



HEATING, VENTILATION, AC & REFRIGERATION

ELIGIBILITY

Open to active SkillsUSA members enrolled in programs with heating, ventilation, air conditioning and refrigeration as the occupational objective.

CLOTHING REQUIREMENTS

Work Pants and shirt, black or brown leather work shoes, and safety glasses with side shields or goggles. No identification of school names on shirts, no torn pants, no sneakers. (Prescription glasses can be used only if they are equipped with side shields. If not, they must be covered with goggles.)

Note: At the district level if a student is not able to wear the official SkillsUSA attire he/she may wear an outfit that would be acceptable in their specific field of study. Please keep in mind that official SkillsUSA attire will be required at the state and national level.

EQUIPMENT AND MATERIALS SUPPLIED BY HOST

1. All heating and air conditioning units, thermostats necessary for the competition
2. Test equipment, UEI digital VOM meters, yellow jacket refrigerant gauges, P/T charts, digital clamp on pipe thermometers, you may bring your own.
3. All tools and supplies to complete the contest.

EQUIPMENT AND MATERIALS SUPPLIED BY CONTESTANT

1. All students must have a one-page, typewritten resume.
2. Safety goggles and work gloves for brazing and refrigeration.
3. Work pants and shirt, Leather work boots or shoes.
4. Electrical digital meter, bring your own or we will provide, your choice
5. Basic hand tools for cutting copper tube, measuring tape, marker or pencil, thermostat screwdriver, wire stripper, pocket level, P/T chart.
6. NO torches, refrigerant gauges, cordless screw guns needed,

SCOPE OF THE CONTEST - (DEFINED BY THE NATIONAL COMPETITION REGULATIONS)

(District Competitions are meant to be a scaled down version of National Competition. It is important for the students to participate in a competition that will reflect a cross-section of the industry skills needed to prepare them for the state and national levels)

This contest is defined by HVAC&R industry standards as set by Pennsylvania Program of Studies standards and objectives. The contest is divided into two parts: a written exam and a series of testing stations designed to assess knowledge and hands-on abilities according to HVAC&R industry standards.

KNOWLEDGE PERFORMANCE

The contest will include a 20-question written knowledge exam assessing knowledge of HVACR industries standards in safety, theory of heat, basic controls, electric motors, refrigeration components, refrigeration cycle, and basic gas heating systems.



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SKILL PERFORMANCE

The contest includes a series of testing stations designed to assess skills identified by industry HVAC&R standards. Industry equipment used during the work stations portion of the contest will include: copper joining techniques such as brazing, flaring, and bending, Goodman 90 % AFUE gas furnace troubleshooting using diagnostic circuit board chart to locate one problem and recommend repair options, install Honeywell low voltage heat and cooling single stage thermostat, Electrical troubleshooting of a fuse, compressor windings, and run capacitor to determine if they are good or bad, Check operation of a working Goodman heat pump unit in cooling mode; able to record Voltage, Amps, Pressure Readings high and low side, determine both superheat and subcooling using Pressure temperature charts and digital thermometers at outdoor unit suction and liquid line and be able to determine if the refrigerant charge is correct, according to the manufacturers charging chart which will be provided.

HVAC&R RATING SHEET

Items Evaluated	Possible Points	Contestant Points
Written Test - 20 questions	20	
Solder Copper	100	
Gas Furnace Troubleshooting	10	
Install Low Voltage Thermostat	10	
Electrical Test Cartridge Fuse	10	
Electrical Test Compressor Motor Windings	10	
Electrical Test Capacitor	10	
Check Operation of a working AC unit in cooling mode	100	
	Subtotal = 270	
No Resume	Deduction -10	
Safety Penalty	Deduction - 10	
Clothing Penalty	Deduction -5	
	TOTAL	

Note: No cell phones or other electronic devices may be used at any time during a competition; this includes using a calculator function on a cell phone for competitions in which calculators are permitted.

Note: Scorecards should only be used as guidance. Changes may occur.