612(a)-F Inspection Form for Condor T4000

Item	Action	Check
General	New Installation	☐
	Existing Installation	☐
	Planned Repairs	☐
	Spring Shutdown	☐
	Remove Track Ducting	☐
	Winter Startup	☐
Visual	Area around SCD, fuel supply or tank is free of combustible material & liquids.	☐
Fuel Supply Line	Verify the fuel supply pipeline leak tests have been completed before starting the SCD inspection. Pipeline tests are performed on initial installation by a qualified gas company. If gaseous odor is detected refer to GI 602 Emergency Procedures for Gas Leaks at Snow Clearing Device (SCD) Facilities	☐ ☐ ☐
Clearance	Horizontal and vertical clearance of Condor housing and ducting does not impose on Metrolinx's track clearance envelope. Refer to GI-601 Dynamic Clearance Envelope.	☐
	Record the clearance measurements in the chart provided on the Condor T4000 Test & Inspection Measurement Record	☐
Air Intake Nozzles	Hood, Intake and plenum are unobstructed and in good condition.	
Point Nozzles	Point nozzles installed.	☐
	Directed at, and tip within 2″ to 6″ of points, and clear of rail head by 2.5″	☐
	Rodent screens installed between duct and silicone gasket under adaptor collars	☐
	Electrical isolation shoulder washers installed.	☐
Track Duct	Track duct installed	☐
	Rodent screens installed	☐
	Appropriate vents open and directing air at switch plates and rods. Keep all openings closed between the ducts, except where the switch rods are located. Open vent openings no more than ¼″.	☐
	Ductwork below top of rail and not interfering with switch operation.	☐
	Track duct deflectors installed, 18″ wide at points protecting point nozzles and track duct and 8″ at heel protecting track duct.	☐
	Ducting condition is acceptable and clear of any obstructions.	☐
Tie Duct	All clips and insulators installed. There is no evidence of cracks or obstructions.	☐
Ground Connection	Confirm power supply wires are connected to SCD and ground conductor is connected to the ground lug inside control access box.	☐
Disconnect Switch	Confirm that disconnect switch is installed and connected to SCD with TECK 90. Wires are terminated in the 600V control access box and the top of the disconnect switch.	☐

Item	Action	Check
Gas Components	Confirm that dirt trap, strainer and regulator are installed.	☐
Gas Regulator Setup (to be performed by a Qualified Gas Fitter).	Check that main gas valve is closed.	☐
	Remove the lid from the T4000 power head. Remove pressure measurement plug (using a six mm hex key/allan key) located on first solenoid and install manometer into the plug.	☐
	Install gas flow meter into the gas train between gas regulator and burner.	☐
	Open main gas valve.	☐
	The gas regulator should initially be set to 6″wc to prevent going above maximum 400000Btu/h of heat input to the switch. Adjustments can be made later to produce the correct output temperature with a maximum of 6.8 w.c. and a gas flow maximum of 388 CFH.	☐
Confirm Surge Arrester is ON	Put both control switches (on the receptacle panel in 120V control access box) in OFF position.	☐
	Turn the main circuit breaker (in 600V control access box) to the ON (I) position.	☐
	Check that the surge arrester LEDs are illuminated.	☐
Power Source	Using an AC voltmeter confirm that 600VAC (± 5%) is measured each line-line voltage at the bottom of the Main Circuit Breaker.	☐
	Using a voltmeter, confirm that 600VAC (± 10%) is present at the primary side of the transformer and that 120VAC is present on the secondary side.	☐
	Verify that 24VDC is present at the output of the power supply. If the output is not 24VDC (it could be between 22 and 28V), adjust the dial located on the power supply until 24VDC is measured at the output.	☐
	Record Line Voltage measurements in the table provided in the Condor T-2000 Test & Inspection Measurement Record.	☐
Motor Rotation	Position the mode switch to 'Manual'.	☐
	Verify that the fan intake pressure is detected at the air intake mesh (motor is rotating in counterclockwise direction).	☐
	If motor is rotating in a clockwise direction, shut the power off (Main Circuit breaker to OFF position) and swap any two of the motor connection wires in the Main Control Panel on terminal T8. Motor should now be rotating in a counterclockwise direction.	☐
Motor Overload	Turn the motor overload dial down below 3A and confirm the motor shuts off and that the alarm indicator flashes once every 2 seconds.	☐
	Turn the dial back to 3.5A and turn the motor starter/breaker to the ON (I) position. The motor should start up again.	☐
Motor Current	While the motor is running, measure L1, L2 and L3 using a clamp-on ammeter. Current should be within 2.5 – 3.5 A.	☐
	Record the current measurements in the chart provided on the Condor T-2000 Test & Inspection Measurement Record	☐

Item	Action	Check
Set Digital Current Sensor	Block the air intake mesh using air blockage tool.	☐
	Turn the dial on the digital current sensor to the left until input 7 LED on the PLC turns OFF.	☐
	Remove the blockage and verify that the input 7 LED turns ON.	☐
	If the LED stays OFF when the motor first starts, turn the dial to the right until the PLC input 7 LED turns ON.	☐
Set High Temp Sensor	Adjust the high temperature sensor dial to 420 ºF.	☐
	Put the maintenance heat switch in the ON position.	☐
	Check that the flame controller module 'Interlocks Closed' LED is lit.	☐
	When the maintenance heat switch has been put in the ON position, the 'Interlocks Closed' LED will be illuminated, and the heat should turn on within 30 seconds.	☐
	Confirm that the 'Run' indication light in 120V control access panel turns on 15 seconds after the heat has started.	☐
Set High Temp Sensor	Let the unit run with the heat on for 30 seconds, then gradually turn the dial on the high temperature sensor down until the heat shuts off.	☐
	At this point the 'Interlocks Closed' LED on the flame controller module and the 'Run' light should be off and the 'Alarm' light in the control access panel should be flashing on and off once every second.	☐
	Adjust the dial up to 420°F and press the 'Reset' button in the control access panel.	☐
	The 'Interlocks Closed' LED should be ON again, and the heat should turn back on in 30 seconds.	☐
	Confirm that the previous action occurs and leave the maintenance heat switch in the ON position. This step confirms that the high temperature sensor is operational.	☐
Flame Alarm	Shut the incoming gas valve off and confirm that the 'Alarm' light becomes illuminated after 30 seconds.	☐
	Open the valve and press 'reset' (red) button. The heat sequence will start again. If the same alarm occurs, press the reset button again and wait another 30 sec.	☐
Timing and Chamber Heat	Connect laptop to SCD serial port with RS232 cable. Open the program Lookout (4.01) and open the file T4000.l14p in the T4000 folder.	☐
	Put the mode switch in the AUTO position and the manual heat switch in the OFF position.	☐
	The motor and the flame module will be on right away and the heat should turn on 30 seconds after that.	☐
	A chamber temperature between 300ºF and 360ºF (adjust gas pressure) will be shown after the T4000 has been running for 3 mins.	☐
	Record the chamber temperature in the Condor T4000 Test & Inspection Measurement Record.	☐

Item	Action	Check
Software Current Sensor	Click on the 'Monitor Motor Current' button.	☐
	Verify that value of 2.5-3.25A is present beside 'Motor Current' by reading on the laptop display.	☐
	Check elapsed time meter and confirm time increments while motor is running.	☐
Temp Sensor	Confirm that the chamber temperature is between 300ºF and 360ºF by reading on the laptop screen.	☐
	Verify that nozzle output temperature is between 200ºF and 250ºF by reading on the laptop screen.	☐
	Set the 'Set Temperature Cut-Off' value to a temperature that is 5°F lower than the currently displayed chamber temperature, and press the 'Set Current Cut-Off' button until the 'Current Cut-Off Value' corresponds to the value above it.	☐
	Check that the heat sequence stops. This confirms that the sensor is operating.	☐
Time Delay	Set the stagger time delay to a value 5 seconds greater than the previously tested SCD or to whatever value desired.	☐
	Record the time day adjustment in the Condor T4000 Test & Inspection Measurement Record.	☐
Gas Pressure	With the manometer for gas pressure connected to the solenoid port, measure and record gas pressure. Acceptable pressure limit is between 5.5" WC and 6.8" W.C.	☐
	Record W.C. data in Condor T4000 Test & Inspection Measurement Record	☐
Nozzle Air Velocity	Record air speed at various output points on nozzles. Refer to the appropriate nozzle layout drawing in T4000 Ducting & Nozzle I, O&M Manual.	☐
	Record CFM data in Condor T-2000 Test & Inspection Measurement Record	☐
Temperature Performance	Verify the ambient Temperature and record Condor T4000 Test & Inspection Measurement Record.	☐
	Use an infrared Temperature sensor gun to measure the temperature at various output points on nozzles	☐
	Total Temperature should be 175º F above ambient +/- 5º. . Refer to nozzle layout drawings in T4000 Ducting & Nozzle I, O&M Manual.	☐
	Record nozzle / duct temperature measurements in the Condor T-2000 Test & Inspection Measurement Record.	☐
Remote Operation	With the T4000 OFF and the mode switch in AUTO, request the RTC to request the SCD ON. Confirm the SCD starts and runs properly and shows on at the RTC Control Office.	☐

Item	Action	Check
Upon Completion of Inspection	**Winter**	
	Check all T4000 doors, are closed, covers are secure.	☐
	T-2000 Mode Switch set to AUTO.	☐
	Spring	
	T4000 Disconnect Switch set to OFF.	☐
	AC Power Feed OFF and Locked out.	☐

Legend
(✓) - Check complete, equipment in satisfactory condition.
(X) – Test not performed or not applicable.
(✕) - Check complete, equipment requires repair or replacement. Indicate the issue and corrective action taken in the Comments/Observations table section

Condor T4000 Test & Inspection Measurements Record

Subdivision		**Mileage**	
Location Name		**SCD/Switch ID**	
Inspected by		**Date of Inspection**	

Item	**Measurements**		
Clearance envelope measurements	Horizontal Distance =_____inches Vertical Distance = _____inches		
AC Supply Voltage (No Load)	L1 – L2 =_____VAC		
	L2 – L3 =_____VAC		
	L1 – L3 =_____VAC		
AC Supply Voltage (Motor Running)	L1 – L2 =_____VAC		
	L2 – L3 =_____VAC		
	L1 – L3 =_____VAC		
AC Motor Operating Current	L1 =_____Amps		
	L2 =_____Amps		
	L3 =_____Amps		
Temperature Readings and air speed	**Location**	**Temperature**	**Air Speed**
	A1	_____ºF	_____m/s
	A2	_____ºF	_____m/s
	A3	_____ºF	_____m/s
	A4	_____ºF	_____m/s
	B1	_____ºF	_____m/s
	B2	_____ºF	_____m/s
	B3	_____ºF	_____m/s
	B4	_____ºF	_____m/s
	C1	_____ºF	_____m/s
	C2	_____ºF	_____m/s
	C3	_____ºF	_____m/s
	C4	_____ºF	_____m/s
Heat Chamber Temperature	_____ º F		
Gas Pressure	_____ W.C.		
Programmed Staggered Time Delay	_____ Seconds		
Nozzle Air Velocity	_____ CFM		
Ambient Temperature	_____ º F		
Nozzle Temperature	_____ º F		
Duct Temperature	_____ º F		

Comments /Observations: