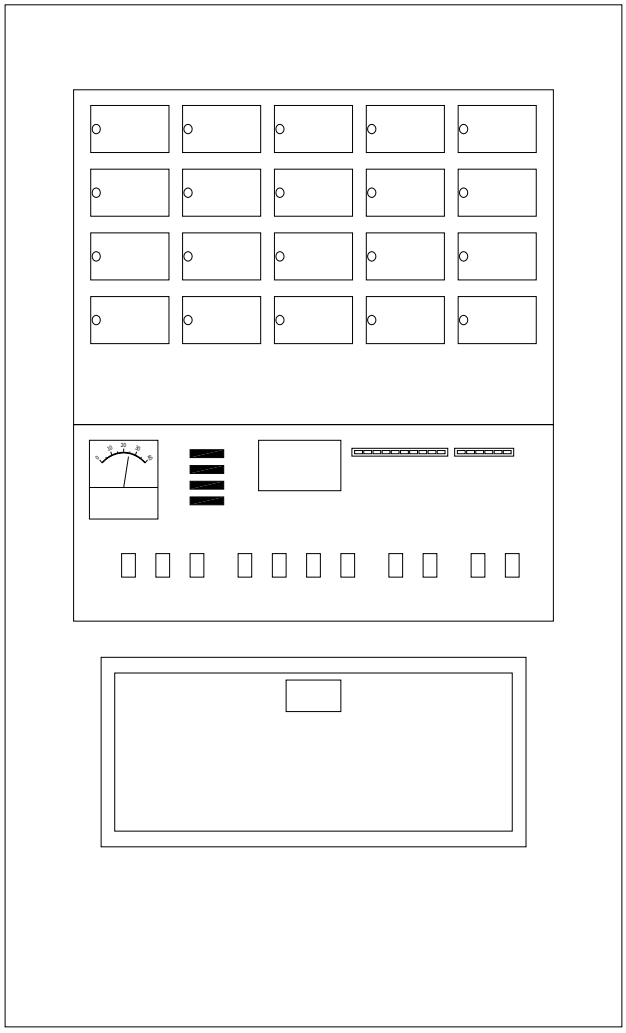
FIRE ALARM CONTROL PANEL

OPERATING MANUAL



Model # AHC-871

HORING LIH INDUSTRIAL CO., LTD.

- INTRODUCTION

In line with technological advanced. Fire alarm systems have become more sophisticated, especially in developed countries. Likewise, our knowledge and expertise in Fire Alarm Control Panel is also second-to-none as compared to those produced by developed countries. We have since designed an Accumulation-type Control Panel that is easy to maintain, aesthetic in outlook and complete with functions that meet most end-users requirements.

- CHARACTERISTICS

* Up-to-date Designs

(1) Accumulative Capability:

We focus on pulsative waves and interfering signals, which are the most common causes of false alarm during operation, especially for panels with smoke detector loops. Our panels can eliminate such phenomenon, minimize the possibilities on false alarm to a very low degree, or even can completely preventing it from occurring.

(2) Automatic Reset Capability:

When the auto reset button is depressed, it will automatically reset after performs a Detector Test, in addition to the normal reset function.

(3) Fuse Fault LEDs:

Any failures due to faulty wiring or other causes will be indicated on the panel.

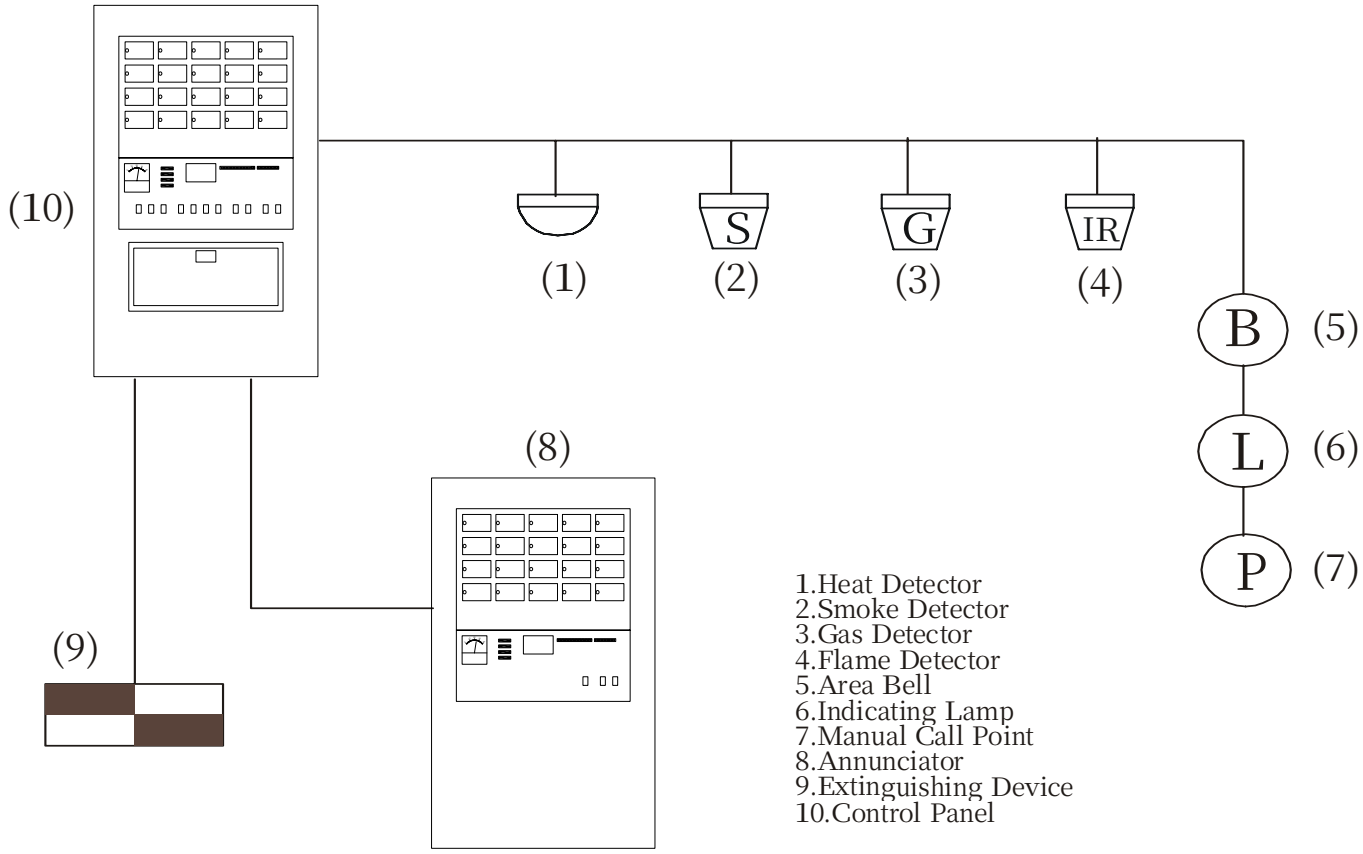
(4) External Indicators:

Our product provides an option for 'light-on' or 'light-off' in the event of power failures. Because Fire Indicating Lamp will light up during a power failure, it will easily drain-off the battery supply and cause the control panel to be in-operative. In the 'light-off' mode Fire Indicating Lamp will remain 'off' all the time and only blink during an outbreak of fire, thus prolonging surveillance capabilities. For 'light-on' switch to position (I) and for 'light-off' switch to position (O).

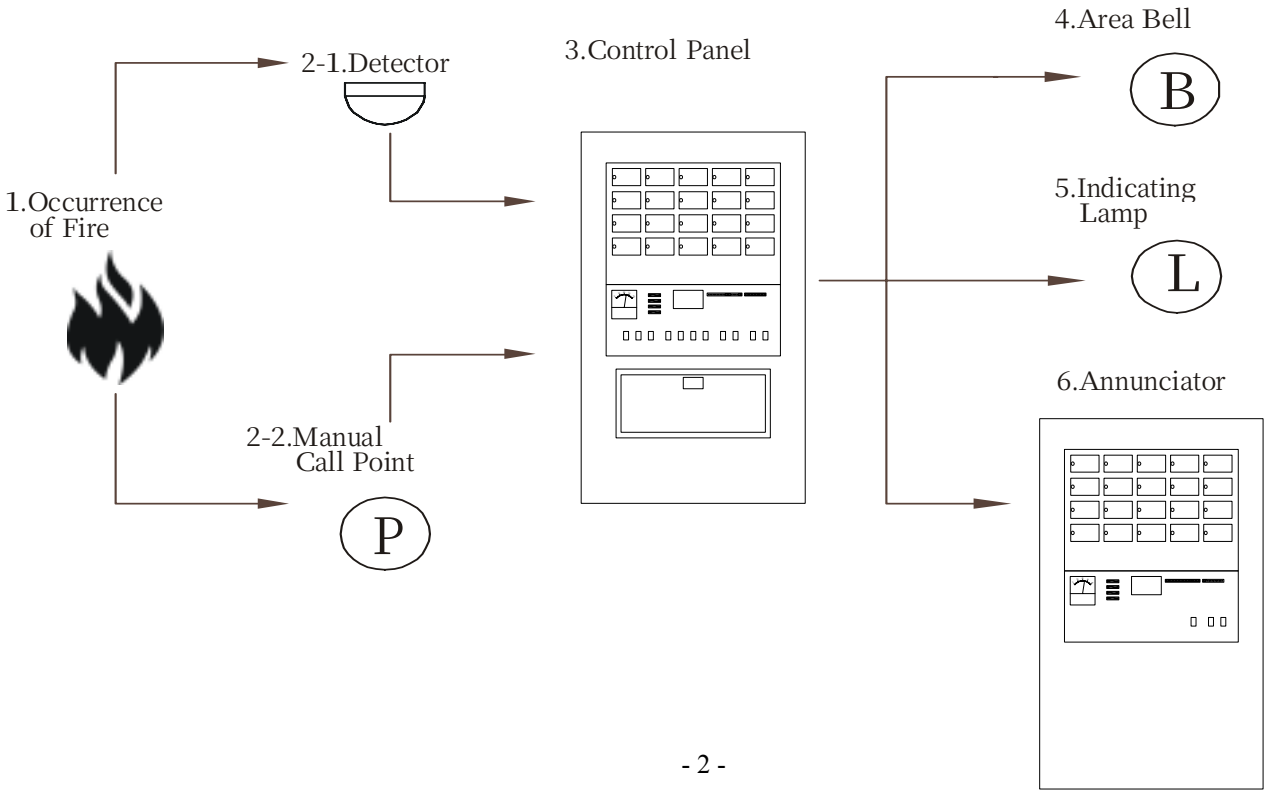
(5) Reserve slot for relay output (Optional).

* The Zone Testing Button is located at the Zone Indicator of the control panel. It is self-returning and can be use to perform test for individual zone.
* Voltage Stabilizer is verified with an applied sudden voltage load. It must pass this test before leaving the factory for delivery.
* The control panel is made of steel-plate and coated with an attractive oven-baked paint.
* Every zone indicator is made up of two LEDs connected in series and covered with a delicate glossy light bulb shield (removable plates are included for labeling of different areas).
* Each group of Circuits is detachable for easy maintenance. It also has a one-piece maintenance Bracket which not only makes the structure of the control panel stronger, but also helps prevent breakdowns during wiring.
* Zone Testing Button and Relay are tightly sealed from dust, preventing bad connection due to accumulation of dust.

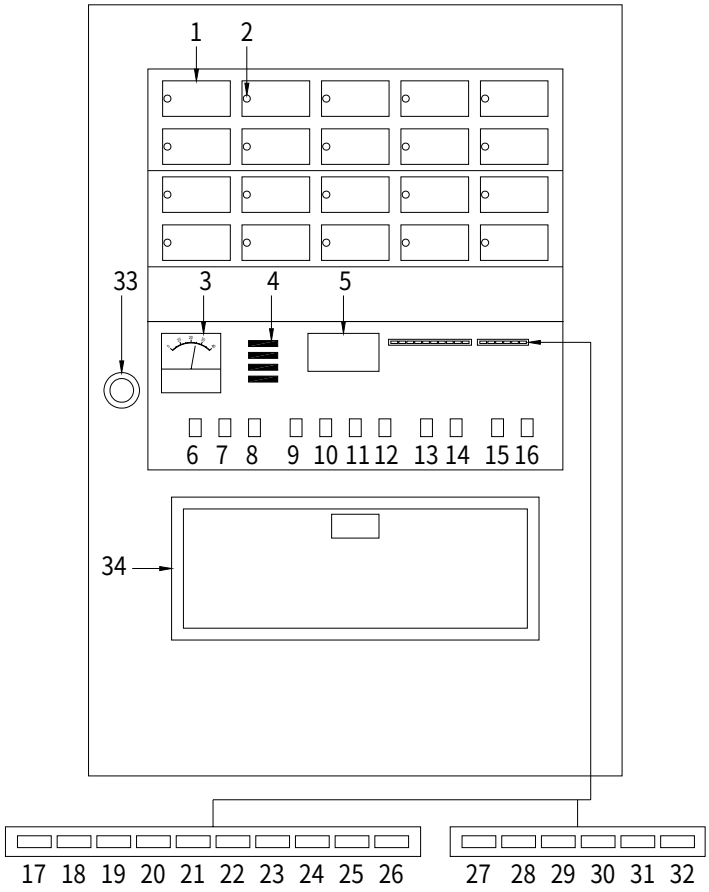
- FIRE ALARM SYSTEM ASSEMBLY DIAGRAM



- FIRE ALARM SIGNAL FLOW CHART



- PANEL DESCRIPTION

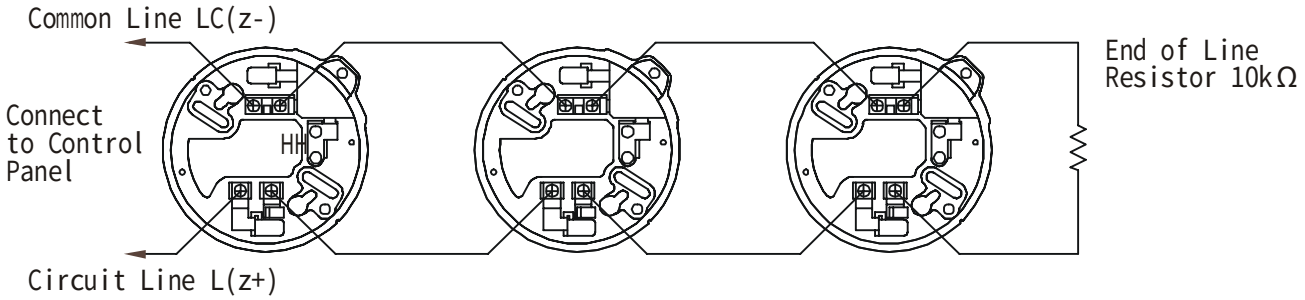


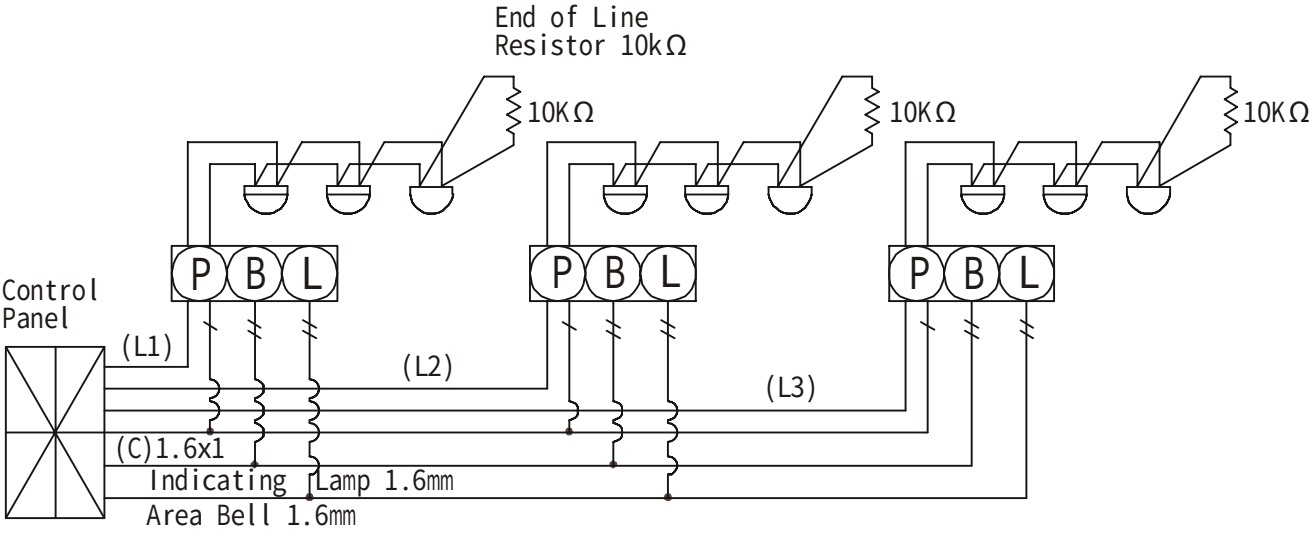
1.Zone Indicator	13.Signal Transfer Switch	24.Water-shortage Indicating LED
2.Zone Test Button	14.Accumulation Switch	25.Water-drawing Indicating LED
3.Voltmeter	15.Auto Revert Switch	26.Fire-fighting Pump Indicating LED
4.Sound	16.Revert Switch	27.AC Power Failure LED
5.Fire Alarm Indicator	17.AC Power Indicating LED	28.Battery Power Failure LED
6.Disconnection Sound Switch	18.Battery Indicating LED	29.Relay Device Failure LED
7.Main Bell Switch	19.Disconnection Indicating LED	30.Indictor Lamp Failure LED
8.Area Bell Switch	20.Attention Switch Indicating LED	31.Area Bell Failure LED
9.Disconnection Test Switch	21.Accumulation In Motion LED	32.DC Power Failure LED
10.Fire Alarm Test Switch	22.Telephone Indicating LED	33.Panel Door Lock
11.Test Switch	23.Transmitter Indicating LED	34.Telephone
12.Battery Test Switch		

- SYMBOLS

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

- DETECTOR'S STANDARD WIRING METHOD

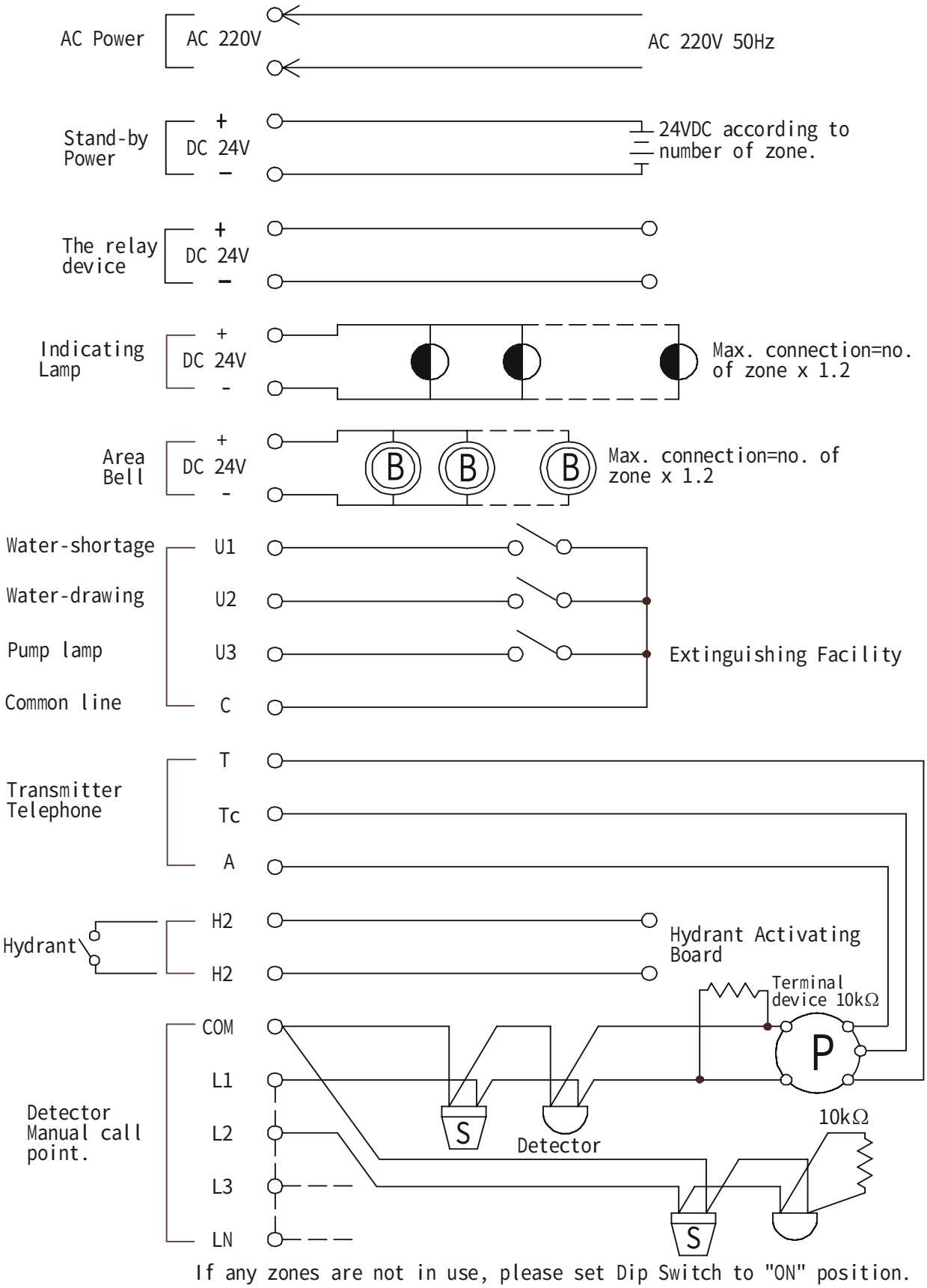




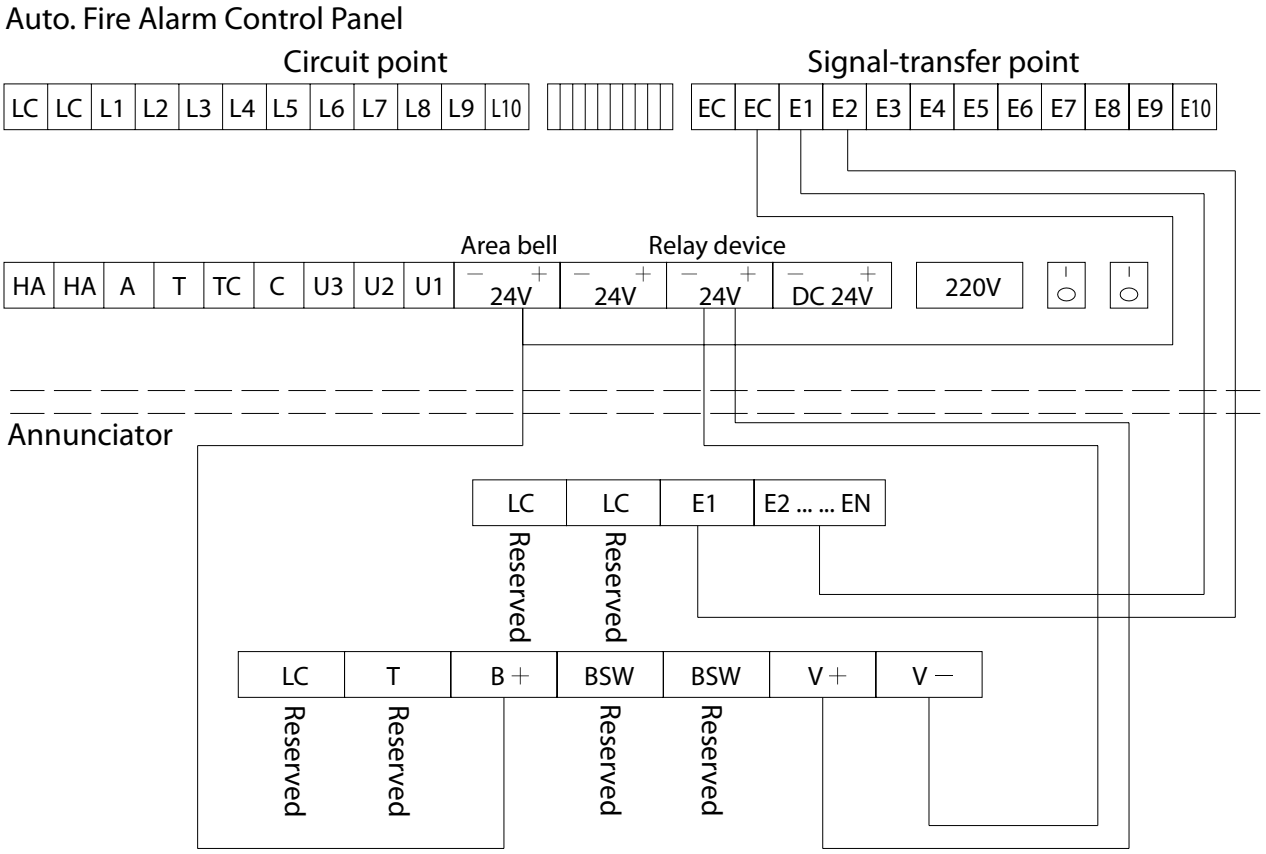
(L) Diameter of Circuit line shall be 1.2 mm.
(C) Common line 1.6mm.

- METHOD OF WIRING

External wiring method



If any zones are not in use, please set Dip Switch to "ON" position.



- WIRING PRINCIPLE

1. Wire Calculation Table (Separate calculation for long distance wiring or large control panel)

ITEM	WIRING SPECIFICATION	QUANTITY	REMARKS
Circuit Line	1.2mm	N	Depends on devices, one line for every zone.
Common Line	1.6mm	N	Every common line should not have more than 7 zones.
Area Bell	1.6mm	2	
Indicating Lamp	1.6mm	2	
Manual Call Point			Parallel connection to each zone's detector.
Telephone	1.2mm	2	
Transmitter	1.2mm	1	
Earth	1.6mm	1	E
AC Power	1.2 to 1.6mm	2	Depending on the load of the control panel.

2. Wire Connection Box

   In order to facilitate inspection, maintenance and repair, every floor or appropriate area shall install a Wire Connection Box in which connecting joints are provided. The Box's casing shall be water-proof 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

5. Terminal Resistor Connecting Method

   Every end of Circuit line shall be fitted with a Resistor (not more then one). If any zone in the control panel are not in use should set Dip Switch on the Terminal to the "ON" position, please refer to page 5 for details.

6. Zone Labeling

   Once the wiring is completed, label the 'Zone Labeling Card' provided. For easy identification, type or print the labeling cards.

7. Wiring Record

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

- OPERATING INSTRUCTIONS

1. Fire Surveillance

   After installing system devices to the panel, connect to an 220VAC 50/60HZ supply source, set all switches on the display board to ready position. At this stage, the "AC Power" indicating LED will be on, Voltmeter should indicate 24V (the allowable voltage is 20V-28V). Indicating Lamp in the combination PBL box light up and surveillance begins.

2. Fire Alarm

   When any detector has activated or manual call point has pressed, it is an indication of fire. At this moment, the "Fire" Indicator (red) and the concerned zone indicator will light up simultaneously. The Main Bell and Area Bell will also sound and the Indicating Lamp on the Combination PBL box will switch from still to blinking. These activities indicate that the fire alarm is valid.

   (1) Disable Main Bell

   To stop the Main Bell from sounding, set the Main Bell Switch to 'off' position. The alarm will stop immediately.

   (2) Disable Area Bell

   To stop the Area Bell, set the Area Bell Switch to 'off' position.

3. Reset

   Once the fire alarm is activated, the "Fire" Indicator and the Related Zone Indicator will remain lighted. If the control panel is required to start the surveillance again after the previous fire situation has been resolve, just depress the 'Revert' button. However, if detectors have been burnt or the manual call point press-down not recovered, reset cannot be activated. In this instance, repair should be completed first, then depress the 'Revert' 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 "Disconnection" LED and the related zone indicator will blink simultaneously. The Disconnection Beeper will also sound. Upon repair of the circuit, the above mentioned will cease.

   (1) Stopping Disconnection Sound

   To stop the disconnection sound, move the 'Disconnection Sound' switch to 'OFF' position.

5. Fire Alarm Test

   To Perform Fire Alarm Simulation Test or test the functions of the fire alarm.

   (1) "Auto Revert" switch "Accumulation" Switch. "Signal Transfer" Switch.

   To perform one-men fire alarm test, first set "Auto Revert" switch to down position; set "Accumulation" Switch to down "off" position; set "Signal Transfer" Switch to down "off" position and then test the Circuit. For every Circuit tested, the signal will automatically reset itself.

   (2) Field Fire Alarm Test

   (A) Detector Test Method: use 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) Manual Call Point Test Method: depress the manual call point 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 Testing

   After repeat test (1), set "Test" Switch to 'Test' position, "Fire Test" Switch to 'Test' position, and then depress Zone Test button (on the Zone Indicator). It will automatically reset after the test. Once completed, set all switches to up position.

6. Disconnection Test

   (1) Set "Test" Switch to 'Test' position, set "Disconnection Test" Switch to 'Test' position, and then depress Zone Test button (on the Zone Indicator). It will automatically reset after the test. Once completed, set all switches to 'up' position.

   (2) Disconnection Site Test: remove the Detector.

7. Standby Power

   The 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 "AC Power" Indicating LED will light off and the "Battery" Indicating LED will light up. The Voltmeter reading will indicate 24V.

   (1) Stand-by Power Test

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

8. Telephone Communication

   The control panel is equipped with a telephone communication device. It has a hand-held telephone which can be plugged into a manual call point to begin communication when connected. The 'Telephone Buzzer' begins to sound inside the panel. Just lift up the telephone and the 'Telephone Buzzer' sound will stop but "Telephone" Indicator will remain lights up and now communication is conducted. The telephone must be replaced to its original position after use. Once this is done, signal will be automatically reset.

9. Consecutive Activation of Hydrants

   The control panel has a voltage-free contact for signal transfer (A contact point x 1 set voltage pack = 24V/10A). It can be utilized to simultaneous activate the Hydrant Activating Devices when the Fire Alarm is valid.

10. Occurrence of Alarm Signal During Testing

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

11. "Attention Switch" Indicator

    When any switch on the display board is not set to up position the "Attention Switch" indicator will blink. The signal will only cease when all switches have been set to up position.

- INSTALLATION LOCATION

Please refer to your local regulation for installation details.

- IMPORTANT NOTES ON MAINTENANCE

1. Normal State of The Panel

   (1) Normal Condition (Fire Surveillance Alert)

   Under normal conditions, the "AC Power" LED should light up, Voltmeter to indicate 24V (allowable range is 20V to 28V). All switches should be set to up position and Indication Lamp on the PBL combination panel should be lighted up.

   (2) Power Failure

   When there is a power failure, the "AC Power" LED will turn off and "Battery" LED will light up. The Voltmeter should indicate 24V (allowable range is 20V to 28V).

2. Maintenance of Devices

   (1) If maintenance may cause disturbances to public, appropriate co-ordination must be made before hand.

   (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

A yearly overall inspection should be carried out by a professional institution, or the Original Equipment Manufacturer. Inspection records must be tabulated and kept by a responsible person or the department concerned, to safeguard the public.

(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: to check whether the fire alarm system is functioning properly.

(B) Circuit Break Test: to check the whether the "Zone Test" button 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

To 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 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 and PBL Combination Panel

The system devices are assembled with many single units (refer page2). Either the 'Detectors', 'Wiring' or 'PBL Combination Panel' is used incorrect, it will affect the function of control panel.

(1) Measure AC power with a Multi-meter for any (AC) voltage. It should read 220V, according to the specifications of the panel.

(2) Check whether the "Normal Power" Switch inside the control panel is set to "ON" position and the green color LED Power Light on the power board is lighted up.

(3) Check whether the "AC Power" Indicator and Voltmeter on the panel board are functioning properly. The system should specify 24VDC.

(4) Check whether fuses are in good condition (or the "AC Power Failure" LED on the Display Board is lighted up).

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

2. Functions of Fuse

The panel has six fuses (F1~F6), each with individual protection function. It must not be replaced with fuses that do not conform to specifications or 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 alternate power source 24VDC.
(2) F2: Fuse for AC power source 220VAC.
(3) F3: fuse for Stand-by power source.
(4) F4: Extra power source when the need arises.
(5) F5: Fuse for Area Bell.
(6) F6: Fuse for Indicating Lamp in the combination PBL box.

3. Stand-by Power Source In Reverse Order

If the stand-by power polarity is in a reverser order, F3 fuse will be burnt. The polarity should be immediately corrected.

4. PBL Combination Panel Indicating Lamp and Area Bell Malfunction.

(1) Remove the external wiring of the Indicating Lamp and Area Bell inside the panel.
(2) Measure the (+) outlet of Indicating Lamp with a multi-meter and check whether it reads DC24V. Then perform a fire test to check for any intermittent power supply. Reset after the test is completed.
(3) Measure the (+) outlet of the Area Bell with multi-meter. It should not have any voltage supply. Then perform a fire test and a 24VDC voltage should be recorded. Reset after the test.
(4) When the test results conform to (2) and (3), it indicates that the 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, about 90% of the zone indicators' malfunction is due to incorrect external wiring. Other factors are mainly due to incorrect handling or incorrect wire joints inside the panel.

6. Blinking of Zone Indicators and "Disconnection" Indicating LED.

When one or several zone indicators and "Disconnection" Indicating LED 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 zones 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 trouble circuit; 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 circuit line and circuit common-line should be 10KΩ.
(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. Zone Indicator and "Fire" Alarm Indicator lights Up

When one or many of the zone indicators and "fire" Indicator lights up simultaneously, it should be regarded as a fire alarm signal. The inspection and repair guidelines are as follows:

(1) Remove the trouble circuit. Measure between the circuit line and common line to check for short circuit or any resistance value lower than 2KΩ (normal value=10kΩ).
(2) After removal of the trouble circuit line, the panel must be reset. At this moment, the zone indicator should carry a disconnection signal. To cut off the signal, set the Dip Switch on the Terminal to "ON" position. After repairing the circuit lines, 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 Specifications

DESCRIPTION		REMARKS
Power Source	220VAC 50/60Hz	Others also available
Stand-by Power	24VDC	
Charging Voltage Current	26VDC 100mA~400mA	With auto adjustment function.
Voltage Current	24VDC short circuit under 5V 30mA	
External Line Resistance	Below 50Ω round trip	
# of Heat Detector Connected	No limit.	Except electronic-type
# of Smoke Detector Connected	30/zone	Horing Lih manufactured
PBL Combination Panel Wiring	4 Lines or 6 Lines	Depending on requirements
# of Indicating Lamp, Area Bell Connected	# of zone ㄨ 1.2	
End of Line Resistor	10KΩ	One per zone
Material	1.6mm steel	
Color	Ivory-white	Others also available
Accessory Functions	Water Shortage Indicating LED, Water Drawing Indicating LED, Hydrant In-action LED. Contacts for the PBL combination panel. Built-in intercom	