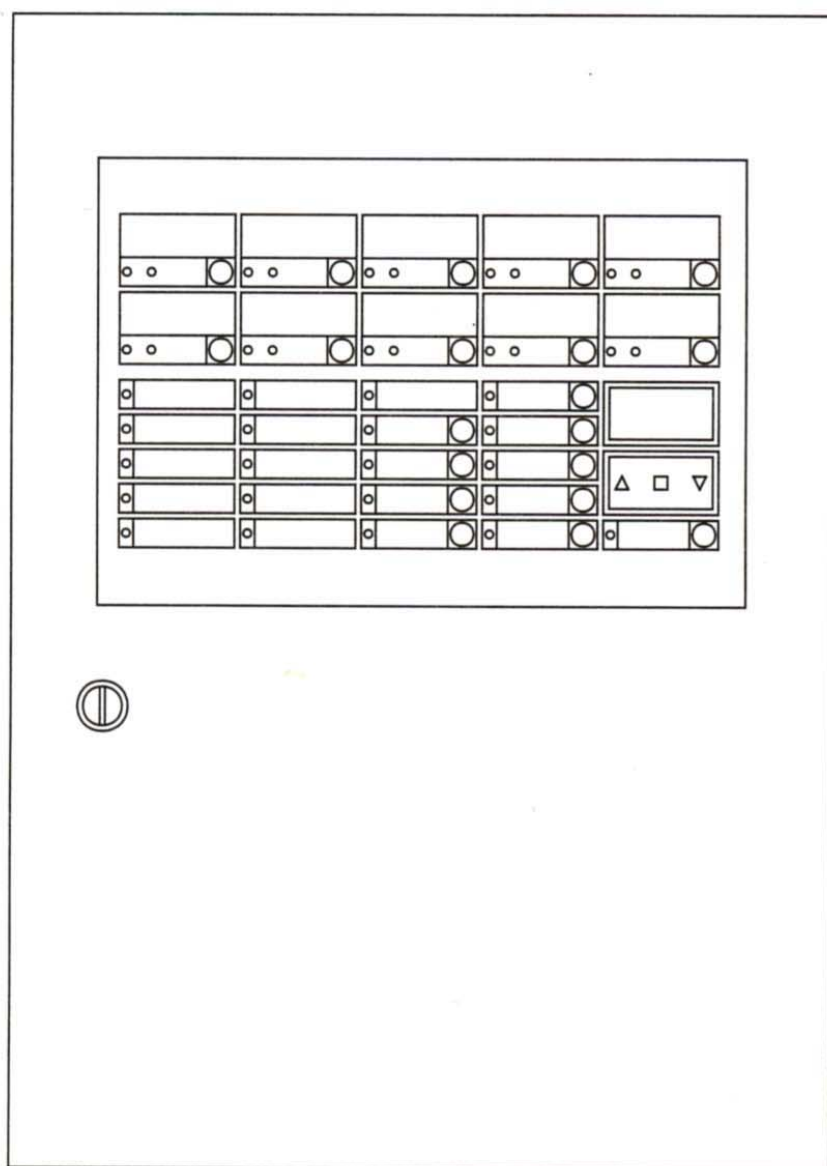


# FIRE ALARM CONTROL PANEL

## OPERATING MANUAL



AH-00212

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- INTRODUCTION

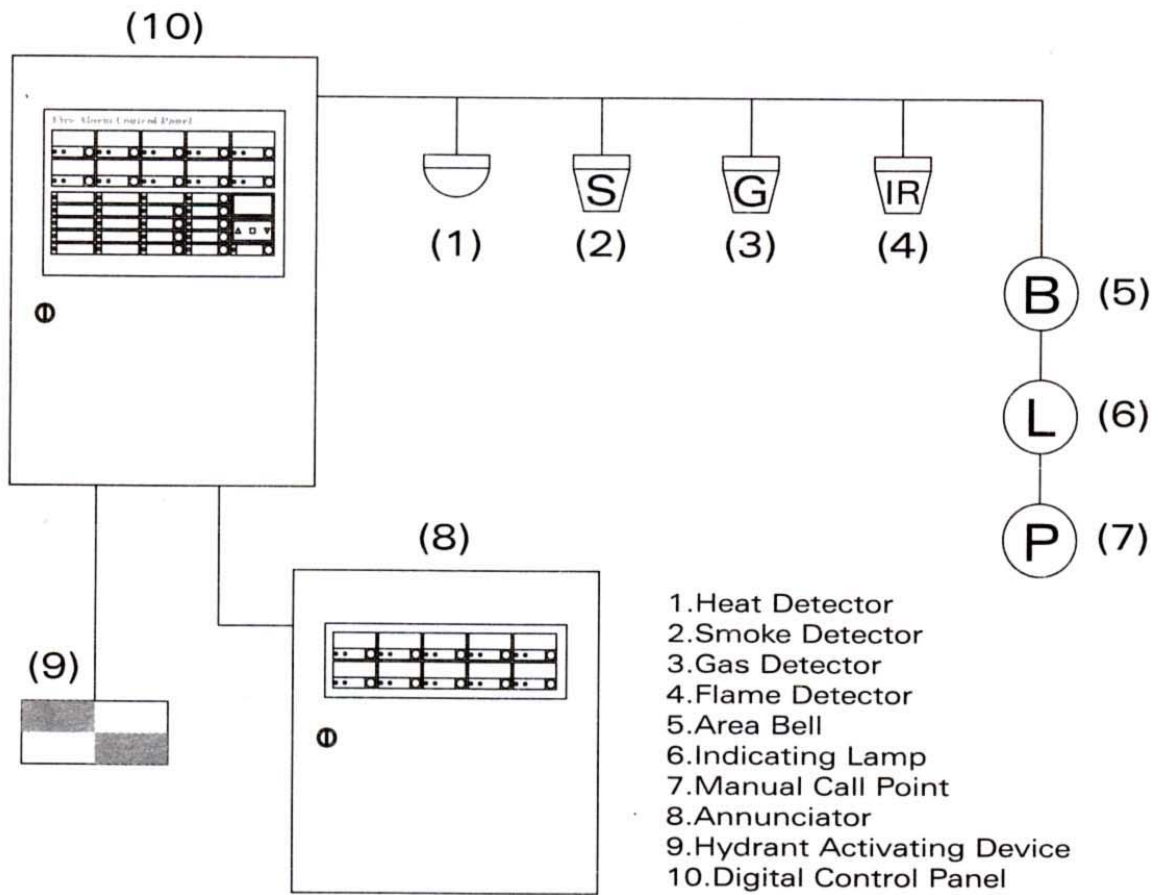
Due to the creativity and progress of fire fighting technology among highly developed countries, we never give up any chance to upgrade our new generation fire alarm control panel. We are not only pursuing higher technology level, but also compact design to meet high quality standard.

- CHARACTERISTICS

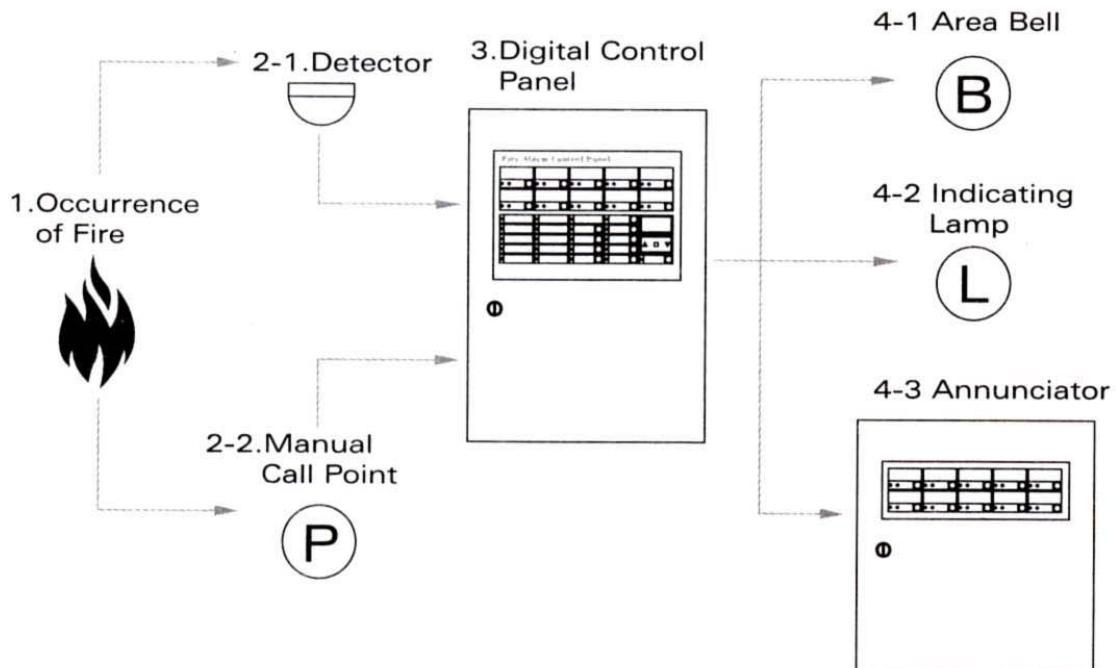
This digital control panel primary use processor to handle relevant signal, which improve most weak points of traditional control panel. See below for more details.

- (1) The use of microprocessor has improved the unit's correctness that used to 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, one set of signal transfer and Aux. contacts are added for new design.
- (7) Loop test 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, these phenomenon usually happened on mechanical-type switch.
- (8) Electronic auto-inspect voltmeter is displayed by 3-color LED and it is easy for verification.

## FIRE ALARM SYSTEM ASSEMBLY DIAGRAM

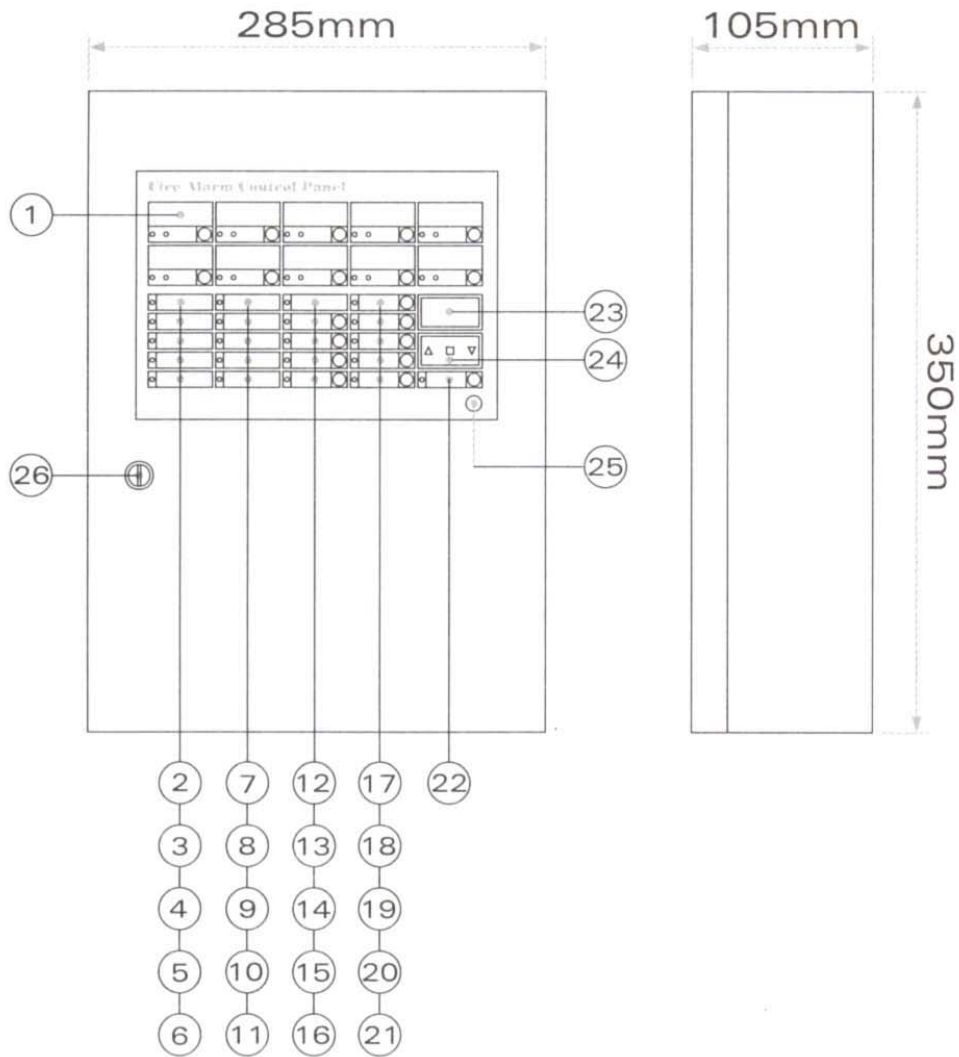


## FIRE ALARM SIGNAL FLOW CHART



## PANEL DESCRIPTION

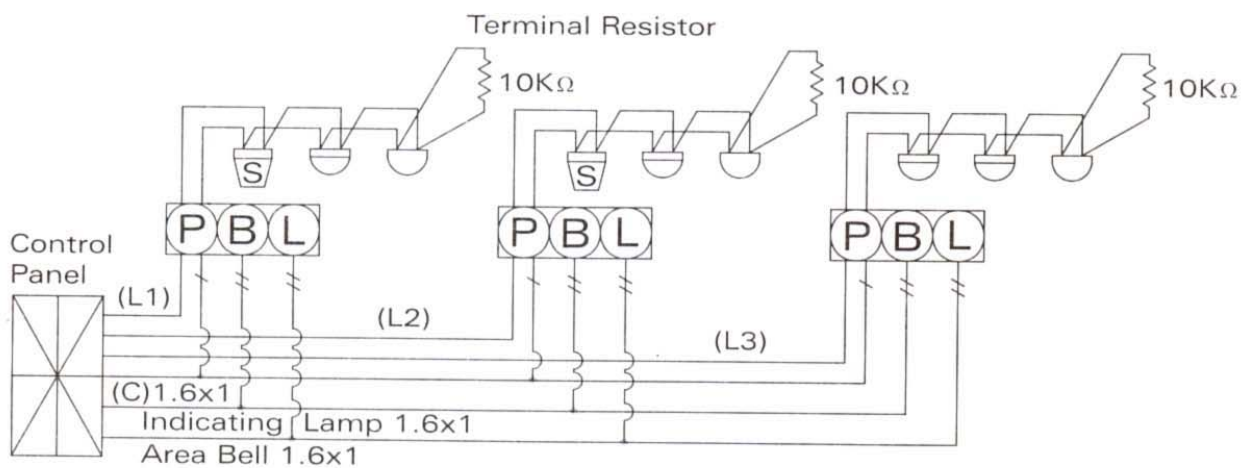
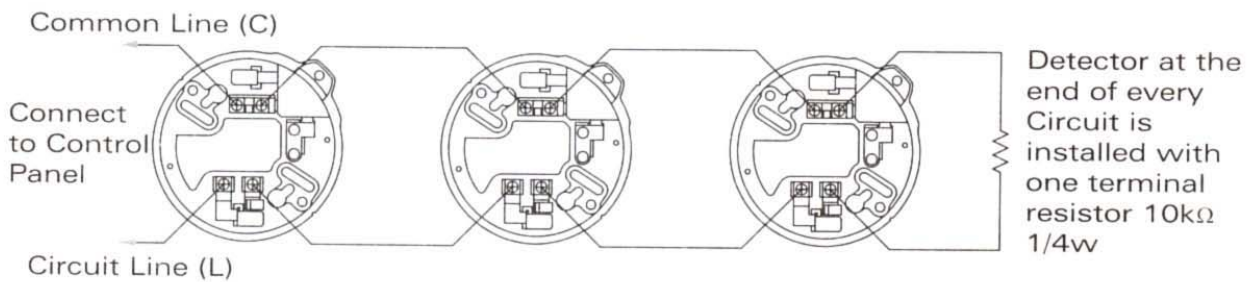
### Dimensions and Specifications



### Description

1. Loop Indicator	10. Aux.-3	19. Accum. SW
2. AC Power	11. Aux.-4	20. Auto Reset
3. Standby PW	12. Discon. Ind.	21. Reset
4. Accum. Ind.	13. Caution. Snd.	22. Batt. Test
5. Telephone	14. Main Bell	23. Fire Indicator
6. Attention SW	15. Area Bell	24. Voltmeter
7. M. C. P.	16. S. Trans. SW	25. Phone Jack
8. Aux.-1	17. Discon. Test	26. "—" Type Lock
9. Aux.-2	18. Alarm Test	

## STANDARD DETECTOR WIRING METHOD



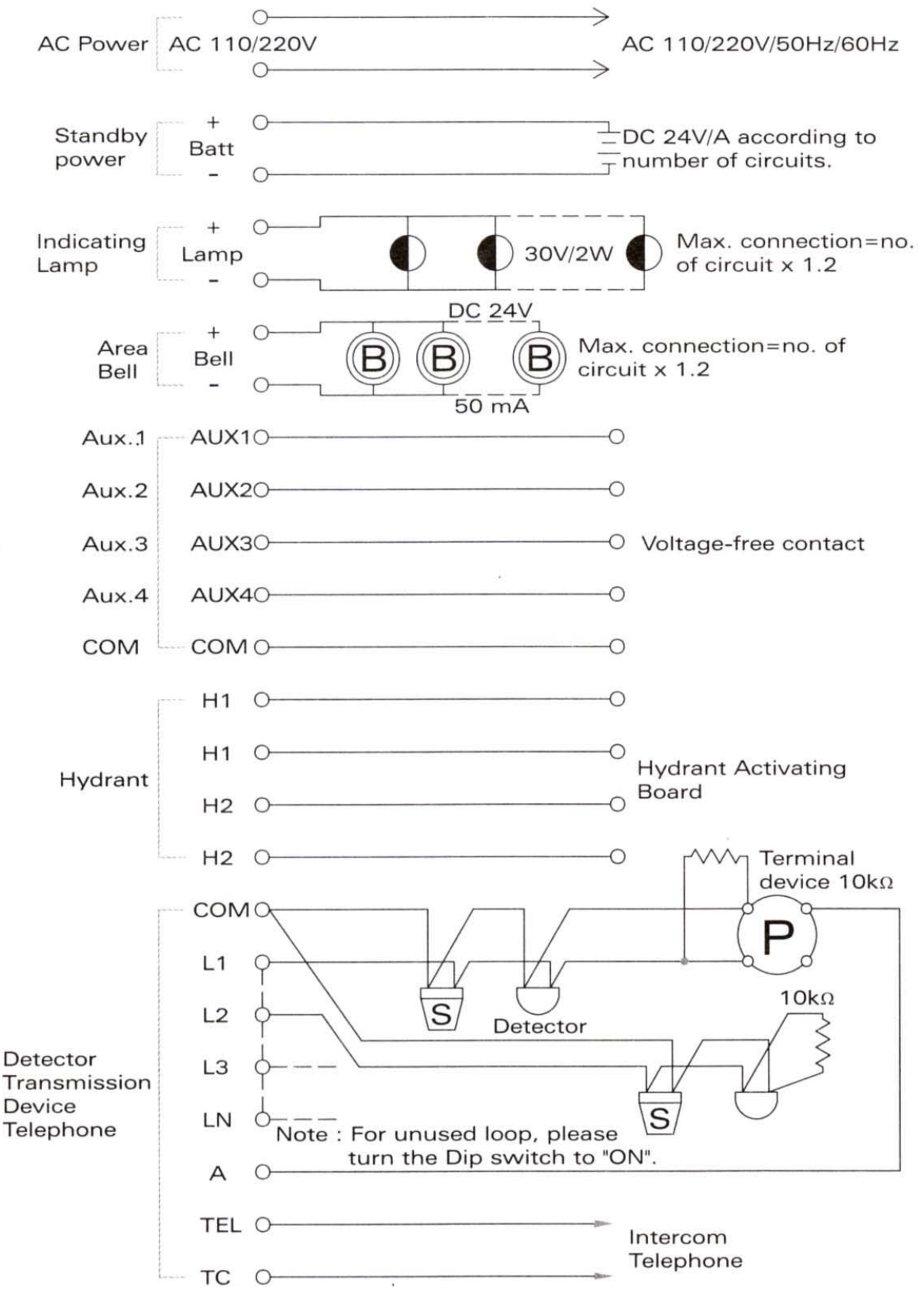
(L) Diameter of Circuit line 1.0~1.2 mm.  
 (C) Diameter of Common line 1.2~1.6 mm.

## SYMBOLS

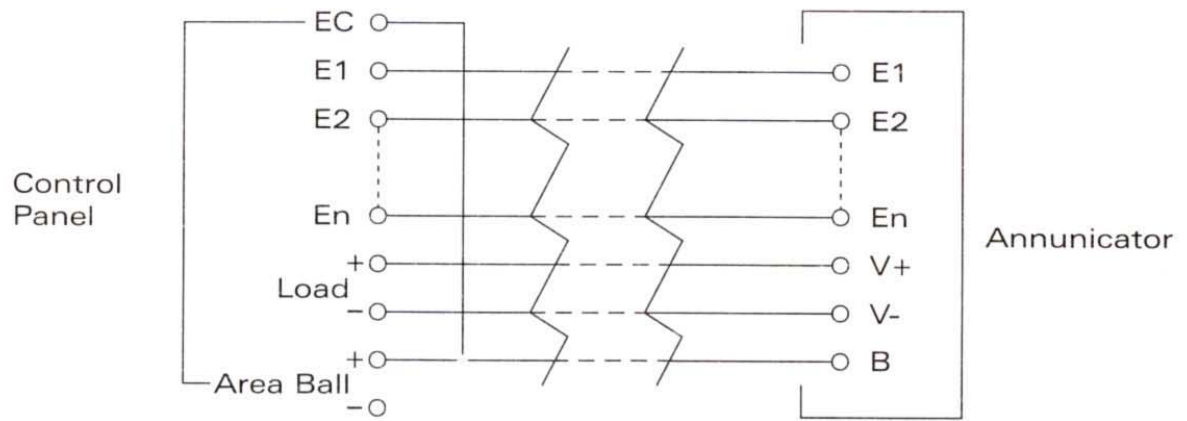
Control Panel	Rate of Rise Detector	Fixed Temp. Detector	Smoke Detector	Combination P. B. L. Box	(P)	Manual Call Point
					(B)	Area Bell
					(L)	Indicating Lamp

# METHOD OF WIRING

External wiring method









● WIRING PRINCIPLE

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

Item	Specification	Quantity	Remarks
Circuit line	1.0 ~ 1.2M/M	N	Depends on loop device, basically 1/loop.
Common Line	1.2 ~ 1.6M/M	N	
Area 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.
Telephone	1.0 ~ 1.2M/M	1	"T" point on the back side of MCP
MCP Push-down LED	1.0 ~ 1.2M/M	1	"A" point on the back side of MCP
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 be 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.

(5) Terminal Resistor Connecting Method

Every end of circuit line shall be fitted with a resistor (not more than one). If any loops in the control panel are not in use, should set Dip Switch on the Terminal to the 'ON' position.

(6) Area Labeling

Once the wiring is laid, label the Loop Indicator with the 'Loop Indication Label' provided by type or print for easy verification.

(7) 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 a AC220V 50Hz/60Hz supply source. The “AC power” indicator light up and Voltmeter indicate “N” (normal) position. Fire Indicating Lamp of the combination PBL box light up and surveillance begins.

### 2. Fire Alarm

When a Detector has detected or a MCP press-down, it is an indication of fire. At this moment, the “Fire” Indicator (red) and the related loop indicator will light up simultaneously. The Main Bell and Area Bell will also sound. The Fire Indicating Lamp of the combination PBL box will become blinking. These activities indicate that the fire alarm is valid.

#### (1) Main Bell Disable

To stop the Main Bell from sounding, press “Main Bell” button the sounding stop immediately.

#### (2) Area Bell Disable

To stop the Area Bell from sounding, press “Area Bell” button the sounding stop immediately.

### 3. Reset

Once the fire alarm is activated, the “Fire” Indicator and the related Loop 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 ‘Loop Disconnection Auto Indication’ function. Should there be a Circuit Break in certain areas, or detachment of the terminal resistor, the “Discon. Ind” indicator and related Loop indicator will light up simultaneously. The disconnection beeper will sound. Upon repair of the circuit, above mentioned situation will cease.

#### (1) Disable Disconnection Sound

To stop the disconnection sound, press “Caution Snd” button the sounding stop immediately.

### 5. Fire Alarm Test

To perform fire alarm simulation test to test the functions of the fire alarm.

#### (1) “Auto Reset”, “Accum. SW”, “S. Trans. SW” button

Press down above three button, then perform loop alarm test, and reset automatically afterwards.

## (2) Field Fire Alarm Test

- (A) Detector Test Method: uses a Tester, place it near detector for a few seconds. As soon as detector has back to normal condition, the fire alarm signal on the control panel will automatically reset itself.
- (B) MCP Push-down Test Method: Press the Manual Test Button to activate the alarm. Pull up the button and the fire alarm signal on the control panel will automatically reset itself.

## (3) Control panel self-test

Repeat (1), press "Alarm Test" button, the indicator will light up, and then press "Loop Test" button (on the "loop Indicator" down side right corner). Once completed, press "Auto Reset" and "Reset" button, the control panel will back to surveillance status.

## 6. Disconnection Test

- (1) Press "Discon. Test" button, the indicator will light up, and then press "Loop Test" button (on the "loop Indicator" down side right corner). Once completed, press "Auto Reset" and "Reset" button, the control panel will back to surveillance status.
- (2) Field Disconnection Test: Just remove the detector.

## 7. Standby Power

The control panel is equipped with automatic rechargeable batteries the stand-by power source (DC24V) shall be installed during operation. When the Main power source has been terminated, the "AC Power" indicator will light off and the "stand-by PW" indicator will light up. Voltmeter indicates to "N" (normal) position.

### (1) Standby Power Test

The control panel should be powered by the main source under normal condition. To test the function of stand-by power source, press "Batt. Test" button and the control panel should response same as power - off situation.

## 8. Telephone Communication

The control panel is equipped with a telephone communication device and two sets of compact phones. Whenever the communication is needed, just plug one of compact phones into the phone jack of field manual call point. Thus, the beeper inside the control panel will sound and "Telephone" indicator will light up. Then plug another compact phone into the phone jack of control panel, the beeper sound will stop and now communication is conducted. After the communication is complete, pullback the phone and signal will reset automatically.

## 9. Simultaneous Activation of Hydrants

The panel has a voltage-free contact for signal transfer (A contact point x 2 set voltage pack = 24V/10A). It can be utilized to simultaneously activate Hydrant Activating Devices when the Fire Alarm is valid.

## 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 ended immediately and the alarm signal Circuit handled first.

## 11. Function of "Attention SW" Indicator

When any of the indicators on the display board is not set to ready status, the "Attention SW" indicator will blink. The signal will only cease when all indicators have been set to ready status.

### ● 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 "AC Power" indicator should light up, Voltmeter to indicate "N" (normal) position. All indicators should be set to ready status and Fire Indicating Lamp on the Combination PBL Box should light up.

##### (2) Power Failure

When there is a power failure, the "AC Power" indicator will light off "Standby PW" indicator will light up the Voltmeter should indicate "N" (normal) position.

#### 2. Maintenance of Devices

(1) If maintenance may cause disturbances to the public, appropriate coordination must be made beforehand.

(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 be carried 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) Control Panel

(A) Fire Test: by “Loop Test” button (on the “loop Indicator” down side right corner) to check whether it is functioning properly.

(B) Disconnection Test: by “Loop Test” button (on the “loop Indicator” down side right corner) to check whether it is functioning properly.

### (3) 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).

### (4) Manual Call Point

Check for integrity of plastic plate, press-down button and condition of wiring inside the MCP.

### (5) Insulation Test

The insulation between power terminal of control panel and earth shall have a value of 250V 20M $\Omega$  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 Loop 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 “AC SW” inside the control panel is set to ‘ON’ and the “AC Power” indicator on the Display Board is light up.

(3) Check whether the “AC Power” indicator and the Voltmeter on the Display Board are functioning properly. The system should specify DC24V.

(4) Check whether fuses are in good condition. Whether LED next to “AC SW” inside the control panel is light up.

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

## 2. Function of Fuses

The Control Panel inside has several fuses, each fuse with individual protection function. It must not be replaced with fuses that do not conform to specifications or are of low 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) F1: Fuse for power source AC 220V.

(2) F2: Fuse for standby power source.

(3) F3: Fuse for Combination PBL Fire Indicating Lamp.

(4) F4, F4-1: Fuse for area bell.

(5) F5: Fuse for direct current source DC24V.

## 3. Causes of Burnt Fuses & Inspection Guidelines

### (1) F1 Fuse Burnt

(A) It could be due to excessive voltage supply that causes the F1 Fuse to be burnt.

(B) Conformance of Specification (lower-rated fuse may be burnt by a surge of current).

### (2) F2 Fuse Burnt

(A) Check whether the standby power polarity '+' and '—' have been in reversed position.

(B) Similar to inspection guidelines for F1 Fuse, the standby power supply will pass through F2 Fuse when power supply from the Main Source has been cut-off.

### (3) F3 Fuse Burnt

(A) Check for any short circuit wiring of the Fire Indicating Lamps or any short circuit of the Fire Indicating Lamp's bulb or bulb holder.

(B) Check for any excessive current consumption of the Fire Indicating Lamp and check for any short circuit of solder wires on the Indicating Lamp's head.

(C) Disconnect the outlet wire ('+' and '—') of the Fire Indicating Lamps and replace F3 Fuse. Measure the outlet for any voltage.

(D) If the output of Control Panel is correct, then to connect the wire only after the external wiring have been repaired.

### (4) F4, F4-1 Fuse Burnt

(A) Check for short circuit of the Area Bells and their respective wiring.

(B) Check for excessive current consumption of the Area Bells.

(C) Disconnect the outlet wire ('+' and '—') of the Area Bells and replace F4, F4-1 Fuse, measure the outlet current for correct output.

(D) If the output of Control Panel is correct, then to connect the wire only after the external wiring have been repaired.

(5) F5 Fuse Burnt

F5 Fuse is allocated to a secondary power and also serves as a second line protection for the panel's direct power source. If F5 Fuse burnt, should check whether other wiring (except F1, F2, F3, F4, F4-1) has power leakage happened.

4. Combination PBL Fire Indicating Lamp & Alarm Bell Malfunction

(1) Remove the external wiring of the Fire Indicating Lamp and Area 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 Area 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. Loop Indicator Malfunction

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

6. Loop Indicator & "Discon. Ind." Indicator light up

When one or several Loop Indicator light up and "Discon. Ind." Indicator blink 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 are not in use, if yes check whether the Dip Switch on the Terminal is in the 'ON' position.

(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  $\Omega$  mode and measure the malfunction circuit resistance value. The resistance value between the circuit line and common line should be around  $10k\Omega$ .

(7) After removal of the circuit line, there should not be any voltage between the circuit line and common line. The wire shall only be connected after the external wiring has been repaired.



## 7. Loop Indicator & “Fire” Indicator light up

When one or more Loop indicators and “FIRE” Indicator light 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 circuit line and common line to check for short circuit or resistance value is normal (normal value is around  $10k\Omega$ ).
- (2) After remote the circuit that in trouble, the control panel must be reset. At this moment, the loop indicator should carry a circuit break signal. To cut off the signal, set the Dip Switch on the Terminal to “ON” position. After repairing the circuit line, re-activate the Dip Switch on the Terminal and then 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	AC 220V 50/60Hz	Others also available
Voltage range	Nominal voltage $\pm 20\%$	
Standby power	DC 24V 800mA ~ 2100mA	With auto adjustment function
Charging voltage, current	DC 26V 100mA ~ 400mA	
Loop voltage, current	DC 24V; short circuit under 5V 30mA	
Exterior resistance	Round-trip under $50\Omega$	
# of heat detector connected	No limit	Except electronic- type
# of smoke detector connected	30/loop	Manufactured by Horing Lih
# 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	$10K\Omega$	One per loop
Material	1.2m/m 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

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