

HEATING AND VENTILATION APPLICATION PRINCIPLES

CLASS FORMAT:

Lab + classroom

The participant is able to “learn-by-doing” in the course; this knowledge can be transferred to the workplace.

STANDARD CLASS SIZE:

For the best results, NTT recommends a class of 12 participants.

NTT PROVIDES:

- Two-days (16 contact hours) of on-site instruction
- Textbooks and lab manuals
- Classroom consumables
- Completion certificates
- Shipping and instructor travel logistics

CLIENT PROVIDES:

- Classroom, with easy access, of 750 square feet or greater
- Projection screen, white board and/or flip chart(s)
- A dock facility or a forklift to unload the training equipment
- A pallet jack to move the crates around after they have been unloaded may also be needed
- The equipment should be placed in the training room for the NTT instructor to test and set up prior to the start of training

SHIPPING:

- 1 crate @ 64” x 44” x 38” = 600 lbs

Learn how to maintain peak efficiencies of HV systems while minimizing the risk of downtime due to unscheduled maintenance and repair.

Since HV system problems are electrical, this course teaches you the proper procedures and equipment for electrical safety testing.

Electrical test meters are also important. These skills are practiced in hands-on exercises with the actual type of test instruments, such as an ohmmeter, voltmeter and ammeter.

COURSE AGENDA

GAS FIRED HEATING SYSTEMS: DESIGN AND OPERATION

- Gas fuels and combustion theory
- Gas regulators, valves and burners
- Heat exchangers
- Pilot safety controls: thermocouples, standing pilot and direct spark
- Glow-coil ignition, hot surface ignition
- Safety devices and controls

CONTROLS AND CONTROL SYSTEMS

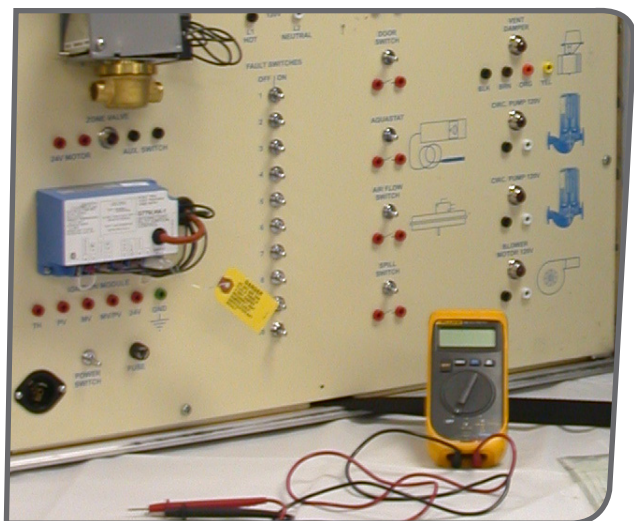
- Thermostats
- Anticipators

GAS FIRED HEATING SYSTEMS: MAINTENANCE AND TROUBLESHOOTING

- Combustion efficiency
- Troubleshooting ignition problems
- Preventive maintenance procedures

PSYCHROMETRICS (STUDY OF AIR)

- Comfort, humidity, humidification, dehumidification
- Wet-bulb and dry-bulb temperature, relative humidity
- Psychrometric chart and air movement
- Fans, centrifugal and axial
- Filter design, selection and maintenance



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COURSE AGENDA

ELECTRICAL COMPONENTS OF HVAC SYSTEMS

- Electrical fundamentals, troubleshooting and safety
- Electrical diagrams
- Electrical test equipment
- Electrical system components

MAINTENANCE AND TROUBLESHOOTING OF FURNACES AND ROOFTOP UNITS

- Fault occurrence
- Scheduled and typical maintenance
- Early detection and diagnosis of problems
- Troubleshooting techniques

HANDS-ON EXERCISES

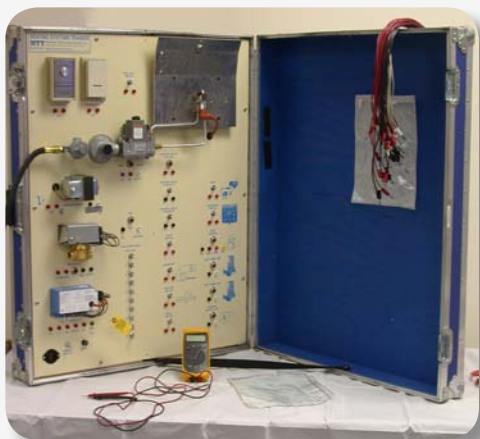
- Reading electrical schematic drawings
- Furnace wiring exercises
- Troubleshooting burner systems
- Troubleshooting wiring problems
- Manifold gas pressure
- Combustion analysis
- Motor terminal identification
- Capacitor testing and replacement
- Measuring ampere draw, voltage and resistance



Participants learn the different types of troubleshooting tests: current, frequency, resistance, continuity, capacitor and diode testing.



Participants learn how to troubleshoot safely based on circuits being open and closed.



Participants learn how to wire equipment based on HVAC industry standards.