



R TYPE INTELLIGENT FIRE ALARM SYSTEM

-TECHNICAL BULLETIN-

HORING LIH INDUSTRIAL CO., LTD



CNS

ISO 9002

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1. System Construction :

This system consists of R-type intelligent fire alarm control panel, addressable detectors, control modules, output modules, monitor modules, addressable manual call points and isolator modules.

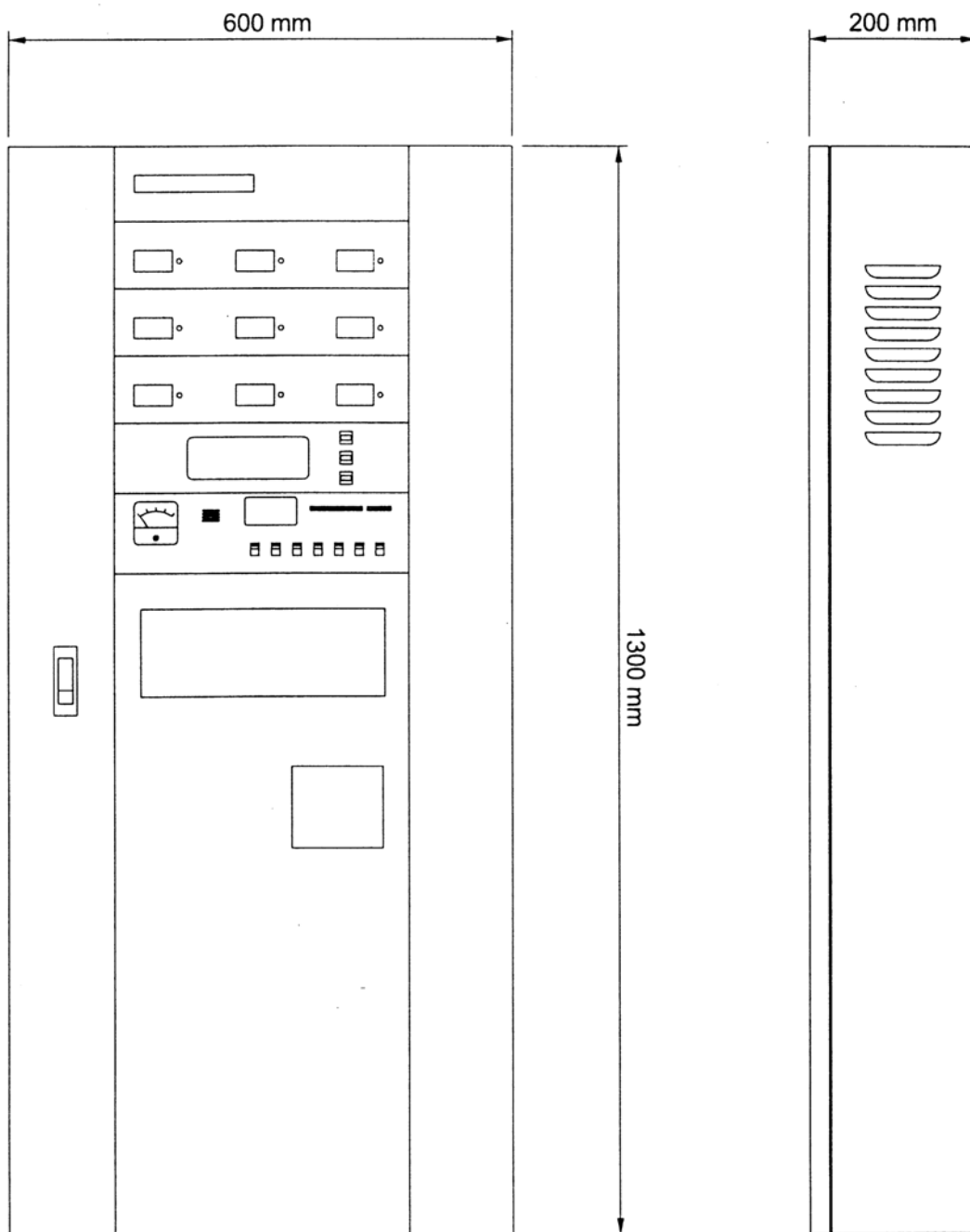
2. System Capability :

- A. System has expansive function to connect different modules for field installation.
- B. Control panel has capacity of 1~8 loops, each loop consists 127 modules and total of 1016 units. Modification or expansion is available to meet field requirement.
- C. System is able to connect conventional detectors and manual call points via control module or directly connect to addressable detectors and addressable manual call points to monitor and control relevant fire-fighting equipment.
- D. System is able to connect with monitor and control modules of fire alarm, smoke evacuation and sprinkler system at same loop. For each of those systems, it has unique alarm indication.
- E. System can monitor the status of each addressable detector or loop. The displaying area of functional system should be divided by alarm area, disconnection area and fault area.
- F. The surface board of system is English designation, clearly notify the field situation to help users understand the installation and operation, also avoid any delay on situation handling.
- G. System is processed by dispersed structure. It has advantage for maintenance, expansion and merging functions, also disperse the risk of failure.
- H. System can review and print out prompt situation and history data from LCD screen and flush-type printer on control panel.
- I. System has the preset function of alarm status, to energize the alarm bells for all areas, certain area and activation for relevant area facilities.
- J. Main bell sound has two-step alarm feature, control panel will do "silence" control after "initial alarm" without affect the next alarm sound, and assist the system to process function test.
- K. External indicating lamp is equipped with power-saving device. Generally, the external indicating lamp will light up during power-off, thus battery will be exhausted quickly and force control panel to lose its function earlier. Power-saving device can select lights ON or OFF for indicating lamp during power-off, but it will blink when fire happens.
- L. System could add functions of PA signal transfer contacts, mimic panel, Touch Screen graphic control interface and remote transmission control according to requirement of building safety.

3. Panel's basic functions :

- A. Power source: 110/220 VAC (other selections are available)
- B. Operating temperature : 0~50°C
Humidity : 10~95%Rh
- C. System capacity : 127 modules/zone (expandable)
- D. System wiring :
 - a. Fire alarm system
 - 1. signal wire: 3-core 2.0mm x 1 (V+, V-, S)
 - 2. Load power wire: 2.0mm x 2 (B+, B-)
 - 3. Indicating lamp wire: 2.0mm x 2 (PL, PLC)
 - 4. Telephone wire: 2.0mm x 2 (T, TC)
 - b. Smoke evacuation system
 - 1. signal wire: 3-core 2.0mm x 1 (V+, V-, S)
 - 2. Load power wire: 2.0mm x 2 (B+, B-) and should not with signal wire at same conduit, the high & low voltage must be separated.
 - If damper voltage is 24VDC, it could use the same wire as the load power wire of fire alarm system.
 - If damper voltage is 110/220VAC, it needs own power wire.
 - c. Sprinkler system
 - 1. Signal wire: 3-core 2.0mm x 1 (V+, V-, S)
 - 2. Load power wire: 2.0mm x 2 (B+, B-) and could use same wire as load power wire of fire alarm system.
- E. Transmitting range: Max. 1000 meters
- F. Accumulation time: 20~60 seconds (upon module)
- G. Installation limit of detector (each module)
 - a. Heat detector: No limit except the electronic type.
 - b. Smoke detector : Max. 30 units.
- H. Control panel provides several communication interfaces :
 - a. Two RS485 interfaces, one for annunciator activation & another for mimic panel.
 - b. Communication control contact for PA system.
 - c. Use RS232 interface and modem for remote control.

4. Configurations :



5. Panel's Specifications (model : AH-00216)

- A. Main power : 110/220VAC 60Hz
- B. Standby power : 24VDC 4/8/12AH
- C. Charging voltage : 26VDC 100mA~1000mA (with auto adjustment)
- D. Loop voltage : 24VDC Short circuit voltage : 5V 30mA
- E. External resistance : Round-trip under 500V 50ohms
- F. Main bell : Electronic sound (buzzer), alarm: above 85dB, disconnection: above 65dB.
- G. System display zone of different functions.
 - a. Fire alarm system display zone (total zones of alarm activation, disconnection and fault)
 - b. Smoke evacuation system display zone (total zones of evacuation activation, disconnection and fault)
 - c. Sprinkler system display zone (total zones of sprinkler activation, disconnection and fault) Every system display zone has inquiry button on the side to check the current status.
- H. The Liquid Crystal Display (LCD) operator interface provides :
 - a. Event location
 - b. Event date
 - c. Event time
 - d. Module location
 - e. Event status
 - f. Event number

*** The [Previous page] , [Next page] and [Total review] buttons assist user to view the latest situation and history data, internal data pool can record 256 current events.
- I. Operating control board
 - a. Indicator: AC indicator, battery indicator, disconnection indicator, attention switch indicator, manual call point indicator, telephone indicator, water shortage indicator, water drawing indicator & pump indicator.
 - b. Fault indicator: AC power fault indicator, battery power fault indicator, module power fault indicator & load power fault indicator.
 - c. Control switch : Main sound, area sound, simultaneous activation, battery test, load power test, accumulation switch & reset switch.
 - d. Fire indicator
 - e. Voltmeter
- J. Built-in printer : Flush-type, paper width 57mm.
- K. Telephone device : Flush-type phone.
- L. Material : Pearl-gray painted steel, 1.6mm thick.

6. Features Description

- A. System Display Zone Of Distributed Function

When field conventional type detector or manual call point start activation, alarm signal will be sent to control panel via module. However, addressable detector or manual call point could directly send alarm signal to control panel. Loop disconnection and fault signal are transmitted the same way as activation. The condition of module (fire alarm, Smoke evacuation, sprinkling) will be showed on display zone, its total event # is showed by number, press the inquiry button for priority condition handling.
- B. LCD Screen
 - a. Use [Previous page] + [Next page] to read before and after the current data.
 - b. [Previous page] + [Total review] to check operation status, loop number and module number.
 - c. [Next page] + [Total review] to check the latest 256 history data.
 - d. [Previous page] + [Next page] will show 4 selections-- (Two data print out), (All data print out), (Record data delete), (Exit). Clear and easy to operate.
- C. Accumulation Switch

This function is to minimize false alarm that caused by pulse or messy signal.
- D. Attention Switch

If any of control switch is not in position, [Attention Switch] will blink. This signal will disappear when all control switches are in position.
- E. Main Sound Switch

Use different frequency of sound to distinguish activation, disconnection, defect of module and various condition of control panel. The designation of reversible switch could temporary turn off the sound from control panel, but it will sound again when received new alarm signal.
- F. Simultaneous Activation Switch

Area bell could active simultaneously or on certain floor as request.
- G. Fan Activation Delay Function

To protect the designation of windpipe and gate from compressed deformation, user can choose to activate smoke evacuation gate first and delay the activation of fan. When activation has released, fan will be turned off first and evacuation gate will be closed after a delay.

H. Single System Transmission Function

When control panel is dual-system structure, user can use single system transmission to maintain normal operation in case any error happened.

I. Time Adjustment

Control panel has function of time recording, so the correct time could be adjusted from inside the control panel.

J. Indicating Lamp Power-Save Device

Control panel equipped with 2 sets of batteries for system & load standby power. When control panel is using battery power, power-save device will temporarily turn off the power of external indicating lamp but it will blink once the module is activated.

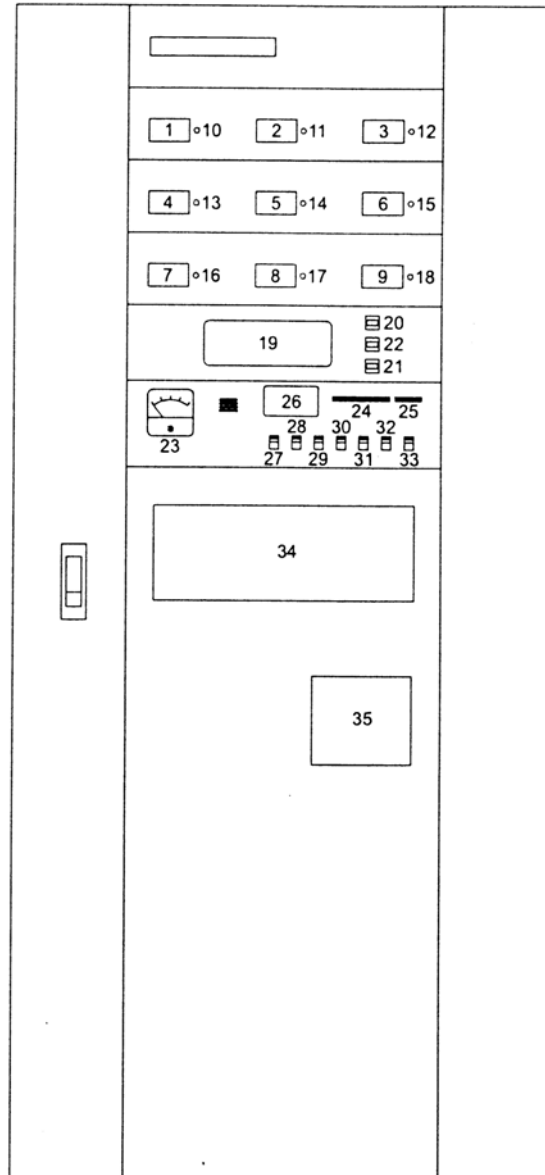
K. Over-Current Protection device

If short circuit or over-current happened during the operation of module, this device could isolate the feedback voltage on signal transmission wire between control panel and module.

L. Flush-type printer, paper width 57mm, can print out current data or history data during activation of control panel.

M. All data programs of area arrangement and relevant simultaneously control for fire alarm, smoke evacuation and sprinkler will not lose memory due to the power-off.

7. Description of Surface Board



1	Total zones of alarm activation	17	Total zones of disconnection	25	AC power fault indicator
2	Total zones of disconnection	18	Total zones of fault		Battery power fault indicator
3	Total zones of fault	19	LCD screen		Module power fault indicator
4	Total zones of evacuation activated	20	Previous page		Load power fault indicator
5	Total zones of disconnection	21	Next page	26	Fire indicator
6	Total zones of fault	22	Total review	27	Main sound
7	Total zones of sprinkler activation	23	Voltmeter	28	Area sound
8	Total zones of disconnection	24	AC indicator	29	Simultaneous activation
9	Total zones of fault		Battery indicator	30	Battery test
10	Zone inquiry of alarm activation		Disconnection indicator	31	Load power test
11	Zone inquiry of disconnection		Attention switch indicator	32	Accumulation switch
12	Zone inquiry of fault		Manual call point indicator	33	Reset switch
13	Total zones of evacuation activated		Telephone indicator	34	Telephone
14	Total zones of disconnection		Water shortage indicator	35	Paper-out
15	Total zones of fault		Water drawing indicator		
16	Total zones of sprinkler activation		Pump indicator		



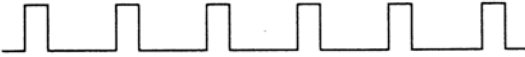


8. Description of Module System

Module has two VR switches for coding, single digit 0~9 are use decimal system & double digit 0~F is use sixteen decimal system. Which will make coding much easier.

System includes module, addressable detector base, output module, monitor module, isolator module and addressable manual call point.

A. Control module (Model : AH-00217)



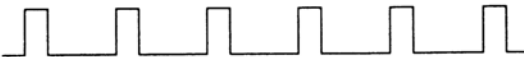


- a. 1-input and 1-output (model-00217B), 1-input and 2-output (model-00217T)
- b. With functions of addressable code, fire alarm transmitting, disconnection signal and simultaneous activation. Memory would not loss due to power-off.
- c. Different interval frequency for different status (transmitting, disconnection and alarm) by LED signal under normal operation. See diagram below :

<u>Status</u>	<u>Module LED Signal</u>	
Normal Transmission		(about once every 9 sec.)
Normal & Output		(about twice every 9 sec.)
Disconnection		(about once every 3 sec.)
Disconnection & Output		(about twice every 3 sec.)
Activation		(every blinking is 3 sec.)

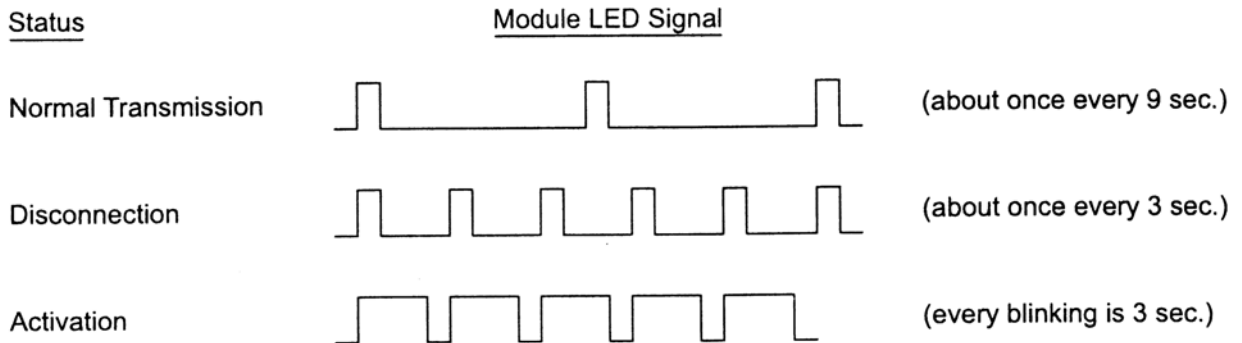
- d. In accordance with all kind of conventional or addressable detector.
- e. Module is designed to separate the input and output for easy maintenance.
- f. Each loop can connect up to 30 smoke detectors, but detector without inner resistance is not limited.
- g. Sounding method of area bell can be controled by software.
- h. Built-in contacts can directly connect to manual call point and transmit signal without via accumulating function of control panel.
- i. The capacity of output NO/NC contact is 30VDC 1.5A, 110/220VAC 0.75/0.35A. Dual output (model : 217-2) has two sets of dry contacts.
- j. Communication between panels uses EMT and 2.0mm 3-core wire.
- k. Installation method has selection of exposed-type or flush-type depends on field condition.

B. Addressable detector base (Model : AH-00118)

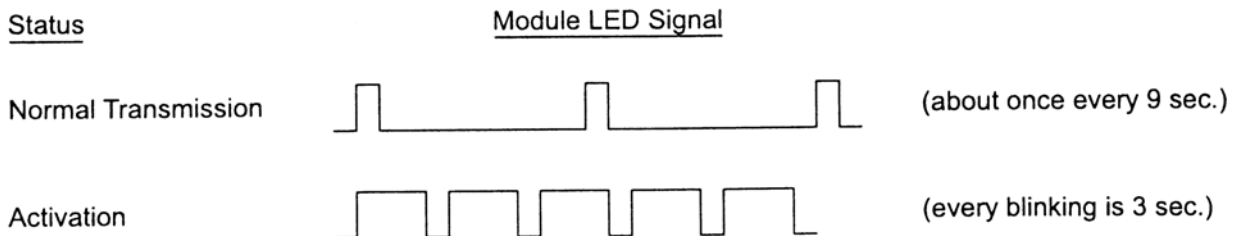
- a. With functions of addressable code, fire alarm transmitting, disconnection signal and simultaneous activation. Memory would not lost due to power-off.
- b. Different interval frequency for different status (transmitting, disconnection and alarm) by LED signal under normal operation. See diagram below :

<u>Status</u>	<u>Module LED Signal</u>	
Normal Transmission		(about once every 9 sec.)
Normal & Output		(about twice every 9 sec.)
Disconnection		(about once every 3 sec.)
Disconnection & Output		(about twice every 3 sec.)
Activation		(every blinking is 3 sec.)

- c. Applicable to all kind of Horing Lih's smoke, heat and flame detectors, no need to change the base for detector replacement.
 - d. Able to connect with conventional detectors at same loop to expand effective alarm area.
 - e. Sounding method of area bell can be controlled by software.
 - f. The capacity of output NO/NC contact is 30VDC 1.5A, 110/220VAC 0.75/0.35A.
 - g. Installation method has selection of exposed-type or flush-type depends on field condition.
 - h. Communication between panels uses EMT and 2.0mm 3-core wire.
- C. Output module (Model : AH-00217A)
- a. It has built-in higher voltage contacts, and activate simultaneously with control module and addressable detector.
 - b. Input power source contact and NO/NC contacts of 110VAC 10A / 220VAC 7A.
 - c. Output power is auto adjustable by input power. If the input power is 220VAC, the output power would be 220VAC.
 - d. Installation method has selection of exposed-type or flush-type depends on field condition.
 - e. Communication between panels uses EMT and 2.0mm 3-core wire.
- D. Monitor module (Model : AH-00217K)
- a. With functions of addressable code and transmitting of outsource signal. Memory would not lost due to power-off.
 - b. Different interval frequency for different status (transmitting, disconnection and alarm) by LED signal under normal operation. See diagram below :



- c. The function of disconnection detecting.
 - d. Low consumption current of transmission, high stability.
 - e. Compact size that makes easier to installed at conduit or junction box.
 - f. Communication between panels uses EMT and 2.0mm 3-core wire.
- E. Isolator (Model : AH-00217H)
- a. If a short circuit occurs, the section of cable between the two adjacent isolators will be disconnected, the rest of the loop will be protected and maintain normal operation. The quantity of isolator used and interval distance between isolators should depends on the design of installed building.
 - b. Installation method can select exposed-type or flush-type depends on field condition.
 - c. Communication between panels uses EMT and 2.0mm 3-core wire.
- F. Addressable manual call point (Model : AH-00119)
- a. With functions of addressable code, fire alarm transmitting, disconnection signal and simultaneous activation. Memory would not loss due to power-off.
 - b. Different interval frequency for different status (transmitting, disconnection and alarm) by LED signal under normal operation. See diagram below :



- c. Communication between panels uses EMT and 2.0mm 3-core wire.

9. Preparation Prior Installation

- A. Organize the number of system loop and module by the blue print on site.
- B. Program the zone information into control panel's EP ROM.
- C. Module programming sample :

Module Number	Zone Identification	Module Type
1101	BF-A, Fire-fighting panel	AH-00217B
1102	BF-A, Monitor room	Smoke detector

10. System Wiring Instructions

- A. Wiring description
 - a. System wire -- Signal wire (V+,V-,S)
 - b. Non-system wire -- Area bell wire
 - Indicating lamp wire
 - Telephone wire
 - AC power wire
 - PA system wire
- System & non-system wire should not at same conduit, the conduit is suggested to be made of metal to have better result on grounding.
- When wiring is completed, do the insulation test first and then connect with control panel and other ancillary device.
- Do not use too much wire during installation to avoid friction when place wire into junction box and even cause the electric leakage.

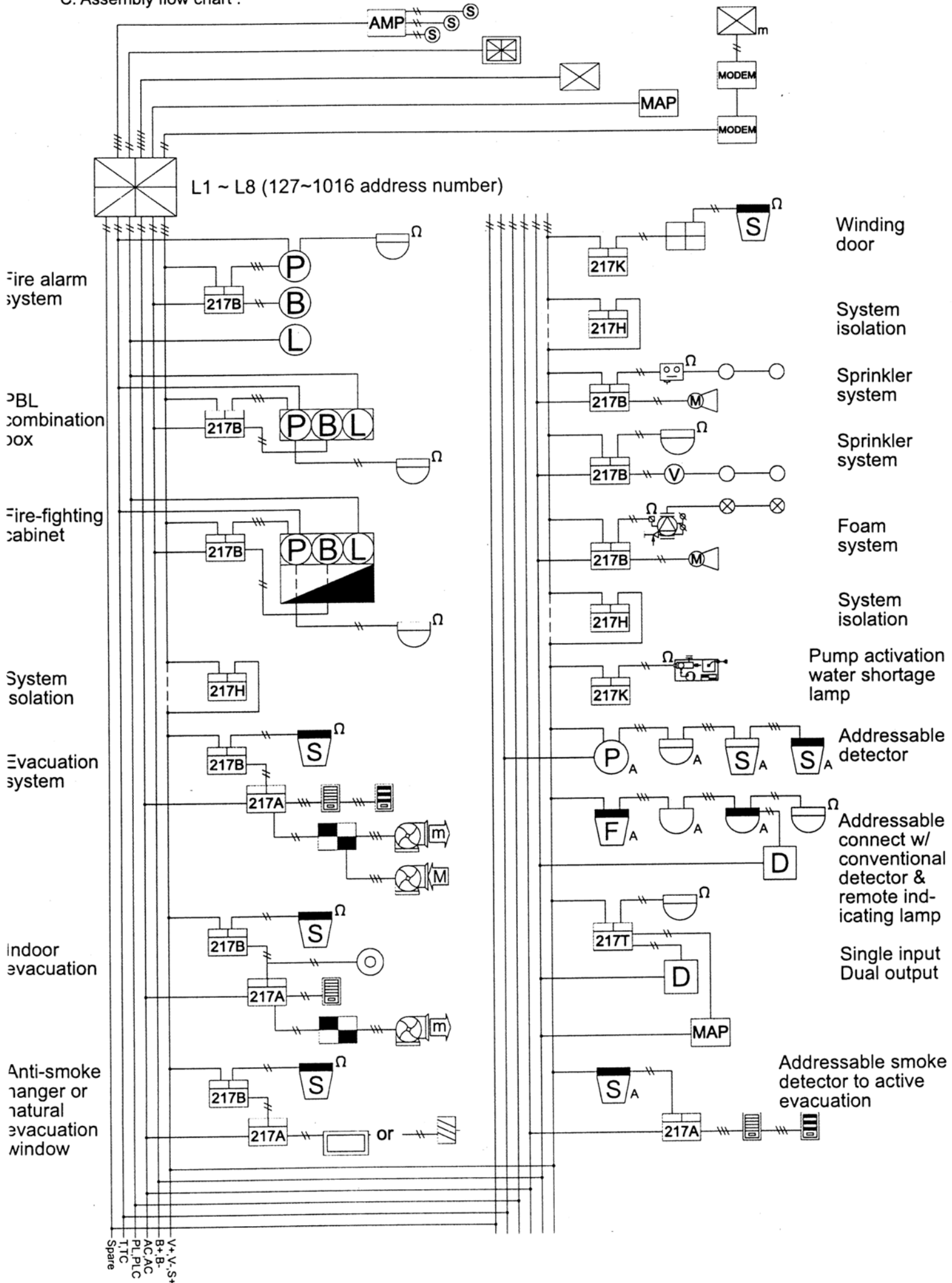
* Major Inspection Point After Installation

- A. Does the external wire normal (check for disconnection & short circuit)
- B. Does the control board in normal condition.
- C. Visual inspection (any abnormal lighting)
- D. Self test.

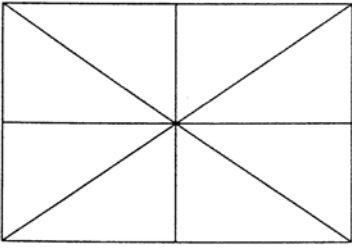
B. Symbol descriptions :

1		R-type control panel	26		Rate of rise detector
2		R-type annunciator	27		Fixed temperature detector
3		Remote control annunciator	28		Combination heat detector
4		Graphic control panel	29		Smoke & heat detector
5		PA panel	30		Evacuation damper
6		Remote modem	31		Ventilating damper
7		Mimic panel	32		Evacuation fan control panel
8		Control module-217B	33		Air-out fan motor
9		Control module-217T	34		Air-in fan motor
10		Monitor module-217K	35		Natural evacuation window
11		Output module-217A	36		Anti-smoke hanger
12		Isolator module-217H	37		Winding door control panel
13		Addressable smoke detector	38		Sprinkler head
14		Addressable rate of rise detector	39		Foam head
15		Addressable fixed temperature detector	40		Pressure switch
16		Addressable combination heat detector	41		Electromagnetic valve
17		Addressable smoke & heat detector	42		Waterflow detector
18		Addressable flame detector	43		Alarm valve
19		Addressable manual call point	44		Sprinkler/foam pump
20		Fire-fighting cabinet	45		PA speaker
21		PBL combination box	46		Remote indicating lamp
22		Manual call point	47		Emergency evacuation initiation device
23		Alarm bell	48		
24		Indicating lamp	49		
25		Smoke detector	50		

C. Assembly flow chart :



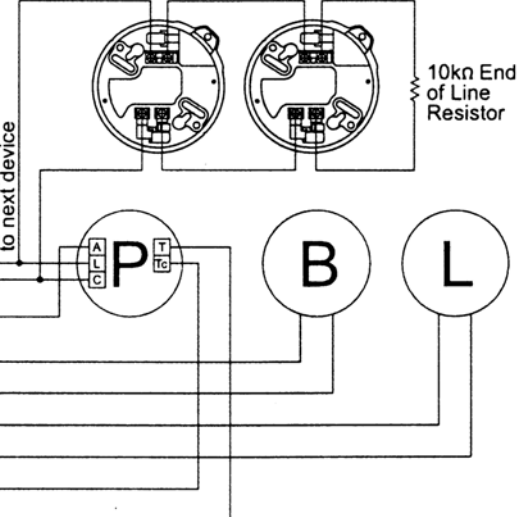
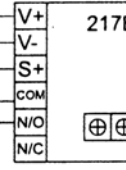
11. Wiring Diagram (A)



T Tc PL PLc Ac Ac B+ B- V+ V- S+

Fire alarm system

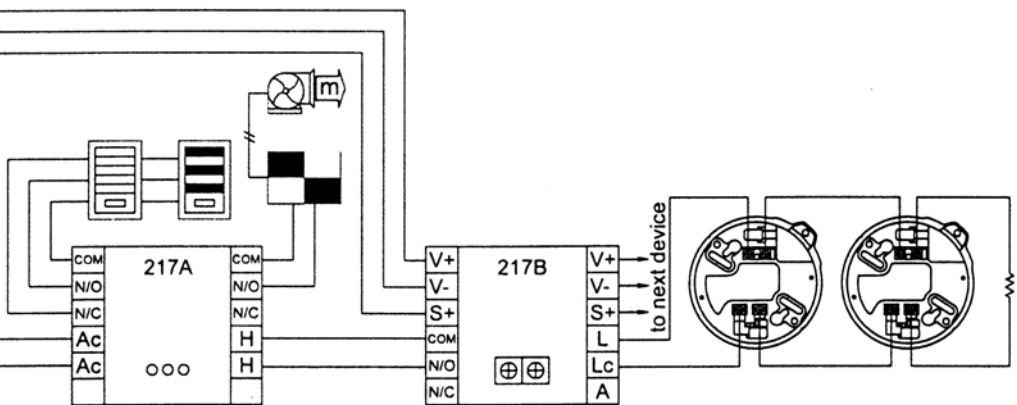
(Model : AH-00217B)



Evacuation system

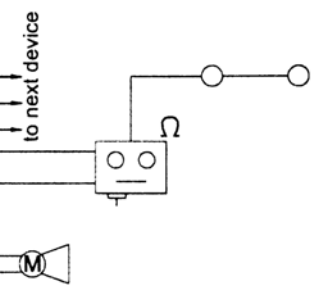
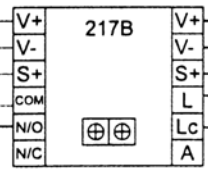
(Model : AH-00217A)

(Model : AH-00217B)

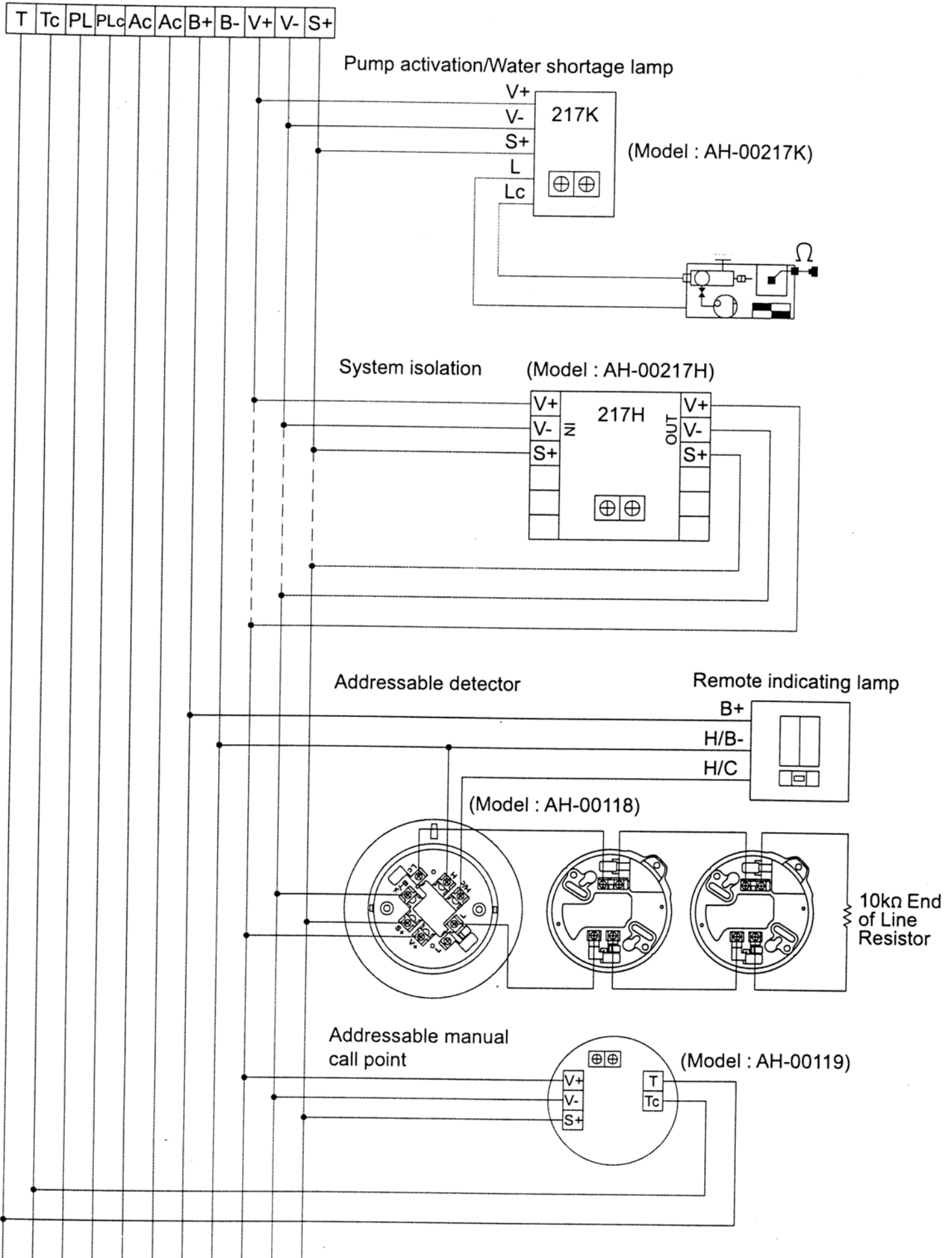


Foam system

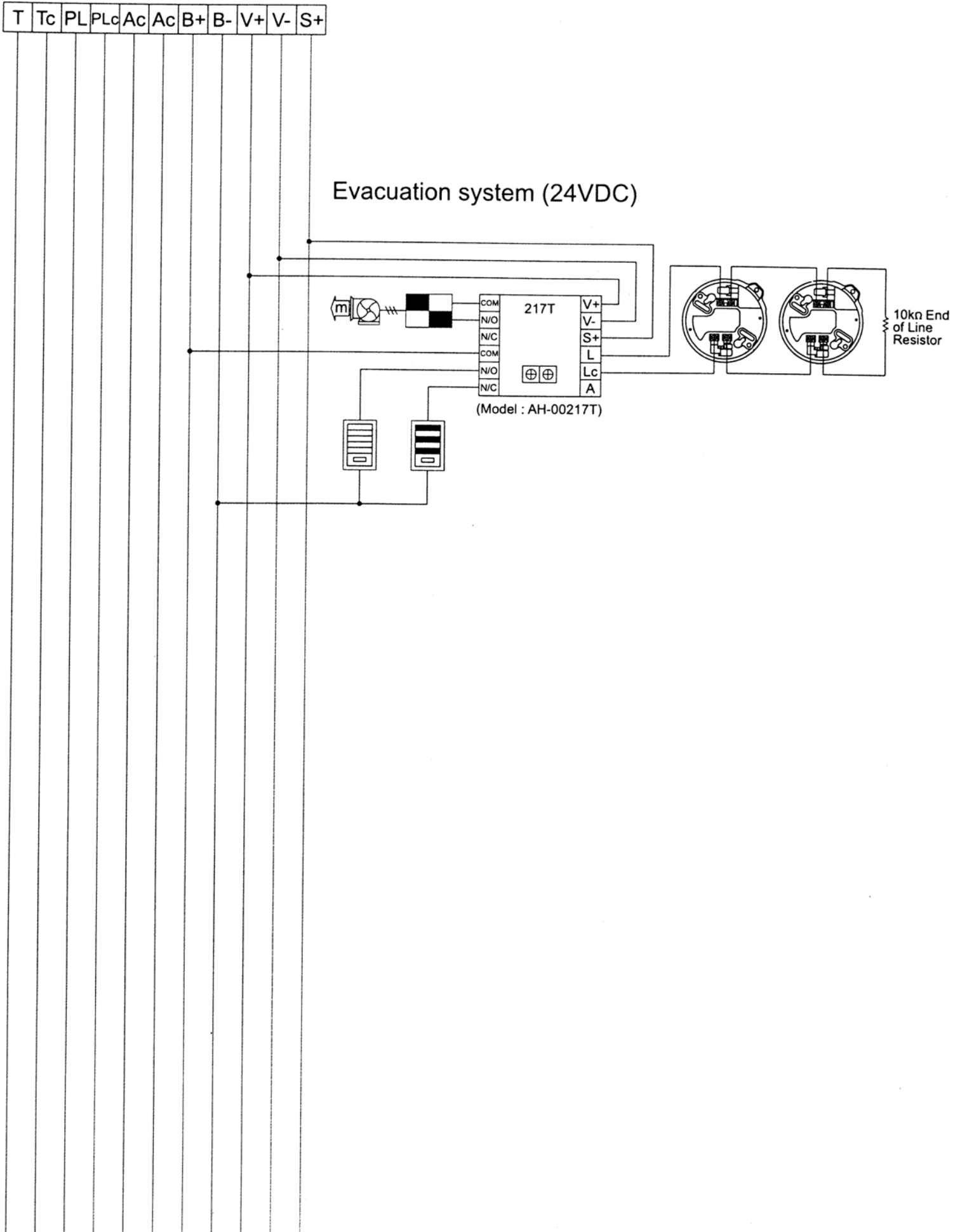
(Model : AH-00217B)



11. Wiring Diagram (B)

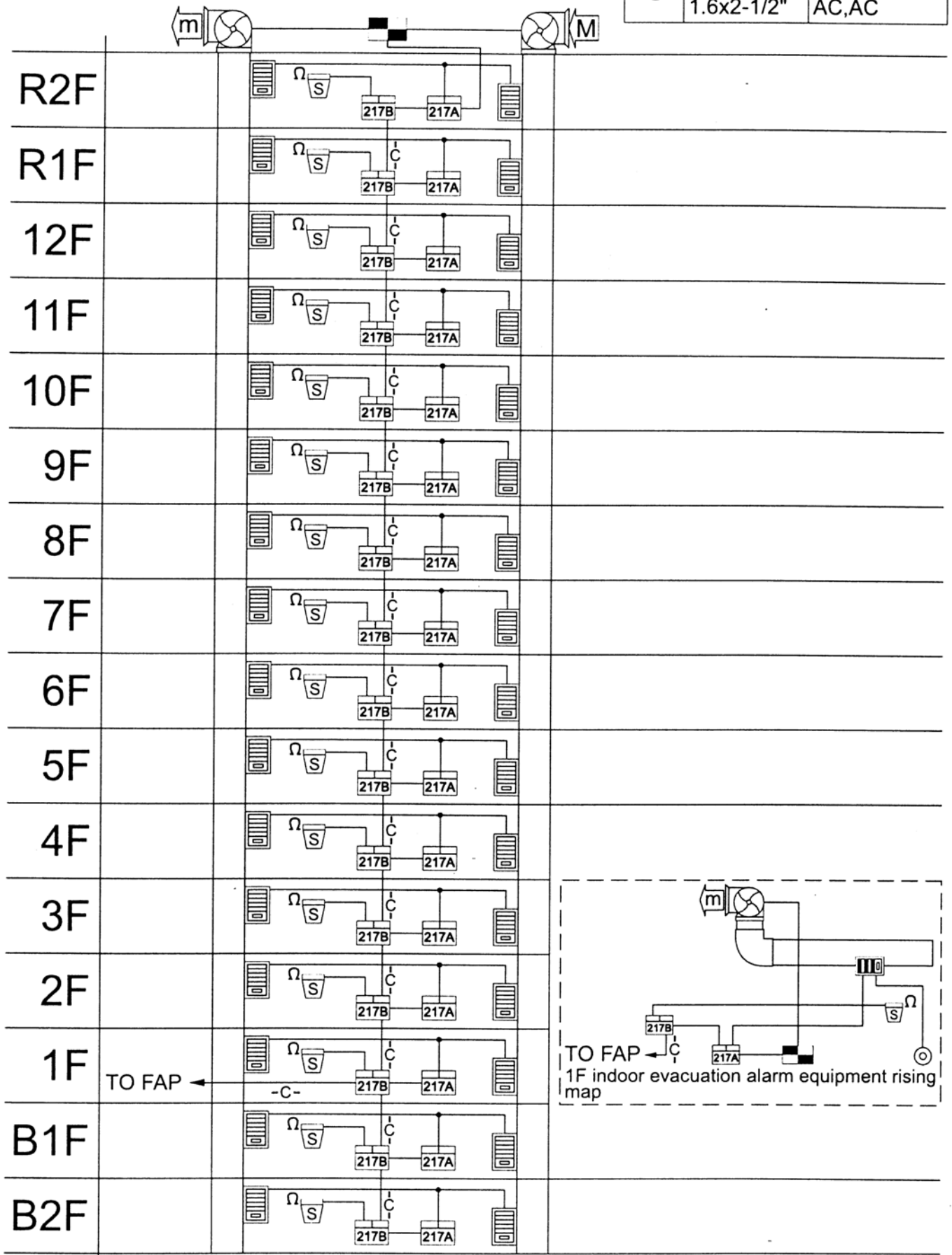


11. Wiring Diagram (C)



13. Evacuation Alarm Equipment Rising Map

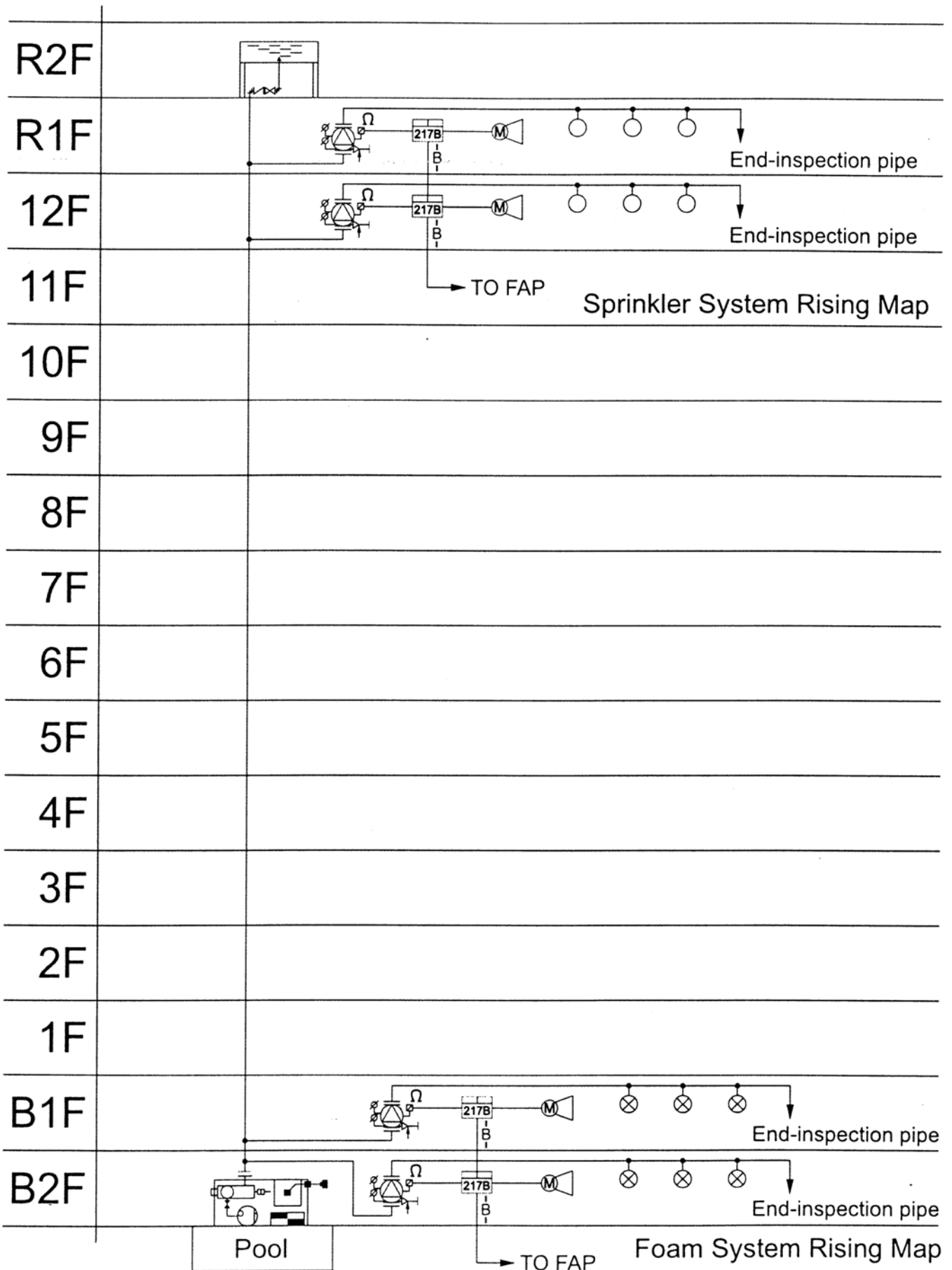
-C-	1.2x3C-1/2"	V+,V-,S+
	1.6x2-1/2"	AC,AC



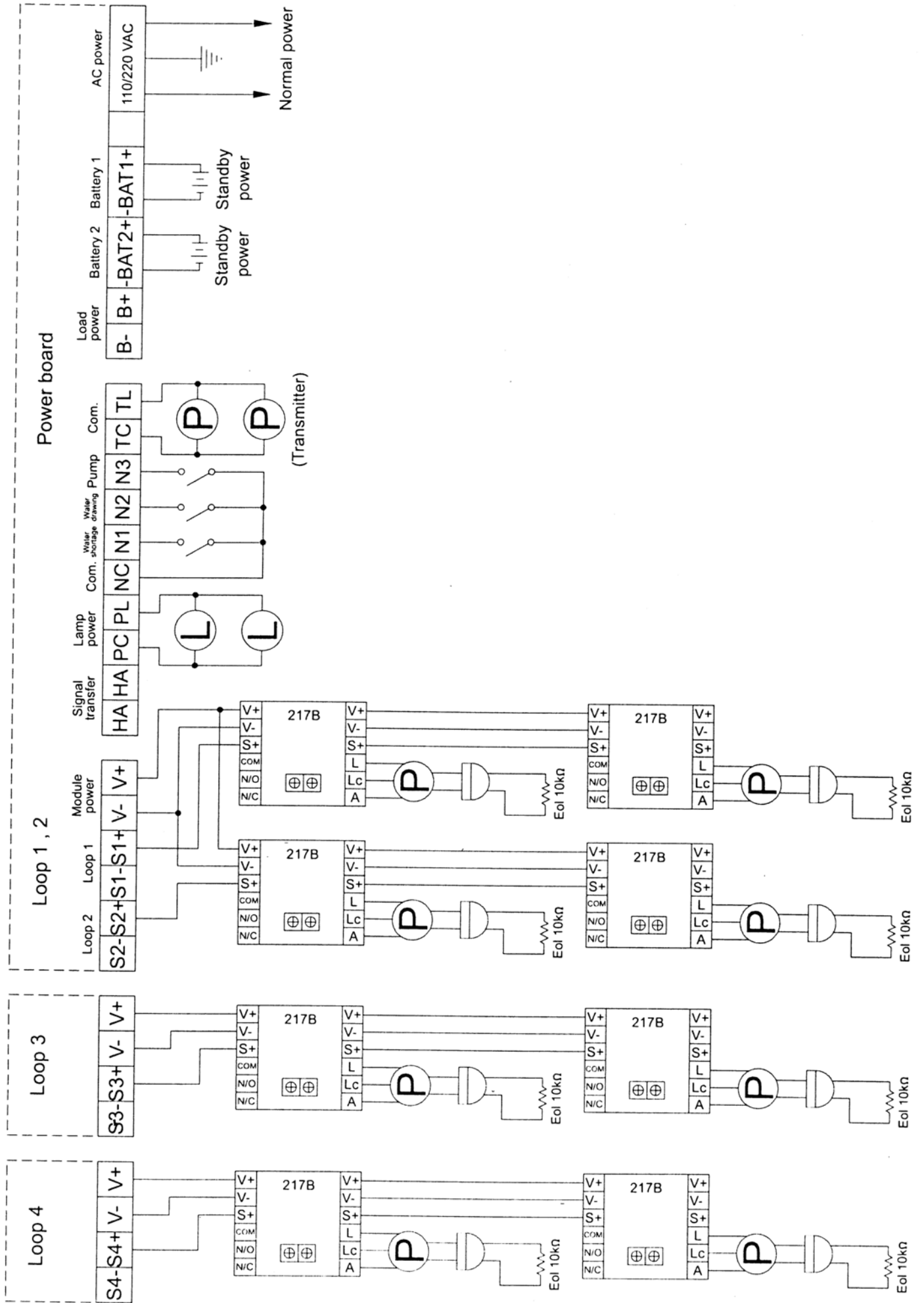
Evacuation alarm equipment rising map

14. Sprinkler & Foam System Rising Map

-B-	1.2x3C-1/2"	V+,V-,S+
	1.6x2-1/2"	B+,B-



15. Wiring Diagram of Control Panel



16. Major Inspection Point After Installation

- A. Does the external wire normal (check for disconnection & short circuit)
- B. Does the control board in normal condition.
- C. Visual inspection (any abnormal lighting)
- D. Self test

17. Simple Fault Elimination

Symptoms	Conclusions
AC power indicator OFF	Check AC power switch Check AC power fuse
Standby power failed	Check battery or DC power switch Check DC power fuse Test the battery for normalization
Fault indicator ON	Check the contents displayed on LCD screen
Fire status can not be reset	Check detector or manual call point
Printer fail to work	No paper No power
Telephone does not work	Check telephone wire for connection
Module keep sending disconnection signal to control panel, and module's disconnection indicator is ON	Check wire connection between detector and base or module
Control panel dose not received alarm signal when module is active.	Check wire connection between module and control panel
Fire indicator does not light ON	Check whether bulb is burnt, external wire is disconnected or fuse is burnt
Alarm bell unable to sound	Check the wire connection Check the bell for normal operation Check the module for bell contact
Fan unable to active	Check the module (no output) Check the fan (no power)
Evacuation damper unable to active	Check the module for output Check the damper for normal operation Check the damper for main power
Buzzer unable to sound	Check the module's buzzer contact Check the buzzer for normal operation Check the input power
Smoke detector false alarm	Check the "B+" fuse on control panel Check the detector for normal operation Check the detector for dust pollution Check the module for normal operation
Heat detector false alarm	Check the detector for normal operation Big change on ambient temperature High ambient humidity Check the module for normal operation