JB-QB-W01 / W02 / W04 / W08 / W16
Multi-wire Fire Alarm Panel

Installation and Operation Manual

CONTENTS

1 GENERAL

These JB-QB-W01 / W02 / W04 / W08 / W16 multi-wire fire panels are designed to be conventional fire panels developed from microprocessor, which can monitor and control 1, 2, 4, 8, 16 zones fire information respectively. Each zone can be connected with 25 conventional fire detectors. Each W01, W02, W04 panel has 4 external devices control output points, and each W08, W16 has 6 points. Through the points, the panel can control such external devices as sounder strobe, siren, etc. The panel maximum load is 4 sounder outputs and 2 panel state outputs. The panel is designed to have internal standby batteries and space for installation (enough for two sealed acid storage batteries). The panel has test and isolating function, it also has day/night mode. It can indicate such states as normal, fault, fire alarming, short circuit and open circuit states; it also can indicate the position of the detectors which detect the fire.

It is very simple and convenient to install and operate these 5 kinds of panels. All control functions start with a key switch on the keypad, and the programming function starts with the same key switch on the keypad and an internal switch.

These 5 kinds of panels have the same functions and same installation and operation, except for having different monitoring zones and output points. The appearances and structures of W01, W02 and W04 are same, and W08 and W16 are same, respectively.

We are taking the W16 as a sample to introduce the installation and operation of these panels.

2 TECHNICAL SPECIFICATIONS

2.1 Operating Voltage

DC 24V$\pm$15%, AC 220V +10%(-15%), 50Hz

2.2 Storage Batteries

The capacity of the batteries is supplied according to panel type and user's demand. The maximum capacity is 7 Ah (for W08, W16); 4 Ah for W01, W02, W04.

2.3 Output Parameters

Detector operation voltage: DC 20-24V,

Standby current: 2.5 mA (when connected with 25 conventional detectors)

Fire alarming resistor: 150Ω-510Ω (normally 390Ω)

Terminal resistor: 3.6kΩ

Sounder output voltage: DC20-24V,

Sounder output current: 1 A

Sounder terminal resistor: 3.6kΩ

Fire output: Aux. power output, 1A, DC 24V

Fault output: Aux. power output 1A, DC 24V
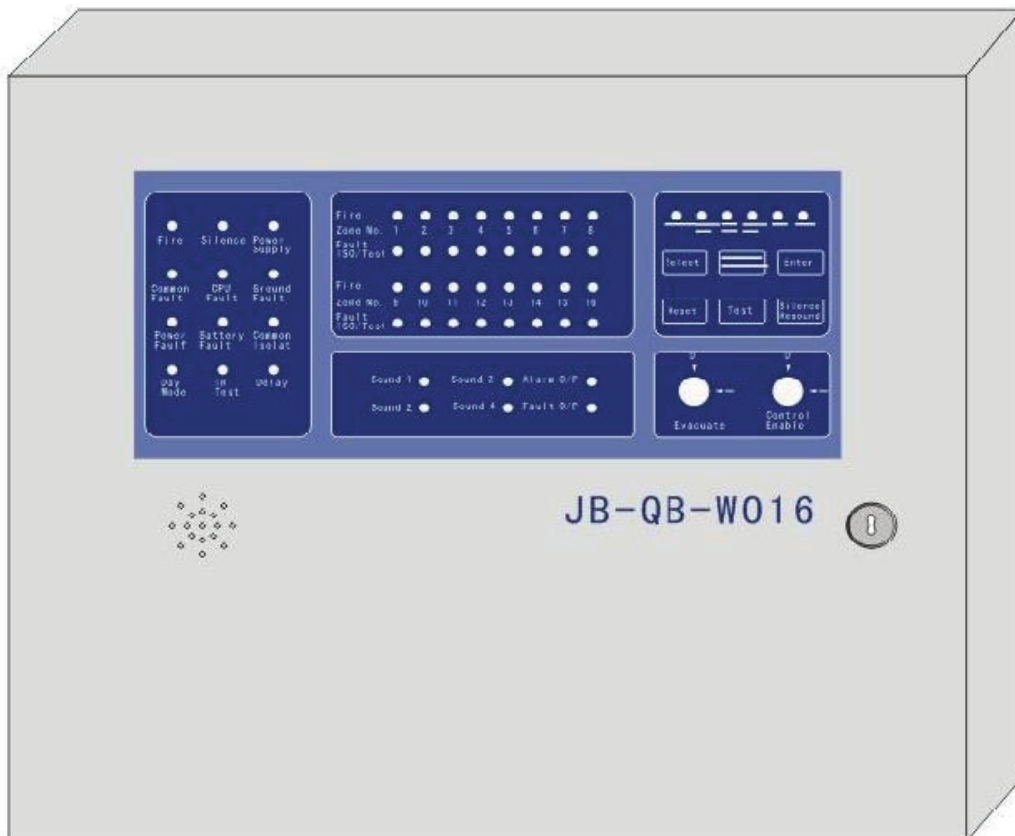
2.4 Dimension

W01,W02, W04:   280mm$\times$320mm$\times$95mm
W08,W16:   380mm$\times$320mm$\times$95mm

3 STRUCTURE

3.1 Appearance

The appearances of W16 show as below:

3.2 The Internal Structure

The W16 internal structure diagram shows as below：
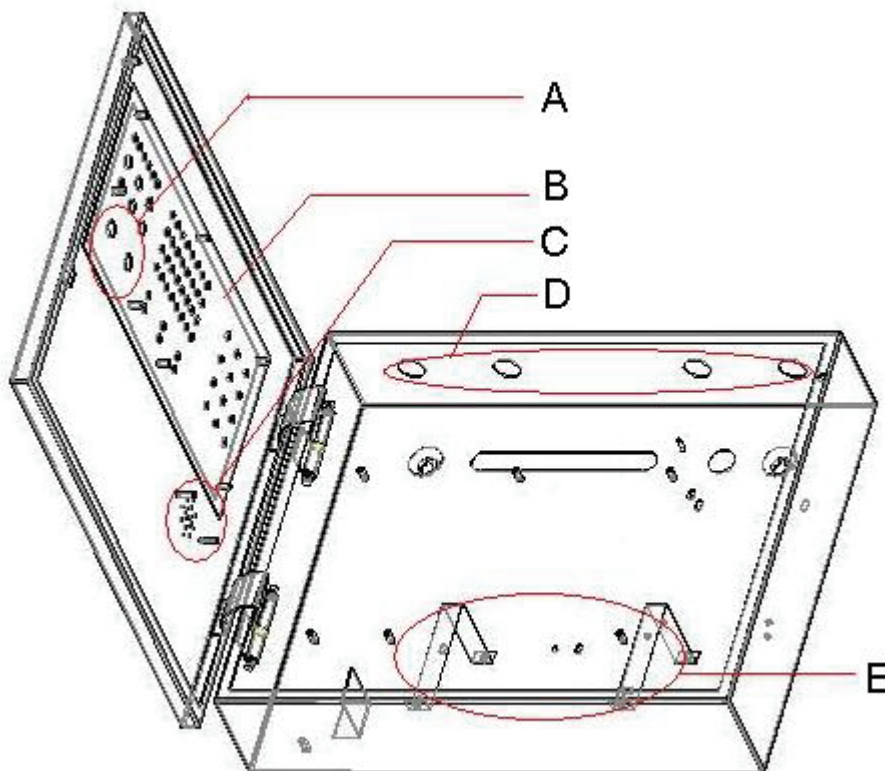
Note1:

    A: Control enable lock

    B: Display board

    C: Buzzer

    D: Leads holes

    E: Batteries clamps

Note2:

    The panel should be wall mounted 0y be put uprightly. Don't be put flatly. When the panel is put flatly, there is some mechanical noise when we open the panel cover.

3.3 The Function Board Diagram
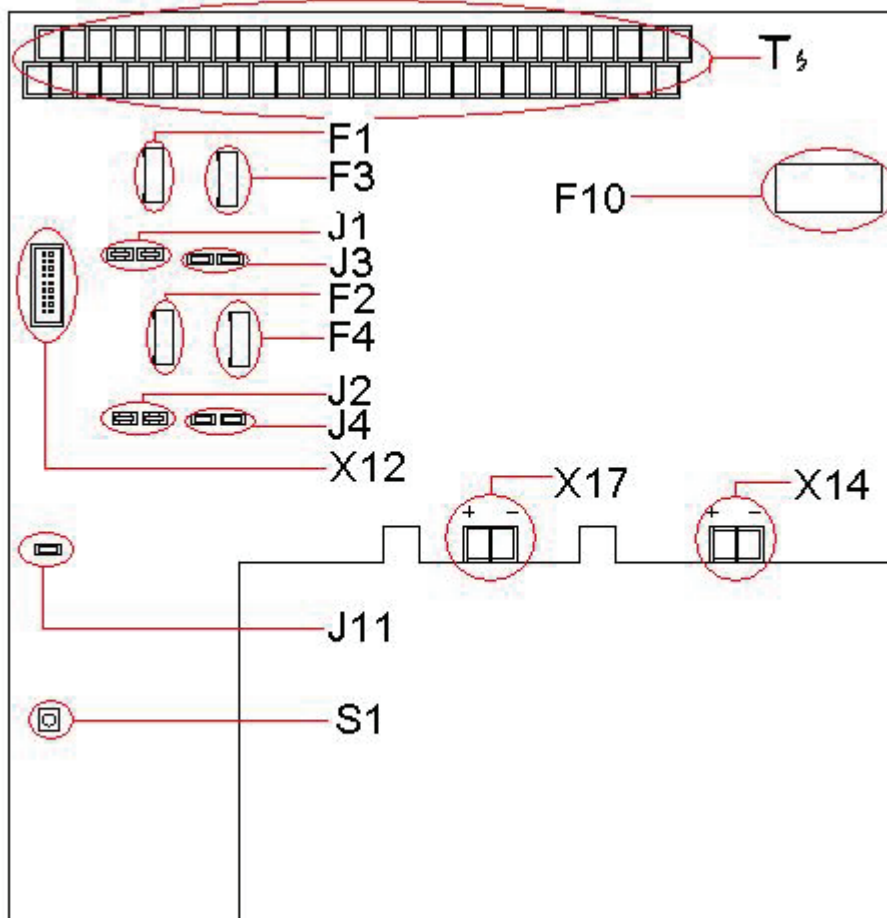
Note:

Ts: Terminals;	**F1:** Fuse 1, 1A
F2: Fuse 2, 1A	**F3:** Fuse 3, 1A
F4: Fuse 4, 1A	**F10:** Fuse 10, 2A
J1: Jumper 1	**J2:** Jumper 2
J3: Jumper 3	**J4:** Jumper 4
J11: Jumper 11	

X12: Terminal 12, it is connected to display board terminal;

X14: Terminal 14, it is connected to power terminal;

X17: Terminal 17, it is connected to storage battery terminal;

S1: Button 1, start storage battery with S1.

3.4 Terminals
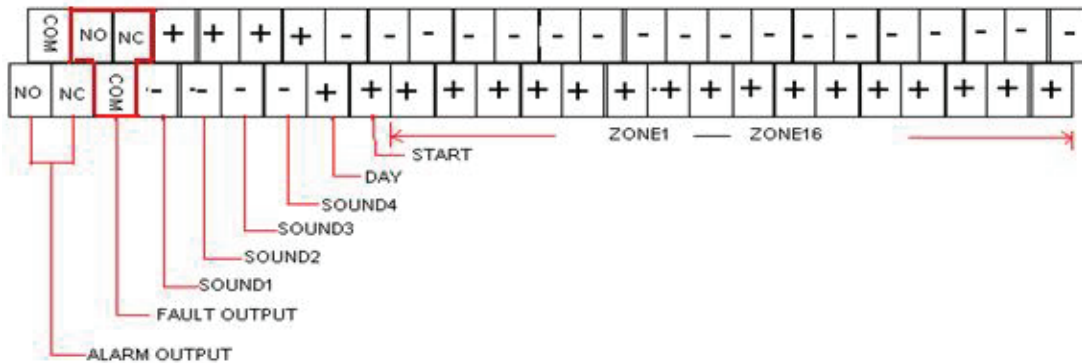
Note:

FIRE OUTPUT (NO, COM, NC): fire output terminals

FAULT OUTPUT (NO, COM, NC): fault output terminals

SOUND1 (+,-): terminal to external sounder1

SOUND2 (+,-): terminal to external sounder2

SOUND3 (+,-): terminal to external sounder 3

SOUND4 (+,-): terminal to external sounder4

DAY (+,-): the switching day/night mode terminal

START (+，-): the terminal which used to start sounder

ZONE (1~16): zone inputting terminals

3.5 Keypad Introduction

3.5.1 General Panel State LEDs

The general panel state LEDs are on the left of the keypad. The LEDs is introduced as below.

Fire: General fire alarm indicating LED (red). Constantly light until the fire alarm is cleared.

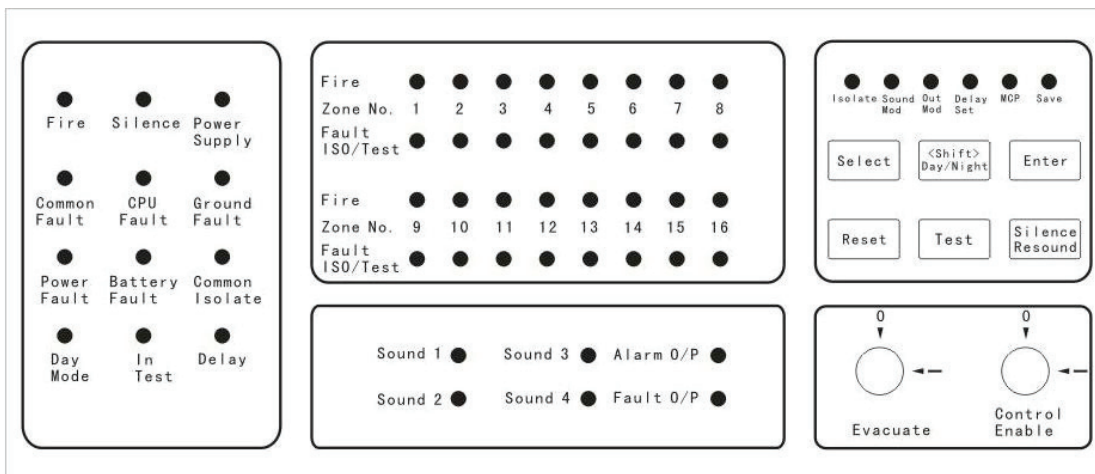**Silence**: Silencing indicating LED (yellow). It lights when the internal buzzer or sounder is muted.

Power Supply: Power supply indicating LED (green), it lights when the power supply.

Common Fault: Fault indication LED (yellow). It will light when any fault occurs.

C.P.U Fault: CPU fault indication LED (yellow). It will light when CPU fault occurs.

Ground Fault: Ground fault indication LED (yellow). It will light when Ground fault occurs.

Battery Fault: Battery fault indication LED (yellow). It will light when battery fault occurs.

Common Isolate: Genera Isolate indication LED (yellow). It will light when any isolation occurs.

Delay: Delay indication LED (yellow). It will light when any output is set to delay.

In Test: Test indication LED (yellow). It will light when the panel is in the test state.

Day Mode: Day Mode indication LED (yellow). It will light when the panel is in the day mode.

C.P.U Fault: CPU fault indication LED (yellow). It will light when CPU fault occurs.

3.5.2 The Zone State Indication LED

There 16 zone fire alarm LEDs and 16 zone fault/isolate/test LEDs in the centre of the keypad.
Fire: Red LED, there are 16 zone fire indicating LED, from Zone No 1 to Zone No 16. The zone fire LED will
 flash when the fire alarm occurs in corresponding Zone. It will light after the Silence key is pressed.
Zone Fault/ SIO/Test: Yellow LED, there are 16 LEDs, from Zone No 1 to Zone No 16. The special zone LED
 will flash when any fault occurs in corresponding Zone. It will light when corresponding zone is isolated.

3.5.3 Operation State Indicating LEDs and Operation Buttons

There are 6 operation state indicating LEDs and 6 operation buttons on the right of the keypad. The operation state indicating LEDs are:

Isolate: Green LED, it will light when we set zone isolation state.

Sound Mod: Green LED, it will light when we set sound mode.

Out Mod: Green LED, it will light when we set output mode.

Delay Mod: Green LED, it will light when we set delay mode.

MCP: Green LED, it will light when we set manual alarming mode.

Save: Green LED, it will light when we press the Save key to complete and save the operation.

 The buttons are:

Select: the button is used to select and set the panel state.

Shift: the button is used to change the panel set state.

Enter: the button is used to confirm operation.

Reset: the button is used to cancel or reset operation.

Silence: the button is used to change the internal buzzer state: silence or non-silence.

Test: the button is used to check the panel.

3.5.4 Output State Indicating LEDs

The panel has 6 output indicating LEDs.

Sound 1: Yellow LED, it will light when sounder strobe 1 has output; it will flash when sounder strobe 1 fault
 occurs.

Sound 2: Yellow LED, it will light when sounder strobe 2 has output; it will flash when sounder strobe 2 fault occurs.

Sound 3: Yellow LED, it will light when sounder strobe 3 has output; it will flash when sounder strobe 3 fault occurs.

Sound 4: Yellow LED, it will light when sounder strobe 4 has output; it will flash when sounder strobe 4 fault occurs.

Alarm O/P: Yellow LED, it will light when there is alarming output; it will flash when the alarming output is isolated.

Fault O/P: Yellow LED, it will light when there is fault output; it will flash when the fault output is isolated.

3.6 The Panel States

3.6.1 The Different Zone States

The panel zone states have 4 kinds.

Alarm state: corresponding zone fire LED flash (0.5m/0.5m) when fire is detected in any zone, it will constantly light after the silence key is pressed. The general "Fire" LED also light at the same time.

Fault state: corresponding zone fault LED flash (0.5m/0.5m) when fault occurs in any zone. The "Common Fault" LED also light at the same time.

Isolation state: corresponding zone fault LED light when any zone is isolated. The "Common Isolate" LED light too, at the same time.

Normal state: the zone fire and fault indicating LEDs go out.

3.6.2 The Different Output State

The panel has 4 kinds of output states.

Output state: corresponding output indicating LED lights.

Output Fault state: corresponding output indicating LED flashes, the "Common Fault" LED lights at same time.

Output Isolation state: corresponding output indicating LED flashes, the "Common Isolate" LED lights at same time.

Normal state: there is none of output LEDs bright.

3.6.3 The Internal Buzzer Setting

Internal buzzer vocalizes according to sound priority.
     Alarm = level 0;
     Fault = level 1;
     Isolation and test = level 2;
     Normal = level 3

Alarm or manual control external sounder: 0.25s on VS 0.25s off

Fault: 0.5s on VS 4.5s off

Silence: 1.5s on VS 9.5s off

3.6.4 Operation Illustration

A. Operation enabled at low level is enabled at higher operation level.

B. In Keypad operation mode, when the operation level is changed or no key is pressed for more than 1 minute,

the panel will cancel all keypad operation and return to the normal monitoring state.

C. The conditions of certain zone output which can be delayed are as below.

The zone is set to be delay output mode;

The panel is in the day mode;

The delay zone has no manual button;

There are no fire alarms in the other zones;

Note: When the zone is in delay mode and there are some fire alarms in other zones, the delay mode will be canceled and the panel outputs immediately.

D. When the memory faults occur, all parameters should be re-set again.

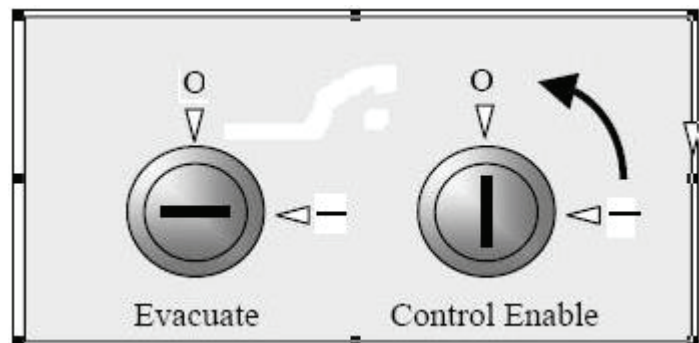First, all parameters are set to be defaults.

Then, re-set zone configures.

In the end, press the save key to complete and save the sets.

3.7 System Setting

3.7.1 Operation Level Setting

The panel operation shows as below.

When the "Control Enable" lock points to "O", the panel is in the operation level 1 (The internal switch S1 of display Board is OFF).

When the "Control Enable" lock points to "__", the panel is in the operation level 2 (The internal switch S1 of display Board is OFF).
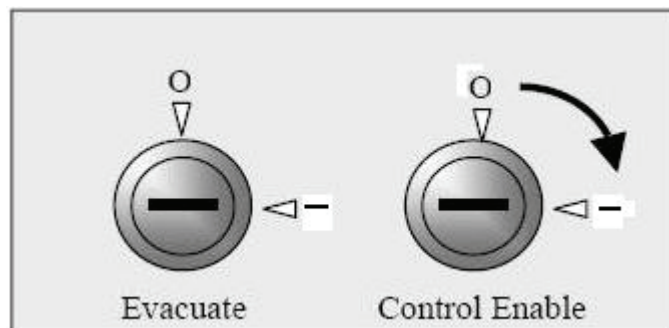
When the "Control Enable" lock points to "__" and the internal switch S1 of the display board is ON, the panel is in the operation level 3.

3.7.2 Relay Output Setting

There are 3 kinds of output modes to 4 sounder strobes outputs and fire alarming relay outputs: active output,

normally open contact output and normally closed contact output.

Sample 1: To set sounder 1 as active output, plug in fuse F1, connect the 5th and 6th, 2nd and 3rd of jumper X1 by short loop.

Sample 2: To set sounder 1 as normally open contact output, remove fuse F1, connect the 1st and 2nd, 4th and 5th of jumper X1 by short loop.

Sample 3: To set sounder 1 as normally closed contact output, remove fuse F1, connect the 1st and 2nd, 3rd and 4th of jumper X1 by short loop.

How to set 4 sounder strobes outputs and fire alarming relay outputs? The operation details are shown as below table.

output	Normally closed contact output		Normally open contact output		Active output	
	Removed fuse	Jumper	Removed fuse	Jumper	Removed fuse	Jumper
Sounder 1	F1	J1/3&4, 1&2	F1	J1/5&4, 1&2		J1/5&6, 2&3
Sounder 2	F2	J2/3&4, 1&2	F2	J2/5&4, 1&2		J2/5&6, 2&3
Sounder 3	F3	J3/3&4, 1&2	F3	J3/5&4, 1&2		J3/5&6, 2&3
Sounder 4	F4	J4/3&4, 1&2	F4	J4/5&4, 1&2		J4/5&6, 2&3

4 OPERATION

4.1 Isolation Setting

A. Isolation setting is valid for the fire alarming outputs, fault outputs and 16 detecting zones.

B. Rotate the "Control Enable" lock to "＿" →→→ push the internal switch S1 to ON →→→ press the "Select" button to let the "Isolate" LED flash →→→ Press the "Enter", the "Isolate" LED lights constantly and the panel enters isolation set mode.

C. Press "Select" to select the zone or output which you want to isolate, the corresponding zone fire LED indicates it is selected.

D. Press "Shift" to change selected zone isolation state. The corresponding zone fault LED is used to shows the isolation state: ON = isolation; OFF = non-isolation.

E. Press "Enter" to complete operation →→→ Press "Save" to save operation, the "Save" LED will light for 1 second to show and confirm save operation.

F. Press "Reset" to exit current operation**.**

Note: When change the alarm output or fault output isolation state, the "Alarm O/P" LED or "Fault O/P" LED is used to indicate corresponding alarm or fault output isolation state.
The default of panel is non isolation.

4.2 Manual Alarm Setting

Manual alarm setting is valid for 16 fire detecting zones.

A. Rotate the "Control Enable" lock to "＿" →→→ push the internal switch S1 to ON →→→ press the

"Select" button to let the "MCP" LED flash →→→ Press the "Enter", the "MCP" LED lights constantly and the panel enters manual set mode.

B. Press "Select" again to select the zone which you want to manually operate, the corresponding zone fire LED indicates it is selected.

C. Press "Shift" to change selected zone operation state. The corresponding zone fault LED is used to shows the operation state: ON = manual; OFF = non-manual.

D. Press "Enter" to complete operation →→→ Press "SAVE" to save operation, the Save LED will light for 1 second to show and confirm save operation.

E. Press "Reset" to exit current operation

Note: The default of panel is non MCP.

4.3 Sound Mode Setting

Sound mode setting is valid for 4 sounders outputs of 16 detecting zones.

A. Rotate the "Control Enable" lock to "__" →→→ push the internal switch S1 to ON →→→ press the "Select" button to let the "SOUND MOD" LED flash →→→ Press the "Enter", the "SOUND MOD" LED lights constantly and the panel enters sound set mode.

B. Press "Select" again to select the zone which you want to change sound mode, the corresponding zone Fire LED and corresponding "Sound" LED lighting indicates it is selected.

C. Press TEST button to select different sounder, different Sound LED will light.

D. Press "Shift" to change selected zone sound mode. The corresponding zone Fault LED flashing number indicates zone sound mode.
　　Flashing one time means sound mode No 1;
　　Flashing two times mean sound mode No 2;
　　Flashing three times mean sound mode No 3.

E. Press "Enter" to complete operation →→→ Press "SAVE" to save operation, the Save LED will light for 1 second to show and confirm save operation.

F. Press "Reset" to exit current operation

Note 1: The default of panel is sound mode No 3, namely continuance sound output.
Note 2: The three kinds of sound modes are as below:
　　Sound mode No 1: The fault LED flashes one time with 1 second interval;
　　Sound mode No 2: The fault LED flash two times with 1 second interval;
　　Sound mode No 3: The fault LED flash three times with 1 second interval.
Note 3: The means of three kinds of sound modes are as below:
　　Sound mode No 1: no sound output;
　　Sound mode No 2: interval sound output;
　　Sound mode No 3: continuance sound output.

4.4 Delay Mode Setting

Delay mode setting is valid for 4 sound outputs, fire alarm output and faults output of 16 detecting zones.

A. Rotate the "Control Enable" lock to "__" →→→ push the internal switch S1 to ON →→→ press the "Select" button to let the "DELAY MOD" LED flash →→→ Press the "Enter", the "DELAY MOD" LED

lights constantly and the panel enters delay set mode.

B. Press "Select" again to select the zone which you want to change, the corresponding zone fire LED flashing indicates it is selected and corresponding Fault LED flashing number indicates delay mode.

C. Press TEST button to select different sounder, different Sound LED will light.

D. Press "Shift" to change selected zone delay mode. Corresponding zone Fault LED Flashing one time means delay mode No 1; flashing two times mean delay mode No 2; flashing three times mean delay mode No 3.

E. Press "Enter" to complete operation →→→ Press "SAVE" to save operation, the Save LED will light for 1 second to show and confirm save operation.

F. Press "Reset" to exit current operation

    Note 1: The default of panel is non delay output.
    Note 2: The three kinds of delay modes are as below:
      Delay mode No 1: The fault LED flashes one time with 2 second interval;
      Delay mode No 2: The fault LED flash two times with 2 second intervals;
      Delay mode No 3: The fault LED flash three times with 2 second intervals.
    Note 3: The means of three kinds of delay modes are as below:
      Delay mode No 1: no output;
      Delay mode No 2: no delay output;
      Delay mode No 3: delay output.

4.5 Delay Setting

Delay setting is valid for 4 outputs, fire alarm outputs and faults outputs.

A. Rotate the "Control Enable" lock to "__" →→→ push the internal switch S1 to ON →→→ press the "Select" button to let the "DELAY SET" LED flash →→→ Press the "Enter", the "DELAY SET" LED lights constantly and the panel enters delay set mode.

B. Press "Shift" to select SOUND1, SOUND2, SOUND3, SOUND4, ALARM, or FAULT. The selected LED lights constantly and the DELAY light flashes to indicate the delay time.
The delay time = N×10 seconds. N = flash times.

C. TEST button is used to add flash time; the SILENCE button is used to minus flash time.

D. Press "Enter" to complete operation →→→ Press "SAVE" to save operation, the Save LED will light for 1 second to show and confirm save operation.

E. Press "Reset" to exit current operation.

    Note: The default of panel is flashing 3 times, namely delay 30 seconds output.

5 THE BASIC OPERATION

5.1 The Fault and Fire Alarm Arrangement

The operation about the sound of fault and fire alarm is in the operation level 1.

A. In the fault state, the Common Fault LED and corresponding zone Fault LED lights, press "Silence" button to let the internal buzzer be in mute state.

B. In the fire alarm state, the Common Fire LED lights, the corresponding zone Fire LED flashes, and at the same time, the panel will control the outputs of external sounder and fire by the programmed mode.

C. If press "Silence" button to let the internal buzzer be in mute state, the corresponding zone flashing fire alarm LED changes to be constant bright.

D. If the external sounder alarms, we can rotate the "EVACUATE" lock from "--" to "O" to close the sounder.

5.2   Self-check and Fire Alarm Clearance

Self-check and fire alarm clearance operation is in the operation level 2.

Press "TEST" button to check the sound and LEDs of panel.

Press "RESET" button to clear fire alarm state of the panel.

5.3   Day/night Work Mode Change

Day/night working mode is related to the delay output. There are two kinds of operations to be used to change Day/night working mode.

A. Shorting the DAYMODE input terminals could enforce the panel to be in the day working mode.

B. Press "shift" button to change mode in the operation level 2. If we select the day mode, the DAY MODE LED will light.

   Note: If the panel works in the day mode for over 18 hours, it will become the night mode automatically. At the same time, the "DAY MODE" LED goes out.

5.4   Control of External Sounders

As in diagram below, when the "Evacuate" lock is from "O" to "__", the 4 external sounders are activated.
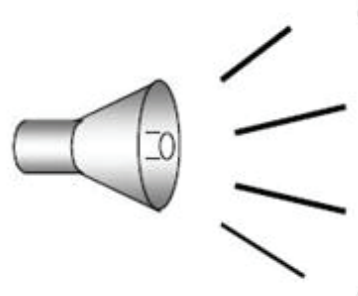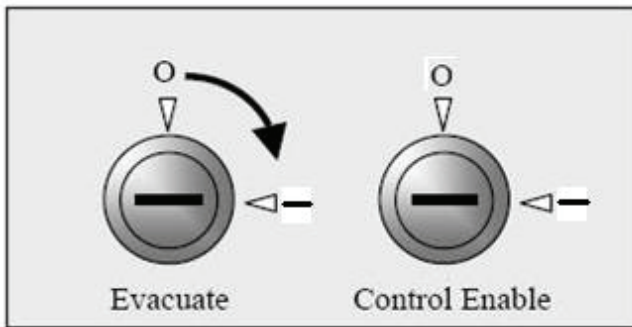
As in diagram below, when the "Evacuate" lock is from "__" to "O", the 4 external sounders are non-activated.
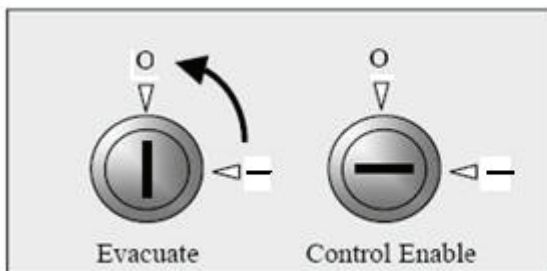
5.5 The Fault Test of Connecting To Ground

If we want to test the function of the fault of connecting to ground, we can short the Jumper 11 with the short loop.

5.6 The Wiring of detectors, MCP (Manual Call Points), and Other Output Devices

The specification of wires allowed for the terminals is cross section within 0.5 mm^2 ~ 2.5 mm^2. Taking the electromagnetic compatibility into consideration, the shield cable is best to be used in the system wiring. Keep the shield cover reliable 360° contact with the chassis when installing.

Each zone can be connected with 25 pieces conventional fire detectors and infinite manual call points. There are two methods of connection.

A. In the loop, connect all the manual call points in front of the detectors, and connect a 3.6K Ω resistor at the end of the loop.
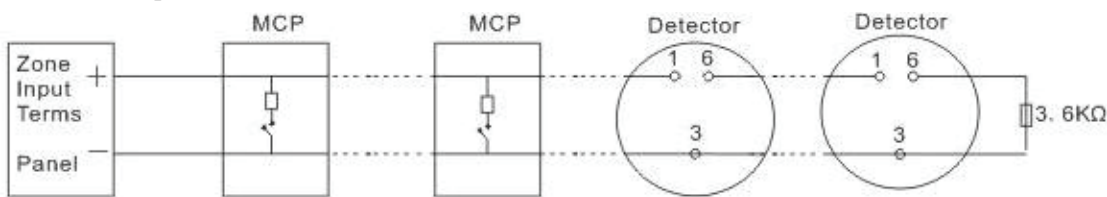
Note: The resistor of MCP is 330 Ω .

B. The wiring of output devices, the connected sounders or remote devices should have polarity and be connected to the circuit according to the terminals polarity. At the end of loop, a 3.6 K Ω resistor is connected in parallel.

5.7 The Typical Wiring Diagram
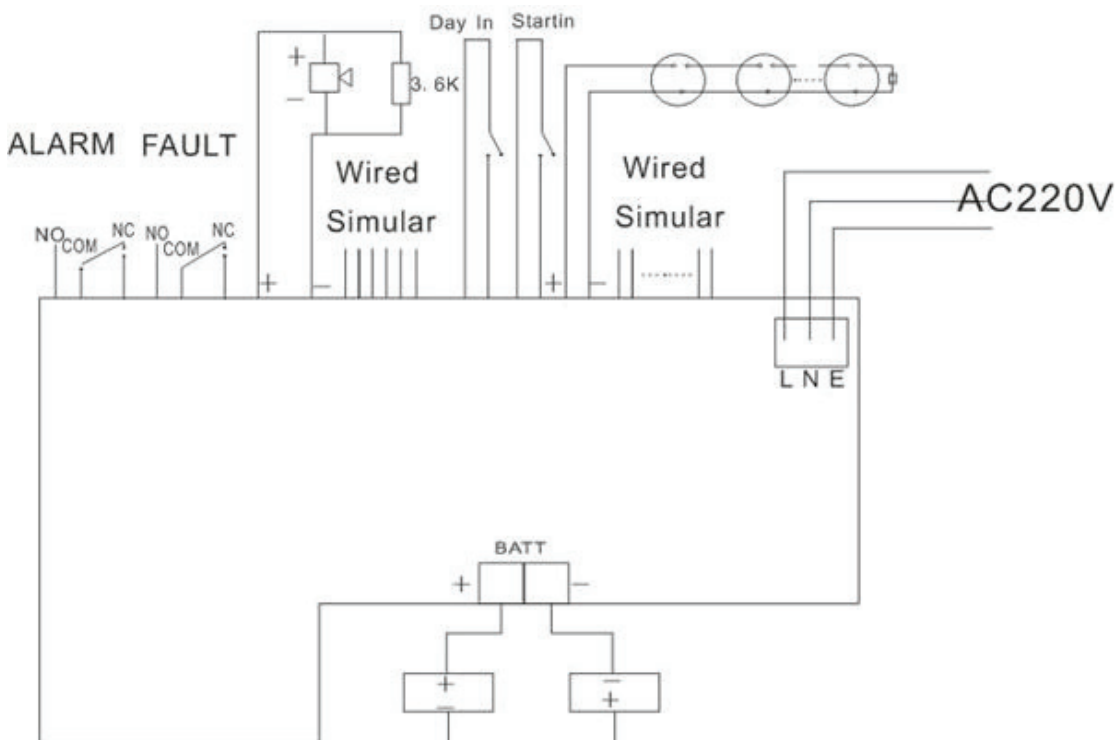
ALARM OUTPUT: alarm output terminals;

FAULT OUTPUT: fault output terminals;

SOUNDER OUTPUT: sounder output terminals;

BATT: storage batteries terminals.

5.8   Calculation of Storage Battery Capacity

1. Battery voltage: 24V
2. power supply

PUS capacity	Maximum current of output loop	Capacity of internal batteries
2.0 A	1.0 A	7 Ah

The storage batteries work in normal monitoring state, the current I1 = 0.13 A.

The alarming current (I2) of storage batteries:

Current of batteries	Quantity （alarming zone）	current	Total current	Note
Input loop	N	0.044	0.044*n	25 pcs detectors/every zone
Output loop			1A	
Output of Aux power				

Suppose C = Min capacity required; T = time of monitoring work of batteries (hours); I1 = current of panel monitoring; I2 = total current of panel alarming.

Then the battery capacity can be calculated by the below formula:

$$C = 1.25 [(I1 \times T) + I1 + I2] \text{ Ah}$$

6 TROUBLESHOOTING

Fault	Cause and Disposal
ALL LEDs are dark after power up	If no +24V and no +5V output, Check and replace the fuse F10. If want the batteries to supply, press S1 to start batteries.
Wrong judgment of zone state or output test state	Check the wiring of zones or output circuits to confirm if there is short or cut circuit.
memory faults	Re-set zone configures. Press the save key to complete and save the sets.