

# HVAC

**T** TIME EQUITIES INC.

HEATING  
VENTILATION  
AIR CONDITIONING

PREVENTATIVE  
MAINTENANCE  
MANUAL



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**THIS HVAC MANUAL IS INTENDED TO ASSIST PROPERTY MANAGERS IN INSPECTING HVAC EQUIPMENT AND EXTENDING ITS USEFUL LIFE.**

**NOTE:** Tasks in **blue** can be performed by the Property Manager/Engineer. Tasks in **black** must be performed by a Licensed HVAC Technician.

## SECTION 1

# ELECTRIC – HEAT EXCHANGER/ COMPRESSOR AND COOLING

### SPRING AND SUMMER MAINTENANCE TASKS

- Replace filters on cooling equipment.
- Check operation of thermostats and other controls by comparing readings to a hand-held calibrated thermostat.
- Check for adequate air flow.
- Check condition of belts and pulleys for fraying and breakage, and replace as needed.
- Check refrigerant charge with pressure gauge and inspect for leaks if charge is low. Add additional refrigerant as required.

### FALL AND WINTER MAINTENANCE TASKS

- Replace filters on heating equipment that have filters.
- Check operation of thermostats and other controls by comparing readings to a hand-held calibrated thermostat.
- Check condition of belts and pulleys for fraying and breakage, and replace as needed.
- Clear drain lines and pans that are clogged.
- Check electrical connections for wear and conductivity.
- Check operation of fan and blower motor with static pressure reading device and adjust if needed.
- Inspect ignition and burner assembly for dirt, dust, and grime, and clean as required.
- Inspect heat exchanger for dirt and corrosion. Call professional heat exchanger cleaner if any signs of dirt, grime, or corrosion are visible.

## OUTDOOR UNITS

- Clean dirt, leaves and debris from inside cabinet. Keep these areas cleaned at all times.
- Inspect coil and cabinet for dirt and corrosion and unusual wear – clean as needed.
- All control box and electrical parts should be checked for wear or damage by checking conductivity. Report low conductivity readings to a licensed HVAC contractor.
- Inspect unit for proper refrigerant level using a pressure gauge and add new refrigerant if necessary.
- Inspect base pan for restricted drain openings – remove obstructions as necessary.
- Inspect fan motor and fan blades for fraying and breakage – on older models lubricate as needed.
- Inspect control box, associated controls/accessories, wiring and connections for conductivity. Report low conductivity readings to a licensed HVAC contractor.
- Inspect compressor and associated tubing for leaks and bad connections. Report leaks and bad connections to a licensed HVAC contractor.

## INDOOR UNITS

- Check combustion blower housing for lint and debris and clean as necessary.
- Inspect for gas leaks in gas furnaces. Report leaks immediately to a licensed HVAC contractor.
- Clean or replace air filters quarterly.
- Clean blower assembly (includes blower housing, blower wheel and motor).
- On older models, lubricate motor and inspect and replace fan belt that is frayed or showing signs of breakage.
- Inspect evaporator coil, drain pan and condensate drain lines for clogging, leaks, and cleanliness. Unclog, repair leaks, and clean as necessary.
- Inspect burner assembly for dirt and dust – clean as needed.
- Inspect ignition system for dirt and dust – clean as needed.
- Inspect heat exchanger or heating elements for damage. Report damage to a licensed HVAC contractor.
- Inspect flue system – check for proper attachment to the furnace, any dislocated sections, and for signs of corrosion. Replace/repair if necessary.
- Inspect control box, associated controls, wiring and connections for conductivity and report any conductivity issues to a licensed HVAC contractor.
- Inspect conditioned airflow system (ductwork) – check for and seal leaks.

## WHILE YOUR SYSTEM IS OPERATING

- Monitor system for irregular starting sequence.
- Listen for abnormal noise.
- Check vent system for a whistling noise. If present, report to a licensed HVAC contractor.
- Monitor system operation per manufacturer's specifications. Consult operating manual provided by manufacturer.
- Search for unusual odors and source of odors. Report any unusual odors to a licensed HVAC contractor.
- Monitor air conditioning and heat pump systems for correct refrigerant charge using a pressure gauge, and recharge to manufacturer's specifications.

## SECTION 2

# GAS FIRED – HEAT AND COOLING

- Inspect the area near the unit to be sure that there is no combustible material nearby. Clearance from combustibles should be at least 3 feet.
- Remove any dirt, dust, or other foreign matter from the burners using a wire brush and/or compressed air. Ensure that all parts are unobstructed. Inspect and clean pilot burner if necessary with a soft brush.
- Check and test the operational functions of all safety devices supplied with your unit included in your System Guide.
- Turn off the manual gas valve and electrical power to the gas duct furnace to verify operational status.
- To clean or replace the main burners, remove the bottom panel and compress the spring by moving the burner toward the manifold. Slide the opposite end of the burner downward from the locating slot while retaining spring is still compressed. Pull the burners away from the manifold.
- With the burners removed, wire brush the inside surfaces of the heat exchanger.
- Check all gas control valves and pipe connections for leaks. Report leaks to a licensed contractor immediately.
- Check the operation of the automatic gas valve by lowering the setting of the thermostat, stopping the operation of the gas duct furnace. The gas valve should close tightly, completely extinguishing the flame on the main burners.
- Inspect the blower section of the system for dust and dirt, and clean as necessary with compressed air.

## SECTION 3

# COOLING TOWER CLEANING AND PREVENTIVE MAINTENANCE

### PROPER COOLING TOWER CLEANING PROTOCOL:

- The Tower basin should be cleaned and disinfected annually.
- All distribution pans should be opened and cleaned annually.
- Pressure wash tower surfaces and basin.
- Vacuum the tower sump.
- Properly dispose of debris.
- Provide daily chemical treatment based on manufacturer's specification.
- The fan housing should be carefully scrubbed and disinfected.



## SECTION 4

# CHILLER – ELECTRIC AND GAS FIRED

- With a pressure washer, clean tubes annually for efficient heat transfer.
- Treat condenser water to prevent scale and corrosion with chemicals as prescribed by manufacturer.
- Check operational status of starters and motors.
- Analyze compressor oil - Send a sample of the lubrication oil to a laboratory for a “spectrometric” chemical analysis once a year.

## SECTION 5

# ABSORBER – STEAM – GAS – ELECTRIC

- Check solution pump seals for leakage. Inspect concentrator steam traps. Report any problems to a licensed HVAC contractor.
- Check operation of all safety devices.
- Check oil level and operation of the purge pump. Refill oil to the level required by manufacturer's specification.
- Provide a written report of work performed and indicate all detected deficiencies quarterly.
- Visually inspect chiller for leaks and report leaks to a licensed contractor .
- Check the lithium bromide solution to adjust inhibitors, and add a lithium bromide solution as required by manufacturer's specification.
- Clean pump cooling water filter in clear water.
- Check condition of all valve diaphragms and replace damaged diaphragms.
- Clean absorption pump strainer with a pressure washer.
- Replace drive belts that are frayed or cracking.
- Check operation of machines/compare conditions of operation against original commissioning data.
- Check water flows and interlocks for clogs, and clear clogs.
- Measure voltage and amperage of the pumps and motors.
- Check the refrigerant for salt, and adjust as required by manufacturer's specifications.

## SECTION 6

# BOILER

### ANNUAL MAINTENANCE

These maintenance items should be done once a year by a licensed heating contractor between heating seasons (May to September):

- Clean low water cut-off.
- Check fuel oil levels.
- Inspect and clean fireside surfaces.
- Inspect all burner refractory material.
- Inspect all gaskets for leaks.
- Inspect and test all system valves.
- Recalibrate all operating controls.
- Clean condensate receiver.
- Inspect electrical terminals.

### PERIODIC MAINTENANCE

These items should be addressed by the building's maintenance staff on a continual basis, or as often as indicated below:

- Clean oil filters at least twice a week.
- Check oil pressure reading at the burners quarterly. Report irregularities to a licensed boiler contractor.
- Keep sight glasses clean. This allows for a clear view of the burner flame and any carbon build-up on the boiler's combustion chamber.
- Keep air filters clean.
- Flush drain low water cut-offs/sidearm oil pre-heater (twice a week).
- Conduct boiler bottom blowdown to clear sludge and sediment, control high water, and control chemical treatment concentrations (monthly or as needed).
- Inspect smoke alarm on a weekly basis:
- Maintain a rigorous boiler chemical feed water treatment program, based on manufacturer's specifications.
- Maintain a boiler room log to record any problems and routine maintenance.
- Conduct pipe inspection program to ensure all pipes are pitched in the direction of steam source (one-pipe steam systems) or condensate drainage (two-pipe systems).



## SECTION 7

# HEAT EXCHANGER – MAINLY IN OFFICE BUILDINGS

### HEAT EXCHANGER MAINTENANCE & CLEANING

- Keep the heat exchanger clean. Check for debris weekly.
- Sample and test fluids twice a year during system operation.
- Whenever there is evidence of dirt, grime, or corrosion build-up, call a licensed contractor to chemically clean the heat exchanger.

## SECTION 8

# FURNACE – TOWNHOMES/APARTMENTS

### TURN THE FURNACE AND GAS OFF

After visual inspection, turn the thermostat off and flip the power switch off on the furnace (or turn off the breaker if the furnace doesn't have a switch). It's very important that if you are performing any kind of gas furnace maintenance that you turn off the gas line. The gas line should have shut off valve near your gas meter. After cleaning or inspection of the furnace, replace the furnace panels and turn the furnace power and gas back on. You may need to relight the pilot light. Inspect and change the filter if dirty.

## SECTION 9

# HEAT PUMP

### HEAT PUMP MAINTENANCE

- Clean or change your filters once a month.
- Maintain the system according to your manufacturers manual.
- Clean outdoor coils whenever they appear dirty.
- Remove foliage and clutter from around the outdoor unit weekly.
- Check ducts, filters, blower, and indoor coil for dirt and other obstructions, and clean as necessary.
- Check for refrigerant leaks and report any leaks to a licensed HVAC contractor.
- Clean the supply and return registers and straighten their fins if bent.
- Check refrigerant charge with a pressure gauge and refill to manufacturer's specifications.
- Lubricate motors and inspect belts for tightness and wear, and replace any belts that are frayed or cracked.
- Calibrate thermostat operation.

## SECTION 10

# PACKAGED SYSTEM PREVENTATIVE MAINTENANCE

- Clean or change your filters once a month.
- Maintain the system according to your manufacturer's manual.
- Clean outdoor coils whenever they appear dirty.
- Remove foliage and clutter from around the outdoor unit weekly.
- Check ducts, filters, blower, and outdoor coil for dirt, other obstructions and clean as necessary.
- Check for refrigerant leaks. Report any leaks to a licensed HVAC contractor.
- Clean the supply and return registers and straighten their fins if bent.
- Correct refrigerant charge with a pressure gauge and refill based on manufacturer's specifications.
- Lubricate motors, and inspect belts for tightness and wear. Repair any belts that are frayed or cracked.
- Calibrate thermostat operation.

## SECTION 11

# AIR HANDLER MAINTENANCE

- Check that fan blades are free of dust buildup and clean as needed.
- Check that all moving parts are free of cracks and excessive wear. Report any damages to a licensed HVAC contractor.
- Check that dampers are free of dirt accumulations, and clean as necessary.
- Check that coils are cleaned at least every six months by a licensed HVAC contractor.
- Check that all coils, refrigerant lines, valves, fittings, etc. are free of leaks. Report leaks to a licensed contractor.
- Check that condensation pans and drains are rust free; wire brush and paint over any corrosion.
- Calibrate the thermostat.
- Keep entire unit properly vacuumed.
- Check that bearing collar set screws on fan shaft are tight and tighten screws as needed.
- Check that damper actuators and linkages are operational and aligned and correct as needed.
- Check that all mechanical connections and dampers are properly lubricated and lubricate as needed.
- Check that all belts are free of wear and cracks and replace belts that are frayed or cracked.

## SECTION 12

# DUCTLESS SYSTEM MAINTENANCE

- Before starting any ductless system maintenance, remember to turn off each component in the system, including the outdoor and indoor units.
- Clean the filters as needed.
- Look for refrigerant leaks and report leaks to a licensed contractor.
- Check the drain hose for blockages and clear blockages with compressed air.

## SECTION 13

# ONLINE HVAC MAINTENANCE LOG

To fill out your HVAC Maintenance Log, please click on the link below:

[CLICK HERE FOR THE ONLINE  
HVAC MAINTENANCE LOG](#)