



VSM-A Introduction

1. Mechanical Diagram



Dimensions: 213.4mm x126mmx41.6mm

Weight:≤1.5Kg

2. Technical specifications

VSM-A is equipped with powerful detecting and controlling functions, which enables it to conduct real time detection to the power supply and control working status of rectifier based on detected data, for the purpose of meeting maintenance and management requirements of the battery groups and ensure reliable operating of the whole power system. There will be alarm when rectifier module abnormality is checked. It can receive queries, settings and control from the host through RS485 and report detected mechanical spec. to the host for the convenience of centralized management.

3. Functions of VSM-A

3.1 Communicating with the host

Being able to communicate with the host is one critical feature of **VSM-A**. The monitor provides the host with RS485, it can:

- (1) Send real time analog data from the monitoring module to the host;
- (2) Send real time digital data from the monitoring module to the host;
- (3) Receive orders of the host including setting sys. Parameter and start up/shutdown of rectifier module;
- (4) Receive control commands from the host;
- (5) Send alarm information to the host



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All operations of reading, setting and controlling shall be executed by the host. The monitor shall not report information without specific orders of the host;

➤ **Analog includes**

- AC voltage, bus bar voltage, battery current, load current, battery temperature, ambient temperature, ambient humidity and speed of module fan;

➤ **Digital data includes**

- module failure, DC under voltage, DC over voltage, LVBD, module on/off, status of battery fuse, load fuse, battery equalizing/float charge, stand-by sensor;

➤ **Alarms include**

- AC/DC over/under voltage, AC phase loss, AC MCB, module failure, fan failure, module current limiting, LVBD, status of load fuse and battery fuse;

➤ **Setting parameters**

- equalizing/float charge voltage, DC output over-voltage alarm set point, load/battery current high alarm set point, battery voltage low alarm set point, battery temperature low/high alarm set point, ambient temperature high/low alarm set point, LVD1/2 voltage value, first/second power recover voltage value, LVBD alarm set point, battery capacity, battery current limiting coefficient, temperature compensation coefficient, coefficient of equalizing charge shift to float charge, coefficient of float charge shift to equalizing charge, interval of periodical equalizing charge, continual equalizing charge duration, limiting current, AC voltage high/low alarm set point, AC power off value;

➤ **Controlling orders**

- module switch on/off, temperature compensation on/off, stand-by relay on/off and manual equalizing charge



3.2 Control

Monitoring module can send signal based on data detected or the controlling orders of the host.

- Modify the output voltage: Modify equalize/float charge voltage via background software, work out the system output voltage according to status of system equalize/float charge.
- Battery management
 - Battery low voltage System background output and dry contact alarms when output voltage is under specified LV.
 - LVD1 Under system condition of battery discharge, when the output voltage under specified 1st power-off voltage, the battery DC contactor cut off and closes all loads. Break off the connection between battery and system, the whole system doesn't act until the re-power on.
- **Battery equalizing/float charge management**
 - When the battery charge current is greater than specified battery upper charge current, the system implements constant current equalizing charge to battery. When the constant current equalizing charge reaches equalizing charge voltage, the system acts constant voltage equalizing charge. The current float charges when the constant voltage equalizing charge current under current shifting from equalizing charge to float charge. And automatically alters to equalizing charge while the float current is greater than current shifting from float charge to equalizing charge, which occurs when duration of system equalizing/float charge reaches preset time. If the constant voltage equalizing charge duration exceeds preset time, the system will automatically shift to float charge and the manual equalizing charge shifts to equalizing charge.
- **Temperature compensation**
 - In condition of battery temperature sensor connected and the temperature compensation on, when the battery temperature exceeds 25°C, the system acts temperature compensation otherwise negative compensation while temperature lower than 25°C. The compensation value equalizes temperature value multiplies the coefficient, generally it is not greater than 2V.



3.3 Inspection

NVSM-A can inspect module and DC output of power system.

- (1) Rectifier module—The monitoring module can inspect on/off status of rectifier module, module output voltage, current, fan speed, failure status.
- (2) DC output —Inspect status of bus voltage, load current, battery current/temperature and status of fuse.

3.4 Other functions

NVSM-A can visually indicate part information to user. There are indicating LED and controlling arrangement on controller:

- (1) Alarm indicating LED =Red LED on
- (2) Monitoring module running indicator = green LED flashes

3.5 LCD Operation of Monitoring Module

(1) Operation keys on the monitor

There are only three operation keys on the front panel “UP、Down、OK ”to conduct the menus, functions and the setup of parameters.

- UP ——Page up of the menus: to change the parameters, raise the numerical value.
- OK——translation move (return); to shift to the menu of the same type, or return.
- Down ——Page down of the menus: to change the parameters, lower the numerical value.

(2) Main display unit

a) Main display screen——display the basic information of system after the batteries are connected into the system or immediately after the system starts to run.

System voltage = 53.5V Load current = xxx A
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The output voltage of the system: 53.5V (Preset value before delivery or the value set during latest operation);

Output current for the loads: xxxA.

b) If the interval of operation exceeds 30s, no matter under what kind of operation or display status, the system will return to the main display picture, and the backlight of the display will off and switch to screensaver.

c) Press any key to cancel screensaver and press any key again to enter the corresponding operation procedure.

3) Structures and levels of monitoring menu:



A tree structure with many levels, all the menus will change step by step in a fixed cycle.

4. Installation of VSM-A

The installation is of convenience when monitoring module applies in NVSM-A Firstly push the monitoring module into its slot along the main cabinet until pins inserted into corresponding socket of system bar in the main cabinet. Finally, finish the installation by firmly fixing the screw on the panel to the main cabinet.

5. Operating ambient requirements of NVSM-A

Operation temperature: -30 ~ 55°C

Storage temperature: -40 ~ 70°C

Ambient humidity: 0 ~ 80% (40±2°C)

Atmospheric pressure: 70 ~ 106KPA

Operation voltage: 40 ~ 60VDC

6. Maintenance of VSM-A

(1). Analysis of communication interrupted and maintenance

①Cause of setting: the baud rate or address of monitoring unit doesn't consist with settings of the host

Maintenance: reset the baud rate or address of monitoring unit.

②Monitoring module CPU circuit failure or the 2nd circuit failure of rectifier module

Maintenance: inform the manufacture to make maintenance.

(2). If the data reported (including analog and digital data) turns out to be faulted, or the controlling status doesn't consist with sent orders, or the parameter setting is not according to actual condition, causes of these problem may be as following:

(1) Input signal faults;

(2) Input circuit damaged;

(3) Rectifier failure

Maintenance: inform the manufacture to make maintenance.

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