A Product of Sentrol, Inc.

INSTRUCTION MANUAL
Part Number 64812365-B
Rev. C

ESL 600 SERIES
ELECTRONIC HEAT DETECTORS and BASES

Model Number	Description
613U5	Electronic heat detector head
601U	Universal base
602U	Universal base with auxiliary relay contacts
602U4	Universal base—four wire

DESCRIPTION
The ESL model 613U5 is a fully electronic, combined fixed temperature/rate-of-rise heat detector, which operates on a twin thermistor principle. One thermistor is exposed to the effects of hot, convected gases. The second thermistor is insulated so that when the ambient temperature increases, its temperature (and therefore, resistance) lags behind the temperature of the exposed thermistor. This results in an electrical imbalance.

When a certain combination of thermistor values is reached during a rapid increase in room temperature, or when the ambient temperature exceeds 136°F (58°C), the detector changes to the alarm state. It will latch in this state until it is reset by a momentary interruption of power.

When the detector is mounted to a universal base, standard features include a local visual alarm indicator and remote alarm indicator capability. A local functional test is done using the magnet in the installation/removal/test tool (ESL model 605A7).

ELECTRICAL COMPATIBILITY
ESL 600 Series detectors are system fire detectors. When used with models 601U and/or 602U mounting bases in two-wire operation, the detector and controls must have compatibility Listing with Underwriters Laboratories, Inc. For information on detector/control unit compatibility, see ESL Detector Compatibility Index guide.

WARNING: SYSTEM MAY NOT OPERATE IF THE DETECTOR IS NOT CONNECTED TO THE CONTROL UNIT INITIATING DEVICE CIRCUIT AS SPECIFIED IN THE DETECTOR OR CONTROL UNIT LITERATURE.

In four-wire operation using model 602U4 mounting base, the voltage range of the detector should equal or exceed the voltage of the control and sufficient current be supplied to insure the operation of the detector(s).

APPLICATION
The ESL model 613U5 is part of the 600 Series family of fire detectors and accessories. The common base/interchangeable sensing head configuration allows great flexibility in product application. ESL 600 Series fire detectors are suited for commercial, industrial, institutional, and residential fire alarm systems.

The heat detector head is for general area protection where smoke detectors are not appropriate. The detector response is unaffected by air velocity or barometric pressure.

INSTALLATION OF UNIVERSAL BASE
600 Series detector heads are installed by plugging the head into a universal mounting base and twisting the head clockwise to secure. Bases will mount directly to standard single-gang electrical boxes, 4" octagonal (e.g., RACO #125 or equivalent) and 3.5" octagonal boxes, or to WIREMOLD No. 5738, 5738A, or 5739 fixture boxes.

The volume of the electrical box is determined by the number and size of conductors as required by the National Electrical Code (NFPA 70). All wiring must be installed in compliance with the NEC or the local code(s) having jurisdiction.

Each base is equipped with six wire-clamp type terminals and bifurcated contact springs for contact with detector head circuit pins. Each wire clamping plate will accommodate two conductors up to 2.0 mm diameter (#12AWG). Terminals are numbered 1 thru 6.

To install the model 601U mounting base, draw all system wiring through the center opening. Secure the base to the mounting surface using the appropriate mounting holes and hardware. See Diagram #1. System wiring should be connected in accordance with Diagram #2. Strip 3/8" of insulation from each conductor and insert under the correct screw terminal. The barrier-type terminals are designed to prevent "looping" of wires and provides for supervision of conductors. Tighten each screw as connections are completed.

CHECK ALL WIRING AND MOUNTING CONNECTIONS.
Model 602U and 602U4 mounting base include a relay for auxiliary switching and alarm initiation operations, respectively. Terminals for the relay contacts are accessible from the rear of the base. Each "tunnel" type terminal accepts one wire. Wiring to the contacts must be accomplished before securing the base to the mounting surface. Complete the installation as described above for the model 601U base.

NOTE: Positive air pressure from wire openings, conduit, mounting boxes, irregular mounting surfaces, or plenums causing air movement through and away from the detector may prevent proper operation. Seal all such openings causing unwanted air flow using UL Listed Expanding Foam or Duxseal.

INSTALLATION OF THE DETECTOR HEAD
After all detector bases are installed, including the end-of-line device, check the system wiring for continuity. A manually operated switch between Terminals 1 and 2 establishes continuity across the alarm initiating circuit at initial installation. The switch is in the closed position on new bases and is automatically opened when an ESL 600 Series sensing head is plugged in. If a detector head is removed for service, the switch may be reset using a small screwdriver, thus re-establishing circuit continuity.

To install a detector head, insert and rotate the head clockwise until it is properly aligned and "sets" into the base. Then rotate an additional 15° and it will automatically lock into place.

REMOVAL OF THE DETECTOR HEAD
Each detector base is equipped with a molded locking tab to prevent unauthorized removal of the detector head. To remove the detector head, insert a small screwdriver blade into the slot on the side of the base while simultaneously turning the detector head counterclockwise. If the detector mounting location does not warrant use of the locking feature, it is recommended that the locking tab be removed prior to installation. To remove the tab, insert a small screwdriver behind the tab, force it outward and take it off.

TESTING THE INSTALLATION
After all connections are completed and the wiring is checked for errors, apply power to the system. There should not be an alarm. If there is, power down the system and check each detector for correct wiring. If no alarm has occurred, go to the last detector and check the smoke detector power with a voltmeter for the specified voltage.

Disconnect alarm signal devices, releasing devices and extinguishing systems prior to performing detector tests. Be sure to reconnect all devices at the conclusion of testing.

To test each detector, use ESL Model 605A1 installation/removal and test tool. Position the tool over the detector so that the alarm indicating lamp may be seen through the opening in the tool apron. Hold in this position for at least 20 seconds or until an alarm occurs. If a successful test, the LED will light. The magnet in the test tool closes a reed switch on the printed circuit board which, in turn, will simulate an increase in temperature exceeding the sensitivity of the detector. This test checks the response capability of both the rate-of-rise and the fixed temperature sensing functions. To reset each detector, operate the system reset switch for 2 to 3 seconds to remove power from the detectors.

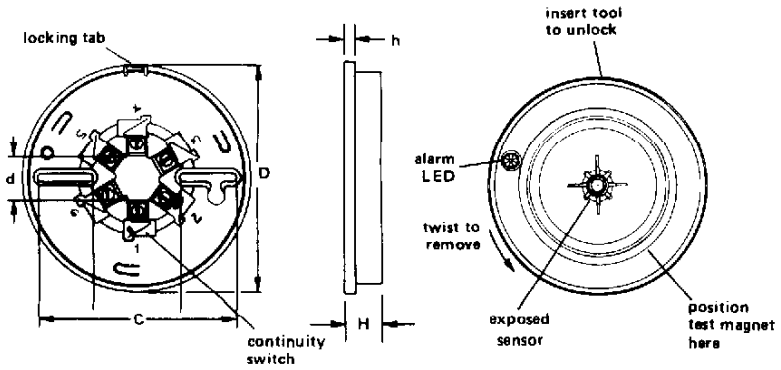
TEST EVERY DETECTOR FOR PROPER OPERATION. This testing procedure should be conducted annually by qualified personnel. If a detector fails to function properly, obtain a Return Authorization Number by calling 1-800-648-7422 or 503-620-8540, then carefully pack it and return it prepaid to the manufacturer. Include an explanation of the suspected failure mode.

APPROVALS
Listed to Underwriters Laboratories, Inc. (UL 521); California State Fire Marshal approved (Listing #7270-447:117); State of Maryland approved (Permit #1885); City of Cleveland approved (Docket S-5-88); New York City, Board of Standards and Appeals approved (Calendar #122-73-SA); Vermont Department of Labor approved.

MAINTENANCE
Disconnect power before attempting to service the detector. ESL 600 Series detectors are designed to require little maintenance. Once a year (more often in dusty environments), use a vacuum and/or a low pressure oil free air line to loosen and remove dust from the sensing area. It is important to notify all concerned parties when any maintenance or testing of a fire alarm system is to occur. Always test each detector after cleaning.

DO NOT attempt to adjust or alter the detector.

INSTALLATION (Diagram #1)



BASES

D =	4-3/4"	120 mm
C =	1-15/16–3-15/16	50-100 mm
d =	3/4"	19 mm
H =	3/4"	19 mm
h =	1/4"	6 mm

Weight = 85 grams; 3 oz.

ELECTRICAL SPECIFICATIONS

Standby Voltage*	8.5–44 VDC
Standby Current	50 μA Max.
Equivalent Capacitance	0.001 μF Max.
Alarm Voltage	33 VDC Max.
Alarm Current	50 mA ±10% @ 24 VDC
Alarm Current @ 10 VDC	40 mA Min.

To insure reset, reduce detector voltage to 4.0 volts or less, or current to 1 mA or less. Reset time: 1 second Max.

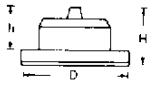
Contact Rating (resistive)—
602U Base 1A @ 30 VDC

*VDC — Filtered; 10% Maximum Ripple

OPERATIONAL DATA

Dimensions with 601U, 602U or 602U4 base.

D =	4.75"	120 mm
H =	2.75"	86 mm
d =	3"	76 mm
h =	1.88"	63 mm



Weight without base = 126 gm; 4.5 oz.

Ambient Temperature Range
32–120°F, 0–50°C

Operating Humidity Range
5–95% RH

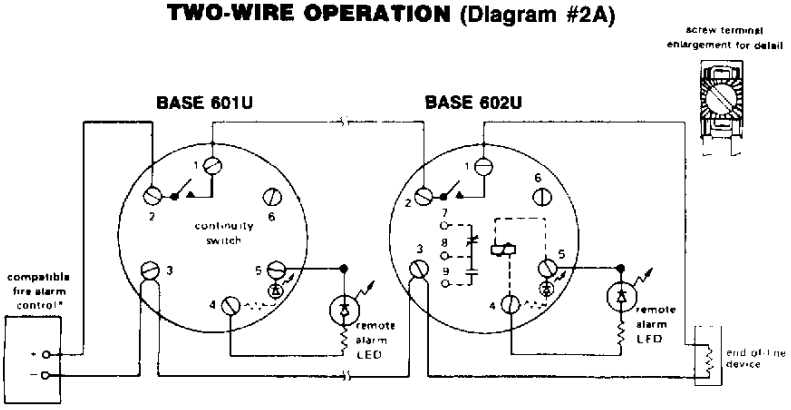
Altitude Range
Unlimited

Nominal Sensitivity
Fixed temperature responds @ 136°F
Rate-of-rise responds to increasing temperature rate of 15° per minute or greater, provided condition persists for 12 seconds and temperature exceeds 105°.

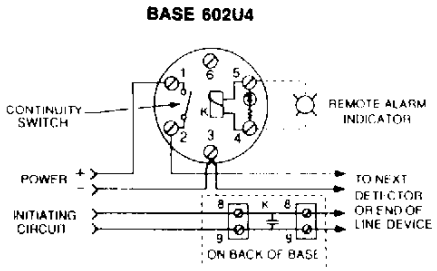
Spacing Rating per UL 521
70 ft.

WIRING CONNECTIONS

TWO-WIRE OPERATION (Diagram #2A)



FOUR-WIRE OPERATION (Diagram #2B)



SENTROL, INC. — UL FILE S2690

ESL 1500 Series Control Unit with BMB, ZEM. Styles B or D wiring.
Maximum line resistance = **100 ohms.**
Compatibility Identifier is **C01.**

Compatible Detector is Model 613U5; Compatibility Identifier S10; maximum 40 detectors per circuit.

For remote alarm indication, use ESL Model 606U1.
For remote test and alarm indication, use ESL Model 606U2.

Emergency operation [Style D (Class A)]: Return initiating circuit wiring to appropriate control unit terminals and connect the end of line devices per the control unit instructions.

NOTE: Positive air pressure from wire openings, conduit, mounting boxes, irregular mounting surfaces, or plenums causing air movement through and away from the detector may prevent proper operation. Seal all such openings causing unwanted air flow using UL Listed expanding foam or Duxseal.

CAUTION: DO NOT use looped wire under screw terminals. These terminals are designed to prevent looping of unbroken wire around or under a terminal screw in a manner that would permit the looped wire to remain unbroken during installation. This would preclude supervision if the wire were to dislodge from the terminal.

SPACING

Spacing of heat detectors should be in accordance with the information provided in NFPA 72E, Chapter 3, and Appendixes A through C.

Consult National Fire Protection Association Publications', "NFPA 72E, Standard on Automatic Fire Detectors," and, where applicable, "NFPA 74, Standard for the Installation, Maintenance, and Use of Household Fire Warning Equipment."

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