FLŌ ENERGY SOLUTIONS	# Field Start-Up Report	SU-FOR-02
Title:	Start-UpAuditFormAirCooledCondenser(6-70 Ton)	

Date:			
Store Name:		**Store Number:**	
Store Address:			
Serial Number:		**Unit Tag:**	

If you require Technical Support during your start-up, call 888-598-1198 Opt. 1

Images of issues need to be sent to startup@systemsflo.com. Log all issues/errors found in section 24 of this form.

IMPORTANT: Turn off and tag out main breaker in electrical panel before proceeding with the start-up.

SECTION 1: EXTERIOR UNIT PREPARATION

Watch video Here	YES	NO	N/A
Is the unit free of damage, paint blemishes, or missing screws? *Photograph any damage, and add notes of the nature of this damage to section 22.*	☐	☐	
Are the roof seams and roof corners sealed with sealant? *Apply sealant if required.*	☐	☐	
Is the unit level and does the drain pan drain towards the p-trap?	☐	☐	
Is the Outdoor Air Hood (OAH) open and properly fastened to the unit? *Open the OAH if it wasn't opened when you arrived.*	☐	☐	☐
Is the birdscreen installed and free of obstructions?	☐	☐	☐
Did you remove the shipping screw from the barometric relief damper(s) and does the relief damper move freely?	☐	☐	☐
Are the p-trap(s) are permanently attached to the unit using the proper adhesive? *If a p-trap is not installed, assemble, and install a p-trap per Flō specification.*	☐	☐	☐
Are all door hinges/handles installed and do the inner door frames have weather seals?	☐	☐	

SECTION 2: DAMPER ASSEMBLY PREPARATION

Watch video Here	YES	NO	N/A
Are all actuators securely fastened to dampers?	☐	☐	☐
Check damper positions when the unit is turned off. Is OAD 100% closed, is RAD 100% open?	☐	☐	☐

SECTION 3: FILTER PREPARATION

Watch video Here	YES	NO
Are all filters installed correctly (arrows pointing towards the coil cabinet)?	☐	☐
Do all filters move freely in the filter rack?	☐	☐
Are the filters clean?	☐	☐

SECTION 4: COIL(S) PREPARATION

Watch video Here

What type of heat recovery is in the Flō unit?	Reheat	☐	Reclaim	☐	No Recovery	☐

	YES	NO	N/A
Is the e-fin coil coating (including capillary lines) free of any chipping or lack of coverage? *Photograph any e-fin coating issues and submit the images to* startup@systemsflo.com.	☐	☐	☐
Are all copper tubing isolated so they do not rub?	☐	☐	☐
Are all suction lines insulated?	☐	☐	☐
Are the shipping straps on the TXV(s) capillary tubes removed and are the tubes separated with silicone?	☐	☐	☐

Verify that cooling circuit TXV sensing bulbs are positioned at 3 or 9 o'clock, insulated and secured on the suction line.

COOLING CIRCUITS	ORIGINAL POSITION	FINAL POSITION	N/A	COOLING CIRCUITS	ORIGINAL POSITION	FINAL POSITION	N/A
Circuit A			☐	Circuit C			☐
Circuit B			☐	Circuit D			☐

	YES	NO	N/A
Is the supply fan mesh installed and properly secured?	☐	☐	☐
If the unit has heat reclaim, are the piping connections installed?	☐	☐	☐
If the unit has heat reclaim, is the pipe chase sealed and clean?	☐	☐	☐
If the unit has heat reclaim or reheat, are the reclaim/reheat temp sensors mounted to the pipe and insulated?	☐	☐	☐
Is the plastic edge guard installed on the edge of the upper drain pan?	☐	☐	☐
Is the PVC or copper tubing from the upper to lower drain pan installed and secured about ½" to 1" above the bottom of the pan?	☐	☐	☐
Is the drain pan properly sealed with caulking along the edges?	☐	☐	☐
Is the drain pan float switch properly installed and secure?	☐	☐	☐

SECTION 5: SUPPLY CABINET PREPARATION

Watch video Here	YES	NO
Did you take a photo of the supply fan motor(s) nameplate?	☐	☐
Are all wires properly wired and secured, including inside the supply fan motor conduit box?	☐	☐
Are the supply fan motor connectors sized appropriately to the wire gauge?	☐	☐

Are the supply fan(s) set screws tight?	☐	☐
Does the supply fan(s) move freely (not wobbling or rubbing)?	☐	☐
Are the supply fan(s) vent plugs opened, and are the plugs hanging?	☐	☐
Are the wire grommets properly secured to the bottom of the VFD drive(s)?	☐	☐
Is the VFD wired correctly, and did you ensure that the grounding wire is installed directly from the VFD to the supply fan conduit box grounding lug?	☐	☐
Are the heat exchangers and/or heat strips clean with no debris in the compartment?	☐	☐

SECTION 6: COMPRESSOR PREPARATION

Watch video Here	YES	NO	N/A
Are the crankcase heaters free of any damage, mounted securely and are the wires covered around sharp edges?	☐	☐	☐
Are all suction lines in the compressor cabinet properly insulated?	☐	☐	☐
Are the digital compressor thermistors on the discharge line positioned to take readings from the top of the line, and are they secured to ensure no movement?	☐	☐	☐

SECTION 7: CONDENSER PREPARATION

Watch video Here	YES	NO	N/A
Are the condenser fan blades roughly an 8th of an inch above the lip of the condenser fan shroud, and do they spin freely?	☐	☐	☐

SECTION 8: ELECTRICAL PREPARATION

Watch video Here	YES	NO	N/A
In all cabinets, did you check all wiring, wiring harnesses, fuses, transformers, terminal blocks, contactors, etc., to ensure they are secure?	☐	☐	☐
***WARNING:** If receiving zero to ground ohms on ground, check for loose screws or wire ends that can drop behind relays, controllers, terminal blocks, etc.*			
Did you Ohm out main terminal blocks to make sure that the unit is not grounded on any of the main three legs of power?	☐	☐	☐
Did you Ohm out main terminal block with disconnect lines connected to ensure no terminals are shorted to the unit and some resistance is found between phases?	☐	☐	☐
Are the overloads for the condenser fans set ½ an amp higher than the condenser amps listed on the unit nameplates?	☐	☐	☐

SECTION 9: HEATING PREPARATION

Watch video Here

What type of heating is in the Flō unit?	Natural Gas ☐	Propane ☐	Electric ☐	Hydronic ☐	None ☐
Record gas static inlet pressure upstream of the gas valve			**"WC**		

	YES	NO	N/A
Is the unit free from leaks at the gas pipe fittings and connections?	☐	☐	☐

SECTION 10: CONTROLS PREPARATION			
Watch video Here	YES	NO	N/A
Is the controller power wiring wired correctly?	☐	☐	☐
If applicable, did you check/ohm LVTB wiring and check for the green ground wire to negative terminals?	☐	☐	☐
Are the smoke detector(s) wired? *Flō's start-up tech must not terminate smoke detectors to the LVTB.* *If the smoke detector(s) are not wired, call 888-598-1198 Opt.1 to report findings.*	☐	☐	
Did you check the wiring to the controller(s) and board(s) to ensure they are wired to the correct points?	☐	☐	☐

SECTION 11: ALL CABINETS PREPARATION		
Watch video Here	YES	NO
Did you check and remove all trash and debris from cabinet areas?	☐	☐
Did you check in and behind the drain pan for debris?	☐	☐
Did you check all wiring inside of cabinet to ensure it is secure, insulated or shielded from slicing or pinch points where needed?	☐	☐
Did you check all wiring inside of cabinet to ensure that it is neat in appearance?	☐	☐
~~Did you input all errors found and corrected during preparation section into error~~ section on test sheet?	☐	☐

***IMPORTANT:* Now energize the unit before starting section 12.**

SECTION 12: ELECTRICAL POWERED — Watch video Here

Use Personal Protective Equipment (PPE) and all safety precautions when recording the voltages and amperage.

Record Supply Line Voltage between supply legs	L1 TO L2 (VAC)	L1 TO L3 (VAC)	L2 TO L3 (VAC)

DPM SETTINGS	LINE VOLTAGE	OVER/UNDER %	TRIP DELAY	RESTART DELAY	PHASE IMBALANCE
Recommended Settings	*Voltage Selected MustBeSetToNameplate*	*10%*	*5-Seconds*	*2-Minutes*	*5%*

CRANK CASE HEATER AMPS	COMP 1	COMP 2	COMP 3	COMP 4

SECTION 13: SUPPLY FAN POWERED

	YES	NO
Using the unit specific Supply Fan VFD parameters information sheet provided in the start-up package provided by Flō, did you check and update the VFD parameters to match Flō's sheet?	☐	☐
After the parameters were set, did you place the VFD in local mode and press start/run?	☐	☐
Did you ensure that the supply fan(s) run in the correct direction and that the wheel is not hitting the plenum with the supply fan door off?	☐	☐
Did you press stop on the VFD and place VFD control back in remote/auto?	☐	☐
Did you replace the supply fan(s) access panel and check all the bolts for stripping?	☐	☐

SECTION 14: CONTROLS POWERED

Watch video Here	YES	NO	N/A
Did you upload the controls program, setpoint files and firmware update to the unit's controller using the Flō provided upload guide?	☐	☐	☐
Did you verify that the unit's controller date and time are set correctly to the local time zone?	☐	☐	☐
Did you set the clogged filter switch for proper operation and verify that it will not generate nuisance alarms?	☐	☐	☐
Using a cold spray or rub test, did you observe a change on the displayed value of Return Air Temp Sensor?	☐	☐	☐

	CONTROLLER READINGS	MEASURED READINGS	OFFSET APPLIED	PASS	N/A
Space Temp Sensor 1 Space Temp				☐	☐
Sensor 2 Space Humidity/Dewpoint				☐	☐
Sensor 1 Space Humidity/Dewpoint				☐	☐
sensor 2				☐	☐
Outdoor Air Temp Sensor				☐	☐
Outdoor Humidity Sensor				☐	☐

	CONTROLLER READING		CONTROLLER READING
Supply Air Temp Sensor		Return Air Temp Sensor	
Reheat/Reclaim Temp Sensor 1		Reheat/Reclaim Temp Sensor 2	
Space CO2 Sensor 1		Space CO2 Sensor 2	

	CONTROLLER READINGS	MEASURED READINGS	PASS (+/- 5)? YES	PASS (+/- 5)? NO	N/A
Compressor A Static Suction Pressure			☐	☐	☐
Compressor A Static Discharge Pressure			☐	☐	☐
Compressor B Static Suction Pressure			☐	☐	☐

	CONTROLLER READINGS	MEASURED READINGS	PASS (+/-5)? YES	PASS (+/-5)? NO	N/A
Compressor B Static Discharge Pressure			☐	☐	☐
Compressor C Static Suction Pressure			☐	☐	☐
Compressor C Static Discharge Pressure			☐	☐	☐
Compressor D Static Suction Pressure			☐	☐	☐
Compressor D Static Discharge Pressure			☐	☐	☐

Did you plug in the loose wires to the low-pressure switches on each compressor?	YES ☐	NO ☐

SECTION 15: ALL CABINETS POWERED

	YES	NO
Did you check and remove all trash and debris from cabinet areas?	☐	☐
Did you input all errors found and corrected during powered section into error section on test sheet?	☐	☐

SECTION 16: SUPPLY FAN VALIDATION

Supply Fan 1 VFD Frequency		N/A ☐	Supply Fan 2 VFD Frequency		N/A ☐

Watch video Here	YES	NO
Observe the unit while the supply fan is running with the supply fan door closed and all cabinet doors closed. Is the unit free of air leaks, whistling, knocking, unreasonably loud supply fan, etc?	☐	☐

SUPPLY FAN(S) AMPS	T1 FROM VFD	T2 FROM VFD	T3 FROM VFD
Supply Fan 1			
Supply Fan 2			

SECTION 17: DAMPER VALIDATION

Watch video Here	YES	NO	N/A
Did you prop open the damper cabinet door and turn on the “Damper Test Mode”	☐	☐	☐
Set all dampers to 0%, verify that all dampers moved to 0%. Did the dampers move to 0% and are there no gaps? Readjust the dampers if any gaps occur.	☐	☐	☐
Set OAD to 100%, verify that the OAD moved to 100% open. Did the OAD open to 100%?	☐	☐	☐
Set RAD to 100%, verify that the RAD moved to 100% open. Did the RAD open to 100%?	☐	☐	☐
Set BAD to 100%, verify that the BAD moved to 100% open. Did the BAD open to 100%?	☐	☐	☐
Did you turn off the Damper Test Mode and close the damper cabinet door?	☐	☐	☐

SECTION 18: HEATING VALIDATION

Watch video Here

Natural Gas: *Inlet Pressure: 6.0" – 10.5" WC* *Low/Hi Fire: 1.75"/3.5" WC (+/-10%)*	*Propane:* *Inlet Pressure: 11.0" – 13.0" WC* *Low/Hi Fire: 5.25"/10.5" WC (+/-10%)*

	NO	YES		N/A
For units equipped with natural gas or propane, did you allow all heating stages to run for at least 5 minutes to burn off any residue remains in the heat exchanger?		☐	☐	☐

GAS VALVE	MGV1	MGV2	MGV3	MGV4	MGV5	MGV6	MGV7	MGV8
Low Fire								
High Fire								

Record gas full burn inlet pressure upstream of the gas valve		"WC	

ELECTRIC HEAT	CONT 1	CONT 2	CONT 3	CONT 4	CONT 5	CONT 6	CONT 7	CONT 8
Amperage								

	YES	NO	N/A
If applicable, is heat reclaim operational?	☐	☐	☐

SECTION 19: COOLING VALIDATION

AIR COOLED CONDENSERS AMPS	L1	L2	L3 (3 PHASE MOTORS)
~~Condenser Fan A~~			
~~Condenser Fan AB~~			
~~Condenser Fan B~~			
~~Condenser Fan C~~			
~~Condenser Fan CD~~			
~~Condenser Fan D~~			

	YES	NO	N/A
Did you confirm that all condensers are rotating in a direction that pulls air from the coil out of the fan port?	☐	☐	☐

COMPRESSOR AMPS	L1	L2	L3
Compressor A			
Compressor B			
Compressor C			
Compressor D			

	YES	NO	N/A
Are the compressors and condenser fans operating correctly based on sound and gauge readouts?	☐	☐	☐
Are the contactors for the compressors and/or condenser fans free of chattering or any loud noises that indicate incorrect phasing or compressor damage?	☐	☐	☐
Did you ensure that the reheat valve runs for 5-10 minutes? If you had to override the valve to turn it on, turn the override off now.	☐	☐	☐

SUB-COOLING & SUPER HEAT					
	YES	NO		YES	NO
1.Is the unit under a full load "not unloading"?	☐	☐	3.Is ambient temperature above 80°F?	☐	☐
2.Are all compressors running at full speed?	☐	☐	4.Is return temperature above 70°F?	☐	☐

1)If you have marked "YES" to all 4 questions above, site conditions meet the criteria to perform a sub-cooling and superheat verification. Proceed with taking initial readings and record results. If adjustments to the system are required, adjust as necessary, and record adjustments and final readings.
2)If you have marked "NO" to question 1 or 2, and "YES" to questions 3 and 4, unplug the low-pressure switch on the circuits that you are not checking and validate one circuit at a time. Only take initial readings, do not adjust the system.
3)If you have marked "NO" to questions 1, 2 and 3, skip the sub-cooling and superheat validation entirely as conditions are not met to do so.

SUPERHEAT *8-15°F*			**SUB-COOLING** *Air Cooled 8-15°F Water Source Heat Pump 4-8°F*			**REFRIGERANT ADJUSTMENT**				**TXV ADJUSTMENT** *Ensure cap is secure after adjustment*		
CIRCUIT	INITIAL READING AFTER 15 MIN OF OPERATION	FINAL READING AFTER ADJUSTMENT (IF APPLICABLE)	CIRCUIT	INITIAL READING AFTER 15 MIN OF OPERATION	FINAL READING AFTER ADJUSTMENT (IF APPLICABLE)	CIRCUIT	ADDED	REMOVED	AMOUNT (LBS)	CIRCUIT	YES	NO
A			A			A	☐	☐		A	☐	☐
B			B			B	☐	☐		B	☐	☐
C			C			C	☐	☐		C	☐	☐
D			D			D	☐	☐		D	☐	☐

SECTION 20: SAFETIES VALIDATION			
Watch video Here	YES	NO	N/A
While the supply fan is running, did you lift-up the drain pan float switch and did the fan ramp/shut down within a minute?	☐	☐	☐

SECTION 21: WRAP UP

Watch video Here	YES	NO	N/A
Did you ensure that the factory installed smoke detector jumper has been removed? *Flō to advise during the checkout if the jumper is approved to be left in the unit.*	☐	☐	☐
Did you ensure that all brass caps on the Schrader valves are installed and tight?	☐	☐	☐
Are the gas valve covers positioned over the gas valves?	☐	☐	☐
Did you power down the unit for 5 minutes and then power it back up (this will clear any overrides entered during the start-up process)?	☐	☐	
Did you check for and resolve any active alarms in the unit? *Note any active alarms that could not be cleared in section 22 of this form.*	☐	☐	☐
Did you do a final check of the unit for any trash or tools left in the unit?	☐	☐	☐

TAKE THE FOLLOWING IMAGES			
Unit nameplate	☐	Outdoor air hood installation	☐
All sides of the unit with doors closed	☐	Supply Fan Motor Nameplate	☐
Supply temp sensor showing location	☐	Humidity/dewpoint sensor(s) showing location	☐
Space temp sensor(s) showing location	☐	Inside of each compartment in the unit	☐
Insulated reheat/reclaim sensor	☐	LVTB field connections (Close Up)	☐
Controller(s) alarm status screen(s)	☐	Controller(s) main menu showing time & date	☐
Controller(s) network info screen(s)	☐	Controller information screen (i-Controller 2.0)	☐

Submit all images above and either the digital copy of your completed form or images of your completed form to startup@systemsflo.com *before calling into your checkout appointment.*

Call into the Flō start-up checkout appointment line (888-598-1198 Opt. 2) when you are done the start-up and have submitted all images

SECTION 22: START-UP TECHNICIAN NOTES

SECTION 23: SITE DEPARTURE

Before departing site, you must call the Flō checkout line (888-598-1198 Opt. 2) at your scheduled appointment time. If you do not have a checkout scheduled, call your Flō Coordinator.

Technician Company		Technician Phone	
Technician Name		Check Out Code	

SECTION 24: FIELD ERROR REPORTING

DESCRIPTION OF THE ERROR FOUND	ARE PARTS REQUIRED?	WAS THE ERROR CORRECTED? (Y/N)
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DESCRIPTION OF THE ERROR FOUND	ARE PARTS REQUIRED?	WAS THE ERROR CORRECTED? (Y/N)
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For a full tech support video tutorial, click here.