SERIES 65 ENGINEERING PRODUCT GUIDE

# series 65

9-33V

## Wide Voltage Conventional Detectors

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Series 65 incorporates well-proven sensing technologies, including an Integrated Circuit based on that used in XP95 analogue addressable detectors.

The Series 65 range has a wide operating voltage of 9–33V and consists of ionisation, integrating ionisation and optical smoke detectors, four grades of heat detector and a range of bases.

This product guide aims to provide engineers with comprehensive information on Series 65, in order to be able to design optimum solutions to fire protection problems.

Apollo Fire Detectors is a Halma company and operates from one site at Havant, near Portsmouth, England. All departments – Research and Development, Sales and Marketing, Manufacturing and Finance – are located here. Apollo applies the most modern production techniques and has invested in sophisticated manufacturing equipment to ensure consistent high quality of product and fast response to customer requirements. Through planned expansion Apollo has reached a leading position in the market for professional fire detectors and exports over half of its production to countries around the world.

Apollo Fire Detectors is certified to ISO9001:2000 by the Loss Prevention Certification Board.

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Information in this guide is given in good faith, but Apollo Fire Detectors Limited cannot be held responsible for any omissions or errors. The company reserves the right to change specifications of products at any time without prior notice.

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## OPERATING PRINCIPLES

The detector has a moulded self-extinguishing white polycarbonate case with wind resistant smoke inlets. Nickel plated stainless steel wiper contacts connect the detector to the base.

Inside the detector case a printed circuit board has the ionisation chamber mounted on one side and the signal processing electronics on the other.

The ionisation chamber consists of a reference chamber contained inside a smoke chamber (Fig. 1). The outer smoke chamber has inlet apertures fitted with insect resistant mesh. The radioactive source holder and smoke chamber form positive and negative electrodes respectively.

An Americium 241 radioactive source mounted within the reference chamber irradiates the air in both chambers, producing positive and negative ions. A voltage across the electrodes produces an electric field.

Ions are attracted to the electrode of the opposite sign to their own charge. Many recombine but a small electric current flows between the electrodes. At the junction between reference and smoke chambers the sensing electrode converts variations in chamber current into voltage changes.

When smoke particles enter the ionisation chamber ions become attached to them with the result that the current flowing through the chambers decreases. This effect is greater in the smoke chamber than in the reference chamber, and the imbalance causes the sensing electrode to become more positive.

The voltage at the sensing electrode is fed to a comparator where it is compared with a factory-set clean air reference voltage. If the monitored voltage exceeds the reference voltage, the comparator switches the alarm latch on, increasing the current drawn from the supply from about 40µA to a maximum of 75mA. This fall in the impedance of the detector is recognised by the control panel as an alarm signal.

The alarm latch current also illuminates the detector integral LED. A remote indicator connected between the L1 IN terminal and the –R terminal will have a voltage equal to the supply voltage less 1 volt across it and so will illuminate. See page 17 for details of the remote indicator.

To ensure correct operation of the detector the control panel must be arranged to supply a maximum of 33 volts DC and a minimum of 9 volts DC in normal operation.

The supply may fall to 6 volts DC in alarm conditions if a supply current of at least 10mA is available at this voltage. To ensure effective illumination of the integral LED and any remote indicator, the supply to the detector should exceed 12 volts.

To restore the detector to quiescent condition, it is necessary to expel any smoke and interrupt the electrical supply to the detector for a minimum of one second.

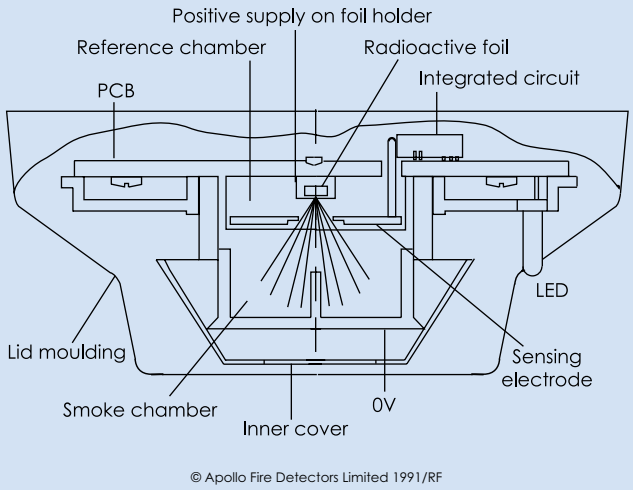


**Fig.1** Side view, Series 65 Ionisation Smoke Detector

## INTEGRATING VERSION

Circuitry in the Integrating Ionisation Smoke Detector protects against transient levels of smoke above the normal threshold level for 10 to 20 seconds. The sensitivity of the detector is not affected by this modification.

## OPTIONS

(Apply to standard and integrating versions)

1. Flashing LED: The alarm indicating LED flashes when the detector is in a quiescent state.
2. Magnetic test switch and Flashing LED: A magnetic test switch in the circuit of the detector can be magnetically activated from outside the case to initiate an alarm condition for test and commissioning purposes. A flashing LED, as outlined above, is also included.

## SAFETY NOTE

In the United Kingdom, ionisation smoke detectors are subject to the requirements of the Radioactive Substances Act 1993 and to the Ionising Radiations Regulations 1999 made under the provisions of the Health and Safety at Work Act 1974.

The detectors, independently tested by the National Radiological Protection Board (NRPB), conform to all the requirements specified in the 'Recommendations for ionisation smoke detectors in implemetation of radiation standards' published by the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD) 1977.

There is no limit to the number of ionisation smoke detectors which may be installed in any fire protection system within the United Kingdom. See Certificate of Approval no. TA1 issued by the Health & Safety Executive for further details.

Storage regulations depend on local standards and legislation, but, in the UK, the number of ionisation smoke detectors in any building or premises shall be less than 500. See Certificate of Approval no. TA3 of 1999 issued by the Health & Safety Executive for further details.

At the end of their recommended working life of ten years, ionisation smoke detectors should be returned to Apollo for safe disposal or disposed of in an otherwise locally approved and environmentally safe manner. Please see "A guide to the care, maintenance and servicing of Apollo products", PP2055.

Guidance on storage and handling can be given by Apollo Fire Detectors and full details can be requested from:

Radioactive Substances
Regulation Function
Environment Agency
Rio House
Waterside Drive
Aztec West, Almondsbury
Bristol BS32 4UD

Outside the UK, please contact the relevant national agency.

## ENVIRONMENTAL CHARACTERISTICS

Series 65 ionisation smoke detectors operate over a temperature range of –20°C to +60°C.

Ionisation detectors have some sensitivity to air movement (wind). The extent to which the sensor output will change depends on the wind speed and on the orientation of the detector relative to the wind direction. Relatively small changes in wind direction can cause significant changes in sensor output.

For wind speeds up to 1m/s (200ft/min) sensitivity will change by less than 20%. Continuous operation in wind speeds greater than 2m/s (400ft/min) is not recommended. However, wind speeds up to 10m/s (2000ft/min) can be tolerated for short periods and will not under any conditions increase the probability of false alarms.

Series 65 ionisation smoke detectors are supplied in individual packing with a red lid serving as a dust cover which can be left in place after fitting to prevent ingress of foreign material until commissioning of the system takes place. At this point the covers must be removed.



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## TECHNICAL DATA

**Specifications are typical and given at 23°C and 50% relative humidity unless specified otherwise.**

**Detector Type:**
Point type smoke detector for fire detection and alarm systems for buildings

**Detection Principle:**
Ionisation chamber

**Chamber Configuration:**
Twin compensating chambers using one single-sided ionising radiation source

**Radioactive Isotope:**
Americium 241

**Activity:**
33.3 k Bq, 0.9 µCi

**Supply Wiring:**
Two wire monitored supply, polarity insensitive

**Terminal Functions:**
L1 IN and L2: supply in connections (polarity insensitive)
L1 OUT and L2:
supply out connections (polarity insensitive).
–R:
remote indicator negative connection

**Supply Voltage:**
9 to 33V DC

**Ripple Voltage:**
2V peak to peak maximum at 0.1Hz to 100kHz

**Quiescent Current:**
20–45µA at 24V

**Switch-on Surge Current:**
110µA

**Alarm Voltage:**
6 to 33V

**Normal Alarm Current:**
61mA at 28V
52mA at 24V
18mA at 10V

**Alarm Indicator:**
Red, Light Emitting Diode (LED)

**Design Alarm Load:**
420Ω in series with a 2V drop

**Holding Voltage:**
6V (min)

**Holding Current:**
10mA (min)

**Minimum Voltage Required to Illuminate Indicator:**
12V

**Alarm Reset Voltage:**
1V

**Alarm Reset Time:**
1 second

**Remote Output Characteristics:**
Remote is a current sink to the negative line limited to 17mA

**Calibration:**
Factory set to ΔV of 0.8V

**Sensitivity:**
Nominal threshold Y value of 0.7 to EN 54–7: 2000

**Temperature Range:**

| | |
|---|---|
| Maximum continuous operating temperature | 60°C |
| Minimum continuous operating temperature | 0°C |
| Minimum operating temperature (no condensation or icing) | –20°C |
| Storage | –30°C to +80°C |

**Temperature Compensation:**
Automatic compensation by dual chambers to comply with EN 54–7: 2000 across the operating temperature range

**Humidity:**
0% to 95% relative humidity (no condensation)

**Atmospheric Pressure:**
Automatic compensation by dual chambers to maintain sensitivity up to a height of 2000m

**Wind Speed:**
10m/s maximum

**IP Rating:**
23D in accordance with BS EN 60529

**EMC, approvals and regulatory compliance:**
Refer to Page 18 of this document

**Dimensions:** (dia. x height)

| | |
|---|---|
| Detector: | 100x42mm |
| Detector in Base: | 100x50mm |

**Weights:**

| | |
|---|---|
| Detector: | 102g |
| Detector in Base: | 153g |

**Materials:**
Detector housing: White polycarbonate rated V-0 in accordance with UL 94.
Terminals: Nickel plated stainless steel

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| Optical Smoke Detector | ▲ Part nos |
|---|---|
| Standard detector | 55000-317 |
| Detector with flashing LED | 55000-316 |
| Detector with magnetic test switch & flashing LED | 55000-315 |

## OPERATING PRINCIPLES

The Series 65 Optical Smoke Detector has a moulded self-extinguishing white polycarbonate case with wind resistant smoke inlets. Nickel plated stainless steel wiper contacts connect the detector to the base. Inside the case a printed circuit board has the optical system mounted on one side and the signal processing electronics on the other. The sensing chamber is a black moulding configured as a labyrinth which prevents penetration of ambient light. The labyrinth has a fine gauze insect-resistant cover. The chamber houses an infrared light emitting diode (LED) and a photo-diode which has an integral visible-light filter as extra protection against ambient light.

Every three seconds the LED emits a burst of collimated light, modulated at 4kHz. In clear air, light from the LED does not fall directly on the diode because the LED is positioned at an obtuse angle to the diode (as shown in Fig 2).

When smoke enters the chamber, a fraction of the collimated light is scattered onto the photo-diode. If the resulting signal from the photo-diode is above a preset threshold, the LED emits two more bursts of light, this time at two-second intervals. If light is scattered onto the photo-diode by both these pulses – due to the presence of smoke – the detector signals an alarm state by switching the alarm latch on, increasing the current drawn from the supply from about 40µA to a maximum of 75mA. This fall in the impedance of the detector is recognised by the control panel as an alarm signal.

The alarm current also illuminates the detector integral LED. A remote indicator connected between the L1 IN terminal and the –R terminal will have a voltage equal to the supply voltage less 1 volt across it and so will illuminate.

To ensure correct operation of the detector the control panel must be arranged to supply a maximum of 33 volts DC and a minimum of 9 volts DC in normal operation. The supply may fall to 6 volts DC in alarm conditions if a supply current of at least 10mA is available at this voltage. To ensure effective illumination of the integral LED and any remote indicator, the supply to the detector should exceed 12 volts.

To restore the detector to quiescent condition, it is necessary to expel any smoke and interrupt the electrical supply to the detector for a minimum of one second.

## OPTIONS

1. Flashing LED: The integral LED flashes when the detector is in a quiescent state.
2. Magnetic test switch and Flashing LED: A magnetic test switch in the circuit of the detector can be magnetically activated from outside the case to initiate an alarm condition for test and commissioning purposes. A flashing LED, as outlined above, is also included.



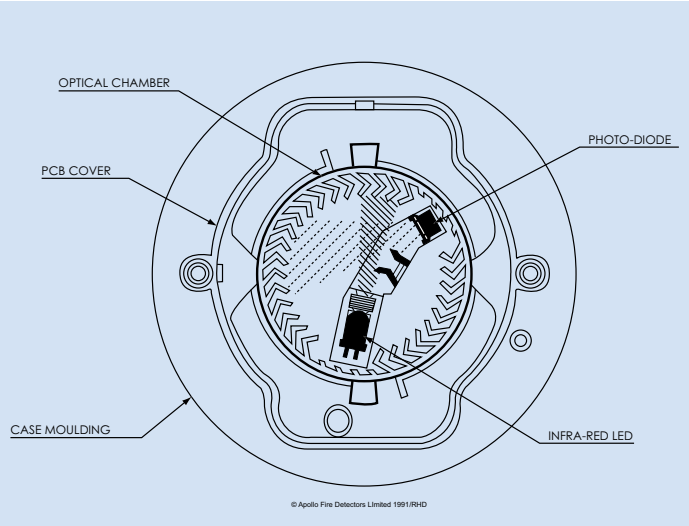


**Fig.2** Top section, Series 65 Optical Smoke Detector

# TECHNICAL DATA

**Specifications are typical and given at 23°C and 50% relative humidity unless specified otherwise.**

**Detector Type:**
Point type smoke detector for fire detection and alarm systems for buildings

**Detection Principle:**
Photo-electric detection of light scattered in a forward direction by smoke particles

**Chamber Configuration:**
Horizontal optical bench housing an infra-red emitter and sensor arranged radially to detect forward scattered light

**Sensor:**
Silicon PIN photo-diode

**Emitter:**
GaAs Infra-red light emitting diode

**Sampling Frequency:**
Once every 3 seconds

**Confirmation Frequency:**
Once every 2 seconds

**Number of Consecutive Sensed Alarm Signals Needed To Trigger Detector Alarm:**
3

**Supply Wiring:**
Two wire monitored supply, polarity insensitive

**Terminal Functions:**
L1 IN and L2: supply in connections (polarity insensitive).
L1 OUT and L2:
supply out connections (polarity insensitive).
–R:
remote indicator negative connection

**Supply Voltage:**
9 to 33V DC

**Ripple Voltage:**
2V peak to peak maximum at 0.1Hz to 100kHz

**Quiescent Current:**
30–50µA at 24V

**Switch-on Surge Current:**
115µA at 24V

**Alarm Voltage:**
6 to 28V

**Normal Alarm Current:**
61mA at 28V
52mA at 24V
18mA at 10V

**Alarm Indicator:**
Clear light emitting diode (LED) emitting red light

**Design Alarm Load:**
420Ω in series with 2V drop

**Holding Voltage:**
6V (min)

**Holding Current:**
10mA (min)

**Minimum Voltage Required to Illuminate Indicator:**
12V

**Alarm Reset Voltage:**
1V

**Alarm Reset Time:**
1 second

**Remote Output Characteristics:**
Remote is a current sink to the negative line limited to 17mA

**Sensitivity:**
Nominal alarm threshold of 0.15dB/m obscuration, measured in accordance with EN 54–7: 2000

**Temperature Range:**
–20° to +60°C
(no condensation or icing).

**Humidity:**
0% to 95% relative humidity (no condensation)

**Wind Speed:**
Insensitive to wind

**Atmospheric Pressure:**
Insensitive to atmospheric pressure

**IP Rating:**
23D in accordance with BS EN 60529

**EMC, approvals and regulatory compliance:**
Refer to Page 18 of this document

**Dimensions:** (dia. x height)

| | |
|---|---|
| Detector: | 100x42mm |
| Detector in Base: | 100x50mm |

**Weights:**

| | |
|---|---|
| Detector: | 99g |
| Detector in Base: | 150g |

**Materials:**
Detector housing: White polycarbonate rated V-0 in accordance with UL 94.
Terminals: Nickel plated stainless steel

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technical data


| Series 65 Heat Class A1R | ▲ Part nos |
|---|---|
| Standard detector | 55000-122 |
| Detector with flashing LED | 55000-121 |
| Detector with magnetic test switch & flashing LED | 55000-120 |
| **Series 65 Heat Class BR** | |
| Standard detector | 55000-127 |
| Detector with flashing LED | 55000-126 |
| Detector with magnetic test switch & flashing LED | 55000-125 |
| **Series 65 Heat Class CR** | |
| Standard detector | 55000-132 |
| Detector with flashing LED | 55000-131 |
| Detector with magnetic test switch & flashing LED | 55000-130 |
| **Series 65 Heat Class CS** | |
| Standard detector | 55000-137 |
| Detector with flashing LED | 55000-136 |
| Detector with magnetic test switch & flashing LED | 55000-135 |

## OPERATING PRINCIPLES

The detector has a moulded self-extinguishing white polycarbonate case. Nickel plated stainless steel wiper contacts connect the detector to the base. Inside the case a printed circuit board holds the signal processing electronics.

A pair of matched negative temperature co-efficient thermistors are mounted on the PCB in such a way that one thermistor is exposed to give good thermal contact with the surrounding air while the other thermistor is thermally insulated.

Under stable conditions both thermistors are in thermal equilibrium and have the same value of resistance. If air temperature increases rapidly the resistance of the exposed thermistor becomes less than that of the insulated thermistor. The ratio of the resistance of the thermistors is monitored electronically and an alarm is initiated if the ratio exceeds a factory preset level. This feature determines the 'rate of rise' response of the detector.

If air temperature increases slowly, no significant resistance difference develops between the thermistors, but at high temperatures a fixed value resistance connected in series with the insulated thermistor becomes significant.

When the sum of the resistance of the insulated thermistor and the fixed resistor compared to the resistance of the exposed thermistor reaches a preset value, an alarm is initiated. The value of the fixed resistor is selected to set the detector into alarm state at a specified fixed temperature.

The detector signals an alarm state by switching an alarm latch on, increasing the current drawn from the supply from about 50µA to a maximum of about 75mA. This fall in the impedance of the detector is recognised by the control panel as an alarm signal.

The alarm current also illuminates the detector integral LED. A remote indicator connected between the L1 IN terminal and the –R terminal will have a voltage equal to the supply voltage less 1 volt across it and so will illuminate.

To ensure correct operation of the detector the control panel must be arranged to supply a maximum of 33 volts DC and a minimum of 9 volts DC in normal operation. The supply may fall to 6 volts DC in alarm conditions if a supply current of at least 10mA is available at this voltage. To ensure effective illumination of the integral LED and any remote indicator, the supply to the detector should exceed 12 volts.

To restore the detector to quiescent condition, it is necessary to restore a normal temperature level and interrupt the electrical supply to the detector for a minimum of one second.

## OPTIONS

1. Flashing LED: The integral LED flashes when the detector is in a quiescent state.
2. Magnetic test switch and Flashing LED: A magnetic test switch in the circuit of the detector can be magnetically activated from outside the case to initiate an alarm condition for test and commissioning purposes. A flashing LED, as outlined above, is also included.

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## RESPONSE TIME

European Standard EN54–5:2000 classifies heat detectors according to the alarm temperature and ambient operating temperature.

Each heat detector classification has a static response (changing to alarm at a preset temperature) and may also have a rate of rise response (changing to alarm at or above a preset increase of temperature). The heat detector classes available in Series 65 are A1R, BR, CR, CS.

The suffix R indicates that the detector has been tested and approved as a 'rate-of-rise' detector. The suffix 'S' indicates that the detector has been tested and approved as a 'static' detector.

| Supply Voltage (V) | A1R Standard | | A1R Flashing LED | | A1R Flashing LED/ Magnetic test switch | |
|---|---|---|---|---|---|---|
| | Quiescent | Alarm | Quiescent | Alarm | Quiescent | Alarm |
| 24 | 45µA | 52mA | 55µA | 52mA | 55µA | 52mA |
| 9 | 40µA | 17mA | 50µA | 17mA | 50µA | 17mA |

**Table 1** Typical current against voltage characteristics for quiescent and alarm states

| Class | Max application temperature °C | Max static response temperature °C | Part number | | |
|---|---|---|---|---|---|
| | | | Standard | Flashing LED | Flashing LED/ Magnetic test switch |
| A1R | 50 | 65 | **55000-122** | **55000-121** | **55000-120** |
| BR | 65 | 85 | **55000-127** | **55000-126** | **55000-125** |
| CR | 80 | 100 | **55000-132** | **55000-131** | **55000-130** |
| CS | 80 | 100 | **55000-137** | **55000-136** | **55000-135** |

**Table 2** Series 65 Heat Detector temperatures and part numbers

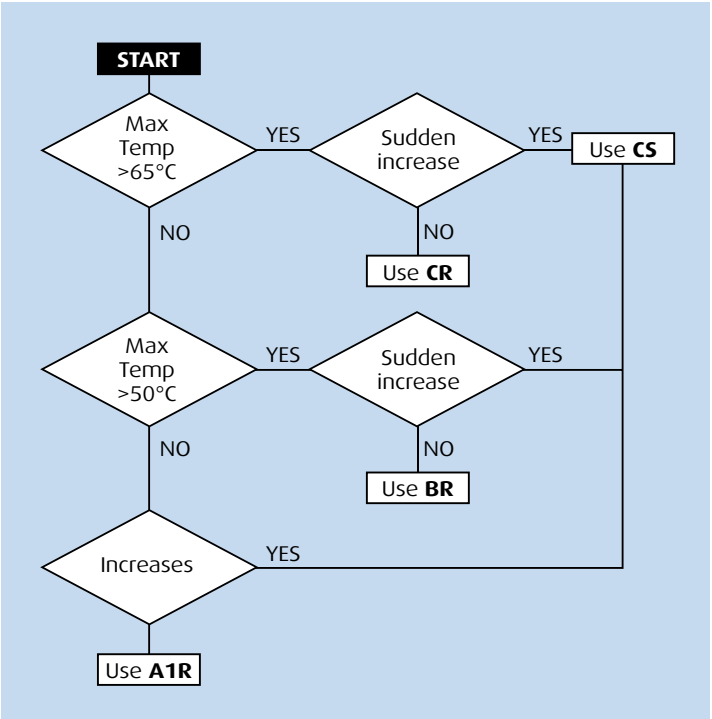


**Fig. 3** Choosing a heat detector

## TECHNICAL DATA

**Specifications are typical and given at 23°C and 50% relative humidity unless otherwise specified.**

**Detector Type:**
Point type heat detector for fire detection and alarm systems for buildings

**Supply Wiring:**
Two wire monitored supply, polarity insensitive

**Terminal Functions:**
L1 IN and L2:
supply in connections (polarity insensitive).
L1 OUT and L2:
supply out connections (polarity insensitive)
–R:
remote indicator negative connection

**Supply Voltage:**
9 to 33V

**Ripple Voltage:**
2V peak to peak maximum at 0.1 Hz to 100 kHz

**Quiescent Current:**
See table 1

**Switch-on Surge Current:**
As per Quiescent Current

**Alarm Voltage:**
6 to 28V

**Alarm Current:**
See table 1

**Alarm Indicator:**
Red light emitting diode

**Design Alarm Load:**
420Ω in series with a 2V drop

**Holding Voltage:**
6V

**Holding Current:**
10mA

**Minimum Voltage Required to Light Alarm Indicator:**
12V

**Remote Output Characteristics:**
Remote is a current sink to the negative line limited to 17mA

**Storage Temperature Range:**
–30°C to 120°C.
Operating Temperature:
–20°C to +90°C (no icing)

**Humidity:**
0% to 95% relative humidity

**Atmospheric Pressure:**
Unaffected

**IP Rating:**
23D in accordance with BS EN 60529

**EMC, approvals and regulatory compliance:**
Refer to Page 18 of this document

**Dimensions:** (dia. x height)

| | |
|---|---|
| Detector: | 100x42mm |
| Detector in Base: | 100x50mm |

**Weights:**

| | |
|---|---|
| Detector: | 80g |
| Detector in Base: | 131g |

**Materials:**
Detector housing: White polycarbonate rated V-0 in accordance with UL 94.
Terminals: Nickel plated stainless steel

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| Series 65 Mounting Base | ▲ Part no |
|---|---|
| Mounting base | 45681-200 |
| Mounting base with diode base | 45681-201 |

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## SERIES 65 MOUNTING BASE

All detectors in the Series 65 range fit into Series 60 standard mounting bases. The bases are of 100mm diameter and have five terminals marked according to their function: Line 1 in, line 1 out, line 2 in and out, remote indicator negative, earth. Detectors are polarity insensitive, so that identification of positive and negative lines is only required if a remote LED is fitted.
An earth connection is not required for either safety or correct operation of detectors. The earth terminal is provided for tidy termination of earthed conductors or cable screens and to maintain earth continuity where necessary. Bases have a wide interior diameter for ease of access to cables and terminals and there are two slots for fixing screws at a spacing of 51 to 69mm. Detectors fit into bases one way only and require clockwise rotation without push force to be plugged in. They can be locked into the base by a grub screw using a 1.5mm hexagonal driver, part no 29600-095.

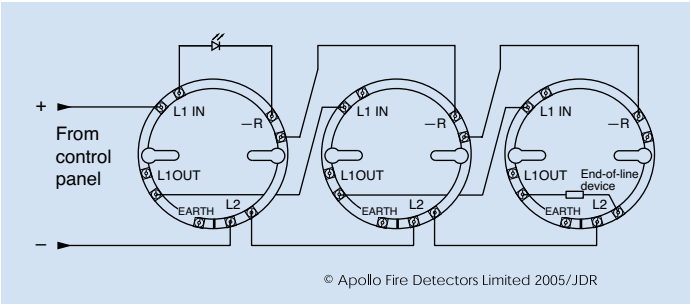



**Fig.4** Schematic wiring diagram of Series 65 monitored detector circuit with a common remote indicator.

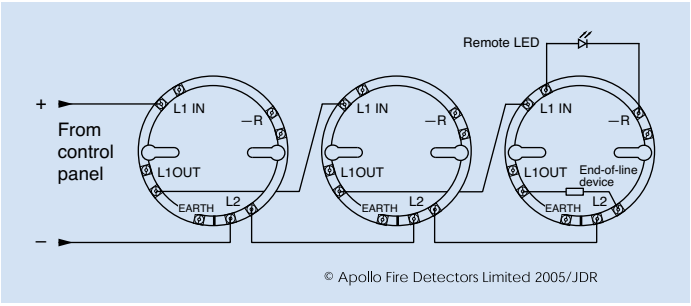



**Fig.5** Schematic wiring diagram of Series 65 monitored detector circuit


| Series 65 Relay Bases | ▲ Part nos |
|---|---|
| Standard Relay Base | **45681-245** |
| Auxiliary Relay Base | **45681-246** |
| EOL (end of line) Relay Base 9-18V DC | **45681-247** |
| EOL (end of line) Relay Base 16-33V DC | **45681-248** |
| 12V Relay Base | **45681-508** |

## SERIES 65 RELAY BASES

Series 65 Relay Bases are primarily intended for use with control units using 4-wire detector supply and alarm initiating circuits. Where local codes allow, they may also be used in 2 and 4-wire circuits to provide volt-free control signals to an auxiliary system such as an automatic door closer. They are not suitable for use in systems where it is specified or required that operation of the auxiliary system shall be fail-safe and must not be used with any other type of detector.

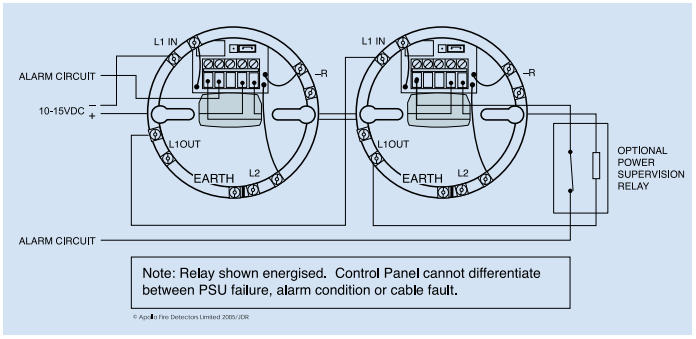



**Fig.6** Wiring diagram of 12V Relay Base

The **Standard Series 65 Relay Base, 45681-245**, provides one set of volt-free, changeover (form C) contacts that change state when the detector signals an alarm.

**Auxiliary Relay Base, 45681-246**, provides two sets of volt-free changeover contacts to facilitate the switching of a remote LED or other auxiliary device.

**EOL (end-of-line) Relay Bases** are intended for use with 4-wire circuits and feature two sets of changeover contacts and a power supervision relay.

Part numbers: **45681-247**, for circuits having a supply voltage between 9 and 18 volts DC and **45681-248** for circuits having a supply voltage between 16 and 33 volts DC.

**The 12 Volt Relay Base, 45681-508**, is a low–profile base for use with Series 65 products. It incorporates one volt–free changeover contact. It is designed to be used for both latching and non-latching applications – such as security control panels. The base is operated by the detector and must therefore be fitted with a Series 65 smoke or heat detector to function. The base is designed to operate over a voltage range of 9V to 15V dc. The negative line is connected to the L1 IN and L1 OUT on the moulding terminals. The positive line is connected to IN+ and OUT+ on the terminal block.

Note: Do not connect any external wire to the –R terminal as this may prevent the relay base from functioning correctly.

Series 65 Sav-Wire Base

▲ Part no
45681-206



## SERIES 65 SAV-WIRE BASE

The Series 65 Sav-Wire Base, 45681-206, is designed to allow Series 65 detectors to be used in 'Sav-Wire' detection and alarm systems and can only be used in conjunction with a Sav-Wire compatible control panel. The base incorporates a circuit which detects the removal of a detector head. If a detector is removed from the base, the control panel will give a fault signal.

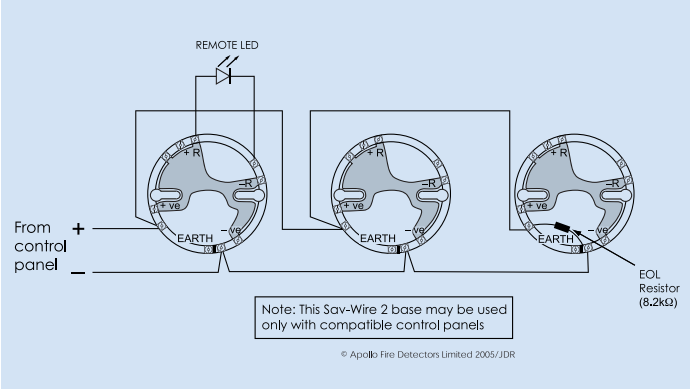



**Fig.7** Wiring diagram of Sav-Wire Base

| Series 65 Sounder Base | ▲ Part no |
|---|---|
| Sounder Base | 45681-512 |
| Sounder Base with Diode | 45681-513 |



## SERIES 65 SOUNDER BASE

The Series 65 Sounder Base is a high-efficiency conventional alarm sounder incorporating a base for the Apollo Series 65 and Series 60 range of detectors. The product offers 32 tones which are shown in the table on page 16.

The sounder base can be secured to a conduit box, a sounder ceiling plate (part number: 45681-311) or surface mounted. Sounder Bases should be located to ensure correct operation of the detector in accordance with the detector manufacturer's recommendations and local regulations or codes of practice.

Note: The sounder is classified as a Type A device according to EN54-3, ie, is suitable for indoor use only.

The sounder base is designed so that separate detector and sounder circuits can be connected. The sounder circuit is connected using the PCB mounted 4-way terminal block. The detector circuit is connected using the terminals marked L1IN, L1OUT and L2 around the rim of the base in the same way as a standard detector base. Two separate earth terminals are provided to allow the screen termination of earth conductors to maintain continuity between cables that contain an earth conductor. As this product is designed for use on conventional systems with separate detector and sounder circuits, the earths should not be connected together.

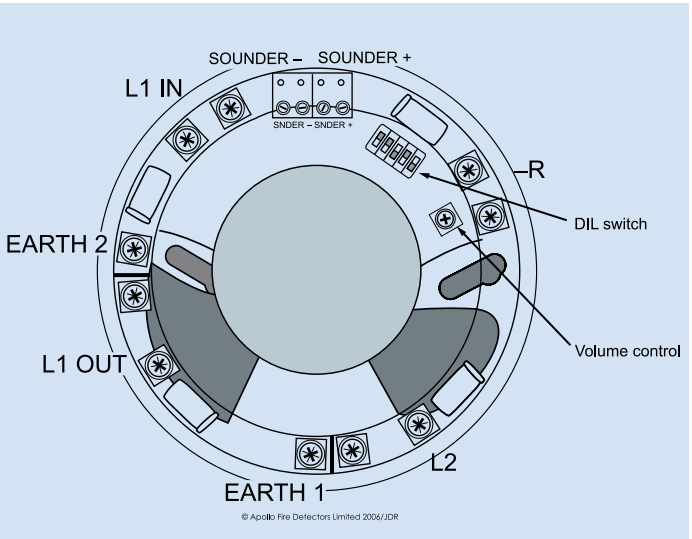



**Fig.8** Wiring diagram of Series 65 Sounder Base

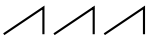
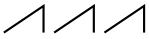
| Tone | Tone Type | Tone description/application | DIL Switch 1_2_3_4_5 | Sound level (dB(A) @ 1m) | Average Current (mA) |
|---|---|---|---|---|---|
| 1 |  | 970Hz (BS5839-1:2002) | 0-0-0-0-0 | 91 | 5 |
| 2 |  | 800/970Hz @ 2Hz (BS5839-1:2002) | 0-0-0-0-1 | 91 | 5.2 |
| 3 |  | 800-970Hz @ 1Hz (BS5839-1:2002) | 0-0-0-1-0 | 95 | 5 |
| 4 |  | 970Hz 1s OFF/1s ON<br>(Apollo Fire Detectors Alert Tone, BS5839-1:2002) | 0-0-0-1-1 | 91 | 3 |
| 5 |  | 970Hz, 0.5s/630Hz, 0.5s<br>(Apollo Fire Detectors Evacuate Tone, BS5839-1:2002) | 0-0-1-0-0 | 91 | 4.2 |
| 6 |  | 554Hz, 0.1s/440Hz, 0.04s<br>(France - AFNOR NF S 32 001) | 0-0-1-0-1 | 91 | 7 |
| 7 |  | 500-1200Hz, 3.5s/0.5s OFF<br>(Netherlands - NEN 2575:2000) | 0-0-1-1-0 | 93 | 4.2 |
| 8 |  | 420Hz 0.625s ON/0.625s OFF<br>(Australia AS2220 Alert Tone) | 0-0-1-1-1 | 84 | 2.7 |
| 9 |  | 500-1200Hz, 3.75s/0.25s OFF<br>(Australia AS2220 Evacuation Tone) | 0-1-0-0-0 | 90 | 2 |
| 10 |  | 550Hz/44Hz @ 0.5Hz | 0-1-0-0-1 | 91 | 5.1 |
| 11 |  | 970Hz, 0.5s ON/0.5s OFF x 3/1.5s OFF<br>(ISO 8201 Low tone) | 0-1-0-1-0 | 91 | 2.6 |
| 12 |  | 2850Hz, 0.5s ON/0.5s OFF x 3/1.5s OFF<br>(ISO 8201 High tone) | 0-1-0-1-1 | 91 | 2.2 |
| 13 |  | 1200-500Hz @ 1Hz<br>(DIN 33 404) | 0-1-1-0-0 | 93 | 3.5 |
| 14 |  | 400Hz | 0-1-1-0-1 | 85 | 4.2 |
| 15 |  | 550Hz, 0.7s/1000Hz, 0.33s ('SafeSound') | 0-1-1-1-0 | 90 | 5.5 |
| 16 |  | 1500-2700Hz @ 3Hz (Vandal Alarm) | 0-1-1-1-1 | 88 | 3.4 |
| 17 |  | 750Hz | 1-0-0-0-0 | 86 | 4.8 |
| 18 |  | 2400Hz | 1-0-0-0-1 | 86 | 4.8 |
| 19 |  | 750Hz 0.33s ON/0.51s OFF | 1-0-0-1-0 | 86 | 3 |
| 20 |  | 750Hz 0.51s ON/0.33s OFF | 1-0-0-1-1 | 86 | 4.3 |
| 21 |  | 800Hz 0.2s ON/0.2s OFF | 1-0-1-0-0 | 86 | 2.6 |
| 22 |  | 510Hz, 0.5s/610Hz, 0.5s | 1-0-1-0-1 | 91 | 5.8 |
| 23 |  | 550Hz, 0.33s/1000Hz, 0.7s | 1-0-1-1-0 | 91 | 5.3 |
| 24 |  | 250-1200Hz @ 12Hz | 1-0-1-1-1 | 87 | 3.8 |
| 25 |  | 500-1200Hz @ 0.33Hz | 1-1-0-0-0 | 92 | 5.1 |
| 26 |  | 2500-2850Hz @ 7Hz | 1-1-0-0-1 | 94 | 4.8 |
| 27 |  | 600-900Hz/0.9s | 1-1-0-1-0 | 90 | 5.5 |
| 28 |  | 600-680Hz/0.9s | 1-1-0-1-1 | 85 | 4.5 |
| 29 |  | 670-725Hz/0.9s | 1-1-1-0-0 | 84 | 4.2 |
| 30 |  | 920-750Hz/0.9s | 1-1-1-0-1 | 93 | 6.1 |
| 31 |  | 700-900Hz, 0.3s/0.6s OFF | 1-1-1-1-0 | 90 | 4.6 |
| 32 |  | 900-760HZ, 0.6s/0.3s OFF | 1-1-1-1-1 | 91 | 4 |

**Table 3** Series 65 Sounder Base tone table

| MiniDisc Remote Indicator | ▲ Part no |
|---|---|
| | 53832-070 |

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## SPECIFICATION

The MiniDisc Remote Indicator is only 20mm high and 80mm in diameter. It comprises two parts – the base which is installed onto a wall or soffit and the lid which is fitted to the base with a bayonet lock.

An anti-tamper screw in the lid locks the unit together. A 1.5mm hexagonal driver, part number 29600-095, is available from Apollo.

Two pairs of keyholes are provided – one for 50mm and the other for 60mm fixing centres.

The MiniDisc Remote Indicator is polarity sensitive. Connect positive line to Terminal A or B and negative line to Terminal C.

## INTERCHANGEABILITY

Any detector in the Series 65 range may be replaced with any other type in the range. If, for example, a smoke detector proved unsuitable for a particular application, it could simply be replaced with a heat detector.

The bases are designed specifically for Series 65 detectors and will not accept devices from other Apollo product ranges, including earlier Apollo models but with the expection of Series 60.

## CONTROL PANEL COMPATIBILITY

Series 65 has been designed to be connected to any conventional control panel that will operate existing ranges of Apollo conventional detectors.

When engineering systems with Series 65, it should be borne in mind that the alarm impedance of a detector be considered as 420 Ohms in series with a 2 volt drop with LED open circuit.

Typical current against voltage characteristics for quiescent and alarm states for heat detectors are shown in Table 1.

## EMC

All Series 65 detectors and relay bases comply with the requirements of the following EMC standards:

Generic Emission Standard EN 61000–6–3 Emission standards for residential, commercial and light industrial environments

Generic Emission Standard EN 61000–6–4 Emission standards for industrial environments

EN 50130–4: Alarm Systems Electromagnetic compatibility – product family standard: immunity requirements for components of fire, intruder and social alarm systems

EN 61000–4–2
Electrostatic discharge

EN 61000–4–3
Radiated immunity

EN 61000–4–4
Fast transient bursts

EN 61000–4–5
Surge immunity

EN 61000–4–6
Conducted immunity

All standard detectors and the relay bases have been assessed to the additional VdS EMC requirements shown below and have demonstrated full compliance:

30V/m with 80% Am sine and 100% pulse modulation depth over the frequency ranges 415 to 467MHz and 890 to 960 MHz.

Series 65 optical detector, part no 55000-317, and heat detector, part no 55000-122, have been declared to be compliant with the standard EN 50155: Railway applications : Electronic equipment used on rolling stock.

## APPROVALS AND REGULATORY COMPLIANCE

The Series 65 range of detectors and relay bases is approved by a large number of certification bodies. These include approvals to EN54 : 2000 with LPCB, VdS, DIBT, BOSEC, and FG. For further information on approvals held by Apollo contact us on sales@apollo-fire.co.uk or phone 023 9249 2412.

Information on approvals is also held on our website www.apollo-fire.co.uk.

Series 65 complies with the requirements of a number of European New Approach Directives such as the EMC Directive 89/336/EEC and the Construction Products Directive 89/106/EEC. Visit the Apollo website to download EC certificates of conformity issued by the Notified Body, LPCB. Copies of Declarations of Conformity issued by Apollo for all applicable New Approach Directives are available from the Apollo website.

All Series 65 products will comply with the marking requirements of the WEEE Directive, 2002/96/EC. For further information on disposing of applicable electrical and electronic waste contact Apollo directly.

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