

SECTION 12 – OPERATIONAL AND MAINTENANCE RECOMMENDATIONS

The following sections list recommended maintenance schedules for a YORK ParaFlow Absorption Unit.

Items are listed according to the time required between inspections. Those items that should be addressed by the operator or maintenance staff at the facility where the machine is installed are marked as such. Those items that are marked (Service technician) should be performed by a qualified service technician. Contact your local YORK Factory Service office for details on maintenance contracts.

Regardless of who performs the work, it is vital that the recommendations contained in this section are followed. Failure to do so may result in unreliable operation, increased service requirements and shortened unit life.

DAILY OPERATION LOGS AND INSPECTIONS

All daily operation and maintenance checks are to be performed by operator of this equipment. These logs and observations can be used by the Service Technician to troubleshoot a problem, if it arises.

GENERAL

1. Check and record Operating Data on the Operations Log sheet located in Appendix D of this manual.
2. Perform an aural and visual inspection of the machine. Note any unusual noises or observations in the comments section of the log form. If the problem persists, contact your local YORK Factory Service office for recommendations.

Direct-Fired Machines (Gas Operation)

1. Record the following data on the Operations Log Form:
 - a. Gas Firing Rate ft^3/hr . (From Gas Meter)
 - b. Inlet Gas Pressure
 - c. Exhaust Gas Temperature
2. Make sure the burner is firing properly. Unusual noises or smells may indicate abnormal firing. Turn burner on and off to make sure it starts and stops properly.
3. Check the fuel/air ratio linkages for tightness and freedom of travel (no binding should be present).

Adjustments should be made by qualified personnel only.

4. Check for leakage in the gas supply piping line. Use a soap solution or a gas indicator. If gas is smelled around the unit, the machine should be shut off and isolated from the gas supply. Contact your gas supplier for details.
5. Verify proper operation of draft system. The two possibilities are either:
 - a. Manual back draft with barometric damper control.
 - b. Sequence overfire draft control (Modulating Damper).

Direct-Fired Machines (Oil Operation)

1. Record the following data on the Operations Log Form:
 - a. Oil Consumption Rate (gal/min) (if flow meter is present).
 - b. Oil Supply Pressure
 - c. Oil Return Pressure
 - d. Oil Pump Inlet Pressure
 - e. Exhaust Gas Temperature
2. Make sure the burner is firing properly. Unusual noises or smells may indicate abnormal firing. Turn burner on and off to make sure it starts and stops properly.
3. Check the fuel/air ratio linkages for tightness and freedom of travel (No binding should be present). Adjustments should be made by qualified personnel only.
4. Check for leakage in the oil supply and return piping. This can be determined visually.
5. Check for smoke or soot in the exhaust gas or breeching/chimney system.
6. Verify proper operation of draft system. The two possibilities are either:
 - a. Manual back drafts with barometric damper control.
 - b. Sequence overfire draft control (Modulating Damper).

Steam-Fired Machines

1. Record condensate flow rate (GPM) and condensate back pressure.
2. Check for leakage in steam piping.

Component	Preventative Maintenance Operation	Maintenance Interval (Months unless otherwise indicated)									
		See Note Below	As Needed	Daily	Monthly	4	6	12	24	36	48
Unit	Solution Chemistry Analysis (Add inhibitors as needed)	(1), T									
	Record Operational Data (Data Form)			O							
	Refrigerant Blowdown	(2), O									
	Check For Refrigerant Contamination (Specific Gravity)						T				
	Leak Test Unit	(3)									
	Check Electrical Connections							T			
	Replace Sight Glasses or Glass Gaskets		T								
	Check For Proper Solution Levels adjust as required						T				
	Check For Proper Refrigerant Levels adjust as required						T				
	Check For proper Concentration of Octyl Alcohol		T								
	Check Unit Level							T			
	Rebuild Spindle Type Sample Valves		T								
Unit Safety Controls - Performance Test	LRT - Low Refrigerant Temperature Cutout Switch							T			
	CHFLS - Chilled Water Flow Switch.							T			
	CWFLS - Condenser Water Flow Switch							T			
	HWFLS - Hot Water Flow Switch (where applicable)							T			
	HP1 + HP2 (20G Direct Fired Units) - High Press. & Temp. Cutout Switches							T			
	HT1 - High Temperature Cutout Switch							T			
	LS - Low Solution Level Cutout Switch							T			
Instrumentation	Accuracy check of thermistors and transducers							T			
	Accuracy check of Condenser Pressure Gauge							T			
Solution and Refrigerant Pumps	Inspection (pump bearing and seal wear) Rebuild as required.	(4)									
	Inspection of pump contactors and overloads							T			
	Check operating amperage of pumps.							T			

PREVENTIVE MAINTENANCE SCHEDULE

Component	Preventative Maintenance Operation	Maintenance Interval (Months unless otherwise indicated)									
		See Note Below	As Needed	Daily	Monthly	4	6	12	24	36	48
Solution and Refrigerant Pumps (continued)	Check electrical connections to pumps							T			
	Check performance of pumps (pressures, etc.)						T				
	Check average skin temperatures of pumps						T				
Purge Pump	Inspection of belt - replace or tighten as needed							O			
	Check operating amperage of pump						T				
	Check electrical connections to pump						T				
	Inspection of pump contactor and overload						T				
	Change oil		O								
	Determine ultimate vacuum of pump						T				
	Rebuild or replace pump		T								
Unit Continuous Purge System	Check for proper operation of purge eductor						T				
	Rebuild Purge Diaphragm Valves		T								
	Accuracy check of manometer or Vacuum Gauge						T				
Tube Bundle Maintenance	Inspect and brush clean absorber & condenser tubes							T			
	Inspect and brush clean evaporator tubes	(5)									
	Inspect and brush clean hot water heat exchanger tubes	(6)									
	Eddy current test high-temperature generator tubes (steam units only)	(6)									
	Eddy current and boroscope inspect absorber and condenser tubes (after brush cleaning)	(5)									
	Eddy current and boroscopic inspect evaporator tubes (after brush cleaning)	(6)									
	Eddy current and boroscope inspect hot water heat exchanger tubes (after brush cleaning)	(6)									

Component	Preventative Maintenance Operation	Maintenance Interval (Months unless otherwise indicated)									
		See Note Below	As Needed	Daily	Monthly	4	6	12	24	36	48
Steam (Steam-Fired Units only)	Inspection for wear of stem valve - Rebuild or replace as needed							T			
	Check for proper steam valve modulation							T			
	Inspect steam system piping and components for leaks			O							
	Inspect for design steam entering conditions			O							
	Check for wear and/or blocking of condensate needle valve(s) – Rebuild/clean or replace as needed.							T			
	Check for proper condensate back pressure			O							
Burner General (Direct-Fired Units Only)	Perform safety test - Spark Pick-Up							T			
	Perform safety test - Pilot Turn-Down							T			
	Performance test of burner fan air proving switch							T			
	Inspection of burner safety interlocks				O						
	Check for flame failure cutout (Main and Pilot)				O						
	Flame signal strength				O						
	Inspection of burner linkage			O							
	Inspection of draft control system				O			T			
	Combustion air - Check to make sure that all sources remain clear and open				O			T			
	Inspection for contamination of vertical heat exchanger tubes, flue and chimney							T			
	Inspection for leakage through pilot and main solenoid or motorized valve(s)							T			
	Inspection for wear of main and pilot gas pressure regulators							T			
	Combustion analysis (i.e., fuel/air ratios, combustion efficiency, etc.)							T			
Inspection of gas pilot system - Remove pilot assembly and inspect								T			

Component	Preventative Maintenance Operation	Maintenance Interval (Months unless otherwise indicated)									
		See Note Below	As Needed	Daily	Monthly	4	6	12	24	36	48
Burner (Direct-Fired Units Only) Gas Operation)	Inspection for cleanliness of main and pilot burner							T			
	Inspection of combustion air fan, motor bearing, etc.							T			
	Check burner electrical connections							T			
	Inspection for leakage through main gas valve(s)							T			
	Performance test of high pressure and low pressure gas switches				O						
	Inspection for wear of main gas pressure regulator						T				
	Inspection for leakage and/or corrosion of gas piping			O							
	Determine gas input by clocking the gas meter							T			
Burner (Direct-Fired Units Only) Oil Operation	Inspection for oil nozzle wear - Replace nozzle as required							T			
	Performance test, inspection for wear of oil solenoid and main oil modulating valve(s)							T			
	Inspection of oil pump unit							T			
	Checking for clogging of oil strainer							T			
	Leak test of piping (visual observation)			O							
	Determine and record oil consumption (Charts or Flow Meter)			O							
	Performance test of oil pressure cutout switch (Refer to burner documentation.)				O						

T = YORK Service Technician O = Operator

1. Units that provide year-round cooling: Once every four months, and as required due to excess purge requirements.
Units that provide only seasonal cooling: Once at the beginning of the cooling season, once in the middle, and as needed due to an excess purge warning.
Units that operate in both heating and cooling modes: Once at the beginning of the cooling season, once in the middle, and once approximately two weeks prior to switching over to heating operation. Also, as needed due to an excess purge warning.
2. Perform once per month, or as indicated by the YORK start-up technician.
3. Units should be leak-tested when excessive purging is noticed. Note: The solution chemistry should always be checked (and adjusted as necessary) prior to performing a leak test. If excessive purging is still present after the inhibitors have been added, an air leak is present. A leak test must be performed.
4. 50,000 - 60,000 Hours. More frequent rebuilds will be required if solids and/or dissolved copper is present in the solution.
5. End of first year and then every other year thereafter.
6. Once every 3 years.