1. GENERAL

1.1 INTENT

.1 Inspect, start and test each piece of mechanical equipment. Verify that equipment has been properly installed and is operating at a level which meets specified requirements.

1.2 RELATED SECTIONS

.1 Construction Schedule Section 01321
.2 Start Up Report Forms Section 01335
.3 Facility Start Up Procedures Section 01811
.4 Starting of Equipment and Systems Section 01812
.5 Testing Adjusting and Balancing Section 01813
.6 Equipment and System Demonstration Section 01821
.7 Mechanical General Requirements: Section 15010.
.8 Operation and Maintenance Data Section 15020.
.9 System Demonstration and Owner Training Section 15026.
.10 General Mechanical Starting and Testing Requirements: Section 15991.
.11 Mechanical Systems Starting and Testing Section 15993.
.12 Testing, Adjusting and Balancing of Mechanical Equipment and Systems: Section 15994.

1.3 FACTORY TRAINED REPRESENTATIVES

.1 Use factory trained representatives and submit manufacturer's check sheets for starting following specialty equipment:

.1 Air handling units.
.2 Boilers.
.3 Chillers.
.4 Compressors and vacuum pumps.
.5 Variable speed drive units.
.6 Air flow measuring stations.
.7 Control components.
.8 Chemical cleaning and treatment.
.9 Pumps

.2 Use manufacturers factory trained personnel where required to maintain manufacturer's warranty.
2.0 PRODUCTS

2.1 COMMISSIONING CHECK SHEETS

.1 Refer to the appendix at the end of this section for samples of commissioning check sheets to be used for the mechanical equipment and systems. Additional check sheets may be required and/or samples altered to more closely represent the specific equipment on this project.

.2 Complete the commissioning check sheets as indicated in specification section 01335 and 01811.

3. EXECUTION

3.1 FUEL FIRED EQUIPMENT - BOILERS

.1 Pre-Starting:

.1 Verify that installation is as drawn and specified and in accordance with manufacturer's recommendations.

.2 Complete manufacturer's installation and start-up check sheets and include following items on check sheets:

.1 Boiler is level on housekeeping base.

.2 Flue and chimney installed without visible damage.

.3 No visible damage to boiler jacket.

.4 No visible damage to refractory or combustion chamber.

.5 Check PRVs for correct operation and specified relief pressure. Adjust as required.

.6 Clearances have been provided and piping is flanged for easy removal and servicing.

.7 Heating circuit pipes have been connected to correct ports.

.8 Labels are clearly visible.

.9 Boiler, burner and flue completely clean and free of construction debris.
.10 Burner blower rotates in correct direction.

.11 Pressure and temperature gauges installed.

.12 Controls completed.

.3 Ensure pumps are operational.

.4 Check for proper operation of pressure reducing valve on gas train, including venting.

.5 Ensure boiler fluid level, flow switch and high temperature interlocks are in place.

.6 Obtain following from manufacturer and submit as specified in Section 15010:

   .1 All equipment performance selection tables.
   .2 Manufacturer's equipment start-up sheets.

.2 Starting:

   .1 Start pumps.

   .2 Perform starting of boilers and adjustment of burners using manufacturer’s factory trained personnel.

   .3 Fill out start-up sheets and attach copy with Contractor Start-Up Report.

   .4 Check and record performance of all factory provided boiler protection devices, and firing sequences.

   .5 Check and record performance of boiler fluid level, flow switch and high temperature interlocks.

   .6 Run-in as recommended or required by manufacturer.

.3 Post Starting:

   .1 Perform following tests for each firing rate for high/low burners and for 100%, 66%, and 33% load for modulating burners. Adjust boiler combustion efficiency (%) at each firing rate to that specified or advertised by manufacturer, if latter is higher.
.1 Measure gas pressure on manifold.

.2 Measure combustion air temperature at inlet to burner.

.3 Measure flue gas temperature at boiler discharge.

.4 Perform flue gas analysis. Measure and record flue gas CO\textsubscript{2} and O\textsubscript{2} concentration.

.5 Measure natural flue draft.

.2 Measure water flow rate, pressure drops, and temperature rise through each boiler.

.3 Inspect expansion tank, make-up water meter, tank pressure, PRV, water level and backflow preventer.

.4 Pre-Interim Acceptance: - Not applicable.

### 3.2 FUEL FIRED EQUIPMENT - SERVICE WATER HEATERS

.1 Pre-Starting:

.1 Verify that installation is as drawn and specified and in accordance with manufacturer's recommendations.

.2 Complete manufacturer's installation and start-up check sheets and include following items on check sheets:

.1 Heater is level on housekeeping base.

.2 Flue and chimney installed without visible damage.

.3 No visible damage to heater jacket.

.4 No visible damage to refractory or combustion chamber.

.5 Check PRVs for correct operation and specified relief pressure. Adjust as required.

.6 Clearances have been provided and piping is flanged for easy removal and servicing.
.7 Labels are clearly visible.

.8 Heater, burner and flue completely clean and free of construction debris.

.9 Burner blower rotates in correct direction.

.10 Controls completed.

.11 Tank has dielectric unions on piping connections.

.3 Verify that chemical sterilization of piping system is completed.

.4 Ensure circulation pump is operational.

.5 Check for proper operation of pressure reducing valve on gas train, including venting.

.2 Starting:

.1 Ensure pilot is operating.

.2 Ensure tank is full of water, vented and flushed.

.3 Ensure thermostat is set at 50°C.

.4 Start as recommended by manufacturer.

.5 Fill out start-up sheets and attach copy with Contractor Start-Up Report.

.6 Check and record performance of all factory provided protection devices, and firing sequences.

.7 Run-in as recommended or required by manufacturer.
.3 Post-Starting:

.1 Measure gas pressure on manifold.

.2 Measure combustion air temperature at inlet to burner.

.3 Measure flue gas temperature at boiler discharge.

.4 Perform flue gas analysis. Measure and record flue gas CO$_2$ and O$_2$ concentration.

.5 Measure natural flue draft.

.6 Adjust heater combustion efficiency (%) to that specified, or advertised by manufacturer if latter is higher.

.7 Fill tank with cold domestic water and determine tank recovery time.

.4 Substantial Completion Acceptance:

.1 Drain tank, refill and vent.
3.3 FUEL FIRED EQUIPMENT - PACKAGED DIRECT FIRED AIR SYSTEMS

.1 Pre-Starting:

.1 Verify that installation is as drawn and specified and in accordance with manufacturer's recommendations.

.2 Complete manufacturer's installation and start-up check sheets and include following items on check sheets:

.1 Unit is level.

.2 No visible damage to unit casing.

.3 Clearances have been provided.

.4 Discharge air thermostats operational and calibrated.

.5 Roof curb sealed to duct penetration, if applicable.

.6 Filter installed.

.7 Labels are clearly visible.

.8 Controls completed.

.3 Check for proper operation of pressure reducing valve on gas train, including venting.

.4 Ensure burner, fan and damper interlocks are in place.

.5 Lubricate bearings on fan as recommended by manufacturer.

.6 Ensure fan wheel rotates in correct direction without vibration or binding.

.7 Adjust belt to proper alignment and tension.
.2 Starting:

.1 Check correct operation of safety interlocks, including exhaust fans, outside air damper, fan and burner interlocks, CO detector.

.2 Start as recommended by manufacturer.

.3 Fill out start-up sheets and attach copy with Contractor Start-Up Report.

.4 Check and record performance of all factory provided burner protection devices, and firing sequences.

.5 Check summer operation burner firing lockout.

.6 Run-in as required by manufacturer.

.3 Post-Starting:

.1 Perform a discharge air combustion products analysis and adjust burner for peak efficiency over entire turn down range of burner.

.2 Measure gas pressure on manifold.

.3 Measure air flow on high and low fire to ensure sufficient velocities across burner profile plate.

.4 Adjust belt tension and change pulley sheaves to desired air flow.

.5 Check to see that following occurs:

.1 Exhaust fans are interlocked with unit.
.2 High temperature limit for correct operation and calibration.
.3 Air flow lockout for proper operation.
.4 High and low gas pressure switches for proper operation.
.5 Burner turn down and flame stability.
.6 Vibration isolators are free.
.7 Calibrate discharge air control and set to specified level.
4 Pre-Interim Acceptance:

.1 Replace filters.
.2 Lubricate bearings.
.3 Adjust belt tension.

3.4 FLUID HANDLING EQUIPMENT - PUMPS

.1 Pre-Starting:

.1 Verify that installation is as drawn and specified and in accordance with manufacturer's recommendations.

.2 Complete manufacturer's installation and start-up check sheets and include following items on check sheets:

.1 Pump is level. Pump is properly aligned and millwright certificate is submitted to engineer.

.2 Isolation valves, strainers, check valve, pressure gauges, by-pass filter and flow meter are installed properly.

.3 Pump suction has sufficient length of straight run piping.

.4 Air has been completely bled off piping system.

.5 Expansion tank is charged and on-line.

.6 Strainers have clean screens in place.

.7 Where specified for large pumps, check pump base vibration isolation and flexible connections on water pipes are properly installed.

.8 Nameplate is readily visible.

.9 Check clearance space is adequate for pump servicing and removal.
.2 Starting:

.1 Start as recommended by manufacturer.
.2 Fill out start-up sheets and attach copy with Contractor Start-Up Report.
.3 Check impeller is rotating in correct direction.

3 Post Starting:

.1 Run-in pumps for minimum 12 continuous hours.
.2 Ensure flows through parallel pumps are equally balanced.
.3 Ensure mechanical seals do not leak, or packing gland type seals are wetted.
.4 Check pump NPSH - net positive suction head.
.5 Where vibration isolation is specified, check for correct static deflection of unit vibration isolators, and that start up and shut down deflection is within resilience limits of isolators and flexible connections.
.6 Verify that motor has sufficient air flow through casing to provide cooling.

.4 Pre-Interim Acceptance:

.1 Clean strainers.
.2 Replace shaft seals if pump has been used to degrease system.

3.5 FLUID HANDLING EQUIPMENT - HEAT EXCHANGERS

.1 Pre-Starting:

.1 Verify that installation is as drawn and specified and in accordance with manufacturer's recommendations.
.2 Complete manufacturer's installation and start-up check sheets and include following items on check sheets:
   .1 Vessel is level on housekeeping base.
   .2 PRVs are properly installed and operational.
.3 Clearances have been provided and piping is flanged for easy removal and servicing.

.4 Primary and Secondary circuit pipes have been connected to correct ports.

.5 Nameplate and labels are clearly visible.

.6 Unit is clean of foreign matter. Remove heads to inspect for cleanliness as required.

.7 Control valve piping is connected for correct flow through valve body and for required fail safe action of valve.

.8 Insulation is complete.

.3 Ensure Primary and Secondary side pumps are complete and operational.

.2 Starting: not applicable.

.3 Starting: Refer to Section 15994 - Testing Adjusting and Balancing of Mechanical Equipment and Systems.

.4 Pre-Interim Acceptance: not applicable.

3.6 FLUID HANDLING EQUIPMENT - COILS

.1 Pre-Starting:

.1 Verify that installation is as drawn and specified and in accordance with manufacturer's recommendations.

.2 Complete manufacturer's installation and start-up check sheets and include following items on check sheets:

.1 Pipe connections have been correctly made for counter current heat exchange between air and fluid.

.2 Clearances have been provided and piping is flanged for easy removal and servicing.

.3 Coil air vent and drain valve and deadleg drain valves have been provided.

.4 Coil is sloped to ensure complete drain down.
.5 Pressure and temperature tappings, Pete's plugs, have been provided.

.6 Fins inspected and combed straight as required.

.7 Cooling coil drain pan and trapped drain line installed correctly.

.8 Labels are clearly visible

.9 Control valve piping is connected for correct flow through valve body and for required fail safe action of valve.

.2 Starting:

.1 Check operation of cooling coil condensate drain with supply fan at maximum air flow. Ensure that condensate will drain away against maximum suction pressure of supply fan. Check for and eliminate condensate carry over at maximum air velocity.

.3 Post-Starting: refer to Section 15994 - Testing Adjusting and Balancing of Mechanical Equipment and Systems.

.4 Pre-Interim Acceptance: not applicable.

3.7 FLUID HANDLING EQUIPMENT - ELECTRIC STEAM GRID HUMIDIFIERS

.1 Pre-Starting:

.1 Verify that installation is as drawn and specified and in accordance with manufacturer's recommendations.

.2 Complete manufacturer's installation and start-up check sheets and include following items on check sheets:

.1 Manifold slopes back to unit to drain condensate away from duct.
.2 Clearances allowed for servicing.
.3 Interlocks and safeties operational.
.4 Make-up water and drain connections complete.
.2 Starting:

.1 Start as recommended by manufacturer.
.2 Fill out manufacturer's check sheets.

.3 Post-Starting:

.1 Check humidistat control of unit.
.2 Check automatic blowdown cycle.
.3 Measure humidifier steaming rate.

.4 Pre-Interim Acceptance: not applicable

3.8 FLUID HANDLING EQUIPMENT - CHILLERS

.1 Pre-Starting:

.1 Verify that installation is as drawn and specified and in accordance with manufacturer's recommendations.

.2 Complete manufacturer's installation and start-up check sheets and include following items on check sheets:

.1 No physical damage to unit has occurred during construction.
.2 Unit is level on housekeeping base.
.3 Check that chiller base vibration isolation and flexible connections on water pipes are properly installed.
.4 Clearances have been provided and piping is flanged for easy removal, servicing and tube cleaning.
.5 Chilled and condenser water circuit pipes have been connected to correct ports.
.6 Labels are clearly visible.
.7 Oil levels are as recommended by manufacturer.
.8 Refrigerant charge is sufficient and leak tested.
.9 Shipping skids/blocks/straps are removed.

.10 Unit has adequate ventilation, as specified in CSA B52-M1983.

.11 Unit condenser refrigerant pressure relief is vented to ambient.

.12 Thermometers, pressure gauges installed.

.13 Control systems and safety interlocks are complete.

.14 Pumps completed and started.

.15 Crankcase heater is on a minimum of 24 hours prior to chiller start-up.

.3 Obtain following from manufacturer and submit as specified in section 15010:

.1 All equipment performance selection tables.

.2 Manufacturer's equipment start-up sheets.

.2 Starting:

.1 Start chillers using manufacturer’s factory trained personnel.

.2 Fill out start-up sheets and attach copy with Contractor Start-Up Report.

.3 Check and record performance of all factory provided chiller protection devices.

.4 Check and record performance of all chiller flow, pump and low temperature interlocks installed or provided by other trades.

.3 Post-Starting:

.1 Run in chiller as recommended by manufacturer.

.2 Check for correct static deflection of the unit vibration isolators, and that start-up and shut down deflection is within resilience limits.

.4 Pre-Interim Acceptance:

.1 Check refrigerant level and charge as necessary.

.2 Check oil level and fill as necessary.

.3 Check refrigerant dryer and change as necessary.
3.9  FLUID HANDLING EQUIPMENT - MISCELLANEOUS

.1 Gauges and Thermometers:

.1 Confirm all gauges and thermometers can be read from the floor level and are installed as recommended by manufacturer.

.2 Calibrate.

.2 Verify following equipment is installed as recommended by manufacturer. Fill out manufacturer's start-up sheets:

.1 PRVs.
.2 Air eliminators.
.3 Strainers.
.4 Check valves.
.5 Balancing valves.
.6 Plumbing fixtures.
.7 Backflow preventers.
.8 Vacuum breakers.

3.10  AIR HANDLING EQUIPMENT - AIR HANDLING UNITS

.1 Pre-Starting:

.1 Check that installation is as drawn and specified and in accordance with manufacturer's recommendations.

.2 Complete manufacturer's installation and start-up check sheets including following:

.1 Air blender, mixing baffles.

.2 Fresh, Exhaust and Recirculation air motorized dampers, operation and size.

.3 Filters.

.4 Check that fan base vibration isolation and flexible connections to ductwork are properly installed.

.5 Special features, access doors, liners, inlet vanes, labels.
.6 For variable volume systems, ensure variable volume/speed controller is operational.

.7 Ensure silencers are installed.

.2 Lubricate bearings on fans as recommended by manufacturer. Ensure fan wheels rotate in correct direction without binding. Adjust belts to proper alignment and tension.

.3 Vacuum clean air systems.

.4 Ensure temporary filters are installed. Never operate system without filters installed.

.5 Ensure all balancing and fire dampers are open and ductwork is complete. For VAV systems ensure at least 60% of boxes are open.

.6 Ensure all coils are in operation. If outside air temperature is less than 2°C ensure coils are dry or filled with glycol.

.7 On parallel fan systems ensure backdraft dampers are installed.

.8 Ensure electrical connections are complete and system disconnects are within sight of unit.

.9 Ensure controls are operational.

.10 Ensure inlet and discharge duct geometry is correct.

.2 Starting:

.1 Follow manufacturer's recommendations.

.3 Post-Starting:

.1 Start fan, for variable speed fans run up to maximum speed, and check for vibration free operation.

.2 Check for correct static deflection of unit vibration isolators, and that start-up and shut down deflection is within resilience limits.

.3 Run for one day and check filters, coils, and humidifier for bypass. Seal as required.
.4 Check that bearings are not overheating.

4 Pre-Interim Acceptance:

1 Replace temporary filters with permanent filters.
2 Vacuum clean heating and cooling coils.
3 Lubricate bearings.
4 Check belts for tension and wear.

3.11 AIR HANDLING EQUIPMENT - FANS

1 Pre-Starting:

1 Check that installation is as drawn and specified and in accordance with manufacturer's recommendations.

2 Complete manufacturer's installation and start-up check sheets including following:

1 Backdraft dampers.
2 Accessories.
3 Special features.
4 Check that fan base vibration isolation and flexible connections to ductwork are properly installed.

3 Lubricate bearings on fans as recommended by manufacturer.

4 Ensure fan wheels rotate in correct direction without binding.

5 Adjust belts to proper alignment and tension.

6 Ensure ductwork and fan casing is free of dirt or foreign material.

7 Ensure electrical connections are complete and disconnect is within sight of fan.

8 Ensure inlet and discharge duct geometry is correct.

2 Starting:

1 Follow manufacturer's recommendations.
.3 Post-Starting:

.1 Start fan, for variable speed fans run up to maximum speed, and check for vibration free operation.

.2 Check for correct static deflection of unit vibration isolators, and that start-up and shut down deflection is within resilience limits.

.3 Check that bearings are not over heating.

.4 Pre-Interim Acceptance:

.1 Lubricate bearings.
.2 Check belts for tension and wear.

3.12 AIR HANDLING EQUIPMENT - AIR FLOW MEASURING STATIONS

.1 Pre-Starting:

.1 Check that installation is as drawn and specified and in accordance with manufacturer's recommendations. Check following:

.1 Manufacturer's recommended length of duct ahead and behind flow station.

.2 Straightening vane installed before flow station.

.3 Flow station located away from fan discharges, silencer outlets, duct branches, etc.

.4 No take off branches have been placed ahead of measuring station location.

.5 Straight section of duct adjacent to flow station to take air flow measurement duct traverses.

.6 Air flow measuring station sized for adequate velocity pressure range, and transducer range is compatible with design velocity range of flow station.

.2 Starting: not applicable.

.3 Post-Starting: refer to Section 15994.
.4 Pre-Interim Acceptance: not applicable.

3.13 AIR HANDLING EQUIPMENT - VAV BOXES

.1 Pre-Starting:

.1 Check that each installation is as drawn and specified and in accordance with manufacturer's recommendations. Check following:

.1 Inlet duct connection:

.1 shall have four duct diameters to box inlet.

.2 shall not have more than 150 mm flexible connection between duct and box.

.3 shall not have flow straightening vanes.

.2 Access to controls.

.3 Completeness of control connections.

.4 Silencer/acoustic duct.

.5 No damage to exterior casing or controls.

.6 Box support adequate.

.7 Nameplate and identification tag is visible.

.2 Starting: not applicable.

.3 Post-Starting: refer to Section 15994.

.4 Pre-Interim Acceptance: not applicable.
3.14 AIR HANDLING EQUIPMENT - UNIT AND CABINET HEATERS

.1 Pre-Starting:

.1 Check each installation is as drawn and specified and in accordance with manufacturer's recommendations. Check following:

.1 Piping connections.
.2 Unit vibration isolation.
.3 Ducting connections.
.4 Controls.
.5 Disconnect switches.
.6 Unit clean.

.2 Starting: as recommended by manufacturer.

.3 Post-Starting: refer to Section 15994.

.4 Pre-Interim Acceptance: not applicable.

3.15 AIR HANDLING EQUIPMENT - MISCELLANEOUS

.1 Refer to Section 15994.

3.16 MISCELLANEOUS EQUIPMENT - VARIABLE SPEED DRIVE UNITS

.1 Pre-Starting:

.1 Obtain following from manufacturer and submit as specified in section 15010:

.1 All equipment performance selection tables.
.2 Manufacturer's equipment start-up sheets.

.2 Verify that installation is as specified and in accordance with manufacturer's recommendations.

.2 Starting:

.1 Start variable speed controllers and motor powered from each drive using manufacturer’s factory trained personnel.

.2 Fill out start-up sheets and attach copy with Contractor Start-Up Report.
.3 Check and record operation of all factory provided protection devices.

.4 Run-in as required and recommended by manufacturer.

.3 Post Starting:

.1 Run motor up to maximum speed, check ampere draw. Check and set overloads.

.2 Check manual override control and manual speed control of motor

.3 Put speed controller in automatic, command motor to full speed and check that motor speed ramp operates correctly accelerating motor to maximum speed without tripping. Command motor to minimum speed and observe controlled deceleration of motor.

.4 Pre-Interim Acceptance: not applicable.

3.17 MISCELLANEOUS EQUIPMENT - TANKS

.1 Pre-Starting:

.1 Verify that installation is as drawn and specified and in accordance with manufacturer's recommendations. Check following:

.1 Tank is level on housekeeping base.

.2 No visible damage to vessel.

.3 Check PRVs for correct operation and specified relief pressure. Adjust as required.

.4 Clearances have been provided and piping is flanged for easy removal and servicing.

.5 Labels are clearly visible.

.6 Controls, gauges, alarm devices, etc. are operational.

.7 Access ports/manholes provided.

.8 Piping sizes - inlet/outlet are correct.

.9 Lining is intact and not damaged.
.10 Tank has dielectric unions on piping connections.

.2 Starting: not applicable.

.3 Post-Starting:

.1 Verify operation of:

.1 Drain line.
.2 Make-up line if applicable.
.3 Gauge glass.
.4 Diaphragm if applicable.

.4 Pre-Interim Acceptable: not applicable.

3.18 MISCELLANEOUS EQUIPMENT - AIR COOLED CONDENSERS

.1 Pre-Starting:

.1 Check that installation is as drawn and specified and in accordance with manufacturer's recommendations.

.2 Complete manufacturer's installation and start-up check sheets including following:

.1 No physical damage to unit has occurred.
.2 All access doors move freely and are weathertight.
.3 Unit is free of foreign debris.
.4 All bolts, screws are tight.
.5 Condenser base vibration isolation and flexible connections on refrigerant pipes are properly installed.
.6 Controls complete.
.7 Check acoustic insulation.
.8 Fan guards are installed.
.3 Lubricate bearings on fans as recommended by manufacturer.

.4 Ensure fan wheels rotate in correct direction without binding.

.5 Adjust belt to proper alignment and tension.

.2 Starting:

.1 Start in accordance with manufacturer's instructions.
.2 Complete manufacturers starting check sheet.

.3 Post-Starting:

.1 Ensure all fan guards are tight.
.2 Check air flows over coils.
.3 Check operation of condenser capacity control device.
.4 Ensure vibration isolation and flexible connections to unit properly damp vibration transmission to structure.

.4 Pre-Interim Acceptance:

.1 Lubricate bearings.
.2 Adjust belt tension.

3.19 MISCELLANEOUS EQUIPMENT - COMPRESSORS AND VACUUM PUMPS

.1 Pre-Starting:

.1 Check following after installation:

.1 No physical damage occurred during construction.
.2 Unit base vibration isolation and flexible connections on service pipes are properly installed.
.3 Adjust belts to proper alignment and tension.
.4 Belt guards are in place.
.5 Unit is level.
.6 Fused disconnect located at unit.
.7 Air dryer properly installed.
.8 Automatic condensate drain installed.
.9 Lubricate bearings.
.2 Starting:

.1 Start unit in accordance with manufacturer's instructions.
.2 Fill out manufacturer's start-up sheets.

.3 Post-Starting:

.1 Check for correct static deflection of unit vibration isolators, and that start-up and shut down deflection is within resilience limits.
.2 Ensure sufficient outdoor air is available to unit.
.3 Check to ensure no oil carryover in air stream.
.4 Air dryer is operating and chilling air to correct temperature. Condensate is being removed from air line.
.5 Pressure regulators and PRV are correctly set.
.6 Automatic condensate drain valve is operating correctly.

.4 Pre-Interim Acceptance:

.1 Change air filter in unit.
.2 Check for oil carryover into air supply.
.3 Check oil levels, and refill as necessary.
.4 Change air line filter cartridges.
.5 Adjust belt tension.
3.20 MISCELLANEOUS EQUIPMENT - PACKAGED AIR CONDITIONING UNITS

.1 Pre-Starting:

.1 After installation check following:

.1 No damage to unit.
.2 Unit is level.
.3 Drain pan and drain line installed correctly.
.4 Compressor base vibration isolation and flexible connections on refrigerant pipes are properly installed.
.5 Make-up water complete.
.6 Humidifier flush water piping complete.
.7 Ductwork complete.
.8 Bearings lubricated.
.9 Filters installed and clean.

.2 Starting:

.1 Start unit in accordance with manufacturer’s instructions.
.2 Fill out manufacturer's check sheets.

.3 Post-Starting: refer to Section 15994 - Testing Adjusting and Balancing of Mechanical Equipment and Systems.

.4 Pre-Interim Acceptance:

.1 Change filters.
.2 Flush humidifier.

3.21 MISCELLANEOUS EQUIPMENT - FIRE EXTINGUISHERS

.1 Check the number, make, model and capacity of each portable fire extinguisher.

.2 Check the pressure drop on each extinguisher over 20 day period. Replace units loosing charge.

.3 Check that all cabinets are clean and door latch functions correctly.

3.22 MISCELLANEOUS EQUIPMENT - FIRE HOSE CABINETS

.1 Check the number, make and model of each cabinet.
.2 Ensure doors open fully and do not block exit or exit corridors.

.3 Check that all cabinets are clean and door latch functions correctly.

.4 Adjust PRV's and record pressures.

.5 Check 32 mm hose connection, 65 mm fire department connection, fire hose and nozzle and fire extinguisher as applicable.

END OF SECTION