Simplex®

*UL Listed**

Series 600 Heat Detectors

Series 600 Heat Detectors
for Two-Wire Bases

Features

Series 600 Heat Detector details:

- Superior performance and reliability
- Attractive new design
- Designed for fast and easy installation
- Unique 'park' position for commissioning and service procedures
- Interfaces seamlessly with a wide range of panels
- Compatible with Tyco® 600 Series for easy upgrade
- Low operating current, up to 32 detectors per zone
- Optional remote alarm indicating LED
- Low profile, discrete and unobtrusive
- Designed for EMI compatibility
- UL listed to Standard 521
- Base and adaptor are UL listed to Standard 268

Available models:

- **601H-RF-UL;** rate-of-rise plus fixed temperature 135° F (57° C), spacing distance is 70 ft (21.3 m)
- **601H-F-UL;** fixed temperature 135° F, spacing distance is 60 ft (18.3 m)
- **631H-F-UL;** fixed temperature 200° F (93° C), spacing distance is 60 ft (18.3 m)

Description

Heat Detector Categories. Heat detectors fall into two main categories; those that go into alarm once a certain sensor temperature has been reached (fixed) and those that go into alarm if the rate of temperature increase is above a certain level (rate-of-rise).

The combination of rate-of-rise and fixed temperature sensing elements allows fire detection from low temperatures, where rate-of-rise sensing would give an earlier alarm than a fixed temperature, with the fixed temperature element available for fires where temperature builds up gradually.

Heat Detector Considerations. Heat detection is not as fast as smoke detection in most fires as early stages of a fire tend to burn less hot than the later stages. However, hostile environments where aerosols, dust, smoke or even extremes of temperature are normally present, preclude the use of smoke detectors as a fire indicator. In these cases a heat detector may provide an acceptable, though less sensitive alternative. Heat detection is also often used where the risk of fires or the consequences of fire are considered low, as heat detection is generally less expensive than smoke detection.

601H-F-UL Heat Detector Mounted
in 5B Base with 6A-5B-UL Adapter

Series 600 Detector Features

Rate-of-Rise. Two negative temperature coefficient thermistors, Rsens and Rref are used in a bridge configuration. One thermistor, Rsens, is exposed to the air while the other, Rref, is thermally lagged inside the detector body.

If the temperature of the air around the detector rises quickly, a temperature difference will be established between Rsens and Rref. The values of the bridge components are chosen such that, if a particular rate of change of temperature is sustained for sufficient time, the comparator will change state and the detector will signal an alarm condition. If the rate of temperature increase is very slow, then the temperatures of the sensing and reference thermistors will be more nearly equal. Under these conditions the bridge components ensure that the comparator changes state when the predetermined fixed temperature is reached.

The Rate-of-Rise detector has a rate sensitivity and fixed (static) temperature setting to suit a particular type of application.

Fixed Temperature. The Fixed Temperature detector is similar to the rate-of-rise detector except that the reference thermistor is replaced by a fixed resistor. The detector, therefore, responds more slowly to Rate-of-Rise of temperature. The bridge components are chosen instead to cause a comparator to change state when the sensing thermistor reaches a predetermined temperature irrespective of the rate of change.

* Refer to page 2 for additional listing information. This product was not ULC or CSFM listed, or approved by FM or MEA (NYC) as of document revision date. Additional listings may be applicable; contact your local Simplex product supplier for the latest status. Listings and approvals under Simplex Time Recorder Co. are the property of Tyco Safety Products Westminster.

Application Reference

Detector Locations (see table on page 4). Heat detectors are used where property protection is desired and where life safety protection is not required or is performed by other equipment. Typical heat detector applications are satisfied by the use of fixed temperature detectors.

The addition of rate-of-rise operation provides two forms of heat detection for use where temperature fluctuations are controlled and are less than 6° F/min (3.33° C/min). Where temperature may fluctuate more quickly, use fixed temperature detectors.

Fixed Temperature Guidelines

135° F (57° C) fixed temperature detectors are for normal temperatures that do not exceed 100° F (38° C).

200° F (93° C) fixed temperature detectors are for normal temperatures that exceed 100°F (38° C) but are less than 150° F (66° C).

WARNING:
In most fires, hazardous levels of smoke and toxic gas can build up before a heat detection device would initiate an alarm. In cases where Life Safety is a factor, the use of a smoke detector is highly recommended.

Product Selection

Model	Description	Compatibility
601H-RF-UL	Heat Detector Fixed 135° F + Rate-of-Rise	Compatible with 5B base; 5" (127 mm) diameter
601H-F-UL	Heat Detector Fixed 135° F	
631H-F-UL	Heat Detector Fixed 200° F	

Compatible Bases

Model	Description	Details	Listing Reference
5B	2-Wire Base with connections for Remote Alarm LED Indicator	IDC and LED connections are screw terminals for input/output wiring; 18 to 14 AWG (1 mm2 to 1.5 mm2)	UL listed under Thorn Security LTD

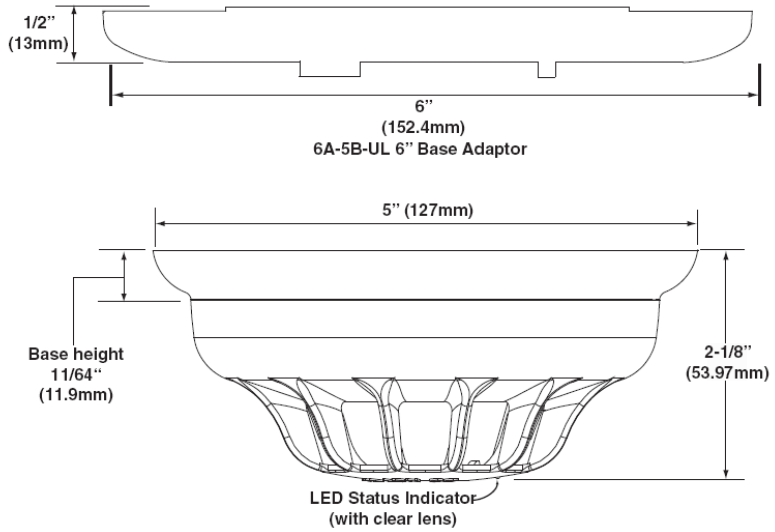
Detector Accessories

Model	Description	Details	Listing Reference
6A-5B-UL	6" (152 mm) Base Adapter	Increases the 5B surface area	UL listed under Thorn Security LTD
CW-5B	Detector Protective Cage	Robust protective cage for Series 600 detectors using the 5B base	Not listed
SA600	Line Shorting Adapter	Commissioning tool, shorts out base contacts to enable cable resistance checks to be carried out	Listing not applicable, service tool only

Detector Status LED Indicators

LED Indication	Status
Pulses approximately every 10 seconds	Normal
Steady On	Alarm

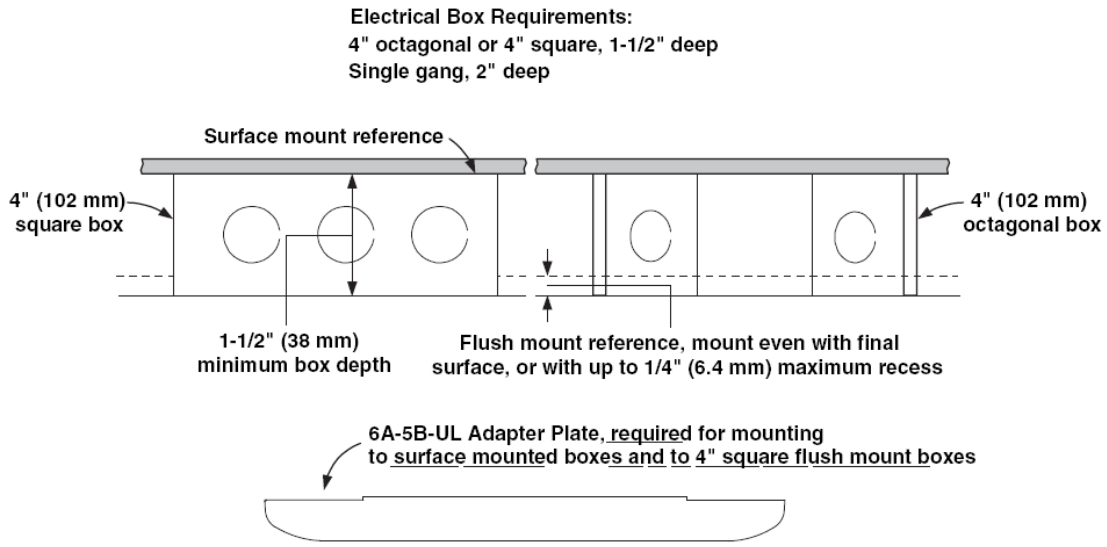
Dimensions and Reference Information



601H-RF-UL, 601H-F-UL, 631H-F-UL Heat Detectors

C5-B Detector Cage

Mounting Information



Specifications

Voltage		10.5 to 33 VDC from fire alarm control panel IDC
Standby Current	601H-F-UL	100µA @ 24VDC
	601H-RF-UL	90µA @ 24VDC
	631H-F-UL	95µA @ 24VDC
Alarm Current		Up to 82 mA maximum, exact current is determined by alarm current limiting of connected IDC
Storage Temperature Range		-13° F to 176° F (-25° C to 80° C)
Operating Temperature Range		32° F to 100° F (0° C to 38° C)
Humidity Range		Up to 95% non-condensing
Color		White 019
Dimensions		
In base		5” Dia. x 2-1/8”” H (127 mm x 55 mm)
In base with base adapter		6” Diameter x 2-9/16” H (152 mm x 66 mm)

Application Reference

The following table provides a reference for the maximum rectangular area covered for detectors rated with the given spacing. For additional information, including consideration of ceiling height, refer to NFPA 72, the *National Fire Alarm Code*.

Maximum Rectangular Area for Single Detector Coverage

60 ft Rated Spacing (18.3 m)	70 ft Rated Spacing (21.3 m)
60 ft x 60 ft (18.3 m x 18.3 m)	70 ft x 70 ft (21.3 m x 21.3 m)
55 ft x 64.6 ft (16.7 m x 19.7 m)	65 ft x 74.6 ft (19.8 m x 22.7 m)
50 ft x 68.5 ft (15.2 m x 20.8 m)	60 ft x 78.7 ft (18.3 m x 24 m)
45 ft x 72 ft (13.7 m x 21.9 m)	55 ft x 82.3 ft (16.7 m x 25 m)
40 ft x 74.8 ft (12.2 m x 22.8 m)	50 ft x 85.4 ft (15.2 m x 26 m)
35 ft x 77.3 ft (10.6 m x 23.5 m)	45 ft x 88.1 ft (13.7 m x 26.8 m)
30 ft x 79.3 ft (9.1 m x 24.1 m)	40 ft x 90.5 ft (12.2 m x 27.5 m)
25 ft x 81 ft (7.6 m x 24.7 m)	35 ft x 92.6 ft (10.6 m x 28.2 m)
20 ft x 82.4 ft (6.1 m x 25.1 m)	30 ft x 94.3 ft (9.1 m x 28.7 m)
15 ft x 83.5 ft (4.5 m x 25.4 m)	25 ft x 95.7 ft (7.6 m x 29.1 m)
10 ft x 84.2 ft (3.05 m x 25.6 m)	20 ft x 96.9 ft (6.1 m x 29.5 m)
5 ft x 84.7 ft (1.5 m x 25.8)	15 ft x 97.8 ft (4.5 m x 29.8 m)
1 ft x 84.85 ft (0.3 m x 25.8 m)	10 ft x 98.4 ft (3.05 m x 30 m)
	5 ft x 98.8 ft (1.5 m x 30.1 m)
	1 ft x 99 ft (0.3 m x 30.2 m)

Application of 600 Series Detectors

The table below is for guidelines only, specific situations are likely to require variations on the suggested detector types. Real situations may require detector combinations to cover all likely risks.

		Environment	A Very clean and dry	B Benign moderately clean regulated temperature	C Dirty - smoky	D Dusty and/or humid	E Unregulated temperature
		For Example	Clean room data processing suite	Offices, light industrial, hospitals, residential, passenger accommodation	Loading bay/ warehouse with diesel fork-lifts etc. Heavy industrial ferry (car deck)	Livestock pen mill, laundry, changing room	Kitchen, engine room, engine test beds
	Fire Loading	Probable Risk					
1	Electronic equipment electrical switchgear electric motors cable conduit	Cable pyrolosis (toxic fumes) electrical arcs (ignition source) associated electrical dangers	601P-UL 601PH-UL 601I-ULC	601P-UL 601PH-UL 601I-ULC	601P-UL		
2	Fabrics, clothes soft furnishings paper, cardboard plastic foams animal bedding wood shavings etc.	Smouldering (difficult to locate - toxic fumes) likelihood of flashover (back-draught)		601PH-UL 601P-UL	601P-UL	601P-UL	
3	Flammable liquids paints, solvents flammable gasses unstable chemicals	Flaming fire (rapid build-up of dense smoke) high temperature fumes associated explosion dangers	601I-ULC 601PH-UL 601P-UL	601I-ULC 601PH-UL 601P-UL	601H-RF-UL 601I-ULC	601H-RF-UL	
4	Foodstuffs general organic waste animal fodder wooden structures solid fuels	Smoke and flame initially fairly slow but high temperatures once established		601PH-UL 601P-UL 601I-ULC	601PH-UL 601H-RF-UL	601P-UL 601H-RF-UL	601H-F-UL 631H-F-UL
5	Plastic, chemicals machinery building materials unknown contents	Type of fire risk may vary as can the type of fire (may require a mix of detection types)	601PH-UL 601P-UL 601I-ULC	601PH-UL 601I-ULC 601H-RF-UL	601P-UL 601I-ULC 601H-RF-UL	601P-UL	601H-F-UL 631H-F-UL