SDV Job #: 5886779 - Shake Shack - 1377 - Alderwood Mall (RTU's)

Service Region:	342 - South Seattle Service		
Service Person:	Gregory Vandertuin		
Customer Number:	773992	**Customer Name:**	Region 108
Address:	Shake Shack 3000 184th St SW Lynnwood, WA 98037		
Region Job #:	5592558		
Region Job Name:	Shake Shack - 1377 - Alderwood Mall (RTU's)		
Sales Region:	108 - Eastern PA Mechanical		
Sales Person:	Joe Shiiba		
Created By:	Gregory Vandertuin	**Creation Date:**	7/31/2023 12:46 PM
Last Modified By:	Gregory Vandertuin	**Last Modified Date:**	8/3/2023 4:34 PM
Dining Room Pressure:	0.0	**Kitchen Pressure:**	0.0
Hours On Job:	0.0	**Extra Hours:**	0.0
Completed:	Yes	**Completed By:**	Gregory Vandertuin
Completion Date:	8/3/2023 4:34 PM		

Job Site Meeting

NONE

UDS

NONE

AQEs

NONE

Fans

Fan 1 - CASRTU2-I.200-18-8T (RTU-1) (RTU-1)

Model: CASRTU2-I.200-18-8T

Other Notes:

N/A

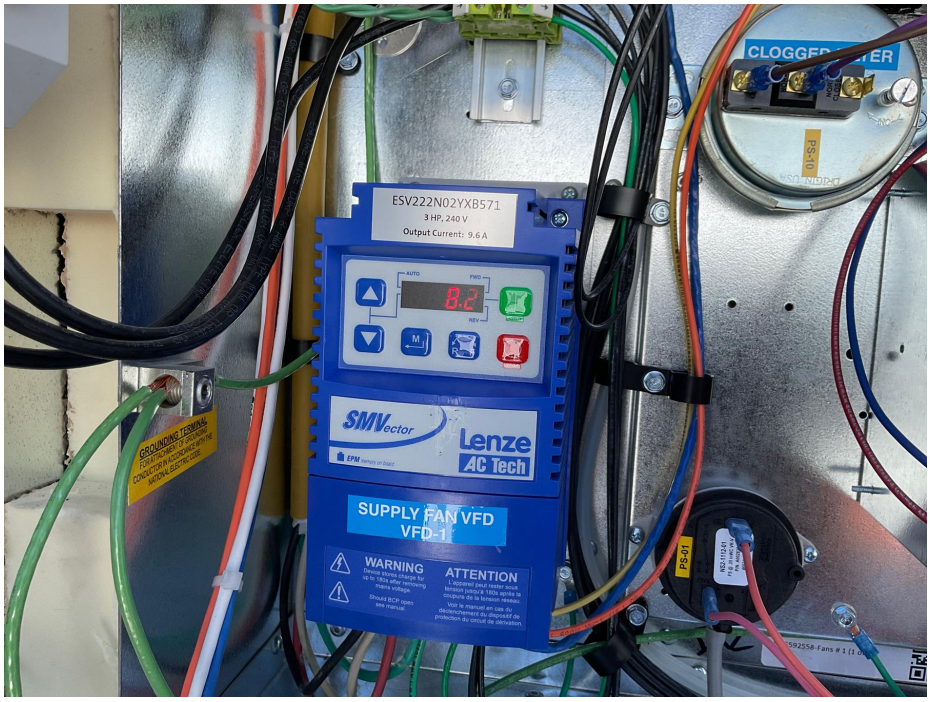
Supply

Supply CFM: Design = 3100 Actual = 2934 (94.6% of design)

VOLTS	Design:	**208**	Actual:	**208**
Is the main transformer (TR-01) tapped for the correct voltage?			Actual:	**Yes**
HP	Design:	**3**	Actual:	**3**
HUB SET SCREW TIGHT	Design:	**Yes**	Actual:	**Yes**
FAN LEVEL	Design:	**Yes**	Actual:	**Yes**
ROTATION	Design:	**Correct**	Actual:	**Correct**
FAN VIBRATION	Design:	**Good**	Actual:	**Good**
RPM - DESIGN	Design:	**1668**	Actual:	**1901**
RPM - MAX	Design:	**2600**	Actual:	**N/A**
RPM - MAX RECOMMENDED	Design:	**2100**	Actual:	**N/A**
Is blower door tamper switch operational? Does blower shut down when the door is opened?	Design:	**Yes**	Actual:	**Yes**
Record the VFD HZ			Actual:	**65**
Record the blower speed from the HMI at Design airflow?			Actual:	**100**
How was supply airflow measured for the T&B?			Actual:	**Duct Traverse**
Design MAX OA %	Design:	**32%**	Actual:	**N/A**
Design MAX OA CFM	Design:	**1000**	Actual:	**909**
Damper voltage at design MAX OA?			Actual:	**10**
Design MIN OA %	Design:	**32%**	Actual:	**N/A**
Design MIN OA CFM	Design:	**0**	Actual:	**0**
Damper voltage at design MIN OA?			Actual:	**0**
How was outside air measured?			Actual:	**Velgid on Intake**
Blower motor actual amperage at design airflow?	Design:	**Less than or equal to 9.5**	Actual:	**8.2**

Other Notes:

N/A

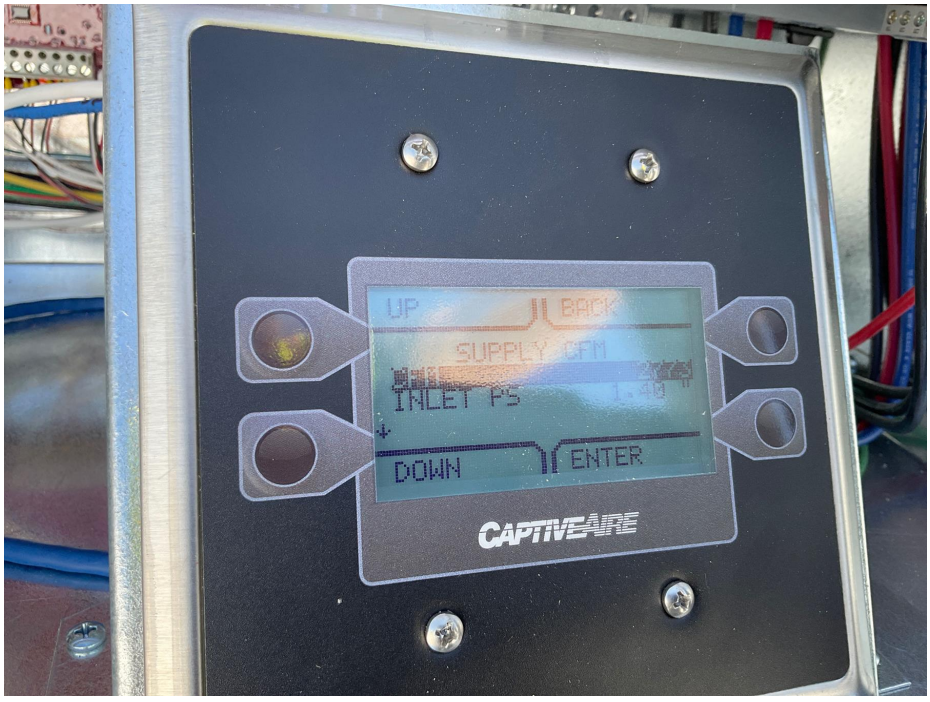


Record pressure off the sampling tube of the air proving switch. For MUA Board: Note the differential pressure displayed on the HMI.

Actual: **1.4**

Other Notes:

N/A



Modulate the blower to the minimum speed that will be required for the application. Modulate the damper to the minimum position required for the application. Calibrate the airflow proving.

Design: **Complete**

Actual: **Complete**

With the blower still at minimum speed and damper at minimum position, calibrate the clogged filter switch.

Design: **Complete**

Actual: **Complete**

Is the return duct installed and sealed to the unit?	Design:	**Yes**	Actual:	**Yes**

DOAS

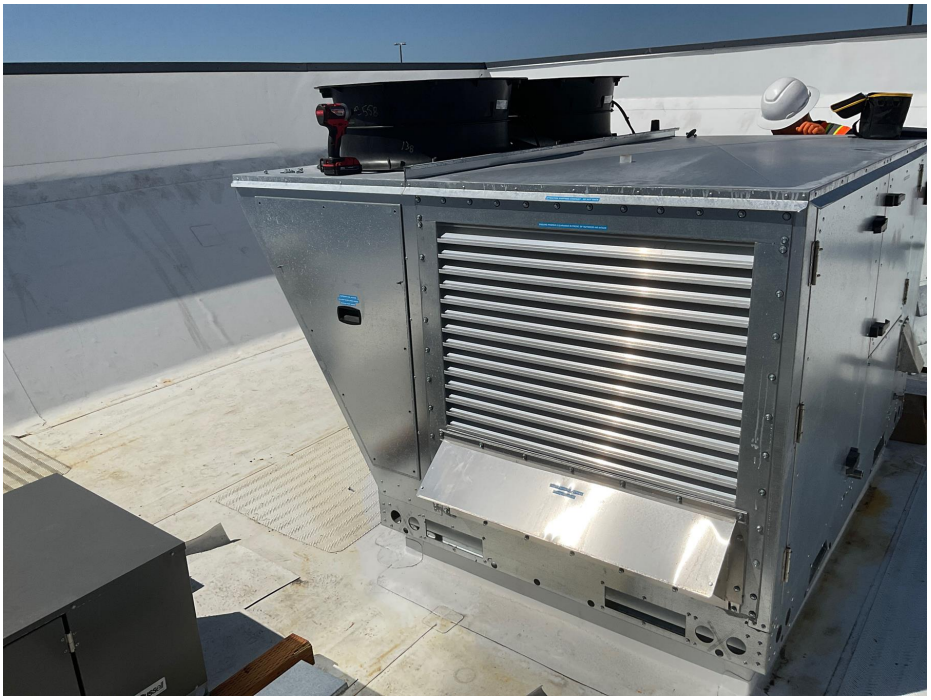
Other Notes:

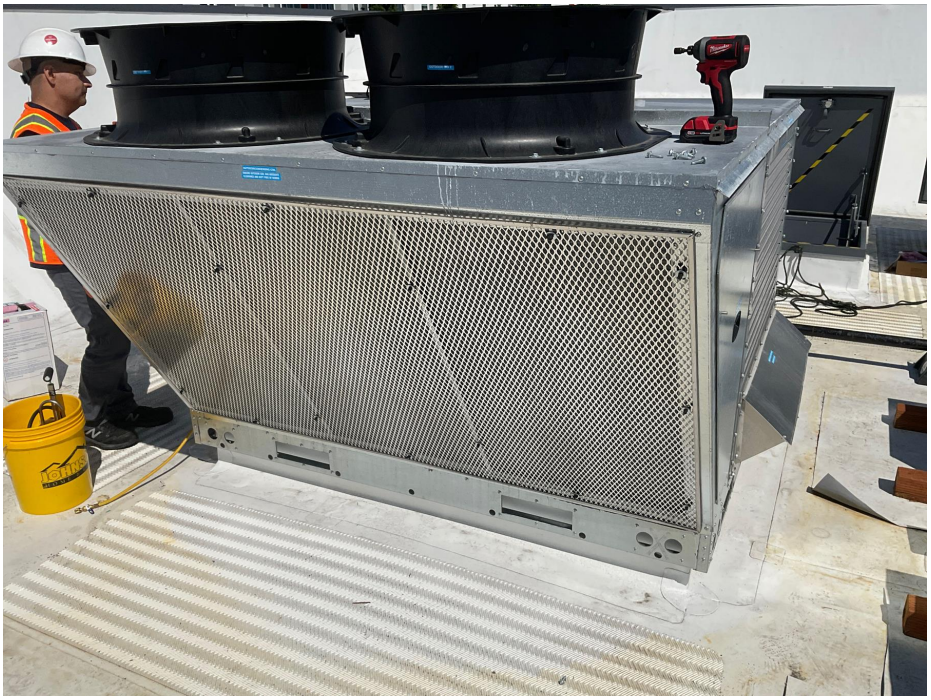
N/A

Take pictures of all four sides of the unit.	Design:	**Complete**	Actual:	**Complete**

Other Notes:

N/A





Duct properly sealed to curb base and not bypassing through openings?	Design:	**Yes**	Actual:	**Yes**
Electrical input properly run through base or side?			Actual:	**Base**
Incoming gauge of wire	Design:	**8 AWG**	Actual:	**8 AWG**
Verify breaker size is appropriate for unit. Breaker size should be greater than or equal to MCA and less than or equal to MOCP. Must include picture.			Actual:	**50**

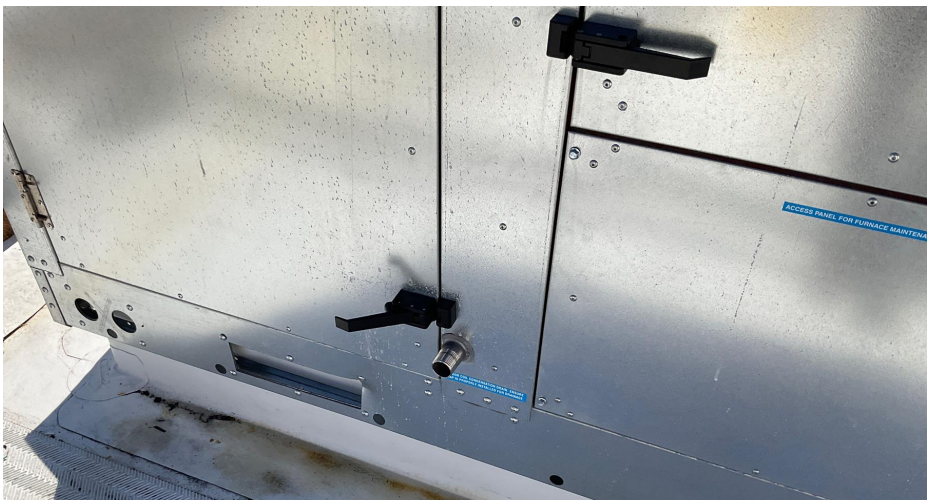
Other Notes:

N/A

Unit within five miles from the coast?			Actual:	**No**
Was the CAS supplied condensate drain used in the installation?	Design:	**Yes**	Actual:	**Yes**

Other Notes:

N/A



Is condensate pan float switch free of debris and able to slide up and down?	Design:	**Yes**	Actual:	**Yes**

Other Notes:

N/A

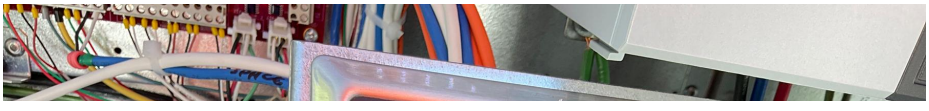
Is there any damage to refrigerant piping, distributor lines, or coils?	Design:	**No**	Actual:	**No**
Confirm field wiring shown on wiring diagrams are complete and check for loose connections. Correct as needed.	Design:	**Complete**	Actual:	**Complete**
Program the list of setting changes through the HMI that were obtained from DOAS@captiveaire.com.			Actual:	**Complete**
Has SCADA been registered, activated and obtained a CASLink heartbeat?	Design:	**Yes**	Actual:	**Yes**

Cooling

Check status of Oil Sensor Level in HMI. Is status open or closed? Open means oil level is low. Do not operate compressor if the OLS is open.	Design:	**Closed**	Actual:	**Closed**
Measure the outside air temp and record the value.			Actual:	**77**

Other Notes:

N/A



For IBT, verify superheat controller settings. For MUA, verify EEV model in settings match the valve install on the unit.	Design:	**Yes**	Actual:	**Yes**
Verify compressor VFD settings. Do settings match schematic?	Design:	**Yes**	Actual:	**Yes**
Place the system in evacuation mode and record the pressure at the suction service port with a gauge set.			Actual:	**215**
With the unit still in evacuation mode, record the suction pressure reading from HMI.			Actual:	**214.9**

Other Notes:

N/A

Difference between the suction service port and suction pressure reading from HMI			Actual:	**0.1**
With the unit still in evacuation mode, record the discharge pressure reading from HMI.			Actual:	**216**
Difference between the suction service port and discharge			Actual:	**-1**

pressure reading from HMI?

For MUA controls, record the liquid pressure reading from the HMI. If the unit has IBT controls, write N/A.	Actual:	**n/a**
Difference between suction service port and liquid pressure reading from HMI?	Actual:	**1**

Over 50F

Start a cooling test and check refrigerant charge in accordance with STB21-1016. Do condensing fans turn on and modulate?	Design:	**Yes**	Actual:	**Yes**
Start a Heat Pump test. Does the reversing valve switch to heat mode? Confirm the discharge air temperature warms up.	Design:	**Yes**	Actual:	**Yes**
Does EEV modulate to maintain 20F superheat?			Actual:	**Yes**
Does the compressor ramp up to max speed (200Hz or 330Hz depending on model) and modulate speed?	Design:	**Yes**	Actual:	**Yes**

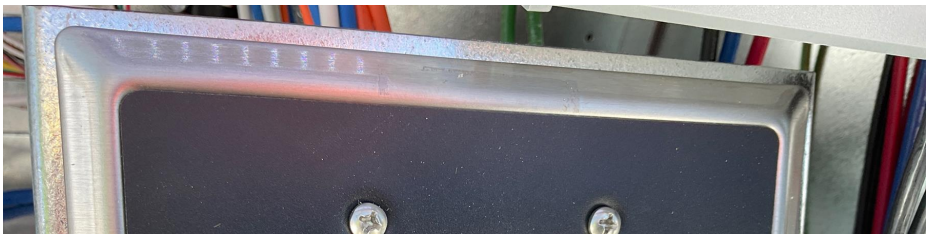
Other Notes:

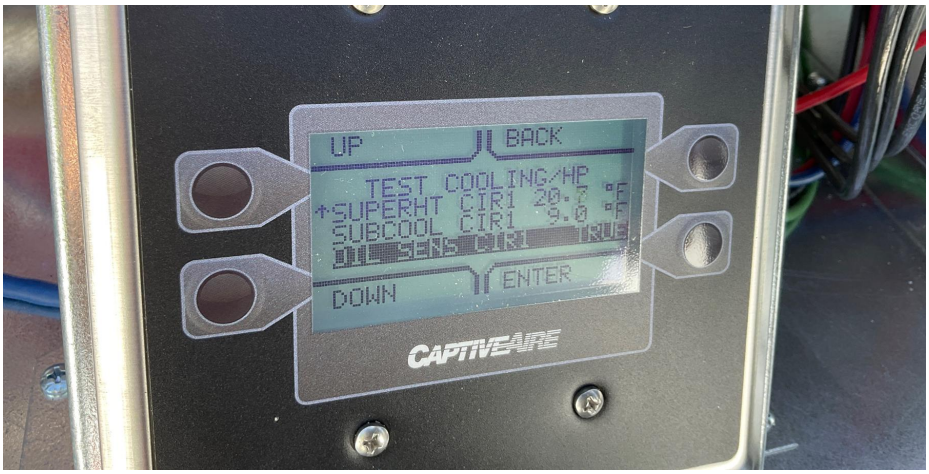
N/A

Does the reheat valve open and modulate?	Design:	**Yes**	Actual:	**Yes**
Cooling superheat measured? (Target is 20)			Actual:	**20**

Other Notes:

N/A



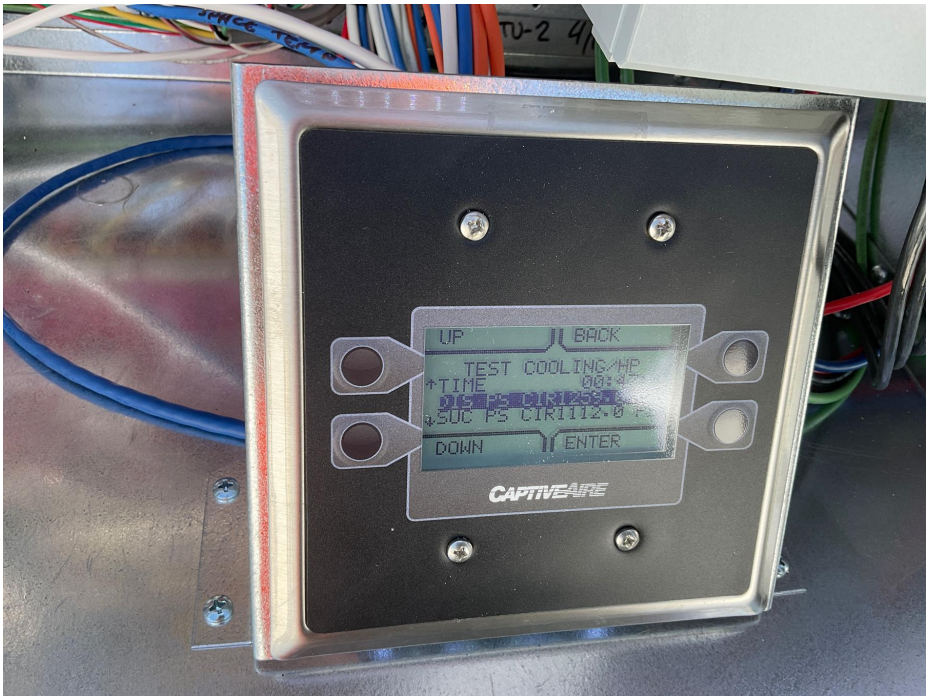


Record discharge pressure reading from HMI.

Actual: **259**

Other Notes:

N/A

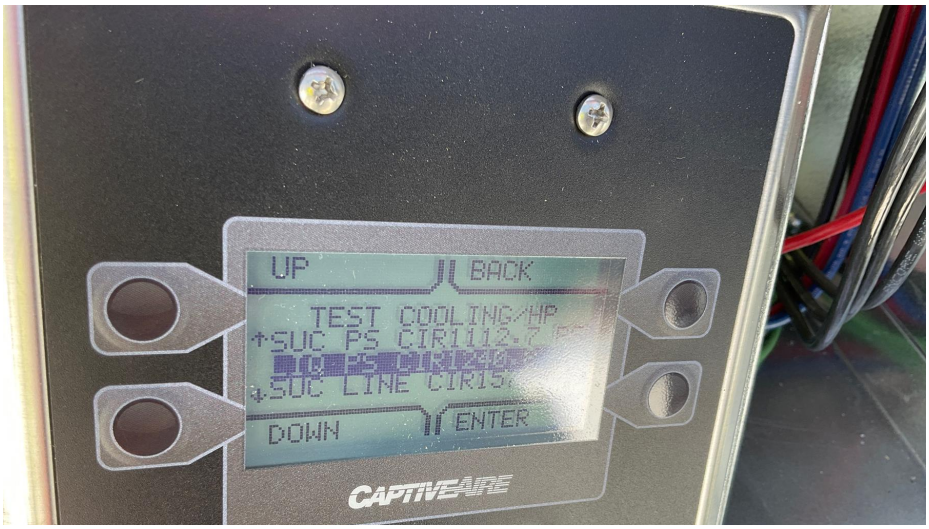


Record liquid line pressure.

Actual: **240**

Other Notes:

N/A



Record liquid line temperature. Actual: **172**

Other Notes:

N/A

Record Subcool reading. Contact DOAS Support if subcooling is outside of the range of 12F - 20F. Do not adjust refrigerant charge until directed to by DOAS Support. Actual: **12**

Temp Verification

Measure intake temp with meter and confirm it is within 10F of HMI readout.	Design:	**True**	Actual:	**True**
Measure return temp with meter and confirm it is within 10F of HMI readout.	Design:	**True**	Actual:	**True**
Measure evap coil temp with meter and confirm it is within 10F of HMI readout.	Design:	**True**	Actual:	**True**
Review intake humidity on HMI. Does it appear to be reporting correctly?	Design:	**Yes**	Actual:	**Yes**
Review discharge humidity on HMI. Does it appear to be reporting correctly?	Design:	**Yes**	Actual:	**Yes**
Are extra HMIs being used? Do not count the HMI in the unit. Upload picture of space HMI(s) and surrounding area.			Actual:	**Yes**

Other Notes:

N/A

Record number of extra HMI's used.			Actual:	**1**
Is HMI address 56 being used for space temperature and humidity readings?			Actual:	**Yes**
Is wired space wall temp/humidity sensor (not HMI) being used?			Actual:	**No**
Measure space temp with a meter and confirm it is within 10F of the average space temp readout on the HMI (Service > Temperatures > Space AVG).	Design:	**True**	Actual:	**True**
Measure space RH with a meter and confirm it is within 10% of the average space temp readout on the HMI (Service > RH Values > Space AVG).			Actual:	**60**

Heater Gas - NOT AVAILABLE!

Installation Notes:

Building had gas turned off at time of the Sdv

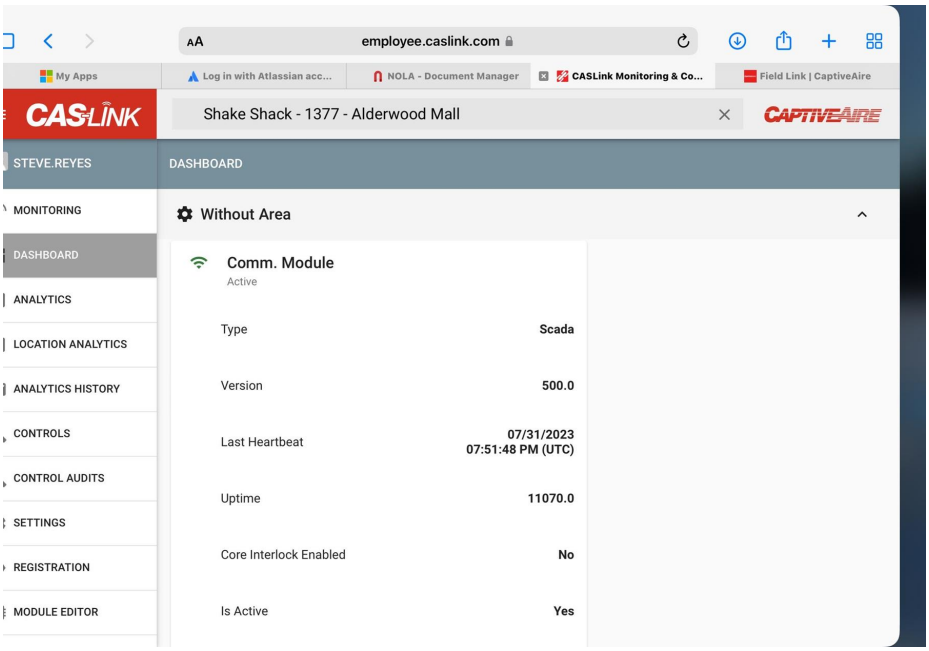
Gas Type	**N/A**
Set mod valve low fire setting using the IOM and STB20-1011. Record manifold gas pressure.	**N/A**
Theoretical low fire temperature rise. Use STB20-1011 Calculator	**N/A**
With unit maintaining steady state low fire, record intake temperature.	**N/A**
With the unit maintaining steady state low fire on only the first stage of heat, record the discharge temperature.	**N/A**
This answer should be auto calculated from the previous two questions. The answer will be the discharge temperature - intake temperature.	**N/A**
Set high fire pressure using test menu procedure in O&IM and record manifold gas pressure on pressure gauge.	**N/A**
Recorded Inlet Gas Pressure With Unit in high fire	**N/A**
Confirm the discharge air temp sensor is reading accurately in high fire. Reference STB20-1007 and modulate the burner to the highest capacity heat that can be achieved. Record the discharge air temp reading on the HMI.	**N/A**
With unit still holding highest capacity heat, go into space and record discharge temp at the supply diffuser closest to unit using a handheld temp probe. Record Temperature.	**N/A**
Difference between measured and actual temperature.	**N/A**

Final Checks

FINAL STEPS OF SDV. ONLY PERFORM FOLLOWING QUESTIONS IF REST OF SDV HAS BEEN COMPLETED!			Actual:	**Ok**
Is the smoke detector input wired and functional?			Actual:	**No**
Is the fire alarm input (terminal F) wired and functional?			Actual:	**No**
Is either the wired occupied override or unit interlock being utilized and operational?			Actual:	**No**
Once all SDV adjustments are complete, update the factory default settings through the service menu.	Design:	**Complete**	Actual:	**Complete**
Once all SDV adjustments are complete, download the CAAL file from the board, label it with the fan number, software revision and upload it to the NOLA job docs.			Actual:	**Complete**
Take picture of CASLink showing last heartbeat.			Actual:	**Complete**

Other Notes:

N/A



DOAS data is visible on CASLink, tagged unique from other equipment and matches field labeling

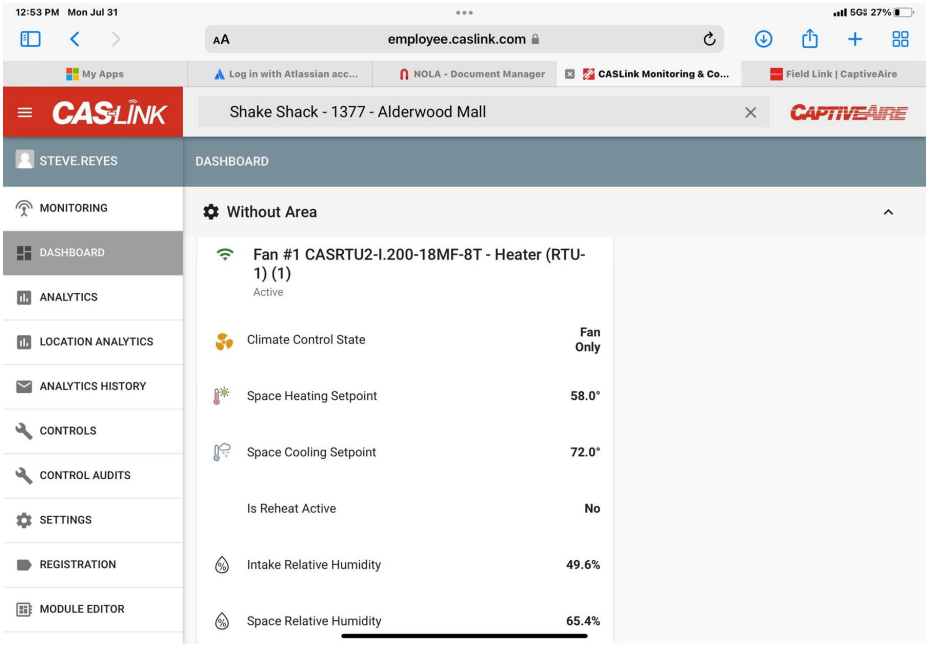
Actual: **Yes**

Take picture of CASLink showing DOAS data responding.

Actual: **Complete**

Other Notes:

N/A



All other equipment on job labeled and can see data on CASLink?

Actual: **Yes**

Has someone from DOAS_support@captiveaire.com confirmed they are seeing data on this job?

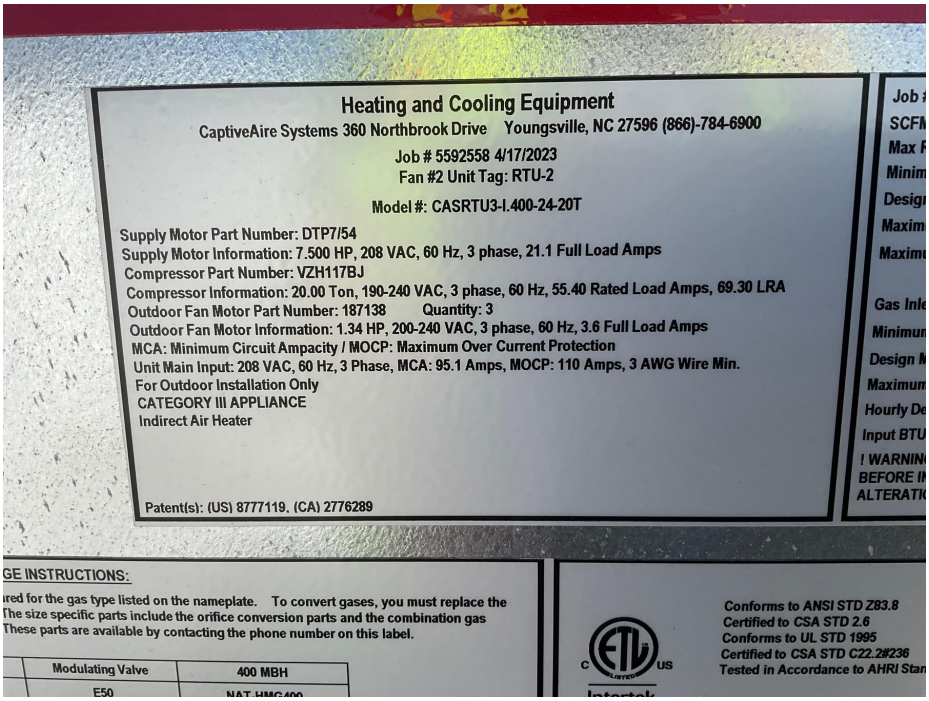
Actual: **Yes**

Fan 2 - CASRTU3-I.400-24-20T (RTU-2) (RTU-2)

Model: CASRTU3-I.400-24-20T

Other Notes:

N/A



Supply

Supply CFM: Design = 4700 Actual = 4726 (100.6% of design)

VOLTS	Design:	**208**	Actual:	**208**
Is the main transformer (TR-01) tapped for the correct voltage?			Actual:	**Yes**
HP	Design:	**7.5**	Actual:	**7.5**
HUB SET SCREW TIGHT	Design:	**Yes**	Actual:	**Yes**
FAN LEVEL	Design:	**Yes**	Actual:	**Yes**
ROTATION	Design:	**Correct**	Actual:	**Correct**
FAN VIBRATION	Design:	**Good**	Actual:	**Good**
RPM - DESIGN	Design:	**1173**	Actual:	**1225**
RPM - MAX	Design:	**1400**	Actual:	**N/A**
RPM - MAX RECOMMENDED	Design:	**1150**	Actual:	**N/A**
Is blower door tamper switch operational? Does blower shut down when the door is opened?	Design:	**Yes**	Actual:	**Yes**
Record the VFD HZ			Actual:	**42**
Record the blower speed from the HMI at Design airflow?			Actual:	**40**
How was supply airflow measured for the T&B?			Actual:	**Flowhood**
Design MAX OA %	Design:	**53%**	Actual:	**N/A**
Design MAX OA CFM	Design:	**2500**	Actual:	**2500**
Damper voltage at design MAX OA?			Actual:	**17.2**
Design MIN OA %	Design:	**53%**	Actual:	**N/A**
Design MIN OA CFM	Design:	**0**	Actual:	**100**
Damper voltage at design MIN OA?			Actual:	**16.2**
How was outside air measured?			Actual:	**Flowhood**
Blower motor actual amperage at design airflow?	Design:	**Less than or equal to 21.1**	Actual:	**21.1**
Record pressure off the sampling tube of the air proving switch. For MUA Board: Note the differential pressure displayed on the HMI.			Actual:	**0.5**
Modulate the blower to the minimum speed that will be required for the application. Modulate the damper to the minimum position required for the application. Calibrate the airflow proving.	Design:	**Complete**	Actual:	**Complete**
With the blower still at minimum speed and damper at minimum position, calibrate the clogged filter switch.	Design:	**Complete**	Actual:	**Complete**
Is the return duct installed and sealed to the unit?	Design:	**Yes**	Actual:	**No**

DOAS

Take pictures of all four sides of the unit.	Design:	**Complete**	Actual:	**Complete**

Other Notes:

N/A

Duct properly sealed to curb base and not bypassing through openings?	Design:	**Yes**	Actual:	**Yes**
Electrical input properly run through base or side?			Actual:	**Base**
Incoming gauge of wire	Design:	**3 AWG**	Actual:	**3 AWG**
Verify breaker size is appropriate for unit. Breaker size should be greater than or equal to MCA and less than or equal to MOCP. Must include picture.			Actual:	**110**

Other Notes:

N/A

Unit within five miles from the coast?			Actual:	**No**
Was the CAS supplied condensate drain used in the installation?	Design:	**Yes**	Actual:	**No**

Other Notes:

N/A

Is condensate pan float switch free of debris and able to slide up and down?	Design:	**Yes**	Actual:	**Yes**
Is there any damage to refrigerant piping, distributor lines, or coils?	Design:	**No**	Actual:	**No**
Confirm field wiring shown on wiring diagrams are complete and check for loose connections. Correct as needed.	Design:	**Complete**	Actual:	**Complete**
Program the list of setting changes through the HMI that were obtained from DOAS@captiveaire.com.			Actual:	**Complete**
Has SCADA been registered, activated and obtained a CASLink heartbeat?	Design:	**Yes**	Actual:	**Yes**

Cooling

Check status of Oil Sensor Level in HMI. Is status open or closed? Open means oil level is low. Do not operate compressor if the OLS is open.	Design:	**Closed**	Actual:	**Closed**
Measure the outside air temp and record the value.			Actual:	**65**
For IBT, verify superheat controller settings. For MUA, verify EEV model in settings match the valve install on the unit.	Design:	**Yes**	Actual:	**Yes**
Verify compressor VFD settings. Do settings match schematic?	Design:	**Yes**	Actual:	**Yes**
Place the system in evacuation mode and record the pressure at the suction service port with a gauge set.			Actual:	**187.1**
With the unit still in evacuation mode, record the suction pressure reading from HMI.			Actual:	**185.5**
Difference between the suction service port and suction pressure reading from HMI			Actual:	**1.6**
With the unit still in evacuation mode, record the discharge pressure reading from HMI.			Actual:	**185.5**
Difference between the suction service port and discharge pressure reading from HMI?			Actual:	**1.6**
For MUA controls, record the liquid pressure reading from the HMI. If the unit has IBT controls, write N/A.			Actual:	**186.2**
Difference between suction service port and liquid pressure reading from HMI?			Actual:	**0.9**

Over 50F

Start a cooling test and check refrigerant charge in accordance with STB21-1016. Do condensing fans turn on and modulate?	Design:	**Yes**	Actual:	**Yes**
Start a Heat Pump test. Does the reversing valve switch to heat mode? Confirm the discharge air temperature warms up.	Design:	**Yes**	Actual:	**Yes**
Does EEV modulate to maintain 20F superheat?			Actual:	**Yes**
Does the compressor ramp up to max speed (200Hz or 330Hz depending on model) and modulate speed?	Design:	**Yes**	Actual:	**Yes**
Does the reheat valve open and modulate?	Design:	**Yes**	Actual:	**Yes**
Cooling superheat measured? (Target is 20)			Actual:	**20**

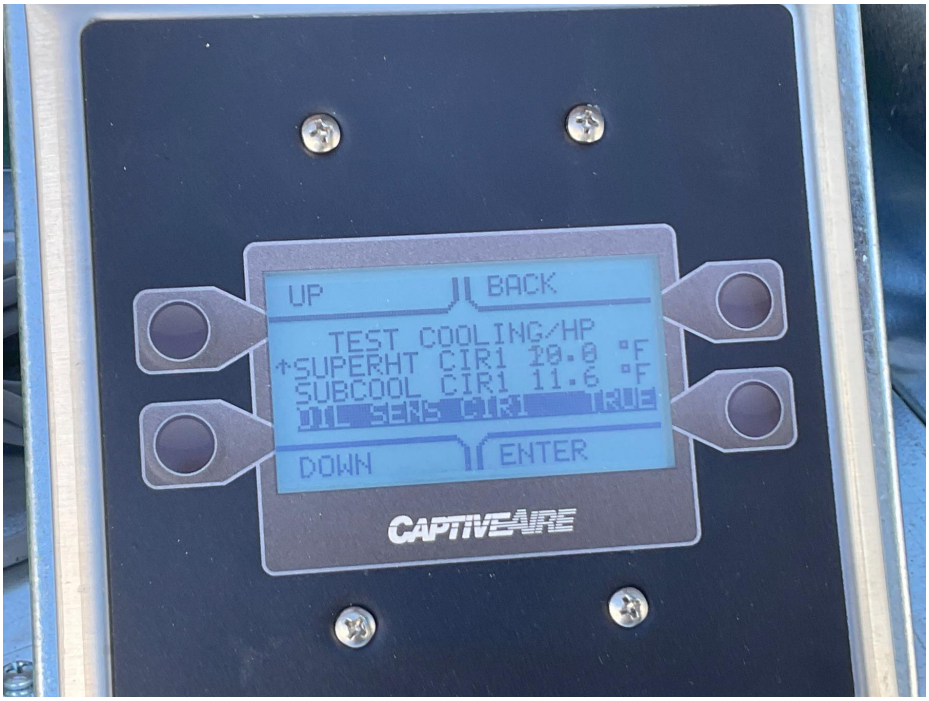
Other Notes:

N/A

Record discharge pressure reading from HMI.	Actual:	**249**
Record liquid line pressure.	Actual:	**234.5**
Record liquid line temperature.	Actual:	**172**
Record Subcool reading. Contact DOAS Support if subcooling is outside of the range of 12F - 20F. Do not adjust refrigerant charge until directed to by DOAS Support.	Actual:	**12**

Other Notes:

N/A



Temp Verification

Measure intake temp with meter and confirm it is within 10F of HMI readout.	Design:	**True**	Actual:	**True**
Measure return temp with meter and confirm it is within 10F of HMI readout.	Design:	**True**	Actual:	**True**
Measure evap coil temp with meter and confirm it is within 10F of HMI readout.	Design:	**True**	Actual:	**True**
Review intake humidity on HMI. Does it appear to be reporting correctly?	Design:	**Yes**	Actual:	**Yes**
Review discharge humidity on HMI. Does it appear to be reporting correctly?	Design:	**Yes**	Actual:	**Yes**
Are extra HMIs being used? Do not count the HMI in the unit. Upload picture of space HMI(s) and surrounding area.			Actual:	**Yes**
Record number of extra HMI's used.			Actual:	**1**
Is HMI address 56 being used for space temperature and humidity readings?			Actual:	**Yes**
Is wired space wall temp/humidity sensor (not HMI) being used?			Actual:	**No**
Measure space temp with a meter and confirm it is within 10F of the average space temp readout on the HMI (Service > Temperatures > Space AVG).	Design:	**True**	Actual:	**True**
Measure space RH with a meter and confirm it is within 10% of the average space temp readout on the HMI (Service > RH Values > Space AVG).			Actual:	**42**

Heater Gas - NOT AVAILABLE!

Installation Notes:

BUILDING GAS IS SHUT 0FF.

Gas Type	**N/A**
Inlet Gas Pressure	**N/A**
Set mod valve low fire setting using the IOM and STB20-1011. Record manifold gas pressure.	**N/A**
Theoretical low fire temperature rise. Use STB20-1011 Calculator	**N/A**
With unit maintaining steady state low fire, record intake temperature.	**N/A**
With the unit maintaining steady state low fire on only the first stage of heat, record the discharge temperature.	**N/A**
This answer should be auto calculated from the previous two questions. The answer will be the discharge temperature - intake temperature.	**N/A**
Set high fire pressure using test menu procedure in O&IM and record manifold gas pressure on pressure gauge.	**N/A**
Recorded Inlet Gas Pressure With Unit in high fire	**N/A**
Confirm the discharge air temp sensor is reading accurately in high fire. Reference STB20-1007 and modulate the burner to the highest capacity heat that can be achieved. Record the discharge air temp reading on the HMI.	**N/A**
With unit still holding highest capacity heat, go into space and record discharge temp at the supply diffuser closest to unit using a handheld temp probe. Record Temperature.	**N/A**
Difference between measured and actual temperature.	**N/A**

Final Checks

FINAL STEPS OF SDV. ONLY PERFORM FOLLOWING QUESTIONS IF REST OF SDV HAS BEEN COMPLETED!			Actual:	**Ok**
Is the smoke detector input wired and functional?			Actual:	**Yes**
Indicate what is wired to the smoke detector input, terminal SD3 (hood fire dry contact, building fire panel, smoke detector in return, etc.)			Actual:	**BUILDING FIRE**
Is the fire alarm input (terminal F) wired and functional?			Actual:	**Yes**
Indicate what is wired to the input (i.e. building fire panel, DCV fire interlock, etc.)			Actual:	**INTERLOCK**
Is either the wired occupied override or unit interlock being utilized and operational?			Actual:	**Unit Interlock**
Once all SDV adjustments are complete, update the factory default settings through the service menu.	Design:	**Complete**	Actual:	**Complete**
Once all SDV adjustments are complete, download the CAAL file from the board, label it with the fan number, software revision and upload it to the NOLA job docs.			Actual:	**Complete**
Take picture of CASLink showing last heartbeat.			Actual:	**Complete**
DOAS data is visible on CASLink, tagged unique from other equipment and matches field labeling			Actual:	**Yes**
Take picture of CASLink showing DOAS data responding.			Actual:	**Complete**
All other equipment on job labeled and can see data on CASLink?			Actual:	**Yes**
Has someone from DOAS_support@captiveaire.com confirmed they are seeing data on this job?			Actual:	**Yes**

ECPs

NONE

CORE

NONE