Australian Standard®

Automatic fire detection and alarm sytems—Methods of test for actuating devices

Method 7: Electromagnetic interference test

1 SCOPE. This Standard sets out the method to determine the susceptibility of the actuating devices to electromagnetic interference. (See performance requirements in the appropriate device Standard.)

2 PRINCIPLE. With the actuating device energized it shall be subjected to electromagnetic fields. The actuating device shall be monitored for alarm or fault state.

3 APPARATUS. The following types of test equipment are recommended:

(a) Shielded room.

NOTE: To comply with local regulations and to prevent biological hazards to the testing personnel, it is recommended that these tests be carried out in a shielded enclosure or anechoic chamber.

(b) Stripline circuit (27 MHz to 500 MHz) (see Figures 1, 2, 3 and 4).

NOTES:

1. Small objects (250 mm × 250 mm × 250 mm) can be tested in a stripline circuit. The actuating device is placed in the centre of the cubicle part of the stripline on a support of foam plastic.
2. The filters on the top of the stripline (see Figure 3) are required to protect adequately the actuating devices signal and power lines and reduce conducted interference liable to affect the external test instrumentation (the use of ferrite rings on the external leads is recommended).

(c) Signal source. Signal generator(s) capable of covering frequency range and having automatic sweep capability of 0.005 octave/s (1.5×10^{-3} decade/s) or slower.

(d) Power amplifier. To amplify signal and provide antenna drive if signal source is incapable of delivering the required power.

(e) Field strength monitors.

(f) Associated equipment for powering and monitoring the actuating device.

NOTE: The use of other means of establishing and controlling the field is not ruled out and is acceptable providing the required conditions can be verified.

4 PROCEDURE. All testing of equipment shall be performed in conditions as close as possible to installed conditions. Wiring should be consistent with the manufacturer's recommended procedures. The radio frequency interference tests shall be as follows:

(a) Connect the actuating device to suitable indicating and monitoring equipment. If the wiring to and from the actuating device is not specified, unshielded untwisted wire shall be used and left exposed to the electromagnetic radiation for a length of 1 m from the point of connection to the actuating device under test. After this, the wiring is interfaced with electromagnetic interference filters and shielded wiring which connects to the test indicating and monitoring equipment.

(b) Place the actuating device to be tested in the centre of the stripline on a support of foam plastic and connect to power and signal leads according to Figures 1 and 3. Place the stripline 1 m away from walls and any metallic surface to prevent reflections. Connect power and signal lines through filters on the top of the stripline to the actuating device under test.

Determine the required field strength by reading the voltage between the two parallel plates using a voltmeter connected on a coaxial tee at the input of the stripline. This value is converted into field strength by the calibration factor.

The calibration factor of the stripline might be considered as the frequency response of the relationship between the input voltage and the field strength in the stripline, when measured with an isotropic sensor antenna in the anticipated location for the actuating device.