

Seattle Fire Department

Permit Conditions

916-Install

Site Address: _____

Inspector: _____

Installation of Gas Detection Systems

Permission is hereby granted under the provisions of the Seattle Fire Code (SFC) to install a Gas Detection System in accordance with the Seattle Fire Code and the following conditions:

GAS DETECTION SYSTEMS

1. Permits shall be kept on the premises designated herein at all times and shall be posted in a conspicuous location or shall be kept on the premises in an approved location. (SFC 105.3.5)
2. Documentation of the gas detection system design and type of equipment to be installed shall be submitted for review for compliance with the SFC. (SFC 916.2.1)
3. The equipment used shall be designed for the type of gas detected and shall be installed per the manufacturer's instructions. (SFC 916.3)
4. The power supply shall be permanently connected to the building electrical power supply or shall be permitted to be cord connected to an unswitched receptacle using an approved restraining means that secures the plug to the receptacle. (SFC 916.4)
5. A trouble signal shall be initiated when power is loss to the gas detection system unless it is connected to a standby or emergency power source. (SFC 916.5)
6. Sensors shall be installed in approved locations where leaking gases are expected to accumulate. (SFC 916.6)
7. Signs shall be provided adjacent to gas detection system alarms signal devices that advise occupants of the nature of the signals and actions to take in response to the signal. (SFC 916.9)
8. Gas sensors and gas detection systems shall not be connected to fire alarm systems unless approved by the fire code official and they are connected in accordance with the fire alarm equipment manufacturer's instructions. (SFC 916.10)
9. Sensor calibration shall be confirmed at the time of sensor installation and calibration shall be performed at the frequency specified by the sensor manufacturer. Inspection and testing of gas detection systems shall be conducted not less than annually. (SFC 916.11)
10. Gas sampling shall be continuous. Analysis shall be processed immediately with the following exceptions:
 1. Hazardous Production Material (HPM) gas analysis shall be performed at intervals not exceeding 30 minutes.
 2. Highly Toxic or Toxic gas that is not an HPM, the gas analysis shall be performed at intervals not exceeding 5 minutes.
 3. Where a less frequent or delay sampling interval is approved. (SFC 916.7)

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CARBON DIOXIDE GAS

1. Gas detection systems for insulated carbon dioxide systems shall have sensors provided within 12 inches of the floor in the area where the gas is expected to accumulate. The gas detection system shall be designed to do the following:
 1. Activate an audible and visible supervisory alarm at a normally attended location upon detection of a carbon dioxide concentration of 5,000 ppm.
 2. Activate an audible and visible alarm with the room or area where the gas detection system is installed upon a detection of carbon dioxide concentration of 30,000 ppm. (5307.3.2)
2. Gas detection systems for carbon dioxide enrichment systems shall have sensors provided within 12 inches of the floor in the area where the gas is expected to accumulate, or leaks are most likely to occur. The gas detection system shall be designed to do the following:
 1. Activate a low-level alarm upon detection of a carbon dioxide concentration of 5,000 ppm.
 - i. The gas detection system upon a low-level alarm shall automatically stop the flow of carbon dioxide to the piping system, activate the mechanical exhaust ventilation system, and activate an audible and visible supervisory alarm signal at an approved location within the building.
 2. Activate a high-level alarm upon detection of a carbon dioxide concentration of 30,000 ppm.
 - i. The gas detection system upon a high-level alarm shall automatically stop the flow of carbon dioxide to the piping system, activate the mechanical exhaust ventilation system and activate an audible and visible evacuation alarm both inside and outside of the carbon dioxide enrichment area, and the area in which the carbon dioxide containers are located.(5307.4.3)

FLAMMABLE GASES

1. A gas detection alarm shall be initiated where any sensor detects a concentration of gas exceeding 25 percent of the lower flammability limit (LFL). (SFC 916.8)
2. Hydrogen fuel gas rooms with gas detection systems shall have the following occur upon activation:
 1. Initiation of distinct audible and visible alarm signals both inside and outside of the hydrogen fuel gas room.
 2. Automatic activation of the mechanical exhaust ventilation system. (SFC 5808.5.1)
3. Failure of the hydrogen gas detection system shall automatically activate the mechanical exhaust system, stop hydrogen generation, and cause a trouble signal that will sound at an approved location. (SFC 5808.5.2)
4. Stationary fuel cell power systems gas detection systems shall be provided in an approved location in the fuel cell power system enclosure, the exhaust system or the room that encloses the fuel cell power system. The system shall be designed to activate at a flammable gas concentration of not more than 25 percent of the lower flammable limit (LFL). A gas detection system activation shall automatically close valves between

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the gas supply and the fuel cell power system, shut down the fuel cell power system and initiate a local audible and visible alarm in approved locations. (SFC 1206.6.3 and 1206.6.3.1)

HIGHLY TOXIC OR TOXIC GASES

1. The gas detection system shall detect the presence of gas at or below the Permissible Exposure Limit (PEL) or ceiling limit of the gas for which detection is provided. The gas detection system shall be capable of monitoring the discharge from the treatment system at or below one-half the Immediately Dangerous To Life and Health (IDLH) limit and shall initiate a local alarm and transmit a signal to a constantly attended control station when a short-term hazard condition is detected. This alarm shall be both audible and visible and shall provide warning both inside and outside the area where the gas is detected. The audible alarm shall be distinct from all other alarms. (SFC 6004.2.2.10 and 6004.2.2.10.1)
2. The gas detection system shall automatically close the shutoff valve at the source on gas supply piping and tubing related to the system being monitored unless:
 1. Reactors utilized for the production of gases that are operated at pressures less than 15 psig.
 2. Constantly attended
 3. Provided with emergency shutoff valves that have ready access. (SFC 6004.2.2.10.2)