

Building Technologies Program

Tax Deduction Qualified Software

Hourly Analysis Program (HAP) version 4.40.0.61

On this page you'll find information about the HAP version 4.40.0.61 <u>qualified computer software</u> (<u>buildings.energy.gov/qualified_software.html</u>), which calculates energy and power cost savings that meet federal tax incentive requirements for commercial buildings.

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Statements in quotes are from the software developer.

Internal Revenue Code §179D (c)(1) and (d) Regulations Notice 2006-52, Section 6 requirements as amplified by Notice 2008-40, Section 4 requirements. (1) The name, address, and (if applicable) web site of the software Carrier / United Technologies developer: Corporation Carrier Software Systems Bldg TR-4, Room 400A P. O. Box 4808 Syracuse, New York 13221 (2) The name, email address, and telephone number of the person to Carrier Software Systems contact for further information regarding the software; Software.systems@carrier.utc.com +1 (800) 253-1794 (3) The name, version, or other identifier of the software as it will Hourly Analysis Program version appear on the list; 4.40.0.61 Provided to DOE. (4) All test results, input files, output files, weather data, modeler reports, and the executable version of the software with which the tests were conducted; and (5) A declaration by the developer of the software, made under penalties of perjury, that-(a) The software has been tested according to ANSI/ASHRAE "The software has been tested Standard 140-2007 Standard Method of Test for the Evaluation of according to ANSI/ASHRAE Standard Building Energy Analysis Computer Programs; 140-2007 Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs." (b) The software can model explicitly— "Carrier HAP v4.40 complies." (i) 8,760 hours per year; (ii) Calculation methodologies for the building components being "Carrier HAP v4.40 complies." modeled; (iii) Hourly variations in occupancy, lighting power, miscellaneous "Carrier HAP v4.40 complies." equipment power, thermostat setpoints, and HVAC system operation, defined separately for each day of the week and holidays; (iv) Thermal mass effects; "Carrier HAP v4.40 complies."

(vi) Ten or more thermal zones: (vi) Part-load performance curves for mechanical equipment: (vii) Capacity and efficiency correction curves for mechanical heating and cooling equipment; and (viii) Alariside and water-side economizers with integrated control. (c) The software can explicitly model each of the following HVAC systems listed in Appendix G of Standard 90.1-2004: (l) Packaged Terminal Air Conditioner (PTAC) (air source), singlezone package (through the wall), multi-zone hydronic loop, air-to-air DX coil cooling, central boiler, hot water coil. (ii) Packaged Terminal Hatel Pump (PTHP) (air source), singlezone package (through the wall), air-to-air DX coil heat/cool. (iii) Packaged Single Zone Air Conditioner (PSZ-AC), single-zone air, air-to-air DX coil cool, gas coil, constant-speed fan. (iv) Packaged Single Zone Air Conditioner (PSZ-AC), single-zone air, air-to-air DX coil cool/heat, constant-speed fan. (v) Packaged Variable-Air-Volume (PVAV) with reheat, multi-zone hydronic loop, air-to-air DX coil, vAV fan, boiler, hot water VAV terminal boxes. (vi) Packaged Variable-Air-Volume with parallel fan powered boxes (PVAV with PFP boxes), multi-zone air, DX coil, vAV fan, boiler, hot water VAV with PFP boxes), multi-zone boxes, electric reheat. (vii) Variable-Air-Volume with parallel dan powered boxes (VAV with PFP boxes), multi-zone air, air-handling unit, chilled water coil, hot water coil, thot water value water coil, not water coil, valuer, air, air-handling unit, chilled water coil, not water coil, valuer, air, air-handling unit, chilled water coil, out water on, valuer, air, air-handling unit, chilled water coil, out water coil, valuer, air, air-handling unit, chilled water coil, not water coal, valuer, air, air-handling unit, chilled water coil, out water on, valuer, and power costs separately: and (i) Design load calculations to determine required HVAC equipment capacities and air and water flow rates. (e) The software can explicitly model: (ii) Mixed mode (natural and mechanical) ve	T	
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	(ii) Mixed mode (natural and mechanical) ventilation.	model this feature and shall not be used for projects with that
(iii) Earth tempering of outdoor air. "Carrier HAP v4.40 does not explicitly	(iii) Earth tempering of outdoor air.	"Carrier HAP v4.40 does not explicitly

	model this feature and shall not be used for projects with that technology."
(iv) Displacement ventilation.	"Carrier HAP v4.40 does not explicit model this feature but can model by equivalent means."
(v) Evaporative cooling.	"Carrier HAP v4.40 does not explicit model this feature and shall not be used for projects with that technology."
(vi) Water use by occupants for cooking, cleaning or other domestic uses.	"Carrier HAP v4.40 does not explicit model this feature and shall not be used for projects with that technology."
(vii) Water use by heating, cooling, or other equipment, or for on site landscaping.	"Carrier HAP v4.40 does not explici- model this feature and shall not be used for projects with that technology."
(viii) Automatic interior or exterior lighting controls (such as occupancy, photocells, or time-clocks).	"Carrier HAP v4.40 can explicitly model automatic interior or exterior lighting controls such as occupancy sensors or time-clocks, but cannot model photocells."
(ix) Daylighting (sidelighting, skylights, or tubular daylight devices).	"Carrier HAP v4.40 does not explicit model this feature and shall not be used for projects with that technology."
(x) Improved fan system efficiency through static pressure reset.	"Carrier HAP v4.40 does not explici model this feature and shall not be used for projects with that technology."
(xi) Radiant heating or cooling (low or high temperature).	"Carrier HAP v4.40 does not explicing model this feature but can model by equivalent means."
(xii) Multiple or variable-speed control for fans, cooling equipment, or cooling towers.	"Carrier HAP v4.40 explicitly models these features."
(xiii) On-site energy systems (such as combined heat and power systems, fuel cells, solar photovoltaic, solar thermal, or wind).	"Carrier HAP v4.40 does not explicite model these features and shall not used for projects with that technology."

Effective Date: 10 April 2009