23.0 - Carbon Monoxide

- Exposure
- Actions to Take
- Effects of Exposure
- Plan of Action

CARBON MONOXIDE

All schools in the Pembina Trails School Division are equipped with carbon monoxide (CO) detectors. These detectors can be found attached to the walls approximately six feet or higher. Each detector has a list of instructions posted beneath it in the event that the digital display starts showing numbers. The monitor will alarm when there is approximately 125 ppm of carbon monoxide present.

CO is an invisible, odorless, tasteless and non-irritating gas – completely undetectable to your senses. Carbon monoxide alarms are designed to detect carbon monoxide from any source of combustion but will not detect smoke, fire or any other gases. These sensors are designed to only detect the presence of carbon monoxide at the sensor; however, carbon monoxide may be present in other areas of the school as well.

Possible sources that can produce carbon monoxide include:

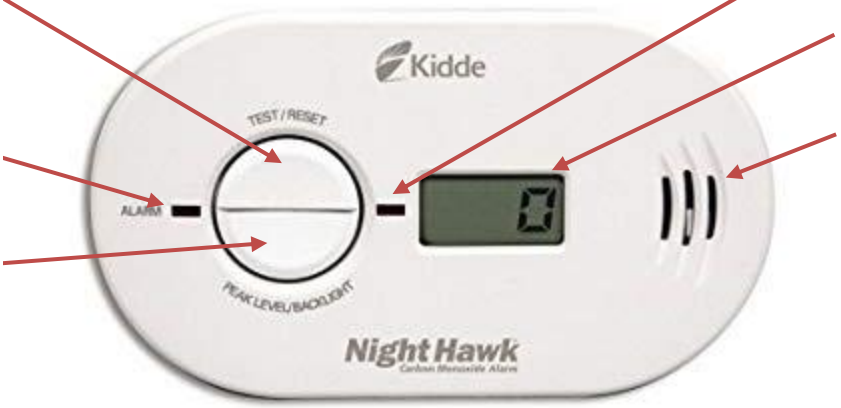
- Appliances used for heating and cooking;
- Vehicles running adjacent to fresh air intake vents;
- Burning of fossil fuels such as gasoline, propane, natural gas, oil and wood;
- Use of fuel fired appliances that are malfunctioning, improperly installed or not properly ventilated such as: automobiles, furnaces, gas ranges/stoves, gas clothes dryers, water heaters, portable fuel fired appliances, blocked chimneys or flues, back drafts, changes in air pressure, corroded or disconnected vent pipes, lose or cracked furnace exchangers, etc.

The following conditions can result in transient CO situations:

- Excessive spillage or reverse venting of fuel burning appliances caused by outdoor wind conditions;
- Vent pipe connections vibrating loose from clothes dryers, furnaces or water heaters;
- Negative pressure resulting from the use of exhaust fans;
- Simultaneous operation of several fuel-burning appliances competing for limited internal air;
- Obstructions in or unconventional, vent pipe designs which can amplify the above situations;
- Extended operation of unvented fuel-burning devices (range, oven, etc.);
- Temperature inversions which can trap exhaust gases near the ground. Etc.

CO alarms provide an early warning to the presence of carbon monoxide, usually before a healthy adult would experience symptoms. This early warning is possible only if your CO alarm is located, installed and maintained as required by the manufacturer. All CO alarms have limitations. Like any other device, CO alarms are not fool-proof and have a limited operational life. CO alarms must be tested monthly to ensure it is operating properly. If the unit fails to test properly or fails its self-diagnostic test, the unit must be replaced.

- Test/Reset Button
- Red Alarm Light
- Peak level Indicator



- Green Operating Light
- Display
- Speaker

Test the unit monthly by pressing the test/reset button. If the unit is operating properly, you will hear four quick beeps, followed by 5 seconds of silence, followed by four quick beeps. The display will show three "eights" (888) and then show a number, usually around 200. Within several seconds, the unit will return to monitor for CO (display 0).

Note: you do not need to press the test/reset button to take a CO reading. Pressing this button simply performs a unit test or silences an existing alarm. To take a CO reading simply look at the display.

BASIC EMERGENCY STEPS:
When the unit senses a dangerous level of CO, it will emit a loud alarm pattern: 4 quick beeps, followed by 5 seconds of silence. The cycle repeats as long as the dangerous CO is present. The monitor will alarm when there is approximately 125ppm of carbon monoxide present. When this occurs, the school should:

- ☐ Prepare to evacuate entire school and immediately move to fresh air – outdoors.
- ☐ Pull the fire alarm and initiate the EVACUATION procedures.
- ☐ Call 911, Pembina Trails emergency phone line (evacuation), divisional Safety Officer.
- ☐ Conduct roll call to ensure that all persons are accounted for.
- ☐ Do not re-enter the premises until emergency services have arrived and cleared the area.
- ☐ Provide first aid to students and staff showing signs of exposure: headache, fatigue, nausea, dizziness, confusion, shortness of breath
- ☐ Emergency services will assess the situation, ventilate the area, ask the custodian to reset the CO monitor.
- ☐ Note:
    - Never reset the CO detector if the CO problem has not been corrected.
    - Pressing the test/reset button will terminate the alarm.
    - If the CO condition that caused the alert in the first place continues, the alarm will reactivate.
    - If the unit alarms again within 6 minutes, it is sensing high levels of CO, which can quickly become a dangerous situation.

SPECIFIC EMERGENCY REQUIREMENTS FOR EACH LEVEL OF CO:

CO Exposure (PPM)	Action	Effects of Exposure	Plan of Action
0-2	**No action**	None	Normal outdoor ambient level
3-9	**No action**	No effect in healthy adults	**The Office of the Fire Commissioner document OFC ITSM 11-0004** states: "Carbon monoxide is also produced by humans as they breathe. If you have a CO detector with a digital readout it may indicate small amounts of CO in the air."
10-25	**Investigate to find source of carbon monoxide.** Notify Facilities & Operations Department and contact the Utilities Supervisor.	No effect in healthy adults	Permissible limits for carbon monoxide are 25 ppm averaged over 8 hours with a 200ppm peak limit. Concentration of CO between 1 and 25 ppm can often occur in normal, everyday conditions. Concentrations of CO below 20ppm may be an indication of a condition that may appear today and never reappear. Some CO conditions may start out as low level leaks but could develop into CO concentrations that may become harmful. If this happens, the CO alarm will detect the dangerous level and alarm, notifying you and others of the conditions.
26-50	**Move staff and students to another area of the building. Bring outdoor clothing. Do not ignore high concentration readings above 35 PPM or a sounding CO alarm.**	The fetus of a pregnant woman is adversely affected by carbon monoxide she inhales.	People with heart or lung conditions or other health problems can be more sensitive to the effects of carbon monoxide.
51-124	**Prepare to evacuate entire school in the event levels reach or exceed 125ppm.**	Slight headache, fatigue, shortness of breath. The fetus of a pregnant woman is adversely affected by carbon monoxide she inhales.	People with heart or lung conditions or other health problems can be more sensitive to the effects of carbon monoxide.

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125	**Unlike a fire evacuation students have time to quickly put on their coats and boots. Carbon monoxide alarm will sound. Evacuate entire building:** **1. Prepare children quickly;** **2. Evacuate school and pull fire alarm.**	**Headache, fatigue, nausea, dizziness**	**At this level, unlike a fire evacuation, students have time to quickly (minutes) put on their coats and boots and evacuate the school.** **Call the Emergency notification phone line to report a gas leak. # 204.488.1767 ext. 0911**
Over 200	**Evacuate Immediately using fire evacuation procedures.**	Headache, fatigue, nausea, dizziness	**Do not stop for coats, etc. Leave the building immediately.**
400	**Evacuate immediately using fire evacuation procedures**	Severe headache, fatigue, nausea, dizziness, confusion, can be life threatening after 3 hours of exposure.	**Do not stop for coats, etc. Leave the building immediately.**
800	**Evacuate immediately using fire evacuation procedures**	Headache, confusion, collapse, death if exposure is prolonged	**Do not stop for coats, etc. Leave the building immediately.**
1600	**Evacuate immediately using fire evacuation procedures**	Less than 203 hours of exposure causes convulsions, loss of consciousness, death	**Do not stop for coats, etc. Leave the building immediately.**
6400	**Evacuate immediately using fire evacuation procedures**	30 minutes of exposure causes convulsions, loss of consciousness, death.	**Do not stop for coats, etc. Leave the building immediately.**
12,800	**Evacuate immediately using fire evacuation procedures**	1-3 minutes of exposure causes convulsions, loss of consciousness, death	**Do not stop for coats, etc. Leave the building immediately.**

PROCEDURES

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