) Each UPS required separated Battery Set, there must be a battery breakers before connected to parallel operation. 3) The length of bypass input cable, output cable should be equal. 4) Connect parallel interface of UPS to parallel interface of Parallel Control Module, meanwhile connect system external output breakers auxiliary contact signal to “SIGNAL” interface of Parallel Control Module.



13. MAINTENANCE & PROTECTION OF THE SYSTEM

13.1 take into consideration the loads and their characters when using UPS

UPS rated output power is an important parameter to determine how much load the product can drive. It depends on the load power factor. For example, a 1KVA may not be able to drive a 1KVA load. To prolong the service life of the UPS, the device should not work under full load for a long period of time. Generally, backup UPS drives a load of 60% ~ 70% of rated power, while online UPS dives a load of 70% ~ 80% of rated power. In addition to that, UPS should not work with too small load for a long time.

13.2 Usage and maintenance tips

- When using the UPS power supply, do follow relevant procedures in the product's manual book or user guide and ensure that the live wire, null line and ground wire are laid in accordance with applicable requirements. User cannot change their orders.
- Conduct right start and shutdown procedure according to the direction of user manual. Avoid sudden increase or decrease load, which may cause unstable UPS output voltage and operation abnormal.
- Do not start or shut down the equipment frequently. Once it is shutdown, wait at least 30s to turn on it. Otherwise, the equipment may come to “start fail” state, which means no mains and UPS output.
- Overload running is prohibited. When the UPS is starting, the load should be within 80% of its rated power. If it runs with too much load, the UPS tube is likely to be punched. It is proved that the UPS operate in the best way, when the load is 30 ~ 60% of its rated power.
- If the UPS is stocked, it should be started every 3 ~ 6 months. Otherwise it might be damaged.
- Maintain the UPS regularly. Clear dust and check fans. Measure and regulate the UPS operation index.

13.3 Battery management

Any battery replacement should be performed by qualified personnel. Batteries that have been removed/ replaced must be taken to a specialized disposal and recycling facility. The batteries are classified as toxic waste by law.

The following precaution should be observed when working on batteries:

- Remove watches, rings or other mental objects.
- Use tools with insulated handles.
- Do not lay tools or mental parts on top of battery or any terminals.
- Never short-circuit the battery terminals.

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