1.0. Introduction

1.1. Introduction - UCL is committed to providing the highest levels of fire safety both in student halls of residences and, in particular, where it provides staff flats, apartments or dwellings. Due to the many deaths and injuries that occur each year in UK homes because of fire, UCL recognize the potential increase in risk in such premises.

1.2. Smoke Alarm System (Dwellings) - a smoke alarm system for dwellings at UCL will meet British Standard BS5839-6:2013, which details the recommendations summarized in this document. As landlord, UCL has a ‘Duty of Care’ to protect our tenants from fire by fitting an alarm system in accordance with relevant standards and guidance:

- New premises - to meet the latest edition Approved Document B (Fire Safety): Vol. 1 (Dwellings);

- Some types of existing premises - to meet Local Authorities Coordinators of Regulatory Services (LACORS) guide to Housing Fire Safety Provisions for Certain Types of Existing Housing issued in 2008 and available through the UCL Fire Safety Manager.

1.3. UCL strives to maintain high standards of fire safety; as such, only fire alarm system designers, installers and maintenance companies that can demonstrate third-party certification to BAFE SP203 or LPC1014, and with
ISO 9001 Quality Management System third-party certification or equivalent, will be acceptable to undertake works on our estate.

1.4. TN055B provides both design specifications and guidance on the type of equipment to be installed in UCL premises that are deemed to meet our Employers’ Requirements. The following information will be of assistance to design consultants, project managers and contractors employed by UCL or its agents. It is to be regarded as a general statement of requirements and may be in addition to any British Standard recommendation or other instructions received from the local fire or Building Control authorities.

1.5. Passive Fire Protection - in all cases, building service engineers and contractors must provide appropriate passive fire protection for all works. Contingency sums are to be provided to ensure that all new works are covered appropriately and additionally any failures of passive fire protection identified during the works are to be made good and reinstated as necessary (See UCL Fire Safety Technical Note 066).

2.0. System Overview for UCL Bungalows, Flats & Apartments and 1 - 3 Storey Houses

2.1. Property Type: General for all UCL dwellings (subject to local requirements)

Level of Protection - the escape routes (hallways, landings etc.) are covered by automatic fire detection along with the high fire risk areas (kitchen & living room); bedrooms may also be covered depending on nature of property and general fire protection measure provided. Medium Protection (Category LD2) - gives good protection to the occupants.

Note - BS 5839-6:2013 states that alarms should not be fitted in toilets, bathrooms, and shower rooms.

Alarm Power / Back-Up - mains powered with Lithium back-up (Grade D). The fire alarm system is powered by a mains supply; it will automatically switch to Lithium cell back up, on mains power failure. The Lithium cells will last the life of the alarm (10 years) and are completely tamperproof.

Alarm Types (Multi-Sensing) - multi-sensor alarms have optical and heat sensor elements that give the best response to a range of fire types, from fast flaming to slow smouldering, which can be used in the most areas of the property. The Kitchen will require a heat alarm due to the nature of the environment.

- **Hallway** - multi-sensor fire alarm product reference = Ei2110
- **Landings** - multi-sensor fire alarm product reference = Ei2110;
- **Living Room** - multi-sensor fire alarm product reference = Ei2110;
- **Bedrooms** - multi-sensor fire alarm product reference = Ei2110;
- **Kitchen** - heat alarm product reference = **Ei164RC**;
- **Alarm Controller** - product reference = **Ei1529RC**;
- **Alarm cable interconnection** = hard-wired (cabling is installed between every alarm to provide the link between them. If an alarm is triggered, it will send a signal down this cabling and all other alarms will sound. Consideration should be taken on the disruption generated when installing the cabling).

2.2. **Procurement** - the following fire alarms and ancillary equipment fully meets the specification provided by UCL:

- Ei2110 Multi-Sensor Fire Alarm
- Ei164RC Heat Alarm
- Ei1529RC Alarm Controller

2.3. These products advice and more detailed specifications are available from:

- **Aico Ltd**, Mile End Business Park, Maesbury Road, Oswestry, SY10 8NN
- **Web:** [www.aico.co.uk](http://www.aico.co.uk)

3.0. **Installation**

3.1. **Installation** - the installer shall be fully trained and competent.

- **Smoke and Heat Alarms to be installed in accordance with requirements of BS 5839 Pt.6:2013 to Grade D, Category LD2**

3.2. Multi-Sensor fire alarms shall be ceiling mounted in the escape routes (hallways & landings) and rooms of the property including the living room and bedrooms if required. A heat alarm shall be ceiling mounted in the Kitchen (Note: alarms should not be fitted in toilets, bathrooms, and shower rooms).

(a). The following requirements should be adhered to:

- The alarms MUST be interconnected so if one alarm sounds, all alarms will sound;
- There must be a minimum distance of 300mm between the alarm and any walls, light pendants, or any form of obstruction, which may impede the flow of smoke & heat to the alarm;
The alarms must be sited so that no point in the protected area is more than 7.5m away from an alarm;

There must be an alarm within 3m of any bedroom door;

3.3. **Alarm Controller** - is to be sited at a convenient position and height on a wall in the property approximately at the same height as any light switches. Generally, sitethe controller in the hallway.

4.0. **Wiring of Smoke and Heat Alarms**

4.1. **Alarms** - the alarms should be wired in a minimum 1mm² PVC/PVC 6243Y (three core & earth) cable. The mains supply should be taken from a convenient regularly used, unswitched lighting circuit or a dedicated supply using a minimum 1mm² PVC/PVC 6242Y (two core & earth) cable.

4.2. **Alarm Controller** - should be wired in a minimum 1mm² PVC/PVC 6243Y (three core & earth) cable, linked to the alarms. The unit shall be easily installed via a three wire connection of Live, Neutral and Interconnect/Control (as standard Smoke/Heat Alarm wiring).

4.3. **Cabling** - cables must be recessed (e.g. in the ceiling void) and any cable entry holes must be sealed with mastic, or similar, to prevent dust and draughts affecting the performance of the alarm/s. In situations where recess wiring is not possible (e.g. concrete ceilings) suitable trunking should be provided.

4.4. **Testing & Commissioning**

(a). When installation is complete the dust cover must be removed from the alarms and the system tested for correct operation both on the mains and stand-by power supplies as detailed in the instructions supplied with the alarms. The alarms should not be tested other than by the means detailed in the instructions

(b). The test function of each alarm shall fully test the alarm’s circuitry, sensor and horn assembly from the test button. The installer should supply a duly completed and signed copy of the attached Installation Certificate for all installations, noting the variations from the requirements of Clause 23.3p of BS 5839-6:2013.
4.5. **Tenant Instructions**

(a). The UCL Fire Safety Manager will ensure the tenant is provided with user instruction leaflet supplied with the alarms and explain how the system works, how to test it, how to silence nuisance alarms and explain the need to cover the alarms when re-decoration work takes place. The dust cover for the alarms must be left with the tenant for use in these circumstances. The tenant should be notified that the batteries within the alarms cannot be removed, and that will not require replacement during the life of the alarms (10 years).

5.0. **Product Specification - Multi-Sensor Fire/Smoke Alarm**

5.1. The fire alarm shall carry the BSI Kitemark to indicate type testing to BS EN 14604: 2005. It will meet the requirements of **Grade D** as defined in BS 5839-6:2013 and shall carry the CE mark to indicate conformance to Low Voltage and Electromagnetic Compatibility Directives.

5.2. The alarm shall have multiple sensing elements - Optical (photoelectric) sensor with high sensitivity photodiode and welded insect resistant fine mesh screen, coupled with a fixed temperature thermistor type heat sensor.

5.3. This shall enhance fire-sensing performance, when compared to single sensor alarms, whilst reducing nuisance alarms.

6.0. **Product Specification - Fixed Temperature (Thermistor Type) Heat Alarm**

6.1. The Heat Alarm shall carry the BSI Kitemark to indicate type testing to BS 5446 Pt.2:2003 for a Class A1 device. It shall be CE marked to indicate conformance to BS EN 60065:1994 Low Voltage, and BS EN 50081-1:1992 and BS EN 50082-1:1992 Electromagnetic Compatibility Directives.

6.2. The alarm shall be of the fixed temperature thermistor type, temperature range 54°C to 62°C (129°F - 144°F).

7.0. **Product Specification - Alarm Controller**

7.1. The unit shall incorporate three x switches marked Locate, Test and Silence. These shall provide control features as detailed in points below.

(a). **Locate Alarm (units in alarm)** - this feature shall allow the user to identify which unit is causing the alarm when all the units in the property are sounding. Pressing the Locate button shall cause all the alarms to stop sounding except for the one that has initiated the signal.
(b). **Test** - pressing this button shall cause all alarms in the system to operate. This allows testing of the entire system without having to reach up to the alarms.

(c). **Silence** - pressing the silence switch shall allow remote silencing of false alarms.

(d). **Mains Check** - the test feature shall not operate in the absence of mains power.

### 8.0. General Features / Specifications - Smoke & Heat Units

8.1. The following features and general specifications (not exhaustive) meet UCL requirements for these types of products.

8.2. The alarm should be powered from the 230V AC Mains Power Supply with built-in tamper proof Rechargeable Vanadium Pentoxide Lithium standby cells, capable of lasting at least 10 years and powering the alarm initially for at least 6 months in the event of mains power failure. The Lithium cell manufacturer shall endorse a minimum 10-year life expectation for the rechargeable cells. The cells shall be automatically monitored and a red LED shall flash along with a single beep if the cells are low on power (this signal shall operate with or without mains power present).

8.3. The alarm shall be supplied with an `Easi-fit` built-in surface mounting plate, with integral terminal block and cable cover. The alarm shall connect to the mains and interconnect/control connections automatically as it slides on to the mounting plate. The alarm shall disconnect from the mains and interconnect/control connections as it slides off the mounting plate, without the need for a lead and connector. All mains wiring shall be covered by a cable cover so that the mains cable is not visible when the Alarm is removed from the ceiling, obviating the need for a ceiling pattress or dry lining box.

8.4. An encased horn assembly shall be fitted and give a minimum sound output of 85dB(A) at 3 metres. The diameter of the piezo disc in the sounder shall measure 35mm, and be securely held with silicone mastic to prevent creepage and premature horn failure. Additionally, soldered contacts shall be used in order to eliminate failures due to corrosion and arcing that are associated with commonly used pressure contacts.

8.5. The alarm shall have a hard-wire interconnect capability so that if one alarm sounds all interconnected alarms sound. Additionally the alarm must have an RF interconnection option when used with a compatible RF mounting base. In this case other RF products, e.g. alarms for the deaf and control switches shall be available for use as an option.

8.6. The alarm shall have a manual integral test/hush button that operates as follows:
(a). Press and hold to test circuitry, sensor, horn and activate all interconnected alarms in the system.

(b). Press and hold to check alarm memory - If unit has been into alarm state within the previous 24hrs, the alarm will emit short beeps when tested as opposed to the full alarm sound.

(c). Press and release to operate ‘Hush’ feature to silence nuisance alarms. Red LED on alarm cover will flash every 10 seconds to indicate that alarm is in ‘Hush’ mode and will automatically reset after approximately 10 minutes.

(d). The alarm shall have comprehensive indicating LEDs as follows:

   (i). Constant green LED shall show to indicate mains power is present;

   (ii). Red LED will flash every 40 seconds to indicate full auto test of circuitry and the rechargeable cells;

   (iii). Red LED shall flash rapidly when the unit is in an alarm state. The red LED shall also give two flashes every 40 seconds to indicate the unit has been in an alarm state within the previous 24hrs;

   (iv). The amber LED shall flash once every 40 seconds to indicate that the smoke sensing chamber is contaminated and requires cleaning;

   (v). The amber LED shall flash once every 40 seconds along with a single beep to indicate that there is a fault with one of the sensor elements;

8.7. The alarm shall have a unique dust compensation feature to reduce false alarms due to contamination. The unit shall automatically monitor the contamination in the smoke sensing chamber and adjust the alarm trigger threshold accordingly. In standby mode, the compensation shall be in ‘slow state’ whereas if the unit is initially powered up, the compensation shall be in ‘fast state’ - the unit shall automatically find the correct threshold within 45 seconds.

8.8. **Alarm Controller** - the unit shall have remote test alarm, silence alarm and locate this feature shall allow the user to identify which unit is causing the alarm when all the units in the property are sounding. Pressing the Locate button shall cause all the alarms to stop sounding except for the one that has initiated the signal.

   (a). The alarm controller shall be designed to allow control of smoke and heat alarms without having to reach up to the alarms.

   (b). The unit shall comply with electrical safety requirements: BS415:1990.
(c). The unit shall be wall mounted for ease of use - can be fixed with surface mount box supplied, or will fit a standard recessed box (not supplied).

(d). The unit shall be suitable for siting at any convenient point in the property. Up to four switches shall be able to be installed in a system along with a maximum of 20 Smoke, Heat or Carbon Monoxide alarms.

(e). The unit shall incorporate three x switches marked Locate, Test and Silence. These shall provide control features as detailed in points below.

   (i). **Locate Alarm (units in alarm)** -

   (ii). **Test** - pressing this button shall cause all alarms in the system to operate. This allows testing of the entire system without having to reach up to the alarms.

   (iii). **Silence** - pressing the silence switch shall allow remote silencing of false alarms.

   (iv). **Mains Check** - the test feature shall not operate in the absence of mains power.
Copy - Certificate of Design, Installation and Commissioning of a Smoke/Heat Alarm System to Grade D, E or F as defined in BS 5839: Pt.6: 2013

Certificate of design, installation and commissioning* of fire detection and fire alarm system at:

Address: ..........................................................................................................................................................................
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It is certified that the fire detection and fire alarm system at the above address complies with the recommendations of BS 5839: Pt.6: 2013 for design, installation and commissioning of a Category..........., Grade....... system, other than in respect of the following variations:*

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Brief description of areas protected (only applicable to Category LD2 systems):

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The entire system has been tested for satisfactory operation in accordance with the recommendations of 23.3p) of BS 5839: Pt.6: 2013*.

The requirements of paragraph p) section i) of Clause 23.3 have not been performed, having been substituted by following the Inspection and Testing Procedure recommendations contained within the Siting and Installation Instructions supplied by the manufacturer of the smoke/heat alarms installed.

Instructions in accordance with the recommendations of Clause 24 of BS 5839: Pt.6: 2013 have been supplied to:* 

Signed.................................................................................................................................................. Date.................................

For and on the behalf of.................................................................................................................................

*Where design, installation and commissioning are not all the responsibility of a single organisation or person, the relevant words should be deleted. The signatory of the certificate should sign only as confirmation that the work for which they have been responsible complies with the relevant recommendations of BS 5839: Pt.6: 2013. A separate certificate(s) should then be issued for other work.

This certificate may be required by an authority responsible for enforcement of fire safety legislation, such as the building control authority or housing authority. The recipient of this certificate might rely on the certificate as evidence of compliance with legislation. Liability could arise on the part of any organisation or person that issues a certificate without due care in ensuring its validity.