UNIVERSITY OF TORONTO | Facilities & Services

Fire alarm systems design standard

Revision 03

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28 46 00 – Fire detection and alarm

1 General

1.1 Acceptable manufacturers and model numbers are as follows:

A. Edwards EST - 4 series for systems with more than 8 zones or those using addressable devices.

B. Edwards EST - FS fire shield series for systems with 1 - 8 zones provided building is not sprinklered.

1.3 All installations with more than 32 zones shall utilize active field devices employing analog addressable technology.

1.4 Data communication links for active field devices shall be configured in a Data Communication Link Style A (DCLA) as defined by CAN/ULC-S524. System installation shall conform to CAN/ULC-S524.

1.5 System operation shall be single stage operation. Manual signal silence only.

1.6 Signalling appliances

A. New installations without Ontario Building Code (OBC)-mandated voice requirements shall utilize a 24VDC parallel-wired horn/strobe, employing a temporal signal pattern.

B. Existing installations/renovations: match existing.

1.7 Annunciation

A. Main control panel or Central Alarm and Control Facilities (CACF) shall be located at the designated fire department response point and used as the main annunciator.

B. Light emitting diode (LED) annunciation of, and liquid crystal display (LCD) annunciation of individual active field devices shall be provided via the alphanumeric LCD.

C. Water shield covers shall be provided for fire alarm panels in sprinklered areas to protect panel from water damage.

D. Fire alarm control panels shall be installed in a secure room that is temperature and humidity controlled. The temperature and humidity shall meet the manufacturer's recommendation.

1.8 Standpipe main flow detection shall annunciate as a supervisory indication only.

1.9 Automatic detection in elevator shafts shall be accomplished with heat detectors.

1.10 Smoke detectors shall be photoelectric type.

1.11 If fire detectors are required, then heat detectors shall be used.

1.12 Residences shall use photoelectric smoke alarms when a smoke alarm is required.

1.13 If the temperature in a room exceeds 95°C such as, boiler rooms, laundry rooms, rooms equipped with autoclave, then use high temperature, fixed type heat detectors. s.

1.14 For spaces that have a temperature below 95°C, rate of rise type heat detection shall be used.

1.15 Fire detection shall be installed in walk-in coolers or cold rooms. Refer to the University's sprinkler and standpipe standard for detailed requirements.

1.16 Recirculating air handling units shall meet the requirements for smoke detection only where specifically required by OBC. Recirculating air handling units that do not have a smoke control mode shall shut down automatically upon any common fire alarm activation and shall restart automatically upon fire alarm system restoration to normal.

1.17 Non-recirculating air handling units shall not be equipped with duct smoke detection.

1.18 Where deemed a requirement, requested by or agreed to by the Client for renovation projects in occupied buildings, provide temporary heat detectors in the area of work connected to the building's fire alarm panel. Provide Client with schematic design documents/ information of the system for review and comments before installation.

1.19 Printers and/or video displays shall not be used for fire alarm system annunciation. All information shall be displayed on the fire alarm control panel and/or the annunciator panel.

1.20 A fire alarm monitoring and signaling system is required in new buildings when fibre lines are installed within the building, the monitoring equipment installation and signaling shall be performed by an external monitoring company and monitored 24/7.

1.21 Monitoring installation requirements to the central monitoring system with Campus Safety is only achievable when copper lines are installed within an existing building – see Appendix A for detailed instructions and illustration from CAN/ULC-524.

1.22 New EST-4 systems shall include the following common control features (password protected):

A. Sprinkler test mode switch.
B. Silent test switch.
C. Ancillary bypass switch.
D. One minute inhibit bypass switch.
E. Fire curtain/fire shutter bypass.
F. Maglock bypass.

1.23 Beam type smoke detectors shall not be incorporated as a means of smoke detection.

1.24 Data gathering panels or remote annunciators (distributed intelligence) shall not be used.

1.25 Fire alarm main breaker on the electrical panel shall be equipped with a lock and permanently labeled in red with "FA". Acceptable permanent means of identification include a lamacoid or printable label with adhesive rated for metal panels.

1.26 In addition to the requirements from deliverable standard, the record drawings shall indicate locations of all fire alarm devices, conduits, junction boxes, and end of line devices. Drawings shall identify numbers of conductors and zones served, as well as device addresses for addressable systems.

2 Conduit and wiring

2.1 Fire alarm system conduits shall be identified every 3 metres by a band of red tape. Junction boxes for fire alarm system wiring shall be similarly identified or marked “F/A”. Signal circuit wiring shall be run in a separate conduit from initiating circuit wiring or communication wiring (including active field device wiring).

2.2 Where fire alarm junction boxes will normally be inaccessible, properly identified access hatches shall be provided. Locations of access hatches shall be shown on record drawings and shall be identifiable in the field by permanently affixed markings reviewed by U of T Fire Prevention.

2.3 All conduits shall enter the fire alarm control units from the bottom of the cabinet. Two additional knockouts shall be punched in the bottom of each cabinet, and fitted with a wire mesh screen to protect system components from possible water damage that may enter the control panel via conduits. Fire alarm control units shall be protected from sprinkler discharge by adequate drip trays.

3 Fire alarm and sprinkler verification

3.1 Refer to fire prevention standard operating procedure for fire alarm and sprinkler verification.

3.2 Refer to the Client’s building commissioning standard and fire sprinkler and standpipe design standard for coordination.

Appendix A: Monitoring installation requirements – (copper line)

The U of T has its own approved proprietary monitoring station at 21 Sussex Ave (Campus Safety). All wiring must terminate to this central monitoring system with alarm, supervisory and trouble information. Following requirements shall be followed:

1. New building fire alarm panels shall be designed and installed as per CAN/ULC-S524.
2. The design and installation location of the interconnection shall adhere to Edwards system specifications under the direction of U of T Fire Prevention.
3. The electrical contractor shall coordinate all wiring and tie-ins with U of T Fire Prevention.
4. The electrical contractor is responsible for terminating the demarcation connections required for the building. These connections shall be mounted in a 6" by 6" box located adjacent to the main control panel. Additionally, an extra demarcation box must be installed in the main IT room or telecom room of the building.
5. A 4-pair #18 AWG conduit shall be run between the two demarcation boxes. The demarcation boxes shall be installed and wired in accordance with CAN/ULC-S524 for central monitoring, at a location approved by U of T Fire Prevention. Refer to the Figure 1 below for clarification on the demarcation between fire alarm control unit and signal transmitting unit.
6. Demarcation box shall not be installed inside the fire alarm panel.
7. The electrical contractor shall arrange for setup of the monitoring connection at the nearest available node at least two weeks prior to City of Toronto permit sign-off. The electrical contractor shall coordinate this work with University of Toronto's Fire Alarm Testing & Maintenance Contractor at least two weeks in advance of its commencement. Verification will not be accepted without a letter of witnessing from the University's Fire Alarm Testing & Maintenance Contractor. The variance request form shall be submitted for proposed alternates and deviations.
8. The electrical contractor shall arrange with U of T Fire Prevention (with a minimum notice of 7 days in advance) for the final system tie-in. U of T Fire Prevention will then arrange for a qualified fire alarm contractor of their choice to perform the final connections and testing between demarcation point, fire panel and central monitoring for acceptable circuits.
9. Chubb Fire and Security shall be contacted by the electrical contractor to program new panel on the central monitoring system.
10. The electrical contractor shall carry the cost of this work.
11. Passive graphic display shall be provided and installed adjacent to the annunciator panel.

12. Before Ready-for-Takeover, U of T Fire Prevention will conduct a walkthrough with the contractor to review the entire fire alarm system.

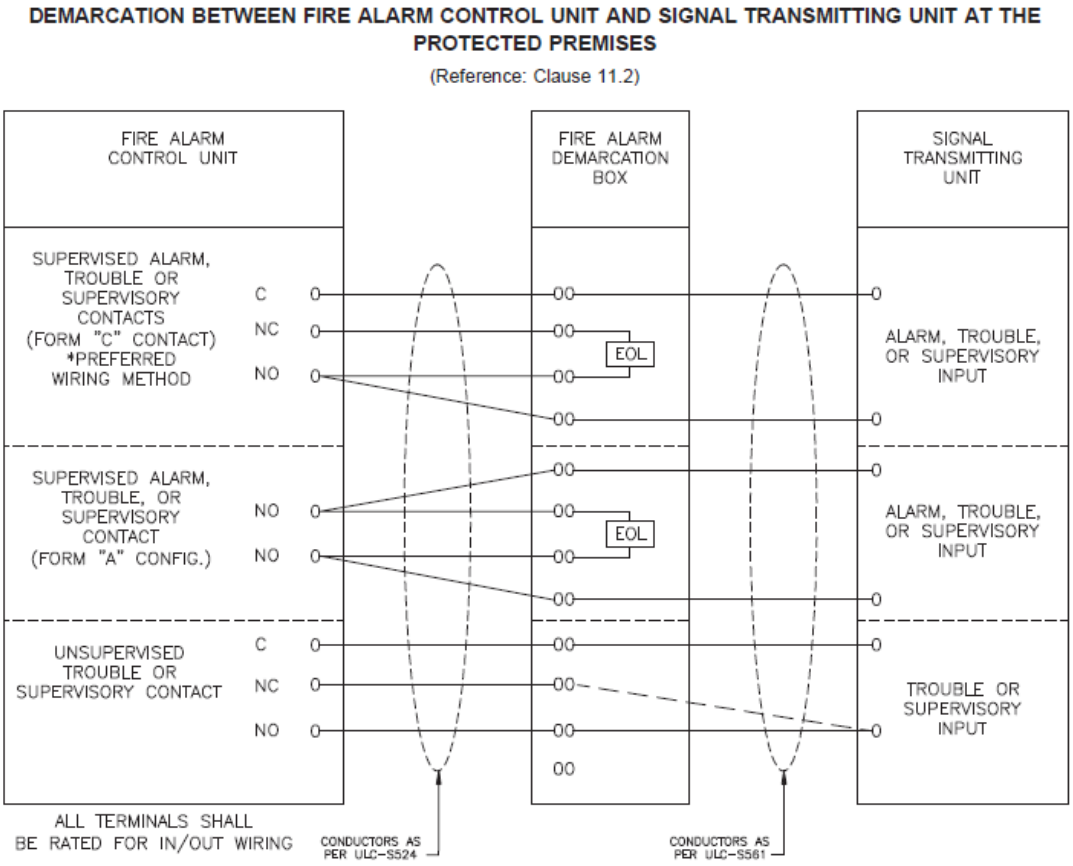

Figure 1 – Demarcation between fire alarm control unit and signal transmitting unit at the protected premises