

# Portable Combustion Analyzers as Safety Devices

Application Note #HV-13-0602



## Portable Combustion Analyzers Can Be Used as Safety Tools for Technicians in Residential or Commercial HVAC Applications

With all residential & commercial boilers, furnaces, & heaters, there is an inherent risk that cracks in the heat exchanger, improperly maintained ducting systems, or other malfunctions can cause combustion gases to leak into the living or working environment of a building. During the combustion process, an inadequate supply of oxygen can result in the production of higher than normal concentrations of carbon monoxide. Thus, if a combustion system is not properly maintained, the occupants of the building or any HVAC contractors working in the boiler room may be at risk of exposure to dangerous levels of carbon monoxide.

Carbon monoxide (CO) is a colorless, odorless, tasteless, flammable and highly toxic gas that can cause adverse health effects if inhaled at certain concentrations. The table below describes the effects of different levels of exposure.

Combustion gas analyzers can be used to measure the levels of ambient CO present in a boiler room and throughout the building to ensure the safety of all occupants.



Concentration	Effects
9 ppm	The maximum allowable concentration for short term exposure in a living environment (ASHRAE).
35 ppm	The maximum allowable concentration for continuous exposure in any eight hour period according to US federal law.
200 ppm	The maximum allowable concentration for any time according to OSHA. Can cause headaches, fatigue, and nausea after 2-3 hours.
800 ppm	Nausea and convulsion within 45 minutes and death within 2-3 hours.
3200 ppm	Headaches and nausea within 5-10 minutes and death within 30 minutes.

### Instrumentation Solution:

The E Instruments models BTU900 and BTU1100 are designed with a built-in ambient CO monitor that can accurately detect dangerous concentrations of CO. This is an essential tool for all boiler technicians, installers, & service providers that enables them to confirm that the HVAC system is operating properly and is not compromising the safety of the equipment or the people in the building.

