

## FH1/FR1 Fire Alarm System - Installation Note

### Overview:

The **Pertronic FH1/FR1** is a compact Fire Alarm Control Panel designed primarily for domestic use. The Fire Alarm system comprises the following components, connected to the **Pertronic FH1/FR1**:

- fire detection components : smoke or heat detectors, manual call-points
- integrated or separate visual and/or audible alerting devices
  - a 2-wire system supports the detectors, MCP's and Alerting devices on the same circuit
- optional sprinkler connection

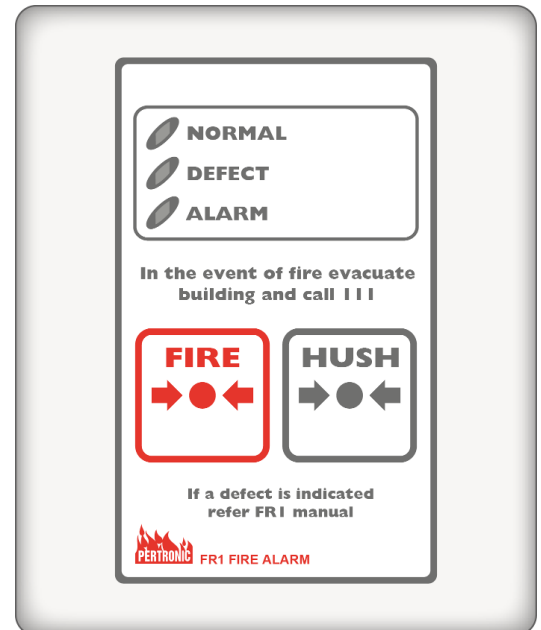
The **FH1/FR1** is 230Vac Mains operated with a 1.2A, 12Vdc battery backup

Suitable batteries include:	Century	PS1212
	Yuasa	NP1.2-12
	Panasonic	LC-P121R3

The **FH1/FR1** is designed in accordance with NZS4514:2009

### Features:

- 'Fire' button to activate Alerting devices
- 'Hush' button to silence Alerting devices
- Integrated piezo Buzzer for 'Alarm' and 'Defect' warning
- May be flush or surface-mounted, using the appropriate housings
- One 10kΩ monitored 2-wire connection for combined conventional zone circuit and alerting devices
  - the latching detector circuit is configured to accept Smoke detectors, indicating Heat detectors and Manual Call-Points (MCPs)
- uses 12V compatible Smoke and/or Heat detectors
- One 10kΩ monitored, non-latching circuit specifically for monitoring a Sprinkler system (DBA)
- Circuits are monitored for Earth Leakage and hard short or open-circuits
- Form C 'Defect' contacts: N/C, COM, N/O for external signaling of Fire, Defect and Test provided



### Specification:

Dimensions:	Flush Mount Box:	135 x 95 x 57	H x W x D mm
	Surface Mount:	150 x 122 x 55	H x W x D mm
	Grid Plate:	142 x 115 x 6	H x W x D mm
Supply Voltage:		230Vac, 4W	- with 12Vdc Battery Backup
Battery	Rating:	1.2A, 12V	
	Dimensions:	98 x 50 x 55	L x W x H mm - including terminals
Supply Current:	Normal:	15mA	
	Defect (Mains OFF):	5mA	
	Alarm:	31 - 33mA (Sounder load extra)	
Relay Contact Rating:	2A @ 24Vdc	Fire, Defect and Test: NO, C, NC	
	Fire	Normally de-energised	
	Defect	Normally energised	
	Test	Normally de-energised	

### Product Codes:

Product Code	Description
FH1-FM	HNZC Flush Mount Panel w/Sprinkler Input NZ4514 Compliant
FH1-SM	HNZC Surface Mount Panel w/Sprinkler Input NZ4514 Compliant
FR1-FM	Residential Flush Mount Panel w/Sprinkler Input NZ4514 Compliant
FR1-SM	Residential Surface Mount Panel w/Sprinkler Input NZ4514 Compliant
FH1-BO	FH1 Braille Overlay. Fire & Hush
BKPI730FH1GP	FH1 Grid Plate, PI730
CBPI731FH1FM	FH1 Flush Mount Back Box, PI731
CBPI748FH1SM	FH1 Surface Mount Case, PI748

## Zone Circuit Limitations:

Smoke Detectors draw a small monitoring current, placing a limit on the number of devices which can be connected to the Zone circuit. Strobes draw a comparatively high current, so extreme care must be taken when designing systems which include a Strobe.

**Pertronic** Indicating Heat Detectors and Indicating Manual Call-Points draw minimal monitoring current so there is a higher limit on the number of these devices that can be connected to the detector circuit.

Use the following formulae and Table to calculate the type and number of devices to be connected to the Zone circuit:

Total Current Load Calculation:

- (i) list the quantity of each device installed in the Quantity Column
- (ii) multiply the Loading per Device x Quantity and write the product in the Current Load column
- (iii) if a 2WTA-B detector is installed, add Quantity = 1 in the appropriate cell and add 25 to the Current Load
- (iv) if no 2WTA-B detectors are used, but a 2151BPI is installed, add Quantity = 1 in the appropriate cell and add 11 to the Current Load
- (v) add the Current Loads and ensure the Total Current Load does not exceed 150mA

Use the following Table to calculate the Total Current Load:

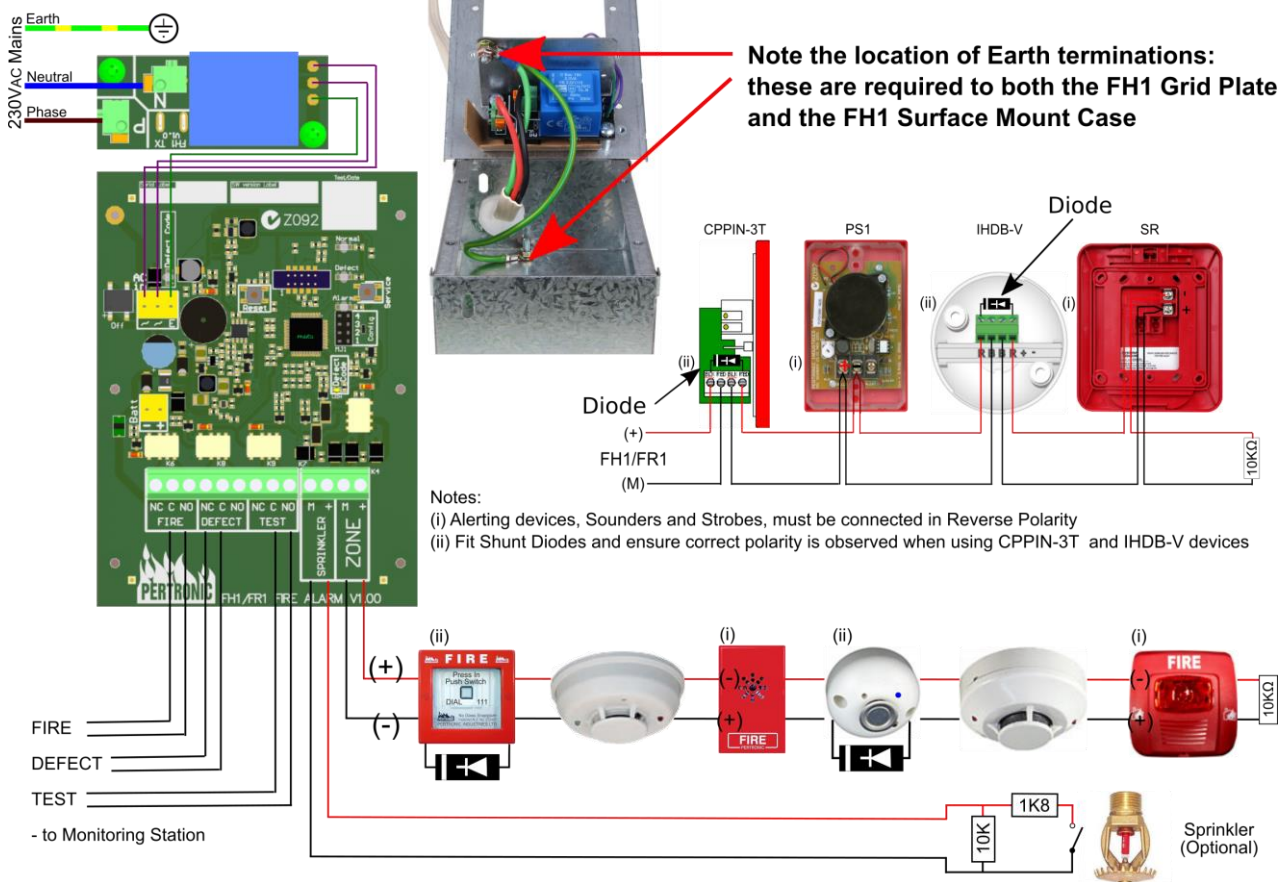
Recommended Devices					
Activating Devices	Model	Description	Loading per Device (mA)	Quantity	Current Load
Smoke Detector	2151BPI	Photoelectric Smoke Detector	1		
Detector Base	B401R	Resistive Detector Base	0		
Heat Detector	IHDB-V	Indicating Heat Detector	5		
Combo Smoke/Heat Detector with Sounder	2WTA-B	Smoke/Thermal Detector with Inbuilt Sounder	12		
Manual Call-Point	CPPIN-3T	Indicating Manual Call-Point	5		
Alerting Devices					
Sounder	PS1	AS2220 Piezo Sounder	10		
Strobe	SR(15)	Strobe 12/24V : 15 Candela	125		
Other Devices					
Remote Vibrating Pad	VIBATX	Remote Vibrating Alarm Unit	1.5		
Smoke Detector Alarm Currents:					
If 2WTA-B installed, add 25mA			25		
If 2151BPI installed but no 2WTA-B, add 11mA			11		
<b>Total Current Load (Maximum = 150mA)</b>					

## Zone Loading Example:

6 x 2WTA-B + 5 x IHDB-V + 5 x CPPIN-3T					
Activating Devices	Model	Description	Loading per Device (mA)	Quantity	Current Load
Smoke Detector	2151BPI	Photoelectric Smoke Detector	1	0	= 0 x 1   0
Detector Base	B401R	Resistive Detector Base	0	0	= 0 x 0   0
Heat Detector	IHDB-V	Indicating Heat Detector	5	5	= 5 x 5   25
Combo Smoke/Heat Detector with Sounder	2WTA-B	Smoke/Thermal Detector with Inbuilt Sounder	12	6	= 6 x 12   72
Manual Call-Point	CPPIN-3T	Indicating Manual Call-Point	5	5	= 5 x 5   25
Alerting Devices					
Sounder	PS1	AS2220 Piezo Sounder	10	0	= 0 x 10   0
Strobe	SR(15)	Strobe 12/24V : 15 Candela	125	0	= 0 x 125   0
Other Devices					
Remote Vibrating Pad	VIBATX	Remote Vibrating Alarm Unit	1.5	0	= 0 x 1.5   0
Smoke Detector Alarm Currents:					
If 2WTA-B installed, add 25mA			25	1	= 1 x 25   25
If 2151BPI installed but no 2WTA-B, add 11mA			11	0	= 0 x 11   0
<b>Total Current Load (Maximum = 150mA)</b>					<b>147</b>

Current & Historic Defects		
Type	Description	Long Flash Position
Mains	Missing for longer than 1 hour	1
Zone 1	Open or Short-Circuit, High Defect	2
Sprinkler	Open or Short-Circuit, High Defect	3
DC	DC Outside Range: 12.2V-14.4V for more than 10 seconds	4
Battery	Battery Missing for more than 30 seconds Battery Capacity Test failed for 3 consecutive 24-Hour tests	5
Earth	Earth Defect	6
System	Internal Memory Error (CRC)	7

## Connection Diagram:



## Installation and Commissioning:

### Before Installation:

- Flush Mount: mount the box (135 x 95 x 57, H x W x D mm) flush with the front of the stud
- Surface Mount: mount the box (150 x 122 x 55, H x W x D mm) as required
- Provide a 230Vac Mains supply – Note: this must be terminated by a registered electrician
- Provide one cable pair for the Zone Fire detectors and Alerting devices
- Provide one cable pair for monitoring the domestic Sprinkler system, if fitted
- Provide one cable pair for each function to be monitored: Fire, Defect and/or Test – optional
- Ensure each cable is clearly identified by function

### External Wiring:

- Connect Detection and Alerting devices to the Zone circuit cable and terminate with 10kΩ EOL resistor
- Where CPPIN-3T and/or IHDB-V devices are used, connect the devices in normal polarity and ensure shunt diodes (1N4007 or similar) are fitted across the '+' terminals (Cathode toward Zone input, Anode toward 10kΩ EOL resistor). The devices may be damaged if these diodes are not fitted.
- Connect Alerting devices (Sounders and Strobes) with reverse polarity: '+' to '-' and '-' to '+'
- Terminate the Sprinkler circuit (if fitted) with a 10kΩ EOL resistor and 1k8Ω Alarm resistor

### Internal Wiring:

- Feed the cabling into the FH1 – connect the Earth lead to BOTH the Grid Plate and the FH1 Case
- Keep the Mains and ELV wiring separate and ensure they are not pinched between the metalwork.
- Connect the Zone cable to connector K4 and Sprinkler cable to connector K7.
- As required, connect cables from the Monitoring Service to the Fire, Defect and/or Test relays

### Assembly:

- When closing the FH1/FR1 plate to the mounting box, ensure excess cable is pushed back into the wall cavity so that it cannot be 'pinched' and/or cut.
- Fix the FH1/FR1 plate to the mounting box with four round-head screws.
- Fix the PCB to the grid plate with six counter-sunk screws.
- Clip the fascia to the grid plate.

### Commissioning:

- Use the CheckList on the back page to commission and test the system
- Select tests to perform as required
- Indicate the result of the selected Test in the Verified column
- Sign and date

## Commissioning Check List

Test	LED			Relay			Buzzer	Walk Test	Alerting Devices	Verified
	NORMAL	DEFECT	ALARM	FIRE	DEFECT	TEST				
System Normal	ON									
FIRE Button ON (>0.5 sec)	OFF		Flashes	ON			ON		ON	
HUSH Button ON (>1 sec)	Flash, then ON	Flash, then OFF	Flash, then OFF	OFF			OFF		OFF	
<b>Activate Smoke Detector</b>	OFF		Flashes	ON			ON		ON	
HUSH Button ON (>1 sec)	OFF		Flashes	OFF			OFF		OFF	
- Circuit Reset: HUSH (2 mins)	OFF	OFF	Flashes							
RESET	Flashes	Flashes	Flashes							
NORMAL	ON	OFF	OFF							
<b>Activate MCP</b>	OFF		Flashes	ON			ON		ON	
HUSH Button ON (>1 sec)	OFF		Flashes	OFF			OFF		OFF	
- Circuit Reset: HUSH (2 mins)	OFF	OFF	Flashes	OFF			OFF			
RESET	Flashes	Flashes	Flashes	OFF			OFF			
ALARM	OFF	OFF	Flashes	ON			ON			
- Circuit Retrigger if Active										
De-Activate MCP	OFF		Flashes	ON			OFF		ON	
HUSH Button ON (>1 sec)	OFF (2 mins), Flash then ON	OFF (2 mins), Flash then OFF	Flashes then OFF after Reset	OFF			OFF		OFF	
<b>Activate Sprinkler Input</b>	OFF		Flashes	ON			ON		ON	
HUSH Button ON (>1 sec)	OFF	OFF	Flashes	OFF			OFF		OFF	
De-Activate Sprinkler Input	ON		OFF	OFF			OFF		ON	
<b>Defect</b> : Defects are Delayed by 15 secs	ON									
- create a Fault, eg Earth a conductor	OFF	ON	OFF		ON		ON		OFF	
HUSH Button ON (>1 sec)	OFF	ON	OFF		ON		OFF		OFF	
- remove the Fault	ON	OFF			OFF		OFF			
<b>Test Mode : Enter</b>										
HUSH Button ON (>5 secs)	Flashes when Active	Flashes to identify Defects	OFF	OFF	OFF	ON	Beeps until Active	ON	OFF	
FIRE Button ON (>0.5 sec)	Flashes		Flashes	ON			ON	ON	ON	
- press HUSH to Reset	Flashes		OFF	OFF			OFF	ON	OFF	
Activate Smoke Detector	Flashes		Flashes	ON			ON	ON	ON	
- clears after 5 secs	Flashes		OFF (after 5 secs)	OFF			OFF	ON	OFF	
Activate MCP	Flashes		Flashes	ON			ON	ON	ON	
- De-activate MCP	Flashes		OFF (after 5 secs)	OFF			OFF	ON	OFF	
Activate Sprinkler Input	Flashes		Flashes	ON			ON	ON	ON	
- press HUSH w SPR ON	Flashes		Flashes	ON			OFF	ON	OFF	
- De-activate SPR	Flashes		OFF	OFF			OFF	ON	OFF	
<b>Test Mode : Exit</b>										
HUSH Button ON (>5 secs)	Flash, then ON	Flash, then OFF	Flash, then OFF					OFF		
Automatically, 5 mins after last button pressed								OFF		