

## 4.6. Heat Detection and Alarm System

**4.6.1.** The Heat Detection and Alarm System shall comply with **Table 8.6.**, and the General Requirements for Fire Detection and Alarm System as per **Table 8.1.**

**Table 8.6: Heat Detection System**

ITEMS	REQUIREMENTS
<b>1. HEAT DETECTION SYSTEM</b>	<ul style="list-style-type: none"> <li>i. Heat detectors shall include in their installation instructions, technical data, and listing documentation the operating temperature and Response Time Index (RTI) as determined by the organization listing the device.</li> <li>ii. All heat sensing detectors shall be approved and listed by Civil Defence. The CoC shall clearly state the end use application of the Heat detectors.</li> </ul>
<b>2. OPERATING TEMPERATURE</b>	<ul style="list-style-type: none"> <li>i. Heat-sensing fire detectors shall be marked with their listed operating temperature.</li> <li>ii. Heat-sensing fire detectors where the alarm threshold is field adjustable shall be marked with the temperature range.</li> <li>iii. Spot Type heat detectors shall be marked with their RTI.</li> </ul>
<b>3. FIXED TEMPERATURE HEAT DETECTORS</b>	<ul style="list-style-type: none"> <li>i. Fixed-temperature heat detectors are designed to alarm when the temperature of the operating element reaches a specified point. The air temperature at the time of alarm can be considerably higher than the rated temperature (depending on the fire growth rate), because it takes time for the air to raise the temperature of the operating element to its set point. This condition is called thermal lag.</li> <li>ii. Fusible Link Type heat detectors made up of eutectic metals are used as a solder to secure a spring under tension. When the element fuses, the spring action closes contacts and initiates an alarm. Eutectic metals cannot be re-stored; either the device or its operating element must be replaced upon actuation.</li> <li>iii. Continuous Line Type detection uses a pair of steel wires in a normally open circuit. The conductors are held apart by a heat-sensitive insulation. The wires, under tension, are enclosed in a braided sheath to form a single cable assembly. When the design temperature is reached, the insulation melts, the two wires contact, and an alarm is initiated. Following an alarm, the fused section of the cable must be replaced to restore the system.</li> </ul>
<b>4. RATE COMPENSATION DETECTORS</b>	<ul style="list-style-type: none"> <li>i. A rate compensation detector is a device that responds when the temperature of the surrounding air reaches a predetermined level, with the rate of temperature rise having minimal effect on response (low thermal lag). Typical rate compensation type is spot type heat detectors.</li> </ul>
<b>5. RATE-OF-RISE HEAT DETECTORS</b>	<ul style="list-style-type: none"> <li>i. The rate-of-rise detector, however, will function when the rate of temperature increase exceeds a predetermined value, typically around 12 to 15°F (7 to 8°C) per minute. Rate-of-rise detectors are designed to compensate for the normal changes in ambient temperature (less than 12°F [6.7°C] per minute) that are expected under nonfire conditions.</li> </ul>