ADEMCO PROVED PERFORMANCE

INSTALLATION INSTRUCTIONS

No.631 SMOKE DETECTOR

GENERAL INFORMATION:

The U.L. Listed No. 631 Smoke Detector is a photoelectric type detector with a solid state long life light source and very low current drain (less than 17 ma). It operates from 6V. DC (battery or unfiltered full wave rectified) and may be powered from controls such as the No. 508 Fire Alarm Control, or combination burglar/fire controls in the No. 340R and 342R Series.

Alarm (open normally) and trouble (closed normally) contacts are provided within the unit and an indicator LED on each unit shows its status as follows:

Indicator LED	Condition
OFF	NORMAL
ON STEADILY	ALARM
FLASHING	TROUBLE

DESCRIPTION OF OPERATION:

A smoke chamber in the unit contains a solid state light source and a light detector photocell shielded from each other by a mask or target. Normally only a small amount of light (reflected from the chamber walls and edges of the target) reaches the light detector cell, thus establishing a "normal" light level in the circuitry.

When smoke enters the chamber, additional light reflecting off of the smoke particles reaches the light detector. When the light level reaches the trip point, the unit's alarm contacts close and its indicator LED lights steadily. The unit will remain tripped until smoke clears from the chamber and the power to the unit is interrupted momentarily when the fire alarm system is reset.

If the "normal" level should decrease (e.g.: component failure), the unit's trouble contacts open and (except in the case of power interruption) its indicator LED flashes on and off.

PLACEMENT CONSIDERATIONS:

The No. 631 is designed for mounting directly to the ceiling. Factors influencing location and layout include environmental conditions and ceiling construction.

Locations to avoid:

The No. 631 should not be used in areas that have: a) Ambient steam, smoke or dust conditions (such as kitchens, furnace rooms or garages), b) Periodic fumigation by fogging or spray methods (such as stables, barns, etc.), c) Unusually high humidity, d) Corrosive atmospheres, e) Temperatures exceeding 100°F, or f) High air flow such as in air conditioning or heating ducts, or adjacent to intake or output ports of such systems.

Never install a detector on a wall. Smoke from a fire rises to the ceiling, spreads out across its surface and begins to travel downward, along or near the

walls. A detector mounted on the ceiling will sense a developing fire far sooner than a detector mounted on a wall. See Diagram 1.

Keep away from the "dead air" space that exists at the junction of a wall and ceiling. As a rule, keep detectors at least 6" away from any wall. See Diagram 2.

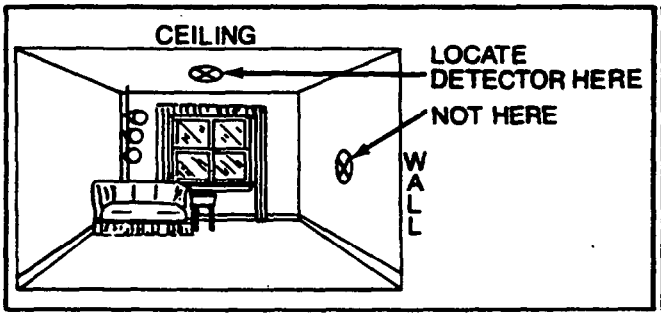


Diagram 1

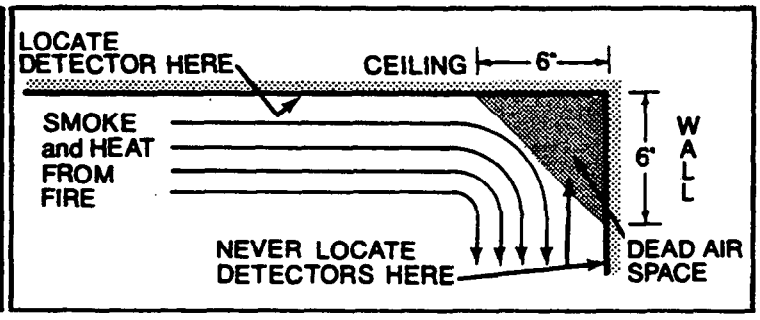


Diagram 2

Layouts:

1. On Smooth ceilings with no forced air flow, spacing of 30 ft. may be used, depending on ceiling height or special response requirements. See Diagram 3.

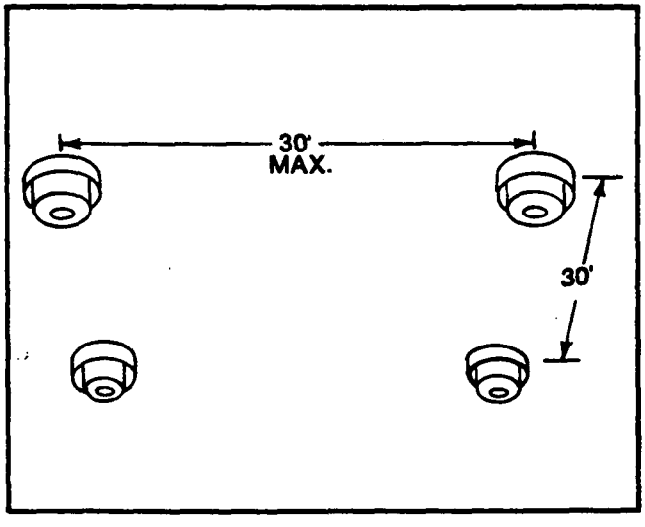


Diagram 3

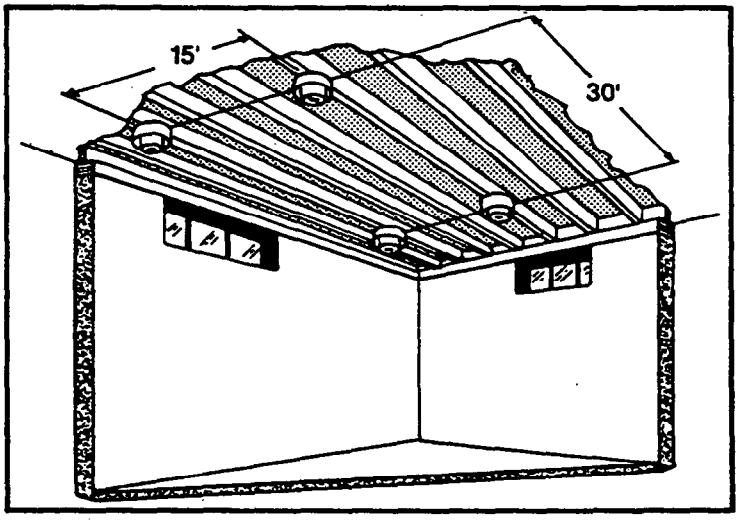


Diagram 4

2. On uneven ceilings or ceilings with beams or joists closer spacing may be required.

   a. Ceiling obstructions 8" or less in depth can be considered equivalent to a smooth ceiling in view of the "spill over" effect of smoke.

   b. With beam construction from 8" to 18" in depth, movement of heated air and smoke may be slowed by the pocket or bay formed by the beams and spacing should be reduced. Detectors should be mounted, in such cases, on the bottom of the beam or joist, not in the channels in between. See Diagram 4.

   c. If the beams exceed 18" in depth and are more than 8 ft. on centers, each bay should be treated as a separate area requiring at least one detector.

3. Sloped ceilings (peaked, shed or cathedral type) present special problems. Air at the top of sloped ceilings has a higher temperature than air in other parts of the room. This temperature difference may create a "thermal barrier" which can prevent rising smoke from reaching the top of the ceiling. Detectors may have to be located below the point where rising smoke will level off. A row of detectors at least 3 ft. below the peak is suggested. Do not install detectors in attics or where temperatures may exceed 100°F.

A pre-installation smoke test with a piece of hemp or similar material will help determine if a "thermal barrier" exists and will indicate if smoke will reach the location(s) where the detector(s) will be located.

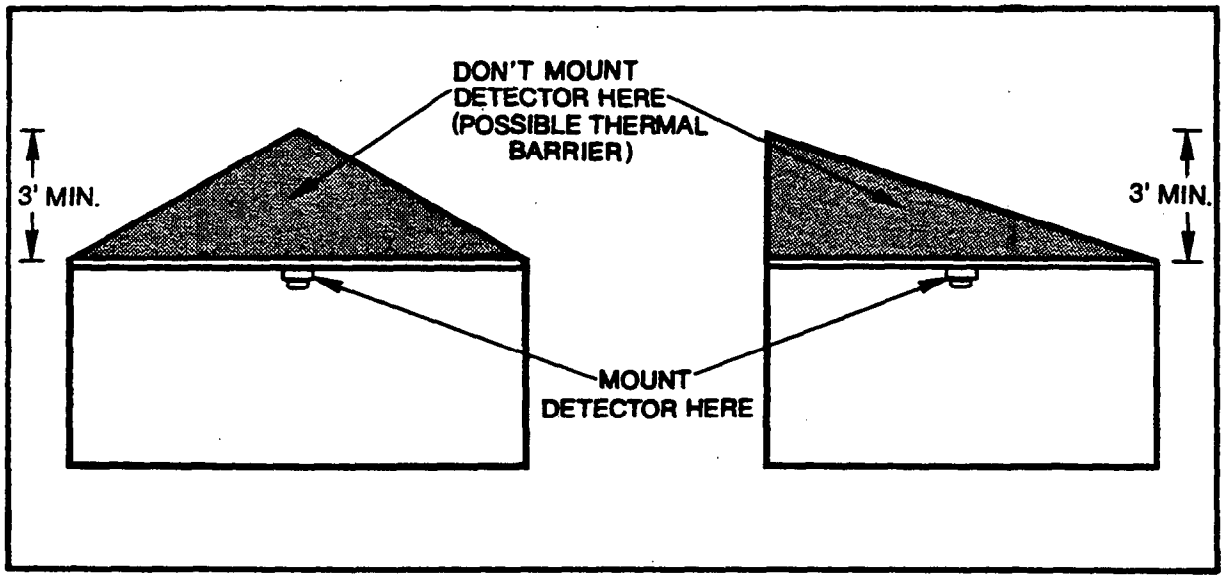


Diagram 5

Note: A detailed analysis of proper locations for smoke detectors is available from the National Fire Protection Association (NFPA), 470 Atlantic Avenue, Boston, Massachusetts 02210. Order NFPA Standards #72E and #74

SOME TIPS ON RESIDENTIAL FIRE PROTECTION:

Since most fires in a home occur at night when everyone is asleep, the ideal location for a smoke detector is between the bedroom area and the rest of the house. If the bedrooms are spread out or if they are located in different sections of the house, one smoke detector should be placed near each of these sleeping areas. See Diagrams 6a and 6b.

In multi-level houses one smoke detector may be sufficient to protect an entire floor. Since smoke rises, a stairwell in a home tends to become a natural "chimney" for smoke rising from one level to the next. Therefore, by locating a smoke detector near the top of the stairs leading to a main sleeping area, all bedrooms can be successfully protected using a minimum of units. See Diagram 6c.

Locating a smoke detector outside a particular bedroom will not protect the occupants of that room should a fire originate there. It may be advisable, therefore, to locate a smoke detector in each bedroom.

In general, early warning fire detection is best achieved by the installation of fire detection equipment in all rooms and areas of the household as follows:

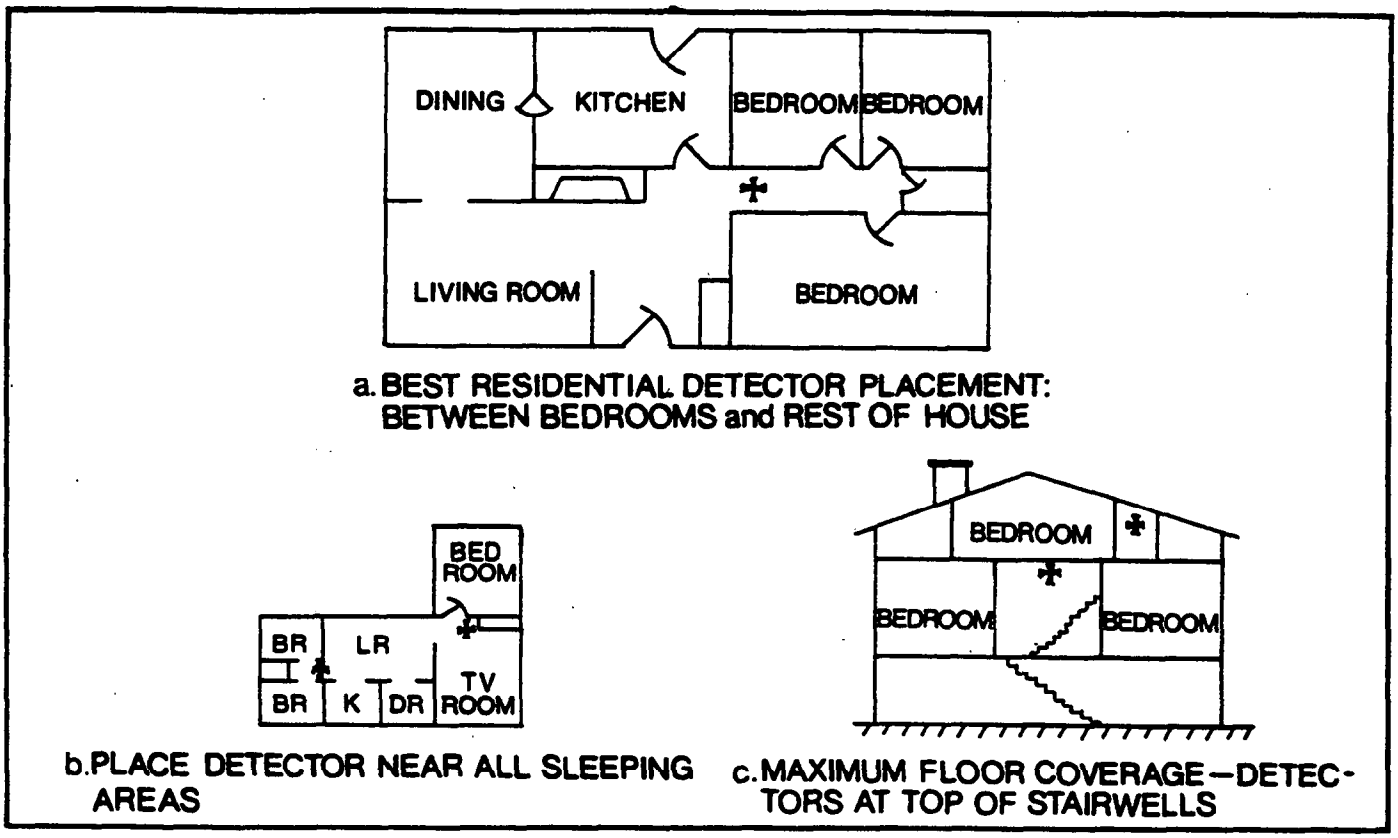


Diagram 6: RESIDENCES

A smoke detector installed in each separate sleeping area (in the vicinity of, but outside of, the bedrooms), heat or smoke detectors in living rooms, dining rooms, bedrooms, hallways, attics, closets, utility and storage rooms, and basements, and heat detectors in kitchens, furnace rooms and attached garages.

INSTALLATION AND WIRING:

The maximum number of detectors that may be used in a particular installation will depend on the control panel used and its power capabilities. For example:

With Nos. 340R-25 and 342R-25 Controls, up to 4 No. 631's may be connected and at least 6 hrs. standby power will still be assured.

With Nos. 340R-50 and 342R-50 Controls, even with 20 No. 631's connected, at least 6 hrs. standby power will still be assured.

With a No. 508 Fire Alarm System the maximum permissible number of No. 631's will depend on the number of bells used with the control and the capacity of the standby battery provided. See the instructions that accompany the No. 508.

1. Run wiring from the control to the location(s) selected for the detector(s). Diagram 7 shows typical wiring and connections required for controls with SUPERVISED DETECTION LOOPS.

Note: For power wiring to the detector(s) follow Table A below, to insure adequate voltage (5.75V. DC minimum) at each detector.

TABLE A: DETECTOR POWER WIRING SIZE

Maximum distance to farthest detector	Number of 631's		
	1-4	5-9	10-12
100 feet	#22	#22	#20
200	#22	#20	#18
300	#22	#18	#16
500	#20	#16	*

*Use separate power runs of 1 to 4 (use #20 wire), or 5 to 9 (use #16 wire) detectors each.

2. Mount the detector(s) to the ceiling after wiring connections are made. Two mounting holes are provided on the flange of each detector.

3. After an alarm the detector locks in until smoke clears from its smoke chamber and its power is momentarily interrupted. This is accomplished automatically when any of the controls shown in Diagram 7 is reset after an alarm.

TESTING:

The following test should be performed on each detector when first installed and at least semi-annually thereafter:

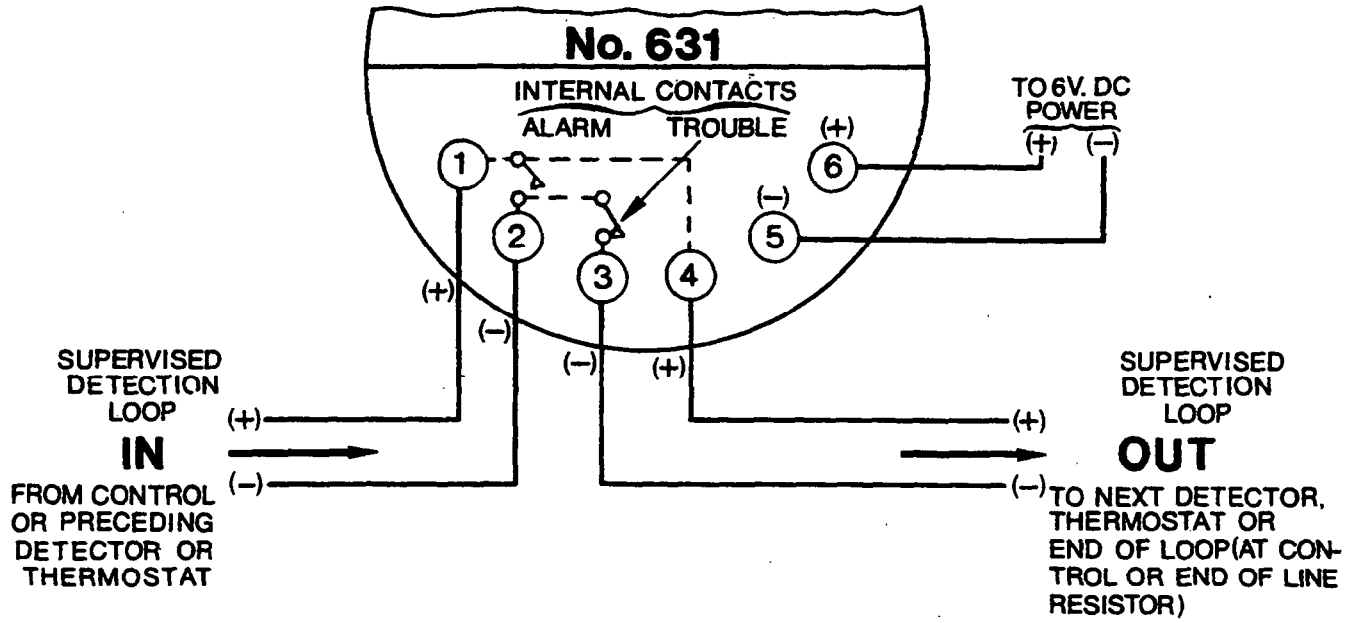
Smoke from a just-extinguished match or from a lit cigarette should be enough to trip the detector. Allow a few minutes for the smoke to clear from the detector before attempting to reset the system.

MAINTENANCE:

The No. 631 Smoke Detector should be cleaned at least yearly and more often (at least every six months) in areas that are dusty or exposed to small insects.

To clean the unit, place the nozzle of a vacuum cleaner near the open space between the lens and housing of the detector and follow this opening around several times with the nozzle.

No other periodic maintenance is required. If a detector does not function properly, the alarm company providing service should be notified.



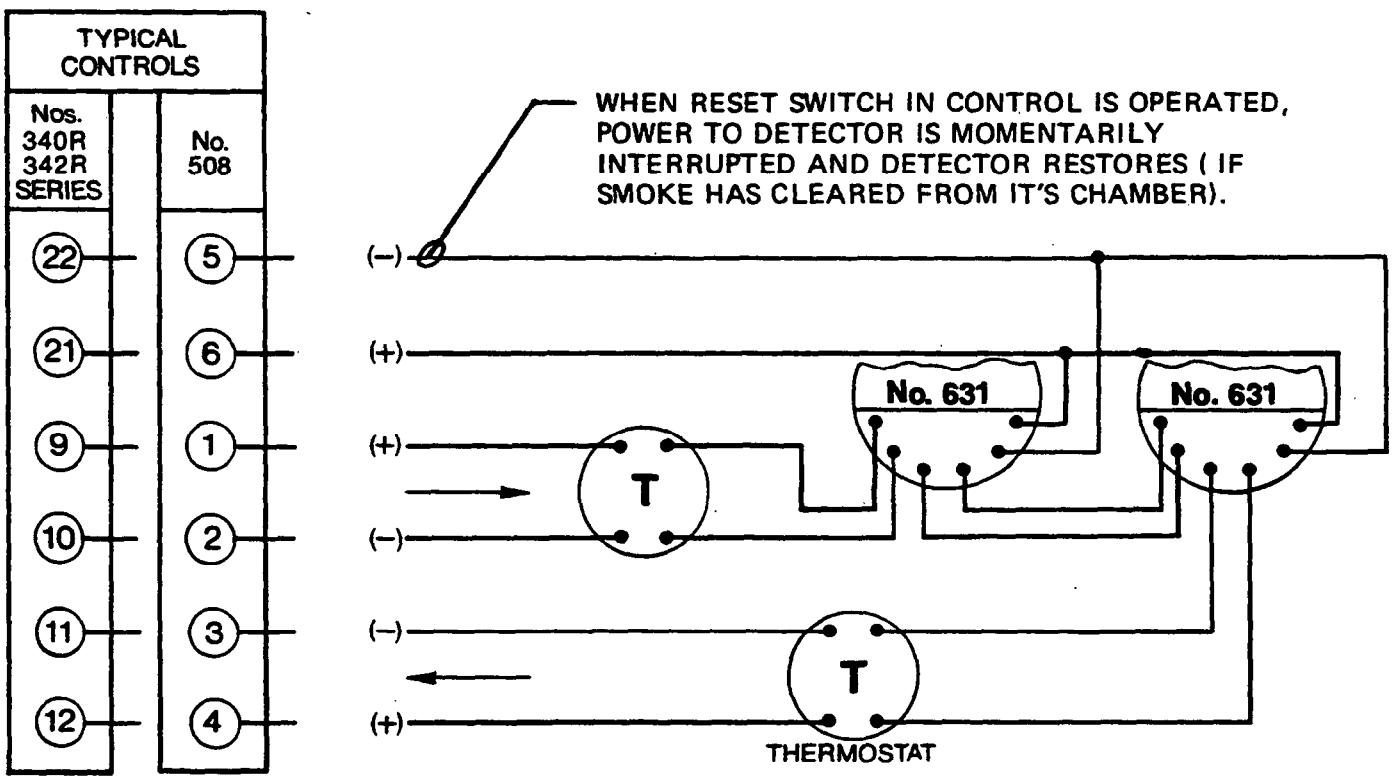


Diagram 7: TYPICAL CONNECTIONS for **SUPERVISED** DETECTION LOOP

GENERAL SPECIFICATIONS:

Physical: Diameter: 6" (15.2 cm)
Height: 3 3/4" (9.5 cm)

Electrical:

	Current Draw	
	Normal	Alarm
6V. DC (full wave rectified, unfiltered)	17 ma	38 ma
6V. DC (rechargeable power supply)	12 ma	28 ma
6V. (dry battery)	10 ma	23 ma

Sensitivity: Factory set to trigger at 2% per ft. smoke obscuration and to give a trouble signal if sensitivity falls to less than 6%.