

Example Functional Testing Scope Outline

Project: _____ Date: _____ Prepared by: _____

Last Edit Date _____

System or Equipment	Equipment or Component Tested	General Description of Modes and Functions to Test	Testing Method (Manual, Trend-log, Data-logging)	Sampling Strategy (list applicable equip.)	Who Executes Test	Seasonal Test Req'd (list applicable equip. & modes)
Chilled Water System	Chillers, primary and secondary CHW pumps, CDW pumps, cooling tower (CT), VFD, controls	All sequences of chiller and cooling tower and related pumps (startup, shutdown, load changes, resets, lead lag action, alarms, lockouts), VFD control, temporary power, chiller capacity and efficiency, CT capacity and efficiency, part load curves with manuf.	Mostly M, with some T and some D	Test all including standby equip., except capacity & efficiency test of chiller & CT need only be done on 1 piece, even if identical	Mech. leads with help from: Cntrl	Chiller test must be done in summer, CT in summer and <u>√</u> winter
Hot Water Heating System	Boiler, steam converter, pumps, controls	All sequences of hot water sytems and related pumps (startup, shutdown, load changes, resets, lead lag action, alarms, lockouts), VFD control, temporary power, efficiency, venting	Mostly M, with some T and some D	Test all including standby equip., except effic. test only one boiler, even if identical	Mech. leads with help from: Cntrl	Must test in winter
Air handling system	AHU, supply, return and exhaust fans, coils, coil pumps, valves, dampers, VFD, controls	All sequences of fans and related components (startup, shutdown, setup, unoccupied conditions, load changes, resets, alarms, lockouts), VFD control, operation of all dampers in all modes, all economizer modes, temporary power, coil capacity, coil effic., OSA control, bldg. pressure,	Mostly M, with some T and some D	Test all	Cntrl leads with help from Mech.	Must test in <u>√</u> sum'r <u>√</u> winter
Air handling system	Terminal units	Verify damper and fan sequences during heating, cooling, debands, occupied, unoccupied, verify flow	M	Test 10% of identical units (see Specs)	Mech. leads with help from Cntrl	No

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Computer Room AC	AC unit, humidifier, controls	All sequences in all modes (normal, deadband, unoccupied, etc.), humidity and reheat functions, backup interlock with primary cooling, temporary power operation	M	Test all	Mech.	No
Spot HVAC Units	Unit heaters, controls	All sequences, occupied, unoccupied, lockouts, simultaneous heating / cooling issues	M	Test 10% of identicals and at least 5	Mech.	No, if htg & cooling condition is simulated
Spot HVAC Units	Spot coolers, controls	All sequences, occupied, unoccupied, lockouts, simultaneous heating / cooling issues	M	Test 10% of identicals and at least 5	Mech.	No, if htg & cooling condition is simulated
Specialty Fans	Stairwell pressurization fans, controls	Tested by fire officials				
Specialty Fans	Central exhaust fans, controls	Occupied, unoccupied, local controls, overrides, schedules, central controls	M	Test all	Mech.	No
Specialty Fans	Fume hoods	Capacity, varying differential pressures, interlocks, safeties	M	Test all	TAB contr.	No, if tested with full and min. OSA
Energy Management Control System	Schedules, sequences, lockouts, alarms, interlocks, control strategies, trending	All sequences of control for HVAC equipment and lighting controls,	M and T with some D	Test all controlled equipment	Cntrl	Yes, see Specs

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Packaged HVAC	AHU, supply, return and exhaust fans, compressor, condensers, coils, valves, dampers, heating elements, VFD, controls	All sequences of fans and related components (startup, shutdown, setup, unoccupied conditions, load changes, resets, alarms, lockouts), VFD control, operation of all dampers in all modes, temporary power, OSA control, building pressure, reversing valves (HP), compressor and cond. fan staging, heating COP & capacity, cooling EER & capacity	Mostly M with some T and some D	Test 20% of identical units < 20 tons. test 40% of identical units > 20 tons. Test at least 4 of each.	Mech. Lead with help from: Cntrl	No, for units < 20 tons, if simulated condition is used. Yes, for units > 20 tons
Heat Exchanger	Heat exchanger, controls	Sequences, lockouts, safeties	M & T	Test all	Mech.	No
TAB	Air and water TAB work	Primary air and water flows and terminal flows	M	Verify a % of TAB readings (see Specs)	TAB	No
Clean Room Air Flows	Air flows and pressures	All sequences and all possible affecting conditions in bldg., varying differential pressures, interlocks, alarms	M and some T	Test all	TAB	No, if tested with full & min. OSA & full htg. & cooling
Service Hot Water	Boiler, heaters, pumps, controls	Boiler or heater sequences, controls & pump schedules	M	Yes (see Specs)	Mech.	No
Lighting Controls	Sweep, occupancy sensors, daylighting	Occupied, unoccupied, overrides, sweep, varying daylight, occupancy, as applicable, occupant use	M	Test all	Elec. leads Cntrls helps	No