1. General Description

The MCT-430 is a low profile, battery operated, photoelectric smoke detector which shares its housing with a UHF PowerCode type transmitter. It has a 57°C (135°F) fixed temperature heat detector and a built-in sounder. The detector sends out the following messages to the control panel:

- Smoke alarm
- Heat alarm
- Tamper alert
- Low battery alert
- Trouble message (when heat sensor malfunctions)
- Service alert (degraded smoke detection sensitivity - internal screen requires cleaning).

During normal and low battery conditions, the LED flashes approximately once every 40 seconds. The smoke/heat detector will sound its built-in temporal horn when smoke activates the detector (the LED flashes rapidly), or when the air temperature reaches 57°C (135°F). A message is also sent to the wireless control panel. After the horn stops, a RESTORE message is transmitted to the control panel and the ID number can be cleared from the panel. The built-in Drift Compensation algorithm automatically maintains the sensitivity of the detector. Once the detector reaches its limit of compensation, it transmits a maintenance signal to the panel. When maintenance is required, the LED stops flashing.

The maintenance signal fully complies with the sensitivity test requirement specified in NFPA 72, 7 - 2.2.

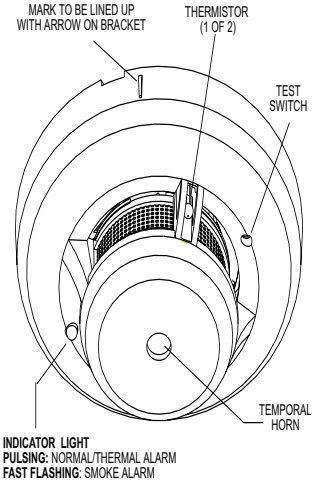

Figure 1. *General View*

2. SPECIFICATIONS

SMOKE AND HEAT DETECTION

Activity Indicator: LED flashes once per 40 sec.

Nominal Smoke Detection Sensitivity: 2.25% per foot obscuration

Heat Detection: Alarm if ambient temperature exceeds 57°C (135°F)

Alarm Sound Level: 85 dB min at 3 m (10 ft) at minimum battery voltage

TRANSMITTER AND CODING

Operating Frequency (MHz): 315

Transmitter's ID Code: 24-bit digital word, over 16 million combinations, pulse width modulation.

Overall Message Length: 36 bits

Supervision: Automatic signaling at 60-minute intervals.

Tamper Alerts: Tamper event (removal of the unit from its bracket) is reported once. Tamper restore is also reported once.

Compliance with standards: Designed to meet FCC part 15, MPT 1340 UL 268 recognized component.

ELECTRICAL DATA

Power Source: Two CR123A lithium batteries in series (6 VDC nominal).

Operating Voltage Range: 4.8 - 6.5 VDC

Current Drain: 14.5 µA standby (typical), 20 mA typical in operation

Battery Life (at room temperature): 3 years typical

Battery Supervision: Once every 60 minutes; automatic transmission of battery status data as part of any transmitted message.

PHYSICAL DATA

Operating Temperature: 0°C to 38°C (32°F to 100°F)

Relative Humidity: 10% to 93%, non-condensing

Dimensions: 140 mm (5.5") diameter with bracket x 52 mm (2.05")

Weight (with batteries): 218 g (7 oz)

APPENDIX A. THE VISONIC LTD. POWERCODE SYSTEM

A-1. The PowerCode Message Format

The PowerCode message transmitted includes the detector's 24-bit ID and a status report (see Fig. A1).

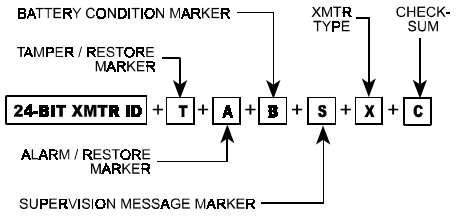

Figure A1. *Transmitted Data*

A message includes the following data:

- **Detector's ID:** Any message transmitted starts with the 24-bit ID assigned to the particular detector unit.
- **Tamper / Restore:** Upon removal of the unit's front cover, a message will be transmitted with a "tamper marker" ON. If the unit's cover is put back, a message will be transmitted with the tamper marker OFF ("Tamper Restore").
- **Alarm:** Once the detector is in alarm, a message will be transmitted with an "alarm marker" ON.
- **Low Battery:** A special battery condition marker is used to report the battery status in any message. The battery is tested once an hour and if found low, the "low battery marker" is set to ON in all following messages.
- **Supervision Message:** A special "supervision message marker", when set to ON, identifies the periodic supervision messages transmitted automatically at 1 hour intervals. This marker will be OFF in all other messages.
- **Transmitter Type:** A special marker indicates the type of the transmitter:
  - Supervised or non-supervised
  - Reports or does not report restorals after alarm
- **Checksum:** Checksum bits at the end of the message allow the receiver to determine whether an incoming message is valid (error-free). This feature considerably upgrades the reliability of the wireless communication link.

A-2. Anti-Collision

To overcome message collisions at the receiving end, PowerCode transmitters transmit 3 data bursts at random intervals, with 6 repetitions of the same message in each burst (Fig. A2). This redundancy improves the probability of reception.

Note: *Periodic supervision messages are an exception to this rule - they consist of a single 6-message burst.*

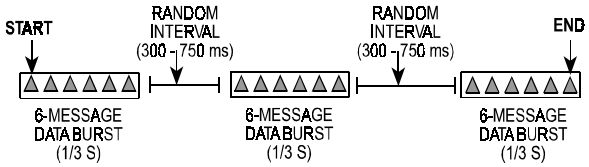

Figure A2. *Anti-Collision Transmission Sequence*

A 10 s plot, showing that transmitter stops transmitting in less than 5 s :