



Fire Products & Solutions

Operation & Installation Manual RFS1 V2

Rev 3

Residential Fire System RFS1 V2



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1 Introduction

1.1 Design Concept

The RFS1 V2 is specifically designed for residential applications, its primary purpose, to provide reliable early warning of a developing fire so that the occupant is given the maximum time to escape to a place of safety.

Fire is not just heat, consideration needs to be given to the smoke and toxic gases generated in all house fires. Brooks recognises that residential applications require special consideration; the RFS1 V2 must be flexible, have design integrity, be reliability and be conscious occupant amenity.

The RFS1 V2 has features that allow the occupant to use and manage the system, but controls that prevent accidental disablement.

Australian Standard AS3786:2014 and AS1603.3:2018 have established a performance standard for Smoke and Heat Alarms for Domestic/Residential applications. Not content to just offer individual products, Brooks has developed a range of residential fire alarm panels to enable fire system engineering principles, normally applied to commercial premises, to be adapted to residential situations.

Please read this manual as it has information that will explain how your RFS1 V2 works and how you can use it.

1.2 System Overview

The Residential Fire Safety System **RFS1 V2** complete with compatible Smoke / Heat Alarms and auxiliary devices provides a complete single zone automatic fire detection and alarm system for residential applications.

The RFS1 V2 is designed to meet the requirements of the National Construction Code (NCC) of Australia (for Smoke Alarm System) and incorporates Smoke Alarms conform to Australian Standard AS3786:2014 and Heat Alarms conform to AS1603.3:2018.

The **RFS1 V2** system consists of a control panel, operator module which provides both status indication and function controls, Smoke and Heat alarms. A pillow shaker and strobe are available for the hearing impaired or deaf. The new Smoke Alarm EIB650iWX and Heat Alarm EIB603CX are designed to be installed in conjunction with the RFS1 V2 control panel as an external power source.

The **RFS1 V2** system has a generic input/output module as an alarm zone device; it enables remote control of ancillary equipment, interfacing to sprinkler flow switch/any dry contact input, provides alarm relay contacts and a supervised 12V_{DC} alarm output.

The connection between the operator module and control panel is via RS485, which allows the operator module to be located remote from the control panel itself, an advantage in multi-storey dwellings. A maximum of 2 operator modules can be fitted to the system.

The power supply of **RFS1 V2** is fully supervised for fault condition; mains fail, battery disconnected, charger high or low and battery low. The alarm zone wiring is supervised via EOL module for both an open and short circuit condition.

The **RFS1 V2** has both an alarm and fault output for either remote monitoring and/or the operation of ancillary equipment. **RFS1 V2** provides not only a truly Deemed to Satisfy Solution but includes additional functions and facilities to allow design flexibility for customising the installation to the application.

Remember: your **RFS1 V2** has been installed to protect you by raising the alarm and maximising your time to escape to safety, if you tamper with it, misuse it or fail to maintain; its performance cannot be guaranteed, you will be putting both you and your family at risk.

2 System Design

The Smoke / Heat Alarms should be installed in compliance with the requirements of NCC; for specific technical guidance of Australian Standards AS1670.6, AS1670.1 and this manual should be used.

A properly designed early warning fire system ensures the alarm is given before the escape route becomes blocked with smoke or heat. Therefore, smoke alarms must be installed along the escape route, heat alarms would not give sufficient warning.

2.1 Smoke / Heat Alarm

2.1.1 Basic Information about your Smoke / Heat Alarm

A Smoke Alarm is an early warning device, used correctly it will detect the onset of a fire, raise the alarm and give occupants valuable time to escape prior to the evacuation path becoming unusable. In today's modern homes natural material like wood and cotton have all but been replaced by synthetics. The result is that when a fire does occur it will burn much faster and much hotter than for natural materials. It will give off visible smoke and toxic fumes at much greater levels. For this reason, Brooks has used only photoelectric Smoke Alarms in the RFS1 V2 system. Research indicates this technology is superior in performance to ionisation in residential applications and is the overall best and most reliable type of smoke alarm technology for use in the modern dwelling.

Heat Alarms are supplementary devices only; for those areas where Smoke Alarms would not be suitable. Heat detection occurs usually once flames are present therefore, they are not early warning. Heat alarms must not be the only detection used and **must be** interconnected to all smoke alarms to provide the best warning throughout the dwelling.

When using household protective devices, basic safety precautions should always be followed.

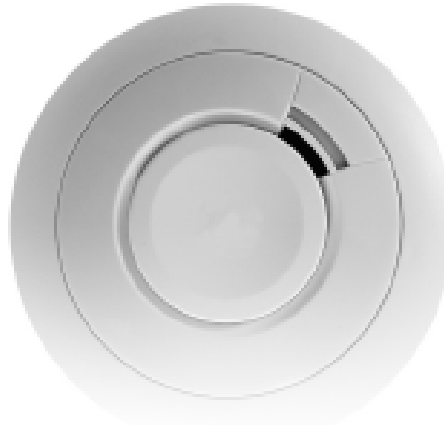
Notes:

- When the power is first connected to the Smoke / Heat Alarms, it may sound for 2-3 seconds and/or the LED may flash quickly for 10 seconds - **this is normal**.
- A Smoke / Heat Alarm does not prevent fires.
- Install correctly, in the centre of the ceiling if possible.
- Test monthly or after servicing any existing fault.
- When the panel chirps every 40 seconds, it means that either the backup battery has reached the low battery threshold (below 12V) or a wiring fault exists in the zone wiring. Restore the mains power immediately or call for technical support for wiring fault.
- For the Photo-electric model EIB650iWX, if the Smoke Alarm beeps **without** the LED flashing at the same time then clean the unit as this is the automatic test feature telling you the chamber is degraded.
- Plan your escape route.
- Proper protection requires more than one Smoke / Heat Alarm.
- If you have any doubt or query about Smoke / Heat Alarms consult the nearest Brooks Office as shown in the last page.

2.1.2 Photoelectric Model (EIB650iWX)

Photoelectric Smoke Alarms senses visible smoke particles. They respond to a sufficiently wide range of fires to be of general use, but are particularly responsive to

smouldering fires and the dense smoke given off by foam filled furnishings or overheated PVC wiring. They are less prone to nuisance alarms from cooking fumes, and furthermore, contain no radioactive material.



However, all photoelectric Smoke Alarms are prone to nuisance alarms caused by dust or insect contamination. Mesh screens are provided and are effective in reducing insect ingress, but it is impossible to make the Alarms dust or insect proof since they would then be effectively smoke proof! For this reason, it is essential that photoelectric Smoke Alarms are periodically cleaned. The recommended areas to install photoelectric Smoke Alarms are in bedrooms and living areas adjacent to kitchens. Refer to the EIB650iWX leaflet.

Operating Principle: Light scattering - transmitter produces pulses of light which are detected by a receiver when smoke enters the sensing chamber.

2.1.3 Heat Model (EIB603CX)

Heat Alarms require less maintenance than photoelectric Smoke alarms. There are locations where the installation of a Smoke Alarm is not recommended, e.g. kitchens, laundries, garages, etc. Yet these areas are a potential of fires and the need for an alternative method of fire detection is, in the opinion of many fire officers and specifiers, essential in this and other vulnerable locations of residential properties.



The Heat Alarm EIB603CX provides such an alternative. Fixed temperature heat alarms are designed to trigger when the temperature reaches approximately 58°C. The heat alarm is not sensitive to smoke, but in a closed room with a vigorous fire they will tend to respond faster than a Smoke Alarm a distance away in the hallway. A Heat Alarm **MUST** be interconnected to your Smoke Alarms so that the Alarm can be heard throughout the building.

Operating Principle: Thermistor sensor - resistance value varies with temperature.

2.2 Roof Space Heat Detectors

2.2.1 Overview

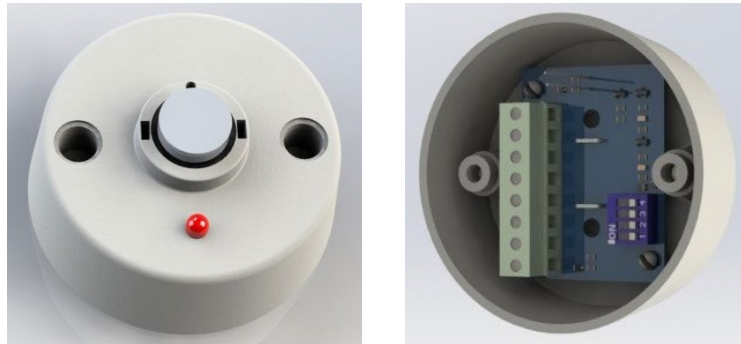


Figure 1 Roof Space Heat Detectors

Standard Smoke or Heat Alarms are not suitable for residential roof space applications where fire may occur.

Brooks has developed a solution to protect residential roof space when a residential fire panel is used. The heat detector utilises a bi-metallic heat switches to detect temperature rise in the roof space.

When the temperature in the roof space reaches the set point of the bi-metallic switch, the contact of the switch will close and connects approximately 12V (with a diode forward voltage drop) to the interconnect which activates all Smoke or Heat Alarms within RFS1. Roof space detectors available for 60° C or 80° C applications.

2.2.2 Features

- Minimum current draw, refer to Table 1 below.
- Up to 10 of HS60V2 or HS80V2 can be connected to RFS1 V2.
- Minimise false alarms.
- Suitable for harsh environment e.g. roof spaces, garages, etc.
- Built-in alarm LED indication
- Support Remote Indicator Light (RIL), with selectable “Latching” and “Non-Latching” mode

2.2.3 Specifications

Table 1 Roof space heat detectors

Function	HS60V2	HS80V2
Temperature	60°C ±5°C	80°C ±5°C
Current Consumption(@12.8V)		
Quiescent	0.1 uA	0.1 uA
Alarm (without RIL)	6.7 mA	6.7 mA
Alarm (with RIL)	14 mA	14 mA
Nominal Voltage	12 V	12 V
No. of units per zone	10	10
Dot Colour	Blue	Red
Size	73mm diameter	73mm diameter

2.2.4 Connection to RFS1 V2

Field wiring as shown in Figure 2 below is same as the standard RFS1 wiring. The bi-metallic switch contact is connected between Interconnect and positive terminals (with protection diode and series resistor) on SUB1034 (60°) / 1035 (80°) board. When the ambient temperature rises to the fixed temperature value, the bi-metallic N/O contact closes, Interconnect voltage goes high and activates all the smoke or heat alarms interconnected to HS60V2 or HS80V2. The red LED will turn on only when the heat switch closes. The roof space heat detector provides 12V output for Remote Indicator Light (RIL), with selectable “Latching” and “Non-Latching” mode. The RIL will be reset when key-switch on the panel is switched to “OFF” or “FIRE” position.

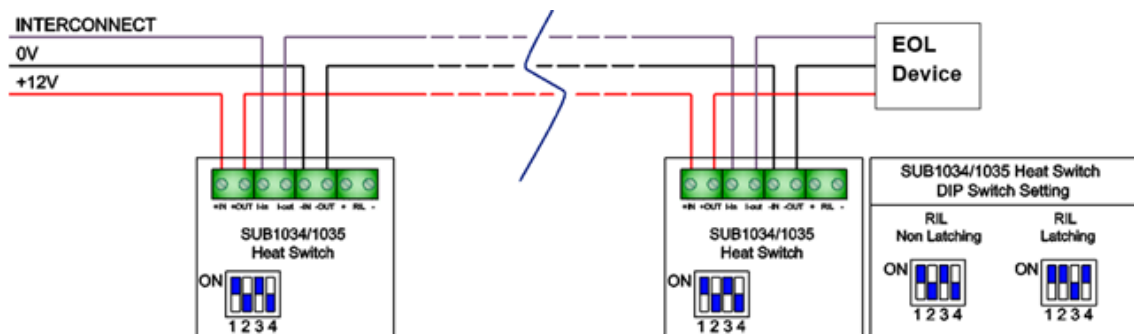


Figure 2 Connection of roof space detectors

2.3 Limitation of Smoke / Heat Alarms

Smoke/Heat Alarms have significantly helped to reduce the number of fire fatalities in countries where they are widely installed.

However independent authorities have stated that they may be ineffective in some circumstances. There are a number of reasons for this:

- The Alarms will not work if the mains power supplied by RFS1 V2 control panel is off and the back-up battery is depleted.
- Smoke/Heat Alarms will not detect fire if sufficient smoke/heat does not reach or prevented to reach the Alarm. Smoke/Heat may be prevented from reaching the Alarm if the fire is too far away, for example, if the fire is on another floor, behind a closed door, in a chimney, in a wall cavity, or if the prevailing air draughts carry the smoke/heat away. Installing Smoke/Heat Alarms on both sides of closed doors and installing more than one Smoke/Heat Alarm as recommended in this manual very significantly improves the probability of early detection.
- The Alarm may not be heard due to background noise, distance from the bedroom or closed doors.
- A Smoke/Heat Alarm may not wake a person who has taken drugs or alcohol.
- Smoke/Heat Alarms may not detect every type of fire to give sufficient early warning. They are particularly ineffective with fires caused by escaping gas, violent explosions, poor storage of flammable rags and/or liquids, (for example petrol, paint, spirits etc). Overloaded electrical circuits, arson and children playing with matches.
- Smoke/Heat Alarms don't last indefinitely. For example, if there is a build-up of contamination, performance will be impaired. The manufacturer recommends replacement of the Smoke/Heat Alarms after 10 years as a precaution.

2.4 Locating Smoke / Heat Alarms

The locations are typically required to meet the Deemed to Satisfy Provisions of the NCC. However, the NCC does not provide specific guidance as to the minimizing of potential of nuisance alarms. There will be dwelling layouts that require further consideration to avoid locating the alarm so that it is not triggered from everyday events such as showers or cooking. This manual as well as AS1670 parts 1 and 6 provides technical guidance with respect to installation.

2.4.1 Smoke Alarms

Sufficient smoke must enter the Smoke Alarm before it will respond. The Smoke Alarm needs to be within 7.5 metres of the fire to respond quickly. It also needs to be in a position where its alarm sounder can be heard throughout the residence, so it can wake the occupants in time for all to escape. As a minimum a Smoke Alarm should be located between the sleeping area and the most likely sources of fire (living room or kitchen for example). A single Smoke Alarm will give some protection if it is properly installed, but most residence will require two or more Smoke Alarms to ensure that a reliable early warning is given. For maximum protection you should put individual Smoke Alarms in all the rooms where fire is most likely to break out, apart from kitchens, bathrooms etc. (see Locations to Avoid).

Note: Some state legislation mandates a Smoke Alarm in every room and hallway in the dwelling.

The living room is the most likely place for a fire to start at night, followed by the kitchen and then the dining room. You should also consider putting Smoke Alarms in any bedrooms where fires might occur. For instance, where there is an electrical appliance such as an electric blanket or where the occupant is a smoker. You could also consider putting Smoke Alarms in any rooms where the occupant is unable to respond very well to a fire starting in the rooms, such as an elderly, sick person or a very young child.

Refer to the Smoke Alarm EIB650iWX and the Heat Alarm EIB603CX leaflets for more details.

2.4.2 Heat Alarms

The Heat Alarm gives a fire warning when the temperature at the unit reaches approximately 58°C. It is ideal for kitchens, garages, boiler houses and other areas where there are normally high levels of fumes, smoke or dust i.e. places where Smoke Alarms cannot be installed without the risk of excessive nuisance alarms.

A Heat Alarm should only be used in a room adjoining an escape route, and must be used in conjunction with Smoke Alarms on the escape routes.

The Heat and Smoke Alarms are interconnected with RFS1 V2 to ensure the early warning will be heard, particularly by somebody sleeping. A properly designed early warning fire system ensures the alarm is given before the escape routes become blocked with smoke or heat. Therefore, there must be Smoke Alarms along the escape routes as Heat Alarms would not give sufficient warning.

However, a fire in a closed room (e.g. kitchen) adjoining the escape route, can eventually cause the corridor to become smoke-logged due to smoke leaking out from around the door before adequate warning can be given by detectors in the corridor. (Smoke leaking out from a room is often cool and slow moving so it can take a long time to rise to the ceiling, and travel to a detector which could be some distance away). A Heat Alarm in the closed room will give earlier warning of fire in that room and help overcome this problem.

This type, with consideration to the above, can be installed in kitchens, laundries, garages and boiler houses and other areas where there are normally high levels of fumes, smoke or dust i.e. places where smoke alarms cannot be installed without the risk of excessive nuisance alarms.

Important: These Smoke/Heat Alarms are designed for use in a residential type environment.

2.4.3 Checking Audibility of Smoke / Heat Alarms

With the Alarm sounding in its intended location, check that you are able to hear it in each bedroom with the door closed above the sound of your radio. The radio should be set to a reasonably loud conversation level. If you can't hear it over your radio, the chances are it would not wake you.

The Smoke / Heat Alarms are interconnectable meaning that when one Alarm within a zone senses smoke or heat, all connected Alarms will go into alarm.

Note: Options within the Smoke Alarm and Residential Fire Panel enable customising of the installation. However, the sound levels are fixed and cannot be adjusted.

2.5 Recommended Locations

For the best location and maximum protection, refer to EIB650iWX and EIB603CX manuals.

2.5.1 Locations to Avoid

Don't place **Smoke Alarms** in any of the following areas:

- **Bathrooms, kitchens, shower rooms, garages** or other rooms where the Smoke Alarms may be triggered by steam, condensation, normal smoke or fumes. Keep at least 6 metres away from sources of smoke.

Don't place **Heat Alarms** in any of the following areas:

- **Bathrooms, shower rooms** or other room where the unit may be affected by steam or condensation.

Don't place **Smoke** or **Heat Alarms** in any of the following areas:

- Places where the normal temperature can exceed 45°C or be below 5°C e.g. attics, furnace rooms etc. directly above **ovens** or **kettles**, as the heat/steam could cause nuisance alarms.
- Near a **decorative object, door, light fitting, window molding** etc., that may prevent smoke or heat from reaching the Alarm. Heat from light fittings may prevent or delay the smoke reaching the detection chamber.
- Surfaces that are normally **warmer** or **colder** than the rest of the room (for example attic hatches, un-insulated exterior walls etc). Temperature differences might stop smoke or heat from reaching the unit.
- Next to or directly above **heaters** or **air conditioning vents, windows, wall vents** etc. that can change the direction of airflow or blow smoke away from the detection chamber.
- In very high or **awkward areas** (e.g. over stairwells) where it may be difficult to reach the alarm (for testing, maintenance, etc).
- Locate away from very **dusty** or **dirty areas** as dust build-up in the chamber can impair performance. It can also block the insect screen mesh and prevent smoke from entering the smoke detector chamber.
- Locate the unit at least 1 metre from **dimmer controlled lights and wiring** – some dimmers can cause interference.
- Locate unit at least 1.5m and route wiring at least 1m away from **fluorescent light fittings** as electrical "noise" and/or flickering may affect the unit.

- Do not locate in **insect infested areas**. Small insects getting into the smoke detection chamber can cause intermittent alarms. Insects and contamination on the Heat Alarm sensor can increase its response time.

2.6 Interconnecting Smoke/Heat Alarms

The Brooks Smoke Alarm EIB650iWX and Heat Alarm EIB603CX provide an interconnect facility to RFS1 V2. When one Smoke/Heat Alarm activates all Smoke/Heat Alarms and panel buzzer will sound, this provides not only an increased sound pressure level but also an alarm warning throughout the entire dwelling. Up to 15 Smoke/Heat Alarms models EIB650iWX, and/or EIB603CX can be interconnected to the **RFS1 V2**.

The unit initiating the alarm can be identified by the red LED on the cover flashing every second, or by pressing the alarm locate button on the operator module.

Note: If obsoleted smoke alarms EIB206 or EIB204 already exists, they can still be used provided they are not over 10 years old and are still working.

The panel is compatible with either the obsoleted smoke alarms and/or the current EIB603CX and/or EIB650iWX.

2.7 Smoke / Heat Alarm Additional Features

The new series of Smoke (EIB650iWX) and Heat (EIB603CX) Alarms have similar features to the previous 200 series Alarms in addition to some new added features:

- Remote Indicator Output (RIL) output: This enables an RIL to be located outside a door to indicate the origin of the alarm.
- Alarm can be isolated by removing the head from the base.
- Removing the head will maintain the Alarms downstream intact i.e. does not remove the interconnection across the zone.
- EIB650iWX is a microprocessor-based design which allows for more features.

2.8 Nuisance Alarms

Smoke Alarms are sensitive devices that may also be triggered by other household activities like cooking or steam from showers or laundries. Remember, your Smoke Alarm can be triggered by you accidentally, this does not mean it is faulty it has simply detected something that to it simulates smoke.

If there is a nuisance alarm simply press the "Locate" button on the operator module to identify the activated Alarm. Once the source of nuisance alarm is located, press "Mute" to silence the active alarm for approximately 5 minutes. If, when the alarm goes off, there is no sign of smoke, heat or noise to indicate that there is a fire, you should get your family into a safe place, before you start investigating.

Check the house carefully in case there is a small fire smouldering somewhere.

- Check whether there is some source of smoke or fumes, for example cooking fumes being drawn past the Smoke Alarm by an extractor.
- Fan the sensing chamber vigorously with a newspaper or similar to clear and silence the alarm.
- If there are frequent nuisance/false alarms, it may be necessary to re-locate the device away from the source of the fumes. If for some reason the Alarm continues to sound (due to insect infestation or contamination build up for example), do the following:
 - Remove the Smoke / Heat Alarm causing nuisance alarm as shown in Figure 3 below. For EIB650iWX and/or EIB603CX, remove the head by disconnecting the adapter board off the Alarm, panel will go into fault.

Push the Sounder Silence button "Ack" on the operator module to stop the panel from beeping if it occurs at night while you are sleeping. Replace your alarm next earliest as soon as possible.

Note: When an Alarm is removed, all other Alarms in the zone will continue working and communicate with the RFS1.

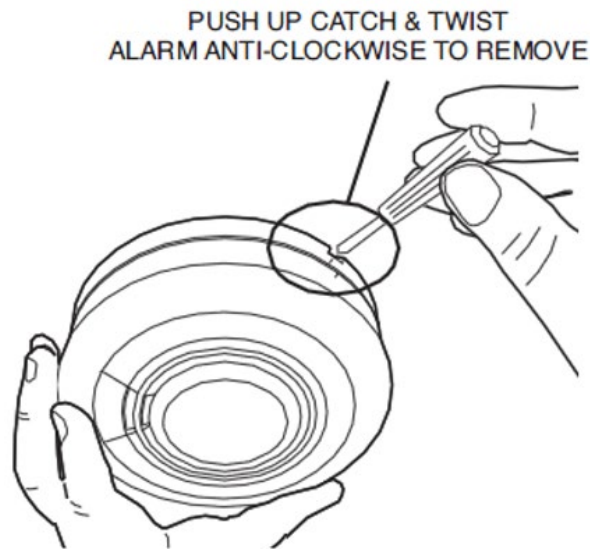


Figure 3 Removing Alarm Heads from EIB603cX and/or EIB650iWX

2.9 Important Safeguards

When using household protective devices, basic safety precautions should always be followed, including those listed below:

- Familiarise yourself with the RFS1 system operation.
- Rehearse emergency escape plans so everyone at home knows what to do in case the alarm sounds.
- Do not disconnect wires to stop alarm sounding. (Fanning vigorously with a newspaper or similar will remove nuisance smoke from the Smoke Alarm and stop it sounding).
- To maintain sensitivity to smoke, do not paint or cover Smoke/Heat Alarms in any manner; do not permit any accumulation of cobwebs, dust or grease.
- If a unit has been damaged in any way or does not function properly, do not attempt a repair, return the Alarm to the nearest Brooks office.
- Smoke/Heat Alarms are intended for premises having a residential type environment.
- Smoke/Heat Alarms are not a substitute for insurance. The supplier or manufacturer is not your insurer.

2.10 Fire Safety

2.10.1 Planning Your Escape

Use the Smoke / Heat Alarm test button or the test button on the operator's display module to familiarize occupants with the alarm sound and to practice fire drills regularly with all family members. Draw up a floor plan that will show each resident at least 2 escape routes from each room. Children tend to hide when they don't know

what to do. Teach children how to escape, open windows, and use roll up fire ladders and stools without adult help. Make sure they know what to do if the alarm goes off.

2.10.2 Fire Safety Hints

- Store petrol and other flammable materials in proper containers.
- Discard oily or flammable rags.
- Always use a metal fireplace screen and have chimneys cleaned regularly.
- Replace worn or damaged sockets, switches, home wiring and cracked or frayed electrical cords and plugs.
- Do not overload electrical circuits.
- Do not overload zone circuit, max of 15 Alarms can be connected to the zone.
- Keep matches away from children.
- Never smoke in bed. In rooms where you do smoke, always check under cushions for smouldering cigarettes and ashes.
- Be sure all electrical appliances and tools have a recognised approval label.
- Smoke Alarms cannot protect all persons at all times. It may not protect against the three most common causes of fatal fires:
 - Smoking in bed.
 - Leaving children at home alone.
 - Cleaning with flammable liquids, such as petrol.

Further information can be obtained from Brooks Australia's Guide to Residential Fire Safety.

3 Residential Fire Safety Panel

3.1 RFS1 V2 Specifications

Table 2 RFS1 V2 Specifications

Feature	Specification
Enclosure	Zink steel 1.2mm powder coated oyster Dimensions 280mm H x 305mm W x 75mm D
Power Supply	Input voltage 88-264V _{AC} , 50W switch mode power supply Output 13.5-16.5V _{DC} adjustable Nominal voltage 14.5V _{DC} , Typical 13.8V _{DC} on battery terminals
Standby Supply	12V _{DC} / 7AH (or 9AH) Sealed lead acid battery
Current Draw	Quiescent: 33mA with only end of line module ¹ Alarm: 100mA
Operating Temperature	0°C to +50°C
No. of zones	Single zone fully supervised by an active end of line device
No. of Devices	A maximum combination of 15 devices is allowed inclusive of the combination of the following: <ul style="list-style-type: none"> • 15 smoke/heat alarms or • 2 MCP or • 2 Sprinkler Clean Contact, or • 2 Strobe Modules or • 2 Vibration Patrice Modules Note: current consumption must be calculated using "Battery capacity calculation sheet" Chapter 9 page 37.
Alarm Output	Supervised 12V _{DC} / 1A fused output 1 set of changeover clean contact
Fault / Defect Output	1 set of changeover clean contact
Fault / Defect Mode	Initiated by abnormal system condition: <ol style="list-style-type: none"> 1. Power Supply fault, mains fail, battery low or removed, etc. 2. Alarm circuit wiring open or short circuit 3. Supervised alarm output open or short 4. Head removed 5. Communications fault 6. Memory fault
Control Switches	Ack Silences panel buzzer until another event occur. Locate Silences all Smoke / Heat Alarms except those that have actuated, restores after approximately 5 minutes. Locate LED illuminates during the 5 minutes timer Mute Silences active Smoke / Heat Alarms, restores after approximately 10 minutes. Mute LED illuminates during the 10 minutes timer Test Activates all Smoke / Heat Alarm sounders, vibration pad and strobes, during test, the test LED illuminates
Visual Indications	Power ON LED, mains power available Alarm LED, Common alarm Defect LED, common defect / fault
Keypad	One keypad per panel and one optional remote keypad or <ol style="list-style-type: none"> 1. 2 remote keypads without panel keypad. 2. Four wires (RS485) required for remote keypad.

¹ To add additional display, additional current is 20mA quiescent and 40mA active.

3.2 Overview

The basic configuration of Brooks **RFS1 V2** consists of a control panel, containing the main processor/termination board (SUB870) and the operator module containing the display and control board (SUB871).

The processor/termination board is a microprocessor based system utilises state of the art components. It provides the control functions, monitoring, power supply, supervision and terminations to the field devices.

The Display board contains indicators, function switches and the interface to the processor/termination board. Interface between main and display board is via an RS485 bus (4 wires) which allows for the display board to be remotely installed.

Figure 4 below shows the front view of RFS1 V2 and Figure 5 shows the Remote Keypad.



Figure 4 RFS1 V2 Panel



Figure 5 Remote Keypad (BARFS1-RKP)

3.2.1 Control Panel

The control panel should be located in a secure area typically a broom cupboard or the like. It must be hard wired to the 230 VAC supply to the dwelling by a licensed electrician. It can be connected to either a dedicated circuit or a lighting circuit.

3.2.2 Operator Module

The Remote Keypad (BARFS1-RKP) shown in Figure 5 above allows the occupant to monitor the status of RFS1 V2 system and provides the necessary indicators and controls to operate the system. Two operator modules can be connected to the control panel. These should be placed in a convenient location at least one of which should be a normally occupied area. In the case of a two-storey dwelling one module could be placed on each level.

3.3 RFS1 V2 Compatible Equipment

3.3.1 New Smoke / Heat Alarms

Smoke / Heat Alarm	Part No
Photoelectric Smoke Alarm for Residential Panels	EIB650iWX
Heat Alarm for Residential Panels	EIB603CX

3.3.2 Other Equipment

External Compatible Equipment	Part No
Remote Second keypad	BARFS11-KPAD
Bellow Shaker (Vibration Patrice)	EIB207V
Generic Input / Output Module	EIB209IO
Ceiling / wall mounting Visual Alarm Device	BVADC / BVADW
RED MCP C/W RES.+ BB RESET + BROOKS GLASS	MRCSSRR

3.4 Power Supply

The primary and standby supplies are calculated to suit the system alarm and standby requirements. If the primary power supply fails, the secondary supply will provide sufficient current to maintain the system fully operational for a period determined by the number of Alarms fitted and the added options to the system.

A battery capacity calculation of RFS1 V2 with all the Smoke / Heat Alarms and ancillary devices must be carried out as per Chapter 9 page 37 to determine the battery size. Up to two 7AH or 9AH in Parallel may be required to meet the requirements of AS3786.

3.4.1 Primary Power Supply / Battery Charger

The primary power supply for RFS1 V2 is fully regulated switch mode power supply 15VDC / 50W. Nominal output is adjusted to 14.5VDC (13.8VDC on the battery terminals), maximum current 3.4A @ 14.5V. The power supply is capable of supplying the max. alarm current required by the RFS1 system without relying on battery.

Note: Power supply voltage output can be adjusted (if required) to the nominal voltage using a potentiometer on the power supply PCB. Maximum constant charging current is 300-400 mA

3.4.2 Standby Supply

Battery capacity is calculated to suit the system requirement². The standard RFS1 V2 can be fitted with 7 or 9 AH battery, if required, additional battery can be fitted

² See battery capacity calculation sheet Chapter 9

inside the enclosure and connected in parallel with the standard battery to increase the capacity to 14 or 18 AH. Battery capacity is dependent on the number of devices fitted.

Note: When two batteries are used, it must be connected in parallel to increase the battery backup time. All Brooks residential panels are 12V systems.

3.5 Main Control and Termination Module (SUB870)

RFS1 V2 main control module is mounted on the rear of the enclosure and has screw terminals for all the field wiring termination, power connection and display modules wiring.

Figure 6 shows the PCB layout and jumper setting for address setting if additional remote keypad required.

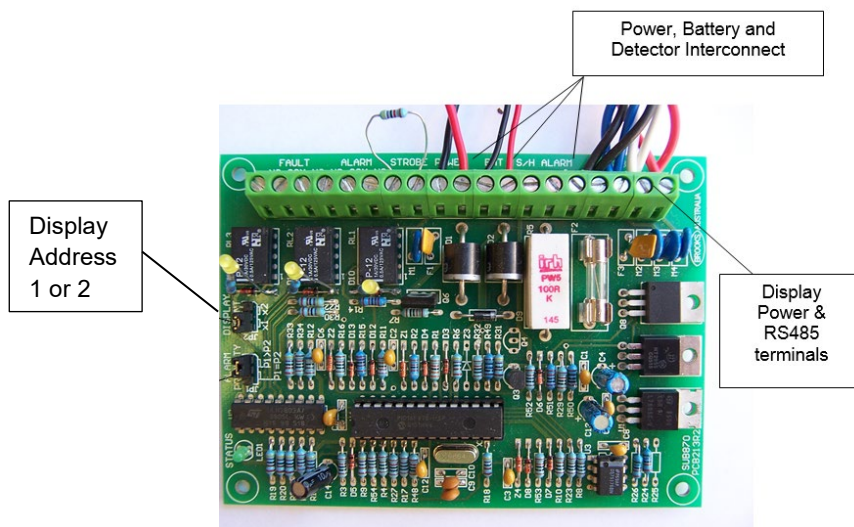


Figure 6 RFS1 V2 Main and Termination Board (SUB870)

Brooks RFS1 V2 has only one priority alarm, any Smoke / Heat Alarm, MCP, sprinkler flow switch, etc will activate sounders in all Smoke / Heat alarm and the common alarm outputs. The two priorities in RFS1 V2 are now not configurable as the new Smoke or Heat Alarms do not support the feature.

The main control board supports 3 different modes:

3.5.1 Normal Mode

During normal operation the main control module scans the system to check for alarms, faults and power supply.

Only the green power on indicator illuminates.

3.5.2 Alarm Mode

In the event of an alarm, all audible and visible devices will be active. The locate LED on the display module will flash to prompt the operator to the next course of action. Pressing the "locate" button will cause the following:

- Silences Smoke / Heat Alarm sounders except the one(s) in alarm
- The locate flashing LED turns to steady for the location time (approximately 5 minutes)
- The "Mute" button flashes to prompt the operator to the next action.

If the alarm has been located, pressing the "Mute" button will mute this Alarm and all other Alarms for 10 minutes and the mute LED turns to steady. Both functions, alarm locate and mute are auto-reset after each timer times out.

3.5.3 Defect/Fault Mode

The main control module constantly monitors the system status and upon detection of a fault condition, the defect LED illuminates and the panel sounder sounds one short beep every 3 seconds.

The panel sounder can be silenced by pressing the acknowledge button “Ack”. This will silence the fault buzzer. However, should a new fault occurs, the sounder will sound again.

Once the fault or defect has been restored, the buzzer will silence automatically and the defect light will turn off.

The illumination and number of flashes of the defect and power On LED's is dependent on the type of fault as shown in Table 3 below.

Table 3 RFS1 V2 Indications and flashing pattern

Fault	Indication	Location
Mains Power Loss	Power LED flashes Defect LED steady ON	Main Control Module
Power Loss	Power LED OFF Defect LED ON Second display steady ON	Display Module
Zone circuit fault 1. Open or short circuit 2. Missing Smoke/Heat Alarm 3. Incorrectly set EOL.	Defect LED flashes once	Display Module
Strobe fault (open or short circuit)	Defect LED flashes two times	Display Module
Power Supply fault 1. Mains Fail 2. Charger high or low 3. Battery Low 4. Battery missing	Defect LED flashes three times	Display Module
Memory fault	Defect LED steady ON	Display Module

3.6 Operator's Module

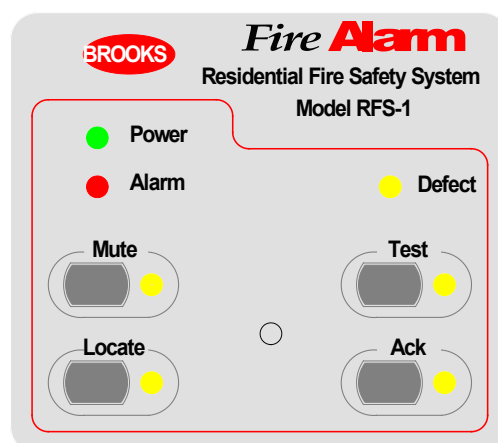


Figure 7 RFS1 V2 Front decal

The display module is connected to the main control module via four-way screw terminals, the front display is shown in Figure 7 above. Two wires for 12V_{DC} supply and two for RS485 data bus which used for the communication between main and display modules. If two display modules have been used, the address in the main control and display modules must be set as per the following table

System	Main Control (JP2 – Display Count)	Display Board (JP1 – Address)
Single Display	X1	#1
Dual Displays	X2	#1 and #2

Notes:

1. Remote display module requires the same four wires, RS485 bus and power.
2. Terminating resistor 1K Ohm must be fitted across the comms terminal of RS485 bus.

3.6.1 Indicators

Table 4 RFS1 V2 Indictors

Descriptor	Colour	Function	Buzzer
Power	Green	Steady On, mains power ok Flashing, mains power off, system running on battery	No Yes
Alarm	Red	Steady on for common alarm	Yes
Defect	Yellow	One blink, Zone circuit fault Two Blinks, Strobe fault Three blinks, Power supply fault Steady On, Memory fault	Yes
Mute	Yellow	Alarms muted, 10 minutes timer running	No
Locate	Yellow	Alarms located, 5 minutes timer running	No
Test	Yellow	Steady On	Yes
Ack	Yellow	Steady On	No

3.6.2 Controls

Table 5 RFS1 V2 Control buttons

Descriptor	Function
ACK	Silences panel buzzer
Locate	Identifies active Smoke / Heat Alarm causing fire
Mute	Silences all active Smoke and Heat Alarms for 10 minutes
Test	Activates Smoke / Heat Alarm sounders and panel buzzer

3.6.2.1 Fault Acknowledge

Pressing the **Ack** button will Silence the defect/fault buzzer, defect LED remains illuminating and fault relay remains de-energised. A new fault condition will re-initiate the buzzer. The defect LED and fault relay remain in fault condition until the fault restores.

3.6.2.2 Alarm Locate

In alarm condition, all the Smoke/Heat Alarms sound, the “**Locate**” LED flashes to prompt the occupant to press the button and identify the location of the alarm origin. Pressing the “**locate**” button once silences all the Smoke/ Heat Alarm sounders except those that have been activated. This function allows the occupant to identify the location of alarm by listening to the Smoke/Heat Alarm sounder. Automatically resets after approximately 5 minutes. If the Smoke/Heat Alarm has been identified

and rectified before the locate timer times out, the locate function can be cancelled by pressing the button once again.

The locate facility acts as a service tool to identify contaminated or faulty Smoke or Heat Alarms.

3.6.2.3 Alarm Mute

When the “**Locate**” button is pressed, the locate LED turns to steady and the “**Mute**” LED starts flashing to prompt the occupant to the next course of actions. Once the alarm has been located, pressing the “**Mute**” button will silence the active Smoke/Heat Alarms for approximately 10 minutes. The mute function deactivates all devices on the alarm circuit (Smoke / Heat Alarm sounders, strobes, vibration pad, etc). Pressing the “**Mute**” button once starts the mute timer for approximately 10 minutes. To cancel the timing sequence, press the button once again. The mute function will automatically reset after the 10 minutes timer.

3.6.2.4 Test Button

The “**Test**” function allows the occupant to test the RFS1 V2 system. Pressing the “**Test**” button once, activates all Smoke/Heat Alarms, panel sounder, strobes, vibration pads, etc. Pressing the button once again will cancel the test mode.

Note: When the “**Test**” button is pressed, the alarm relay remains in normal mode.

4 Installation

The RFS1 V2 is factory pre-wired and fully tested before delivery. After receipt of the panel, the unit should be carefully checked for any possible mechanical damage during transportation. Report any damage to your nearest Brooks supplier.

Carefully remove the faceplate from the panel enclosure and unplug the 4 way plug from the main control module.

Store in a safe position until panel is installed and wired.

4.1 RFS1 V2 Surface Mounting Instructions

The RFS1 is always surface mounted however, to mount the RFS1:

1. Locate the position where the panel is to be sited.
2. Mark the position of the two mounting holes and the cable cut-outs, knockouts available between the two mounting holes.

Note: Power and ELV cables are to be kept segregated.

3. Select the appropriate mounting hardware and prepare the two mounting holes.
4. Fix the top two points, leaving approximately 6 mm of the protrusion from the wall. Mount the Panel and secure all mounting hardware.

4.2 RFS1 V2 Cable Termination

4.2.1 AC Power

The 230V_{AC} input is terminated on the mains 3-way terminal block (complete with fuse holder and fuse) and earth stud provided on the rear inside of the enclosure.

4.2.2 Field Wiring

All field cabling is to be terminated on the terminals provided on the Main Control Module as drawn in Figure 18 page 38. The panel is compatible with either the obsoleted 200 series alarms and/or the current EIB603CX and/or EIB650iWX. These alarms use 3 core cabling for either smoke or heat alarms on the zone.

In order to ensure that voltage drop is kept to a minimum and ensure that Smoke / Heat Alarms operate up to 100m runs, use low resistance cables of 19.5 Ω /km maximum DC resistance at 20°C with each core at 1.0 mm². Brooks strongly recommends using these cables:

- **BAC4C1/100** Metre 4 core 1mm² Red Cable
- **BACAC1/250** 250 Metre 4 Core 1mm² Red Cable

Cables should be terminated as required, ensuring all cables are neat and secured using plastic ties.

4.2.3 Battery

Place the Battery on the bottom of enclosure and connect leads provided.

RED - POSITIVE

BLACK - NEGATIVE

Note: Battery capacity calculation must be carried out based on the battery calculation sheet to determine the battery capacity required. Failing to use the correct battery capacity will void the compliance to AS3786:2014. Two batteries connected in parallel might be required.

Ensure to turn the mains on before connecting the battery

4.2.4 Refit Faceplate

Carefully refit the faceplate to the enclosure by firstly plugging in the 4 way plug to the connector in the main control module, switch on the mains power and connect battery leads to battery. Then with the hardware supplied fit the faceplate to the enclosure.

4.3 Termination of EIB650iWX or EIB603CX Alarms

The new Smoke EIB650iWX and Heat EIB603CX Alarms are to be plugged in the interface base BAX16 which consists of SUB1012, adapter board SUB1005, ribbon cable and extended plastic base. Figure 8 below shows the complete BAX16.

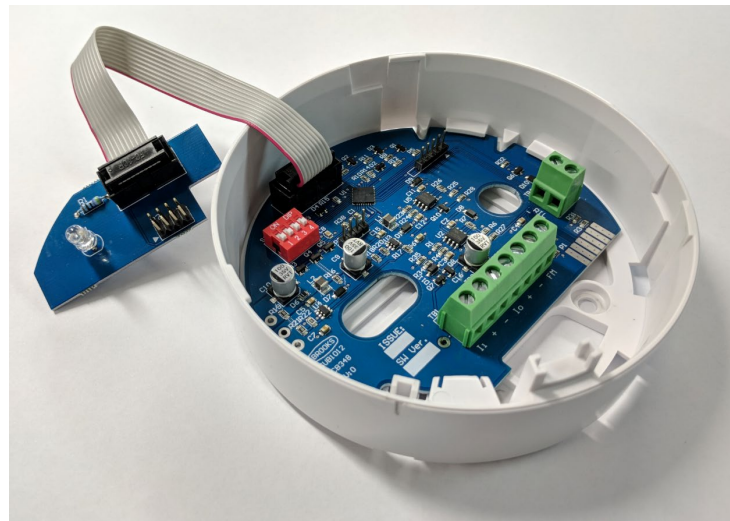


Figure 8 Interface Base BAX16

The new interface base BAX16 is connected to EIB650iWX or EIB603CX via the adapter board and the 10 Way ribbon cable.

The interface card in BAX16 will automatically detect alarm head type of either EIB650iWX or EIB603CX upon system initialisation and supply the required power accordingly.

The BAX16 interface and termination board SUB1012 is shown in Figure 9 below.

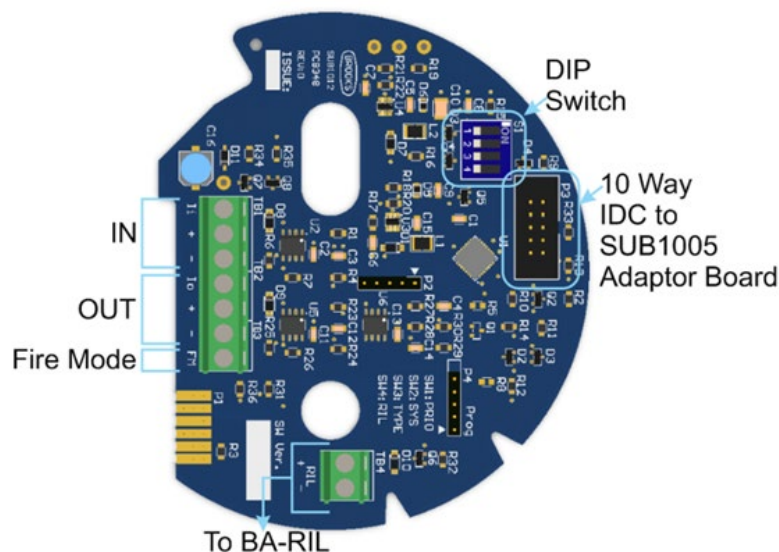


Figure 9 SUB1012 Terminals

To install EIB650iWX or EIB603CX, the following procedures can be used:

- 1) Before installing EIB650iWX or EIB603CX to the zone, ensure the panel is fully switched off and the panel battery is disconnected.
- 2) Mount the interface card base assembly BAX16 to the ceiling and terminate the field wiring according to the panel drawings shown in the Block Wiring Diagram in Figure 18 page 38.

Note: Interconnect **IN** / **OUT** must be terminated correctly i.e. from **RFP** to **IN** and **OUT** to the **next** BAX16 and so on. If **IN** / **OUT** are swapped, a fault will be generated.

- 3) Connect the appropriate Smoke/ Heat Alarm head to BAX16 by plugging the adapter board SUB1005 into the socket in the Alarm as shown in Figure 10. Refer to Figure 11 for head removal.

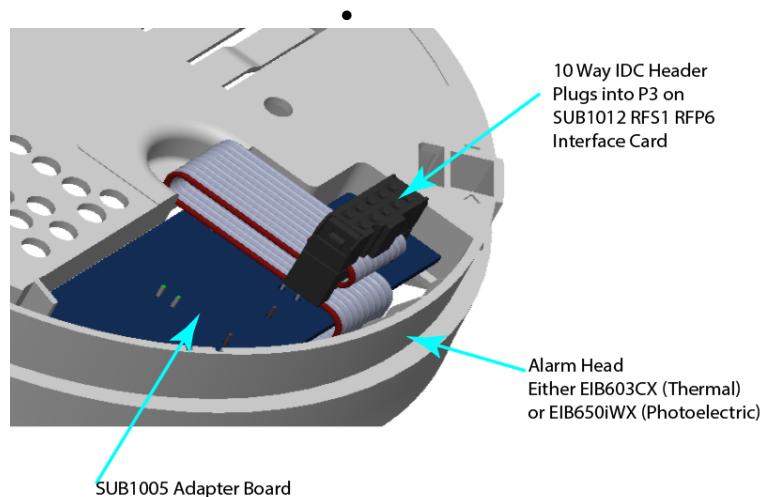


Figure 10 Ribbon cable from SUB1005

- 4) Select the DIP switch settings (see Table 6 on page 25) before powering the panel ON.
- 5) The panel should initialise and maintain in the normal state (Green LED steadily lit) if everything is connected correctly.
- 6) If the ribbon cable assembly is disconnected from an Alarm, the panel should revert into fault state (refer to respective manuals in alarm head for fault indications) and panel will chirp and also show a fault indication.
- 7) If ANY changes to the DIP switch settings are to be made while the panel is operating, please power down the panel first then set DIP switch. The panel will reinitialise with the new settings.

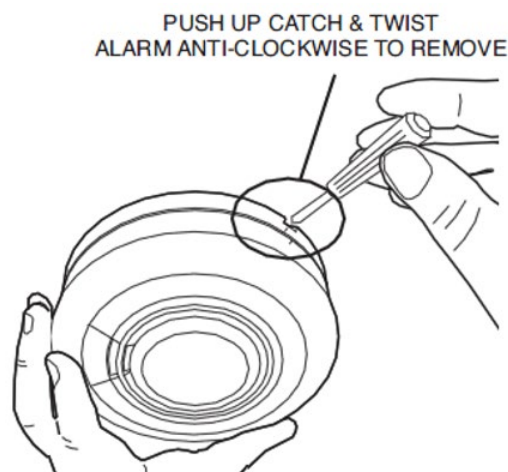


Figure 11 Removing Alarm Heads from BAX16

IMPORTANT PRECAUTION:

Do not install the actual alarm head itself in new or renovated buildings until all work is completed (including floor coverings) and the building has been fully cleaned. The wiring can be installed when appropriate. (Excessive dust and debris from building work can contaminate the smoke chamber or heat sensor and cause problems; it will also invalidate the guarantee). If it must be installed, cover it completely, particularly around the edge, with a dust cover (e.g. with the elasticated cover supplied or a plastic bag), until all cleaning is finished.

Warning: Wiring should only be installed by a properly trained technician or electrician in accordance with current wiring regulations for electrical installation. The installation must also be in accordance with the control panel instructions in this manual.

Warning: The mains circuit used to power the RFP must be a 24-hour circuit and be wired on a separate circuit (with no other lights or appliances) to ensure maximum reliability of the supply. Mains circuit must be connected by a licenced electrician.

Warning: For safety reasons the voltage supply from the control panel must not be greater than 15V_{DC}.

Note: Applies to all Alarm models, T-Off wiring must be avoided, all terminations from one Smoke / Heat Alarm to the next one should be done at the terminal block provided in each smoke or heat alarm, refer to the block wiring diagram in Figure 18, page 38.

The terminal blocks on SUB1012 are uni-directional, meaning that **cables must terminate to the "IN" termination points from the previous Smoke Alarm or closest to the panel for the first alarm.** The cables are terminated to the "OUT" terminals to the next Alarm. This means the field wiring coming from the panel direction must be terminated to the incoming termination point as marked as "IN" in Figure 18 page 38 whereas the field wiring on the end of line direction must be terminated to the outgoing termination point as marked as "OUT".

An RIL terminal is also provided for remote indicators.

Note: Do not interchange the order from IN to OUT, a zone fault will be generated.

Table 6 DIP Switch Settings for SUB1012

DIP Switch (S1)	Description	RFP V2	
		ON (UP)	OFF (Down)
1	Panel Model Selection (RFS1)	✓	-
2	Not used	N/A	N/A
3	Last Alarm in a zone ³	Last Alarm	Not Last
4	RIL Latch Operation	Latch	Non-Latch

Note: ✓ means that switch must be set to this position.

Take special care to check DIP Switch 3 during installation or expanding the system. There can only be one Smoke/Heat Alarm that is set as the EOL device in the zone

³ The end of line device is not required if DIP switch no. 3 is set as the last alarm in the zone.

circuit and it must be on the last Smoke/Heat Alarm. If this is set incorrectly, the fault LED will be indicated on the panel.

Note: It is essential that DIP switch 3 is set to “ON” position if SUB1012 is situated in the last position on the zone. Outgoing termination point is to be left empty.

4.4 Input / Output Module EIB209IO

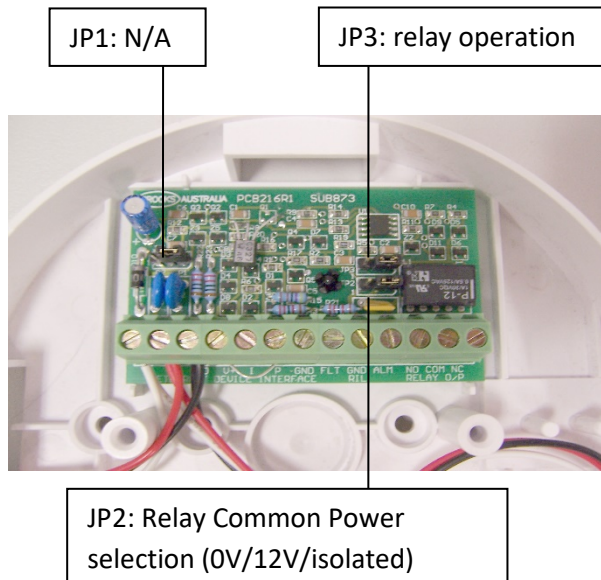


Figure 12 Generic input / output field module EIB209IO

The input/output module is a zone module which interfaces the control panel to external devices. The module is fitted (clip in) in x-series rectangular base.

The input is a clean contact input and non-supervised, it can be used to interface a manual call point or a sprinkler flow switch to RFS1 V2.

The alarm output can be either a changeover relay contact or 12V_{DC} (or 0V_{DC}) switched output via the “COM” terminal depending on the position of jumper link JP2, the output is limited to 1Amp, non-supervised and may be utilised to drive strobes or vibration pads.

The module provides terminals for remote indication RIL, this indication can be either for remote alarm or for remote fault indication or both.

4.4.1 Jumper Link Setting

Table 7 EIB209IO card jumper settings

Jumper	Function	Description	Jumper Position
JP1	Priority Selection	Not used in RFS1 V2	
JP2	Alarm Relay	Voltage free contact	Jumper not fitted
		Com=0V (switches 0V to NO terminal)	Jumper across pin 1 & 2
		Com=12V_{DC} (switches 12V _{DC} to NO terminal)	Jumper across pin 2 & 3
JP3	Alarm Relay & RIL Trigger	Standalone , activated of Smoke or Heat Alarm	Jumper across pin 1 & 2 or not fitted
		Common , activated of Common Interconnect Bus	Jumper across pin 2 & 3

4.4.2 PCB Layout

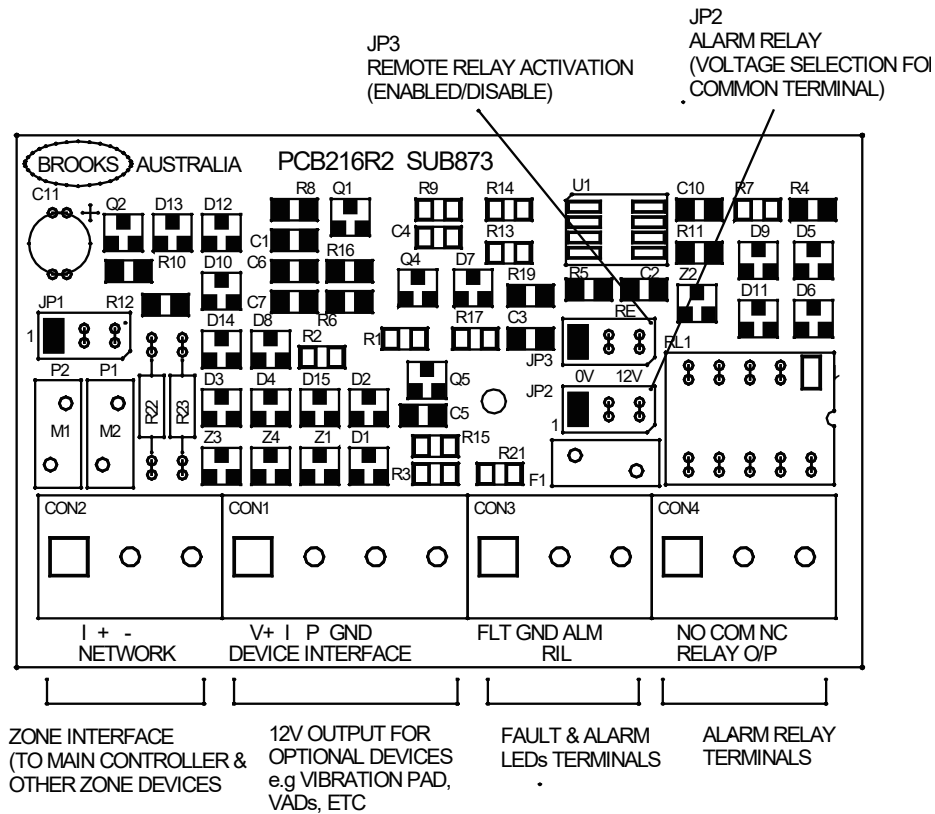


Figure 13 EIB209IO Input / Output Module (SUB873)

4.4.3 Switch Input Application

The following diagram shows how the module is used as an input module for clean contact normally open contact such as sprinkler flow switch or manual call point.

Note: Jumper JP1 for selecting priorities is not in use in RFS1 V2

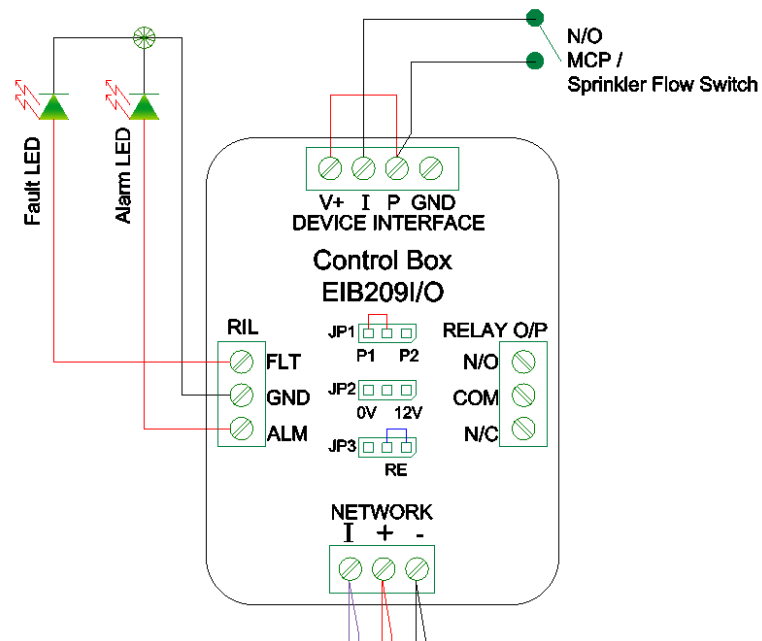


Figure 14 EIB209IO connection to N/O contact sprinkler flow switch input

4.5 Vibration Pad EIB207V

Smoke and Heat Alarms may not provide an early warning for hearing impaired. Brooks has added additional equipment to provide warning for the hearing impaired occupants, the Vibration pad EIB207V is a device that can be placed under the pillow to provide an early warning for hard of hearing occupants.

Note: The Vibration pad does not detect fire, it responds only to a fire detected by Smoke or Heat Alarm which compromises a part of RFS1 V2 zone detection circuit.



EIB207V Control Box



EIB207V Vibration Pad

Figure 15 EIB207V Vibration pad

The diagram shown Figure 16 below is used for wiring a vibration pad to **RFS1 V2**, note the jumper link setting. The jumper across pin 1 & 2 in the vibration pad plug is used to generate a fault when the plug is not fitted in the socket. The relay is configured to switch +12V_{DC} via the NO contact (0V is required from the zone -ve)

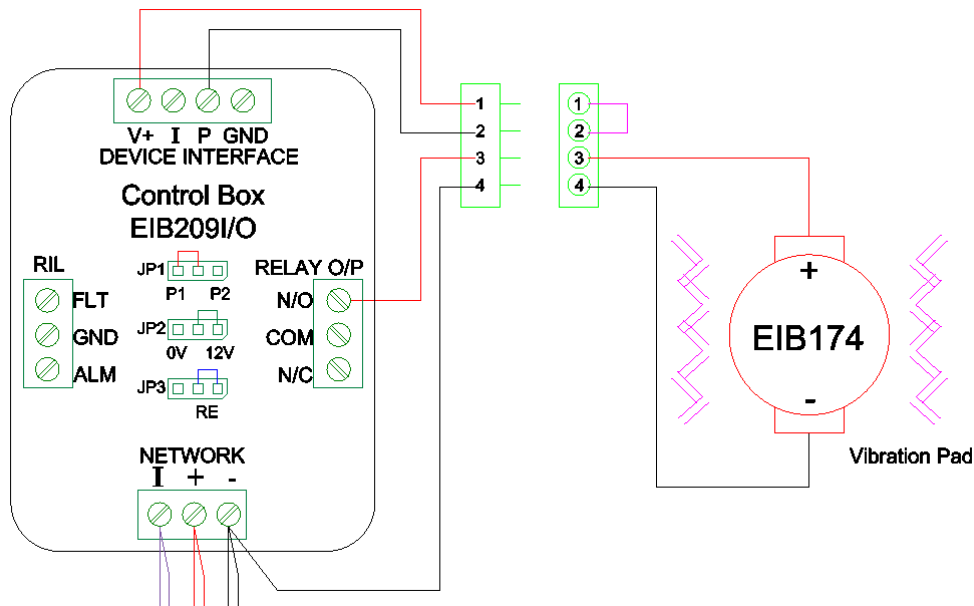


Figure 16 EIB207V connection diagram

4.6 Strobe Output

The second type of devices for hearing impaired is the strobe light, white and red strobes conform to EN54.23 are now available to interface to EIB209I/O.

The connection diagram in Figure 17 below is used to connect a strobe (flashing light) to the generic input / output module.

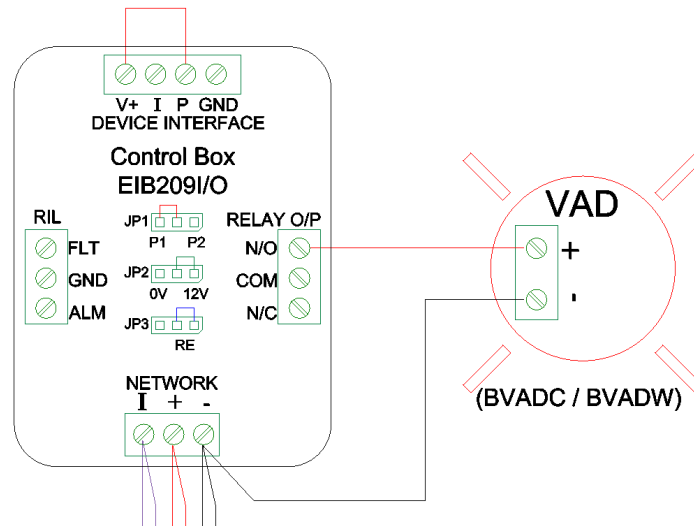


Figure 17 Strobe connection to EIB209IO

Note: JP3 – ‘RE’ = Remote Relay Enable, common interconnect energises the relay – used for strobe and billow shaker.

4.7 End of Line Setting

The end of line module must be terminated on the last device on the zone circuit. Only one device required for each RFS1 V2 system. EOL modules can be replaced by setting the DIP switch no.3 on the interface card SUB1012 to the ON position as shown in Table 6 page 25.



Note: There should only be one EOL module/device connected in the alarm circuit. A fault status would be indicated if 2 or more EOL device is detected in the circuit.”.

The EOL module sets the normal operating voltage of the interconnect line. The voltage of the interconnect input to the main control module determines the three modes of operation: normal, alarm or fault.

Interconnect Voltage Threshold:

The following voltages can be used to diagnose a faulty system.

Note: Voltage ranges may vary +/-10%

Table 8 Interconnect voltage threshold

Function	Voltage (V _{DC})
Alarm	5.0 ~ 13
Missing Alarm Head fault	2.5 ~ 5.1
EOL (normal)	0.6 ~ 2.5
Open Circuit fault	0.0 ~ 0.6

Colour coding:

Red wire +12 V_{DC}
Black wire 0 V_{DC}
White wire interconnect

5 Commissioning

The fire alarm installer shall ensure that all documentation, logbook, handbook (operators and installers manuals), as-installed drawings, and check list are available at the time of commissioning.

The fire alarm system installer should rectify any faults in the fire detection and alarm installation, as appropriate, where the results of the commissioning tests are outside the manufacturer's limits.

An as-installed diagram of the wiring layout of the complete installation, including the positions of the Smoke/Heat Alarms and any ancillary devices, should be provided before a final inspection is made.

5.1 Commissioning Tests

The following checks are to be performed:

5.1.1 System Configuration

1. Ensure that the Smoke / Heat Alarm locations and the Residential Fire Panel are appropriate for the type of site and usage.
2. Check that all Smoke or Heat Alarms used in the system are:
 - Listed in this manual
 - Compatible with the zone specifications
 - Combination of Smoke/Heat Alarms and/or ancillary devices does not exceed (15) and
 - Installed in an environment for which is suitable.
3. Check that the AC mains power supply for the system has been provided in accordance with AS3000.
4. Visually check all field wiring terminations (refer to the panel wiring instructions, Figure 18).
5. Upon power up, check that there are no faults indicated on the panel. Rectify any existing faults according to Table 4 page 20.
6. Check that the battery (or batteries) fitted in accordance of the battery capacity calculation sheet. It should be of a suitable type and capacity (refer to Chapter 9 page 37).
7. Check that as-installed drawing has been correctly marked up and that they are consistent with the installation.
8. Record the results of the commissioning test on the commissioning sheet in this Handbook.

6 Testing

This section describes the procedures to test your RFS1 V2 system to ensure that the system is fully functional.

Before you commence testing your RFS1 V2 system, it is important to ensure that you advise any relevant people i.e. tenants or a security / fire monitoring company, that system testing is occurring, as alarm and defect warnings will be initiated.

6.1 Power Supply

Power supply voltage is pre-set at the factory to 14.5V_{DC} (13.8V_{DC} on battery terminal):

1. Insert the fuse holder (with fuse fitted) in the 3-way mains terminal block to switch the mains power ON, the power on LED illuminates green. The panel sounder will sound and the defect LED illuminates yellow until the battery is fitted.
2. Switch off the AC supply few times to check that the system will not false alarm.
3. Connect the battery leads to the battery, the panel sounder will stop sounding and the defect LED distinguishes. Ensure that only the power ON LED is illuminating.

6.2 Smoke / Heat Alarm Test

1. Proceed to each Smoke or Heat Alarm, check that the green light on the Alarm is 'ON'.
2. Press and hold the test button of a Smoke or Heat Alarm for up to 10 seconds to ensure the sensor chamber, electronics and sounder are working. A red light on the cover will flash while horn is sounding. The alarm will stop when the button is released.
3. Ensure all Alarms are sounding within about 5 seconds of the first Alarm sounding. The red alarm light on the first unit only will flash once a second and the alarm LED on RFS1 V2 will illuminate.

Pressing the test button simulates the effect of smoke or heat during a real fire and is the best method to ensure the Alarm is operating correctly.

WARNING: DO NOT TEST WITH FLAME, this will damage both the Alarm and the house.

Brooks do not recommend testing with smoke or heat as the results can be misleading unless special equipment is used.

6.2.1 Alarm Output Test

1. Ensure alarm outputs are not isolated
2. Proceed to any smoke or heat alarm and press the test button, the alarm outputs should activate.
3. Check for the operation of any ancillary devices i.e. strobe, MDH, etc. connected to the alarm output.
4. Check that the remote indicator (if fitted) illuminates – Red LED

Note: this will only illuminate while the alarm is sounding

6.2.2 Checking Alarm “Test” Switch

1. Press ‘**Test**’ switch, all Smoke and Heat Alarms will sound. All ancillary devices will be triggered on both RFS1 and in the field **except** the alarm contact relay on the Main Board.
2. Press ‘**Test**’ switch again to cancel the alarm test

6.3 “Locate” and “Mute” Switches

1. Spray some smoke from a smoke tester, all Smoke and Heat Alarms sound and the ‘**Locate**’ LED RFS1 front flashes.
2. Press the ‘**Locate**’ switch, all Smoke and Heat Alarms stop sounding and the locate LED turns to steady.

Note: To cancel function, press the locate button for about 4 seconds then release. The locate functions remains active for approximately 5 minutes.

3. Ensure only the active (on test) Smoke Alarm is sounding.
4. Press the ‘**Mute**’ button, the active Smoke Alarm stops sounding, the locate LED distinguish and the mute LED illuminates.

Note: To cancel the mute function, press the mute button for about 4 seconds and then release. The mute function will be active for approximately 10 minutes.

6.4 Defect Mode Test

1. Proceed to the Smoke/Heat Alarm containing the EOL (last). Remove the EOL device positive / interconnect wire or switch OFF DIP switch no. 3 (if used), check for the following:
 - a) Defect amber LED illuminates
 - b) The panel sounder sounds continuously
 - c) Defect Mode relay activate
2. Press the acknowledge button “**ACK**”, the panel sounder silences
3. Check for the operation of any ancillary devices i.e. strobe, MDH etc. connected to the defect output.
4. Restore the wire or S3 to ON position, amber Defect LED extinguishes.
5. Check the Panel sounder silences and defect output deactivates.

6.5 As-Installed Diagrams and Installer's Statement

An as-installed diagram of the wiring layout of the complete installation, including the positions of the Smoke/Heat Alarms should be provided before a final inspection is made.

6.6 Log Book

A log should be kept by the person on-site responsible for the RFS1 V2 system. The responsible person's name and contact details should be kept at the RFS1 V2 control panel. A separate section of this manual provides an example for the recording of all alarm/service/maintenance details.

6.7 Maintenance

For the continuous reliability of the system, provision should be made for regular inspection, testing and preventative maintenance of the installation. AS1851 provides guidance.

A properly designed and installed detection system offers effective life and property protection; however, for ongoing reliability the system must be maintained at its peak performance. A poorly maintained system can lead to nuisance alarms or complete system failure. Under these conditions the system will not perform to the level of protection needed.

1. It is recommended that the owner test each Smoke/Heat Alarm every month including the operation of any ancillary device.
2. It is also recommended that each 12 months a full system test be performed. Battery and power supply voltages should be checked and adjusted, if necessary.

7 Troubleshooting

7.1 False Alarms

In the event of a "false alarm" it is imperative that the cause is determined and corrective action taken.

Condition: False Alarm - System is fully activated; Red Alarm LED 'ON'.

7.1.1 Frequent Nuisance Alarms Occur

1. Close kitchen/bathroom door when in use.
2. Ensure that the Alarm is sited at least 6m away from sources of fumes.
3. Contamination from insects, paint or paint fumes may have occurred. Clean the Alarm as described in the Alarm booklet.
4. If the problem persists, re-sitting of the unit should be considered. Alternatively, replace with a new unit

7.1.2 Alarm Sounds for no Apparent Reason

1. Identify the alarm source, press alarm "Locate" at the RFS1, all the Smoke/Heat Alarms stop sounding except the Alarm which is the source of the alarm.
2. Check for fumes; steam etc. from the kitchen or bathroom. Paint and other fumes can cause nuisance alarms. Fan the Smoke Alarm vigorously with a newspaper or cloth to try to clear smoke from inside the sensing chamber. If the Smoke Alarm silences, press the "Locate" button to restore the system.
3. If required, press the "Mute" button to silence all the Smoke/Heat Alarm for 10 minutes.
4. If the Alarm does not stop sounding, turn the panel power off, remove the Alarm head then unplug the adapter board (Only remove the identified Alarm). If a replacement cannot be acquired immediately, restore the power. The defect mode will be active, press the "Ack" button to acknowledge the fault, other Alarms will continue to operate normally.
5. When a replacement is available, turn the Panel power off, plug-in the adapter board into the new Alarm and mount the head to its base. Restore the panel power.

Note: EIB650iWX and/or EIB603CX are not serviceable, if suspected to be faulty or contaminated, they have to be replaced.

7.2 Faults

7.2.1 Line Fault

If the fault LED is lit and the sounder is pulsing, then an Open Circuit or Short Circuit has occurred. If a Short Circuit has occurred, then the fuse on the zone would have been blown. If a short occurs between +Ve and Interconnect, the panel generates an alarm, this will not be indicated on the panel as a fault. If a short occurs between the -Ve and Interconnect, the panel will activate locate mode, this also will not be indicated on the panel as a fault.

If an Open Circuit has occurred while the fuse is intact, the field wiring should be disconnected and metered to locate the source of the open circuit.

There should only be one Smoke/Heat Alarm that is set as the EOL device in the zone circuit and it must be on the last Alarm for that zone (either by EOL device or

DIP switch setting). If this is set incorrectly, the panel will indicate a fault and the panel buzzer will sound in short intervals. Refer to Table 6, page 25 for correct DIP switch setting.

7.3 Low Battery (RFS1 System)

If the battery in RFS1 becomes depleted, the panel buzzer will sound and defect LED will illuminate. Check the mains supply to the panel and if missing restore as a matter of urgency. If the mains is intact, change the battery.

7.4 Connection Fault

The connection from RFS1 V2 to all Alarms must be wired as shown in Figure 18, page 38

If interconnect **IN** and interconnect **OUT** are reversed in any Alarm in the zone circuit, a fault will be generated in RFS1.

8 Spare Parts

To obtain any of the spare parts shown below or equipment service, please contact your nearest Brooks office shown in the end of the manual

8.1 Main Panel

Stock no.	Description
SUB870A	RFS1 Main Control Module PCB.
SUB871A	RFS1 Operator Module PCB.
SUB873A	RFS1 Input / Output Relay Module PCB (for EIB209IO).
BARFS1-RKP	Remote Keypad for RFS1 V2
FU155	Fuse Fast Blow 1.5Amp
BAPS15V50W	Power Supply
Lead Acid Battery	BBAT12V6.5 BBAT12V9

8.2 Field Devices

Stock no.	Description
EIB650iWX	Photo Electric Smoke Alarm Head
EIB603CX	Heat Alarm Head
BAX16	Smoke / Heat Alarm deep base C/W interface card
EIB207V	Vibration Patrice
EIB209IO	Input/output module
HS60V2	Roof Space Heat Detector 60° C
HS80V2	Roof Space Heat Detector 80° C

9 Battery Capacity Calculation

The required battery capacity can be calculated using the active battery calculation spread sheet. By selecting the RFS1 V2, no. of smoke/heat alarms and adding any ancillaries, the spread sheet will automatically calculate the battery capacity required to maintain the system for 72 hours in standby condition followed by 4 minutes in alarm as required by AS3786.

RFS1 V2 Battery Calculations				Rev	1	Date	22-Jul-19
Project:							
System Components	Stock Number	No. of Units	Quiescent Current I _Q		Alarm Current I _A		Comments
			mA	Total mA	mA	Total mA	
Single Zone Residential Fire Panel (1 Keypad)	RFS1V2	1	33.0	33.0	100.0	100.0	Voltage @ 13.8V
Second keypad	BARFS1-KPAD	0	40.0	0.0	40.0	0.0	
Photoelectric Smoke Alarm	EIB650iWX	1	4.5	4.5	30.0	30.0	Max. 15 Alarm
Heat Alarm	EIB603CX	1	6.0	6.0	50.0	50.0	
Roof Space Heat Detector 60°	HS60V2	1	0.0	0.0	6.7	6.7	If RIL fitted I _A = 14mA
Roof Space Heat Detector 80°	HS60V2	1	0.0	0.0	6.7	6.7	If RIL fitted I _A = 14mA
Billow Shaker (Vibration Patrice)	EIB207V	1	1.3	1.3	100.0	100.0	
Generic Input / Output Module	EIB209IO	1	1.3	1.3	45.0	45.0	
Strobe Light (VAD)	BVADC/BVADW	1	1.3	1.3	25.0	25.0	
Total no. of Alarms		5					
Ancillary Output (not shown above)				0.0		0.0	
Others				0.0		0.0	
Total current consumption. (mA)				47.4		363.4	
Standby Time (hours)		72					
Alarm Time (minutes)		4					
Battery Requirement (in AH)		4.326567					Use 7 AH Battery
Nearest Standard Battery Size (A/h)		7					
Note: Only yellow cells can be edited							

Manual calculation of battery capacity can also be calculated as follow:

Total Quiescent Current I_Q = _____ mA Standby time T₁ = 72 Hrs

Total Alarm Current I_A = _____ mA Alarm time T₂ = 4 minutes.

$$\text{Battery Capacity (Ah)} = \frac{[(I_Q \times T_1) + 2(I_A \times T_2) / 60] \times 1.25}{1000}$$

Power supply requirements = I_A + 300mA (where 300mA is the battery charge current)

10 Block Wiring Diagram

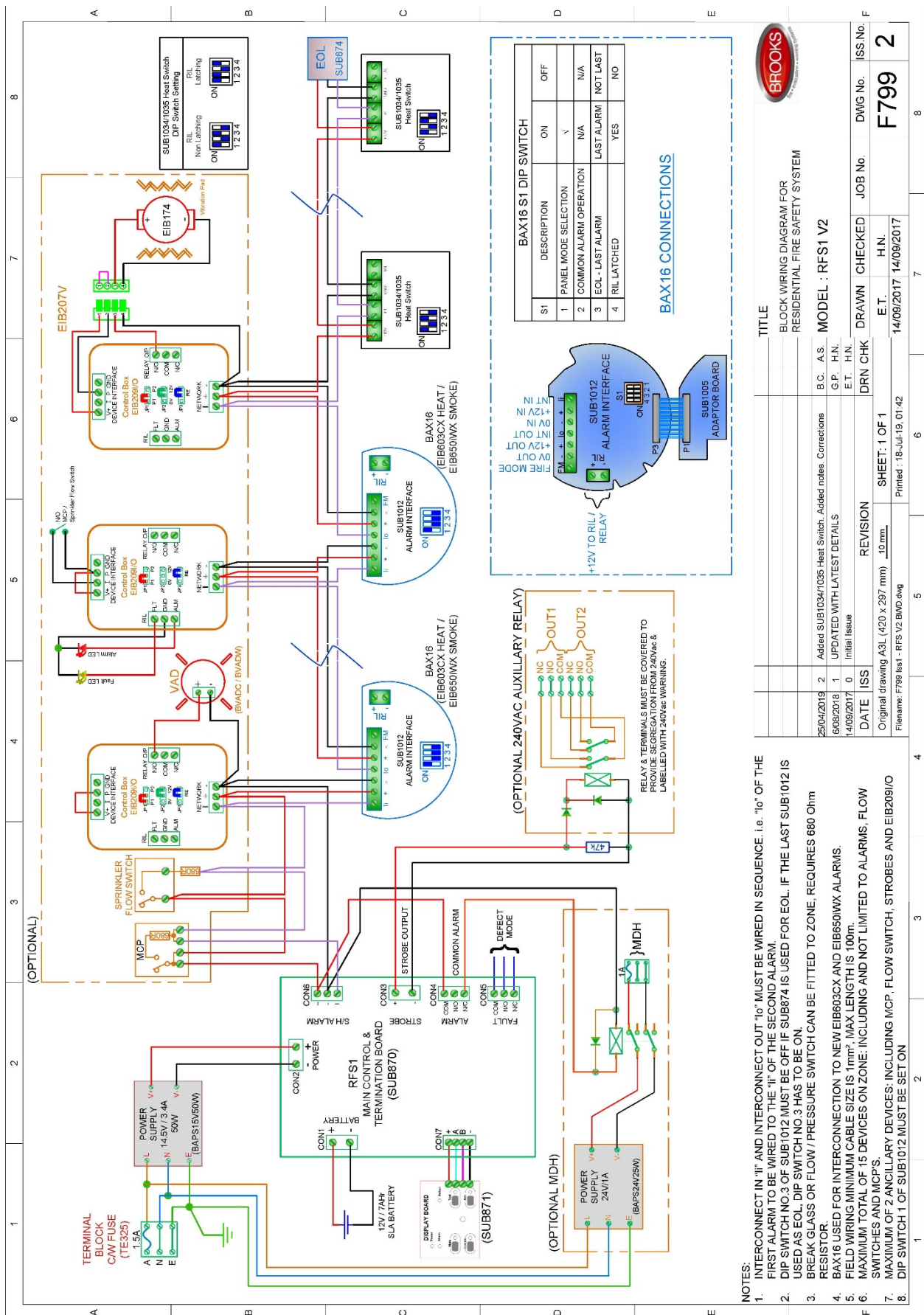


Figure 18 RFS1 V2 Block Wiring Diagram



11 Commissioning Checklists

RFS1 V2 SYSTEM

Installer's Statement

Page 1 of 2

1. Building Name

2. Address

3. Is the system monitored? YES/NO If YES, by whom:

4. Name of nearest Fire Brigade Station Phone:

5. Type of Panel: RFS1 V2 Serial No.:

6. Number of Alarms connected:

7. Describe any ancillary equipment installed and connected to the RFS1 V2 Panel.

8. Main Supply Voltage

9. Battery Type and Capacity

10. Nominal Battery Voltage (13.8 V_{DC})

11. Maintenance Agreement held by

12. Has Log Book been supplied YES/NO

13. Have as-installed drawings been supplied YES/NO



TEST REPORT

SYSTEM CONFIGURATION

As installed Diagrams Correct/Incorrect

Log Book Details Correct/Incorrect

SMOKE ALARMS

Layout Correct/Incorrect

Number Correct/Incorrect

Type Selection Correct/Incorrect

HEAT ALARMS

Layout Correct/Incorrect

Number Correct/Incorrect

Type Selection Correct/Incorrect

Ancillary Devices

Layout Correct/Incorrect

Number Correct/Incorrect

Type Selection Correct/Incorrect

Panel Position

IF INCORRECT, COMMENT:

CONTROL PANEL

Alarm Test Correct/Incorrect

Fault Test Correct/Incorrect

Battery Voltage Correct/Incorrect

Mains Connection Correct/Incorrect

Field Wiring Termination Correct/Incorrect



IF INCORRECT, COMMENT

FIELD DEVICES

End of Line Fault Test	Correct/Incorrect
Smoke Alarms All Operational	Correct/Incorrect
Manual Call Points All Operational	Correct/Incorrect
Ancillary Equipment All Operational	Correct/Incorrect

IF INCORRECT, COMMENT:

12 Product Guarantee

Brooks Australia Pty Ltd guarantees the RFS1 V2 control panel for a period of either fifteen (15) months from the date of purchase or twelve (12) months from the date of installation, whichever is the lesser. Brooks Australia Pty Ltd. Guarantees the Smoke/Heat Alarms for five years from date of purchase. If a product has any defect due to faulty workmanship or material it will upon return to Brooks be repaired or replaced free of charge.

If the control panel or any Smoke/Heat Alarm should become defective within the guarantee period, it must be returned to Brooks Australia, with proof of purchase, carefully packaged, with the problem clearly stated. Brooks shall at its discretion repair or replace the faulty unit. If returning the complete product all accessories and documentation MUST be returned.

This guarantee only applies to normal conditions of use and service, and does not cover damage caused to the product or its components as a resulting from accident, neglect, misuse, unauthorized dismantling, or contamination howsoever caused, incorrect installation, careless handling or where repairs have been made or attempted by others. Onsite warranty repairs are not part of this guarantee. This guarantee excludes incidental and consequential damage. This guarantee does not cover costs associated with the removal and/or installation of alarms.

No other guarantees written or verbal are authorised to be made on behalf of Brooks. All other conditions and warranties whether expressed or implied are, to the extent permitted by law, hereby excluded.

As Brooks has no control over the system's design, installation to the relevant Australian Standard or maintenance, the Company and its agents take no responsibility for any damage, financial loss or injury caused to any equipment, property or persons resulting from the use of the RFS1 V2 system.

Do not interfere with the Alarm or attempt to tamper with it. This will invalidate the guarantee, but more importantly may expose the user to shock or fire hazards. This guarantee is in addition to your statutory rights as a consumer.

13 Revision history

Issue	Date	Description	Written By	Checked By
0	6/4/2007	First revision	O.K.	A.S.
2	17/7/2008	Minor update	O.K.	A.S.
2.1	26/3/2015	Update to new Brooks manual format & add block wiring diagram		A.S.
3	18/07/2019	Update panel to use with new Smoke Alarms EIB650iWX, Heat Alarms EIB603CX, roof space Het detector HS60V2 and HS80V2. Remove reference to old Alarms	A.S. / H.N.	A.S.

NSW - Head Office

P.O. Box 7050 Silverwater NSW 1811

4 Pike Street Rydalmere NSW 2116

Ph: 02 9684 1466

Website: www.Brooks.com.au

VIC

9/71 Victoria Crescent, Abbotsford, VIC 3067

Ph: 03 9879 5294

SA

P.O. Box 101 Woodville SA 5011

729A Port Road, Woodville, SA 5011

Ph: 08 8347 0000

QLD

P.O. Box 511 Archerfield QLD 4108

2/49 Boyland Ave Coopers Plains, QLD 4108

Ph: 07 3373 8222

WA

P.O. Box 2114, Midland DC W.A. 6936

6/91 Leach Highway, Kewdale WA 6105

Ph: 08 6262 8095

Or National Australian Sales Number: 1300 78 FIRE (3473)

For the cost of local call.



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