

Fire Alarm Control Panel

**Installation, Commissioning & Operating
Manual**

RAVEL ELECTRONICS PVT LTD.,
150-A, Electronics Industrial Estate,
Perungudi, Chennai - 600 096.
Ph.: 91-44-24961004, 24960825.
Fax: 91- 44 - 42049599.

Fire Alarm System Limitations

An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual Call Points, audible warning devices, and a fire alarm control with remote notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire. The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premise following the recommendations of of IS 2189: 1999 and any other local codes of practice that are applicable. While fire alarm systems are designed to provide early warning against fire, they do not guarantee warning or protection against fire. A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles of combustion or "smoke" from a developing fire may not reach the sensing chambers of smoke detectors because:

- Barriers such as closed or partially closed doors, walls, or chimneys may inhibit particle or smoke flow.
- Smoke particles may become "cold," stratify, and not reach the ceiling or upper walls where detectors are located.
- Smoke particles may be blown away from detectors by air outlets.
- Smoke particles may be drawn into air returns before reaching the detector.

The amount of "smoke" present may be insufficient to alarm smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm.

Smoke detectors, even when working properly, have sensing limitations. Detectors that have photo electronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is necessarily best and a given type of detector may not provide adequate warning of a fire.

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).

While a fire alarm system may lower insurance rates, it is not a substitute for fire insurance!

Heat detectors do not sense particles of combustion and alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist. *Heat detectors are designed to protect property, not life.*

IMPORTANT! Smoke detectors *must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power.* If detectors are not so located, a developing fire may damage the alarm system, crippling its ability to report a fire.

Audible warning devices such as hooters and bells may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol or medication.

Please note that:

- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.
- Studies have shown that certain people, even when they hear a fire alarm signal, do not respond or comprehend the meaning of the signal. It is the property owner's responsibility to conduct fire drills and other training exercise to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.
- In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A fire alarm system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been maintained properly.

Equipment used in the system may not be technically compatible with the control panel. It is essential to use only equipment listed for service with your control panel.

The most common cause of fire alarm malfunction is inadequate maintenance. To keep the entire fire alarm system in excellent working order, ongoing maintenance is required as per the manufacturer's recommendations. Environments with large amounts of dust, dirt or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer's representative. Maintenance should be scheduled monthly or as required by National and/or local fire codes and should be performed by authorized professional fire alarm installers only. Adequate written records of all inspections should be kept.

NOTES:

Table of Contents

CHAPTER 1: Introduction	7
1.1: System Design & Planning.....	7
1.2: General	7
1.3: Fire Alarm Procedure	8
1.4: User Responsibility.....	8
1.5: Routine test.....	9
CHAPTER 2: Product Description	10
2.1: Product Features	10
2.2: Specifications	11
2.3: Controls and Indicators	12
2.3.1: LED Indication.....	12
2.3.2: Controls.....	13
2.4: Mechanical Construction.....	14
CHAPTER 3: Installation	15
3.1: Installation Precaution.....	15
3.2: Mounting Details	17
3.3: Input Circuits.....	18
3.4: Output Circuits	19
CHAPTER 4: Operating Instructions.....	20
4.1: Switch Functions	20
4.2: Status LED.....	21
4.3: Operation.....	22
4.3.1: Zone Fault Response	22
4.3.2: Zone Fault Restoral	22
4.3.3: Zone Fire Response	22
4.3.4: Zone Fire Restoral	23
4.3.5: Zone Isolate.....	23
CHAPTER 5: Servicing.....	24
5.1: Walk test mode... ..	24
5.2: Installation/Replacement of PCB.....	25
5.3: Test.....	25
5.4: Lamp Test.....	26
CHAPTER 6: Power Calculation.....	26
CHAPTER 7: Trouble Shooting.....	27
CHAPTER 8: Wire Requirement.....	28
CHAPTER 9: Abbreviation.....	29
General Arrangement diagram.....	30

Chapter 1: Introduction

This manual is intended as a complete guide to the RE 150D model Conventional Fire Control Panel. User operating Instructions are provided in the first part of this manual. This is followed with sections describing installation and commissioning procedures and full technical details are provided.

1.1 System Design and Planning

It is assumed that the system, of which this control panel is a part, has been designed by a competent fire alarm system designer in accordance with the requirements of IS 2189: 1999 and any other local codes of practice that are applicable. The design drawings should clearly show the positions of the field devices and the control equipment.

1.2 General

The panel is self-contained with integral power supply and space provision for two sealed lead-acid standby batteries and comply with the requirements of IS 2189: 1999. The panel functions are microprocessor controlled and test and isolate functions are included. Provision is made for a repeater function of panel status output. The panel can accept, per zone, automatic detectors with a total maximum loading of 2.4mA quiescent current rating (refer to chapter 2.2), and an unlimited number of manual call points.

End of Line (EOL) devices

The panels can continue to monitor manual call points with detectors removed, providing the detectors are fitted with a Schottky diode and an a EOL device is used.

Installation

The panel is easy to install and operate. The panel fascia is retained by tamper-proof screws.

1.3 Fire Alarm Procedures

In accordance with IS 2189: 1999, written procedures should be laid down for dealing with alarms of fire, fault warnings, and the isolation of any part of the system. The responsible person should ensure that users of the system are instructed in its proper use and are familiar with the procedures.

On hearing the fire alarm:

CARRY OUT THE PRESCRIBED PROCEDURE Subsequent actions will depend on the circumstances, and may include silencing the audible alarms and resetting the system, as described later.

Fault Indication:

If the control panel indicates a Fault condition, make a note of all illuminated indicators, refer to the chart on **Page 27**, and call the service engineer.

1.4 User Responsibility

In addition to the routine testing described on routine test, the user has a responsibility for ensuring certain actions are taken following a fire or fault, and for implementing remedial action following a specified incidence of false alarms. As a minimum, the user shall record any incident and inform the service organization, who may be required to retest the system. The user's responsibilities are described fully in IS 2189: 1999.

1.5 Routine Testing

In order to ensure that the system is fully operational, and to comply with the requirements of IS 2189: 1999, the following routine attention is recommended:

Daily - Check the panel to ascertain that it indicates normal operation. If any fault is indicated check that it has been recorded and that the appropriate actions have been taken, e.g. informing the maintaining company.

Weekly - Test at least one detector or call point to confirm the operation of the panel and the audible alarms. Test a different zone each week and, if possible, a different device. Keep a record of the device and zone tested each week. Record and report any malfunction.

Quarterly - The responsible person should ensure that every three months the system is checked by a competent person. Check the standby batteries and the charger voltage Test at least one device in each zone to check the panel functions. Check the operation of the audible alarms and any link to a remote manned centre, Central Station, etc. Carry out a visual inspection of the installation to check for alterations or obstructions and issue a certificate of testing.

Annually - The responsible person should ensure that, in addition to the quarterly checks, each device on the system is tested and that a visual inspection is made of the cable fittings and equipment.

Note: The control panel case should be cleaned periodically by wiping with a soft, damp cloth. **Do not** use any solvents.

Chapter 2: Product Description

The RE – 150D is a 2 zone microprocessor based conventional Fire Alarm Control Panel. The Panel accepts water flow devices, conventional input devices like 2 wire smoke detectors, pull stations and other normally open contact devices. The Outputs include Notification Appliance Circuits (sounders), Three Form – C relays for alarm. It supervises all wiring, AC voltage and Battery level.

2.1 Product Features

- Fully confirms IS 2189: 1988
- 16SWG Rugged CRCA with powder coated finish.
- Modular construction.
- Operates on 230V, A.C supply.
- Battery backup with built in charging.
- 16x2 LCD Dot matrix Display.
- Fire / Fault status in unambiguous coloured LED indication.
- Low battery / battery fail warning audio / visual indication.
- A.C fail audio / visual warning.
- Charger fail audio / visual warning
- System on, AC on, Battery on & Charger on indications
- Potential Free Relay Contacts for actuators.
- Lamp test facility.
- One man walk test facility.
- Compatible to all types of conventional detectors.
- Twin RED LED indication for fire.
- Zone Isolation facility with loop voltage cut off.
- Earth Fault with Audio and Visual Indications.
- Supervised Sounder 24v DC output for External notification devices (Sounder, Bell, etc.).

2.2 Specification

AC Power

220-240 VAC, 50 Hz.

Wire size: 1.5 Sq. mm with 600V insulation

Battery (Lead Acid only)

Charging: Constant Voltage – 27.6v @ 0.5A

Charging Capacity: 26 Amp Hour Battery Max.

System Quiescent Current: 70mA + (4.4 – 6.8mA per zone)

Initiating Device Circuits (Zone Circuit)

All zones are Class B wiring

Normal Operating Voltage: Nominal 24 VDC

Alarm Current: 15 – 35mA threshold

Short Circuit Current: 42mA Maximum

Loop resistance: 50 ohms Maximum

End-Of-Line Resistor: 4.7K, 1/4watt

Standby Current: 6.8mA (2.4mA for Detectors)

Notification Appliance Circuits (Sounder Circuit)

Class – B wiring

Operating Nominal Voltage: 24 VDC

Hooter (NACs) output: 0.2A X No. of zone

End-Of-Line Resistor: 4.7K, 1/4watt

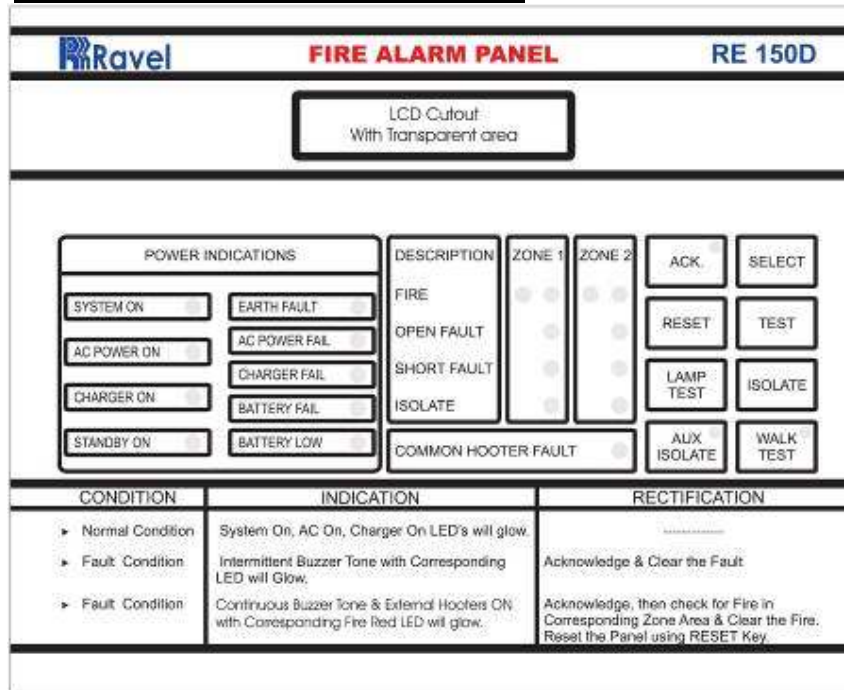
Three Form – C Relays

Relay Contact Rating: 2Amps @ 30 VDC, 2Amps @ 30VAC (Fire – 3 No's).

24 VDC Power – For remote devices

Operating Voltage: 24VDC, 500mA Max.

2.3 Controls and Indication



2.3.1 LED Indication

- System On – Green
- A.C Power On – Green
- Battery On – Green
- Charger On – Green
- AC Power Fail – Yellow
- Battery Fail – Yellow
- Earth Fault – Yellow
- Battery Low – Yellow
- Common Hooter Fault – Yellow
- AUX. Isolate – Yellow
- Walk Test – Yellow
- Silence – Yellow
- Zone Fire – Red
- Zone Fault – Yellow
- Zone Isolate – Yellow

Local Buzzer

A piezo buzzer provides separate and distinct sounds for alarm and trouble conditions:

- Alarm – steady
- Fault – pulse 0.5sec ON and 0.5sec OFF

2.3.2 Controls

SELECT, TEST and ISOLATE Keys: The SELECT is used to select any particular zone for isolation or for test. When it is pressed, zone 1 will be selected first with the identification of ISOLATE LED blinking; consecutive SELECT key presses can change the zone selection to 2. The particular zone can be isolated by pressing ISOLATE key or tested by pressing TEST key.

When pressing the ISOLATE by selecting the zone, the previous status of isolate LED will be interchanged, i.e. it may go from ON to OFF or OFF to ON. The ON status indicates that the zone has been isolated. By the time, no voltage will be there in the isolated zone loop. And the OFF status indicates that the zone has been normalized.

After the selection of particular zone, if the TEST key is pressed, that particular selected zone is tested with buzzer sound.

Note:

- a. We strongly recommend to avoid isolating any particular zone unless it is essential for maintenance purpose.*
- b. For zone isolation and their normalization, use ISOLATE key.*

ACK Key: During fire/fault condition, ACK key is used to silence the external Sounders (NAC) and the internal buzzer tone.

RESET Key: This key is pressed to reset the entire system and While in reset condition, all detector loop voltages are cut off up to 3 seconds for Detectors and MCPs, Then voltages are put on to the loop.

Note: The zone loop voltage will cut off only in fire condition during reset.

WALK TEST Key: For testing of detector or MCP, we can go for walk test mode by pressing this key. This mode can identify by walk test LED ON / OFF. And this same key is used to quit from walk test mode.

Note: During in walk test mode, if there is no more operation in the testing, automatically it will quit from walk test mode after 10 minutes.

2.4 Mechanical Construction

The enclosure of the Panel is constructed by CRCA sheet with powder coated finish and it's designed to afford the degree of protection as per IP-54. The \varnothing 19mm knock outs are given for cable entry at the top of the cabinet.

The panel also has a built in battery provision to accommodate 2 Nos. of 12v, 7Ah batteries (Up to 12 Zone).

The front side of the panel consists of the following,

- a. Tactile switches.
- b. LED indications

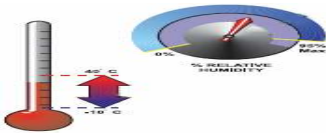
Chapter 3: Installation

3.1 Installation Precaution

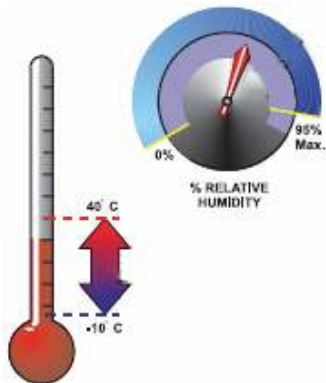


Installation Precautions

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until this manual is read and understood.



CAUTION - System Reacceptance Test after Software Changes. To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site-specific software. Reacceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.



This system meets NFPA requirements for indoor dry operation at 0-49° C/32-120° F and at a relative humidity of 93 ±2% RH (non-condensing) at 32 ±2° C/90 ±3° F. However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and all peripherals be installed in an environment with a nominal room temperature of 0-50° C/32-120° F.

Verify that wire sizes are adequate for all initiating and Indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

Adherence to the following will aid in problem-free installation with long-term reliability:

Like all solid-state electronic devices, this system may operate erratically or can be damaged when subjected to lightning-induced transients. Although no system is completely immune from lightning transients and interferences, proper grounding will reduce susceptibility. *Overhead or outside aerial wiring is not recommended, due to an increased susceptibility to nearby lightning strikes.* Consult with the Technical Services Department if any problems are anticipated or encountered.

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, and printed circuit board location.

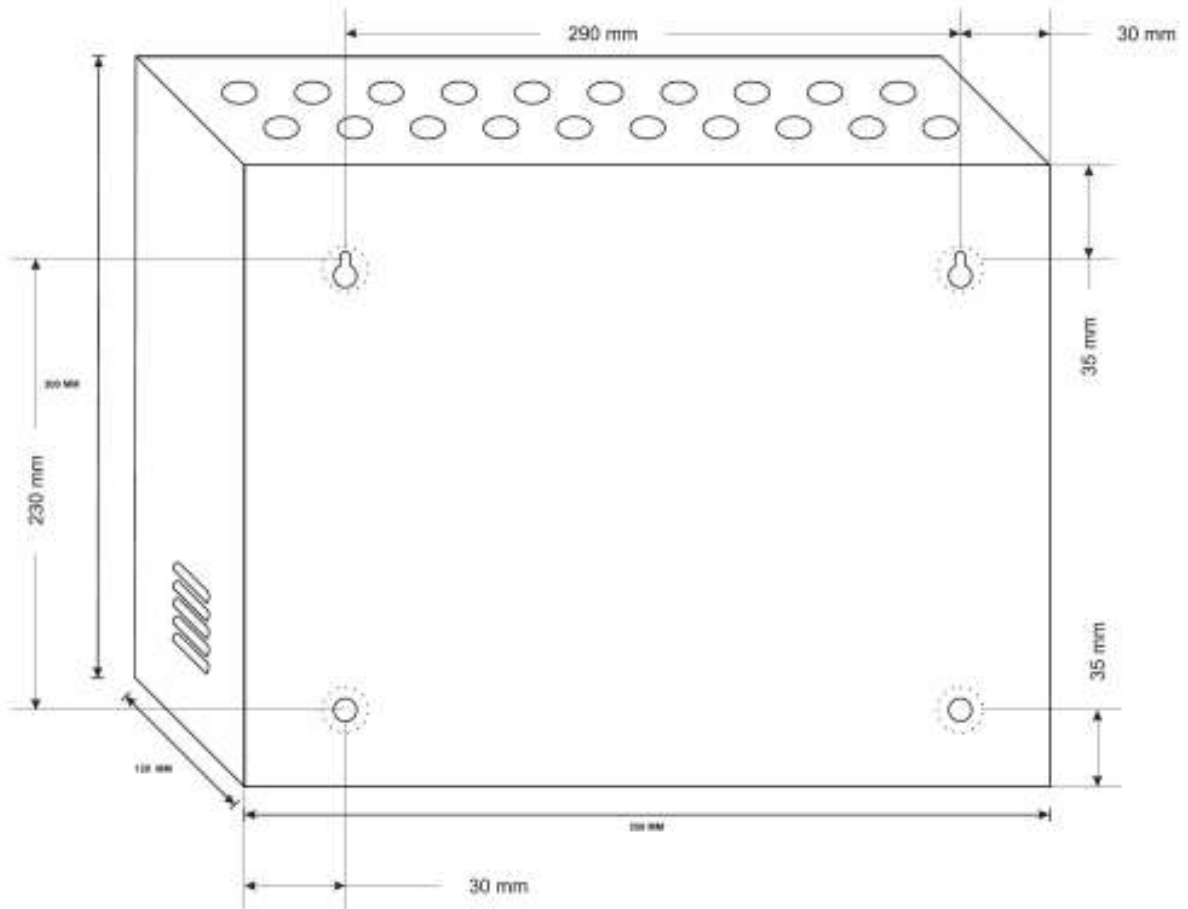
Do not tighten screw terminals more than 9 in-lbs.

Over-tightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

Though designed to last many years, system components can fail at any time. This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static-suppressive packaging to protect electronic assemblies removed from the unit.

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation by authorized personnel.

3.2 Mounting Details



Note: For Higher zones and apart from standard zone the size on request.

Place the panel in its mounting position and fix the panel to the wall using the slots of the four screws. Ensure the enclosure and the inner parts of the panel are given sufficient protection during installation. All external cables are to be entered via the $\varnothing 19\text{mm}$ preformed knockouts located at the top of the panel.

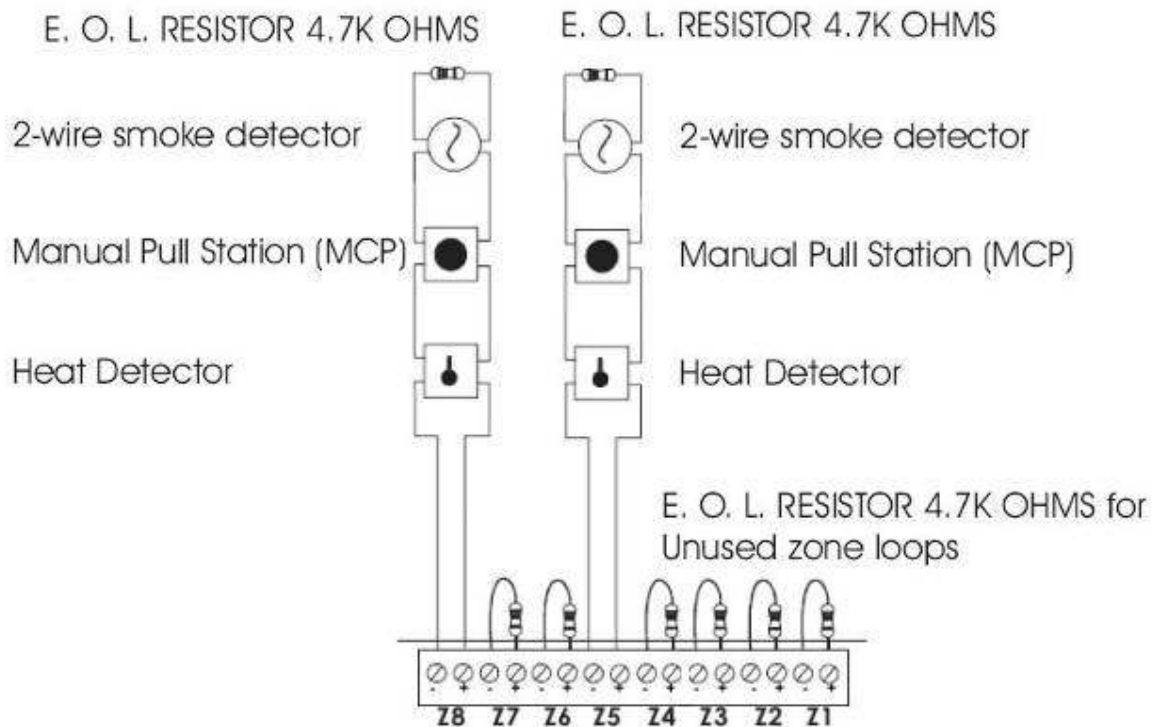
When the installation of all the cables has been completed, clean the interior of the enclosure ensuring all masonry debris and drilling swords are removed.

3.3 Input Circuits

The control panel has 2 zone input circuits depending on the variant. The maximum loop resistance limit for each input circuit is 50 ohms. All field wiring of each zone is supervised for opens and ground faults. Both conditions are visually and audibly (toggle tone) annunciated.

Each zone is a Class B Initiating Device Circuit (IDC – Zones) designed to accept any normally open contact devices and conventional 2-wire, 24 volt smoke detectors.

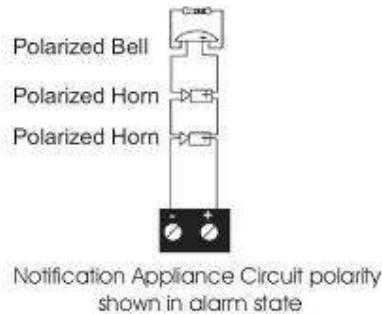
It is allowable to mix an assortment of device types (i.e. smoke detectors, heat detectors, pull stations, etc.) on any zone.



3.4 Output Circuits

Sounder Circuits: The RE – 150D provides Notification Appliance Circuits standard as Class B. The total load capacity of this circuit is capacity of this O/P may be calculated as no. of zones X 0.2Amps.

Class B Notification Appliance Circuit (Supervised) 4.7K ohms, ½ watt



E. O. L. RESISTOR 4.7K OHMS FOR UNUSED
NAC(Sounder) LOOPS

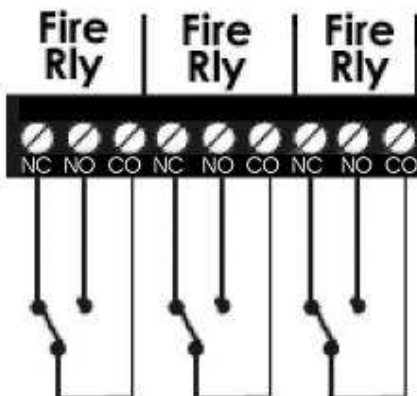
Sounder Circuit – Class B

Note: If the non polarized devices are used, connect the device as mentioned in page 27.

Standard Relay

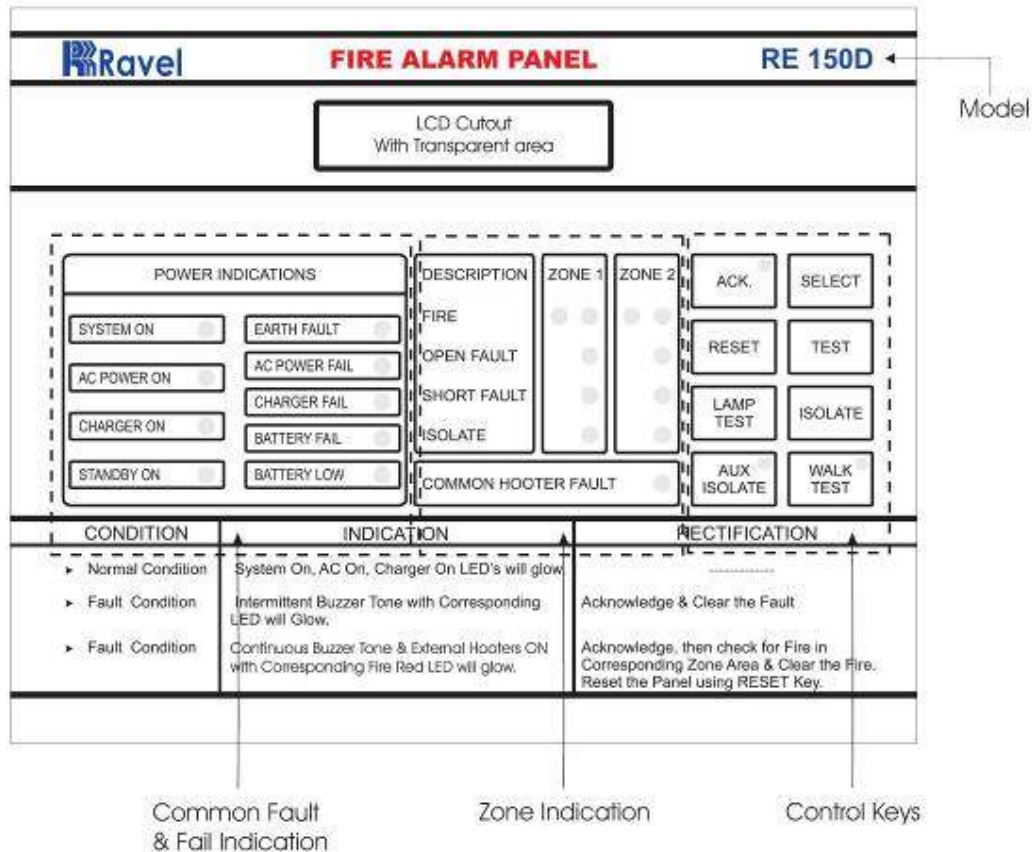
The control panel provides three Form-C relays rated for 2.0 amps @ 30 VDC and 2.0 amps @ 30 VAC.

Relay connections may be power-limited or nonpower-limited, provided that a minimum of 0.25" is maintained between conductors of power-limited and nonpower-limited circuits.



Relay contacts shown with power applied to the panel no active Fault or Fire

Chapter 4: Operating Instruction



4.1 Switch Functions

ACK Key: This key is used in Fire / Fault Condition. To acknowledge the external sounder / internal buzzer press this key. During fire condition, after silencing the silence LED glows to indicate that external Sounders (NAC) are silenced and authorized person is accessed.

RESET Key: This key is also used in only Fire Condition. The panel is reset by pressing this key and during reset condition, all the detector input voltages are cut off up to 3 seconds for Detectors and MCP's, Then voltages are put on to the loop.

LAMP TEST Key: This key is used to check the all LED's in panel is in good condition with continuous buzzer tone.

SELECT Key: This key is used to select the particular zone for the self test and isolation purpose.

TEST Key: This key is used to test all zone circuit automatically or selected zone.

ISOLATE KEY: This key is used to isolate the selected zone.

WALK TEST Key: This key is used to change the panel mode from normal to walk test mode. During walk test mode, the panel automatically silence and reset the panel. This function is useful for maintenance purpose.

AUX ISOLATE Key: This key is used to isolate the Fire Relay during the maintenance. When this key is activated the AUX Isolate LED glows.

4.2 Status LED:

Normal: In the Normal Condition, **SYSTEM ON, AC POWER ON, CHARGER ON** green LED will be illuminated. There should be **no other amber / red LED visual indication or audible tone.**

A.C POWER ON: This LED indicates the presence of main supply. Whenever the Main Supply (220v A.C) is present this LED will glow.

A.C POWER FAIL: Whenever the Main Supply (220v A.C) fails / fuse blown, the AC Power fail LED will glow and it also indicated by toggle Buzzer tone.

STANDBY ON: This LED indicates the presence of standby power supply. Whenever the Main Supply (220v A.C) fails and panel supply is switched to standby power supply with BATTERY ON indication.

BATTERY FAIL: Whenever the backup battery fails / fuse blown, the battery fault LED will glow and it also indicated by toggle Buzzer tone.

BATTERY LOW: Whenever the backup battery voltage goes below the 21v, the low battery LED will be illuminated and it also indicated with toggle Buzzer tone.

CHARGER ON: This LED indicates the condition of charging circuit.

CHARGER FAIL: Whenever the Charging circuit fails / fuse blown, the charger fail LED will glow and it also indicated by toggle Buzzer tone.

EARTH FAULT: This LED indicates the earth fault of the zone loops. Whenever the zone loop (+ve OR -Ve Terminal) is grounded (Body) this LED glows.

AUX ISOLATE: When the AUX Output is disabled, then the AUX isolate LED will be illuminated.

HOOTER FAULT: Whenever there is any fault in Notification Appliances Circuits like Hooter (Sounder) loop open / short, it will be identified by COMMON HOOTER FAULT LED.

4.3 Operation

4.3.1 ZONE FAULT RESPONSE:

When faults like Open/ Short occurred in the loop, the corresponding ZONE FAULT LED would identify it.

Note: *During the above fault conditions, apart from the specific fault identification LED, common fault relay and Local buzzer with intermittent tone will be activated. During this time, if 'SILENCE.' is activated, intermittent tone will be silenced.*

4.3.2 ZONE FAULT RESTORAL:

When the faults condition of the FAP is **restored**, then the corresponding fault LED goes off and also common fault relay and intermittent buzzer tone is deactivated.

4.3.3 ZONE FIRE RESPONSE:

When the control panel detects Fire via the Detector / MCP, the corresponding ZONE FIRE red LED will be illuminated. At the same time hooter, potential free contact (Fire Relay) and local buzzer (continuous tone) will be activated.

The External hooter (NAC / Sounder) and buzzer will be silenced by using the **ACK** Key and silenced LED indicates its acknowledgement.

Always the recent fired zone FIRE LED will blink continuously, rest of the fired zone FIRE LED's will glow constantly till it goes to RESET. **The FIRE LED indication will remain ON condition till the panel is RESET.**

4.3.4 ZONE FIRE RESTORAL:

The control panel returns to normal after all alarms have been cleared and a system reset key has been pressed. The control panel will perform the following upon restoral of all active alarms, The Zone Fire LED, Hooters, buzzer and fire relay are turn off.

Note:

- 1. The Fire and Fault relay will be in ON condition till the fire and fault LED's go OFF.*
- 2. By silencing, sounders are switched off and Fire relay output for actuators will remains in ON Condition until reset.*

4.3.5 ISOLATION:

There are two types of disablements (Isolation) as given below.

- a. Zone Isolation
- b. Aux Isolation

a. Zone Isolation:

The Zone Isolation using the Isolate key by selecting the particular zone using the select key. The corresponding Isolation LED identifies the zone, which isolated. The ON status indicates, the zone is Isolated from the monitoring with its loop voltage being cut off. The OFF status indicates the zone is in monitoring condition.

For Zone Isolation the follow the steps given below.

- a. Press the 'select' key zone1 selects first with indication of isolate LED blinking.

- b. press 'select' key consequently until select the zone which is to be isolated.
- c. After selecting the particular zone press the ISOLATE KEY.

Now the particular zone is ISOLATED with the glowing **Isolate LED** and the voltage to that particular zone will be switched off.

To bring back the isolated zone to the normal monitoring condition perform the steps (a) to (c) as mentioned above.

b. Aux Isolation:

The Auxiliary isolation is done for the maintenance purpose to avoid the unnecessary tripping of AHU, CO₂ systems and etc. The isolation is indicated by the AUX Isolate LED. The AUX Isolation / Normalization are done by pressing the AUX ISOLATION key.

Chapter 5: Servicing

5.1 Walk Test Mode:

The RE – 150D provides the capability to perform a walktest of the system without triggering the Fire Relay. Walk test Mode allows for testing of all the zones.

For a walktest, the initiating device activated on a zone will cause the Notification Appliance Circuits (Sounder/Hooter) to turn on for three seconds. Any smoke detectors that are activated will be reset automatically after 6 seconds.

Placing the control panel into Walktest Mode will be possible only if the system has no active alarms.

After entering into the walktest mode, the fire relay contact disablement is activated automatically and it will go back to previous status while we are coming out from this mode.

This feature helps to perform the testing of devices by a single person. In this mode if the panel detects any fire then after 3 seconds the panel will get automatically silenced. After 6 seconds of silence, the panel will go to reset. This reset is done for only that particular zone.

Once in Walktest Mode, the control panel will immediately:

- Disable the fire relay.
- Display all alarm conditions as they occur.
- Display all zone troubles as they occur.
- Display all system troubles as they occur.
- If fire is created, turns on the Notification Appliance Circuits for 3 seconds for alarm on a zone.

Note:

- a. The maintenance person should enter into the walktest mode in normal condition of the panel.*
- b. If there is no more testing, ensure that the zone is brought back to the normal Condition.*
- c. During in this mode, the Potential free Relay will not be activated while in fire condition.*
- d. If there is no more testing for 10 minutes, the panel return back to normal mode automatically.*

5.2 Installation/Replacement of PCB:

Remove the screws of PCB, which has to be changed and remove the PCB from the mounting position and place the new PCB in that same position with the screws tightened properly.

5.3 Test:

This feature is used to test whether the LED and zone card is working properly or not. We can do the test in two ways. One way is to test all the zones at a time and the other way is to test a particular zone only.

To test all the zones at a time, press the TEST KEY. After pressing the key, Open, Short & Fire test is performed for all the zones one by one.

To test a particular zone, follow the procedure as below

1. Press the 'select' key zone1 selects first with indication of isolate LED blinking.
2. Press 'select' key consequently until select the zone which is to be test.

3. After selecting the zone press the TEST KEY
4. After the TEST KEY is pressed, Open , Short & Fire test is Performed for that particular zone.

Once the testing procedure is finished, the previous conditions of the panel are retained.

5.4 Lamp Test:

The lamp test function done by pressing 'LAMP TEST' key in system (Panel) is normal condition. In this mode we can check that all the LED's are working in good condition by glowing all LED's.

Chapter 6: Battery Calculation

Normal Condition : $X = \mathbf{S}$ (Amps) x ____ Hrs. (Backup time required)

Alarm Condition : $Y = \mathbf{F}$ (Amps) x ____ Hrs. (Backup time required)

Battery Ah required : $AH = (X + Y) \times 1.2$ (Derating Factor).

Note: Refer specification (Page 10) for Quiescent, standby, alarm currents

System current (**S**) = Quiescent Current +
(Standby current X No. of zone)

Fire current (**F**) = (Alarm Current x no. of zones) +
(Hooter Current x No. of Hooter).

Example: (4 Zone with 48 Hrs in normal condition & 1 Hr in Alarm condition)

$$S = 0.050A + (0.0068A \times 4) = 0.0772A$$

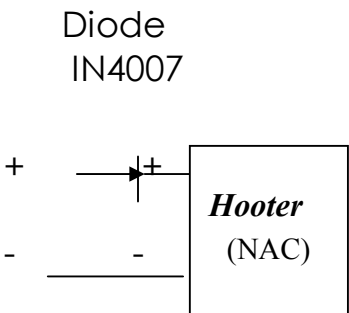
$$F = (0.035A \times 4) + [0.2 \times 4(\text{no. of sounder})] = 0.94A$$

$$X = S (0.0772A) \times 48 \text{ Hrs.} = 3.7056$$

$$Y = F (0.94A) \times 1 \text{ Hrs.} = 0.94$$

$$AH = X + Y = (3.7056 + 0.94) \times 1.2 = 5.57472Ah$$

Chapter 7: Trouble Shooting

Indication	Root Cause	Remedy
There is no indication on the panel	No power to the Panel	Check AC power and Standby power.
If there is any false alarm from the detector	May be the detector is faulty or check EOL resistor	Ensure the AC supply within $220v \pm 10\%$ (or) Change the faulty detector
Detector OPEN is not detected by the panel	Total zone loop current exceed the rated value	Check number of detectors connected in the loop. Total detectors current should not go above 3mA
Hooter fault indication	There is no proper connection in the hooter Or loop Fault.	If there is no hooter connected to the output, check if EOL resistor connected there or not.
<p><u>Connection Details for Non Polarized Hooter</u></p>  <p style="text-align: center;">Diode 1N4007</p>		<p>Check loop wiring for short / open using a meter.</p> <p>If hooter is non-polarized, then ensure each hooter's +ve loop is connected to 1N 4007 diode's cathode and the hooter -ve loop connected to the anode of 1N 4007.</p>

Chapter 8: Wire Requirements

Connecting external system accessories to the RE - 150 main circuits must be carefully considered to ensure proper operation. It is important to use the correct type of wire; wire gauge and wire run length per each RE - 150 circuits. Reference the chart below to specify wire requirements and limitations for each RE - 150.

TABLE 8-1: Wire Requirements

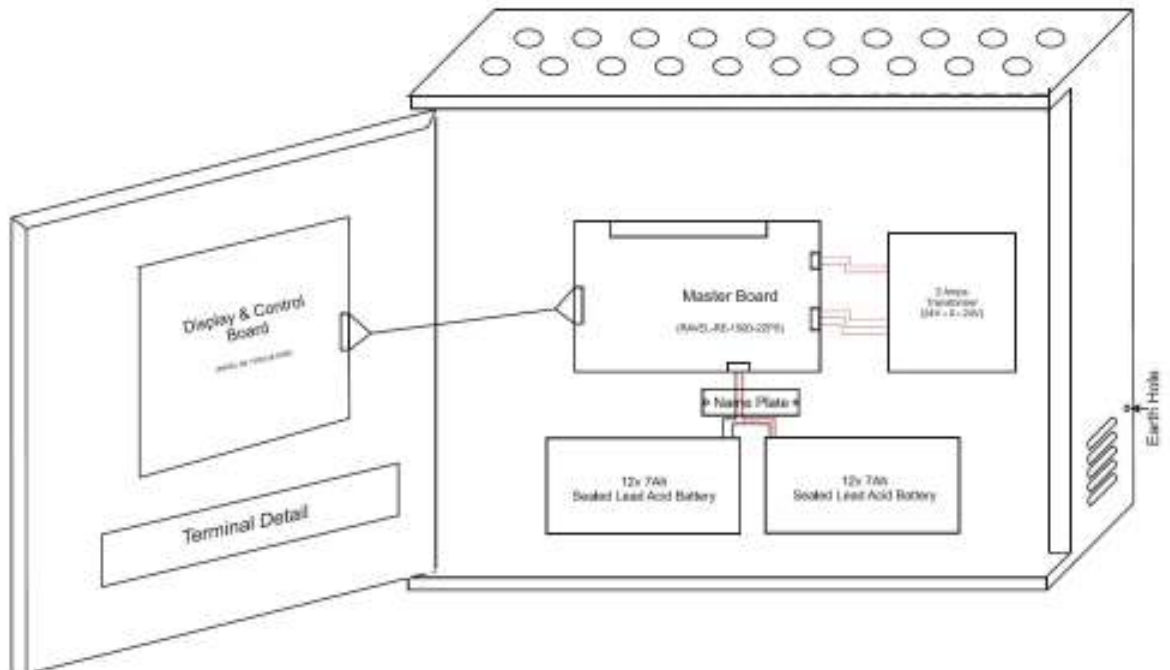
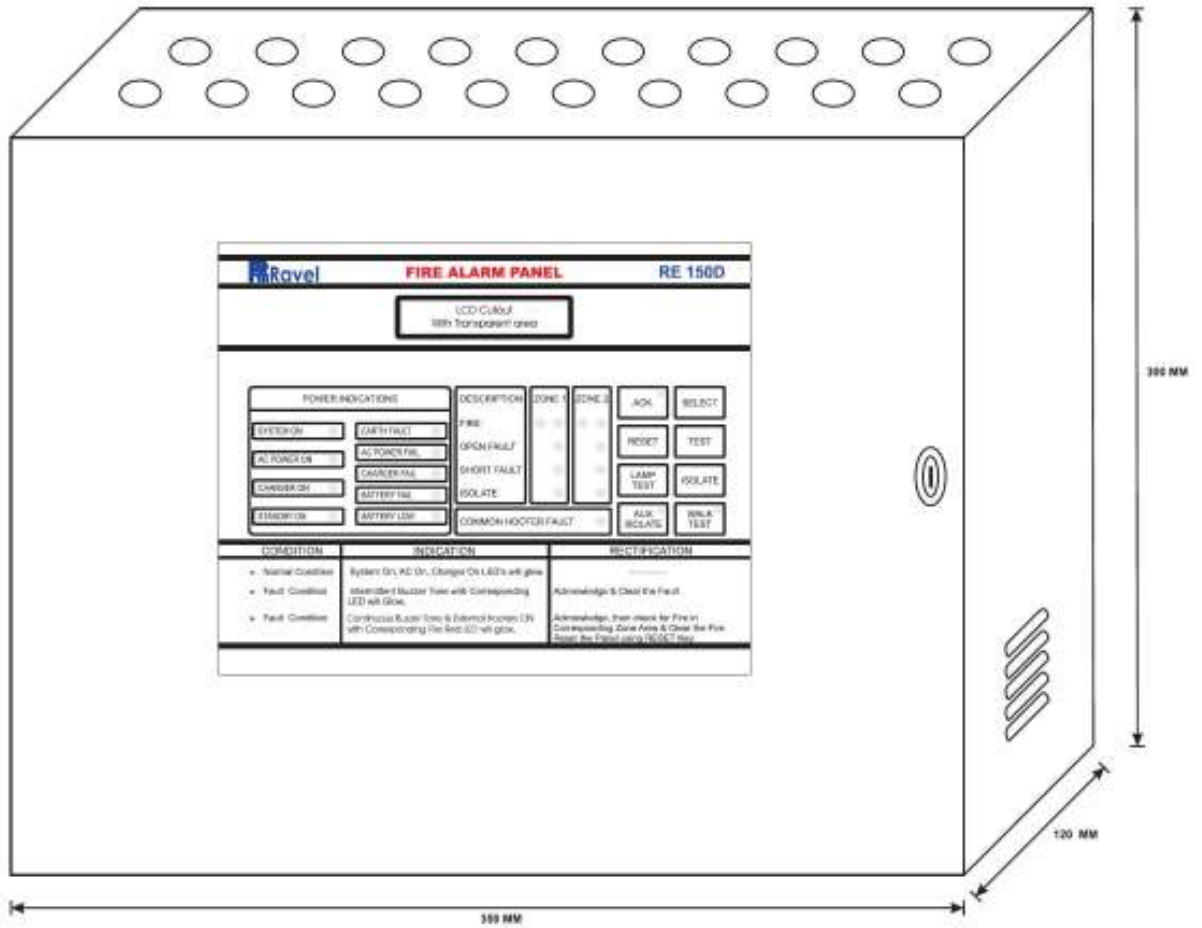
CIRCUIT TYPE	CIRCUIT FUNCTION	WIRE TYPE AND LIMITATIONS	RECOMMENDED MAX. DISTANCE Feet (meters)	WIRE GAUGE
Initiating Device Circuit	Connects to Initiating Devices	Untwisted, unshielded wire (Do not exceed 50 ohms)	10,000 (3,000 m) 8,000 (2,400 m) 4,875 (1,480 m) 3,225 (975 m)	12 AWG (3.25 mm ²) Belden 9583 WPW999 14 AWG (2.00 mm ²) Belden 9581 WPW995 16 AWG (1.30 mm ²) Belden 9575 WPW991 18 AWG (0.75 mm ²) Belden 9574 WPW975
24 VDC resettable, nonresettable	Connects to annunciators and other accessories	No more than 1.2 volt drop allowed from supply source to end of any branch	Distance limitation set by 1.2 volt maximum line drop	12 AWG (3.25 mm ²) - 18 AWG (0.75 mm ²)

Chapter 9: Abbreviation

The short forms, which are given in this manual, are abbreviated below,

RE	-	Ravel Electronics Pvt Ltd.,
IS	-	Indian Standard.
AC	-	Alternating Current
DC	-	Direct Current
CRCA	-	Cold Rolled Carbon Alloy
LED	-	Light Emitting Diode
O/P	-	Output
mm	-	millimeter
no(s).	-	number(s)
v	-	volt(s)
Ah	-	Ampere hour
IEE	-	Institute of Electrical Engineering
EOL	-	End Of Line
PCB	-	Printed Circuit Board
CPU	-	Central Processing Unit
MCP	-	Manual Call Point
S.Nos	-	Serial Numbers
mA	-	milli Ampere
Kgs	-	killo grams
CO,NO,NC-	-	Common, Normally Open, Normally Closed

General Arrangement Diagram:





RAVEL ELECTRONICS PVT. LTD

No. 150-A, Elec. Indsl. Estate, Perungudi, chennai – 600 096. India
Tel.: 24961004 / 24960825 Fax: 044-4204 9599

Email: marketing@ravelfirepanels.com

Web: www.ravelfirepanels.com



DATE:

TEST CERTIFICATE

This is to certify that the following items are tested and checked.
Microprocessor Based Conventional Fire Alarm Control Panel.

Model No.: RE – 150D

Serial No.:

No. of zones:

For **RAVEL ELECTRONICS PVT.LTD,**

Q.C. – Engineer

Tested By



RAVEL ELECTRONICS PVT. LTD

No. 150-A, Elec. Indsl. Estate, Perungudi, chennai – 600 096. India
Tel.: 24961004 / 24960825 Fax: 044-4204 9599

Email: marketing@ravelfirepanels.com

Web: www.ravelfirepanels.com



WARRANTY CERTIFICATE

Model No.: RE – 150D

Serial No.:

Ravel Electronics warrants each product to be free from defects in material and workmanship. This obligation is limited to servicing or part returned to the company for that purpose and making good any parts thereof which shall be within warranty period, returned to the company under a written intimation and which to the company's satisfaction to be found defective. The company reserves the right to decide the workplace for the repair work. The freight for defective material will have to be borne by the purchaser, and the transit risk for such material will rest with the purchaser.

This warranty will last for a period of **12 months** from the date of Invoice of the product from the factory. The warranty is applicable only if the product is used within its specifications. The warranty for the replaced components will lapse along with that of the main product.

THIS WARRANTY IS VALID UP TO: 12 months from the date of invoice

Authorised Signatory