ADDENDA

ANSI/ASHRAE/ACCA Addendum a to
ANSI/ASHRAE/ACCA Standard 180-2008

Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems

Approved by the ASHRAE Standards Committee on January 21, 2012; by the ASHRAE Board of Directors on January 25, 2012; by the Air Conditioning Contractors of America on November 18, 2011; and by the American National Standards Institute on January 26, 2012.

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ACCA®
Air Conditioning Contractors of America
2800 Shirlington Rd., Ste 300, Arlington, VA 22206 www.acca.org

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FOREWORD

Standard 180 was created in a collaborative effort between ASHRAE and ACCA, the Air Conditioning Contractors of America. Its intent is to provide consistent practices for inspecting and maintaining HVAC systems in commercial, institutional, and other buildings. For the public good, it is essential that the HVAC systems in all buildings where people work, visit, or reside support a high quality indoor environment that is sustainable.

Standard 180 describes the minimum acceptable level of maintenance for commercial building HVAC systems. Other standards or guidance documents may establish more specific or rigorous requirements that apply to certain buildings. Where applicable, those requirements should be followed or considered (if guidelines).

Currently, Standard 180 is in "continuous maintenance" status. A thorough review of the standard under the continuous maintenance process has resulted in improvements, revisions, and updates to the tables in Section 5. This document is an addendum to the original standard. The changes were deemed necessary in order to eliminate duplication, list equipment tables in alphabetical order for easier reference, and consolidate similar equipment where appropriate.

This standard is written in code-intended language so it may be referenced or adopted by enforcement authorities as the minimum acceptable level of performance within their jurisdiction.

***Note:** This standard is specifically focused on the impacts of maintenance on occupant thermal comfort, indoor air quality, and energy efficiency. Additional maintenance program considerations related to equipment reliability, equipment robustness, and minimizing overall maintenance costs are also appropriate in order to support sustainability efforts, protect the HVAC capital investment, and/or minimize system downtime. These considerations, however, are outside of the scope of this standard.*

***Note:** In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.*

Addendum a to Standard 180-2008

[Revise the list of the types of equipment and systems in Section 5 as follows.]

5. REQUIRED INSPECTION AND MAINTENANCE TASKS

Table Number	Equipment/System
Table 5-1	Air Distribution Systems
Table 5-2	Air Handlers
Table 5-3 ~~5-6~~	Boilers
Table 5-4 ~~5-3~~	Chillers—Absorption
Table 5-5 ~~5-4~~	Chillers—Air Cooled
Table 5-6 ~~5-5~~	Chillers—Water Cooled
Table 5-7 ~~5-12~~	~~Free Standing Heating or Cooling Coils~~ Coils and Radiators
Table 5-8 ~~5-7~~	Condensing Units
Table 5-9 ~~5-8~~	Control Systems
Table 5-10 ~~5-9~~	Cooling Towers and Evaporative Cooled Devices
Table 5-11 ~~5-10~~	Dehumidification and Humidification Devices
Table 5-12	Economizers—Air Side
Table 5-13 ~~5-11~~	Engines, Microturbines
Table 5-14 ~~5-13~~	~~Free Standing~~ Fans (e.g., Exhaust, Supply, Transfer, Return)
Table 5-15 ~~5-14~~	Fan Coils, Hot Water, and Steam Unit Heaters
Table 5-16 ~~5-15~~	Furnaces, Combustion Unit Heaters
Table 5-17 ~~5-23~~	HVAC Water Distribution Systems
Table 5-18 ~~5-16~~	Indoor Section Duct-Free Splits
Table 5-19	Outside Air Heat Exchanging Systems
Table 5-20 ~~5-17~~	PTAC/PTHP (Package Terminal Air Conditioners or Heat Pumps)
~~Table 5-18~~	~~PTHP (Package Terminal Heat Pumps)~~
Table 5-21 ~~5-19~~	Pumps
Table 5-22 ~~5-20~~	Rooftop Units
Table 5-23 ~~5-21~~	Steam Distribution Systems
Table 5-24 ~~5-22~~	Terminal and Control Boxes (e.g., VAV, Fan Powered, Bypass)
Table 5-25 ~~5-24~~	Water Source Heat Pumps

To determine the required *inspection* and *maintenance tasks* for each subsystem or piece of equipment in your building, use the following procedure.

1. Referring to the HVAC equipment and systems inventory prepared as required in Section 4.2.1 of this standard, prepare a listing of the different equipment or subsystem types that exist in the building.
2. Using this list, identify from the following ~~24~~25 tables (Tables 5-1 through 5-25~~5-24~~) those that apply to the HVAC systems and equipment in the building.

[Revise and relocate/renumber the equipment tables in Section 5 as shown on the following pages. The current Table 5-6 has been relocated and re-identified as Table 5-3. The current Table 5-12 has been relocated and re-identified as Table 5-7. Tables 5-12 and 5-19 have been added. The current Table 5-23 has been relocated and re-identified as Table 5-17. The current Tables 5-17 and 5-18 have been combined into Table 5-20, and Table 5-18 has been removed in its entirety.]

TABLE 5-1 Air Distribution Systems

	Inspection/Maintenance Task	Frequency[a]
a	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, adjust or replace components to ensure proper operation.	Semiannually
b	Visually inspect grilles, registers and diffusers for dirt accumulation. Clean as needed to remove dirt build up	Semiannually
c	Assess ~~Lubricate~~ field serviceable bearings, lubricate if necessary.	Annually
d	Check for proper damper operation. Clean, lubricate, ~~R~~repair, replace or adjust as needed to ensure proper operation.	Annually
e	Visually inspect areas of moisture accumulation for biological growth. If present, clean or disinfect as needed.	Annually
f	Visually inspect exposed ductwork for insulation and vapor barrier integrity. Correct as needed.	Annually
g	Visually inspect internally lined ductwork until first turn or up to 20 feet ~~into supply plenum from air handler~~ from a potential moisture source such as supply plenum from air handler, outside air damper, humidifier, etc. for ~~visible~~ water damage and/or biological contamination and, if necessary, take corrective action.	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-2 Air Handlers

	Inspection/Maintenance Task	Frequency[a]
a	Check for particulate accumulation on filters. Clean or replace ~~if accumulation results in pressure drop or airflow outside of established operating limits~~ as necessary to ensure proper operation.	Quarterly ~~Monthly~~
b	Check air filter fit and housing seal integrity. Correct as needed.	Annually ~~Monthly~~
c	Check UV Lamp. Clean or replace as needed to ensure proper operation.	Quarterly
d	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, adjust or replace ~~components~~ as needed to ensure proper operation.	Semiannually
e	Check P-trap. Prime as needed to ensure proper operation.	Semiannually
f	Check fan belt tension. Check for belt wear and ~~proper alignment~~ replace if necessary to ensure proper operation. ~~Replace if necessary to ensure proper operation~~. Check sheaves for evidence of improper alignment or evidence of wear and correct as needed.	Semiannually
g	Check variable frequency drive for proper operation. Correct as needed.	Semiannually
h	Check for proper operation of cooling or heating coil for damage or evidence of leaks. Clean, restore or replace as required.	Semiannually
i	Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.	Annually
j	Check motor contactor for pitting or other signs of damage. Repair or replace as needed.	Annually
k	Check fan blades and fan housing. Clean, repair or replace as needed to ensure proper operation.	Annually
l	Check refrigerant system ~~pressures and/or~~ temperatures. If outside of recommended levels, find cause, repair and adjust refrigerant charge to achieve optimal operating levels.	Annually
	~~Check for fouling, corrosion or degradation. Clean or repair as needed.~~	~~Annually~~
	~~Check drive alignment, wear, seating and operation. Repair or replace as needed.~~	~~Annually~~
m	Check integrity of all panels on equipment. Replace fasteners as needed to ensure proper integrity and fit/finish of equipment.	Annually
n	Assess ~~Lubricate~~ field serviceable bearings, lubricate if necessary.	Annually
o	Check drain pan, drain line and coil for biological growth. Clean as needed.	Annually
p	Check ~~coil fins~~ for evidence of build-up on or fouling of heat exchange surfaces. Restore ~~if possible~~. ~~Replace coil if necessary to return to proper functioning.~~ as needed to ensure proper operation.	Annually
q	Inspect for evidence of moisture carryover beyond the drain pan from cooling coils. Make corrections or repairs as necessary.	Annually
r	Check for proper damper operation. Clean, lubricate, ~~R~~repair, replace or adjust as needed to ensure proper operation.	Annually
s	Visually inspect areas of moisture accumulation for biological growth. If present, clean or disinfect as needed.	Annually
t	Check condensate pump. Clean or replace as needed.	Annually
u	Visually ~~Visual~~ inspect exposed ductwork and external piping for insulation and vapor barrier for integrity. Correct as needed.	Annually
	~~Visually inspect internally lined ductwork until the first turn or up to 20 feet into the supply plenum from air handler for integrity, and if degraded, correct.~~	~~Annually~~

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-3 ~~TABLE 5-6~~ Boilers

	Inspection/Maintenance Task	Frequency[a]
a	Visually inspect fuel filter. Clean, repair or replace as needed to ensure proper operation.	Monthly
b	Perform chemical testing of system water. Treat as needed to ensure proper water chemistry.	Monthly ~~(open system)/ Quarterly (closed system)~~
c	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, replace or adjust components as needed to ensure proper operation.	Semiannually
d	Check fuel pump for proper operation. Repair or replace as needed to ensure proper operation.	Quarterly
e	Inspect blow-down or drain valve. Clear all debris to ensure proper operation. Repair or replace if needed.	Quarterly
	~~Check steam system traps, pumps and controls. Clean or replace as needed to ensure proper operation.~~	~~Semiannually~~
f	Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.	Annually
g	Check motor contactor for pitting or other signs of damage. Repair or replace as needed.	Annually
h	Check for evidence of build-up or fouling, corrosion or degradation on heat exchange surfaces. Restore~~Clean or repair~~ as needed to ensure proper operation.	Annually
i	Check for evidence of build-up or fouling on heat exchange surfaces (tubes). Clean as needed to ensure proper operation.	Annually
j	Check for proper damper operation. Clean, lubricate, ~~R~~repair, replace or adjust as needed to ensure proper operation.	Annually
k	Check combustion chamber, burner and flue for deterioration, moisture problems, condensation, and combustion products. Clean, test and adjust combustion process for proper operation.	Annually
l	Inspect refractory for damage or wear, repair or replace as necessary to ensure proper operation. Clean upper and lower drums.	Annually
m	Observe burner flame at high load for correct clearance from refractory.	Annually
n	Check for evidence of leakage of fuel supply, heat transfer fluid, and flue gas. Repair as needed to ensure proper operation.	Quarterly
o	Verify proper operation of safety devices per manufacturer's recommendations. Repair or replace as needed.	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-4 ~~Table 5~~-3 Chillers—Absorption

	Inspection/Maintenance Task	Frequency[a]
a	Check for the presence of noncondensibles. Take necessary steps to eliminate noncondensibles in system.	Weekly
	~~Visually inspect fuel filter. Clean, repair or replace as needed to ensure proper operation.~~	~~Monthly~~
b	Perform chemical testing of system water. Treat as needed to ensure proper water chemistry.	Monthly (open systems)/ Quarterly (closed systems)
	~~Check fuel pump for proper operation. Repair or replace as needed to ensure proper operation.~~	~~Quarterly~~
	~~Inspect gearbox for excessive wear. Repair or replace as needed.~~	~~Quarterly~~
c	Check steam system traps, pumps and controls. Clean or replace as needed to ensure proper operation.	Semiannually
d	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, adjust or replace components as needed to ensure proper operation.	Semiannually
e	Check variable frequency drive for proper operation. Correct as needed.	Semiannually
f	Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.	Annually
g	Check motor contactor for pitting or other signs of damage. Repair or replace as needed.	Annually
h	Check for fouling, corrosion or degradation. Clean or repair as needed.	Annually
i	Check drive alignment, wear, seating and operation. Repair ~~and~~ or replace as needed.	Annually
j	Check for evidence of build-up or fouling on heat exchange surfaces. Restore ~~Clean~~ as needed to ensure proper operation.	Annually
k	Check for proper fluid flow and for fluid leaks. Clean, adjust and repair as needed to restore proper flow.	Annually
l	Check inhibitor and internal fluid chemistry. Correct inhibitor and internal fluid chemistry if outside of established operating ranges.	Annually
m	Verify proper operation of safety devices per manufacturer's recommendations. Repair or replace as needed.	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-5 ~~Table 5-4~~ Chillers—Air Cooled

	Inspection/Maintenance Task	Frequency[a]
a	Perform chemical testing of system water. Treat as needed to ensure proper water chemistry and freeze protection.	~~Monthly (open system)~~/ Quarterly ~~(closed systems)~~
b	Inspect gearbox for excessive wear. Repair or replace as needed.	Quarterly
c	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, replace or adjust components as needed to ensure proper operation.	Semiannually
d	Check fan belt tension. Check for belt wear and ~~proper alignment~~ replace if necessary to ensure proper operation. ~~Replace if necessary to ensure proper operation~~. Check sheaves for evidence of improper alignment or evidence of wear and correct as needed.	Semiannually
e	Check variable frequency drive for proper operation. Correct as needed.	Semiannually
f	Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.	Annually
g	Check motor contactor for pitting or other signs of damage. Repair or replace as needed.	Annually
h	Check fan blades and fan housing. Clean, repair or replace as needed to ensure proper operation.	Annually
i	Check refrigerant system pressures and/or temperatures. If outside of recommended levels, find cause, repair and adjust refrigerant charge to achieve optimal operating levels.	Annually
	~~Check for fouling, corrosion or degradation. Clean or repair as needed.~~	~~Annually~~
j	Check open drive alignment, wear, seating and operation. Repair ~~and~~ or replace as needed.	Annually
k	Assess ~~Lubricate~~field serviceable bearings, lubricate if necessary.	Annually
l	Check for evidence of build-up on or fouling of heat exchange surfaces. Restore ~~Clean~~ as needed to ensure proper operation.	Annually
m	Check for proper fluid flow and for fluid leaks. Clean, adjust and repair as needed to restore proper flow.	Annually
n	Inspect air-cooled condenser surfaces for damage or evidence of leaks. Repair or clean as needed.	Annually
o	Check low ambient head pressure control sequence for ~~proper~~ evidence of improper operation. Repair or replace components or modify software/algorithm to ensure proper operation.	Annually
p	Check compressor oil level and/or pressure on refrigerant systems having oil level and or pressure measurement means. Repair, replace or adjust as needed to ensure proper control.	Annually
q	Check variable frequency drive for proper operation. Correct as needed.	Semiannually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-6 ~~Table 5-5~~ Chillers—Water Cooled

	Inspection/Maintenance Task	Frequency[a]
a	Perform chemical testing of system water. Treat as needed to ensure proper water chemistry and freeze protection.	Monthly (open system)/ Quarterly (closed system)
b	Inspect gearbox for excessive wear. Repair or replace as needed.	Quarterly
c	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, replace or adjust components as needed to ensure proper operation.	Semiannually
d	Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.	Annually
e	Check motor contactor for pitting or other signs of damage. Repair or replace as needed.	Annually
f	Check refrigerant system pressures and / or temperatures. If outside of recommended levels, find cause, repair and adjust refrigerant charge to achieve optimal operating levels.	Annually
g	Check open drive alignment, wear, seating and operation. Repair ~~and~~ or replace as ~~needed~~ necessary.	Annually
h	Check for evidence of build-up or fouling on heat exchange surfaces. Restore ~~Clean~~ as needed to ensure proper operation.	Annually
i	Check for proper fluid flow and for fluid leaks. Clean, adjust and repair as needed to restore proper flow.	Annually
j	Check compressor oil level and or pressure on refrigerant systems having oil level and or pressure measurement means. Repair, replace or adjust as needed to ensure proper control	Annually
k	Check variable frequency drive for proper operation. Correct as needed.	Annually
l	Assess field serviceable bearings, lubricate if necessary.	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-7 ~~Table 5-12 Free-Standing Heating or Cooling Coils~~Coils and Radiators

	Inspection/Maintenance Task	Frequency[a]
a	Check UV Lamp. Clean or replace as needed to ensure proper operation.	Quarterly
b	Check for proper operation of control valves and vents. Correct, as required.	Quarterly
c	Check P-trap. Prime as needed to ensure proper operation.	Semiannually
	~~Check for proper operation of cooling or heating coil. Clean, restore or replaced as required.~~	~~Semiannually~~
d	Check refrigerant system ~~pressures or~~ temperatures. If outside of recommended levels, find cause, repair and adjust refrigerant charge to achieve optimal operating levels.	Annually
e	Check for ~~fouling, corrosion or degradation~~ evidence of build-up on or fouling of heat exchange surfaces. Restore as needed to ensure proper operation. ~~Clean or repair as needed.~~	Annually
f	Check integrity of all panels on equipment. Replace fasteners as needed to ensure proper integrity and fit/ finish of equipment.	Annually
g	Check for proper fluid flow and for fluid leaks. Clean, adjust and repair as needed to restore proper flow.	Semiannually
h	Check drain pan, drain line~~,and~~ coil and other areas of moisture accumulation for biological growth. Clean or disinfect as needed.	Annually
i	Check ~~evaporator~~ coil fins. Restore if possible. Replace coil if necessary to return to proper functioning.	Annually
j	Inspect for evidence of moisture carryover beyond the drain pan from cooling coils. Make corrections or repairs to eliminate the condition.	Annually
	~~Visually inspect areas of moisture accumulation for biological growth. If present, clean or disinfect as needed.~~	~~Annually~~
k	Check control system and devices for evidence of improper operation. Clean, lubricate, repair, replace or adjust as needed to ensure proper operation.	Semiannually
l	Check condensate pump. Clean or replace as needed.	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-8 ~~Table 5-7~~ Condensing Units

	Inspection/Maintenance Task	Frequency[a]
a	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, replace or adjust components as needed to ensure proper operation.	Semiannually
b	Check fan belt tension. Check for belt wear and ~~proper alignment~~ replace if necessary to ensure proper operation. ~~Replace if necessary to ensure proper operation~~. Check sheaves for evidence of improper alignment or evidence of wear and correct as needed.	Semiannually
c	Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.	Annually
d	Check motor contactor for pitting or other signs of damage. Repair or replace as needed.	Annually
e	Check fan blades and fan housing~~for balance and particulate buildup~~. Clean, repair or replace as needed to ensure proper operation.	Annually
f	Check refrigerant system pressures or temperatures. If outside of recommended levels, find cause, repair and adjust refrigerant charge to achieve optimal operating levels.	Annually
g	~~Check for fouling, corrosion or degradation. Clean or repair as needed.~~ Check for evidence of build-up on or fouling of heat exchange surfaces. Restore as needed to ensure proper operation.	Annually
h	Check open drive ~~alignment, wear, seating and operation.~~ couplings, bearings and seals for evidence of wear or alignment problems. Lubricate and ~~R~~repair or ~~and~~ replace as needed. ~~For direct coupled fan/motor assemblies, check bearings and lubricate field serviceable or replace motor if needed.~~	Annually
i	Inspect air-cooled condenser surfaces for damage or evidence of leaks. Repair or clean as needed.	Annually
j	Check low ambient head pressure control sequence for ~~proper~~ evidence of improper operation. Repair or replace components or modify software/algorithm to ensure proper operation.	Annually
k	Check refrigerant oil levels for refrigerant systems with oil pressure/level controls. Repair, replace or adjust as needed to ensure proper operation.	Annually
l	Check variable frequency drive for proper operation. Correct as needed.	Semiannually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-9 ~~Table 5-8~~ Control Systems

	Inspection/Maintenance Task	Frequency[a]
a	Check compressed air system (e.g., compressor, dryer, receiver, blow-down valve) for proper operation. Check for evidence of oil carryover and condition of oil filter. Repair or replace as needed to ensure proper operation.	Monthly
b	Check for proper air pressure. Repair or replace pneumatic system components as needed.	Monthly
c	Measure relative humidity and repair, clean, or adjust system as necessary to ensure intended operation.	Quarterly
d	Check control system ~~and~~ devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, replace or adjust components as needed to ensure proper operation.	Semiannually
e	Check time of day schedule to confirm consistency with facility operation	Semiannually
f	Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.	Annually
g	Check motor contactor for pitting or other signs of damage. Repair or replace as needed.	Annually
	~~Check for improper damper operation. Clean, lubricate, repair, replace or adjust as needed to ensure proper operation.~~	~~Annually~~
h	Check pneumatic lines for blockages. Clean as needed.	Annually
i	Check to see that back up of digital control program is current	Annually
j	Check battery backup and verify proper operation	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-10 ~~Table 5-9~~ Cooling Towers and Evaporative Cooled Devices

	Inspection/Maintenance Task	Frequency[a]
a	Check water system UV Lamp. Clean or replace as needed to ensure proper operation.	Quarterly
b	Perform ~~water treatment analysis~~ chemical testing of system water. Treat as needed to ensure proper water chemistry. Adjust bleed or blowdown rate as required.	Monthly (open system)/ Quarterly (closed system)
c	Inspect blow-down or drain valve. Clear all debris to ensure proper operation. Repair or replace if needed.	Quarterly
d	Check chemical injector device. Clean as needed.	Quarterly
e	Check cooling tower fan open drive system couplings, bearings, and seals for ~~excessive~~ wear~~, proper bearing seating~~ and proper alignment. Adjust, lubricate, repair, or replace as needed ~~to ensure proper operation~~.	Quarterly
f	Check belt tension. Check for belt wear. Replace if necessary to ensure proper operation. Check sheaves for evidence of improper alignment. Correct as necessary to ensure proper operation.	Quarterly
g	~~Inspect sump and strainer.~~ Check for fouling, corrosion, degradation or dirt/debris accumulation on or in: sump and strainer, wet decks, fill, nozzles, and exterior louvers. Clean or repair as needed.	Quarterly
h	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, adjust or replace components as needed to ensure proper operation.	Semiannually
i	Check variable frequency drive for proper operation. Correct as needed.	Semiannually
j	Visually inspect pumps and associated electrical components. Repair or replace as needed to ensure proper operation	Semiannually
k	Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.	Annually
	~~Check motor contactor for pitting or other signs of damage. Repair or replace as needed.~~	~~Annually~~
l	Check fan blades and fan housing. Clean, repair or replace as needed to ensure proper operation.	Annually
	~~Check for fouling, corrosion or degradation. Clean or repair as needed.~~	~~Annually~~
m	Assess ~~Lubricate~~ field serviceable bearings, lubricate if necessary.	Annually
	~~Check for evidence of build-up or fouling on wet decks, fill, and exterior louvers. Clean as needed to ensure proper operation.~~	~~Annually~~
n	Check for proper fluid flow and for fluid leaks. Clean, adjust and repair as needed to restore proper flow.	Annually
o	Check for proper damper operation. Clean, lubricate, ~~R~~repair, replace or adjust as needed to ensure proper operation.	Annually
	~~Check for dirt and debris. Clean as needed.~~	~~Annually~~
p	Check cooling tower motor(s) and~~/or~~ pump(s) for proper operation. Repair or replace as needed to ensure proper operation.	Annually
	~~Check nozzles. Clean as needed.~~	~~Annually~~

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-11 ~~Table 5-10~~ Dehumidification and Humidification Devices

	Inspection/Maintenance Task	Frequency[a]
a	Check UV Lamp. Clean or replace as needed to ensure proper operation.	Quarterly
b	Check for proper fluid flow and for fluid leaks. Clean, adjust and repair as needed to restore proper flow.	Quarterly
c	Check steam system traps, pumps and controls. Clean or replace as needed to ensure proper operation.	Semiannually
d	Measure relative humidity and ~~repair, clean, or~~ adjust system controls as necessary. ~~to ensure intended operation~~.	Quarterly
e	Check for fouling, corrosion or degradation. Clean or repair as needed.	Annually
	~~Check for evidence of build-up or fouling on heat exchange surfaces. Clean as needed to ensure proper operation.~~	~~Annually~~
	~~Check for excessive scale or debris on evaporative condenser surfaces. Clean as needed.~~	~~Annually~~
f	Check strainers. Clean as needed.	Annually
g	Visually inspect distributors, drain pans and other areas of moisture accumulation for biological growth. ~~If present,~~ Celean or disinfect as needed.	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-12 Economizers—Air Side

	Inspection/Maintenance Task	Frequency[a]
a	Check air filter and housing integrity. Correct as needed.	Monthly
b	Check for particulate accumulation on filters. Clean or replace as necessary to ensure proper operation.	Monthly
c	Check condition, setting and operation of outdoor sensor, return air sensor, or change-over controller. Repair, adjust, or replace components to ensure proper operation.	Semiannually
d	Check condition, setting and operation of the economizer controller. Repair, adjust, or replace components to ensure proper operation.	Semiannually
e	Check condition, setting and operation of the mixed air/discharge sensor or changeover controller. Repair, adjust or replace components to ensure proper operation.	Semiannually
f	Check dampers for proper operation, condition, setting and operation. Repair, adjust, lubricate, or replace components to ensure proper operation	Semiannually
g	Check condition, setting and operation of the economizer damper motors. Repair, adjust, lubricate, or replace components to ensure proper operation.	Semiannually
h	Check sealing integrity of all panels on equipment. Replace fasteners and gasketing as needed.	Semiannually
i	Visually inspect areas of moisture accumulation for biological growth. If present, clean or disinfect as needed.	Semiannually
j	Assess field serviceable bearings, lubricate if necessary.	Annually
k	Check condition, setting and operation of the low limit stat. Repair, adjust, or replace components to ensure proper operation.	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-13 ~~5-11~~ Engines, Microturbines

	Inspection/Maintenance Task	Frequency[a]
a	Check oil level and pressure. Add and adjust as needed to ensure proper operation.	Monthly
b	Visually inspect fuel filter. Clean, repair or replace as needed to ensure proper operation.	Monthly
c	Check for particulate accumulation on turbine intake air filters. Clean or replace as necessary to ensure proper operation.	Monthly
	~~Check turbine intake air filters. Clean or replace as needed to maintain proper flow.~~	~~Monthly~~
d	Inspect flex connections. Repair as needed.	Quarterly
e	Check fuel pump for proper operation. Repair or replace as needed to ensure proper operation.	Quarterly
f	Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.	Annually
g	Check motor contactor for pitting or other signs of damage. Repair or replace as needed.	Annually
h	Check open drive ~~alignment, wear seating and operation.~~ couplings for evidence of wear or alignment problems. Repair ~~and~~ or replace as ~~needed~~ necessary.	Annually
i	Check exhaust system for corrosion. Repair or replace as needed.	Annually
j	Verify proper operation of safety devices per manufacturer's recommendations. Repair or replace as needed.	Annually
k	Assess field serviceable bearings, lubricate if necessary.	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-14 ~~Table 5-13 Free-Standing~~ Fans (e.g., Exhaust, Supply, Transfer, Return)

	Inspection/Maintenance Task	Frequency[a]
a	Check fan belt tension. Check for belt wear and replace if necessary to ensure proper operation. Check sheaves for evidence of improper alignment or evidence of wear and correct as needed.	Semiannually
b	Check ~~drive alignment, wear, bearing and coupling seating and operation~~ fan drive for problems due to poor alignment or poor bearing seating. Repair ~~and~~ or replace as needed.	Annually
c	Check fan blades and fan housing. Clean, repair or replace as needed to ensure proper operation.	Annually
d	Assess field serviceable bearings, lubricate if necessary.	Annually
e	Check variable frequency drive for proper operation. Correct as needed.	Annually
f	Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.	Annually
g	Check motor contactor for pitting or other signs of damage. Repair or replace as needed.	Annually
h	Check integrity of all panels on equipment. Replace fasteners as needed to ensure proper integrity and fit/finish of equipment.	Annually
i	Visually inspect exposed ductwork and external piping for insulation and vapor barrier integrity. Correct as needed.	Annually
j	Check for proper damper operation. Clean, lubricate, repair, replace or adjust as needed to ensure proper operation.	Annually
k	Check control system and devices for evidence of improper operation. Clean, lubricate, repair, replace or adjust as needed to ensure proper operation.	Annually
l	Check integrity of flexible connections. Correct as needed.	Annually
	~~Check motor electrical connections & verify proper current and voltage draw.~~	~~Annually~~

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-15 ~~Table 5-14~~ Fan Coils, Hot Water, and Steam Unit Heaters

	Inspection/Maintenance Task	Frequency[a]
a	Check for particulate accumulation on filters. Clean or replace ~~if accumulation results pressure drop or airflow outside of established operating limits.~~ as necessary to ensure proper operation.	Quarterly ~~Monthly~~
b	Check air filter fit and housing seal integrity~~and.~~ ~~e~~Correct as needed ~~at time filters are replaced or serviced~~.	Annually ~~At filter Change~~
c	Check UV Lamp. Clean or replace as needed to ensure proper operation.	Quarterly
d	Check steam system traps, pumps and controls. Clean or replace as needed to ensure proper operation.	Semiannually
e	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, adjust or replace components as needed to ensure proper operation.	Semiannually
f	Check P-trap. Prime as needed to ensure proper operation.	Semiannually
g	Check fan belt tension. Check for belt wear and ~~proper alignment.~~ ~~R~~replace if necessary to ensure proper operation. Check sheaves for evidence of improper alignment or evidence of wear and correct as needed.	Semiannually
h	Check for proper operation of cooling or heating coil for damage or evidence of leaks. Clean, restore or replace as required.	Semiannually
i	Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.	Annually
j	Check fan blades and fan housing. Clean, repair or replace as needed to ensure proper operation.	Annually
k	Check refrigerant system ~~pressures or~~ temperatures. If outside of recommended levels, find cause, repair and adjust refrigerant to achieve optimal operating levels.	Annually
l	~~Check for fouling, corrosion or degradation. Clean or repair as needed~~. Check for evidence of build-up on or fouling of heat exchange surfaces. Restore as needed to ensure proper operation.	Annually
	~~Check drive alignment, wear, seating and operation. Repair and replace as needed.~~	~~Annually~~
m	Check integrity of all panels on equipment. Replace fasteners as needed to ensure proper integrity and fit/finish of equipment.	Annually
n	Assess ~~Lubricate~~ field serviceable bearings, lubricate as necessary.	Annually
o	Check for proper fluid flow. Clean, adjust and repair as needed to restore proper flow.	Annually
p	Check drain pan, drain line and coil for biological growth. Clean as needed.	Annually
q	Check coil fins. Restore if possible. Replace coil if necessary to return to proper functioning.	Annually
r	Inspect for evidence of moisture carryover beyond the drain pan from cooling coils. Make corrections or repairs as necessary.	Annually
s	Check for proper damper operation. Clean lubricate, ~~R~~repair, replace or adjust as needed to ensure proper operation.	Annually
t	Visually inspect areas of moisture accumulation for biological growth. If present, clean or disinfect as needed.	Annually
u	Check condensate pump. Clean or replace.	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-16 ~~Table 5-15~~ Furnaces, Combustion Unit Heaters

	Inspection/Maintenance Task	Frequency[a]
a	Check for particulate accumulation on filters. Clean or replace ~~if accumulation results in pressure drop or airflow outside of established operating limits.~~ as necessary to ensure proper operation.	Quarterly ~~Monthly~~
b	Check air filter fit and housing seal integrity. Correct as needed.	Annually ~~At air filer change~~
c	Visually inspect fuel filter. Clean, repair or replace as needed to ensure proper operation.	Monthly
d	Check fuel pump for proper operation. Repair or replace as needed to ensure proper operation.	Semiannually
e	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, adjust or replace components as needed to ensure proper operation.	Semiannually
f	Check fan belt tension. Check for belt wear and ~~proper alignment.~~ ~~R~~replace if necessary to ensure proper operation. Check sheaves for evidence of improper alignment or evidence of wear and correct as needed.	Semiannually
g	Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.	Annually
h	Check fan blades and fan housing. Clean, repair or replace as needed to ensure proper operation.	Annually
i	Check fan drive ~~alignment, wear seating and operation~~ for problems due to poor alignment or poor bearing seating. Repair ~~and~~ or replace as needed.	Annually
j	Check integrity of all panels on equipment. Replace fasteners as needed to ensure proper integrity and fit/ finish of equipment.	Annually
k	Assess ~~Lubricate~~ field serviceable bearings, lubricate if necessary.	Annually
l	Check for proper damper operation. Clean, lubricate, ~~R~~repair, replace or adjust as needed to ensure proper operation.	Annually
m	Check heat exchanger, combustion chamber, burner and flue for deterioration, moisture problems, condensation, and combustion products. Clean, test and adjust combustion process for proper operation.	Annually
	~~Check heat exchanger. Clean as necessary to ensure proper operation and to remove scale and sediment. Check for possibility of leaks.~~	~~Annually~~
n	Verify proper operation of safety devices per manufacturer's recommendations. Repair or replace as needed.	Annually
o	Check for proper operation of heating coil and for damage or evidence of leaks. Clean, restore or replace as required	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency

TABLE 5-17 ~~Table 5-2~~3 HVAC Water Distribution Systems

	Inspection/Maintenance Task	Frequency[a]
a	Perform chemical testing of system water. Treat as needed to ensure proper water chemistry.	Monthly (open system)/ Quarterly (closed system)
b	Check chemical injector device. Clean as needed.	Quarterly
c	Check makeup water system for pressure and operation	Quarterly
d	Vent air from system high points, Check for proper fluid flow and check piping for leaks. Repair as needed.	Quarterly
e	Visually inspect pumps and associated electrical components. Repair or replace as needed to ensure proper operation	Semiannually
f	Check for evidence of build-up or fouling on heat exchange surfaces. ~~Clean~~ Restore as needed to ensure proper operation.	Annually
g	Check for proper fluid flow. Clean, adjust and repair as needed to restore proper flow.	Annually
h	Check strainers. Clean as needed.	Annually
i	Visually inspect external piping insulation and vapor barrier for integrity. Correct as needed.	Annually
j	Check freeze stats, relief valves, flow and float switches, low water cutoffs and other safety devices for proper operation and repair or replace as required.	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency

TABLE 5-18 ~~Table 5-16~~ Indoor Section Duct-Free Splits

	Inspection/Maintenance Task	Frequency[a]
a	Check for particulate accumulation on filters. Clean or replace ~~if accumulation results in pressure drop or airflow outside of established operating limits~~ as necessary to ensure proper operation.	Quarterly ~~Monthly~~
b	Check air filter fit and housing seal integrity. Correct as needed.	Annually ~~At filter change~~
c	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, adjust or replace components as needed to ensure proper operation.	Semiannually
d	Check P-trap drain. Clean if necessary.	Semiannually
e	Check for proper operation of cooling or~~and~~ heating coil for damage or evidence of leaks. Clean, restore or replace as required.	Annually ~~Semiannually~~
f	Check fan blades and fan housing. Clean, repair or replace as needed to ensure proper operation.	Annually
g	Check refrigerant system temperatures. If outside of recommended levels, find cause, repair and adjust refrigerant charge to achieve optimal operating levels.	Annually
h	Check integrity of all panels on equipment. Replace fasteners as needed to ensure proper integrity and fit/finish of equipment.	Annually
i	Assess ~~Lubricate~~ field serviceable bearings, lubricate if necessary.	Annually
j	Check for proper fluid flow. Clean, adjust and repair as needed to restore proper flow.	Semiannually
k	Check drain pan, drain line and coil for biological growth. Clean as needed.	Annually
l	Check coil fins. Restore if possible. Replace coil if necessary to return to proper functioning.	Annually
m	Visually inspect areas of moisture accumulation for biological growth. If present, clean or disinfect as needed.	Annually
n	Check condensate pump. Clean or replace.	Annually
o	Check variable frequency drive for proper operation. Correct as needed.	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-19 Outside Air Heat Exchanging Systems

	Inspection/Maintenance Task	Frequency[a]
a	Check air filter and housing integrity. Correct as needed.	Monthly
b	Check for particulate accumulation on filters. Clean or replace as necessary to ensure proper operation	Monthly
c	Check control system devices for evidence of improper operation. Repair, adjust, or replace components to ensure proper operation.	Semiannually
d	Check P-trap drain. Clean if necessary.	Semiannually
e	Check fan belt tension. Check for belt wear and replace if necessary to ensure proper operation. Check sheaves for evidence of improper alignment or evidence of wear and correct as needed.	Semiannually
f	Check for proper operation of heat exchanger. Clean, restore, repair, adjust, or replace components to ensure proper operation.	Semiannually
g	Check for proper operation of enthalpy device. Clean, restore, repair, adjust, or replace components to ensure proper operation.	Semiannually
h	Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.	Semiannually
i	Check for proper fluid flow and for fluid leaks. Clean, restore or replace as required.	Semiannually
j	Check drain pan, drain line and heat exchanger for biological growth. Clean as needed.	Semiannually
k	Check dampers for proper operation, condition, setting and operation. Repair, adjust, lubricate, or replace components to ensure proper operation.	Semiannually
l	Check condition setting and operation of damper motors. Repair, adjust, lubricate, or replace components to ensure proper operation.	Semiannually
m	Check sealing integrity of all panels on equipment. Replace fasteners and gasketing as needed.	Semiannually
n	Visually inspect areas of moisture accumulation for biological growth. If present clean or disinfect as needed.	Semiannually
o	Assess field serviceable bearings, lubricate if necessary.	Annually
p	Visually inspect exposed ductwork for insulation and vapor barrier integrity. Correct as needed.	Annually

Note a: Refer to Section 4.2.2.d for procedure to modify frequency.

TABLE 5-20 ~~Table 5-17~~ PTAC/PTHP (Package Terminal Air Conditioners or Heat Pumps)

	Inspection/Maintenance Task	Frequency[a]
a	Check for particulate accumulation on filters. Clean or replace ~~if accumulation results in pressure drop or airflow outside of established operating limits.~~ as necessary to ensure proper operation.	Quarterly ~~Monthly~~
b	Check air filter fit and housing seal integrity. Correct as needed.	Annually ~~Monthly~~
	~~Check UV Lamp. Clean or replace as needed to ensure proper operation.~~	~~Quarterly~~
c	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, adjust or replace components as needed to ensure proper operation.	Semiannually
	~~Check condensate drain path and remove debris as needed to assure it is free flowing.~~	~~Semiannually~~
	~~Check for proper operation of cooling or heating coil. Clean, restore or replace as required.~~	~~Semiannually~~
d	Check motor contactor for pitting or other signs of damage. Repair or replace as needed.	Annually
e	Check fan blades and fan housing. Clean, repair or replace as needed to ensure proper operation.	Annually
f	Check refrigerant system temperatures. If outside of recommended levels, find cause, repair and adjust refrigerant charge to achieve optimal operating levels.	Annually
g	Check integrity of all panels on equipment. Replace fasteners as needed to ensure proper integrity and fit/finish of equipment.	Annually
h	Check for proper fluid flow for damage and for evidence of leaks. Clean, adjust and repair as needed to restore proper flow.	Semiannually
i	Check drain pan, drain line and coil for biological growth and debris. Clean as needed.	Annually
j	Check evaporator coil fins. Restore if possible. Replace coil if necessary to return to proper functioning.	Annually
k	Inspect for evidence of moisture carryover beyond the drain pan from cooling coils. Make corrections or repairs as necessary.	Annually
l	Inspect air-cooled condenser surfaces for damage or evidence of leaks. Repair or clean as needed.	Annually
m	Visually inspect areas of moisture accumulation for biological growth. If present, clean or disinfect as needed.	Annually
n	Assess field serviceable bearings and lubricate if necessary.	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-18 PTHP (Package Terminal Heat Pumps)

Inspection/Maintenance Task	Frequency[a]
Check air filter and housing integrity. Correct as needed.	At Filter Change
Check for particulate accumulation on filters. Clean or replace if accumulation results in pressure drop or airflow outside of established operating limits.	Monthly
Check UV Lamp. Clean or replace as needed to ensure proper operation.	Quarterly
Check control system and devices for evidence of improper operation. Repair, adjust or replace components to ensure proper operation.	Semiannually
Check trap. Prime as needed to ensure proper operation.	Semiannually
Check for proper operation of cooling or heating coil. Clean, restore or replace as required.	Semiannually
Check motor contactor for pitting or other signs of damage. Repair or replace as needed.	Annually
Check fan blades. Clean, repair or replace as needed to ensure proper operation.	Annually
Check refrigerant system pressures or temperatures. If outside of recommended levels, find cause, repair and adjust refrigerant to achieve optimal operating levels.	Annually
Check drive alignment, wear, seating and operation. Repair and replace as needed.	Annually
Check integrity of all panels on equipment. Replace fasteners as needed to ensure proper integrity and fit/finish of equipment.	Annually
Lubricate field serviceable bearings.	Annually
Check drain pan, drain line and coil for biological growth. Clean as needed.	Annually
Check evaporator coil fins. Restore if possible. Replace coil if necessary to return to proper functioning.	Annually
Inspect for evidence of moisture carryover beyond the drain pan from cooling coils. Make corrections or repairs as necessary.	Annually
Inspect air-cooled condenser surfaces. Repair or clean as needed.	Annually
Visually inspect areas of moisture accumulation for biological growth. If present, clean or disinfect as needed.	Annually

Note a: Refer to Section 4.2.2.d for procedure to modify frequency.

TABLE 5-21 ~~Table 5-19~~ Pumps

	Inspection/Maintenance Task	Frequency[a]
a	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, replace or adjust components as needed to ensure proper operation.	Annually ~~Semiannually~~
b	Check variable frequency drive for proper operation. Correct as needed.	Semiannually
c	Visually inspect pumps and associated electrical components. Repair or replace as needed to ensure proper operation	Semiannually
	~~Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.~~	~~Annually~~
d	Check motor contactor for pitting or other signs of damage. Repair or replace as needed.	Annually
e	Check pump drive ~~alignment, wear, bearing and coupling seating and operation.~~ for wear or problems due to poor alignment or poor bearing seating. Repair ~~and~~ or replace as needed.	Annually
f	Check for proper fluid flow. Clean, adjust and repair as needed to restore proper flow. Check pump, piping and seals for fluid leaks. Repair as needed.	Annually
g	Assess ~~Lubricate~~ field serviceable bearings and lubricate if necessary.	Annually
h	Check insulation, vibration isolators, and flexible connectors for integrity. Repair as needed.	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-22 ~~Table 5-20~~ Rooftop Units

	Inspection/Maintenance Task	Frequency[a]
a	Check for particulate accumulation on filters. Clean or replace ~~if accumulation results in pressure drop or airflow outside of established operating limits.~~as necessary to ensure proper operation.	Quarterly ~~Monthly~~
b	Check air filter fit and housing seal integrity. Correct as needed.	Annually ~~Monthly~~
c	Check UV Lamp. Clean or replace as needed to ensure proper operation.	Quarterly
d	Check steam system traps, pumps and controls. Clean or replace as needed to ensure proper operation.	Semiannually
e	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, adjust or replace components as needed to ensure proper operation.	Semiannually
f	Check P-trap. Prime as needed to ensure proper operation.	Semiannually
g	Check fan belt tension. Check for belt wear and ~~proper alignment.~~ ~~R~~replace if necessary to ensure proper operation. Check sheaves for evidence of improper alignment or evidence of wear and correct as needed.	Semiannually
h	Check variable frequency drive for proper operation. Correct as needed.	Semiannually
i	Check control box for dirt, debris and/or loose terminations. Clean and tighten as needed.	Annually
j	Check motor contactor for pitting or other signs of damage. Repair or replace as needed.	Annually
k	Check fan blades and fan housing. Clean, repair or replace as needed to ensure proper operation.	Annually
l	Check refrigerant system ~~pressures or~~ temperatures. If outside of recommended levels, find cause, repair and adjust refrigerant charge to achieve optimal operating levels.	Annually
m	Check fan drive ~~alignment, wear, seating and operation.~~ for wear or problems due to poor alignment or poor bearing seating. Repair ~~and~~ or replace as needed.	Annually
n	Check integrity of all panels and curbs on equipment. Replace fasteners as needed to ensure proper integrity and fit/finish of equipment.	Annually
o	Assess ~~Lubricate~~ field serviceable bearings and lubricate if necessary.	Annually
p	Check for evidence of build-up on or fouling on heat exchange surfaces. ~~Clean~~ Restore as needed to ensure proper operation.	Semiannually ~~Annually~~
q	Check for proper operation of cooling coil, ~~or~~ heating coil or heat exchangers and for damage or evidence of leaks. Clean, restore or replace as required.	Semiannually
r	Check drain pan, drain line and coil for biological growth. Clean as needed.	Annually
s	Check evaporator coil fins. Restore if possible. Replace coil if necessary to return to proper functioning.	Annually
t	Inspect for evidence of moisture carryover beyond the drain pan from cooling coils. Make corrections or repairs as necessary.	Annually
u	Check for proper damper operation. Clean, lubricate, ~~R~~repair, adjust or replace as needed to ensure proper operation.	Annually
v	Inspect air-cooled condenser surfaces for damage or evidence of leaks. Repair or clean as needed.	Annually
w	Check low ambient head pressure control sequence for proper operation. Repair or replace components or modify software/algorithm to ensure proper operation.	Annually
	~~Check for excessive scale or debris on condenser surfaces. Clean as needed.~~	~~Annually~~
x	Check combustion chamber, burner and flue for deterioration, leaks, moisture problems, condensation, and combustion products. Clean, test and adjust combustion process for proper operation.	Annually
y	Visually inspect insulation and areas of moisture accumulation for biological growth. If present, clean or disinfect as needed.	Annually
	~~Check condensate pump. Clean or replace.~~	~~Annually~~
z	Check ~~refrigerant~~ compressor oil levels and or pressure on refrigerant systems having ~~with~~ oil level or pressure ~~controls~~ measurement means. Repair, replace or adjust as needed to ensure proper operation.	Annually
aa	Visually ~~Visual~~ inspect exposed ductwork and external piping for insulation and vapor barrier for integrity. Correct as needed.	Annually
	~~Visually inspect internally lined ductwork until the first turn or up to 20 feet into the supply plenum from air handler for integrity, and if soiled or degraded, correct.~~	~~Annually~~

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-23 ~~Table 5-21~~ Steam Distribution Systems

	Inspection/Maintenance Task	Frequency[a]
a	Perform chemical testing of system condensate and feed water. Treat as needed to ensure proper water chemistry.	~~Monthly (open system)~~/ Quarterly ~~(closed system)~~
b	Check steam system traps, pumps and controls. Clean or replace as needed to ensure proper operation.	Semiannually
c	Check piping for leaks. Repair as needed.	Quarterly
d	Check safety devices per manufacturer's recommendations.	Quarterly
e	Check piping anchors for integrity, and check piping for alignment and expansion fittings for proper operation lubricate as needed.	Quarterly
f	Inspect blow-down or drain valve. Clear all debris to ensure proper operation. Repair or replace if needed.	Quarterly
g	Check chemical injector device. Clean as needed.	Quarterly
h	Check for evidence of build-up on or fouling on heat exchange surfaces. ~~Clean~~ Restore as needed to ensure proper operation.	Annually
i	Check for proper fluid flow. Clean, adjust and repair as needed to restore proper flow.	Annually
j	Check strainers. Clean as needed.	Annually
k	~~Visual~~ Visually inspect external piping insulation and vapor barrier for integrity. Repair or replace as needed.	Annually
l	Check interior of condensate return piping for wall thickness integrity	Annually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-24 ~~Table 5-22~~ Terminal and Control Boxes (e.g., VAV, Fan Powered, Bypass)

	Inspection/Maintenance Task	Frequency[a]
a	Check for particulate accumulation on filters. Clean or replace ~~if accumulation results in pressure drop or airflow outside of established operating limits.~~ as necessary to ensure proper operation.	Quarterly ~~Monthly~~
b	Check air filter fit and housing seal integrity. Correct as needed.	Annually ~~At filter change~~
c	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, adjust or replace components as needed to ensure proper operation.	Semiannually
d	Check fan blades and fan housing. Clean, repair or replace as needed to ensure proper operation.	Annually
e	Check integrity of all panels on equipment. Replace fasteners as needed to ensure proper integrity and fit/finish of equipment.	Annually
f	Check for proper operation of cooling or heating coil and for damage or evidence of leaks. Clean, restore or replace as needed.	Semiannually
g	Check for proper damper operation. Clean, lubricate, ~~R~~repair, replace or adjust as needed to ensure proper operation.	Annually
h	Visually inspect areas of moisture accumulation for biological growth. If present, clean or disinfect as needed.	Annually
i	Visually inspect exposed ductwork and external piping for insulation and vapor barrier for integrity. Correct as needed.	Annually
j	Check for proper fluid flow. Clean, adjust and repair as needed to restore proper flow	Semiannually

Note a: Refer to 4.2.2.d for procedure to modify frequency.

TABLE 5-25 ~~Table 5-24~~ Water Source Heat Pumps

	Inspection/Maintenance Task	Frequency[a]
a	Check for particulate accumulation on filters. Clean or replace ~~if accumulation results in pressure drop or airflow outside of established operating limits.~~ as necessary to ensure proper operation.	Quarterly ~~Monthly~~
b	Check air filter fit and housing seal integrity. Correct as needed.	Annually ~~At filter change~~
c	Check control system and devices for evidence of improper operation. Clean, lubricate, ~~R~~repair, adjust or replace components as needed to ensure proper operation.	Semiannually
d	Check fan blades and fan housing. Clean, repair or replace as needed to ensure proper operation.	Annually
e	Check integrity of all panels on equipment. Replace fasteners as needed to ensure proper integrity and fit/finish of equipment.	Annually
f	Visually inspect areas of moisture accumulation for biological growth. If present, clean or disinfect as needed.	Annually
	~~Check fan belt tension. Check for belt wear and proper alignment. Replace if necessary to ensure proper operation.~~	~~Semiannually~~
g	Check drive alignment, wear, seating and operation. Repair or ~~and~~ replace as needed.	Annually
h	Assess~~Lubricate~~ field serviceable bearings and lubricate if necessary.	Annually
i	Check UV Lamp. Clean or replace as needed to ensure proper operation.	Quarterly
j	Check P-trap. Prime as needed to ensure proper operation.	Semiannually
k	Check motor contactor for pitting or other signs of damage. Repair or replace as needed.	Annually
l	Check refrigerant system ~~pressures or~~ temperatures. If outside of recommended levels, find cause, repair and adjust refrigerant charge to achieve optimal operating levels.	Annually
	~~Check for fouling, corrosion or degradation. Clean or repair as needed.~~	~~Annually~~
m	Check for evidence of build-up on or fouling of heat exchange surfaces. ~~Clean~~Restore as needed to ensure proper operation.	Annually
n	Check drain pan, drain line and coil for biological growth and debris. Clean as needed.	Annually
o	Check coil fins. Restore if possible. Replace coil if necessary to return to proper functioning.	Annually
p	Check for proper fluid flow. Clean, adjust and repair as needed to restore proper flow.	Annually
q	Inspect for evidence of moisture carryover beyond the drain pan from cooling coils. Make corrections or repairs as necessary.	Annually
r	Check for proper operation of cooling coil or heating coil and for damage or evidence of leaks. Clean, restore or replace as needed~~required~~.	Semiannually
s	Check condensate pump. Clean or replace.	Annually
	~~Check refrigerant oil levels for refrigerant systems with oil pressure/level controls. Repair, replace or adjust as needed to ensure proper operation.~~	~~Annually~~

Note a: Refer to 4.2.2.d for procedure to modify frequency.

(This appendix is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

[Update the bibliography in Informative Appendix C as follows:]

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[Remaining references are left unchanged.]

POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the standards and guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive technical committee structure, continue to generate up-to-date standards and guidelines where appropriate and adopt, recommend, and promote those new and revised standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating standards and guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

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