AMPAC

ADVANCED WARNING SYSTEMS

ZoneSense DH4

Fire Alarm Control Panel

Installation, Commissioning & Operation

MAN 1531-4

WORLD LEADER OF INNOVATIVE SOLUTIONS
IN FIRE DETECTION AND ALARM SYSTEMS

Responding To An Alarm

Access Level 1 (Normal Operation)

Zone FIRE Alarm Indicator - flashing

Common FIRE Alarm Indicator – flashing

To Silence the FACP Buzzer Press 

To Silence External Sounders Enter Access Level 2 – Key in Password - 3, 2, 1, 0

Press 

CONTROLS ENABLED indicator - steady 

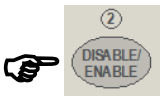
and
Zone FIRE Alarm indicator – steady

Common FIRE Alarm indicator – steady 

REMOTE OUTPUT ON indicator – steady 

Disabling the Alarm Zone/s

Enter access Level 2

Press 

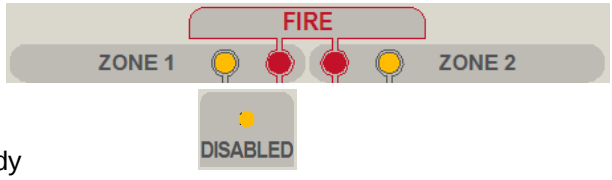
Zone 1 Selected. Press 

to select Zone in FIRE then 

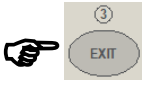
to Disable

To Disable Zone FIRE Alarm

Zone DISABLED Indicator – flashing then steady



Common DISABLED Indicator – flashing then steady

Press 

to EXIT the ENABLE / DISABLE mode and Access Level 2

Zone DISABLED Indicator –steady

Common DISABLED Indicator –steady 

CONTROLS ENABLED Indicator – off 

Resetting the Panel

Press 

RESETS FACP (ZONE ALARM)

Note: Audible feedback will be given for each button pres

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1 About This Manual

1.1 Introduction

This manual contains all the information required to install, commission and operate the ***ZoneSense – DH4 Fire*** Alarm Control Panel (FACP) and is only available to and for the use of personnel engaged in its installation, commissioning and operation.

1.2 General Requirements

The ***ZoneSense – DH4*** FACP has been designed and manufactured from high quality commercial components so as to comply with major world standards. To ensure these standards are not compromised in any way installation staff and operators should;

- Be qualified and trained for the task they undertake;
- Be familiar with the contents of this manual prior to the installation, commissioning or operation of a FireFinder control system;
- Observe anti-static pre-cautions at all times; and
- Be aware that if a problem is encountered or there is any doubt with respect to the operational parameters of the installation the supplier should be contacted.

1.3 References

AS1851 - Maintenance of Fire Protection Systems and equipment - Fire Detection and Alarm Systems.

AS4428 - Fire Detection, Warning, Control and Intercom Systems – Control and Indicating Equipment. Part 1 and Part 5

1.4 Symbols

ⓘ Important operational information

☞ **Note:** Configuration considerations

Observe antistatic precautions

Mains supply earth

DANGER mains supply present

2 System Overview

The ***ZoneSense DH4*** Fire Alarm Control Panel (FACP) is supplied, as a four (4) Zone Conventional FACP with two (2) dedicated Alarms and Door Holder outputs. It can be supplied in either ABS (BX1) or Metal cabinet (BX10)

Features include:

- Controls that have tactile and audible feedback of operation.
- On-site programming.
- Terminals cater for up to 2.5mm diameter cables.

Buzzer Operation

- The buzzer provides audible:
- Indication at system start-up (3 tone bursts of increasing frequency)
- Indication of a fire condition. Tone is continuous, until the buzzer is silenced or the fire condition is cleared by reset.
- Indication of a fault condition. Tone is 1 second on, 1 second off, until the fault condition clears.
- Feedback when a key is pressed.
- Feedback when multiple keys are pressed simultaneously or illegal key press (for example RESET when at access level 1) or there is a timeout condition entering the password.

The buzzer

- Is silenced by SILENCE BUZZER but will resound on any new alarm or fault condition.
- Sounds during a lamp test.
- Sounds (fault indication), when the power supply is not calibrated.
- Sounds when calibration is successful (same tone bursts as at system start-up)

3 ZoneSense – DH4 Description

The ZoneSense DH4 is a four (4) zone conventional Fire Alarm Control Panel (FACP) with a front panel layout that offers a user friendly interface, clear visual indications and tactile-feedback for controls.

- The design of the ZoneSense DH4 focuses on applications for local alarm FACP's – i.e. a non-brigade calling system but with a host of features.
- Key features of the ZoneSense DH4 FACP include:
- Dual Door Holder Outputs – two failsafe 24VDC outputs for fire door operation. The outputs being de-activated and doors released if an alarm condition is present or they are manually released at the front panel Mains Only Mode or optional backup battery operation – factory set to operate on mains only. Changing the setting will permit monitoring of optional batteries
- Low quiescent current – of particular benefit if the battery option is used
- Walk Test Facility – allows a single person to perform a system test
- Class Change Input – allows the alarm output to be controlled by an external programmable timer
- Alert Input – when an alert input is active the alarm output will pulse on & off in 1 sec intervals
- Easy to use – the panel is simple to operate, install and commission therefore reducing costs
- Each detection circuit accommodates up to 40 Conventional Fire Detectors

The main board:

- Accommodates the visual indications and controls
- Two (2) volt-free changeover contacts (Fire & Fault)
- Termination for detection zones
- Two (2) monitored alarms outputs – open collector
- Two (2) unmonitored door holder outputs
- Two (2) non-latching inputs ('class change' and 'alert')
- Auxiliary 24VDC output
- On board power supply

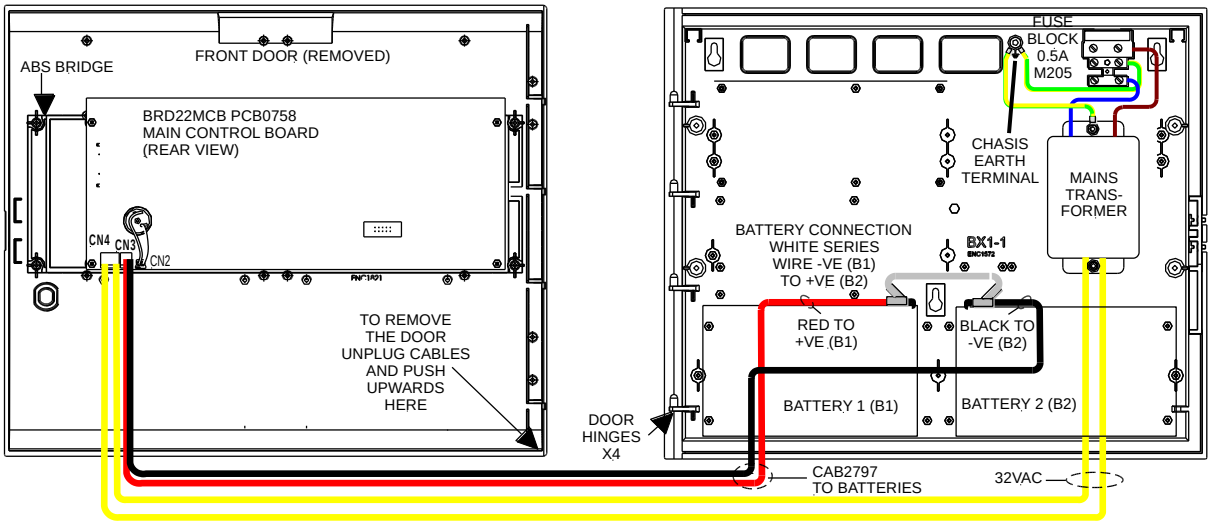


Figure 1: Typical Example of a ZoneSense – DH4 Layout

4 Placing the Basic System into Operation

4.1 Unpacking

Carefully unpack the ***ZoneSense – DH4***

The package should include:

- Main Card, with all controls and indicators mounted directly onto it;
- a switch-mode power supply;
- 2 X 12 Volt batteries connected in series.
- 2 X 003 keys

4.2 Anti-Static Precautions

To prevent damage to components, modules and boards, anti-static precautions ***MUST*** be observed while performing any task within the FACP. The same applies to those situated in the field

4.3 Working On The System

Prior to unplugging any connector, connecting or disconnecting any wiring, removing or replacing any module or board, ensure that both the Mains and Batteries have been isolated to prevent damage to panel components.

4.4 The Cabinet

Features:

- The cabinet is available in three different styles. Each style has the capability of being either surface or flush mounted. With flush mounting though a surround is required.
- Normally painted Arch White Ripple. Other colours are available on request.
- The inner and outer door hinges are mounted on the left-hand side of the cabinet which allow the doors open to an angle of 100º. Locking is normally keyless though keyed entry is available on request.
- Knockouts are positioned at the top and rear of the cabinet to simplify cable entry.

4.5 Mounting The Cabinet

☞ **Note:** It is recommended the cabinet should be installed in a clean, dry, vibration-free area.

Open the front door. Use the keyhole mounting holes in the top corners and in the lower middle of the unit to mount it on the wall. Cables to connect the system to its external actuating devices are brought in through the knockouts on the top or bottom of the cabinet.

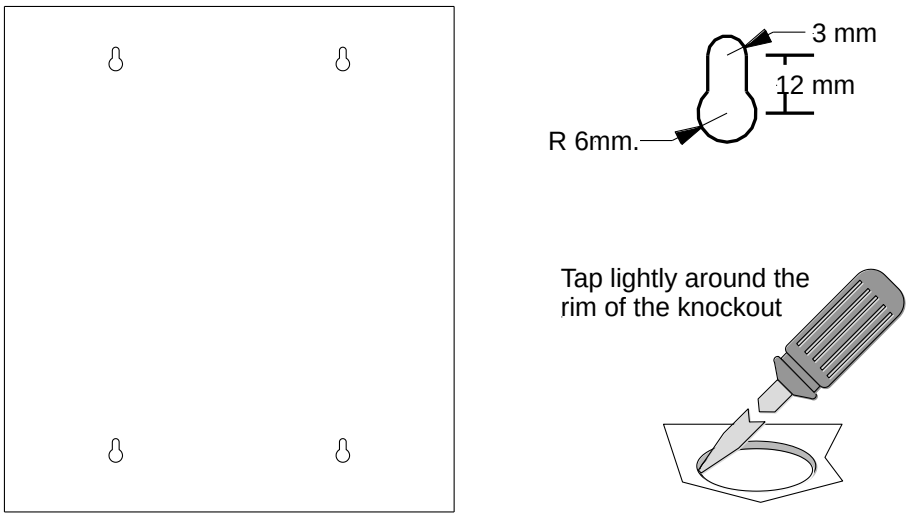


*Figure 2: Example **ZoneSense -DH** Mounting & Removing Knockouts*

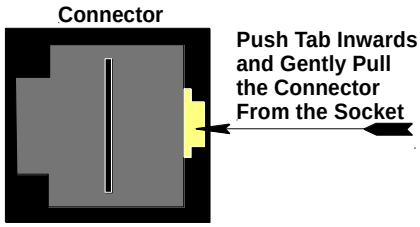
4.6 PCB Removal / Replacement

If the PCB's have to be removed the following precautions should be observed;

- Removing the door will provide better access to the boards and ensure the hinges are not accidentally stressed.
- Personal anti- static procedures must be followed.
- When disconnecting the 20 way connecting cable from the PCB, make sure that the cable remains connected to at least one board to prevent it being misplaced.

☞ **Note:** *Care should be taken when detaching this connector as it is necessary to depress the small locking tab to unlock the connector from its base. To reconnect the cable the connector must first be correctly aligned then pushed into the socket so it locks into position.*

- Carefully remove the retaining screws at each corner of the board taking care not to damage any of the components.
- Place each board into anti- static storage once removed.



4.7 Power Supplies and AC Mains Installation

4.7.1 Primary Power Supply

The FACP consists of the Main Control Card and mains transformer. The control board is broken into two sections, the main control circuitry and the power supply / charger.

4.7.2 Mains wiring

The requirement for the Mains supply to the FACP is fixed wiring, using three core cable (no less than 0.75mm″ and no more than 2.5mm″) or a suitable three conductor system, fed from an isolating switch fuse spur, fused at 3A. This should be secured from unauthorised operation and be marked 'FIRE ALARM: DO NOT SWITCH OFF. The Mains supply must be exclusive to the FACP.

4.7.3 Connecting the Panel

Connecting ***ZoneSense – DH4*** internal connections and boards is best undertaken immediately prior to Commissioning.

Before beginning ensure all devices on the circuits are correctly connected and that cable integrity is verified throughout the installation.

ⓘ *Important: DO NOT use an insulation tester ('Megger') with any electronic devices connected. Faults occurring in the wiring which are not picked up at this stage will almost certainly result in spurious and intermittent faults when the equipment is energised.*

ⓘ *Important: Under no circumstances should the* ***ZoneSense PLUS - AR*** *panel be operated without the Power Supply correctly mounted in the enclosure and the retaining screws securely tightened.*

4.7.4 Connecting the Mains Earth

All earth cabling shall be terminated to the panel Chassis Earth Terminal in a star configuration.

The earth cable closest to the cabinet body shall have an M4 SPW beneath the lug then an M4 SPW and M4 nut.

Each additional earth cable shall be terminated with an M4 SPW and M4 nut.

An additional M4 nut and M4 SPW are fitted to the Chassis Earth Terminal for installers to connect their Mains Earth.

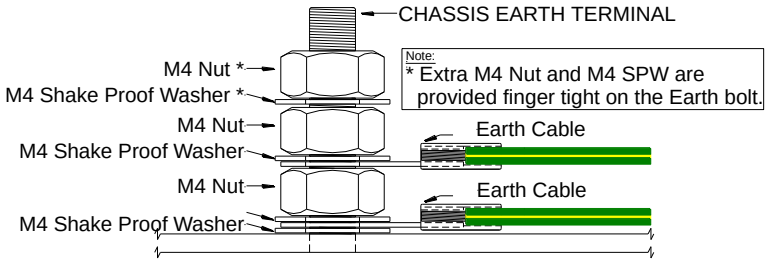


Figure 3: Panel Earthing

4.7.5 Connecting the Mains Power to the Mains Transformer

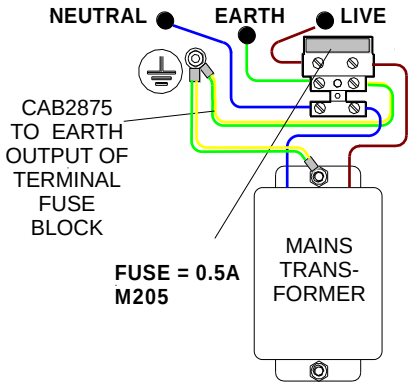


Figure 4: Mains Transformer Wiring

4.8 Power Supply

The power supply equipment (PSE) consists of a primary power supply and battery standby if required.

The primary power supply derives the appropriate voltages to run the FACP and charge the batteries (if fitted) from the available mains supply. In the event of a failure of the mains supply the PSE automatically switches over to the standby rechargeable sealed lead acid batteries to power the FACP. During this time the FACP will indicate there is a power fault (Power Fault LED flashes) and continue to function normally. When the mains is restored the PSE automatically switches back to the primary power source. If the mains interruption is of such duration that the standby battery capacity is reduced to such a level as dictated by the battery manufacturer the FACP will shut down.

The maximum size batteries that can be accommodated within the enclosure are 7A/Hr.

4.8.1 Primary Power Supply

The primary power supply operates from 204 to 265VAC, is capable of producing a nominal 24VDC at up to 1.6 amps. It consists of a transformer mounted to the rear of the enclosure and appropriate circuitry located on the control card.

A DC to DC converter converts the 24VDC to 3.3VDC to power the FACP microprocessor.

4.8.2 Standby Power Supply

The optional backup battery supply is required to be able to maintain FACP quiescent operation for 24 hours (72 for non monitored applications) in the event of mains power failure, then supply full alarm load for a period of 30 minutes.

The standby power supply has a low voltage disconnect to prevent the batteries from being discharged below 21VDC.

Requirements of the battery charger are to:

- Ensure the batteries are charged according to the manufacturers specifications.
- To provide a facility to measure the battery voltage, and detect a missing or damaged battery
- To provide a facility to turn off the charger output.
- To provide a facility to measure the charger voltage
- To ensure the battery connection is protected against reverse or short circuit connection
- To ensure the battery does not discharge through the battery charger, when the charging voltage is less than the battery voltage.

4.8.3 Setting Battery Monitoring

If the optional backup battery supply is not fitted to the FACP the battery monitoring is disabled (at access level 3) by using switch 1 of the 4 way DIP switch SW10. Switch is ON to enable monitoring, and OFF to disable monitoring.

4.8.4 Power Faults

Power faults are detected within 10 seconds and displayed by the FACP. Faults detected are;

- Loss of mains and if batteries are fitted and monitoring enabled.
- Missing or damaged batteries
- Battery voltage below 21.6V
- Charger voltage in excess of 28.8VDC
- Loss of charger voltage

4.8.5 Power Management

The following is the current requirements of the panel.

Requirement	Current mA
Battery Charger	234
4 x Zones @ 25mA (in alarm)	100
4 x Zones @ 2mA (normal)	8
2 x Alarm Outputs (250mA each)	500
2 x Door Holder Outputs (250mA each)	500
Aux 24VDC	150
FACP electronics	25
Total	1517

In the quiescent state, current requirements are:

Requirement	Current mA
Battery Charger (assume max charge)	234
4 x Zones @ 2mA (normal)	8
2 x Door Holder Outputs (250mA each)	500
Aux 24VDC	150
FACP electronics	25
Total	917

In the alarm state, current requirements are: (assume all 4 zones are in alarm and the charger has been disabled).

Requirement	Current mA
Constrained battery charge	50
4 x Zones @ 25mA (normal)	100
2 x Alarm Outputs (250mA each)	500
Aux 24VDC	150
FACP electronics	25
Total	825

4.8.6 Powering Up and Down Sequence – Batteries Fitted

Given the current involved on “power up” the following procedure ***MUST*** be followed;

Power Up

- Connect the batteries – white cable +ve red terminal to black terminal –ve (places the batteries in series) red cable to red + ve terminal, black cable to –ve black terminal.
- Switch on the mains supply

Power Down

Switch off the mains supply

Remove the positive (+ve) lead from the batteries

ⓘ **Note:** *After a “Power Down” the mains supply and batteries **MUST** be left disconnected for at least 1 minute to allow any residual capacitive charge to be dissipated. If this process is not followed a SYSTEM FAULT could be incorrectly indicated*

5 Main Control Board

The Main Control Board provides a range of different field terminations – inputs, zone circuits, monitored outputs, voltage free outputs (relay).

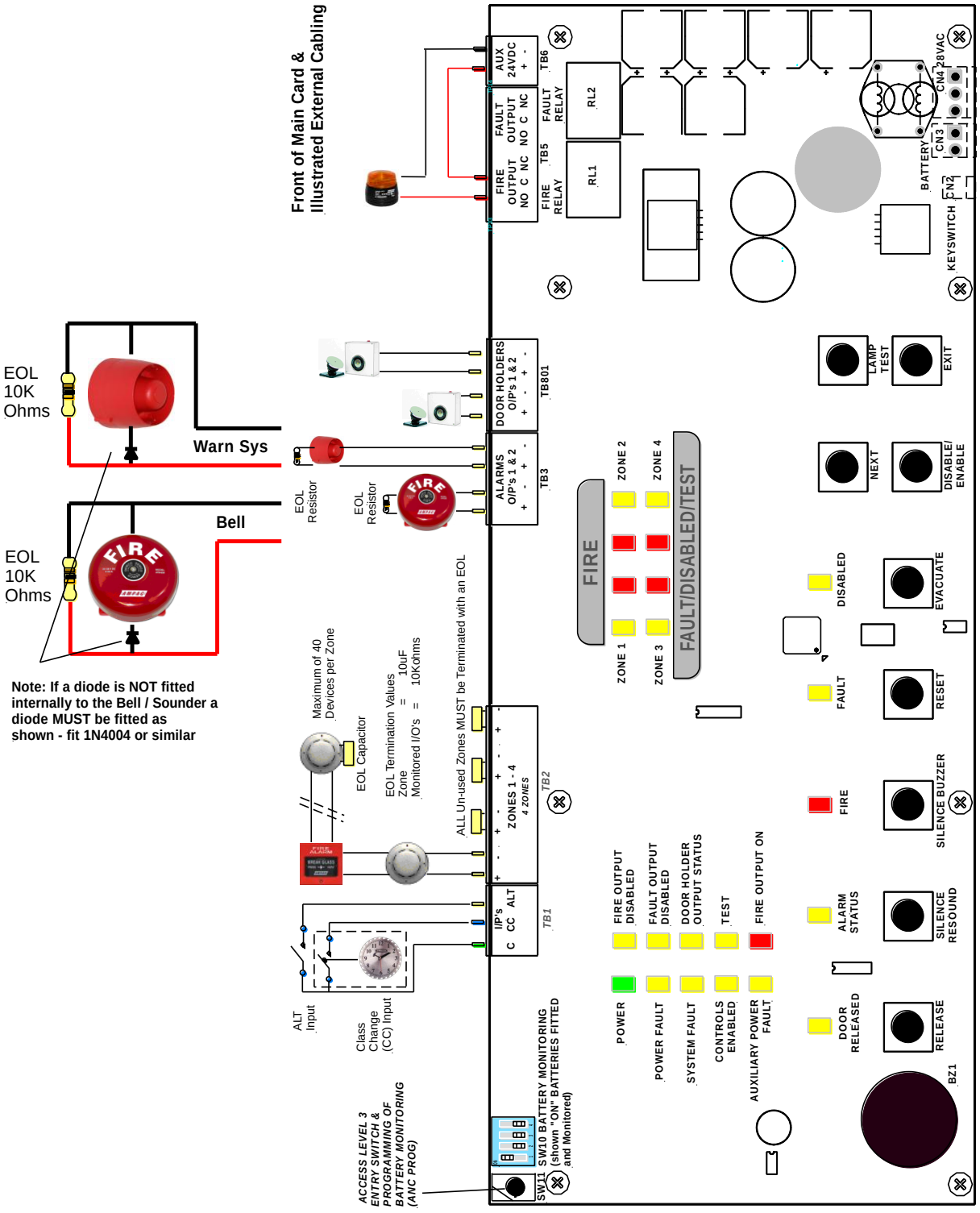


Figure 5: Main Board Layout

5.1 Inputs (TB1)

5.1.1 Common Terminal (TB1 Com)

Used for inputs requiring a 0V potential to initiate a change of state in an output.

5.1.2 Class Change Input (TB1 Com / 1)

This input allows a remote voltage free, closing set of contacts to operate the Alarm outputs. The non-latching input is active when it is pulled down to 0v potential. When active the Alarm Outputs will operate continuously, no visual indication is given and no other output shall operate.

5.1.3 Alert Input (TB1 Com / 2)

This non-latching input allows a remote voltage free, closing set of contacts to operate the Alarm outputs. The input is active when it is pulled down to 0v potential. When active the Alarm Outputs will pulse at a rate of 1sec on 1 sec off, no visual indication is given and no other output will operate.

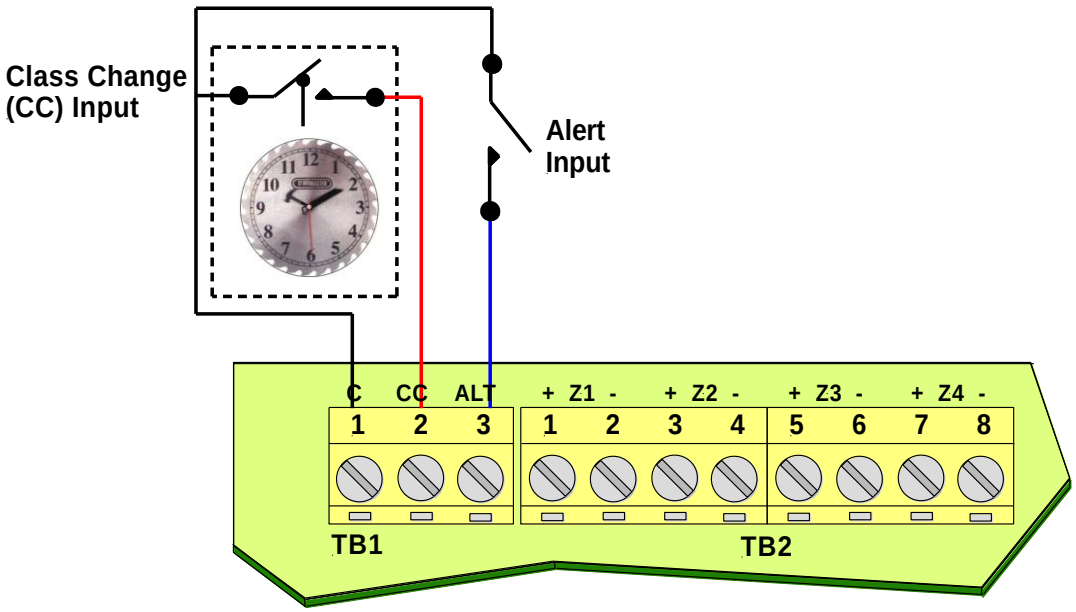


Figure 6: Typical Class Change / Alert Input Termination and location on the Main Ctrl Card

5.2 Detector Zones (TB2)

A maximum of 40 x 24volt Optical / Heat detectors, Multi-sensor detector and / or Manual Call Points mixed in any order can be fitted to each circuit. An output current of 4mA for each circuit with capacitive EOL is considered to be normal and in a worst case or fault S/C condition each circuit is current limited to a maximum of 25mA.

The Main Control Board has up to four (4) zone circuits that connect to the 24VDC conventional fire detectors. The maximum number of detectors and MCP's that can be supported will be influenced by the quiescent current draw of the detectors and MCP's being fitted to the system.

The wiring for each zone circuit should be connected to the relevant terminal block on the Main Control PCB and if screened the screens terminated at the panel's base earth post.

ⓘ **Note:** An End of Line EOL 10µF Bi-polar Capacitor must be connected across the terminals of the last device on each circuit to allow the circuit to be monitored. Zones that are not used must also have an End of Line capacitor fitted to the terminal block at the panel.

The detector interface is compatible with Apollo conventional detectors (refer to the list of compatible devices). Reset time is 2 seconds. Each zone circuit will function as follows.

Reported Condition	Comment
Disable	When the zone circuit has been disabled
Fault	Short circuit exists on the zone circuit
Alarm	One or more detectors have been activated
Fault	EOL capacitor is not detected (O/C condition), detector removed
Normal	All detectors are normal and EOL capacitor is connected

5.2.1 Operating Conditions

All zone fault conditions are non latching hence cleared when the reset control is activated, and are re-announced within 10 seconds if the fault condition still exists.

Zone alarms are only configured as latching. This means that irrespective of the condition of the zone itself the alarm condition can only be cleared when the front panel reset control is activated,

Typically MCP's must be fitted with series resistors (470 or 680 ohm), so as when the MCP is activated a short circuit is not present on the zone circuit.

The zone circuits can be disabled by using the front panel controls. Once disabled, the zones do not cause the activation of the alarm outputs, remote relay output or ancillary output.

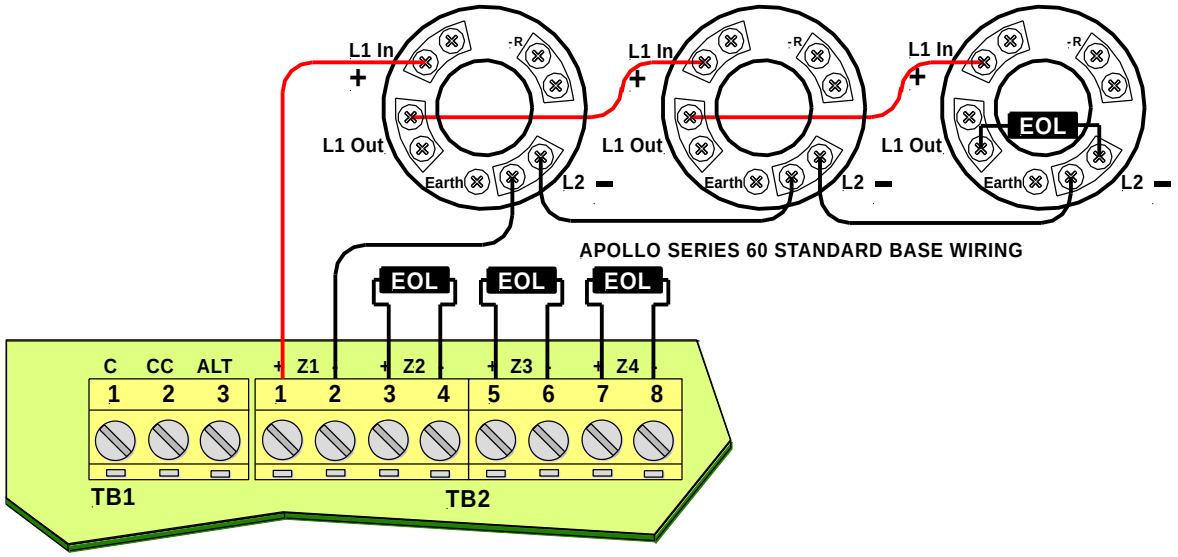


Figure 7: Detector Wiring

5.3 Outputs – Supervised "Alarm" (TB3) & Unsupervised "Door Holder" (TB801)

The Main Control Card has two (2) parallel PTC protected supervised outputs (TB3) typically used to power electronic type sounders referred to as alarm outputs and two (2) parallel PTC protected un-supervised outputs (TB801) used to power door holders and referred to as the door holder outputs. Each output is nominally rated at 250mA @ 24VDC.

Supervision is achieved by the sensing of the End of Line (EOL) 10kΩ resistors and is independent of the loading of bells and sounders. The supervision is forward biased and requires diodes to be fitted in series with each bell and sounder. Faults on the supervised outputs will be indicated by the FACP within 60sec.

The Supervised Alarm Outputs (TB3) are activated by the:

- Class change input
- Alert input
- Front panel evacuate control, silence/resound control
- Zones entering the alarm condition. If there are no delays programmed the alarm outputs will be activated within 3 seconds of the zone entering the alarm condition.

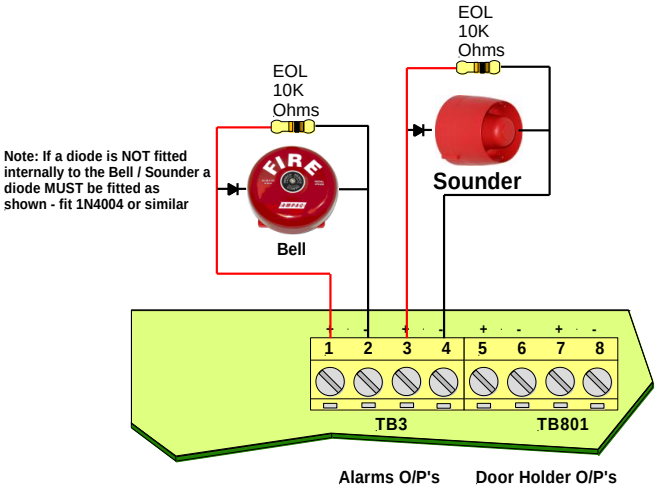


Figure 8: Alarm Output Wiring

☞ **Note:** *If a diode is NOT fitted internally to the Sounder a diode MUST be fitted as shown above*

The Unsupervised Door Holder 1 and Door Holder 2 Outputs (TB801) are;

- Normally energised and
- De-energised on a Fire condition, evacuate condition and mains fail condition. There is a small de-bounce time (approx 5 seconds) for mains fail, so the door holder outputs are not de-energised on a power glitch.

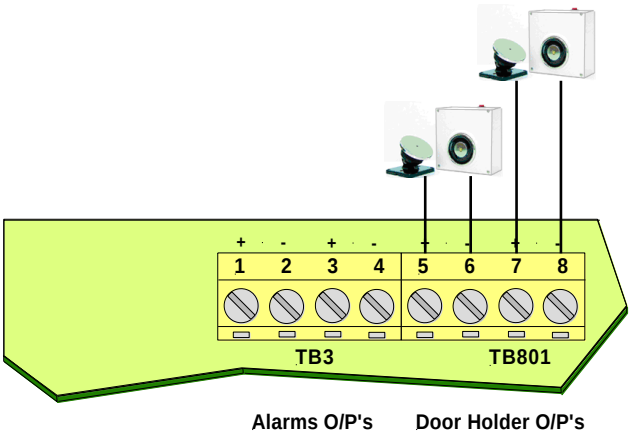


Figure 9: Door Holder Wiring

5.4 Outputs – Volt Free Relay (TB5)

There are two voltage free relay outputs, the Remote output, and the Fault output.

5.4.1 Fire Output Relay

The Fire Output Relay has 1A 30VDC unsupervised voltage free single change over contacts that are activated when any zone circuit reports an alarm condition. The front panel indicator “Fire Output On” is illuminated when the output is activated and is reset via the front panel reset control.

The output can also be disabled by using the front panel controls. Once disabled the relay will remain off until re-enabled and the front panel indicator “Fire Output Disabled” is illuminated.

5.4.2 Fault Output Relay

The Fault Output Relay is energised if the FACP is operating normally and has unsupervised 1A 30VDC voltage free single change over contacts. The output can be disabled by using the front panel control. Once disabled the relay will remain on until it is re-enabled and the FAULT OUTPUT front panel indicator is illuminated when this output is disabled.

If a fault is present on the FACP the output relay is de-energised and remains de-energised until the fault conditions have cleared. There are a number of front panel fault indicators that detail the nature of the fault. These are:

- Power Fault – fault relating to the power supply.
- System Fault – fault relating to the operation of the FACP.
- Auxiliary Power Fault – fault relating to the auxiliary power output.
- Individual zone fault indicators.
- Alarm Outputs.

☞ **Note:** All faults are non latching, except for system fault.

☞ **Note:** Faults associated with zones are cleared on a reset condition.

☞ **Note:** Power faults are indicated

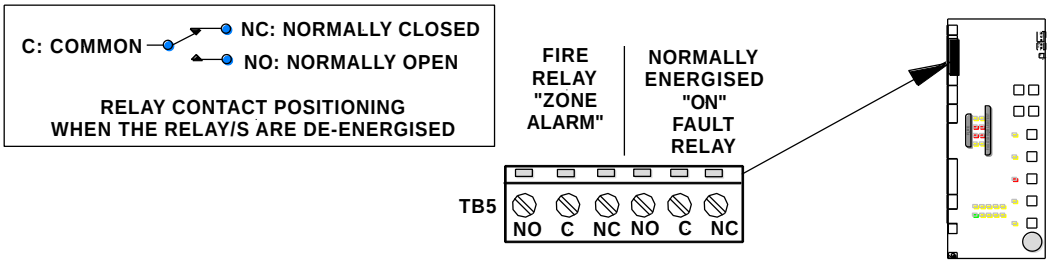


Figure 10: TB5 Alarm and Fault Relay Termination & Location on the Main Ctrl Card

5.5 Walk Test (TEST)

A Walk Test can be introduced to test each zone. This is done by entering the password to access level 2, disabling the Door Release O/P, pressing the TEST key then, if necessary press the NEXT key to select the required zone as indicated by the ZONE TEST indicator (Amber Flashing). A test alarm can then be generated on the selected zone by activating a detector with smoke or by placing a 470 to 680Ω resistor across a detector in the selected zone. As long as the resistor is across the line the Alarm Outputs (sounders) will be active, removing the resistor automatically resets the FACP and silences the alarm. To halt the test press EXIT or NEXT to select another zone.

☞ **Note:** *The test does not time out and has to be cancelled at the FACP.*

5.6 Watchdog Circuitry

The Main Control Board has watchdog circuitry external to the main processor that strobes the main processor at intervals equal to or less than 1 second. If the 1 second interval is not met the main processor is reset by the Watchdog circuitry, the system fault and common fault indicators will be illuminated and the buzzer will sound. These indicators remain illuminated until reset.

If the main processor fails to successfully restart after six to twelve reset operations the processor is held in reset. In the situation where the processor is held in reset, the buzzer will sound, the system fault and fault indicators will flash at 0.25Hz that is On for 2 seconds and Off for 2 seconds.

5.7 Checksum

At periods not exceeding one hour, the main processor performs a checksum operation on the application software and configuration data. If the application software or configuration data has become corrupted then the main processor enters the reset state, the buzzer will sound, and the system fault / fault indicators will flash at 0.25Hz that is On for 2 seconds and Off for 2 seconds.

6 ZoneSense Front Panel Controls and Indicators

6.1 Introduction

The front panel consists of 9 push buttons and 23 LED indicators, and an optional enable key-switch.

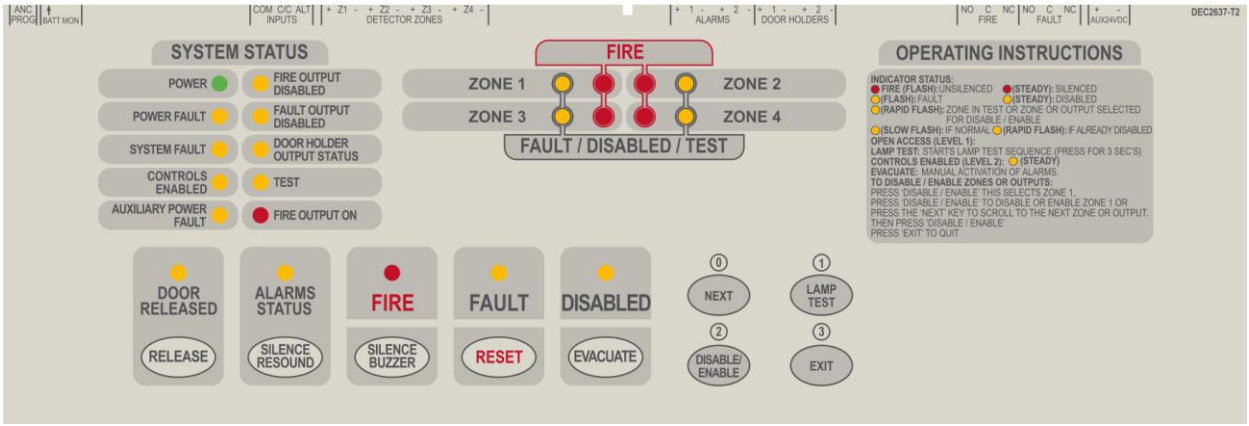


Figure 11: Front Decal Layout

6.2 Controls

6.2.1 Access Levels and Passwords

ZoneSense has three levels of controlled operator access and are defined as level 1, level 2 and level 3.

Level 1

Operational control, or normal operation, at access level 1 is limited to;

- Silencing the buzzer
- Overriding any set output delays
- Password entry to access level 2

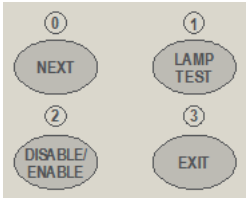
Level 2

Entry to access level 2 can be gained by entering a fixed digit password (3210).

☞ **Note:** *When the FACP is in access level 2, the* 

indicator is illuminated.

Password Entry



The password is entered by pressing

- Exit ③, then
- Enable/Disable ②, then
- Lamp Test ①, and finally the
- Next ⓪ key.

☞ **Note:** *The timing between key presses must be 2 seconds or less. If not entry will timeout, the buzzer will beep and the password will have to be re-entered.*

☞ **Note:** *If the FACP is in access level 2 and no controls are operated within 120 seconds, then the FACP will revert to access level 1.*

Level 3

Used to Enable / Disable Battery Monitoring

- Enter the level 2 password as shown above.
- Press the ANC PROG button (SW11). The panel should beep.
- Switch 1 of SW10 can now be toggled to Disable / Enable battery monitoring. (Switch 1 'ON' battery monitoring enabled. Switch 1 'OFF' battery monitoring Disabled (See Figure 7)
- Press the Exit key to return to level 1
- Battery Monitoring can be verified by entering level 3 again. The POWER FAULT indicator should be steady for Enabled battery monitoring or Off if Disabled.

Door Release - Active at access level 2 and above

Control is used to de-activate the door holder outputs (1 and 2) which release the doors. Door holder outputs remain de-activated until cleared by the reset control.

Silence / Resound Alarms - Active at access level 2

Used to turn off the alarm outputs once they have been operated by a fire or evacuate condition.

In the event of a new fire condition the alarm outputs will again operate. Pressing a second time reactivates the Alarm outputs once they have been silenced.

Silencing an alarm will cause the Common Fire LED and any Zone Fire LED to change from flashing to steady.

Silence Buzzer - Active at access level 1 or above

Used for silencing either the fault or alarm warning buzzer at access level 1 and above. The buzzer will resound on any new event.

Reset - Active at access level 2

The reset control is used to return the FACP back to a quiescent state from a fire alarm or fault condition and to extinguish the "System Fault Indicator". This means all zone circuits are reset for 2 seconds.

As a result of the reset, all alarm outputs, and fire output will be switched off, and the door holder outputs activated

Where a fault condition is cleared as a result of a reset, and if the fault condition is still prevailing, it shall be appropriately reflected at the FACP within 20 seconds. The fault conditions that are cleared by Reset are system fault and any zone related faults. All other faults are non latching

The reset button is unique and is not to be used for any other purpose.

☞ **Note:** *Reset is also used to extinguish the System Fault indicator.*

Evacuate - Active at access level 2

Turns on and latches alarm outputs, fire output and local buzzer and the common Fire indicator flashing. The door holder outputs are switched off. No other outputs or indicators are affected.

Activating the silence / resound alarms control, will turn off the alarm outputs, and cause the common fire LED to go steady. Activating the silence / resound again will cause the alarm outputs to be activated and common fire LED to flash.

Operation of the silence/resound control has no effect on the door holder output state

Activating the reset switch, will cancel the evacuate condition, which results in the alarm outputs being turned off, door holder outputs activated and the common fire led being extinguished.

Next ⓪ - Active at access level 1 and 2.

At access level 1, the Next ⓪ key is used to enter the 0 digit of the 3210 password.

At access level 2, the Next ⓪ key is used to select zone circuits for the walk test and outputs for disable / re-enable.

Lamp Test ① - Active at access level 1 and 2.

At access level 1, the Lamp Test ① key is used to enter the 1 digit of the 3210 password, and instigate a lamp and buzzer test if the key is depressed for 3 seconds or more. The lamp test sequentially illuminates all indicators and sounds the buzzer for approximately 1 second.

☞ **Note:** *The lamp test will be cancelled if a fire condition is to be announced and can not be instigated if a fire condition is present.*

☞ **Note:** *The lamp test is cancelled if a fault condition is to be announced but can be instigated if a fault condition is present.*

At access level 2, the Lamp Test ① key is used to commence the walk test.

Disable/Enable ②

Active at access level 1 and 2

At access level 1, is used to enter the 2 digit of the 3210 password.

At access level 2, is used to disable / enable selected zones and / or outputs.

Exit ③

Active at access level 1 and 2.

At access level 1, Exit ③ is used to enter the 3 digit of the 3210 password.

At access level 2, Exit ③ is used to exit from the disable / enable, and walk test procedure.

6.3 Indicators

There are 23 LED indicators on the front panel of the FACP. The indicators are in three groups.

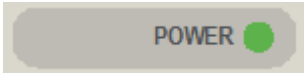
There are 10 system status indicators, 5 control indicators and 8 zone indicators

All indicators are visible at access level one. If flashing indicators are used then the on / off periods shall not be less than 0.25 seconds and the flash frequencies shall not be less than:

- 1Hz for Alarm indications (0.5 second on, 0.5 seconds off)
- 0.5Hz for fault indications (1 second on and 1 second off)
- 2 Hz for rapid flashing (0.25 seconds on and 0.25 seconds off)
- 0.25 Hz for slow flashing (2 seconds on and 2 seconds off)

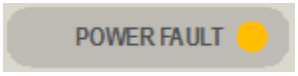
Where the same indicator is used for fault and disable then the fault indicator shall flash and the disable shall be steady. The disable condition has display priority.

6.3.1 System Status Indicators



Power – Green

Illuminates steady when the FACP is supplied with mains power and flashes if mains fail.

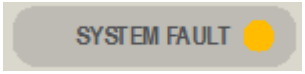


Power Fault – Amber

Illuminated steady when there is a fault with the system power supply. Fault can be no mains, high charger voltage, low battery voltage or missing / damaged battery (if batteries are fitted).

Will not be illuminated for a low battery voltage or missing battery if the FACP has been configured so that battery monitoring has been disabled.

Flashes at the fault rate when the power supply has not been calibrated.



System Fault - Amber

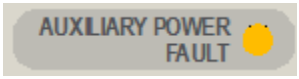
Indicates a failure of the FACP to provide the mandatory functions such as software or hardware failure.

This indicator is latched ON, until cleared by master reset.

If the processor on the main card undergoes a watchdog condition, then the System fault indicator will be illuminated ON and steady, and remain ON until cleared by a master reset.

Controls Enabled - Amber

Illuminates steady to indicate the FACP is at access level 2.



Auxiliary Power Fault - Amber

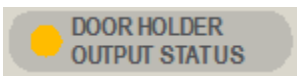
Illuminated steady on a fault condition to the DC feed common to the auxiliary 24VDC feed.

Fire Output Disabled - Amber

Illuminates steady if the “Fire Output” relay is disabled.

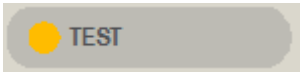
Fault Output Relay Disabled - Amber

Illuminates steady if the “Fault Output” relay is disabled.



Door Holder Output Status - Amber

This indicates a disable condition (steady). Display priority: Disable (steady) then fault (flash)



Test - Amber

Illuminated to show that the FACP is in the Walk Test mode. The indicator is illuminated steady when the walk test is active.

Fire Output On - Red

Illuminates steady when the “Fire Output” relay is active as a result of a fire condition.

6.3.2 Control Indicators

There are five (5) control indicators within the central control area of the FACP.

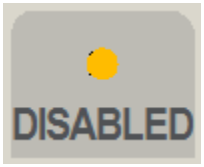
Common Fire - Red

Common fire indicator will be flashing at the alarm rate when a fire condition is present or the evacuate control is operated (when the FACP is at access level 2). The indicator will become steady when silence resound switch is pressed.

A new fire condition or activation of the evacuate control will cause the indicator to flash again.

Common Fault - Amber

Fault indicator - illuminated steady by any fault condition.



Disabled - Amber

Disabled indicator illuminated steady by any disablement on any zone or output.

Door Released - Amber

The indicator is illuminated when the door holder outputs (1 & 2) have been deactivated.

Alarms Status - Amber

This indicator is immediately above the Alarms silence / resound switch and indicates a disable condition (steady) or a fault condition (flashing at the fault rate) on any of the alarm outputs.

Display priority: Disable (steady) then fault (flash)

6.3.3 Zone Indicators

There are two indicators for each alarm zone fitted to the FACP.

Zone Fire – Red

Individual zone Indicators showing when each zone is in the fire condition (flashing at the alarm rate) and will become steady when silence resound switch is pressed. An incoming alarm on another zone will cause that fire indicator to flash while the original indicator will remain steady.

Zone Fault / Disabled / Test – Amber

Flashes at the fault rate due to a fault condition on individual zones. Disabling that zone causes the LED to become steady. Reminder - the disablement has priority over displaying a fault condition.

Other Indications

The zone indicators are utilised in the disable /enable and walk test process. The following table summarises the functionality of the zone indicators:

Condition	Fire Indicator	Fault/Disabled Test Indicator
Alarm (un-silenced)	Flashing at the alarm rate	-
Alarm (silenced)	Steady	-
Fault	-	Flashing at the fault rate
Disabled	-	Steady (priority over fault)
Normal	-	-
Disable / Enable Operation		
Disable	-	Rapid Flash
Enable		Slow Flash
Walk Test		
Selected and under test	Steady – when the alarm condition has been detected (3 seconds only)	Rapid Flash

7 FACP Operation

7.1 Normal Condition

The FACP is in its normal condition when there are no;

- Fire alarm/s
- Fault/s
- Disable/s
- Testing
- Programming
- The power indicator is illuminated steady (indicating mains power is available) and
- The door holder outputs shall be activated.

The FACP can be in access level 1 or access level 2. If the FACP is at access level 2, then the Controls Enabled LED will be illuminated steady.

7.2 Fire Alarm Condition

General Conditions

- An alarm is triggered when any of the detectors on a zone circuit sense a fire or a manual call point is manually operated.
- Each zone operates in isolation to the others.
- If a zone/s circuit/s have been disabled the FACP is prevented from initiating an alarm condition on that zone circuit.
- If a lamp test is in progress when an incoming alarm is recognised it will be aborted.
- If the FACP is in programming mode when an alarm is recognised, then programming mode is aborted.

When the FACP is in the fire alarm condition, then the fire output will be activated immediately

Associated with the fire output is the fire output on indicator.

The fire output can be disabled (isolated). If the fire output is disabled, then it is not activated as detailed above, and the fire output disabled indicator is illuminated.

The door holder outputs are de-activated immediately.

Indication of the Fire Alarm Condition

The fire alarm indications are the;

- Common fire indicator flashes (goes steady when the Silence Resound button is pressed)
- Individual zone fire indicator flashes (goes steady when the Silence Resound button is pressed)
- Buzzer sounds. Press the silence buzzer control (reminder; the buzzer will resound for each new zone that goes into alarm)
- Alarm sounders and enabled outputs will be activated.

Subsequent Alarms

If at any time after the first alarm occurs other alarms are initiated the FACP will;

- Reactivate the buzzer, alarm sounders and outputs if they have been silenced
- Flash the Common Fire indicator
- Flash the appropriate zone Fire indicator of the zone that has come into alarm
- Continue to indicate (flashing) the previous zone or zones that were in the alarm condition (steady when the Silence button was pressed)

Reset from Fire Alarm Condition

Enter the password to access level 2 and press the Reset button.

7.3 Fault Condition

The FACP enters the fault condition when any received signals are interpreted as a fault.

The FACP recognises the following faults;

- Individual zone circuits
- Short or open circuit on the alarm outputs
- Fault with the power supply – loss of mains power, loss of batteries, low battery voltage condition (21.6VDC without mains available) and high charger voltage (28.8VDC)
- System fault – operational main board processing, correct cabling, address setting and monitoring of any ancillary modules connected to the system
- Short circuit on the auxiliary power output

The FACP recognises all sources of faults within 10 seconds.

The FACP can be prevented from detecting a fault condition under the following conditions;

- Presence of a fire alarm condition on the zone circuit
- Disablement of a zone circuit
- Testing of a zone circuit
- Activation of the alarm outputs
- Disablement of the alarm outputs
- Disablement of the door holder outputs

Indication of the Fault Condition

The presence of fault conditions are automatically indicated without manual intervention by;

- The common fault indicator
- The individual fault indicator for each zone. For fault conditions the individual indicators are flashing.
- For alarm output faults, the alarms status indicator is flashing.
- For faults with the power supply, the power fault indicator is illuminated.
- For system fault, the system fault indicator is illuminated.
- For a short circuit fault on the auxiliary power output, the auxiliary power fault indicator is illuminated.

For all faults the buzzer will sound. The buzzer can be silenced by the silence buzzer control. The buzzer will resound for any new fault condition.

Reset from the Fault Condition

Except for a System Fault, which has to be manually Reset, all faults are automatically cleared on clearance of the fault.

7.4 Disablement Condition

Selected functions of the FACP can be temporarily disabled under controlled conditions for such purposes as testing and maintenance. One or more of the following can be selected and then disabled;

In order of selection they are;

Zone circuits 1-2, 3-4

Door holder output

Fault output (has a dedicated disable indicator)

Fire output (has a dedicated disable indicator)

Alarm outputs

Disablement and re-enablement of any of the above items is not affected by reset from the fire alarm condition or the fault condition.

Disablement and re-enablement can only be carried out using the proper procedure at access level 2.

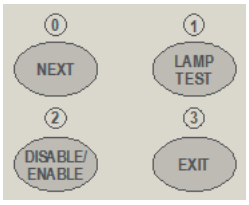
There is a common disablement indicator, which is illuminated when any of the above items have been disabled and for zone circuits there is a disable indicator which is common with the fault indicator. Disable has priority over the fault condition and the indicator is steady to indicate the disablement condition.

For alarm outputs the alarms status indicator is illuminated steady and has priority over the fault indication.

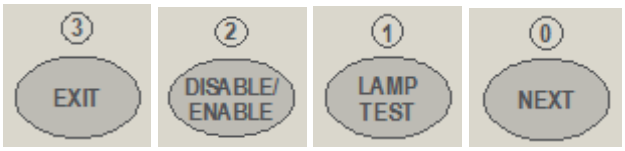
For the Door holder outputs the door holder status indicator shall be illuminated and has priority over the fault indication. When the door holder outputs are disabled the outputs remain energised regardless of a fire condition, evacuate condition or the manual door release control being activated. If there is a mains fail while the door holder outputs are disabled, then the outputs shall be de-energised after a suitable de-bounce period and then re-energised once the mains is restored.

7.4.1 Example of Disabling the Fault Output

Step 1

Enter the level 2 password by pressing these 

keys in the following order.



The 

LED will illuminate (steady)

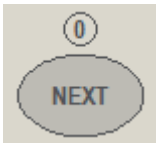
Step 2:

Press 

and the Zone 1 FAULT/DISABLE/TEST LED will flash and 

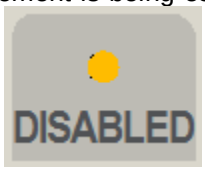
will flash. (slow for enabled, fast for disabled).

Step 3:

Press 

to step through the options until 

LED is illuminated (slow for enabled, fast for disabled)) and press 

again. The Fault Output Disabled LED will continue flashing while the disablement is being established and then become steady once the disablement is established as will the 

LED.

☞ **Note:** *Disablement and re-enablement of any of the above is not affected by Reset from the fire alarm condition or the fault condition and can only be carried out by following the appropriate procedure at access level 2.*

☞ **Note:** *Disable has priority over the fault condition. Disabling a zone will override the alarm condition and cause any outputs activated as a result of the zone going into alarm to be cleared.*

8 Compatible Devices

Ampac Item Number	Description
Detectors	
201-0500	ORBIS Heat Detector AIR BR (type A – rate of rise)
201-0504	ORBIS Heat Detector AIR A2S (type B)
201-0508	ORBIS Heat Detector CR (type C rate of rise)
201-0510	ORBIS Heat Detector Cs (type D)
201-0512	ORBIS Optical Smoke Detector
201-0514	ORBIS Multisensor Smoke Detector
Bases	
201-0541	ORBIS Timesaver LX Base
201-0543	ORBIS Timesaver Relay Base
201-0544	ORBIS S60 Base Adapter
Manual Call Point	
213-0017	AMPAC ACP-01 Manual Call Point Red,
213-0018	AMPAC ACP-01 Manual Call Point Yellow
213-0019	AMPAC ACP-01 Manual Call Point, White
213-0020	AMPAC ACP-01 Manual Call Point, Green
213-0021	AMPAC FP2 Manual Call Point Red
213-0022	AMPAC FP2 Manual Call Point White
Door Holder	
212-0012	AMPAC 50Kg @ 24VDC
Sounders	
205-0062	Vantage Sounder Red Inc Shallow Base AS1670.4
205-0063	Vantage Sounder White Inc Shallow Base AS1670.4
205-0066	Vantage Combi Red Inc Shallow Base AS1670.4
205-0067	Vantage Combi White Inc Shallow Base AS1670.4
205-0077	Vector White AS1670.4
206-0012	AMPAC Bell 150mm

8.1 Item Codes

Ampac Item Number	Description
2250-4200	ZoneSense DH4 ABS (BX1) excl Batteries
2250-4250	ZoneSense DH4 METAL (BX10) excl Batteries
ENC3016-a	Metal BX10 Surround

9 Specifications

Power Supply

Mains Supply Voltage		204 to 264VAC 47 – 63 Hz
Main Control Board Power Supply		Set to 27.2VDC - Modulated: 27.2V with no alarm condition, with the battery fully charged and the ambient inside cabinet temperature is 25°C
Power Supply Output Current Limiting		max current 1.6A
P/S, Battery Charger and Battery Monitoring		Yes
Battery Over Discharge Protection		Yes (Deep discharge cut off 21.2VDC)
Max. Battery Size and Type		2 X 12V - 7AH sealed lead acid connected in series
Mains Fuse		0.5A
Supply Fault Indication	Volts High	28VDC
(at room temperature)	Volts Low	23.5V
Main Board quiescent current		20mA

Dimensions

Size	
ABS (BX1)	360mm (W) x 300mm (H) x 80mm (D)
Metal (BX10)	360mm (W) x 300mm (H) x 80mm (D)

Environmental Operating Conditions

Temperature range	-5˚C to +55˚C
Relative humidity	25% to 75%

Detector Circuits

Number of Circuits	4
Zone circuit monitoring	Open and short circuit
Maximum quiescent detector current	4mA
Zone circuit EOL value	10uF
Maximum cable length / DC Resistance	3km / 50 Ω
Maximum cable capacitance	1µF
Recommended Cable Size	2 core 1.5mm² to 2.5mm²
Recommended MCP internal resistor value	470Ω to 680Ω
Short circuit current limiting per zone	25mA
Max. number of detectors & MCP's per zone	40 (influenced by the number & type of different devices)

Outputs

Alarm output 1 & 2 [supervised]	250mA each, S/C protected
Door Holder output 1 & 2 [unsupervised]	250mA each, S/C protected

Voltage Free Contacts Outputs

Fire Output	NO, NC & COM Contacts @ 1A
Fault Output	NO, NC & COM Contacts @ 1A

Auxiliary Outputs

Aux +/- 24VDC	Supervised & current limited to 150mA

Auxiliary Inputs

Class Change - Unsupervised, non-latching	Required I/P- 0VDC to operate - closing contact
Alert - Unsupervised, non-latching	Required I/P- 0VDC to operate - closing contact

10 Certification Information

The ***FireFinder***™ is designed and manufactured by:

AMPAC TECHNOLOGIES PTY LTD
7 Ledgar Rd
Balcatta
WA 6021
Western Australia
PH: 61-8-9242 3333
FAX: 61-8-9242 3334

HEAD OFFICE

Manufactured to: _____

Certificate of Compliance Number: _____

Equipment Serial Number: _____

Date of Manufacture: _____

11 Glossary of Terms

ACF:	ANCILLARY CONTROL FACILITY
ACKD:	ACKNOWLEDGED
AHU:	AIR HANDLING UNIT
ALM:	ALARM
AVF:	ALARM VERIFICATION FACILITY
AZF:	ALARM ZONE FACILITY
AZC:	ALARM ZONE CIRCUIT
C:	RELAY COMMON CONTACT (WIPER)
CIC:	CONTROLLER INTERFACE CARD
CN:	CONNECTOR
CPU:	COMMON PROCESSOR UNIT
DGP:	DATA GATHERING POINT
EARTH:	BUILDING EARTH
EOL:	END OF LINE
FDS:	FIRE DETECTION SYSTEM
FACP:	FIRE ALARM CONTROL PANEL
FLT:	FAULT
GND:	GROUND (0 VOLTS) NOT EARTH
I/O:	INPUT/OUTPUT
LCD:	LIQUID CRYSTAL DISPLAY
MAF:	MASTER ALARM FACILITY
MCP:	MANUAL CALL POINT
MOV:	METAL OXIDE VARISTOR (TRANSIENT PROTECTION)
NIC:	NETWORK INTERFACE CARD
N/C:	NORMALLY CLOSED RELAY CONTACTS
N/O:	NORMALLY OPEN RELAY CONTACTS
N/W:	NETWORK
PCB:	PRINTED CIRCUIT BOARDS
P/S:	POWER SUPPLY
PSM:	POWER SUPPLY MODULE
REM:	REMOTE
SPOT:	SINGLE PERSON OPERATING TEST
TB:	TERMINAL BLOCK
VDC:	DIRECT CURRENT VOLTS

12 Definitions

Addressable system - a fire alarm and detection system that contains addressable alarm zone facilities or addressable control devices.

Alarm Verification Facility (AVF) - that part of the FACP, which provides an automatic resetting function for spurious alarm signals so that they will not inadvertently initiate Master Alarm Facility (MAF), or ACF functions. Using ConfigManager prior to downloading to the ***FireFinder***™ sets this option

Alarm zone - the specific portion of a building or complex identified by a particular alarm zone facility.

Alarm Zone Circuit (AZC) - the link or path that carries signals from an actuating device(s) to an alarm zone facility(s).

Alarm Zone Facility (AZF) - that part of the control and indicating equipment that registers and indicates signals (alarm and fault) received from its alarm zone circuit. It also transmits appropriate signals to other control and indicating facilities.

Alert signal - an audible signal, or combination of audible and visible signals, from the occupant warning system to alert wardens and other nominated personnel as necessary to commence prescribed actions.

Ancillary Control Facility (ACF) - that portion of the control and indicating equipment that on receipt of a signal initiates predetermined actions in external ancillary devices.

Ancillary equipment - remote equipment connected to FACP.

Ancillary relay - relay within FACP to operate ancillary equipment.

Ancillary output - output for driving ancillary equipment.

Approved and approval - approved by, or the approval of, the Regulatory Authority concerned.

Card-detect link - a link on a module connector to indicate the disconnection of the module.

Conventional System - is a fire detection system using a dedicated circuit for each alarm zone.

Distributed system - a fire alarm and detection system where sections of the control and indicating equipment are remotely located from the FACP or where sub-indicator panel(s) communicate with a main FACP.

Field connections - are connections made to FACP or ancillary equipment during installation.

Fire alarm system - an arrangement of components and apparatus for giving an audible, visible, or other perceptible alarm of fire, and which may also initiate other action.

Fire detection system - an arrangement of detectors and control and indicating equipment employed for automatically detecting fire and initiating other action as arranged.

Fire Alarm Control Panel (FACP) - a panel on which is mounted an indicator or indicators together with associated equipment for the fire alarm or sprinkler system.

Fire resisting - an element of construction, component or structure which, by requirement of the Regulatory Authority, has a specified fire resistance.

Indicating equipment - the part of a fire detection and or alarm system, which provides indication of any warning signals (alarm and fault), received by the control equipment.

Interface - The interconnection between equipment that permits the transfer of data.

Main equipment - equipment essential to the operation of the system including, control equipment, amplification equipment and power supply modules.

Master Alarm Facility (MAF) - that part of the equipment which receives alarm and fault signals from any alarm zone facility and initiates the common signal (alarm and/or fault) for transmission to the fire control station. Bells and other ancillary functions may be initiated from this facility.

Power Supply - that portion of the FACP which supplies all voltages necessary for its operation.

Regulatory Authority - an authority administering Acts of Parliament or Regulations under such Acts.