

4.2. Smoke Detection System

- 4.2.1.** The Smoke Detection and Alarm System shall comply with **Table 8.2.** and the General Requirements of Fire Detection and Alarm System as per **Table 8.1.**

Table 8.2: Smoke Detection and Alarm Systems

ITEMS	REQUIREMENTS
1. IONIZATION TYPE SMOKE DETECTORS (FOR INFORMATION ONLY. NOT ACCEPTABLE IN UAE)	<ul style="list-style-type: none"> i. An ionization smoke detector has a very small amount of radioactive material (an alpha emitter) that ionizes the air in the sensing chamber, rendering the air conductive and permitting a minute current flow through the air between two charged electrodes. This gives the sensing chamber an effective electrical conductance. When smoke particles enter the ionization area, they decrease the conductance of the air by attaching themselves to the ions, causing a reduction in ion mobility. The current flow is monitored and when conductance is below a predetermined level, the detector is in alarm. ii. With analog addressable detectors the alarm threshold can be varied to compensate for ambient conditions.
2. PHOTOELECTRIC TYPE SMOKE DETECTORS	<ul style="list-style-type: none"> i. The presence of suspended smoke particles generated during the combustion process affects the propagation of a light beam passing through the air. The effect can be utilized to detect the presence of a fire in two ways: <ul style="list-style-type: none"> a. obscuration of light intensity over the beam path OR b. scattering of the light beam. ii. Smoke detectors that operate on the principle of light obscuration consist of a light source, a light beam collimating system, and a photosensitive device. When dense smoke obscures part of the light beam, or less dense smoke obscures more of the beam, the light reaching the photosensitive device is reduced and this initiates the alarm. iii. In Smoke detectors using Scattering of light principle, when smoke particles enter a light path, scattering results. Smoke detectors utilizing the photoelectric light-scattering principle are usually of the spot type. They contain a light source and a photosensitive device arranged so the light rays normally do not fall onto the device. When smoke particles enter the light path, light strikes the particles and is scattered onto the photosensitive device, causing the detector to respond.
3. SELECTION OF SMOKE DETECTORS	<ul style="list-style-type: none"> i. The selection and placement of smoke detectors shall take into account both the performance characteristics of the detector and the areas into which the detectors are to be installed to prevent nuisance and unintentional alarms or improper operation after installation.
4. AMBIENT CONDITION	<ul style="list-style-type: none"> i. Smoke detectors shall not be installed where following conditions exist. <ul style="list-style-type: none"> a. Temperature is below 0°C. b. Temperature is above 38°C. c. Relative Humidity is above 93%. d. Air velocity is greater than 1.5 m/sec (300 ft./min).