



Unitary Dehumidifier Start-Up Guide

	UNITARY DEHUMIDIFIER START-UP GUIDE	
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Prior to Performing a Start-up

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The Operation and Maintenance Manual (OMM) as well as the Installation Manual (IM) are included with the unit and are vital documents for review, along with this document prior to completing a start-up. Read the Dehumidified Air Services (DASV) Warranty Statement carefully before conducting work on any equipment supported by Dehumidified Air Services. A copy of these documents can also be found at www.Dehumidifiedairservices.com.

Familiarize yourself with the general equipment components, equipment selections, operating principles, and HMI navigation prior to attempting start-up.

All warranty failures must be confirmed and documented with Dehumidified Air Services (DASV), and prior authorization provided by DASV before the completion of any warranty repairs. Failure to operate within the warranty terms and policies may result in loss of warranty coverage.

All start-up reports must be digitally completed in full and returned to Warranty@dehumidifiedairservices.com for review and approval within one-week of the completion of startup to register the equipment warranties.



CAUTION: The equipment contains refrigerant under pressure, moving mechanical components, high voltage, and may contain flammable gases. All work should be completed by qualified and competent HVAC/R technicians only. Appropriate PPE must be worn. Exercise extreme caution while performing Start-Up or other service work!



NOTICE: Only Dehumidified Air Services technicians, and factory certified third party technicians are authorized to complete equipment start-up. Start-ups completed by non-certified technicians may be improperly completed resulting in premature equipment or component failure.

Start-Up Options

There are three approved options for equipment start-up. Remote Assisted Start-up (RASU), in person Factory Assisted Start-up (FASU), and Factory Certified third-party Start-up (FCSU). All

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start-up tasks and requirements remain the same whether a Remote Assisted Phone Start-up (RASU), an in-person Factory Assisted Start-up (FASU), or a Factory Certified third-party Start-up (FCSU) is completed.

To request a Remote factory Assisted Start-up (RASU), or an in-person Factory Assisted Start-up, complete the Pre-Start-Up Checklist in full and return it to Scheduling@dehumidifiedairservices.com a minimum of three weeks prior to the requested start-up date. Dehumidified Air Services will make every effort to accommodate the requested date(s) however, the agreed start-up date will depend on scheduling availability. The Remote Assisted Startup Agreement must be signed and returned to Scheduling@dehumidifiedairservices.com for RASU scheduling.

Remote Factory Assisted Start-Up (RASU)

A Dehumidified Air Services technician will assist the qualified local technician with the equipment start-up remotely by use of WebSentry and phone communication.

WebSentry communication is required for the full duration of the RASU when selected. RASU is only available for unitary equipment not exceeding 16 Tons.

The onsite local qualified technician must be prepared with all start-up tools and materials. This includes standard hand tools, multi-meter, various temperature clamps and probes, psychrometer, refrigerant handling tools, refrigerant, glycol, and glycol transfer pump suitable for the application.

In Person Factory Assisted Start-Up (FASU)

A Dehumidified Air Services (DASV) technician will be present on site to provide assistance and supervision for the qualified local technician for the equipment start-up.

The onsite local qualified technician must be prepared with all start-up tools and materials. This includes standard hand tools, multi-meter, various temperature clamps and probes, psychrometer, refrigerant handling tools, refrigerant, glycol, and glycol transfer pump suitable for the application. The onsite local qualified technician must be present for the full duration of start-up.

Factory Certified Third-party Startup (FCSU)

Following the successful completion of the Dehumidified Air Services (DASV) start-up training and certification program, an authorized third-party representative or service technician may complete start-up on unitary equipment not exceeding 16 tons.

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Following completion of start-up, the Start-up report, site photos and any supporting documentation must be submitted to Warranty@dehumidifiedairservices.com for review, approval, and warranty registration.



NOTICE: Only qualified, trained HVAC/R technicians certified by DASV should perform a unit start-up! Attempts to perform a start up by non-qualified personnel may result in unit malfunction, damage, or injury of said person. Dehumidified Air Services (DASV) reserves the right to limit or refuse to provide technical assistance if personnel attempting a start-up are deemed unqualified by the Dehumidified Air Services Service team.

Startup Quick Reference

Review this document in its entirety for full and detailed start-up procedures. The quick reference guide should only be used as a brief overview of the start-up process.

Inspect Equipment and Site

Inspect the equipment, mechanical room, natatorium, and installation. Verify there are no damages, confirm that the site and installation is ready for start-up. Complete the related Start-up Report checklists.

Verify Voltage

Check all electrical connections and verify that the correct voltage is supplied to the unit. Confirm proper transformer secondary voltage on all internal transformers. Document voltage readings on the Start-up Report.

Verify Configuration

Verify the correct integration of all internal and external systems and the unit configurations related to all internal and external systems. Activate CORELink router and/or establish WebSentry communication. Indicate integrated systems on the Start-up Report.

Verify Ventilation Components

Inspect operation of all internal dampers and fans as well as the protocol pump when equipped. Verify correct rotation, inspect for vibration, and confirm amperage. Document all motor models and serial numbers and document various motor operational amperage readings on the Start-up Report.

Verify Space Heating Operation

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Identify space heating type, document heater model and serial number. Complete start-up process for heater used and document heater operational data on the Start-up Report.

Verify Compressor Circuit Operation

Document compressor(s) model and serial numbers. Verify refrigerant circuit charge and operation in all modes. Document refrigerant circuit operational data on the Start-up Report.

Verify Normal Mode Operation

Enable compressor(s) and commission unit. Backup software settings and observe equipment operation in normal mode.

Register Dehumidifier Warranties

Email the start-up report, supporting documents, and start-up pictures to DASV for review, approval, and warranty registration.

Start-Up Procedure

Use this guide in conjunction with the latest start-up report for startup of unitary and modular equipment. The start-up report must be sent to Scheduling@dehumidifiedairservices.com within one-week for review and approval to register the equipment warranties. Ensure the start-up report is digitally completed in full.



NOTICE: A digitally completed Start-Up Report must be submitted to Dehumidified Air Services within one-week of start-up for review, approval, and warranty registration. Failure to properly submit an approved start-up report and supporting documents may result in loss of warranty coverage for your equipment as outlined within the equipment warranty terms.

Inspection Checklists

Complete all checklists. Use the comments and notes sections as needed. All fields must be digitally completed in full.

Section A - Installation Inspection Checklist

Identify the dehumidifier location, thoroughly inspect the equipment for any damage, loose debris, and inspect the ductwork, electrical systems, drain line(s) and dehumidifier clearances for installation verification. Obtain pictures of all sections of the dehumidifier and pictures of

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each side of the dehumidifier. Complete all checklist items, identify any noteworthy items, and indicate in the Comments or Notes section of the start-up report.

- Outdoor air duct must be connected to the OA collar, NOT the return air duct.
- Bonding loop must be connected to the pool bonding loop lug when equipped with pool water heating to prevent galvanic corrosion of pool heating coax coil.
- Verify ductwork and connections at the dehumidifier are complete and correct.

Section B - Mechanical Room and Natatorium Inspection Checklist

Inspect the mechanical room and natatorium for start-up readiness. Confirm substantial completion of construction, proper chemical storage, and ductwork installation. Obtain pictures of the mechanical room and natatorium. Complete all checklist items, identify any noteworthy items, and indicate in the Comments or Notes section of the start-up report.

- Chemicals must be stored in a separate ventilated room.
- The mechanical room should be ventilated
- Ductwork in natatorium should be completed
- Supply air should sweep all exterior doors and windows to prevent condensation buildup in winter.
- Test and balance (TAB) should be completed. Design Outside air, Exhaust air, and blower airflow should all be identified and configured in the HMI.



NOTICE: Chemicals must be stored in a ventilated storage room isolated from the dehumidifier. Chemical storage within the dehumidifier mechanical room may result in premature equipment corrosion. Failures due to improper chemical storage may not be applicable to warranty coverage.

Section C - OACC Installation Checklist

This section is only applicable for unitary dehumidifiers when equipped with an OACC (refrigerant to air condenser). Identify the OACC location, lineset size, lineset length, confirm proper utilization of oil traps, confirm OACC clearances, and general OACC start-up readiness. Complete all checklist items, identify any noteworthy items, and indicate in the Comments or Notes section of the start-up report.

- Factory specified lineset size is indicated on the dehumidifier nameplate.
- Oil traps must be installed in the discharge line every 15' of vertical lineset lift.
- Lineset length is not to exceed 50'.
- Reference the equipment IM for full installation requirements.

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Section D - OAFC Installation Checklist

This section is only applicable to unitary and modular dehumidifiers when equipped with an OAFC (glycol to air fluid cooler). Identify the OAFC location, fluid loop pipe size, fluid loop pipe length, confirm OAFC clearances, and general OAFC start-up readiness. Complete all checklist items, identify any noteworthy items, and indicate in the Comments or Notes section of the start-up report.

Section E - Condenser Loop Checklist

This section is only applicable to fluid-cooled unitary and modular dehumidifiers connected to a third-party condenser loop. Identify the type of condenser loop utilized, control method for condenser loop temperature, if a modulating bypass valve is installed, and fluid type within the external loop. Complete all checklist items, identify any noteworthy items, and indicate in the Comments or Notes section of the start-up report.

- A modulating bypass valve controlled by the unit is recommended when using a third-party condenser loop for modulating head pressure control.
- A modulating bypass valve controlled by the unit is required when using a third-party chilled-water condenser loop for modulating head pressure control.
- External loop must not exceed the dehumidifier's rated pressure.

Section F - General Equipment Checklist

General equipment components must be checked and confirmed for start-up readiness. All hose clamps must be tightened, all blower shipping bolts removed, and blower isolation springs adjusted (modular dehumidifiers only), service valves back seated, and general component verification for start-up readiness. Complete all checklist items, identify any noteworthy items, and indicate in the Comments or Notes section of the start-up report.

- Test all dampers (reference Ventilation section)
- Confirm all fan rotation and operation (reference Ventilation section)
- Verify rotation of modulating refrigerant valves (reference Prepare for Compressor Circuit Operation section)

Section G - Electrical Checklist

All electrical connections must be verified and tightened. Ensure all connections within disconnects, sub panels and connection points at the various components are checked and tightened. Reference the Electrical Verification section. Complete all checklist items, identify any noteworthy items, and indicate in the Comments or Notes section of the start-up report.

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Section H - Controls Checklist

Verify all HMI touchscreens are communicating, CORELink has been activated, master/slave configuration status, WebSentry communication, board inputs/outputs have been configured, software settings verified and, sensors have been calibrated. Reference the Controls Verification section.

Electrical Verification

Verify proper voltage before turning on power to the equipment. Confirm correct control power at all control and secondary transformers.

- Record nameplate rated voltage for the dehumidifier and OACC/OAFC within the electrical data section.
- Verify proper power supply (phasing, voltage, etc.) at the main distribution block.
 - Primary voltage must not exceed +/-10% of the nameplate rated voltage.
- Verify proper Voltage Monitor (VM) settings.
 - Reference Voltage Monitor Quick Setup Guide QA-0233-R-EN
- Check Voltage Monitor status – address respectively, if any, alarms are shown.
 - If Voltage monitor (VM) indicates phase reversal on three-phase power supply – power unit down and reverse/switch any two power leads. All motors, compressors, pumps within the unit are synchronized with Voltage Monitor. proper phasing to Voltage Monitor from main power will ensure proper rotation.
 - Record Voltage Monitor settings on the startUp report.
- Verify proper secondary control voltage on all internal transformers.
 - Transformer primary tap may need to be adjusted to obtain proper secondary voltage. Control voltage must be 24VAC +/- 10%
- Record voltage reading between all legs of power in the electrical data section of the startUp report for both the dehumidifier and OACC/OAFC.
 - Voltage must be within 10% of the nameplate rated voltage.
- Record controls transformer secondary voltage within the electrical data section.
- Verify compressor(s) crankcase heater operation.



NOTICE: Unit must be powered up at least 24 hours prior to a start-up for crankcase heaters to mitigate any liquid refrigerant that has migrated to the compressor(s) sump.

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NOTICE: Fuse FU-5 Must be removed when the OAC enable contacts (J10-1 and J10-2) are used for modulated head pressure control. Failure to do so may result in board, actuator and/or OACC/OAFC fan failure.

Controls Verification

Activate CORELink, confirm WebSentry communication, verify touchscreen communication, identify all sensors, inputs, and interlocks, confirm unit configuration.

Activate CORELink

All current models are provided with a CORELink Cellular router. The CORELink will be factory installed on most models but may need field installed on some models. CORELink is available for purchase when not factory equipped.

- When supplied with a CORELink (Cellular router), the sim card must be activated. Contact Support@dehumidifiedairservices.com referencing the unit serial number to activate the cellular service.
 - Reference the CORELink Installation and Setup guide for CORELink setup.
 - Reference the WebSentry Installation Guide for WebSentry setup.
- When a local network is used for WebSentry communication, no activation is required.
 - Reference the WebSentry Installation Guide for WebSentry setup.



TIP: The web connection must be connected to the Ethernet port on the Rabbit Core Module (RCM) affixed to the center of the Command Center board for WebSentry communication. WebSentry communication is required for the extended labor warranty activation.

Verify HMI Operation

- Verify all HMI touchscreens power up and display valid data.
 - On the home screen, Comm will be highlighted in green when the touchscreen is communicating.
 - On V8 boards, when multiple HMI touchscreens are used, one should be plugged into a red ethernet port, and the other should be plugged into a yellow ethernet port near the bottom of the Command Center board.
- Verify all sensors, inputs, outputs, and external systems utilized are enabled.

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- Indicate what external systems, interlocks or components are being utilized.
- Indicate what terminals are being used for all interlocked systems.
- Reference the Sensors, Inputs, and Interlocks section for additional information.

Verify Configuration

Unit profile and various configurations must be confirmed and adjusted as needed.

Profiles

The unit profile identifies what options the unit is equipped with and changes some configurations based on the selections. The profile identifies the type of unit and number of Compressor circuits, type of heat control, identifies if pool heating is equipped and the amount of pool heating circuits.

Identify the profile applicable to the dehumidifier being started. Once identified, highlight the selection, and select Apply.

- Select Advanced, Tools, Profiles, select appropriate profile, select Apply.
- The first section indicates the type of unit and number of compressor circuit.
 - Classic, New Gen, Protocol, etc.
 - 1 refrigerant circuit or 2 refrigerant circuit.
 - Additional unit types are listed but not applicable under this guide.
- The second section (after the comma) indicates the heat control type.
 - Staged or modulating heat control.
- The last section (after the second comma) indicates Pool heat control.
 - No pool heating, 1 pool circuit, 2 pool circuit.
 - When no pool heating is equipped, there is no text for pool heating.
 - Protocol units will also indicate if pool heating is modulated or staged.



TIP: When scrolling through the selections, use the up and down selections to scroll to scroll through the list. Once a selection is highlighted, the list is not able to scroll past the selection you have made on the screen. If you have selected a profile on accident, select Back, then re-select Profile. Do not press on a profile selection until you have identified the correct profile.

Classic

Dehumidifiers identified as Classic will be unitary dehumidifiers with staged refrigerant circuit

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control. The number next to classic indicates the number of compressor circuits the dehumidifier is equipped with.

- Classic 1
 - Indicates unitary dehumidifier, Single circuit, staged refrigerant circuit control.
- Classic 2
 - Indicates unitary dehumidifier, two circuits, staged refrigerant circuit control.

New Gen

Dehumidifiers identified as New Gen will be unitary dehumidifiers with modulating refrigerant circuit control. The number next to New Gen indicates the number of compressor circuits the dehumidifier is equipped with.

- New Gen 1
 - Indicates unitary dehumidifier, Single circuit, modulating refrigerant circuit control.
- Classic 2
 - Indicates unitary dehumidifier, two circuits, modulating refrigerant circuit control.

Protocol

Dehumidifiers identified as Protocol will be modular dehumidifiers, standard equipped with modulating AC and reheat control. The number next to Protocol indicates the number of compressor circuits the dehumidifier is equipped with.

- Protocol 2
 - Indicates modular dehumidifier, two circuits, AC and Reheat control.

Staged Heat

All dehumidifier types may be equipped with staged heat. When equipped, select the appropriate profile containing staged heat.

- Stg Heat
 - Indicates heat control type is staged.

Modulating Heat

All dehumidifier types may be equipped with modulating heat. When equipped, select the

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appropriate profile containing modulating heat.

- Mod Heat
 - Indicates heat control type is modulating.

No Pool Heating

All dehumidifiers may or may not be equipped with pool heating. When not equipped, select a profile that does not indicate pool heating.

1 Pool/ 1 Mod Pool

Dehumidifiers may be equipped with 1 pool or 2 pool circuit control. When equipped with 1 common pool circuit, select a profile that indicates 1 Pool.

- 1 Pool/ 1 Mod Pool
 - 1 Pool Indicates 1 common pool circuit for unitary dehumidifiers.
 - 1 Mod Pool indicates 1 common pool circuit for modular dehumidifiers.
 - When equipped with multiple refrigerant circuits, both compressors will serve one common pool circuit.

2 Pool/ 2 Mod Pool

Dehumidifiers may be equipped with 1 pool or 2 pool circuit control. When equipped with 2 separate pool circuits, select a profile that indicates 2 Pool.

- 2 Pool/ 2 Mod Pool
 - 2 Pool Indicates 2 individual pool circuits for unitary dehumidifiers.
 - 2 Mod Pool indicates 2 individual pool circuits for modular dehumidifiers.
 - 2 pool indicates each compressor will serve an individual pool circuit.

Software Settings

Various configurations options must be verified and/or configured. Reference the Software Settings Guide for full details.

Key configurations are indicated below but do not include all considerations.

- Advanced, Ventilation, Supply Fan
 - CFM Controlled

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- Factory default is No, change to Yes when equipped with airflow monitoring.
 - See Sensors section for additional information.
 - Additional configuration required when set to Yes.
- Fire Alarm Reset
 - Factory default is Manual, change to Auto if desired.
- Advanced, Ventilation, Economizer/ Purge
 - Purge Mode
 - When equipped with purge option, change to Yes. When not equipped with Purge mode, change to NO.
- Advanced, Compressors, Options.
 - Protocol Pump Enabled.
 - Set to Yes for all modular dehumidifiers.
 - EXV Controlled
 - Set to Auto when equipped with an Electronic Expansion Valve (Also referred to as EVD or EEV, and EXV).
 - Set to NO when equipped with a mechanical expansion valve.
 - Pump down At Start
 - Set to NO for all unitary equipment less than 16 Tons.
 - Set to Yes for all modular equipment 16 Tons or greater.
 - Bypass Damper Minimum Position
 - Factory default is 50%. Change to 0% for improved suction pressure control.
- Advanced, Compressors, Pressures
 - Low Pressure Max
 - Change to 170.
 - High Pressure Min
 - Change to 250
 - High Pressure Relief On
 - Change to 475
 - High Pressure Relief Off
 - Change to 425
- Advanced, Compressors, Condenser/Fluid Cooler
 - Cooler Type
 - Select Condenser when an OACC is installed.
 - Select Fluid Cooler when an OAFC is installed/ unit is fluid cooled.
 - Pump Enabled
 - Set to Yes for fluid cooled unitary dehumidifiers when equipped with a factory OAFC.
 - Set to Yes for fluid cooled unitary dehumidifiers on a third-party

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- condenser loop when the dehumidifier is responsible for enabling the condenser loop pump.
- High Pressure Deadband
 - Change to 15 for improved head pressure control.
- Degree Minute Less
 - Change to 30
- Degree Minute More
 - Change to 30
- Stabilize Time
 - Change to 30
- Advanced, (Sensors, Controls, and Inputs)
 - Reference Sensors, Inputs, and Interlocks section.
- Advanced, Network, WebSentry
 - Enabled
 - Set to Yes
 - Server IP
 - Set to 54.208.1.11
- Advanced, Network, (TCP/IP, BACnet, Modbus Unit Network, Devise Network)
 - Refer to various supporting documents for BMS, internal components communication, EXV integration, Master Slave integration and other network considerations.
- Advanced, Modbus Devises
 - Refer to EVD installation manual and additional manuals for related configuration information.
- Electronic Expansion Valve Controller
 - Refer to EVD installation manual.
 - May be referred to as EEV, EXV or, EVD)

Sensors, Inputs, and Interlocks

Sensors, inputs interlocks utilized vary depending on the options selected on any given dehumidifier. All utilized sensors, inputs and interlocks must be confirmed as enabled and accurate.

Sensors

Standard sensors include Return air temperature, return air humidity, supply air temperature and compressor circuit sensors including air off evaporator, suction temperature, discharge temperature, suction pressure, and discharge pressure.

Commonly equipped sensors include outdoor air temperature, outdoor air humidity, pool

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water in temperature (1 and 2 when equipped with 2-pool control), pool water out temperature (1 and 2 when equipped with 2-pool control), exhaust temperature and supply air flow. Additional sensors may be equipped and must be verified when installed.

Verify Sensor Data

- Identify all sensors utilized.
- Confirm all sensors utilized are enabled.
 - On the HMI select Advanced, Sensors, Usage, select the sensor in question from column on left, select appropriate usage (Usually Default), select Enter.
 - To exit, press Home.
- Confirm and configure terminal used:
 - On the HMI select Advanced, Sensors, Terminal Assignment, select sensor in question from column on left, select correct terminal, select Enter.
 - To exit, press Home.
- When airflow sensors are used, the quantity and K factor must be confirmed.
 - On the HMI select Advanced, Sensors, Extras, select desired selection and adjust accordingly.
 - The Blower K factor reference chart must be utilized to confirm the correct K factor setting.
- Calibrate sensor readings.
 - Measure the actual temperature/relative humidity/pressure in question at the location of the sensor in question.
 - Verify the actual reading matches the sensor data displayed on the HMI.
 - If the data does not match, an offset may be added by selecting Advanced, Sensors, Calibration, select sensor in question, add or subtract differential between displayed reading and actual reading, select Enter. verify sensor reading is now accurate.



TIP: When calibrating air temperature and relative humidity sensors, the Blower, Exhaust and/or Outside air should be operating accordingly to ensure airflow across the sensor during calibration. Compressor pressure sensors should be checked first at standing pressure, and then confirmed again once operating. Some delay may occur between the sensor reading and the displayed value.

Digital Input/ Outputs

Various digital inputs and digital outputs may be integrated with the dehumidifier. The polarity of digital inputs may be configured as normally open or normally closed. When utilized, configuration must be confirmed.

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Common factory digital inputs in addition to the standard blower and refrigerant fault circuits include Blower Fault, Dirty Filter, No Airflow, and Pool Waterflow. These inputs must be verified during startup.

Verify Digital Inputs

Additional digital inputs and digital outputs may be enabled for integration of external systems and or control. Common digital inputs include Fire Alarm, Occupied Override, Pool Enabled, Purge Override, Space Heat Enabled, AC Enabled, and Compressors Enabled.

- Identify all Digital Inputs utilized.
- Confirm all Digital Inputs utilized are enabled.
 - On the HMI select Advanced, Inputs, Enabled, select the Digital Input in question from column on left, select Yes to Enable or No to disable, select Enter.
 - To exit, press Home.
- Confirm and configure terminal used.
 - On the HMI select Advanced, Inputs, Terminal Assignment, select the Digital Input in question from column on left, select correct terminal, select Enter.
 - To exit, press Home.
- Confirm Digital Input Polarity
 - Select Advanced, Inputs, Polarity, select polarity for the input as implemented.
 - To exit, press Home.



TIP: Pay close attention to the verbiage used when setting the polarity for a digital input. Polarity is interpreted based on the verbiage of said input. For example, “Blower Enabled” with a polarity of “Closed” will mean the blower is enabled when the digital input is closed. “Compressor High Pressure” with a polarity of “Open” would mean when the input is open a Compressor high pressure fault is active, a closed input for would be the normal/no fault state for this input.

Verify Digital Outputs

Common Digital outputs include Alarm, Exhaust (external exhaust control), External Cooling, Pool Auxiliary Heat, Pool Pump and Space Heater (When integrated with external heater).

- Identify all Digital Outputs utilized.
- Confirm all Digital Outputs utilized are enabled.
 - Select Advanced, Controls, DO Terminals, select Digital Output in question from column on left, select correct terminal, select Enter.

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- To exit, press Home.

Ventilation Menu

Within the Vent submenu, you will find various sensor readings which may include return air relative humidity, return air temperature, supply air temperature, outdoor air humidity, and outdoor air temperature. Actual sensor values displayed will vary depending on the features equipped on any given unit.

Also found under the Vent submenu are the control commands and status for various dampers and motors. The various components may include Blower, Outdoor Air Damper 1 (OAD 1), Outdoor Air Damper 2 (OAD 2/POA), Exhaust 1 (EXH 1), Exhaust 2 (EXH 2) and Heat recovery pump. Any given component is not enabled when highlighted in grey and is enabled when highlighted in green. The number displayed next to a given component selection is the speed or position that component is currently being commanded to.

Actual components displayed may vary depending on the features equipped on any given unit. The verbiage, menu structure and component names displayed may vary depending on the software and firmware installed on any given unit.



NOTICE: Correct electrical voltage, electrical connections, set screws, mounting fasteners and clearances and cleaning of any debris must be checked and confirmed before operating any fan.



CAUTION: High voltage, rotating fans, and moving mechanical components may cause injury or death. Exercise extreme caution when working with mechanical equipment. Only qualified, competent technicians should work with the equipment.

Damper(s)

There are up to five different dampers controlled under the Ventilation submenu. The damper types may include Outdoor Air Damper 1 (OAD1), Outdoor Air Damper 2 (OAD 2/ POA), the respective modulating dampers for each OAD 1 and OAD 2 and the Return Air Damper. When equipped with purge mode, the return air damper will be energized to close when OAD 2 is energized to open.

Verify Dampers

- Two position (on/off) actuators
 - Press the desired damper in the Vent submenu. Once energized, the

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corresponding damper will engage.

- Modulating actuators
 - Select the number next to the desired damper name in the Vent submenu. Then with **(+)** and **(-)** change the value of the modulating signal, press Enter.
- Observe damper operation.
 - All dampers must be confirmed to sweep fully and freely from the 100% closed position to the 100% open position.
 - When equipped with purge mode (Modular/Protocol equipment only), the return air damper will close when the Outdoor Air Damper 2 (OAD 2)/ Purge Outdoor Air damper (POA) is energized to open.



TIP: All current models equipped with modulating outside air will have a two-position damper/actuator on the exterior of the unit. There will then be a secondary damper on the interior of the unit with modulating actuator(s). The operation of both damper assemblies will need to be confirmed when equipped with modulating outdoor air.

Exhaust

When equipped, there are two exhaust types, Exhaust 1 (EXH1), and Exhaust 2 (EXH2/Purge). Exhaust 1 is the standard exhaust during normal mode operation. Exhaust 2/ Purge Exhaust will engage when the unit is operating in purge mode. Exhaust 2 will only be installed when the equipment is selected with purge mode.

Verify Exhaust Fan(s)

- Record model and serial numbers from the motor nameplate for Exhaust 1 fan(s) in the respective location on the startup report.
- Record motor nameplate rated amperage for each Exhaust 1 fan(s) in the respective location on the startup report.
- Enable EF1.
 - In the Vent submenu, select Exhaust 1.
 - When equipped with modulating exhaust, select the number next to Exhaust 1, then with **(+)** and **(-)** change the value of the modulating signal, Press Close.
 - Observe Exhaust 1 fans(s) for correct rotation, abnormal vibration and/or abnormal noise.
 - Record operational amperage within the startup report for all legs of power on each Exhaust 1 motor.

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- Stop Exhaust Fan 1
 - Select the number displayed next to EXH1, press Reset then Close. Deselect EXH 1.

Test Purge Fan(s)/ Exhaust Fan 2 (EF 2/ EXH 2)

- Record model and serial numbers from the motor nameplate for Exhaust 2/ Purge fan(s) in the respective location on the startup report.
- Record motor nameplate rated amperage for each Exhaust 2/Purge fan(s) in the respective location on the startup report.
- Enable EF2
 - In the Vent submenu, select Exhaust.
 - When equipped with modulating exhaust, select the number next to Exhaust 2, then with (+) and (-) change the value of the modulating signal, press Close.
 - Observe Exhaust 2 fans(s) for correct rotation, abnormal vibration and/or abnormal noise.
 - Record operational amperage within the startup report for all legs of power for each Exhaust 2 motor.
- Stop Exhaust Fan 2.
 - Select the number displayed next to EXH2, press Reset then Close. Deselect EXH 2.



TIP: When equipped with single speed Purge motors, Purge motor contactor(s) will engage, and fan(s) will start after the respective Exhaust 2 damper end switch has been made. When equipped with modulating Purge exhaust fans, the exhaust fan motor(s) will receive the enable command once the damper end switch has been made for exhaust 2. The purge motor will not start until it receives a speed signal.

Main blower(s)

Dehumidifiers may be equipped with VFD controlled induction motors, non-speed-controlled induction motors, modulating ECM motors or any combination of these motors. Refer to the equipment manual(s) and any accompanying VFD manuals for more details. When equipped with a VFD, the VFD configuration must be confirmed.

Verify Blower Operation

- Record model and serial numbers for main blower(s) respectively as indicated on the startup report.
- Record the blower(s) nameplate rated amperage on the startup report.
- Obtain data from the motor nameplate, NOT the equipment nameplate.

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- Verify VFD(s) configuration when equipped.
- Enable Blower(s)
 - In the Vent submenu, select Blower.
 - In the Vent submenu, press the number displayed next to Blower. With **(+)** and **(-)** change the value of the modulating signal as desired, then press Close.
 - Observe blower operation for correct rotation, abnormal vibration and/or abnormal noise.
 - test amperage on all legs of power for each blower and make record in the Startup Report
- Stop Blower
 - Select the number displayed next to Blower, press Reset then Close. Select Blower- Blower is no longer enabled when Blower is highlighted in grey.

Heat Recovery Loop

When equipped, the heat recovery loop will have a pump within the return section of the unit. Glycol is then pumped between the unit exhaust, and the outdoor air intake.

Test Heat Recovery Pump

- Record the heat recovery pump model and serial number respectively as indicated on the start-up report.
- Record the heat recovery pump nameplate rated amperage in the respective location on the start-up report.
 - In the Vent submenu, select Heat Recovery - verify pump. Listen for signs of air in the heat recovery loop. If present, the air will need to be bled out. Heat recovery loop may need to be topped off with glycol.
- Record heat recovery loop pump amperage readings for all legs of power on the startup report.
- Record both inlet and outlet heat recovery loop pump pressures.



TIP: The inlet glycol pressure should read at least 15 PSI while the heat recovery loop is operating. Loop may need to be topped off with glycol if pump inlet pressure is lower while the pump is operating.

Space Heating

There are several different factory options for the heater type. Modulating gas heater, single stage electric heater, two stage electric heater, modulating electric heater, single stage hydronic heating, and modulating hydronic heating. In addition to the factory provided heating

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options, various third-party heaters may be interlocked with the dehumidifier.



NOTICE: Gas pressure will need to be confirmed and adjusted for gas fired heaters. Reference the heater manufacturers' installation and maintenance manual(s) for instructions to do so.



CAUTION: Natural gas and propane are highly flammable. Extreme caution must be used when working with systems containing flammable gases. Failure to follow appropriate safety measures may result in fire, explosion, injury, or death. Only qualified and competent technicians should work with systems containing natural gas or propane.

Space Heating types

- Identify and record the type of heater being used (Modulating or staged, Gas, electric, hydronic, or other).
- Record the model and serial number respectively for all heaters on the startup report.
 - Heater model and serial number is only required when an electric or gas heater is installed. Hydronic coil information is not needed when hydronic heating is used.
- Record heater nameplate amperage for electric heaters, design GPM for hydronic heaters, and design low/high fire gas pressures for gas heaters on the startup report.
- Where applicable, the heater manufacturers' startup report must be completed in addition to the DASV startup report.



NOTICE: The main blower(s) must be running while testing Space Heating components. Also engage Outside Air Damper 1 and Exhaust Fan1 (if/where applicable). Heating operational data should be recorded at design airflow. Set Blower, Exhaust 1, and Outdoor Air Damper 1 at values determined by the Test and Balance (TAB) to be design airflow.

Verify Staged Heat Operation

- Enable blowers, Outside air and Exhaust 1 at values established during Test and Balance (TAB) to be design airflow.
- Test Stage 1 heat operation.
 - In the Heat submenu, enable Heat 1.
 - Record amperage on all legs of power when equipped with electric heat.

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- Record heating water GPM if equipped with hydronic heat.
- Allow supply air temperature to stabilize.
- Record return air and supply air temperatures on the startup report within the respective Stage 1 operational data section.
- Test Stage 1 and Stage 2 heat operation.
 - In the Heat submenu, enable Heat 1 and Heat 2.
 - Record amperage on all legs of power when equipped with electric heat.
 - Record heating water GPM if equipped with hydronic heat.
 - Allow supply air temperature to stabilize.
 - Record the return air and supply air temperature on the startup report within the respective Stage 1+ Stage 2 operational data section.
- Remove command for heat by Deselecting Heat 1 and Heat 2 in the Heat submenu.
 - Allow heating element(s) or heat exchanger(s) to cool before stopping main blower.

Verify Modulating Heat Operation

- Enable blowers, Outside air and Exhaust 1 at values established during TAB to be design airflow.
- Test Modulating heat operation.
 - In the Heat submenu, enable Heat 1 and Heat 2.
 - To adjust the heating command, select the number next to Heat 1, then with **(+)** and **(-)** change the value of the modulating signal, press Close.
 - Command the modulating output to 30%.
 - Allow supply air temperature to stabilize.
 - Record the return air and supply air temperature on the start-up report within the respective Heat operational data section.
 - Repeat these steps at 30%, 60% and 100% heating command. Record the supply and return air temperature in the respective heating operational data section on the start-up report.
 - Record amperage for all legs on electric heater or heating water GPM for hydronic heaters at 100% heating command.
 - Record high fire gas pressure at 100% heating command. Low fire command percentage may vary. Reference the heater manufacturers' installation and operation manual(s) for heater start-up procedures.
- Remove command for heat by first commanding the heat output to 0% and then deselecting Heat 1 and Heat 2 in the Heat submenu.



NOTICE: Allow heating element(s) or heat exchanger(s) to cool before stopping main

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blower following heating operational testing.



TIP: When equipped with modulating hot water hydronic heating, the Modulating Heat Analog Output polarity should be set to 10V. The heating valve needs to be configured as normally open (flow through heating coil), power close (bypass heating coil) for freeze protection in case of power loss at the dehumidifier. All other heat types, including gas, electric, and steam hydronic heating should be configured as “OV” Polarity. Steam heating coils will be configured to be normally closed (bypass heating coil), power open (flow through heating coil) and should be equipped with an automatic drain down valve for freeze protection.

Compressor Menu(s)

Start-up process will vary depending on the type of equipment being started - Modular or Unitary, Condenser heat rejection method - OACC, OAFC or, third-party condenser loop. The process will also vary depending on the refrigerant circuit mode control - Staged or, Modulating.

Unitary dehumidifiers will be equipped with a refrigerant to air reheat coil and may be equipped with either an OACC or refrigerant to glycol heat exchanger for AC mode. The heat exchanger may be connected to a factory supplied or a third-party condenser loop. Unitary dehumidifiers may have staged modulating mode control.

Identify AC Mode Heat Rejection Method

All equipment will have modulated head pressure control capabilities. In AC mode, the refrigerant circuit heat rejection is accomplished by use of an OACC, OAFC, or third-party condenser loop.

Modular dehumidifiers will be equipped with an internal modulating bypass valve for partial head pressure control.

There is one analog output for head pressure control (Factory default J8-10). The analog output will be wired to the internal bypass valve on modular equipment, and to the OACC, OAFC, or external modulating bypass valve on unitary equipment. The same analog output should also jump to the OAFC to enable dry contacts (Factory default J10-1) on modular equipment. When in AC mode, the OAFC enable contacts will close (J10-1 to J10-2) thereby allowing the head pressure control analog output to control the fluid cooler fan or external bypass valve in addition to the internal head pressure control valve.

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NOTICE: Fuse FU-5 Must be removed when the OAC enable contacts (J10-1 and J10-2) are used for modulated head pressure control. Failure to do so may result in board, actuator and/or OACC/OAFC fan failure.

OACC

Refrigerant-to-Air condenser with modulated condenser fan for head pressure control. OACC is only available in unitary dehumidifiers. OACC may be a single circuit, or multiple circuits depending on the size and compressor circuits of the dehumidifier.

OAFC

Glycol-to-Air fluid cooler. All current model factory provided OAFC's will be equipped with modulating fluid cooler fans. Previous models were equipped with two stage (High/Low) fluid cooler fans for head pressure control.

Unitary dehumidifiers equipped with an OAFC will have a pump compartment containing the fluid loop pump (sometimes referred to as protocol pump) and flow valves affixed to the OAFC. All OAFC assemblies will be single circuit.

Third-Party Condenser Loop

Fluid cooled units may use a third-party condenser loop with various heat rejection methods for AC mode heat rejection. A unit controlled modulated bypass valve should be field installed for modulated head pressure control.

Protocol Loop

Modular dehumidifiers will have a protocol loop (condenser loop) where the refrigerant circuit(s) will reject heat to. The protocol loop will have modulating valves to divert the glycol to the glycol-to-air reheat coil and/or the glycol-to-air fluid cooler (OAFC) as needed.

When equipped with a pool heating option, the dehumidifier may be equipped with either a refrigerant to water pool coax coil, or a glycol to water pool heat exchanger. All modular dehumidifiers will be modulated mode control.

Verify Protocol/Fluid Loop

(Modular dehumidifiers, and fluid cooled unitary dehumidifiers)

- Record the protocol pump model and serial number respectively as indicated on the start-up report.

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- Record the protocol pump nameplate rated amperage in the respective location on the start-up report.
- In the Comp 1 submenu, select Prot Pump - verify pump starts.
 - Listen for signs of air in the fluid loop. If present, the air will need to be bled out. fluid loop may need to be topped off with glycol.
 - Record protocol loop pump amperage readings for all legs of power on the start-up report.
 - Record both inlet and outlet heat recovery loop pump pressures.
 - To turn of the pump, deselect Prot Pump in the compressor 1 submenu.



TIP: The inlet glycol pressure should read at least 25 PSI and will usually have about 15 PSI differential while the pump is operating. Loop may need to be topped off with glycol if pump inlet pressure is lower while the pump is operating. You may need to sweep the reheat and AC valves on modular equipment to force all air out of the system.

Head Pressure Control

- Record model and serial numbers for OACC/OAFC motors as indicated on the start-up report.
- Record the OACC/OAFC motor nameplate rated amperage on the start-up report.
- Obtain data from the motor nameplate, NOT the equipment nameplate.

Verify Internal Bypass Valve Operation

Observe internal bypass valve position (modular dehumidifiers only)

- In the Comp 1 or OAC submenu, press the number displayed next to OAC. With **(+)** and **(-)** change the value of the modulating signal to 100%, then press Close.
 - Observe the internal bypass valve operation, ensure full unimpeded rotation of the valve.
 - To return the valve to the fully bypass position, command the modulating signal to 0%

Verify External Bypass Valve Operation

Observe external bypass valve position (when connected to third-party condenser loop only)

- In the Comp 1 or OAC submenu, press OAC to enable to enable to OAC.
- In the Comp 1 or OAC submenu, press the number displayed next to OAC. With **(+)** and **(-)** change the value of the modulating signal to 100%, then press Close.
- Observe the external bypass valve operation, ensure full unimpeded rotation of the valve.

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- To return the valve to the fully bypass position, command the modulating signal to 0%

Observe OACC/OAFC Fan Operation

- Record the OACC/OAFC voltage between all legs of power in the respective location on the start-up report.
- In the Comp 1 or OAC submenu, press OAC to enable to enable to OAC (Modular Dehumidifiers).
- In the Comp 1 or OAC submenu, press the number displayed next to OAC. With **(+)** and **(-)** change the value of the modulating signal to 100%, then press Close.
- Observe OACC/OAFC fan operation for correct rotation, abnormal vibration and/or abnormal noise.
- Test amperage on all legs of power for each OACC/OAFC fan and record in the Start-up Report
- Stop OACC/OAFC fan by selecting the number displayed next to OACC/OAFC, press Reset then Close. Deselect OAC.



TIP: The head pressure control must be manually commanded in service mode during the start-up process. Use the OAC enable and OAC modulated head pressure command to maintain 385PSI +/- 15PSI of head pressure in all modes of compressor operation.

Evaporator Bypass Damper

All dehumidifiers will be equipped with evaporator bypass damper(s). The damper(s) will be mounted next to the evaporator coil(s) and is actuator controlled.

Verify Evaporator Bypass Damper Operation

- In the Comp 1 submenu, select Bypass Close
 - Visually inspect the damper(s) to ensure they freely and fully move to the closed position.
 - Deselect Bypass close once damper operation is confirmed.
- In the Comp 1 submenu, select Bypass Open
 - Visually inspect the damper(s) to ensure they freely and fully move to the open position.
 - Deselect Bypass Open once damper operation is confirmed.



TIP: The bypass damper is used to maintain suction pressure of 119 PSI +/- 5 PSI. The damper must be manually commanded in service mode during the start-up testing process by selecting the Bypass Open command to reduce suction pressure and Bypass Close command to increase suction pressure. The damper will move in the direction commanded (Open or Close)

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when the respective command is engaged. The damper will stop in place when both bypass open and bypass close are deselected. You must disengage command for open or close before commanding the other direction.

Identify Compressor Mode Control Type

Compressor Circuit operation will vary slightly depending on the type of equipment (Modular or Unitary), the type of mode control equipped (Staged or modulating), and the options equipped (Pool water heating or no Pool water heating).

Protocol Loop (Modular Dehumidifiers)

Modular equipment will contain a protocol loop (fluid loop) where all refrigerant circuit heat is rejected to. The heat is then rejected from the protocol loop through a glycol-to-air reheat coil, and a glycol-to-air OAFC coil (fluid cooler) or a third-party condenser loop. Flow to the reheat coil and OAFC or third-party condenser loop is controlled by internal modulating actuators acting opposite of each other. Modular dehumidifiers may be equipped with a solenoid-controlled refrigerant to pool water coax coil, or glycol to pool water flat plate heat exchanger for pool water heating.

Staged Mode Control (Unitary Dehumidifiers)

Unitary equipment may be equipped with staged (solenoid) mode control. Staged control will have one solenoid per mode of operation to control flow through each high side coil (reheat coil, AC/condenser coil, pool heat coil). All modes in staged equipment are either on or off.

Modulated (Unitary Dehumidifiers)

Modulated units may have one or two actuated, modulating refrigerant valves to modulate the amount of refrigerant fed to each high side coil (Reheat, AC/Condenser, and Pool Heat). When not equipped with pool heating, there will be one modulating valve in the discharge line diverting refrigerant to the reheat coil and/or AC (condenser) coil.

When equipped with pool heating or pool heat ready options, there will be two modulating valves in the discharge line. The first valve closest to the compressor will be the reheat valve. It will receive discharge gas from the compressor and divert it to the reheat coil and/or the inlet of the second valve. The second valve is the Pool heat valve. It receives hot gas from the reheat valve and diverts it to the pool coax or AC (Condenser) coil.

Prepare For Compressor Circuit Operation

All compressor circuit operational data should ideally be recorded with space conditions as close to design conditions as possible and NOT below 78 deg Fahrenheit return air

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temperature and 45% return air Relative Humidity. Supply, Exhaust and Outside airflow must be set to design CFM during all compressor circuit operational verification processes. Failure to maintain design airflow may result in inaccurate operational adjustments and data recorded will not reflect real time normal operational data.

- Verify all service valves and solenoid valve stems are in the fully back seated position (fully counterclockwise) and all refrigerant ball valves are open.
- Verify TXV sensing bulb(s) are tightly secured and well insulated.
- Verify all equipment doors are on/closed.
- Verify field charge has been added for the field installed lineset and condenser.
- Verify Blower, Exhaust and Outside Air are on/enabled, and unit is moving design airflow.
- Natatorium doors should be closed.
- Pool flow established to the dehumidifier and pool water is at least 75 deg.
- The Natatorium is heated ideally to design conditions but NOT below 78 deg (except where design conditions are less than 78 deg).
- All previous operational verifications have been completed.



TIP: Supplemental heating and/or cooling may be used during start-up to maintain natatorium conditions during testing. In some cases, it is helpful to enable the unit heater when waiting for the compressor circuit(s) to stabilize in AC and/or partial modes when testing in low ambient load conditions. When doing so, after the compressor circuit has stabilized, you must disable space heating and wait for the supply air temperature to stabilize before recording operational data.



TIP: When the Natatorium is under low humidity conditions, wetting the pool deck and/or enabling pool water features may help to increase humidity load for equipment testing.

Verify Compressor Circuit Operation (Protocol Dehumidifiers)

The protocol pump must be enabled before the compressor(s) are energized. The pumpdown solenoid should always be used to shut off the compressors. Deenergize the pumpdown solenoid and the compressor will shut off when the suction pressure drops below 75PSI.

When equipped with pool water heating, the pool water temperature rise should be 10-20 Deg Fahrenheit in pool heating modes.

- Record model and serial numbers for compressor(s) respectively as indicated on the start-

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up report.

- Record the compressor(s) nameplate rated amperage on the start-up report.
- Obtain data from the compressor nameplate, NOT the equipment nameplate.



TIP: Field refrigerant trim charge may need to be added during start-up. Refrigerant charge adjustments are a normal requirement during the start-up processes and not necessarily an indication of a refrigerant leak.

Reheat Mode Operation

Record compressor operational data with all compressors energized.

- Ensure pool water flow is established (When equipped with pool water heating)
- In Comp 1 submenu, select Reheat +.
 - Verify the reheat valve is in the 100% open position, and the AC valve is in the 0% open position.
- In the comp 1 submenu, select Prot Pump.
- In Comp 1 submenu, select Pump Down.
- Once the suction pressure has risen to approximately 120PSI, press CC (Compressor Contactor). The compressor should now start.
- Observe refrigerant pressures and operation for abnormal noises, vibration, and monitor oil level.
 - Modulate evaporator bypass damper and OAC control accordingly to maintain 120PSI +/- 5PSI suction pressure, and 385PSI +/- 15PSI discharge pressure.
 - Allow the refrigerant circuit to stabilize for 10-15 minutes.
- Verify the liquid line sight glass is clear with a full column of liquid.
- Verify the superheat is maintained between 15-25 deg Fahrenheit, adjust TXV as needed.
- Record compressor amperage from all three legs of power.
- Repeat the above steps for all compressor(s).
- Record all noted data in the Reheat operational data column on the start-up report with all compressors operating.

AC Mode Operation

Record all compressor operational data with all compressors energized.

- Reengage compressors as indicated under Reheat mode operation if not still operating.
- In the Comp 1 submenu, deselect Reheat +, and Select Reheat -.
 - Verify reheat level modulates to 0% open and AC valve modulates to 100% open.
- Observe refrigerant pressures and operation for abnormal noises, vibration, and

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monitor oil level.

- Modulate evaporator bypass damper and OAC enable command and OACC fan speed control accordingly to maintain 120PSI +/- 5PSI suction, and 385PSI +/- 15 discharge pressure.
- Allow the system to stabilize for 10-15 minutes.
- Verify the liquid line sight glass is clear with a full column of liquid.
- Verify compressor superheat is maintained between 15-25 deg Fahrenheit, adjust TXV as needed.
- Repeat the above steps for all compressor(s).
- Record all noted data in the AC mode operational data column on the start-up report with all compressors operating.

50/50 Mode Operation

Record all compressor operational data with all compressors energized.

- Reengage compressors as indicated under Reheat mode operation if not still operating.
- In the Comp 1 submenu, using the Reheat+ and/or Reheat- selections, command to 50% reheat. Deselect both Reheat + and Reheat- to stop valves from moving.
 - Verify reheat level modulates to 50% and both the AC and Reheat valve modulates to 50% open.
- Observe refrigerant pressures and operation for abnormal noises, vibration, and monitor oil level.
 - Modulate evaporator bypass damper and OAC enable command and OAFV fan speed control accordingly to maintain 120PSI +/- 5PSI suction, and 385PSI +/- 15 discharge pressure.
 - Allow the system to stabilize for 10-15 minutes.
- Verify the liquid line sight glass is clear with a full column of liquid.
- Verify compressor superheat is maintained between 15-25 deg Fahrenheit, adjust TXV as needed.
- Repeat the above steps for all compressor(s).
- Record all noted data in the 50/50 operational data column on the startup report with all compressors operating.

Reheat + Pool Heat Operational Verification

Record compressor operational data with all compressors engaged.

- Reengage compressors as indicated under Reheat mode operation if not still operating.
- In the Comp 1 submenu, select Reheat +.
 - Verify the reheat valve is in the 100% open position, and the AC valve is in the 0%

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open position.

- In the Heat submenu, select Pool Heat 1 and Pool Heat 2 (solenoid-controlled pool heat), or Pool 1 +, and Pool 2 + (modulating controlled pool heat).
 - Verify pool heating solenoid(s) open (solenoid controlled).
 - Verify pool heating actuator moves to 100% (modulating control).
- Observe refrigerant pressures and operation for abnormal noises, vibration, and monitor oil level.
 - Modulate evaporator bypass damper accordingly to maintain 120PSI +/- 5PSI suction pressure.
 - Allow the refrigerant circuit to stabilize for 10-15 minutes.
- Verify the liquid line sight glass is clear with a full column of liquid.
- Verify the superheat is maintained between 15-25 deg Fahrenheit, adjust TXV as needed.
- Record compressor amperage from all three legs of power.
- Repeat the above steps for all compressor(s).
- Record all noted data in the Reheat + Pool Heat operational data column on the start-up report with all compressors operating.

AC + Pool Heat Operational Verification

Record compressor operational data with all compressors engaged.

- Reengage compressors as indicated under Reheat mode operation if not still operating.
- In the Comp 1 submenu, select Reheat -
 - Verify the reheat valve is in the 0% open position, and the AC valve is in the 100% open position.
- In the Heat submenu, select Pool Heat 1 and Pool Heat 2 (Solenoid controlled pool heat), or Pool 1 +, and Pool 2 + (Modulating controlled pool heat)
 - Verify pool heating solenoid(s) open (Solenoid controlled).
 - Verify pool heating actuator moves to 100% (Modulating control)
- Observe refrigerant pressures and operation for abnormal noises, vibration, and monitor oil level.
 - Modulate evaporator bypass damper and OAC enable command and OAC fan speed control accordingly to maintain 120PSI +/- 5PSI suction, and 385PSI +/- 15 discharge pressure.
 - Allow the refrigerant circuit to stabilize for 10-15 minutes.
- Verify the liquid line sight glass is clear with a full column of liquid.
- Verify the superheat is maintained between 15-25 deg Fahrenheit, adjust TXV as needed.
- Record compressor amperage from all three legs of power.

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- Repeat the above steps for all compressor(s).
- Record all noted data in the AC + Pool Heat operational data column on the start-up report with all compressors operating.

Verify Compressor Circuit Operation (Unitary Dehumidifiers- Staged Control)

The Fluid loop/Protocol loop pump must be engaged before compressor operation for fluid cooled dehumidifiers. The pumpdown solenoid should always be used to shut off the compressors. Deenergize the pumpdown solenoid and the compressor will shut off when the suction pressure drops below 75PSI.

When equipped with pool water heating, the pool water temperature rise should be 10-20 Deg Fahrenheit in pool heating modes.

- Record model and serial numbers for compressor(s) respectively as indicated on the start-up report.
- Record the compressor(s) nameplate rated amperage on the start-up report.
 - Obtain data from the compressor nameplate, NOT the equipment nameplate.



TIP: Field refrigerant trim charge may need to be added during start-up. Refrigerant charge adjustments are a normal requirement during the start-up processes and not necessarily an indication of a refrigerant leak.



TIP: Liquid refrigerant will migrate to the components not being utilized during extended runtime and during low ambient operation. Ensuring pool water flow and enabling OACC/OAFC operation while testing in modes not normally requiring pool water flow and/or OACC/OAFC operation will decrease the time in which liquid migration occurs, thereby improving the refrigerant charge verification accuracy during start-up.



TIP: Completing Test and Balance (TAB) prior to equipment start-up is the only fully accurate method to ensure proper design airflow and TAB should be completed on all equipment. However, if TAB has not been completed, open the Outside Air to approximately ¼" and adjust exhaust speed to maintain a slight negative pressure in the natatorium. Begin testing with the blower speed at 80% on all unitary equipment. Adjust blower speed until you can maintain 120PSI suction pressure with use of the evaporator bypass damper, with the head pressure at 385PSI +/-15PSI in AC mode. If the suction pressure is too low, this may indicate low airflow. If the suction pressure is too high, this may indicate high airflow. All

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testing is assuming proper refrigerant charge and must be completed with the space conditions as close to design conditions as possible.

Reheat Mode Operation

Record compressor operational data with all compressors operating.

- Ensure pool water flow is established (when equipped with pool water heating)
- In the comp 1 or OAC submenu, enable the OACC/OAFC fan to 100%
 - In the Comp 1 submenu, select Prot Pump (when equipped with OAFC)
- In the comp 1 submenu, Select Reheat and Pump down.
- Once the suction pressure has risen to approximately 120PSI, Press CC (Compressor Contactor). The compressor should now start.
 - Observe refrigerant pressures and compressor operation for abnormal noises or vibration.
 - Modulate evaporator bypass damper to maintain 120PSI +/- 5PSI suction pressure.
 - Allow the system to stabilize for 10-15 minutes.
- Verify the liquid line sight glass is clear with a full column of liquid.
- Verify the superheat is maintained between 15-25 deg Fahrenheit, adjust TXV as needed.
- Record compressor amperage from all three legs of power.
 - Record amperage of all three legs even when single phase.
- Repeat the above steps for all compressor(s).
- Record all noted data in the Reheat operational data column on the start-up report with all compressors operating.

AC Mode Operation

Record compressor operational data with all compressors operating.

- Reengage compressors as indicated under Reheat mode operation if not still operating.
- In the Comp 1 submenu, enable AC and then disable Reheat.
 - Observe refrigerant pressures and operation for abnormal noises, vibration. Monitor oil levels where applicable.
 - Modulate evaporator bypass damper to maintain 120PSI +/- 5PSI suction pressure.
 - Allow the system to stabilize for 10-15 minutes.
- Verify the liquid line sight glass is clear with a full column of liquid.
- Verify compressor superheat is maintained between 15-25 deg Fahrenheit, adjust TXV as needed.
- Repeat the above steps for all compressor(s).
- Record all noted data in the AC operational data column on the startup report with all

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compressors operating.

Reheat + Pool Heat Operational Verification

Record compressor operational data with all compressors operating.

- Reengage compressor(s) as indicated under Reheat mode operation if not still operating.
 - In the comp 1 or OAC submenu, enable the OACC/OAFC fan to 100%
- In the Comp 1 submenu, Enable Reheat and Disable AC.
- In the heat submenu, select Pool Heat 1 and Pool Heat 2
 - Verify pool heating solenoid(s) open.
 - Observe refrigerant pressures and operation for abnormal noises, vibration, and monitor oil level.
 - Modulate evaporator bypass damper to maintain 120PSI +/- 5PSI suction pressure.
 - Allow the system to stabilize for 10-15 minutes.
- Verify the liquid line sight glass is clear with a full column of liquid.
- Verify compressor superheat is maintained between 15-25 deg Fahrenheit, adjust TXV as needed.
- Repeat the above steps for all compressor(s).
- Record all noted data in the Reheat + AC operational data column on the start-up report with all compressors operating.

AC + Pool Heat Mode Operation

Record compressor operational data with all compressors operating.

- Reengage compressors as indicated under Reheat mode operation if not still operating.
- In the Comp 1 submenu, enable both Reheat and AC
 - Observe refrigerant pressures and operation for abnormal noises, vibration, and monitor oil level.
 - Modulate evaporator bypass damper and OACC fan speed control accordingly to maintain 120PSI +/- 5PSI suction, and 385PSI +/- 15 discharge pressure.
 - Allow the system to stabilize for 10-15 minutes.
- Verify the liquid line sight glass is clear with a full column of liquid.
- Verify compressor superheat is maintained between 15-25 deg Fahrenheit, adjust TXV as needed.
- Repeat the above steps for all compressor(s).
- Record all noted data in the AC + Pool Heat operational data column on the start-up report with all compressors operating.
- To disengage compressor(s), deselect Pumpdown for heat compressor. Compressor(s)

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will disengage once suction pressure has dropped below 75PSI.

Verify Compressor Circuit Operation (Unitary Dehumidifiers- Modulating Control)

The Fluid loop/Protocol loop pump must be engaged before compressor operation for fluid cooled dehumidifiers. The pumpdown solenoid should always be used to shut off the compressors. Deenergize the pumpdown solenoid and the compressor will shut off when the suction pressure drops below 75PSI.

When equipped with pool water heating, the pool water temperature rise should be 10-20 Deg Fahrenheit in pool heating modes.

- Record model and serial numbers for compressor(s) respectively as indicated on the start-up report.
- Record the compressor(s) nameplate rated amperage on the start-up report.
 - Obtain data from the compressor nameplate, NOT the equipment nameplate.



TIP: Field refrigerant trim charge may need to be added during start-up. Refrigerant charge adjustments are a normal requirement during the start-up processes and not necessarily an indication of a refrigerant leak.



TIP: Liquid refrigerant will migrate to the components not being utilized during extended runtime and during low ambient operation. Ensuring pool water flow and enabling OACC/OAFC operation while testing in modes not normally requiring pool water flow and/or OACC/OAFC operation will decrease the time in which liquid migration occurs, thereby improving the refrigerant charge verification accuracy during start-up.



TIP: Completing Test and Balance (TAB) prior to equipment start-up is the only fully accurate method to ensure proper design airflow and TAB should be completed on all equipment. However, if TAB has not been completed, open the outside air to approximately ¼" and adjust exhaust speed to maintain a slight negative pressure in the natatorium. Begin testing with the blower speed at 80% on all unitary equipment. Adjust blower speed until you can maintain 120PSI suction pressure with use of the evaporator bypass damper, with the head pressure at 385PSI +/-15PSI in AC mode. If the suction pressure is too low, this may indicate low airflow. If the suction pressure is too high, this may indicate high airflow. All testing is assuming proper refrigerant charge and must be completed with the space conditions as close to design conditions as possible.

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Reheat Mode Operation

Record compressor operational data with all compressors operating.

- Ensure pool water flow is established (when equipped with pool water heating)
- In the Comp 1 or OAC submenu, enable the OACC/OAFC fan to 100%
 - In the Comp 1 submenu, select Prot Pump (when equipped with OAFC)
- In the Comp 1 submenu, select Reheat+ and Pumpdown.
 - Verify the reheat valve moves in the correct direction and is in the 100% reheat position.
- Once the suction pressure has risen to approximately 120PSI, Press CC (Compressor Contactor). The compressor should now start.
 - Observe refrigerant pressures and compressor operation for abnormal noises or vibration.
 - Modulate evaporator bypass damper to maintain 120PSI +/- 5PSI suction pressure.
 - Allow the system to stabilize for 10-15 minutes.
- Verify the liquid line sight glass is clear with a full column of liquid.
- Verify the superheat is maintained between 15-25 deg Fahrenheit, adjust TXV as needed.
- Record compressor amperage from all three legs of power.
 - Record amperage of all three legs even when single phase.
- Repeat the above steps for all compressor(s).
- Record all noted data in the Reheat operational data column on the startup report with all compressors operating.

AC Mode Operation

Record compressor operational data with all compressors operating.

- Reengage compressors as indicated under Reheat mode operation if not still operating.
- In the Heat submenu, enable Pool- and ensure Pool+ is disabled.
 - Verify the pool heat valve moves in the correct direction and is in the 100% AC position (0% Pool Heat).
- In the Comp submenu, disable Reheat+ and Enable Reheat-.
 - Confirm the reheat valve moves in the correct direction and is in the 0% Reheat position.
 - Observe refrigerant pressures and operation for abnormal noises, vibration. Monitor oil levels where applicable.
 - Modulate evaporator bypass damper and OACC fan speed control accordingly to maintain 120PSI +/- 5PSI suction, and 385PSI +/- 15PSI discharge pressure.
 - Allow the system to stabilize for 10-15 minutes.

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- Verify the liquid line sight glass is clear with a full column of liquid.
- Verify compressor superheat is maintained between 15-25 deg Fahrenheit, adjust TXV as needed.
- Repeat the above steps for all compressor(s).
- Record all noted data in the AC operational data column on the start-up report with all compressors operating.

Reheat + AC Mode Operation

Record compressor operational data with all compressors operating.

- Reengage compressors as indicated under Reheat mode operation if not still operating.
- In the Heat submenu, enable Pool- and ensure Pool+ is disabled.
 - Verify the pool heat valve moves in the correct direction and is in the 100% AC position (0% Pool Heat).
- In the Comp submenu, disable Reheat- and Enable Reheat+, Disable Reheat+ when reheat level is at 50%
 - Confirm the reheat valve moves in the correct direction and is in the 50% Reheat position.
 - Observe refrigerant pressures and operation for abnormal noises, vibration. Monitor oil levels where applicable.
 - Modulate evaporator bypass damper and OACC fan speed control accordingly to maintain 120PSI +/- 5PSI suction, and 385PSI +/- 15PSI discharge pressure.
 - Allow the system to stabilize for 10-15 minutes.
- Verify the liquid line sight glass is clear with a full column of liquid.
- Verify compressor superheat is maintained between 15-25 deg Fahrenheit, adjust TXV as needed.
- Repeat the above steps for all compressor(s).
- Record all noted data in the Reheat + AC operational data column on the start-up report with all compressors operating.

Reheat + Pool Heat Operational Verification

Record compressor operational data with all compressors operating.

- Reengage compressors as indicated under Reheat mode operation if not still operating.
- Enable OACC to 100%.
- In the Heat submenu, enable Pool+ and ensure Pool- is disabled.
 - Verify the pool heat valve moves in the correct direction and is in the 100% Pool heat position.
- In the Comp submenu, use the Reheat+ and Reheat- commands to move the reheat

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valve to the 50% position.

- Confirm the reheat valve moves in the correct direction and is in the 50% Reheat position.
- Once in the 50% position, deselect both Reheat+ and Reheat- to maintain current reheat level.
- Observe refrigerant pressures and operation for abnormal noises, vibration. Monitor oil levels where applicable.
- Modulate evaporator bypass damper accordingly to maintain 120PSI +/- 5PSI suction.
- Allow the system to stabilize for 10-15 minutes.
- Verify the liquid line sight glass is clear with a full column of liquid.
- Verify compressor superheat is maintained between 15-25 deg Fahrenheit, adjust TXV as needed.
- Repeat the above steps for all compressor(s).
- Record all noted data in the Reheat + Pool Heat operational data column on the start-up report with all compressors operating.

AC + Pool Heat Operational Verification

Record compressor operational data with all compressors operating.

- Reengage compressors as indicated under Reheat mode operation if not still operating.
- In the Heat submenu, use the Pool- and Pool+ commands to obtain 50% Pool heat command.
 - Verify the pool heat valve moves in the correct direction and is in the 50% Pool Heat position.
 - Deselect both Pool- and Pool+ to maintain current pool heat level.
- In the Comp submenu, disable Reheat+ and Enable Reheat-
 - Confirm the reheat valve moves in the correct direction and is in the 0% Reheat position.
 - Observe refrigerant pressures and operation for abnormal noises, vibration. Monitor oil levels where applicable.
 - Modulate evaporator bypass damper and OACC fan speed control accordingly to maintain 120PSI +/- 5PSI suction, and 385PSI +/- 15PSI discharge pressure.
 - Allow the system to stabilize for 10-15 minutes.
- Verify the liquid line sight glass is clear with a full column of liquid.
- Verify compressor superheat is maintained between 15-25 deg Fahrenheit, adjust TXV as needed.
- Repeat the above steps for all compressor(s).
- Record all noted data in the AC operational data column on the start-up report with all

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compressors operating.

- To disengage compressor(s), deselect Pumpdown for heat compressor. Compressor(s) will disengage once suction pressure has dropped below 75PSI.

Normal Mode Operation

Following the completion of all operational verification, disengage manual operation of all compressors, blowers, exhaust, heat, and outside air.

Commissioning the unit and Switching to Normal Mode Operation

Enable all components and place the dehumidifier in Normal Mode.

- Verify unit setpoints.
 - Select User, Setpoints, adjust air temperature, humidity, and pool water temperature setpoints to match design conditions.
 - Record setpoints on the startup report.
- Set Date and Time
 - Select User, Date & Time, correct date, time, and time zone.
- Enable Compressor(s)
 - Select Advanced, Compressors, Options, Compressors Enabled, Change to Yes.
- Close unit
 - Install all service port and service valve caps, ensure all drains are free and clear of obstruction or valved off and capped (glycol fill and drain valves) where appropriate.
 - Install all doors, covers, panels.
 - Adjust latches as needed to ensure a tight seal where applicable.
- Commission Unit
 - Select Advanced, Service, Commission, Commissioned, change to Yes.
 - HMI will restart and provide the option of Service Mode or Normal mode. select Normal Mode.
 - Following the initial delay, blowers will start, and normal operation will commence.
- Observe normal mode operation.
 - It is advisable to monitor normal mode operation for a short period onsite.
 - It is advisable to monitor the unit operation via WebSentry for a few weeks following start-up. Some minor configuration and/or operational adjustments may be needed to ensure optimal operation as applications vary.

System Backup

After completing all configuration changes and the unit startup, complete a system backup. A system backup will store configuration changes onto the SD card when completed at the touchscreen, or to the WebSentry server when completed on WebSentry.

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System backup will help in the event of unwanted configuration changes, or in the event of a board failure.

- Select Advanced, Tools, System Backup, Backup.
 - The backup file will appear in the column on the left. The format will be the date reflected as YYYYMMDD.BAK
- To restore a backup file, highlight the desired file and select Restore.



TIP: Pool water temperature should usually be set 2 Deg Fahrenheit below the air temperature unless system capacity is sized to manage the additional load. Pool water evaporation will increase as the pool water temperature exceeds the room temperature, resulting in additional humidity load.

Register Equipment Warranties

Following the completion of all startup tasks outlined within this document, start-up has been completed. Ensure all documentation is fully and digitally completed and all required site pictures have been taken. Email the dehumidifier start-up report, site pictures as well as the heater start-up report (where applicable) to Warranty@dehumidifiedairservices.com.

The start-up report will be reviewed for verification. If any issues are identified, DASV will advise, and revisions may be needed. Equipment warranties are registered upon the receipt of an approved start-up report. Warranty certificates may be provided upon request.