

AlarmSense  
2-wire  
detection  
and alarm  
system



Product  
Guide

**AlarmSense**

**apollo**  
FIRE DETECTORS LIMITED

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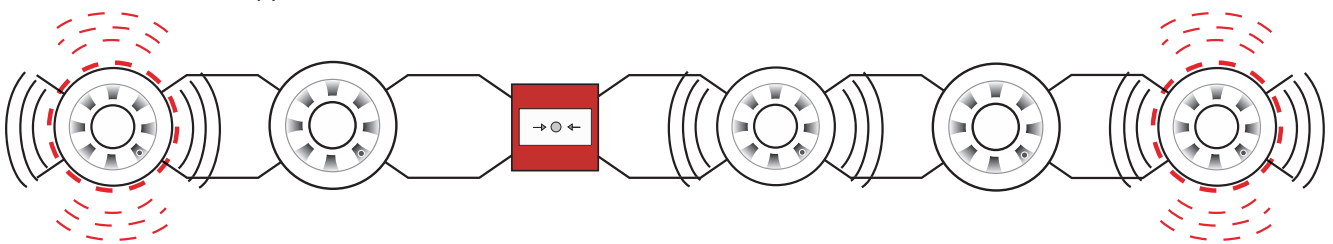
# AlarmSense

## What is AlarmSense?

AlarmSense is a range of Apollo conventional fire detection and alarm products specially designed to be connected to the same pair of supply wires in a detection and alarm zone. The range comprises detectors, a manual call point, a sounder, a beacon, a sounder beacon and a relay module.

AlarmSense detectors and devices are powered and controlled by purpose-designed control and indicating equipment. Details can be supplied by Apollo Fire Detectors.

AlarmSense is acceptable for BS 5839-1 systems and BS 5839-6 systems and is therefore particularly useful for fire protection in Houses in Multiple Occupation (HMOs). For more information please refer to the AlarmSense Application Guide: HMO, PP2260.



## The Purpose of AlarmSense

AlarmSense has been developed to make the task of designing and installing a fire detection and alarm system easier and more cost-effective in small to medium-sized buildings. Because it offers greater flexibility it is also ideal for Houses in Multiple Occupation (HMOs).

AlarmSense is

- flexible
- reliable
- cost-effective
- compliant with BS5839
- easy to install
- easy to extend

## How AlarmSense works

AlarmSense sounders and manual call points are fitted to the same zone as detectors. In quiescent state the zone is powered at between 9 and 15 volts, nominally 12 volts, at which voltage only detectors and call points operate. Sounders require 24V to operate.

When an alarm is detected on a particular zone, the control panel increases the line voltage to 24V on that zone, causing the sounders to produce a continuous 'Evacuate' sound. Any voltage-sensitive output devices — relay modules or other alarm devices—also operate.

When the voltage is increased to 24V, the detector alarm current will reduce to 1.5mA. The detectors are latched in alarm until they are reset by reducing the voltage to less than 2V for greater than 1 second. Output devices will de-activate each time the voltage is reduced to 12V unless otherwise stated in their specification.

On other zones, where detectors have not changed to the alarm state, generation of the 'Alert' tone can be achieved by pulsing the supply voltage from 12V to 24V with Line 1 positive and the sounders configured to continuous output. Pulse frequency is determined by the control panel but a frequency of 1 second on, 1 second off, is recommended for compliance with BS 5839 Pt1.

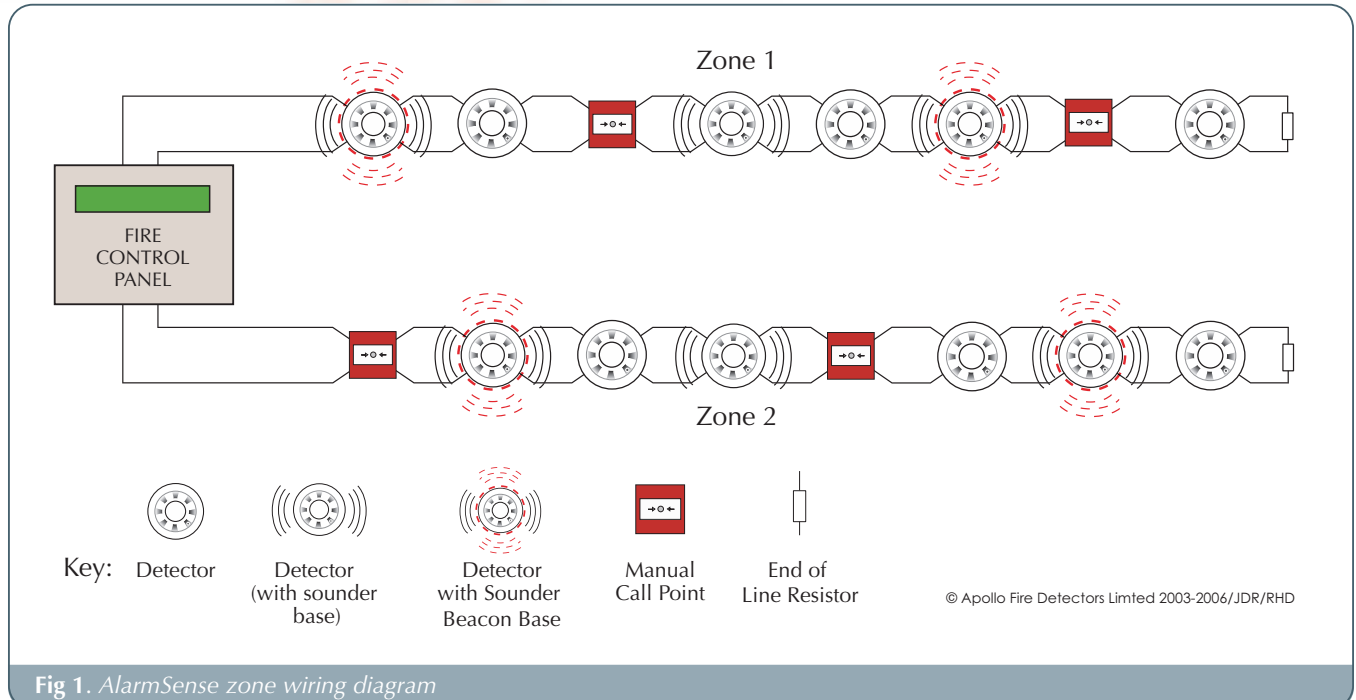


Fig 1. AlarmSense zone wiring diagram

## Alarmsense Features

### Detector Removal Monitoring

By connecting like-polarity 'zone in' and 'zone out' wires to the same terminal, wiring continuity is maintained in the event of head removal.

Unauthorised removal of a detector head results in the generation of a fault warning. AlarmSense bases monitor the condition of terminal L1 OUT and detection circuitry in the panel registers the pulses generated if a detector is removed.

*In the event that a detector has been removed, there will be no loss of power to any sounder base, sounder beacon base or call point, no matter where on the zone they are fitted.*

### Priority/Non-priority sounder setting

The AlarmSense sounder and sounder beacon base may be switched by means of a DIL switch to provide either a general or a local alarm. In an HMO the sounder or sounder beacon could be set to non-priority to give a local alarm in individual flats or apartments while the devices in communal and circulation areas and escape routes are set to priority to give a general alarm.

In the event of a detector in an apartment changing to the alarm state the control panel would switch the associated sounder or sounder beacon to non-priority alarm. This will warn the occupants who then have 2 minutes to investigate and remove any cause of false alarm, such as overheating food in the kitchen.

If the cause of the alarm is cleared within 2 minutes the system will reset. If the detector is still activated after 2 minutes the system will switch all sounders to full alarm.

*Notes: 1. The operation of an AlarmSense Manual Call Point will always trigger a priority (general) alarm to warn all building occupants of a fire.*

*2. Apollo recommends that, when a heat detector is fitted to a sounder base or sounder beacon base, the sounder be set only as a 'Priority' sounder.*

### 'Spread of Fire' Detection

It is possible to check to ascertain whether additional detectors (in other zones) have changed to the alarm state as a fire spreads.

This is done either by interrupting the 'evacuate' tone for a period of no longer than 15ms and applying 12V to the line or by sensing during the 1 second off period of the 'Alert' tone.

Any detectors in alarm will increase their current to 25mA for this 15ms period.

### Detection of manual call point operation

AlarmSense manual call points are polarity sensitive in order that they may be disabled independently of sounders or detectors. In addition, call points switch to the 25mA alarm current at a lower voltage than detectors (approx 3V below), hence it is possible to identify call point operation, even if detectors are in the alarm condition.

### Independent disablement of manual call points

Manual call points may be disabled independently of detectors by reversing the zone voltage.

### Multiple LEDs

The zone output should be current limited to approximately 20mA at voltages below 18V. This will ensure that there is sufficient, but not excessive, current available to keep LEDs illuminated when multiple detectors are in alarm, due to the spread of fire.

### Silencing alarms, resetting detectors and de-activating output devices

To silence alarms, reduce the line voltage to <15V (12V nominal) for at least 2 seconds.

To reset detectors in the alarm condition, reduce the line voltage to less than 2V for at least 1 second.

Depending upon their individual specifications, the various AlarmSense output devices will either de-activate at less than 15V or may require the line voltage to be reduced to less than 2V in order to perform a reset.





AlarmSense optical detector

Part no 55000-390



AlarmSense heat detector

Part no 55000-190 (A1R)  
55000-193 (CS)

## Optical Detectors

AlarmSense optical detectors work on the light scatter principle.

They change to the alarm state at a pre-set threshold of smoke penetration into the sensing chamber.

### TECHNICAL SPECIFICATIONS

<b>Operating voltage range</b>	9–33V
<b>Polarity</b>	polarity insensitive
<b>Quiescent current at 15V</b>	<50µA
<b>Alarm current at</b>	
2–8.5V	<1.5mA
10.5–15V	25 ± 2mA
18–24V	<1.5mA
33V	<2mA
<b>Maximum reset voltage</b>	2V
<b>Reset time</b>	1s
<b>Max supply interruption time</b>	40ms
<b>EMC</b>	CE marked to EN50130-4
<b>Dimensions</b>	100mm diameter x 42mm detector in base 100mm diameter x 50mm
<b>Weight</b>	100g

Detectors are housed in standard Apollo pure white polycarbonate mouldings, and fitted with two LEDs in order to allow 360° visibility.

An integrating optical detector, part no 55000-391, is available for use in areas where smoke is present as a result of normal activity. Residents of a House in Multiple Occupation (HMO) might be smokers and the integrating detector would help avoid false alarms.

## Heat Detectors

Heat detectors are classified according to the requirements of EN54, part 5. The AlarmSense range includes one rate-of-rise heat detector and one static (fixed-temperature) detector.

### TECHNICAL SPECIFICATIONS

<b>Operating voltage range</b>	9–33V
<b>Polarity</b>	polarity insensitive
<b>Quiescent current at 15V</b>	<50µA
<b>Alarm current at</b>	
2–8.5V	<1.5mA
10.5–15V	25 ± 2mA
18–24V	<1.5mA
33V	<2mA
<b>Maximum reset voltage</b>	2V
<b>Reset time</b>	1s
<b>Max supply interruption time</b>	40ms
<b>Available grades</b>	A1R & CS
<b>EMC</b>	CE marked to EN50130-4
<b>Dimensions</b>	100mm diameter x 42mm detector in base 100mm diameter x 50mm
<b>Weight</b>	100g

Detectors are housed in standard Apollo pure white polycarbonate mouldings, and fitted with two LEDs in order to allow 360° visibility.



AlarmSense mounting base

Part no 45681-244

## AlarmSense Base

AlarmSense detectors may be mounted only into AlarmSense bases. These bases are fitted with electronic circuitry to monitor the presence of detectors and allow a fault to be signalled if a detector is removed without authorisation. This is also the case with the sounder bases and the sounder beacon bases.



### TECHNICAL SPECIFICATIONS

<b>Quiescent current, detector head fitted</b>	<3µA
<b>Load presented to zone, head removed</b>	47Ω for 10ms every 4 seconds
<b>Dimensions</b>	100mm diameter
<b>Weight</b>	55g

*Warning: do not use Series 65 detectors on AlarmSense systems. Although they might appear to work initially, their use could cause severe system malfunction. If used with the sounder or sounder beacon base the non-priority function will not operate correctly.*

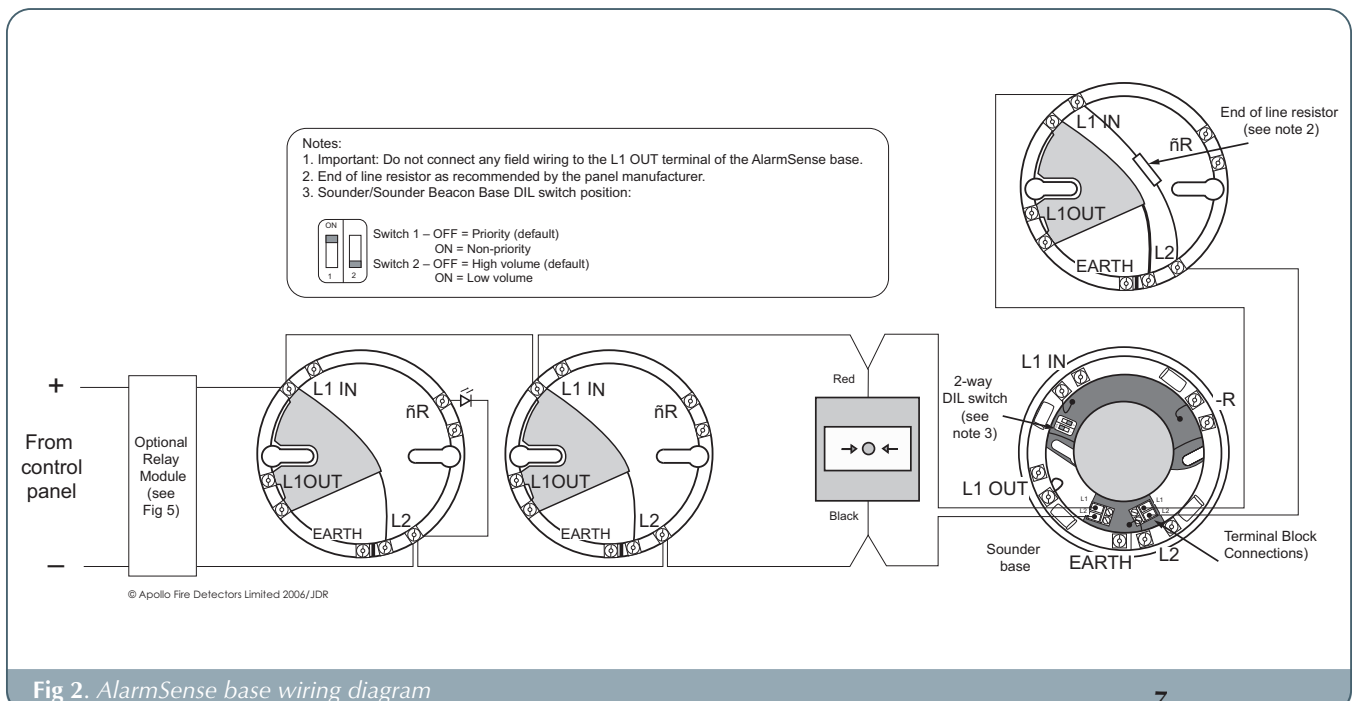


Fig 2. AlarmSense base wiring diagram



AlarmSense sounder base

Part no 45681-510



AlarmSense sounder beacon base

Part no 45681-509

## Sounder Base

### TECHNICAL SPECIFICATIONS

#### Sound output (SPL) at 24V, DIL-switch selectable

High volume setting, maximum	87dB(A)
Low volume setting, nominal	70dB(A)

**Polarity** polarity insensitive

**Operating voltage** sounders active, 18–33V  
sounders off, <15V

**Quiescent current at 12V** <20µA

**Sounder active current at 24V** 5mA

**Head removal load** 47Ω for 10ms every 4s

**EMC** CE marked to EN50130–4

**Dimensions** 115 diameter x 40 mm

**Weight** 150g

**Housing** white polycarbonate moulding  
red or white caps available

Notes:

1. For wiring diagram please see Fig 2, page 7.
2. Priority/non-priority signalling.
3. High/low volume setting.
4. Sounder base monitors for head removal. If used as a stand-alone sounder a wire link must be fitted between L1IN and L1OUT.
5. Remote LED indicators may not be used in conjunction with this sounder base.
6. Red or white caps are available for stand-alone installation.

## Sounder Beacon Base

### TECHNICAL SPECIFICATIONS

#### Sound output (SPL) at 24V, DIL-switch selectable

High volume setting, maximum	87dB(A)
Low volume setting, nominal	70dB(A)

**Polarity** polarity insensitive

**Operating voltage** sounders active, 18–33V  
sounders off, <15V

**Quiescent current at 12V** <20µA

**Sounder active current at 24V** 5mA

**Head removal load** 47Ω for 10ms every 4s

**EMC** CE marked to EN50130–4

**Dimensions** 115 diameter x 40 mm

**Weight** 150g

**Housing** white polycarbonate moulding  
red or white caps available

Notes:

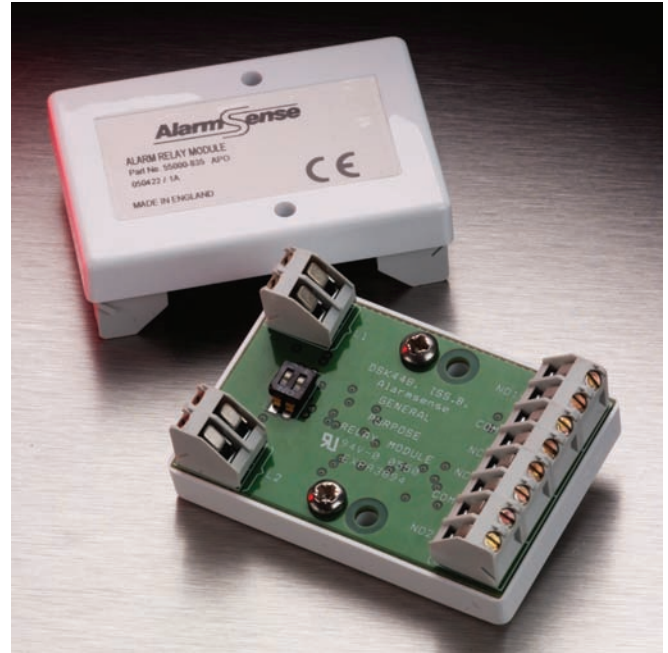
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2. Priority/non-priority signalling.
3. High/low volume setting.
4. Sounder base monitors for head removal. If used as a stand-alone sounder a wire link must be fitted between L1IN and L1OUT.
5. Remote LED indicators may not be used in conjunction with this sounder base.
6. Red or white caps are available for stand-alone installation.





AlarmSense manual call point

Part no 55000-894



AlarmSense Alarm relay (reset on silence) Part no 55000-835

## Manual Call Point

The AlarmSense Manual Call Point is different from other conventional call points in that it can be detected as an operated call point rather than a detector that has changed to the alarm state.

### TECHNICAL SPECIFICATIONS

<b>Operating voltage range</b>	9–33V
<b>Polarity</b>	polarity insensitive
<b>Quiescent current at 15V</b>	<50µA
<b>Alarm current at</b>	
2–8.5V	<1.5mA
10.5–15V	25 ± 2mA
18–24V	<1.5mA
33V	<2mA
<b>Maximum reset voltage</b>	2V
<b>Reset time</b>	1s
<b>LED indicator</b>	red
<b>Maximum supply interruption</b>	40ms
<b>EMC</b>	CE marked to EN50130-4
<b>Dimensions</b>	87x87x52mm
<b>Material</b>	KAC Class 6000 in RED Cycology C2800 polycarbonate/ ABS moulding
<b>Weight</b>	170g

## Alarm Relay (reset on silence)

The Alarm Relay operates in three configurations:

- relay activation places AlarmSense zone voltage on the output contact terminals.
- relay activation reverses the polarity of the AlarmSense zone voltage on the output contact terminals. This mode is designed to allow the use of monitored conventional sounders fitted with series diodes.
- two sets of volt-free contacts for use by door closure units, etc.

### TECHNICAL SPECIFICATIONS

<b>Operating voltage</b>	9–33V
<b>Polarity</b>	polarity insensitive
<b>Relay operation voltage</b>	>18V
<b>Relay reset voltage</b>	>15V
<b>Quiescent current at 12V</b>	<20µA
<b>Surge current at relay set voltage</b>	15mA for 20ms
<b>Relay set current at 24V</b>	<120µA
<b>Relay contact ratings</b>	1A at 30V DC
<b>Dimensions</b>	65x45x25mm
<b>Weight</b>	35g

Notes:

1. Power loss on the AlarmSense circuit will cause the relay to reset. In the event of the relay being activated during transit, the status of the relay is unknown. This then places the onus on the commissioning engineer to check and, if necessary, reset the relay by increasing the zone voltage to 24V for >2s and then reducing the zone voltage back to 12V.
2. DIL switch selectable relays reset delay:  
OFF = no delay ON = 2s delay.
3. The Alarm Relay will, by switching a DIL switch, recognise non-priority signals from the control panel. It could, therefore, be used to activate a staff alarm or a stand-alone alarm indicator.

## Control Panel Requirements

AlarmSense detectors and other devices depend for their operation on the ability of the control and indicating equipment to switch between several different operating voltages. Control and indicating equipment must, therefore, be designed for the specific purpose of powering and controlling AlarmSense detectors, manual call points, sounders and other devices and must meet the requirements listed below. Standard control panels will not be able to power and control AlarmSense equipment.

1. In the quiescent state the 12V supply should have an output impedance of 220 ohms or be current-limited to 20mA.
2. The period for which the zone supply is switched from 24v to 12V to check for operation of a detector while sounders are operating should not exceed 15ms.
3. Reset time must be at least 1s.
5. Output impedance at 24V should be suitable for the alarm load.
6. The switching time from 12V to 24V must not exceed 5ms.



**AlarmSense**



