Air Conditioning & Heating

FALL & WINTER CHECK UP

With each heating and cooling season a system check up is important to ensure the proper operation of your air conditioning system as well as ensure the health and safety of the occupants in your home. Following our fall check up recommendation will help your system go a long ways.

The Heating Fall & Winter Check up Includes:

- Confirm system operations. Cycle through thermostat / comfort controller.
- Life Safety check for carbon monoxide in living spaces.
- Test for combustion leaks in attic. Test heat exchanger for cracks, holes, and leaks.
- Check and measure supply and return air temperatures.
- Calculate rise across heat exchanger. (30 – 60 degrees, acceptable)
- Check system voltage to ensure it is within the acceptable range. (120V +/-5%)
- Check and compare amperage on blower motor to name plate rating.
- Check and compare amperage on inducer motor to name plate rating.
- Check operation of high limit safety switches.
- Check flame roll out safety switches.
- Check inducer motor vacuum pressure safety switch.
- Visually check and verify flame safety sensor, remove and clean, as needed.
- Check blower high temperature limit safety switch.
- Check ignitor or remove and clean pilot assembly / orifice, as needed.
- Verify proper vent pipe exhaust. Check flue for obstructions.
- Inspect all gas connections; lines and flex gas hose within 5' of the furnace.
- Manually open and close gas cutoff valve to verify operation.
- Inspect all wiring and electrical connections.
- Test door safety switch.
- Visually inspect for water leaks from the air conditioning system.
- Visually inspect accessible & visible ducts from the equipment platform.

Carbon Monoxide Levels & Risks

It is important and sometimes critical to evaluate carbon monoxide levels and the associated risks of exposure.

CO Level	Action
1-4ppm	Normal levels in human tissues produced by body.
3-7ppm	6% increase in the rate of admission in hospitals of non-elderly for asthma. (Sheppard-1999)
5-6ppm	Significant risk of low birth rate if exposed during last trimester (Ritz & Yu-1999)
5ppm	1st visual display on NSI 3000 Low Level CO Monitor
9ppm	ASHRAE standard for allowable spillage from vented appliances, indoors, for 8 hours exposure daily. EPA standard for outdoors for 8 hours and a maximum 3 times per year. (Clean Air Act)
10ppm	Outdoor level of CO found associated with a significant increase in heart disease deaths and hospital admissions for congestive heart failure. (JAMA, Penny) lst ambient level occupants should be notified-NCI Protocol
15-20ppm	First level World Health Organization lists as causing impaired performance, decrease in exercise time and vigilance 1st Alarm level for NSI 3000 Low Level CO Monitor-5 minutes
25ppm	Maximum allowable in a Parking Garage (International Mechanical Code)
27ppm	21% increase in cardio respiratory complaints (Kurt-1978)
30ppm	Earliest onset of exercise induced angina (World Health Organization) 1st visual display on UL2034 approved CO Alarm-Must not alarm before 30 days
35ppm	US NIOSH recommended 8 hour maximum workplace exposure EPA standard for outdoors for 1 hour and a maximum of 1 time per year Level many fire departments wear breathing apparatus before entering 2nd ambient level occupants should be notified and space ventilated 2nd Alarm level for NSI 3000 Low Level Monitor-5 minutes
50ppm	US OSHA recommended 8 hour maximum workplace exposure Maximum NCI level for Unvented appliances
70ppm	1st Alarm level of UL2034 approved CO Alarms- 2-4 hours 3rd Alarm level for NSI 3000 - 30 seconds NSI 3000 Low Level Monitor cannot be silenced by reset button
100ppm	Maximum NCI CO level during run cycle in all vented appliances(stable) Maximum NCI CO for all oil appliances
200ppm	First listed level(established in 1930) healthy adults will have symptoms-headaches, nausea NIOSH & OSHA recommend evacuation of workplace Maximum "Air Free" CO for vented water heater and unvented heaters (ANSI Z21) UL approved alarms must sound between 30 – 60 minutes(NSI 3000 – 30 seconds)
400ppm	Healthy adults will have headaches within 1-2 hours. Life threatening after 3 hours Maximum "Air Free" CO in all vented heating appliances (ANSI Z21) Maximum EPA levels for industrial flue exhaust UL Alarms must alarm within 15 minutes (NSI 3000 – 30 seconds) Maximum recommended light-off CO for all appliances – NCI (except oil)
800ppm	Healthy adults will have nausea, dizziness, convulsions within 45 minutes. Unconscious within 2 hours then Death(established in 1930) Maximum "Air Free" CO for unvented gas ovens (ANSI Z21)
800ppm+	Death in less than one hour
2000ppm	EPA standard for new vehicle emissions
3000ppm+	Typical emissions from propane lift trucks, gasoline powered tools etc. Death in less than 30 minutes.

NCI™ National Comfort Institute, Inc.