Start-Up Sheet

AHU-152-001E

START-UP & SERVICE DATA INSTRUCTION

COMMERCIAL PACKAGE UNITS

3.0 To 40.0 TONS

START-UP CHECKLIST

Date: 10/22/2015

Job Name: NORAMCO EXPANSION PROJECT (CYMA)

Customer Name: NORAMCO

Address: 500 Swedes Landing Rd.

City: Wilmington State: DELAWARE Zip: 19801

Model Number: V52AC04O5CCVAI0001 Serial Number: N1C5542780

Qualified Start-up Technician: KEVIN FRAZE (JCI) Signature:

HVAC Contractor: EJ DESETA Phone: (302)691-2040

Address: 322 A Street / Suite 200 / Wilmington, DE 19801

Contractor's E-mail Address: info@ejdeseta.com

Electrical Contractor: TRI-M GROUP Phone: (610)444-1000

Distributor Name: JOHNSON CONTROLS (PLYMOUTH MEETING, PA) Phone: (610)276-3738

WARRANTY STATEMENT

Johnson Controls/UPG is confident that this equipment will operate to the owner's satisfaction if the proper procedures are followed and checks are made at initial start-up. This confidence is supported by the 30 day dealer protection coverage portion of our standard warranty policy which states that Johnson Controls/UPG will cover parts and labor on new equipment start-up failures that are caused by a defect in factory workmanship or material, for a period of 30 days from installation. Refer to current standard warranty policy and warranty manual found on UPGnet for details.

In the event that communication with Johnson Controls/UPG is required regarding technical and/or warranty concerns, all parties to the discussion should have a copy of the equipment start-up sheet for reference. A copy of the original start-up sheet should be filed with the Technical Services Department.

The packaged unit is available in constant or variable air volume versions with a large variety of custom options and accessories available. Therefore, some variation in the startup procedure will exist depending upon the products capacity, control system, options and accessories installed.

This start-up sheet covers all startup check points common to all package equipment. In addition it covers essential startup check points for a number of common installation options. Depending upon the particular unit being started not all sections of this startup sheet will apply. Complete those sections applicable and use the notes section to record any additional information pertinent to your particular installation.

Warranty claims are to be made through the distributor from whom the equipment was purchased.

EQUIPMENT STARTUP

Use the local LCD or Mobile Access Portal (MAP) Gateway to complete the start-up.

A copy of the completed start-up sheet should be kept on file by the distributor providing the equipment and a copy sent to:

Johnson Controls/UPG
Technical Services Department
5005 York Drive
Norman, OK 73069

SAFETY WARNINGS

The inspections and recording of data outlined in this procedure are required for start-up of Johnson Controls/UPG's packaged products. Industry recognized safety standards and practices must be observed at all times. General industry knowledge and experience are required to assure technician safety. It is the responsibility of the technician to assess all potential dangers and take all steps warranted to perform the work in a safe manner. By addressing those potential dangers, prior to beginning any work, the technician can perform the work in a safe manner with minimal risk of injury.

⚠WARNING

Lethal voltages are present during some start-up checks. Extreme caution must be used at all times.

⚠WARNING

Moving parts may be exposed during some startup checks. Extreme caution must be used at all times.

NOTE: Read and review this entire document before beginning any of the startup procedures.

DESIGN APPLICATION INFORMATION

This information will be available from the specifying engineer who selected the equipment. If the system is a VAV system the CFM will be the airflow when the remote VAV boxes are in the full open position and the frequency drive is operating at 60 HZ. **Do not proceed with the equipment start-up without the design CFM information.**

Design Supply Air CFM: 8750 Design Return Air CFM: 8200

Design Outdoor Air CFM At Minimum Position: 550

Total External Static Pressure: 2.65 IWG

Supply Static Pressure: _____

Return Static Pressure: _____

Design Building Static Pressure: 0 IWG

Outside Air Dilution: Economizer Position Percentage: 7% CFM: 550

Supply Gas Pressure After Regulator W/o Heat Active N/A Inches_____

ADDITIONAL APPLICATION NOTES FROM SPECIFYING ENGINEER:

Supply Fan is a CHICAGO Size 222 DESIGN 51 Airfoil Blower. (Consult CHICAGO for Fan Curve and Blower design specs).

FIELD INSTALLED ACCESSORIES:

2PM04700124 - PHASE MONITOR KIT

2DF0402 - DIRTY FILTER SWITCH

S1-03102529006 - WALL TEMPERATURE SENSOR, YORK

REFERENCE

General Inspection	Completed	See Notes
Unit inspected for shipping, storage, or rigging damage	☑	☐
Unit installed with proper clearances	☑	☐
Unit installed within slope limitations	☑	☐
Refrigeration system checked for gross leaks (presence of oil)	☐	☑
Terminal screws and wiring connections checked for tightness	☑	☐
Filters installed correctly and clean	☑	☐
Economizer hoods installed in operating position	☑	☐
Condensate drain trapped properly, refer to Installation Manual	☑	☐
Economizer damper linkage tight	☑	☐
Gas Heat vent hood installed	N/A ☐	☐
All field wiring (power and control) complete	☑	☐

Air Moving Inspection	Completed	See Notes
Alignment of drive components	☑	☐
Belt tension adjusted properly	☑	☐
Blower pulleys tight on shaft, bearing set screws tight, wheel tight to shaft	☑	☐
Pressure switch or transducer tubing installed properly	☑	☐

Exhaust Inspection Powered ☑ Barometric Relief ☐	Completed	See Notes
Check hub for tightness	☑	☐
Check fan blade for clearance	☑	☐
Check for proper rotation	☑	☐
Check for proper mounting (screen faces towards unit)	☑	☐
Prove operation by increasing minimum setting on economizer	☑	☐

Economizer Inspection Standard ☑ BAS ☐	Completed	See Notes
CO_2 sensor installed Yes ☐ No ☑	☐	☐
Check economizer setting A ☐ B ☑ C ☐ D ☐	☐	☐
Prove economizer open/close through PC or Control Module	☑	☐

Reheat Mode Normal ☐ or Alternate ☐ Not Applicable ☑
Humidistat Location _____
Note: BAS System Control Reheat through Intellicomfort/VAV Board

1034349-UCL-B-0814

Operating Measurements - Air Flow

Fan operates with proper rotation	ID Fans ☑	Exh. Fans ☑	Cond. Fans ☑	
Pressure drop across dry evaporator coil (At maximum design CFM) [1]			0.35	IWC
External Static Pressure			2.6	IWC
Return Static Pressure			-1.6	IWC
Supply Static Pressure			1.0	IWC
Supply Air CFM Using Dry Coil Chart			9800	CFM
Final Adjusted Supply Air CFM[2]			9000	CFM

1. Consult the proper airflow to pressure drop table to obtain the actual airflow at the measured pressure differential.
2. Was a motor pulley adjustment or change required to obtain the correct airflow?
   Was it necessary to increase of decrease the airflow to meet the design conditions?
   If the motor pulley size was changed, measure the outside diameters of the motor and blower pulleys and record those diameters here;

Blower Motor HP 10 FLA 12.5 RPM 1770

Pulley Pitch Diameter 9.0″ Turns Out Fixed Final Turns Out Fixed

Blower Pulley Pitch Diameter 9.4″ Fixed Sheave 2B5V94

ELECTRICAL DATA

T1 - T2 471 Volts T2 - T3 471 Volts

Control Voltage 25.3 Volts T1 - T3 471 Volts

Device	Nameplate		Measured List All Three Amperages	
Supply Fan Motor[1, 2]	12.5	AMPS	9.2 / 8.7 / 8.0	AMPS
Exhaust Motor (Dampers 100%)	9.7	AMPS	5.8 / 5.6 / 5.6	AMPS
Condenser Fan #1	2.15	AMPS	1.8 / 1.8 / 1.7	AMPS
Condenser Fan #2 (if equipped)	2.15	AMPS	1.1 / 1.1 / 1.1	AMPS
Condenser Fan #3 (if equipped)	2.15	AMPS	1.1 / 1.1 / 1.1	AMPS
Condenser Fan #4 (if equipped)	2.15	AMPS	1.3 / 1.3 / 1.2	AMPS
Compressor #1	10.6	AMPS	7.1 / 7.5 / 6.7	AMPS
Compressor #2 (if equipped)	10.6	AMPS	7.5 / 7.8 / 7.1	AMPS
Compressor #3 (if equipped)	10.6	AMPS	7.4 / 7.6 / 6.9	AMPS
Compressor #4 (if equipped)	10.6	AMPS	7.3 / 7.6 / 6.7	AMPS

1. VAV units with heat section - simulate heat call to drive VAV boxes and VFD/IGV to maximum design airflow position.
2. VAV units without heat section - VAV boxes must be set to maximum design airflow position.

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OPERATING MEASUREMENTS - COOLING

Stage	Discharge Pressure	Discharge Temp.	Liquid Line Temp.[1]	Subcooling[2]	Suction Pressure	Suction Temp.	Superheat
First	300 #	150 °	88.9 °	7.1 °	130 #	63 °	18 °
Second (if equipped)	330 #	145 °	82.4 °	18.1 °	135 #	56 °	9 °
Third (if equipped)	320 #	131 °	80.0 °	18.3 °	135 #	56 °	9 °
Fourth (if equipped)	310 #	142 °	78.1 °	17.9 °	125 #	60 °	17 °
Reheat 1st Stage	#	°	°	°	#	°	°

1. Liquid temperature should be taken before filter/drier.
2. Subtract 10 psi from discharge pressure for estimated liquid line pressure

Outside air temperature	74	°F db	59	°F wb	42 %RH
Return Air Temperature	67	°F db	57	°F wb	53 %RH
Mixed Air Temperature		°F db		°F wb	%RH
Supply Air Temperature	57	°F db	54	°F wb	85 %RH

REFRIGERANT SAFETIES

Action	Completed	See Notes
Prove Compressor Rotation (3 phase only) by gauge pressure	☑	☐
Prove High Pressure Safety, All Systems	☑	☐
Prove Low Pressure Safety, All Systems	☑	☐

OPERATING MEASUREMENTS - GAS HEATING

Fuel Type: ☐ Natural Gas ☐ LP Gas

Action		Completed	See Notes
Check for gas leaks		☐	☐
Prove Ventor Motor Operation		☐	☐
Prove Primary Safety Operation		☐	☐
Prove Auxiliary Safety Operation		☐	☐
Prove Rollout Switch Operation		☐	☐
Prove Smoke Detector Operation		☐	☐
Manifold Pressure	Stage 1	IWC	☐
	Stage 2 (If Equipped)	IWC	☐
	Stage 3 (If Equipped)	IWC	☐
Supply gas pressure at full fire		IWC	☐
Check temperature rise[1]	☐ measured at full fire	°F	☐

1. Input X Eff. (BTU output)
   1.08 X Temp. Rise

OPERATIONAL MEASUREMENTS - STAGING CONTROLS

Verify Proper Operation of Heating/Cooling Staging Controls	
Create a cooling demand at the Thermostat, BAS System or Simplicity PC Verify that cooling/economizer stages are energized.	☑
Create a heating demand at the Thermostat, BAS System or Simplicity PC Verify that heating stages are energized.	☐ N/A
Verify Proper Operation of the Variable Frequency Drive (If Required)	
Verify that motor speed modulates with duct pressure change.	☑

FINAL - INSPECTION

Verify that all operational control set points have been set to desired value Scroll through all setpoints and change as may be necessary to suit the occupant requirements.	☑
Verify that all option parameters are correct Scroll through all option parameters and ensure that all installed options are enabled in the software and all others are disabled in the software. (Factory software settings should match the installed options)	☑
Verify that all access panels have been closed and secured	☑

OBSERVED PRODUCT DIFFICIENCIES & CONCERNS:

1133388-JIM-A-1014
Supersedes: 689676-JIM-D-0614

York International Corporation
5005 York Drive
Norman, OK 73069