Operating Manual

For

AH-02412

HORING LIH INDUSTRICAL CO., LTD.

CONTENTS

- INTRODUCTION

Due to the creativity and progress of fire fighting technology among highly developed countries, we never give up any chance to upgrade our new generation fire alarm control panel. We are not only pursuing higher technology level, but also compact design to meet national quality standard.

- CHARACTERISTICS

This digital control panel primary uses processor to handle relevant signal, which improve most weak points of traditional control panel. See below for more details.

(1) The use of microprocessor has improved the unit's correctness that used to be affected by bad characteristic of traditional devices.

(2) Uses digital mode to transmit and control signal process, which highly increase the precision of signal.

(3) Internal control voltage uses 5V that prevent burning circuit caused by traditional high voltage.

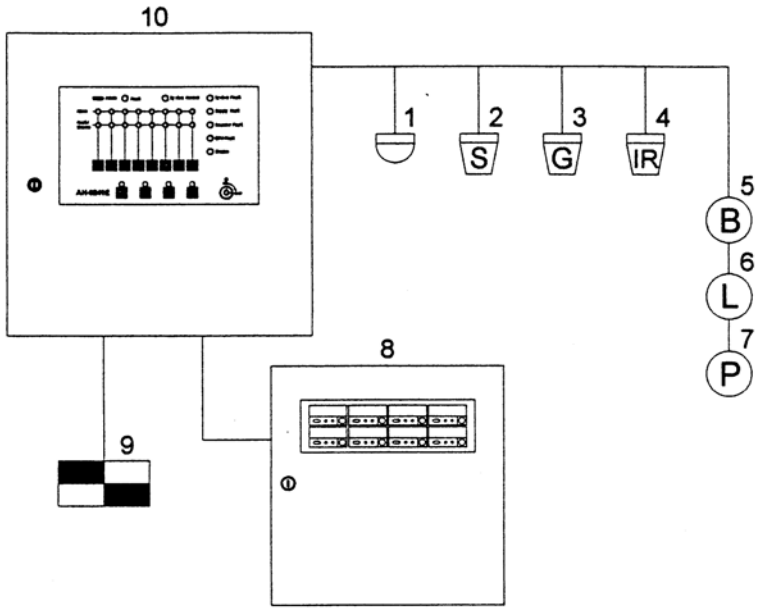
(4) Module type design simplified entire system, function up-grade just has to change related module and no need big work to complete it. Thus, users are able to save big bucks on up-grade or repair cost.

(5) Microprocessor can be revised according to user's request, its expand ability has much greater than traditional ones.

(6) Shortage of terminal has not seen on this unit, up to four sets of signal transfer contacts (relay outputs) are added for new design.

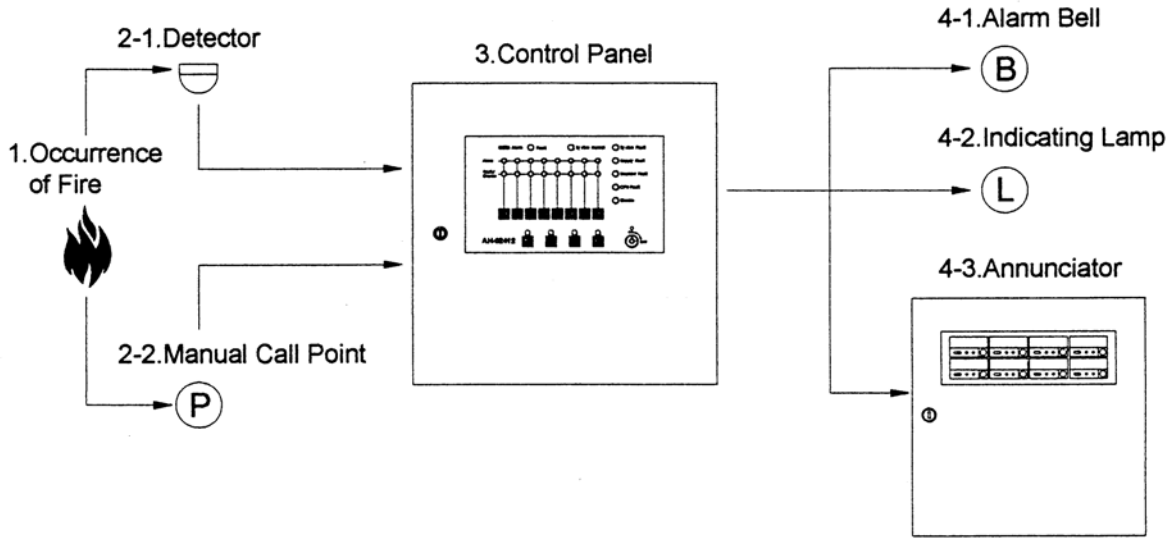
(7) Zone isolating button and control board switches are electronic-type and used digital 0 and 1 signals for switch control signal. Also they will not damaged by abnormal high voltage because of undirected control high voltage and interfered by dust, this phenomenon usually happened on mechanical-type switch.

FIRE ALARM SYSTEM ASSEMBL DIAGRAM



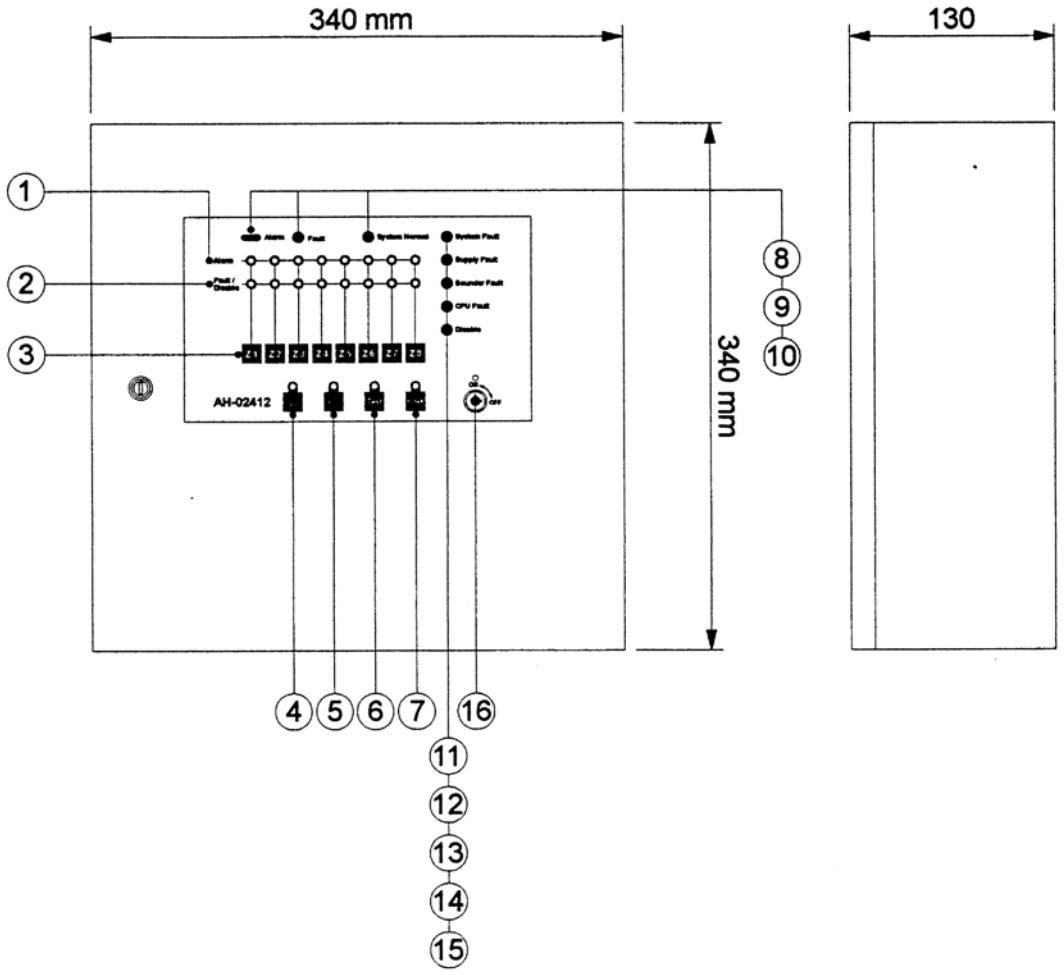
1.Heat Detector
2.Smoke Detector
3.Gas Detector
4.Flame Detector
5.Alarm Bell
6.Indicating Lamp
7.Manual Call Point
8.Annunciator
9.Extinguishing Device
10.Control Panel

FIRE ALARM SIGNAL FLOW CHART



PANEL DESCRIPTIPN

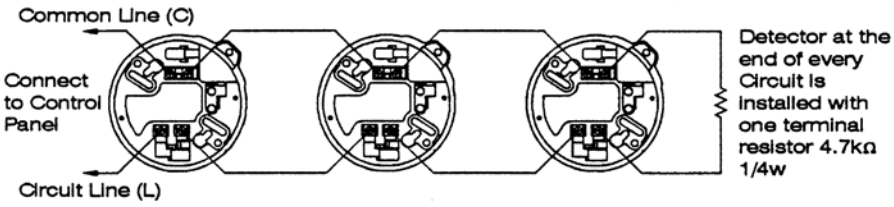
Dimensions and Specifications

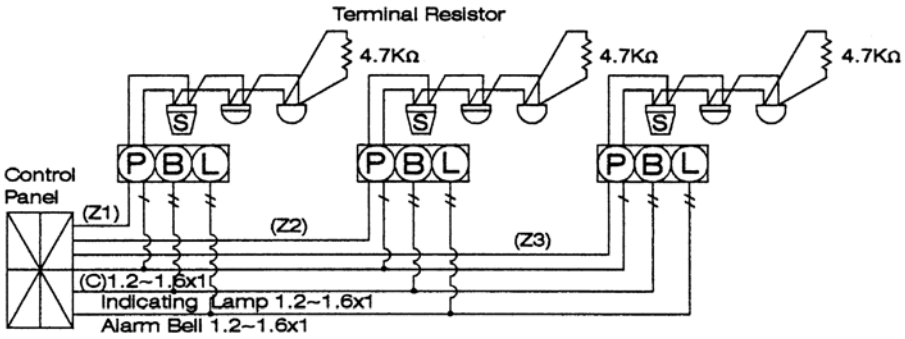


Description :

1.Zone Alarm LED
2.Zone Fault/Disable LED
3.Zone Disable
4.Silence Sounders
5.Mute Internal Buzzer
6.Lamp Test
7.Reset
8.Fire Alarm LED
9.Fault LED
10.System Nomal LED
11.System Fault LED
12.Supply Fault LED
13.Sounder Fault LED
14.CPU Fault LED
15.Disable LED
16.Key Switch

STANDARD DETECTOR WIRING METHOD



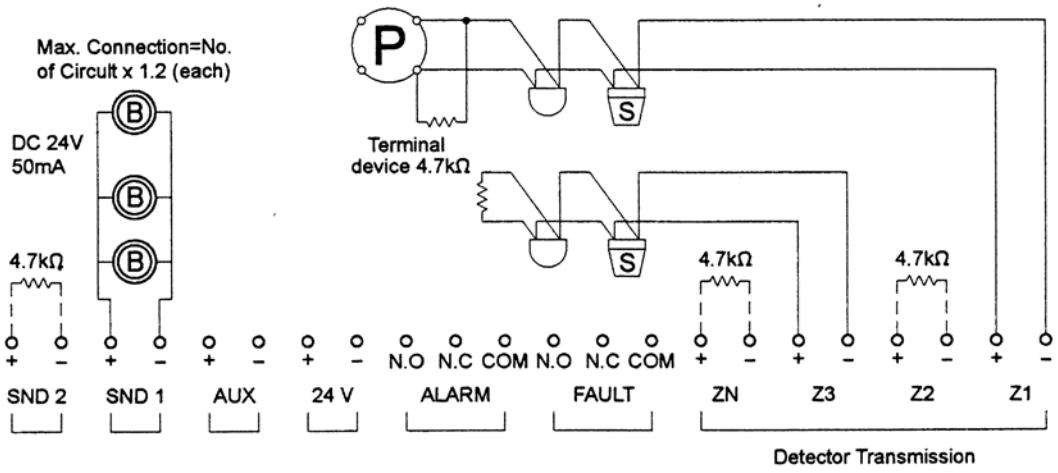


(L) Diameter of Circuit line shall be 1.0~1.2mm.
(C) Common line 1.2~1.6mm. Limited to seven Circuit lines per wire (according to regulation).

SYMBOLS

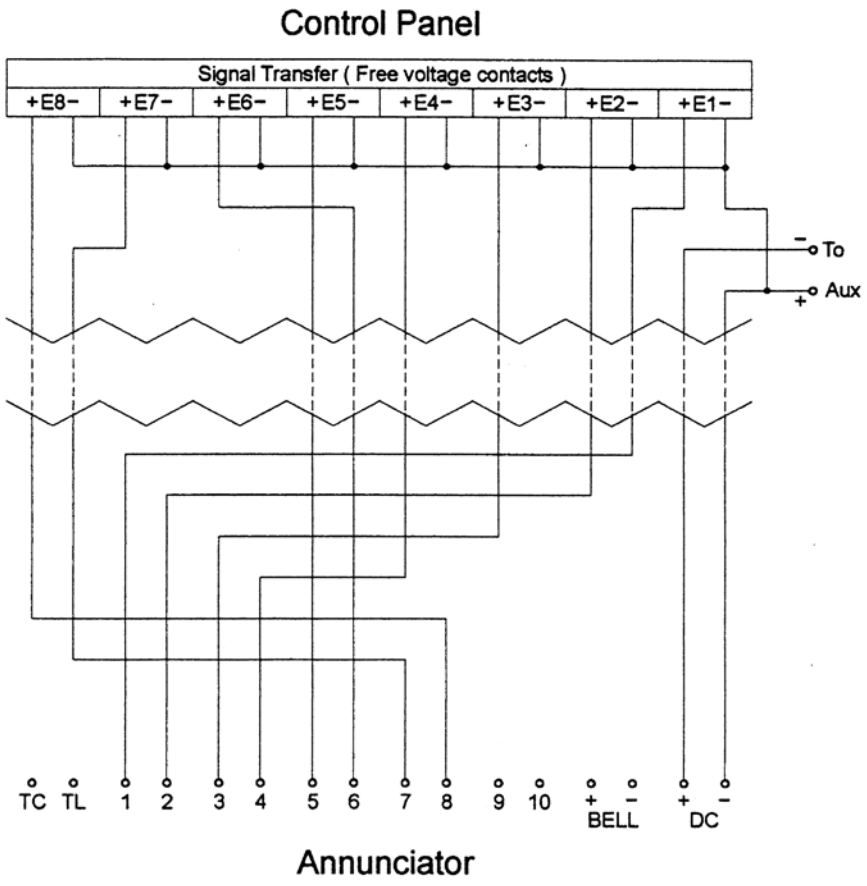
Control Panel	Rate of Rise Detector	Fixed Temp. Detector	Smoke Detector	Combination P. B. L. Box		
					(P)	Manual Call Point
					(B)	Alarm Bell
					(L)	Indicating Lamp

METHOD Of WIRING



Signal Transfer (Free Voltage Contacts)							
+E8−	+E7−	+E6−	+E5−	+E4−	+E3−	+E2−	+E1−

METHOD Of WIRING
Panel to Annunciator



WIRING PRINCIPLE

(1) Wiring Material Table (longer distance excluded; please refer to your local regulation)

Item	Specification	Quantity	Remarks
Detector Zone	1.0 ~ 1.2M/M	N	Depends on zone device, basically 1/zone.
Zone Common Line	1.2 ~ 1.6M/M	N	No more than 7 zones per common line.
Alarm Bell	1.2 ~ 1.6M/M	2	
Fire Indicating Lamp	1.2 ~ 1.6M/M	2	
Manual Call Point	1.0 ~ 1.2M/M		Parallel connect with detectors.
Earth	1.0 ~ 1.6M/M	1	
AC Power	1.2 ~ 2.0M/M	2	Dependents on panel's load.

(2) Wire Connection Box

In order to facilitate inspection, maintenance and repair, every floor or appropriate area should install a Wire Connection Box in which connecting joints are provided. The Box case shall be waterproof and the wording 'Fire Fighting Only' should labeled on an aluminum plate.

(3) Wire-Point Labels and Joint Clips

Inside the Control Panel and every Wire Connection Box, the wire points are to be attached to Label Covers or Label Stickers and then connected to the Y-clip.

(4) Wiring Method

Please refer to Page 4 ~ 6 of this handbook for the wiring of safety equipment.

(5) Terminal Resistor Connecting Method

Every end of a Detector zone shall be fitted with a resistor (not more than one).

(6) Wiring Record

Once the external wiring is laid, a record of the detailed external wiring diagram shall be kept for future inspection and repair.

OPERATING INSTRUCTIONS

1. Fire Surveillance

   After installed system devices into the panel, connect with AC supply source and the “System Normal” indicators will lighten up. Fire Indicating Lamp of the combination PBL box light up and surveillance begins.

2. Fire Alarm

   When detector has detected a signal of fire, the Fire “Alarm” Indicator (red) and the related zone indicator will lighten up simultaneously. The Main Bell and Alarm Bell will also sound. The Fire Indicating Lamp of the combination PBL box will blink. These activities indicate that the fire alarm is valid.

   (1) Main Bell Disable

   To stop the Main Bell from sounding, press “Mute Internal Buzzer” button the sounding stop immediately. It will resound when next alarm is issued.

   (2) Alarm Bell Disable (SND1 & SND2)

   To stop the Alarm Bell from sounding, press “Silence Sounder” button the sounding stop immediately. It will resound when next alarm is issued.

3. Reset

   Once the fire alarm is activated, the Fire “Alarm” Indicator and the Zone “Alarm” Indicator will remain lighten. If the control panel requires starting the surveillance again after the previous fire situation has been resolve, just depress the ‘Reset’ button. However, if detectors have been burnt or the MCP press-down not recovered, reset cannot be activated. For this matter, repair should be completed first, then depress the ‘Reset’ button to reset the system.

4. Disconnection Alarm

   The panel is equipped with a ‘Zone Disconnection Auto Indication’ function. Should there be a Circuit Break in certain areas, or detachment of the terminal resistor, the “Fault” indicator and the related Zone “Fault/Disable” indicator will lighten up simultaneously. The internal beeper will sound. Upon repair of the circuit, the mentioned situation above will cease.

5. Disable Disconnection Sound

   To stop the disconnection sound, press “Mute Internal Buzzer” button.

6. Field Fire Alarm Test

Detector Test Method: uses a Tester, place it near detector for a few seconds. Even thought detector has back to normal condition, the fire alarm signal on the control panel will still maintain.

7. Standby Power

The control panel is equipped with automatic rechargeable batteries the stand-by power source (24VDC) shall be installed during operation. When the Main power source has been terminated, the “System Normal” indicator will light off and the “Fault” indicators will light up.

8. The Display Module LCD

The LCD is only comes with model AH-02412L and has a backlight display with 2 rows of 20 characters each. By means of the 12 buttons on right side, it is possible to obtain detailed information for the warning signaled LED’s on the front panel and set up the security code for protection purpose. Input 4-digits security code (xxxx) and then press ACK button to start. Use S/C for displayed heading selection and information clear, the ↑ and ↓ buttons scroll of the manual headings.

9. Consecutive Activation (Alarm & Fault)

The panel has 2 voltage-free contacts for signal transfer. It can be utilized to consecutively activate Hydrant Activating Devices when the Fire Alarm Circuit is being connected.

10. Occurrence of Alarm Signal during Testing

If there is an alarm signal in any Circuit other than those under testing, the test must be end immediately and handle the alarm signal Circuit first.

11. System Fault & Supply Fault:

When there is any problem on AC or Battery (“Supply Fault” indicator), the related “Fault” LED will on and sound. When AC power is too high, “Fault” & “System Fault” indicators will light up. When AC power is too low, “Fault” & “CPU Fault” indicators will light up.

12. Fault & Disconnection Indications

Any fault in the outputs or extinguishing activation as well as disconnection from power supply or any other connection will be indicated separately on the panel.

13. Extinguishing Facility (AH-02412E only)

The extinguishing system will be activated after fire alarm has issued for 0 ~ 60 seconds with adjustable timer (please refer to the logic switch located on main board, single digit on the right and decimal digit on the left) and gas discharge will automatically turned off after 10 seconds or by pushing the “Nac” button. While activated, the LED (Active) on the panel will be ON until the system’s supply power was turned OFF and ON again. When user intends to stop the extinguishing process just press the “Nac” button. The extinguishing facility is only activated when both zone in same area have issued fire alarm.

- INSTALLATION LOCATION

  Please refer to your local regulation for installation details.
- IMPORTANT NOTES ON MAINTENANCE

1. Normal State of Control Panel
   (1) Normal Condition (Fire Surveillance Alert)

   Under normal conditions, the “System Normal” indicator should light up. All other indicators should be OFF for ready status and Fire Indicating Lamp on the Combination PBL Box should light up.

   (2) Power Failure

   When there is a power failure, the “Fault” indicators will light on.
2. Maintenance of Devices
   (1) If maintenance may cause disturbances to public, appropriate co-ordination must be made before.
   (2) Priority should be given to those faulty devices in the area.
   (3) Maintenance should be scheduled at least twice a year and must include both physical and functional inspections.
3. Overall Maintenance

   Annual overall inspection should carry out by the professional institution or the original equipment manufacturer. Inspection records must be tabulated and kept by a responsible person or the department concerned, to ensure the public safety.

(1) Power Supply

Check whether the external wiring of the panel its power consumption are within the safety regulation, whether the standby power conforms to specifications and whether the duration of power supply is within the safety regulation.

(2) Detectors

To perform a site test for the detectors in order to check whether they are functioning properly and also to check the condition of detector's Indicating LED (on the detector's base).

(3) Insulation Test

The insulation between power terminal of control panel and earth shall have a value of 250V 20MΩ and above.

- TROUBLE SHOOTING

The Control Panel is produced with an advanced technology and delicate design that is easy to assemble. It requires no special skills to trouble-shoot a malfunction, thus avoiding any teething problems that might be encountered during maintenance.

1. Malfunction of Zone Indicator & Combination PBL Box

The system devices are assembled with many single units (refer page 2), either the 'Detectors', 'Circuits' or 'Combination PBL Box ' become defective, it will affect the functionality of the Control Panel.

(1) Measure terminal "AC" with a Multi-meter for any voltage.

(2) Check whether the "System Normal" indicator is functioning properly. The system should specify 24V DC.

(3)Check whether fuses are in good condition.

(4)Check whether the external devices and wiring conform to specifications, as stated in this handbook.

2. Function of Fuses

The Control Panel has fuses, each fuse with individual protection function. It must not be replaced with fuses that do not conform to specifications or are of bad quality; otherwise we will not be liable for any damage. Burnt fuses are probably caused by external wiring error, short circuit or faulty external devices.

(1) AC: Fuse for power source AC.
(2) BATT: Fuse for standby power source.
(3) SND1,SND2: Fuse for alarm bell. (Resettable type)
(4) AUX: Fuse for Combination PBL Fire Indicating Lamp. (Resettable type)
(5) DC24V: Fuse for direct current source 24VDC. (Resettable type)

3. Causes of Burnt Fuses & Inspection Guidelines

(1) AC Fuse Burnt
    (A) It could be due to excessive voltage supply that causes the AC Fuse to be burnt.
    (B) Conformance of Specification (lower-rated fuse may be burnt by a surge of current).
(2) BATT Fuse Burnt
    (A) Check whether the standby power polarity '+' and '—' have been in reversed position.
    (B) Similar to inspection guidelines for AC Fuse, the standby power supply will pass through BATT Fuse when power supply from the Main Source has been cut-off.

4. Combination PBL Fire Indicating Lamp & Alarm Bell Malfunction

(1) Remove the external wiring of the Fire Indicating Lamp and Alarm Bell.
(2) Measure the ('+' and '—') outlet of Fire Indicating Lamp with a multi-meter and Check whether it is read DC24V. Then perform a fire test. Reset after it is completed.
(3) Measure the ('+' and '—') outlet of the Alarm Bell with multi-meter. It should not have any voltage supplied. Then perform a fire test and a DC24V voltage should be recorded. Reset after the test.
(4) When the test results conform to (2) and (3), it indicates that the control panel is functioning properly. The wires should only be connected after the external wiring have been repaired.

5. Zone Indicator Malfunction

Based on our experience, most of the Zone Indicator malfunction due to incorrect external wiring. Other factors are mainly due to incorrect handling or incorrect wiring terminal inside the control panel.

6. “Fault” Indicator & “Fault/Disable” Indicator light up

When one or several “Fault/Disable” Indicator and “Fault” Indicator light up simultaneously, it should be regarded as a signal of circuit break. In this instance, inspection and repairs should be carried out in the following manner:

(1) Check for any loops in the control panel not use End-of-line resistor.
(2) Remove the circuit that in trouble; the disconnection signal should immediately go off.
(3) If test results conform to (2), it indicates that the control panel is functioning properly. The wire shall only be connected after the external wiring has been repaired.
(4) Inspect the external circuit to check whether last detector has been installed one End of Line Resistor, or improperly installed.
(5) Check for any break in the external wiring as well as any dislocation of detectors.
(6) Set the multi-meter to Ω mode and measure the malfunction circuit resistance value. The resistance value between the zone line and common line should 4.7kΩ.
(7) After removal of the circuit line, there should not be any voltage between the zone line and zone common line. The wire shall only be connected after the external wiring has been repaired.

7. Zone ”Alarm” Indicator & Fire “Alarm” Indicator light up

When one or more zone “Alarm” indicators and Fire “Alarm” Indicator lighten up simultaneously, it should be regarded as a fire alarm signal. The inspection and repair guidelines are as follows:

(1) Remote the circuit that in trouble. Measure between the loop line and loop common line to check for short circuit or resistance value is normal (normal value=4.7kΩ).
(2) After remote the circuit that in trouble, the control panel must be reset. At this moment, the zone indicator should carry a circuit break signal. After repairing the circuit line, re-connect the external circuit line.
(3) Check for presence of any short circuit of the external wiring, or any defective detectors.

- MAIN SPECIFICATION

Descriptions		Remarks
Power	220VAC 50/60Hz	Others also available
Voltage range	Nominal voltage ± 15%	
Standby power	24VDC 4Ah	
Charging voltage, current	26VDC 100mA ~ 400mA	With auto adjustment function
Loop voltage, current	24VDC; short circuit under 5V 30mA	
Exterior resistance	Round-trip under 50Ω	
# of heat detector connected	Max. 30 per loop	Mechanic type has no limit
# of smoke detector connected	Max. 30 per loop	Horing Lih's products
# of fire indicating lamp connected	# of loop x 1.2	
# of alarm bell connected	# of loop x 1.2	
Digital Switch	500000 cycles Min. reliability	
End of line resistor	4.7KΩ	One per loop
Material	1.2mm steel plate	
Color	Ivory white	Others also available
Accessory functions	Aux. Contacts for signal transfer and computer monitor, MCP contact and phone Jack.	Optional selections