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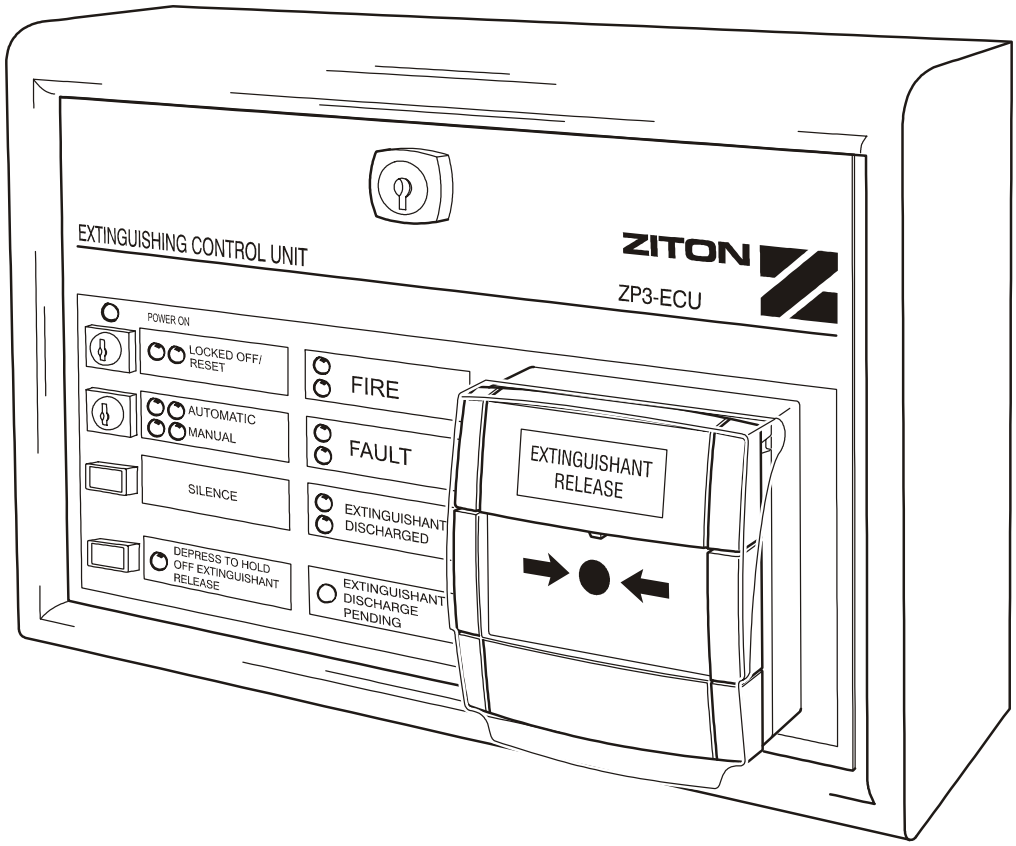
ZP3-ECU Extinguishing Control Unit
User Guide



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Further information can be found on the following website: *http://www.recyclethis.info/*.

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Associated Publications and References

The following document, or part thereof, is referenced from this manual:

ZP3-ECD Extinguishing Control Unit Display Board Installation Sheet, doc. no. 501-0804ZE-1-01

List of Abbreviations, Acronyms and Terms

Abbreviation/Acronym/Term	Definition
DC	Direct Current
Extinguishant	Generic term to describe an extinguishing agent (for example water, dry chemical, foam etc.) used to combat fires.
GND	Ground
LCD	Liquid Crystal Display
LED	Light Emitting Diode
mA	milliampere
PC	Personal Computer
RX	Receive
SW	Switch
TX	Transmit
V	Volts

Preface

This manual is intended for use by the user of the Ziton ZP3 Extinguishing Control System. It provides the information required to effectively operate the Extinguishing Control System in all operating modes.

Limitations

Sensing Equipment Limitations

The Extinguishing Control System equipment is reliant on external detection equipment such as detectors, call points and fire control panels in order to activate effective fire alarms. Incorrect positioning of the detectors, limitations in the detector itself or incorrect application can result in failure of the detection process.

Power Faults

In the event of a mains fault the Ziton ZP Fire System can run off on board batteries for approximately twenty four (24) hrs depending on the loading of the system. After this time, the Ziton ZP Fire Control System will no longer detect fires and thus cause the Extinguishing Control System to be unable to extinguish fires until such time as the mains power is returned.

Bells and Sirens

When the Extinguishing Control System causes an extinguishing discharge, the appropriate fire bells and sirens sound. These could prove useless unless they are situated in close proximity to the people they are supposed to alert.

Extinguishing System Design

The Extinguishing Control System only controls the extinguishing activating circuits. The design of the piping nozzles extinguishing pressure etc. is the responsibility of the extinguishing system design engineer.

Maintenance System

As with most extinguishing systems the most common cause of their malfunction is lack of maintenance. A full maintenance plan should be carried out on a regular basis as described under “Routine Maintenance” in Chapter 3 of this manual (see page 16).

Chapter 1: Introduction

System Overview

Control of Fire Extinguishing Systems

The ZP Analogue Addressable Fire Detection System is ideally suited to operating fire extinguishing systems that use an extinguishant such as foam, dry chemical or powder to combat fires in any size area. Fire extinguishing systems are extensively used to protect risks such as computer rooms, data storage, transformers, electrical control rooms, file storage and, essentially, any area where the use of water is inappropriate.

The nature of extinguishing systems imposes certain criteria upon the fire detection and control equipment. These are needed to prevent accidental discharge, audible alarms indicating alarm and discharge, time delays to allow evacuation of personnel from the area, shutdown of equipment and ventilation, and the closing of doors and shutters to prevent leakage.

The ZP Extinguishing Control System not only achieves these requirements, but also includes the many advantages of advanced addressable analogue fire detection.

A major feature of the system is that all functions are software controlled. All actions carried out at the Extinguishing Control Unit, both automatic and manual, are reported to the main ZP Fire Alarm Panel via the Addressable communication line.

The arrangement of a typical system is illustrated in Figure 1.

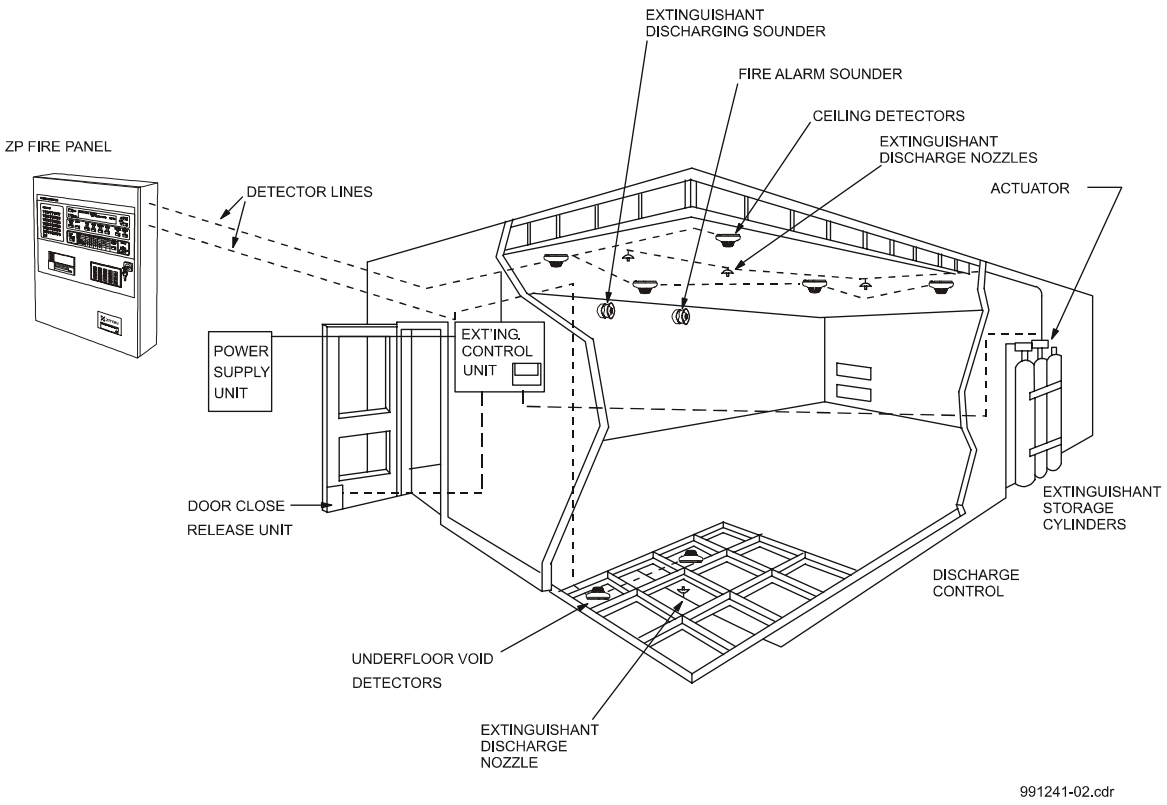

Figure 1: Extinguishing System Configuration

Extinguishing Control Unit

The Ziton ZP3-ECU Extinguishing Control Unit, see Figure 2, is designed to connect to a ZP fire detection system, and control a fire extinguishing system. It interfaces to the fire detectors of a ZP fire detection system, and provides secure "coincidence connection" control of the extinguishing system.

The self-contained unit has key switches for automatic or manual selection, as well as lock-off for maintenance. Other controls are a manual extinguishant release, an alarm silence push-button, extinguishant hold off button and indicators for automatic, manual, locked-off, fault, fire, extinguishant discharged and reset status.

Outputs are provided for extinguishant release valves or actuators, audible fire alarm sounders, separate extinguishant release sounders, visual exit signs, door closing and shutter release. Also provided are facilities for remote manual extinguishant release, and remote operation and status functions.

Extensive monitoring is provided for many functions, including power supply, fuses, and operation. Field wiring is monitored for extinguishant release valves/actuators, fire sounder, extinguishant sounder and manual extinguishant release units.

Optional monitoring is provided for low extinguishant pressure, extinguishant release verification, and locked/unlocked entry door status of the protected area.

The extinguishing control unit is under the control of its ZP fire control panel. It communicates with the fire panel every two seconds, and reports the status of all functions. A fault signal is raised at the fire panel for any out-of-normal condition, which exists at the extinguishing control unit. The fire panel indicates the type of fault, and where applicable, reports the condition to a building management system.

Remote status of each extinguishing control unit -automatic, manual, fault, locked-off, or extinguishant discharged can be displayed at the ZP fire control panel without additional wiring.

Each extinguishing control unit operates one fire extinguishing system. Any number of extinguishing control units may be used on a ZP fire detection system, with each unit requiring two system addresses. The system is field programmable, with functions such as detector cross-mapping, automatic extinguishant release delay, selection of delay/no delay for manual extinguishant release, and output relay control being fully configurable.

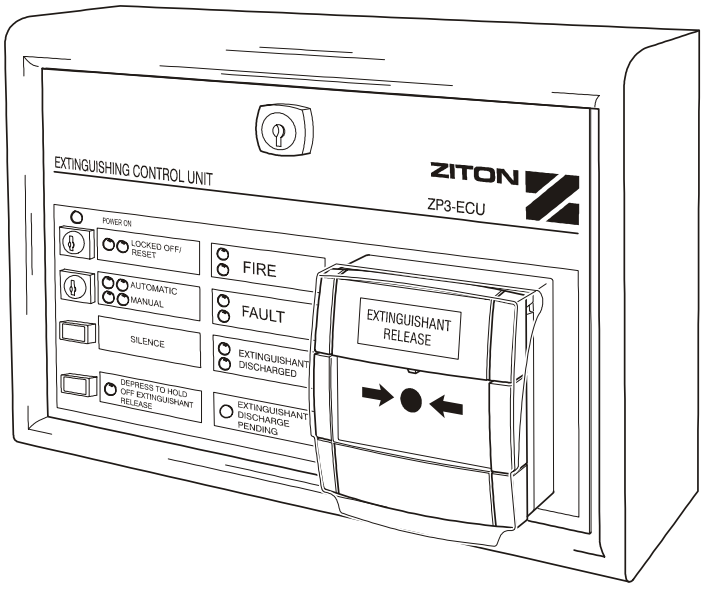

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Figure 2: Extinguishing Control Unit – External View

Extinguishing Status Unit

The Ziton ZP3-ECUS Extinguishing Status Unit, see Figure 3, is designed to connect to a ZP3-ECU Extinguishing Control Unit.

The Extinguishing Status Unit has key switches to enable remote control of the Extinguishing Control Unit for automatic or manual selection, as well as lock-off for maintenance. Other controls are manual extinguishant release via the callpoint, alarm silence push button, as well as an extinguishant hold off more time button. Indicators mimic those on the Extinguishing Control Unit for automatic, manual, locked-off, extinguishant discharged and reset status.

Manual extinguishant release facilities are monitored from one Status Unit to another with an end of line resistor connected at the unit furthest from the Extinguishing Control Unit. This resistor can be connected by means of a link.

Up to ten Extinguishing Status Units and/or Repeater Units may be attached to any one Extinguishing Control Unit.

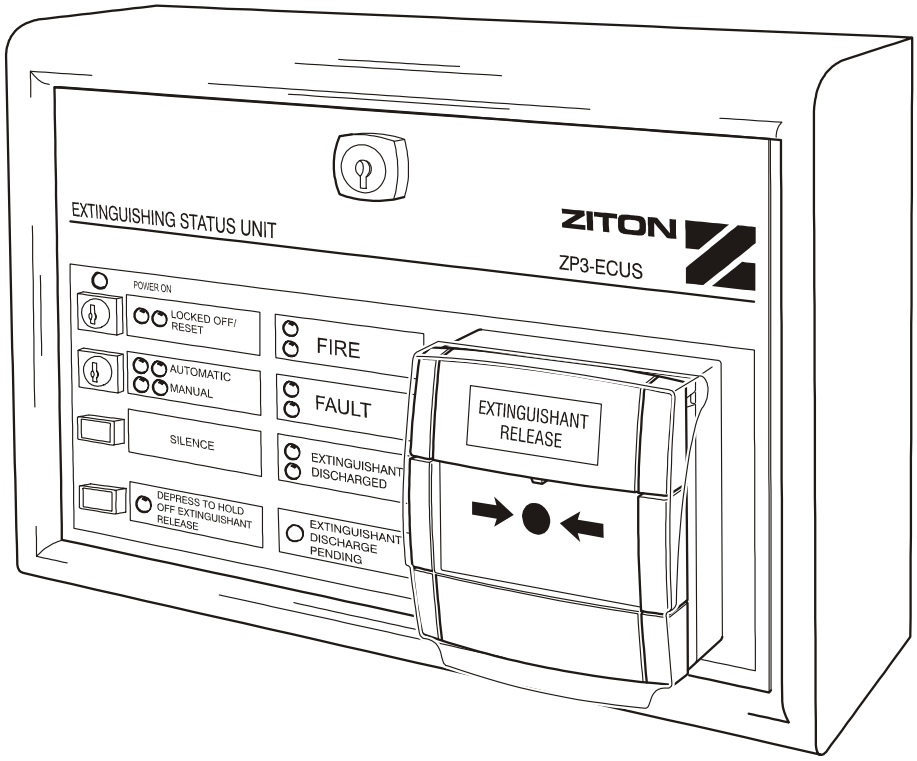

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Figure 3: Extinguishing Status Unit – External View

Extinguishing Repeater Units

The ZP3-ECUR Extinguishing Repeater unit, see Figure 4, connects to a ZP3-ECU Extinguishing Control unit in the same way as an Extinguishing Status unit. However, the repeater unit only mimics the indications of the control unit: it does not enable remote control of the unit.

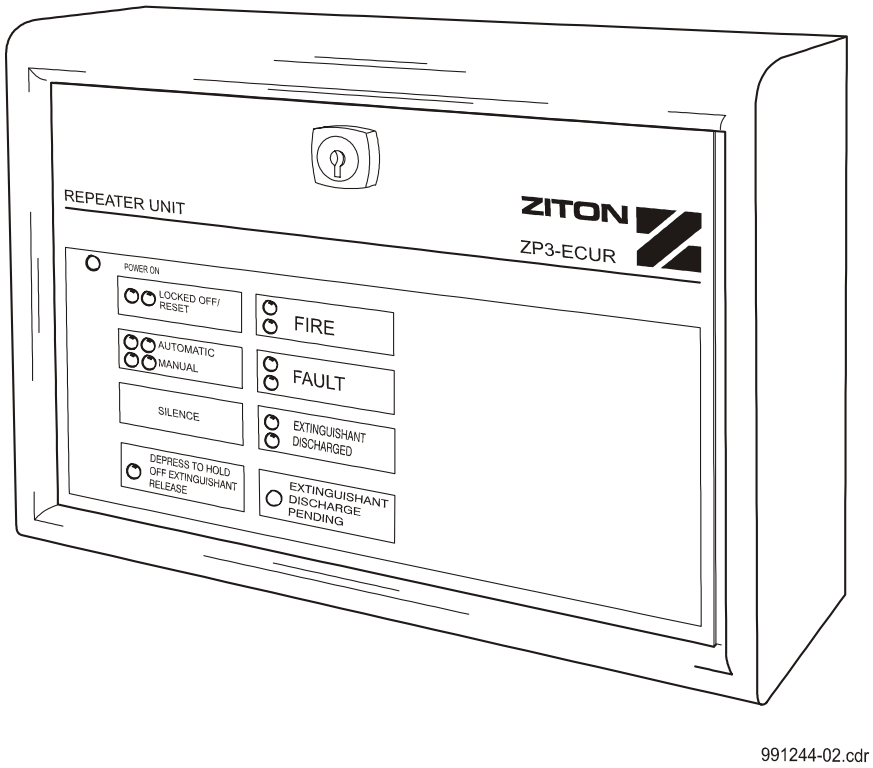

Figure 4: Extinguishing Repeater Unit – External View

Extinguishing Control Door Monitor Board

The Extinguishing Control Door Monitor Board is an optional board, which fits "piggy-back" on the Extinguishing Control Unit Main Control Board. The door monitor board gives an alarm when an extinguishant protected room is left in an automatic discharge condition while personnel are still in the room, or, if left in a manual discharge condition when the room is unoccupied. A switch connected to the entrance lock detects whether or not the room is occupied.

Chapter 2: Operating the System

Extinguishing Control Unit

Controls and Indicators

The relevant operating controls and indicators are shown in Figure 5.

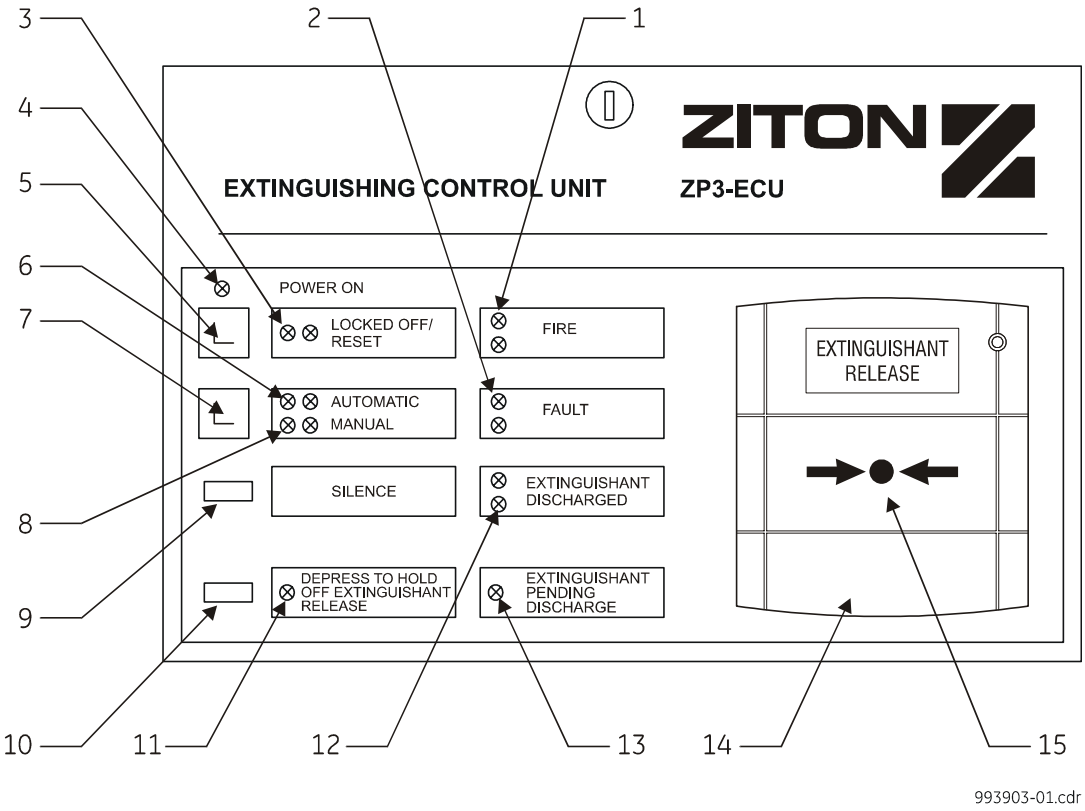

Figure 5: ZP3-ECU Extinguishing Control Unit Front Panel

Legend:

Item	Description	Item	Description
1	Fire LED's	9	Silence pushbutton
2	Fault LED's	10	Hold off Extinguishant Release button
3	Locked-off/Reset LED's	11	Hold off Extinguishant Release LED
4	Power-on LED	12	Extinguishant Discharge LED's
5	Locked-off/Reset key switch	13	Extinguishant Discharge Pending LED
6	Automatic mode LED's	14	Break Glass Unit protective flap
7	Automatic/Manual key switch	15	Break Glass pane
8	Manual mode LED's		

Normal Operating Condition

Under normal operating conditions the following indications exist:

- Yellow "Automatic" LED's, Figure 5 (item 6) ON if key switch, Figure 5 (item 5) in vertical position, OR
- Green "Manual" LED's, Figure 5 (item 8) ON if key switch, Figure 5 (item 5) in horizontal position
- Green "Power On" LED, Figure 5 (item 4) ON
- No audible alarms sounding.

Fire Operation - Manual Extinguishing

Note: The guidelines below are given for guidance only. You must comply with your own fire drill instructions and local codes or practice.

The extinguishing sequence can be initiated manually if fire is detected in the protected area. This can be done with the Extinguishing Control Unit in any mode except "Locked-off" mode.

Manual Extinguishing Initiation

1. Evacuate all personnel from the protected area.
2. Lift the protective flap, Figure 5 (item 14) on the Break Glass unit and break the glass pane, Figure 5 (item 15). Leave the area of the Extinguishing Control Unit (if inside the protected area).

System Response to Manual Extinguishing Initiation

- The Extinguishant discharge sounder sounds.
- Any plant/ventilation etc. connected to the Extinguishing Control Unit shuts-down, and doors and openings automatically close.
- The extinguishant is discharged. This action might be instantaneous or occur after a time delay depending on set-up.
- The two red "Extinguishant Discharge" LED's, Figure 5 (item 12) illuminate on the Extinguishing Control Unit.
- This event is displayed on the ZP Fire Detection Panel in the format "ECU DROP!" with the zone number and line address of the Extinguishing Control Unit.
- If a printer is connected to the ZP Fire Detection Panel then the message "ECU RELEASE" is printed with details of the Extinguishing Control Unit line address, zone number, event number and date and time.

Operator Response after Manual Discharge of Extinguishant

- Call the Fire Department.
- Investigate the protected area and make sure that the source of smoke or heat has been adequately extinguished.
- Disable the Extinguishing Control Unit by turning the "LOCK-OFF/RESET" key switch, Figure 5 (item 5) clockwise so that the two red LED's, Figure 5 (item 3) illuminate.
- The Extinguishant discharge sounder silences.
- Press the Accept key followed by the Reset key on the ZP Fire Detection Panel and the panel should return to normal.
- Notify the maintenance staff or company to have the broken Break Glass pane, Figure 5 (item 15) on the Break Glass unit replaced, the extinguishant cylinders refilled and actuator replaced.

- Turn the "LOCK-OFF/RESET" key switch, Figure 5 (item 5) anti-clockwise and the Extinguishing Control Unit returns to its normal operation condition.

Fire Operation - Unit Set to Automatic

The following information is for guidance only. You must comply with your own fire drill instructions and local codes of practice.

As a precaution against inadvertent extinguishant discharge, the Extinguishing Control Unit is configured so that Fire Alarm has to be received from two independent sources (coincidence connection) before automatic discharge takes place. This can only happen if the system is set to AUTOMATIC.

Initial Fire Alarm

Indications

When the first device detects heat or smoke in the protected area, the following occurs:

- The two red "Fire" LED's, Figure 5 (item 1) on the Extinguishing Control Unit illuminate.
- The Extinguishant discharge sounder is activated.
- The panel buzzer on the ZP Fire Detection Panel sounds, the zone and common Fire LED's flash, and a message is displayed in the format "FIRE" with the zone and device number.
- The red LED at the triggered device flashes.
- If a printer is connected to the ZP Fire Detection Panel then the message "**FIRE**" is printed with details of the triggered detector's type, device number, zone number, event number and date and time.

Operator Response to Initial Fire Alarm

1. Press the "Silence" pushbutton, Figure 5 (item 9) on the Extinguishing Control Unit to silence the sounders connected to it.
2. Press the "ACCEPT" key on the ZP Fire Detection Panel to silence the panel buzzer. The zone and common fire LED's revert to a steady illumination and sounders connected to the ZP Fire Detection Panel are silenced.
3. Investigate the alarm and remove the source of smoke or heat from the detector which initiated the alarm.

- If the fire is extensive, manual extinguishing can be initiated as under "Manual Extinguishing Initiation" on page 7.

Resetting the System after Clearance of Initial Fire Alarm

1. Press the "Reset" key on the ZP Fire Detection Panel once the source of smoke or heat has been removed, and any damage rectified. The panels return to normal operating condition if the initiating source has been adequately handled.
2. Briefly turn the "LOCK-OFF/RESET" key switch, Figure 5 (item 5) on the Extinguishing Control Unit clockwise and then anti-clockwise to reset the unit.

- The unit returns to normal.

Second Knock Fire Alarm

This sequence occurs if the Extinguishing Control Unit is set to AUTOMATIC and a second detection device detects smoke or heat.

Indications of Pending Automatic Discharge

- When a second device coincidence connection is detected the Extinguishant discharge sounder sounds.
- Any plant/ventilation etc. connected to the Extinguishing Control Unit shuts-down.
- The preset time delay before extinguishing commences.
- Evacuate the protected area of all personnel.

Emergency Stop of Pending Automatic Extinguishing

If for any reason personnel cannot be evacuated and you need to perform an emergency stop to the automatic extinguishing, turn the LOCK-OFF/RESET key, Figure 5 (item 5) clockwise to lock off the unit.

Automatic Extinguishing

- Automatic extinguishing starts once the preset time delay has lapsed.
- The two red "Extinguishant Discharge" LED's, Figure 5 (item 12) illuminate on the Extinguishing Control Unit when extinguishing has started.
- This event is displayed on the ZP Fire Detection Panel in the format "ECU DROP!", with the zone number and line address of the Extinguishing Control Unit.
- If a printer is connected to the ZP Fire Detection Panel then the message "ECU RELEASE" is printed with details of Extinguishing Control Unit line address, zone number, event number and date and time.

Operator Response to Automatic Extinguishing

1. Call the Fire Department.
2. Investigate the protected area and check that the source of smoke or heat has been adequately extinguished.
3. Press the "ACCEPT" followed by the "RESET" key once the source of smoke or heat has been removed. The ZP Fire Detection Panel and the panel should return to normal if the initiating source has been adequately handled.
4. Reset the Extinguishing Control Unit by turning the "LOCK-OFF/RESET key switch, Figure 5 (item 5) clockwise once and then anti-clockwise to the vertical position.
    - The Extinguishant discharge sounder silences.
    - The two red "Extinguishant Discharge" LED's, Figure 5 (item 12) go out.
    - Notify the maintenance staff or company to have the extinguishant cylinder re-filled and the actuator replaced if necessary.

Operation of Other Functions

Refer to Figure 6.

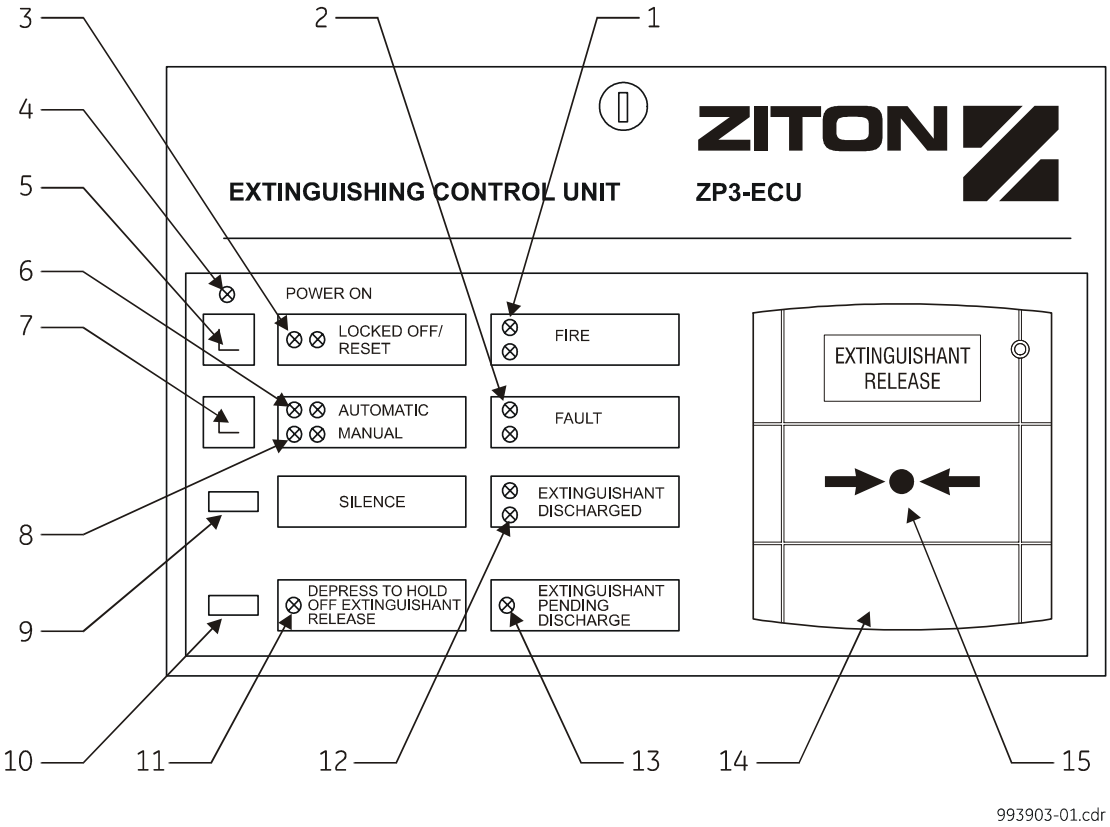

Figure 6: ZP3-ECU Extinguishing Control Unit Front Panel

Legend:

Item	Description	Item	Description
1	Fire LED's	9	Silence pushbutton
2	Fault LED's	10	Hold off Extinguishant Release button
3	Locked-off/Reset LED's	11	Hold off Extinguishant Release LED
4	Power-on LED	12	Extinguishant Discharge LED's
5	Locked-off/Reset key switch	13	Extinguishant Discharge pending LED
6	Automatic mode LED's	14	Break Glass Unit protective flap
7	Automatic/Manual key switch	15	Break Glass pane
8	Manual mode LED's		

Automatic/Manual Key Switch

Use this feature to isolate automatic release of the extinguishant, particularly when the protected area is occupied.

Turn the "Automatic/Manual" key switch, Figure 6 (item 7) to the horizontal position to select "Manual" operating mode, the following occurs:

- The two green "Manual" LED's, Figure 6 (item 8) illuminate.
- If a printer is connected to the ZP Fire Detection Panel then the message "MANUAL" is printed as well as the extinguishing unit address, the zone number, the event number and the date and time.

Turn the "Automatic/Manual" key switch to the vertical position to select "Automatic" operating mode, the following occurs:

- The two yellow "Automatic" LED's, Figure 6 (item 6) illuminate.
- If a printer is connected to the ZP Fire Detection Panel, then the message "AUTO" is printed as well as the extinguishing unit address, the zone number, the event number and the date and time.

Lock-off/Reset Key Switch

The Extinguishing Control Unit can be disabled while the system is being maintained in order to prevent accidental activation of extinguishant.

Turn the "LOCKED-OFF"/RESET key switch, Figure 6 (item 4) clockwise to the horizontal position to disable the unit, the following occurs:

- The two red "LOCKED-OFF/RESET" LED's, Figure 6 (item 3) illuminate.
- If a printer is connected to the ZP Fire Detection Panel then the message "FAULT" is printed as well as the extinguishing unit address, the zone number, the event number and the date and time.

Turn the "Lock-Off/Reset" key switch anti-clockwise to the vertical position to enable the Extinguishing Control Unit once maintenance has been completed. The two red "Lock-Off/Reset" LED's go out and the ZP Fire Detection Panel printer prints "MANUAL" or "AUTO" depending on the selected mode.

Fault Condition

The following takes place if a fault occurs on the Extinguishing Control System:

- The two yellow "fault" LED's, Figure 6 (item 2) on the Extinguishing Control Unit illuminate.
- The panel buzzer on the ZP Fire Detection Panel sounds, the common fault LED illuminates and a message is displayed in the format "GENFLT" with the zone number and line address.

Note: For fault messages "OPMODE" and "LOCKOUT", refer to the optional Door Lock Monitor Unit if fitted.

- If a printer is connected to the ZP Fire Detection Panel then the message "GENFAULT" is printed as well as the line address, the zone number, the event number and the date and time.
- Press the "ACCEPT" key on the ZP Fire Detection Panel to silence the panel buzzer.
- Notify the maintenance staff or company to have the fault investigated and rectified.
- Press the "ACCEPT" key then the "RESET" key on the ZP Fire Detection Panel after clearance of the fault. The panel should return to normal.

Delay Time Settings

The delay period is factory set to thirty seconds but is adjustable between five (5) and forty-five (45) seconds.

Hold Off Extinguishant Release Button

The Extinguishing Control Unit provides a means of ensuring evacuation. There are four modes of operation, which are selected by switch settings on switch SWT3 on the Extinguishing Unit's main board. See Figure 7 for an illustration showing the default switch settings of SWT3 and refer to Table 1 for a description of the switch functions.

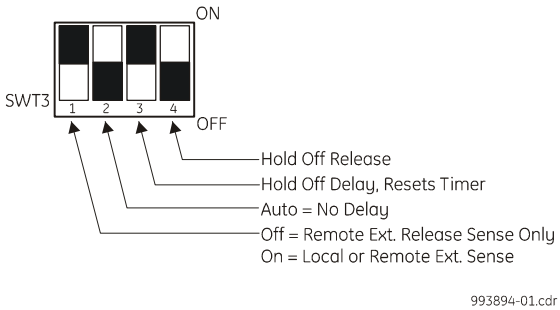

Figure 7: SWT3 Default Setting:

Table 1: SWT3 Switch Functions:

Sw No	Default Setting	Function
1	ON	There are two extinguishant discharged report mechanisms. When switch 1 is ON (default setting), the ECU panel senses an exstinguishant release by way of its internal circuitry and by way of a remote sense resistor, external monitor is connected to TB1, pins 17 & 18 on the ECU main board. When switch 1 is OFF, the ECU only reports an extinguishant discharge if the external monitor resistor is short-circuited.
2	OFF	When switch 2 is OFF, the ECU has a time delay before exstinguishant is released, **if triggered by way of an automatic trigger**. An automatic trigger is a trigger mapped to the configured ECU addresses. Automatic delay is set by potentiometer RV1 on the ECU main board. The delay time factory default setting is 30 seconds. When switch 2 is ON there is no delay in response to an automatic trigger.
3	ON	The hold off delay switch configures the operation of the button labeled 'DEPRESS TO HOLD OFF EXTINGUISHANT RELEASE' on the ECU front panel. When switch 3 is ON and switch 4 is OFF, the ECU delay time countdown is reset each time the button is pressed. There is no limit to the amount of times this function can be used. The hold off extinguishant release function settings on the ECU Main Board are applicable to automatic release mode ONLY. Note that manual release settings are set by way of links on the ECU Display Board (see Installation Sheet. document number 501-0804ZE-1-01). Automatic release delay for mapped trigger is set by potentiometer RV1 on the ECU Main Board. The factory default delay time setting for automatic delay is 30 seconds. This switch setting is used together with switch 4 (see below). Switch 3 OR 4 must be ON (depending on the hold off release operation required).
4	OFF	When switch 3 is OFF and switch 4 is ON the user must hold down the button before the delay period has timed out. If the button is released before the time out period the ECU timer continues with the count down and releases extinguishant at the end of the countdown. If the button is kept down for a longer period e.g. 50 seconds, extinguishant release is held off until the button is released, extinguishant release is then immediate. There is no time limit on the hold off time when using this mode.

Extinguishing Status Unit

Controls and Indicators

The relevant operating controls and indicators are shown in Figure 8.

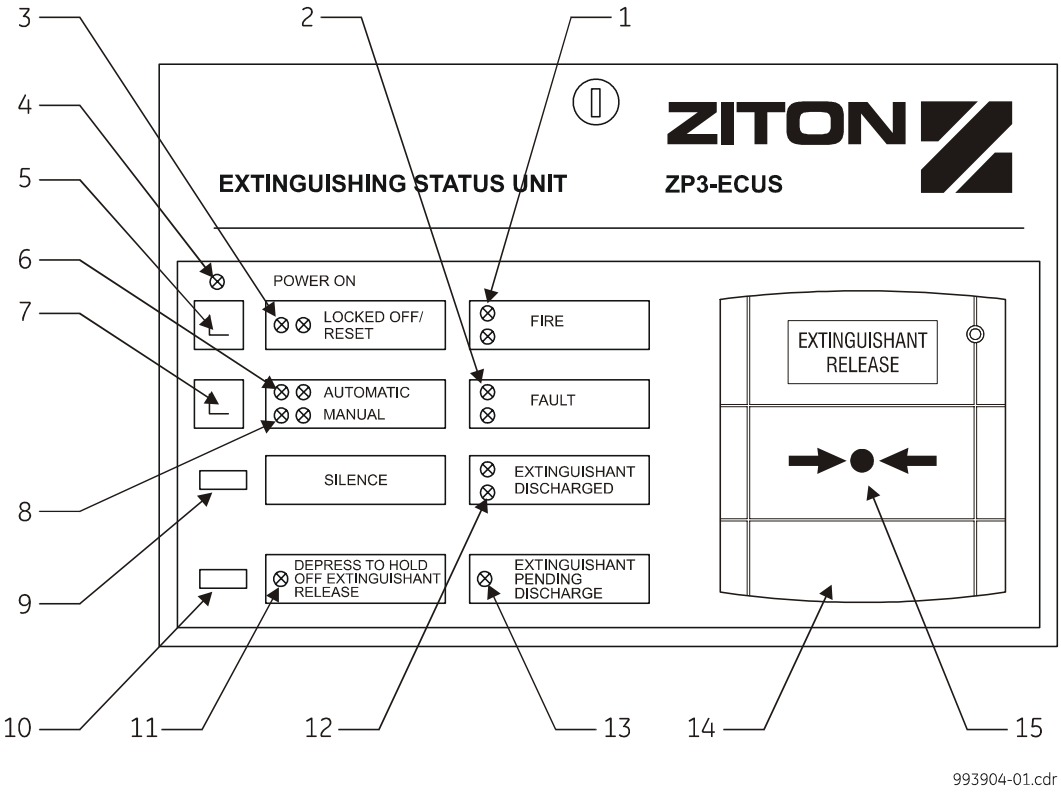

Figure 8: ZP3-ECUS Extinguishing Status Unit Front Panel

Legend:

Item	Description	Item	Description
1	Fire LED's	9	Silence pushbutton
2	Fault LED's	10	Hold off extinguishant release button
3	Lock-off/Reset LED's	11	Hold off extinguishant release indicator
4	Power-on LED	12	Extinguishant discharge LED's
5	Lock-off/Reset keyswitch	13	Extinguishant discharge pending indicator
6	Automatic mode LED's	14	Break Glass Unit protective flap
7	Automatic/Manual keyswitch	15	Break Glass pane
8	Manual mode LED's		

Operation

The operation of the Extinguishing System from the Extinguishing Status Unit (Figure 8) is exactly the same as the operation from the Extinguishing Control Unit. This is described in the following paragraphs:

- Normal operating condition – see page 7
- Fire operation - manual extinguishing – see page 7
- Fire operation - unit set to automatic – see page 8
- Operation other functions – see page 10

If the key switch control on either the Extinguishing Control Unit or the Extinguishing Status Unit is set to Auto, the system will be on Automatic as indicated by the front panel LED's. Similarly, if the key switch control on either the Extinguishing Control Unit or the Extinguishing Status Unit is set to Locked-off, then the system will be locked off as indicated by the front panel LED's.

Extinguishing Repeater Unit

Controls and Indicators

The relevant operating controls and indicators are shown in Figure 9.

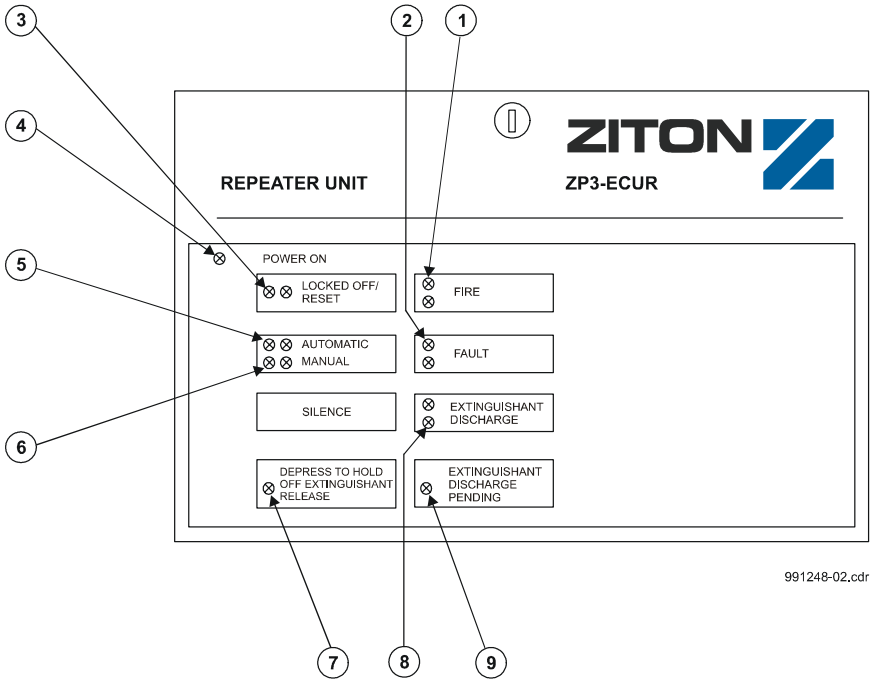

Figure 9: ZP3-ECUR Extinguishing Repeater Unit Front Panel

Legend:

Item	Description	Item	Description
1	Fire LED's	6	Manual Mode LED's
2	Fault LED's	7	Hold off extinguishant release indicator
3	Lock-off/Reset LED's	8	Extinguishant discharge LED's
4	Power-on LED	9	Extinguishant discharge pending indicator
5	Automatic Mode LED's		

Operation

No control of the Extinguishing system is possible from an Extinguishing Repeater Unit. Operation takes place from either the Extinguishing Control Unit or Extinguishing Status Unit as described under “Extinguishing Control Unit” on page 6 or ”Extinguishing Status Unit” on page 13 respectively. The LED indications provided at the Repeater Unit (Figure 9) are a mimic of those provided from either of these units.

Extinguishing Door Monitor Board

Normal Operating Condition

Normal operating condition, when a door lock monitor is fitted to an Extinguishing Control Unit controlling a protected room, is as follows:

- Room occupied (door unlocked) - Extinguishant discharge on manual
- Room unoccupied (door locked) - Extinguishant discharge on automatic

The manual/automatic LED’s indicate accordingly and the door monitor buzzer is silent.

Room Occupied (Door Unlocked) - System on Automatic

This is a potentially hazardous situation to occupants of the room. If the door is unlocked and the system is not switched to manual, then the door monitor buzzer sounds as a warning of the hazard. If the system has not been switched to manual within thirty (30) seconds, then a fault message is communicated to the Fire Control Panel.

Room Unoccupied (Door Locked) - System on Manual

This is a potentially hazardous situation in that no one is present to manually activate the system in the case of fire. An automatic discharge resulting from sensor detection is required.

If the door is locked and the system has not been switched to automatic, then a buzzer sounds as a warning of the situation. If the system has not been switched to automatic within thirty (30) seconds, then a fault message is communicated to the Fire Control Panel and a buzzer sounds.

Chapter 3: Routine Maintenance

Daily Maintenance Checks

On a daily basis, the operator should make sure that:

1. ONLY the "Power on" and "Auto/Manual" LED's are illuminated on the Extinguishing Control Unit front fascia.
2. The Control Panel does not indicate that a fault exists on the Extinguishing Control Unit.
3. If a door lock monitor is fitted, the buzzer sounds if the unit is switched to manual while the door is locked, or if the unit is switched to automatic when the door is unlocked.
4. The check is listed in the system log.

Weekly Maintenance

The operator should perform the following maintenance tasks on the Extinguishing Control System on a weekly basis, for example:

- Clean following fascias as applicable:
  - Extinguishing Control Unit (Figure 2)
  - Extinguishing Status Unit (Figure 3)
  - Extinguishing Repeater Unit (Figure 4)
- Inspect key switch operation of the following Extinguishing Control System equipment:
  - Extinguishing Control Unit (Figure 2)
  - Extinguishing Status Unit (Figure 3)

Clean Extinguishing Control System Fascias

The Extinguishing Control System fascias must remain clean at all times. The regularity of cleaning depends on the installation environment.

Wipe off excess dust on each of the Extinguishing Control System fascia panels (as applicable) using a clean, damp cloth.

Inspect Key Switches Operation

Check for correct and smooth operation of each key switch of the respective units. Make sure that they operate smoothly without sticking. Lubricate sticky key switches if required using 2 to 3 drops of a general purpose lubricant, for example 3-in-1 Oil.

Quarterly (Three-monthly) Maintenance

Quarterly maintenance must be carried out by suitably trained personnel. Contact your local installation/maintenance company to make sure that routine maintenance is carried out on a regular basis.

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