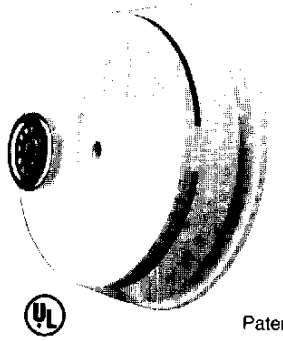
INSTRUCTION MANUAL

Part number 10085, REV 492

ESL 447C SERIES, FOUR WIRE PHOTOELECTRONIC SMOKE DETECTORS



Patented

MODEL	DESCRIPTION
447C	Smoke Detector
447CT	Smoke Detector with 135° F heat sensor

GENERAL DESCRIPTION

ESL's 447C Series are photoelectronic, four-wire system smoke detectors operating on the light-scattering detection principle. 447C Series smoke detectors are suited for commercial, industrial, and institutional fire alarm systems.

The detectors are intended for four-wire connection to UL Listed 12 VDC and 24 VDC fire alarm control units. Each detector has one Form A (SPST-NO) alarm relay contact for connection to an alarm initiating circuit. An integral heat sensor rated 135° F is available as an option on Model 447CT.

INSTALLATION

The 447 Series smoke detectors mount to standard single-gang or 4" octagonal (e.g., RACO #125 or equivalent) electrical 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. After identifying the proper electrical box to be used, open the smoke detector cover by inserting the blade of an 1/8" screw driver in the small slot on the side of the smoke detector, opposite the hinge. Gently depress the cover release tab and swing the cover open. Locate the proper knockouts inside the smoke detector base which will allow mounting to the applicable electrical box (refer to diagram #1 on the reverse side) and remove the knockouts with a slotted screw driver.

All field wiring connections are made to the quick-disconnect terminal block supplied with the unit. This unique terminal block plugs into the base of the detector from the rear (refer to diagram #2 on the reverse side). This connector permits quick removal of the smoke detector without disconnecting system wiring. Each screw of the terminal block will accommodate two wires of the same gauge, one on either side of the screw. The acceptable wire gages for this application are from 14 AWG to 26 AWG. This terminal block design prevents "looping" of wires and provides for supervision of conductors. Supervision of installation wiring is accomplished by connecting the incoming power wire to terminal position number 6, while the outgoing power wire is connected to terminal position number 1. An electrical interlock is accomplished through the detector head when wired in this manner. Strip 3/8" of insulation from each conductor and insert wire under the appropriate screw terminal and tighten (refer to diagram #2 on reverse side for proper wiring).

CHECK ALL WIRING AND CONNECTIONS. Dress wiring neatly and secure the detector to the mounting box using the appropriate mounting holes and supplied hardware. Close and securely latch the detector cover.

TESTING THE INSTALLATION

After all connections are completed and the wiring is checked for errors, apply power to the system. There should be no alarm. If an alarm is reported, check to verify if an actual alarm has occurred or if there is a problem with the installation. If it is not an actual alarm, power down the system and check each detector for correct wiring. If no alarm has occurred, check each detector's LED to verify that it is pulsing at approximately one pulse every seven seconds. Go to the last detector and check the smoke detector power with a volt meter for the specified voltage. To test each detector for alarm operation, hold a smoldering punk stick or cotton wick near the smoke entry areas and blow gently directing the smoke into the detector. You can also use Home Safeguard's canned smoke to test; follow the manufacturer's instructions carefully.

Continue for up to 20 seconds or until an alarm is indicated.

BE SURE TO PROPERLY EXTINGUISH THE SMOKE SOURCE AFTER TESTING!

This is a gross test and is not a reliable indication of the sensitivity of the detector. If it is a successful test the LED will light steady. To reset the detector, operate the system reset switch for 2 to 3 seconds to remove power from the detectors. Control unit alarm and all ancillary functions should be verified for a complete test of each detector. Follow this procedure for the remaining 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.

SENSITIVITY MEASUREMENT

The actual sensitivity of the ESL 447C Series Smoke Detectors may be determined by use of UL Listed control equipment arranged for the purpose, such as the Gemini Model 501 Aerosol Generator. Refer to the information supplied with the Gemini for proper operation and flowmeter settings. Additionally, the actual sensitivity of the detectors may be determined by testing in a correlated UL 217/268 smoke test chamber. For a nominal charge ESL will perform this test and, if a detector is found to be outside of the marked sensitivity range, will clean the detector.

Sensitivity measurements should be taken on all detectors towards the end of the first 12 months of operation, and every 24 months subsequent. If a detector responds incorrectly, contact ESL Customer Service for details on the return of the product.

ESL does not endorse the use of an unmeasured concentration of aerosol for detector sensitivity testing. Unmeasured aerosols do not test detector sensitivity with accuracy. In fact, the result of such a test may be misleading. The ESL product warranty does not cover contamination by aerosols.

APPROVALS

The smoke detector is for use in commercial fire protective signaling systems (NFPA 71 and 72) and in household fire warning systems (NFPA 74).

This product is Listed by Underwriters Laboratories, Inc. Approvals pending for: California State Fire Marshal, New York City, Board of Standards and Appeals, Factory Mutual, State of Maryland, City of Cleveland.

SUPERVISION OF SYSTEM WIRING

The detector's power is supervised by installing a 204A or 204C power supervision unit for the appropriate control unit voltage at the end of the detector power circuit The contacts of the supervision unit are wired in series with the system's alarm initiating circuit, and are closed when energized.

A break in the detector power circuit or a loss of power de-energizes the power supervision unit, opening the contacts and causing a trouble annunciation at the fire alarm control unit. (Refer to Diagram #2 on the reverse side).

MAINTENANCE

The 447C Series smoke detectors are designed to require little maintenance. Once a year (more often in dusty environments), open the detector cover and use a vacuum and/or filtered compressed air to loosen and remove dust from the screen surrounding the optical sensing mechanism. For detectors installed in hostile (dusty) environments, it may be necessary to purge the chamber with canned or clean, dry compressed air. 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.

ELECTRICAL SPECIFICATIONS

SMOKE DETECTORS - 447C, 447CT

Standby Voltage*	8.0-33 VDC or UFWR
Standby Current	20 uA @ 10V; 120 uA @ 30V
Alarm Voltage	8.0-33 VDC
Alarm Current	15 mA @ 10V, 50 mA @ 30V
Contact Rating (resistive)	1 Ampere @ 30 VDC or 120 VAC

POWER SUPERVISION UNITS	MODEL 204A	MODEL 204C
Operating Voltage*	5.1-19.8 VDC	14.5-33 VDC
Operating Current	40 mA @ 12 V	10 mA @ 24 V
Contact Rating (resistive)	1 Ampere @ 30 VDC or 120 VAC	

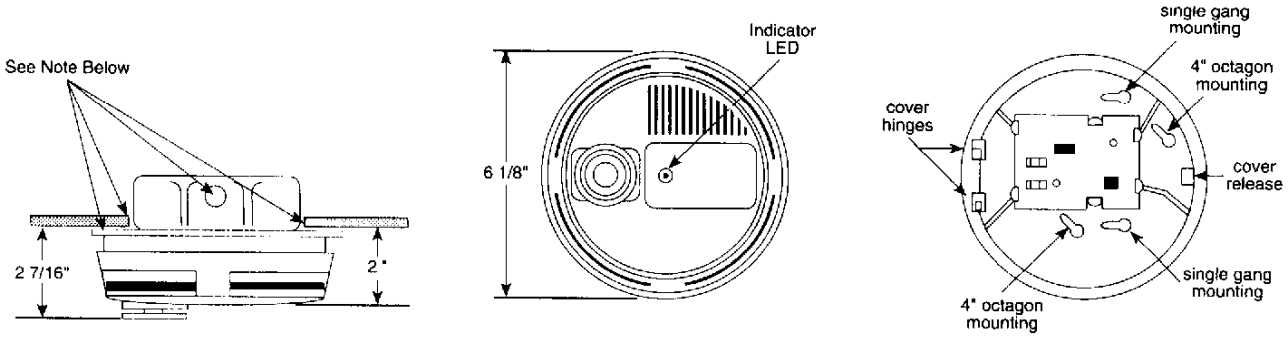
* VDC - Filtered; 10% Maximum Ripple
UFWR - Unfiltered Full Wave Rectified

OPERATIONAL DATA

Operating Temperature Range	0° C to 50° C; 32° F to 120° F
Operating Humidity Range	0 to 95% RH
Detector Size: Diameter	6.1/8 in. 15.6 cm
Height	2.7/16 in. 6.2 cm
Weight	8.1 oz. 0.23 kg.
Power/Alarm Indicator LED	Standby - Flashing Alarm - Steady
Electronic Alarm Latch	Reset by momentary power interruption
Sensitivity to Smoke	3.1 ± 0.5%/ft.

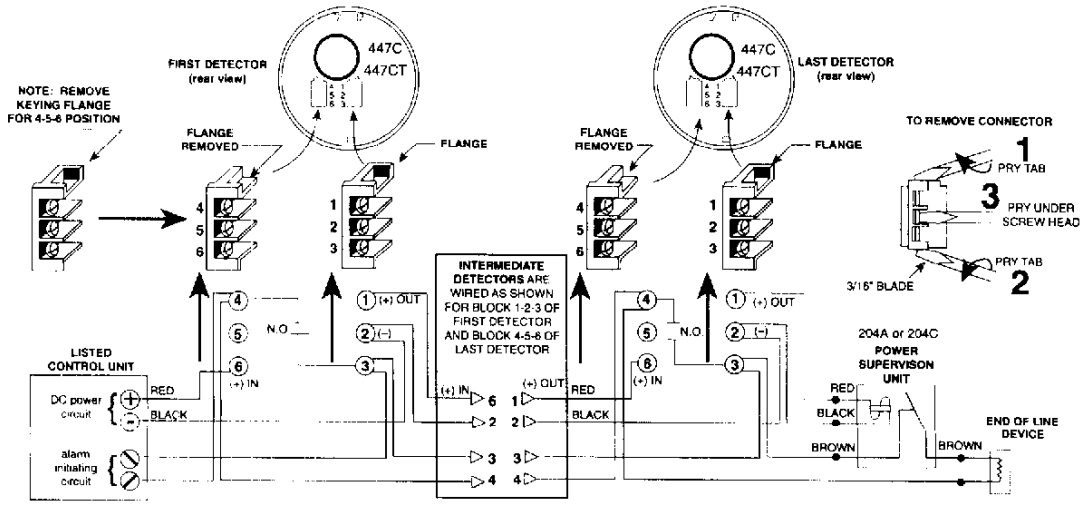
INSTALLATION (Diagram #1)

FLUSH MOUNTING ON 4" OCTAGON BOX



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.

WIRING CONNECTIONS (Diagram #2)



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.

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.

SMOOTH CEILING SPACING

On smooth ceilings, spacing of 30 feet (9.1 meters) may be used as a guide. Other spacing may be used depending on ceiling height, high air movement, and other conditions or response requirements.

In all installations, good engineering judgment should govern.

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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