



[Seresco: (pronounced sir-s-ko) meaning “to become dry”]

Installation, Operation and Maintenance Manual

OA Series Dehumidifiers

Models: OA-016 to 024-NH/V/M/N-I



CAUTION

ONLY TRAINED, QUALIFIED PERSONNEL SHOULD INSTALL AND/OR SERVICE SERESCO EQUIPMENT. SERIOUS INJURY AND PROPERTY DAMAGE CAN RESULT FROM IMPROPER INSTALLATION/SERVICE OF THIS EQUIPMENT. HIGH VOLTAGE ELECTRICAL COMPONENTS AND REFRIGERANT UNDER PRESSURE ARE PRESENT

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OA Series Features

1 - Air Filters. The standard filter is a 2" pleated 30% efficient filter. 4" 95% filters are available on certain models. Access to the filters is through a service access door.

2 – Evaporator. The coil is corrosion protected to ensure a long lifespan and designed to ensure premium dehumidification performance. It is also recessed into the cabinet allowing these units to perform even if the duct connection is less than perfect.

3 - Drain Pan. The drain pan has compound slopes to ensure zero water retention.

4 - Reheat Coil. This corrosion protected condenser coil is capable of rejecting 100% of compressor heat to the air stream.

5 - Blower. Plug fans are standard on all units. The backward inclined airfoil blower wheel provides high static pressure with low motor power. This feature helps ensure the OA unit will perform to specifications even if the duct connections to the unit or if the overall duct installation is less than ideal.

6 - Direct driven blowers. No belts to adjust or maintain! The OA Series uses Inverter Spike Resistant direct driven blower motors. This blower drive design simplifies unit maintenance and delivers the air more efficiently.

7 - Compressors. The OA Series is equipped with robust high-efficiency scroll compressors. Compressor pumpdown and a crankcase heater offer redundant protection against refrigerant flood back. Suction line temperature and compressor discharge temperature is also monitored for increased security and can be verified on WebSentry®.

8 - Electrical Panel. All electrical components and connections are inside this panel.

9 - Receiver. The receivers have two sight glasses. This facilitates the system charging process

10 - Cabinet. Seresco has taken all possible commercially feasible precautions to protect the OA Series units against corrosion. The sheet metal is galvanized automotive grade G-90 with both sides painted.

11 - Refrigerant Pressure transducers. These allow the user or serviceman to access the vital information of refrigerant pressures through the operator panel of the microprocessor rather than having to connect a set of refrigerant manifold gauges. This is the most important operation and diagnostic data for any refrigeration system.

12 – WebSentry®. Allows owners, operators or service companies to remotely gain access to their Seresco dehumidifier via the Internet, and are monitored 24/7 by the factory. Units can even be monitored on your mobile phone! The facility owner, especially those in remote locations will have a much more affordable means of ensuring their units are monitored and serviced by experienced factory trained service companies.

13 - CommandCenter® microprocessor. Seresco systems have a multitude of unit-mounted sensors including refrigerant pressure. The service technician can access all necessary information regarding unit operation and performance from their remote computer or mobile phone.

14 - Field Adjustable Dew Point. Typically, the design engineer dictates dew points but field adjustment is now possible with the OA Series! As a result of the flexibility to adjust supply CFM on site, the supply dew point can be set from 47-55F for sizes up to 13HP, and as low as 40F for the larger units. The operator now has the ability to fine-tune the supply dew point on site.

OA Series Features

15 - One side access Design. There is always one side of a Seresco unit that does not require service access. This allows the designer the flexibility when laying out the mechanical room, and provides the unit with a compact footprint.

16 - Service Vestibule. Compressors and virtually all refrigeration components are out of the process air stream. By keeping hot components out of the conditioned air stream maximum air conditioning efficiencies are maintained. Refrigeration service is simplified with easy access to these components.

17 - Quality Cabinet Design. An ultra corrosion resistant cabinet with 2 coats of mill applied silicone modified polyester paint is applied to both sides of all G90 galvanized steel used on a Seresco unit. The cabinet is assembled with stainless steel fasteners. All units have a double walled floor and roof. All outdoor models are fully 2" double walled.

18 - Voltage Monitor. Provides protection against unstable voltage.

Installation

Uncrating and Inspecting

Seresco inspects and fully tests each dehumidifier in all operating modes before it ships from the factory. The unit can suffer damage in transit. Check the equipment thoroughly for both visible and concealed damage before you sign the receiving papers. Document any damage in writing on the carrier's bill of lading to ensure that damage claims are handled promptly. If the unit has been damaged, obtain a claim form from the carrier. Promptly fill out and return the form, and notify Seresco of any damage.

Damage claims or missing parts must be filed with the freight carrier.

Mounting and Service Clearance

The OA Series dehumidifier continuously removes a significant amount of moisture from the room air. Condensate lines and pool water circuits can leak.

Do not install the unit in a location where a water leak will cause damage.

- The mechanical room where the unit is installed should have a floor drain.
- If there is no floor drain, a secondary pan with a drain or condensate pump should be installed under the entire unit. (as is done with a residential washing machine)
- Do not store pool chemicals in the same room as the dehumidifier.

Install the unit on an appropriate mounting base or a platform. Install industry standard components that prevent vibration and sound transmission. Never install the dehumidifier on a wooden platform that can resonate. Do not install the unit near occupied rooms such as bedrooms. Never suspend from the floor joists of an occupied room above the mechanical room. Never locate the unit above a swimming pool or a spa water surface.

- Figures 1 and 2 illustrate typical unit mounting configurations.
- Ensure the support structure will not interfere with the operation of or access to unit.
- No Access = no service or maintenance.

All OA series units have been designed to require only two sides access.

Looking into the return duct connection allow a minimum of 36 inches of clearance on the right side and opposite end of the OA series dehumidifier for piping, duct connections, and service access.

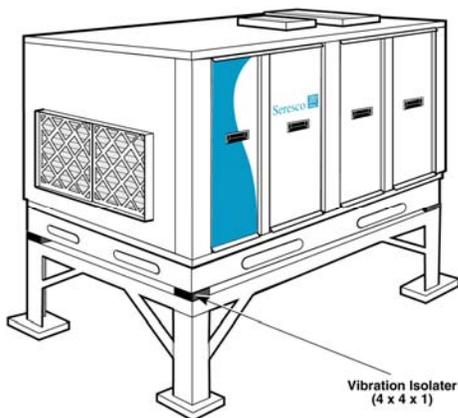


Figure 1 – Typical Floor Installation

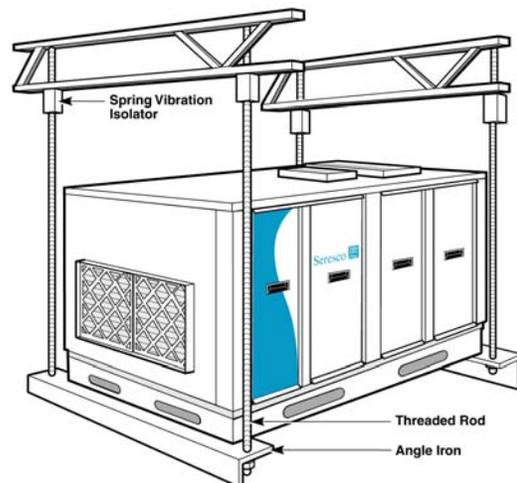


Figure 2 – Typical Suspended Installation

Installation

DO NOT install a standard indoor dehumidifier in an unconditioned space or where ambient temperatures can fall below 45°F or climb above 90°F. If such a space is being considered, Seresco offers outdoor-rated dehumidifiers with weatherproofing and thicker insulation.

High Voltage Electrical Connections

The installing contractor must ensure that all electrical wiring satisfies all National, State and Local codes.

Wire and Fuse Sizing

The field-installed power supply wires and over current devices must be sized to handle the minimum ampacity of the dehumidifier without exceeding the maximum fuse size rating. Both the MCA and MOP are indicated on the unit nameplate.

Improper wiring to the dehumidifier could create the possibility of shock and may lead to system failure.

Line Voltage Connections

Figure 3 shows typical power wiring connections. Single-phase units power supply must have 3 wires (2 power, 1 ground). On three phase units the power supply must have 4 wires (3 power, 1 ground). Connect the power supply wires to the main power block located inside the electrical panel.

Always check the nameplate voltage before connecting to the unit.

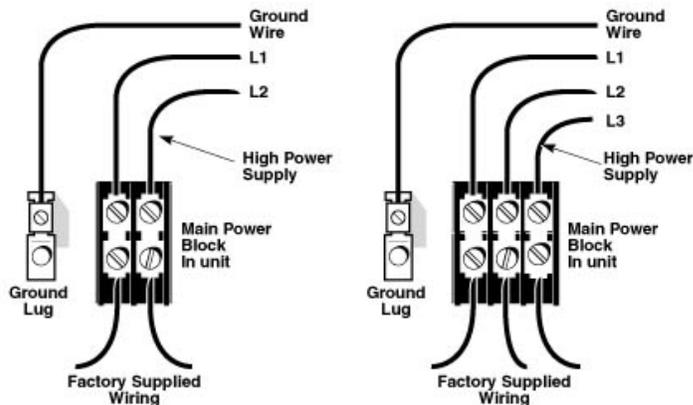


Figure 3 – Power Wire Connection

Control Wiring

The OA Series dehumidifiers have all necessary sensors unit mounted and set points pre-programmed at the factory. Remote duct heaters, outdoor air-cooled condensers, auxiliary pool water heaters and remote exhaust fans all require interfacing with the dehumidifier. The microprocessor has been programmed to control their operation. Figure 4 illustrates how an Ethernet connection to the Internet allows all functions to be monitored by trained professionals with Seresco's Websentry. It is the final step to ensure the facility operates trouble free.

Installation

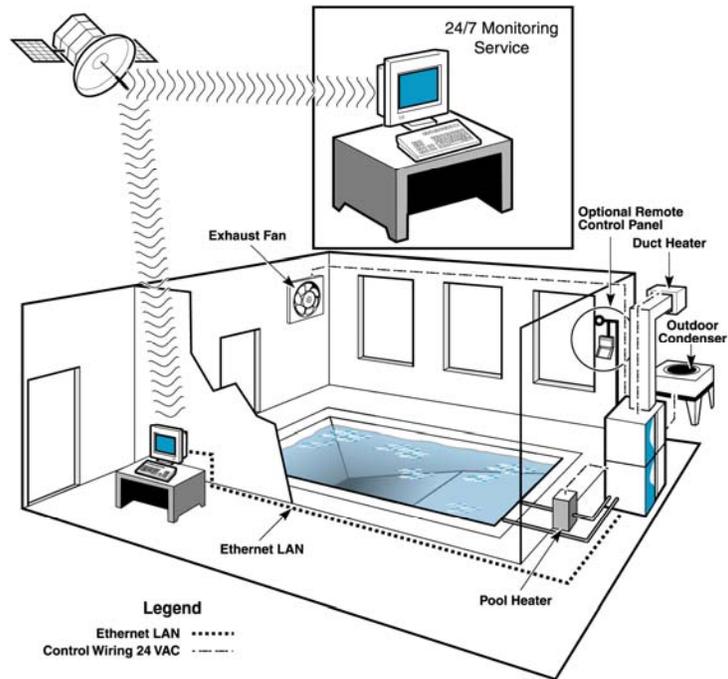


Figure 4 Control Wiring

Controller, Programming and Sensors

The OA Series Command Center is the brains behind the OA Series Dehumidification System. The Command Center is composed of a microcontroller system, an LCD display and keypad, an Ethernet interface, and WebSentry – a web browser based remote interface tool for monitoring and controlling OA Series systems from anywhere in the world via the internet

CommandCenter Operation

Startup Screens

When the unit start up you will see the following menu screen. A 60 second timer is started and if no selection is made before timer expires, Normal Mode will automatically be selected.

1. Normal Mode
2. Service Mode

Selecting Normal Mode will take you to the main sensor screen. If the voltage monitor fault signal is not active, blower will start right away. If voltage monitor fault signal is active, 60 second timer will continue running. When timer expires, the voltage monitor fault signal will be checked again. If signal now is cleared, the blower will start, otherwise blower will remain off and there will be a voltage monitor fault alarm.

Navigation Mode and Edit Mode

The menu system implements two different modes where the keys have different meanings. Navigation mode is used to navigate the menu system and Edit mode is used when changing data.

The following keys are used in Navigation mode:

- Keys 1-3 (and 4-6) are used to select a menu item. If there are more than 6 menu items, menu items will be listed 1-3 on every screen.
- Up and Down arrows are used to scroll up or down a page. Arrows at the top right corner indicates which direction you can scroll. If no more than 6 items either down or up arrow will be displayed (no scrolling “around corner”). If more than 6 menu items, both arrows will be displayed and you can scroll “around the corner”. Obviously no arrows when 3 or less menu items.
- Back key takes you back to previous menu level.
- Enter key has a special meaning. From any menu screen it will take you directly back to the main screen (the sensor screen). If you now press the Back key it will take you back to the screen where you were before pressing Enter. On the sensor screen you can still use the Up and Down arrows to scroll up and down a page and the Back key will still take you back to where you were before pressing Enter. If you press 1 however (Main Menu) the back shortcut is lost (it’s not a true history list yet).
- Key 3 on the sensor screen is another hidden feature. It will toggle sensor readings between displaying values with a one decimal prevision and no precision. Default is no precision. This applies to all temperatures and the humidity level.

To enter Edit mode you select the number key corresponding to the data item you want to edit on a navigation screen with data items. To indicate that you are in edit mode, the data value is highlighted.

The following keys are used in Edit mode:

- Keys 1-3 are not used.
- Up and Down arrows are used to scroll up and down in the value list. More info about different types of data items later in this document.
- Back key takes you back to navigation mode and cancel any changed data. Data is with other words not saved when you press the Back key.
- Enter key will save the data and most of the time take you directly back to navigation mode (covered under data types).

Data Types

Most of the data (properties) you can change are changed using values in a selection list. You use the Up and Down arrows to scroll up and down in the selection list. You can scroll “around the corner”. For data items with only two selection items (e.g. Yes/No), you can use either the up or down key to toggle between the two values.

Most Integer values are edited as lists with a min and max range. The value might also be restricted to be changed in specific increments (e.g. 5, 10, 15, 20, ...). In a few rare cases integer values are entered one digit a time. When entering edit mode, the integer value will be displayed as a five digit zero padded number. To enter a number less than 5 digits, leave the first digits at 0. Press Enter until all digits are set.

CommandCenter Operation

Date and Time values are edited in a special way. Using date as an example, when entering edit mode, the year (or last two digits of the year) will be highlighted. Use Up and Down arrows to change year. When done, press Enter. Now the month will be highlighted and you change it in the same way. Press Enter again and the day is highlighted. Pressing Enter a final time will save the new date. Pressing Back at any time when editing the date will cancel the change operation and take you back to navigation mode.

A time value is entered in the same way as a date.

An IP address is entered the same way as date and time except that you edit one digit at a time.

Passwords are entered one digit at a time pressing Enter after each digit.

Information Messages

Certain actions and certain conditions will generate information messages. Information messages will popup over current menu screen. The message can be cleared by pressing either key 1 or 2. Key 1 will clear current message and key 2 will clear all queued messages. Messages can be of three different types. Short, Long or Confirmed. A short message will be cleared automatically after 3 seconds (default). A long message will be cleared after 5 minutes (default). A confirmed message will never be cleared (unless there is a system restart) and have to be cleared by pressing key 1 or 2.

Menu Quick Reference

The root menu screen is where you see all the sensors and one menu option that takes you to the Main Menu. Some menu selections are dependent on current unit configuration and will not always be displayed. These menu selections are marked as Optional.

For data menu items, the default value is displayed in the summary.

<ul style="list-style-type: none"> User Settings Setpoints <ul style="list-style-type: none"> Supply Temp S Supply Temp W Dew Point Temperature Freezestat Supply Temp Date & Time <ul style="list-style-type: none"> Date Time Zone Daylight Date Format Time Format Synch System Info Display <ul style="list-style-type: none"> Backlight Temp Unit Reset Display User Password <ul style="list-style-type: none"> Enabled Password Retention Remote OP (Only on Remote OP) <ul style="list-style-type: none"> Version Info RS-232 Port RS-485 Port 	<ul style="list-style-type: none"> System Control <ul style="list-style-type: none"> Start/Stop Blower System Restart System Status <ul style="list-style-type: none"> Environment Compressor Ventilation Network Serial Ports Alarms <ul style="list-style-type: none"> Current Alarms Alarm Log Service [Optional] <ul style="list-style-type: none"> Force Contacts Reset All Ventilation <ul style="list-style-type: none"> Blower Blower Speed OA Damper Heating <ul style="list-style-type: none"> Heat Stage 1 Heat Stage 2 Modulated Heat Compressor 1 <ul style="list-style-type: none"> Contactor Pump Down OACC Head Pressure More Reheat Less Reheat 	<ul style="list-style-type: none"> Service (continued) <ul style="list-style-type: none"> Compressor 2 <ul style="list-style-type: none"> Contactor Pump Down OACC Head Pressure More Reheat Less Reheat Cooler <ul style="list-style-type: none"> Contactor Pump Down Other <ul style="list-style-type: none"> System Status Network <ul style="list-style-type: none"> Ping Console Clear Alarm Log Clear All Logs Commission <ul style="list-style-type: none"> Tested Commissioned
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CommandCenter Operation

<p>Factory Settings</p> <p>Ventilation</p> <ul style="list-style-type: none"> Blower <ul style="list-style-type: none"> Normal Speed Max Speed Timers <ul style="list-style-type: none"> Stabilize Freezestat 1 Freezestat 2 No Airflow Dirty Filter Options <ul style="list-style-type: none"> Fire Reset Compressor <ul style="list-style-type: none"> Configuration <ul style="list-style-type: none"> Compressor 1 <ul style="list-style-type: none"> Enabled Resource ID Compressor 2 <ul style="list-style-type: none"> Enabled Resource ID Cooler <ul style="list-style-type: none"> Enabled Options <ul style="list-style-type: none"> Active Refrigerant Superheat Reheat Time Reheat Steps Evap Offset PSI Monitor PD At Start Timers <ul style="list-style-type: none"> Min Startup Stabilize Min Run Time Min Stop Time Alarm Stop Anti Block Reheat Calib Pressures <ul style="list-style-type: none"> LP Vacuum LP Alarm LP Start LP Max HP Min HP OACC Min HP OACC Max Space Control <ul style="list-style-type: none"> Room Temperature <ul style="list-style-type: none"> Deg*Min On Deg*Min Off Setpoint Adj A/C <ul style="list-style-type: none"> Sensor <ul style="list-style-type: none"> Deg*Sec On Deg*Sec Off 	<p>Factory Settings (continued)</p> <p>Heating</p> <ul style="list-style-type: none"> Type <ul style="list-style-type: none"> Deg*Sec On Deg*Sec Off Sensor <ul style="list-style-type: none"> Mod Step Size Stage 2 On Cold Start Cold Level Deadbands <ul style="list-style-type: none"> SA Temp Low SA Temp High Dew Point Low Dew Point High Air Temp Low Air Temp High Network <ul style="list-style-type: none"> TCP/IP <ul style="list-style-type: none"> DHCP IP <ul style="list-style-type: none"> Mask GW DNS Time Link Monitor Serial Ports <ul style="list-style-type: none"> Port B (RS-232) <ul style="list-style-type: none"> User Baud Rate Databits Parity Flow Control Reply Delay Port C (RS-485) <ul style="list-style-type: none"> User Baud Rate Databits Parity Echo Test Port D (RS-485) <ul style="list-style-type: none"> User Baud Rate Databits Parity Echo Test WebSentry <ul style="list-style-type: none"> Enabled Use DNS IP <ul style="list-style-type: none"> Port Comm Interval Comm Segment Stay Alive BACnet [Optional] <ul style="list-style-type: none"> Enabled Interface Device ID Port 	<p>Factory Settings (continued)</p> <p>Modbus [Optional]</p> <ul style="list-style-type: none"> Device ID LON [Optional] <ul style="list-style-type: none"> Refresh Rate Inputs/Outputs <ul style="list-style-type: none"> Sensor Type <ul style="list-style-type: none"> HP LP Superheat HP 2 LP 2 Superheat 2 OA/RA Temp OA/RA Rel Hum OA Dew Point Rel Humidity Return Air Outdoor Air OA/RA Rel Hum Sensor Usage <ul style="list-style-type: none"> HP LP Superheat Suct Temp Discharge HP 2 LP 2 Superheat 2 Suct Temp 2 Discharge 2 OA/RA Temp OA/RA Rel Hum OA Dew Point Rel Humidity Return Air Supply Air Outdoor Air Sensor Calibration <ul style="list-style-type: none"> HP LP Superheat Suct Temp Discharge HP 2 LP 2 Superheat 2 Suct Temp 2 Discharge 2 OA/RA Temp OA/RA Rel Hum OA Dew Point Supply Air Evap Temp Rel Humidity Return Air Outdoor Air
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CommandCenter Operation

<p>Factory Settings (continued)</p> <ul style="list-style-type: none"> AO Polarity Modulated Heat Blower Speed Head Press 1 Head Press 2 Sample Rates AI Samples AI Sample Rate Refresh Sens DI Samples DI Sample Rate Assignments Analog Inputs Supply Air OA/RA Temp OA/RA Rel Hum OA Dew Point Evap Temp HP LP Suct Temp Discharge HP 2 LP 2 Suct Temp 2 Discharge 2 Exhaust Air Reheat Temp Analog Outputs Modulated Heat Blower Speed Head Press 1 Head Press 2 	<p>Factory Settings (continued)</p> <ul style="list-style-type: none"> Digital Inputs Compressors Space Heater Blower On/Off Occupied A/C Override Heat Override Freezestat Dirty Filter No Airflow Firestat Blw Overload Volt Monitor Digital Outputs Blower More Reheat Less Reheat Compressor 1 Compr 1 PD Compressor 2 Compr 2 PD Cooler Cooler PD OACC OACC 2 Heat Stage 1 Heat Stage 2 Heat Stage 3 System Status 	
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Menu Structure Description

This is a more detailed description of each menu item.

1. User Settings

1.1. Setpoints

If user password has been enabled, you will need to enter the password before you can change any setpoint.

The Supply Temp setpoint is a floating setpoint that is controlled by the Room Temperature controller. You can reset the setpoint value but it will not stay at the level you set.

1.2. Date & Time

System time properties. Here you can set the date, time, time zone and if daylight savings is in effect. You can also set what date time format that should be used.

Date is always edited in Year-Month-Day syntax and the time is always edited in 24-hour clock format not matter what the format settings are.

Time zone can be set to -3:30, -4:00 to -10:00 and GMT time.

The daylight property only determines if an extra hour should be added to the current time. No automatic detection if we need to add the extra hour. If time synchronization is enabled, this property will be set by the synchronization feature.

CommandCenter Operation

The following date formats are supported:

Y-M-D, D/M/Y, M/D/Y and M D, Y.

The last format will be spelled out as Jan 1, 2006.

Clock is either a 12 or 24-hour clock.

Note that if the unit is connected to the Internet, you do not need to set the clock. The clock will automatically be synchronized with a time server. Time zone and date/time formats still needs to be set.

- 1.3. System Info
The System Info screen lists some useful information when troubleshooting the system like Software and Board version, current IP and MAC address.
- 1.4. Display
Use **Backlight** to enable/disable the keypad backlight.

Use **Temp Unit** property to set temperature unit to be used in the system (Celsius or Fahrenheit).

Reset Display controls how long the operator panel will stay idle at a menu screen before being returned to the main sensor screen.
- 1.5. User Password
Here you can enable user passwords (disabled by default). You can also change the user password and set for how long the user password protected menu items should stay open after they have been unlocked (retention time).
- 1.6. Remote OP
This menu selection is only visible on a remote OP (operator panel connected to the board using a serial port).

Under version info you can see the software version of the remote OP as well as the minimum main board software version required to be able to communicate with a main board.
- 1.7. RS-232 and RS-235 are used to configure the remote OP end of the serial port interface. Only a subset of the serial port parameters are available compared to what you can configure from the main board serial port configuration. See 5.5.2 for description of parameters.

2. Factory Settings

To access these settings you need to enter a service password.

- 2.1. Ventilation
 - 2.1.1. Blower
Normal Speed sets the normal main blower running speed as a percentage of full capacity.

Max Speed sets the max main blower running speed as a percentage of full capacity. Blower will only switch to max speed if unit is equipped with a high speed override input.
 - 2.1.2. Timers
Stabilize is how long time system will wait for sensors to stabilize after blower has started. No other internal components will start until sensors are stable.

Freezestat 1 is the Freezestat 1 alarm debounce timer. Freezestat 1 is tripped when supply air drops below the freezestat setpoint.

Freezestat 2 is the Freezestat 2 alarm debounce timer. Freezestat 2 is tripped if supply air drops stays below the freezestat setpoint after Freezestat 1 has been tripped.

No Airflow property is the No Airflow debounce timer.

CommandCenter Operation

Dirty Filter property is the Dirty Filter debounce timer.

2.1.3. Options

Fire Reset property controls how the system will recover after a Fire Alarm. Set to auto, system will automatically go back to normal once the alarm is cleared. If set to Manual, a System Restart is required to make the system operational again.

2.2. Compressor

2.2.1. Configuration

Up to two compressors and one compressor cooler can be configured. The following parameters can be set for each one.

Use **Enabled** property to enable or disable compressor or cooler.

Use **Resource ID** to determine in which order compressors will be used. This property is only used for compressors.

2.2.2. Options

Use **Active** property to enable or disable usage of compressors. Compressors are disabled by default when unit is shipped and still in Commission mode.

Refrigerant sets the type of Refrigerant used in the system. This will affect some of the pressure levels used to control the compressors.

Superheat controls the minimum superheat level. This parameter is used when calculating the minimum Suction temperature as described in the document Alarm Descriptions.

Reheat Time is the time it takes the reheat valve to move from fully closed to fully opened.

Reheat Steps defines the number of steps it takes to move from fully closed to fully opened. Divide reheat time with reheat steps to see how many seconds the valve will move every time there is a demand for more or less reheat.

Evap Offset is used in the calculation of the evaporation setpoint used to determine when to turn off a stage of dehumidification or cooling.

PSI Monitor is a timer used for monitoring low and high pressure. Low pressure is monitored to not rise too high and high pressure is monitored to not drop too low. A check is made every time this timer expires. If either low or high pressure indicates a bad pressure 7 times in a row, a compressor fault alarm will be tripped.

PD At Start control if compressor will do an initial pump down at startup of compressor if LP is above start level.

2.2.3. Timers

Min Startup timer controls the minimum time compressor will wait before starting compressor even if minimum Low Pressure level is met.

Stabilize timer controls for how long time the compressor will run before we enable the Low Pressure alarm. During this time the system will still monitor for a low pressure level reaching vacuum levels using the low pressure transducer.

Min Run Time timer controls the minimum time the compressor has to run before it can be stopped.

Min Stop Time control the minimum time the compressor has to be stopped before being started again after a normal stop.

Alarm Stop control the minimum time the compressor has to be stopped before being started again after an alarm.

CommandCenter Operation

The **Anti Block** timer is used when deciding if the compressor should be started even if the low pressure has not reached minimum level. It is also used decide for how long we will wait for the low pressure to reach its shutoff level before stopping the compressor anyway.

Reheat Calib timer controls how long the reheat valve will continue moving after it reaches either fully closed or fully opened. This is used to calibrate valve position to avoid any drifting.

2.2.4. Pressures

LP Vacuum pressure setting controls at what Low Pressure level compressor will trip on Low Pressure alarm while compressor is in stabilizing mode.

LP Alarm pressure setting controls at what Low Pressure level compressor will trip on Low Pressure alarm once it is past Stabilize state.

LP Start pressure setting controls at what minimum Low Pressure level compressor will start. Note that there also are some timers controlling when compressor can start (Min Startup and Anti Block).

LP Max pressure setting controls the maximum Low Pressure level we allow the compressor to run at. A check against this level is done intermittently defined by Fault Delay timer.

HP Min pressure setting controls the minimum High Pressure level we allow the compressor to run at. A check against this level is done intermittently defined by Fault Delay timer.

HP OACC Min pressure setting controls at what High Pressure level Outdoor Air Condenser will start (minimum capacity).

HP OACC Max pressure setting controls at what High Pressure level Outdoor Air Condenser will run at maximum capacity.

2.3. Space Control

2.3.1. Room Temperature

The **Deg*Min On/Deg*Min Off** properties controls for how long the control logic will wait until increasing or decreasing the supply air setpoint.

Setpoint Adj determines number of degrees to increase or decrease the supply air setpoint every time setpoint is changed.

2.3.2. A/C

The **Sensor** property determines how cooling will be controlled. Supply means that space temperature will be controlled by using supply air sensor only. Return means that the space temperature will be controlled by the Room Temperature controller using the return air sensor.

The **Deg*Sec On/Deg*Sec Off** properties controls for how long the control logic will wait until adding or removing a Cooling stage after a stage has been added/removed.

2.3.3. Heating

Type sets heating type.

The **Deg*Sec On/Deg*Sec Off** properties controls for how long the control logic will wait until adding or removing a Heating stage after a stage has been added/removed.

The **Sensor** property determines how heating will be controlled. Supply means that space temperature will be controlled by using supply air sensor only. Return means that the space temperature will be controlled by the Room Temperature controller using the return air sensor.

Mod Step Size defines the increments for the modulated signal when heater is configured as a modulated heater.

CommandCenter Operation

Stage 2 On controls when the second stage digital output will be turned on for a modulated heater. First stage is turned on when heating is started.

Cold Start determines under what temperature we consider being in cold conditions at startup of unit.

Use **Cold Level** to set the startup heating level when starting up in cold conditions.

2.3.4.

Deadbands

This section is used to configure setpoint deadbands. Air temperature deadbands can be set in 1/10th of a degree.

2.4.

Network

2.4.1.

TCP/IP

Set **DHCP** to use Dynamic IP and set it to No to use Static IP. In the first case, the IP, Mask, GW and DNS property will be set automatically and you will be able to see what they are set to (as soon as a network connection has been detected and a DHCP server has been found).

IP is the systems IP address.

Mask is the network mask.

GW is the IP address for the gateway.

DNS is the IP address for the Domain Name Server.

Time is the IP address for the time server (used to synchronize the clock).

Link Monitor is how often the system will check that there still is a physical network link. If you unplug the Ethernet cable, it can take up to this time before it is detected.

2.4.2.

Serial Ports

Port properties are the same for all ports except where noted.

User defines the user of the port. Default is Seresco which means the port is opened for inbound traffic using the Seresco protocol. Other users are other protocols like LON and Modbus as well as 3&4 compressor slave board communication.

Baud Rate, Databits and Parity defines your common serial port configuration parameters.

Flow Control defines if hardware flow control should be used. Can only be configured for the RS-232 port (port B).

Echo Test defines if we will do an echo test every time we transmit data over the port. Normally all data should be echoed back and therefore adding the echo test enable us to have one more test to ensure data was transmitted with no errors. However, if there is a minor hardware problem with the port chip, this will cause the port not to work at all. Disabling the echo test might enable us to still use the port even with the hardware error.

Reply Delay defines for how long we will wait for a reply message before considering it a communication fault.

2.4.3.

WebSentry

These properties controls WebSentry connection.

Set **Enabled** to No to disable WebSentry. You can do this if you temporarily want to disable WebSentry connections. Also you should do this if a unit is not connected to the Internet to avoid unnecessary attempts trying to detect a physical network link.

CommandCenter Operation

Use DNS controls if DNS should be used to resolve the IP address associated with the hard coded WebSentry server name. You should set this to No if there seems to be a problem resolving the IP address and instead use the IP property to define the IP address.

IP is the WebSentry server IP address. Use this property to configure the IP address or to see what it is if DNS is enabled.

Port is the WebSentry port to connect to. This is configurable in case the port will change in the future.

Comm Interval is how often the system will try to connect to the WebSentry server between disconnects.

Comm Segment is how often the system will try to connect to the WebSentry server between disconnects when we can not transmit all non-sent data in one session.

Stay Alive is how long the TCP connection will stay active from the last time a message was received from the WebSentry server. Normally the WebSentry server should disconnect before this time.

2.4.4. BACnet

These properties controls BACnet connections and are only available if the CommandCenter has been loaded with BACnet support.

Set **Enabled** to Yes to enabled BACnet. It is disabled by default.

Set **Interface** to BACnet interface type. Currently only Ethernet and IP is supported.

Use **Device ID** to set a unique device ID for unit on the BACnet network.

Port can be used to change the default port setting.

2.4.5. Modbus

Use these properties to configure Modbus communication.

2.4.6. LON

Use these properties to configure LON-Modbus gateway communication.

2.5. Inputs/Outputs

2.5.1. Sensor Type

The sensor types controls how an input signal is translated into a value. Note that some sensors that are available under sensor calibration are not available under sensor types. These are temperature sensors for which there are no other sensor type that can be used except Thrm.

The following sensor types are available:

- Thrm, thermistor sensor to be used for all temperature sensors.
- GS-RA, Greystone return air sensor.
- GS-RH, Greystone RH sensor.
- SG145, Saginomiya transducer, max 145 psi.
- SG435, Saginomiya transducer, max 435 psi.
- JC-RH, Johnson Controls RH sensor.
- JC100, Johnson Controls transducer, max 100 psi.
- JC500, Johnson Controls transducer, max 500 psi.
- BMS, Building Management System controlled sensor.
- Calc, Calculated sensor.

2.5.2. Sensor Usage

The sensor usage option determines how a sensor is being used. There are four values that can be set.

CommandCenter Operation

None will disable sensor. It will not be used for control and will not be displayed on sensor screen.

Dflt is the default setting for most sensors. It means that that sensor will be used as determined by the system. For sensors used for control, sensor will used both for control and it will also be displayed on sensor screen.

Set sensor to **View** to disable sensor for control but still have it displayed on sensor screen.

Set sensor to **Ctrl** to not show it on sensor screen but still have it enabled for control.

2.5.3. Sensor Calibration

All sensor calibration values are changed the same way. You use the up and down arrow to change the value to a few steps above or below 0.

2.5.4. AO Polarity

These options are used to set the polarity of the analog outputs. **0V** means that device is off or closed at 0 volts. **10V** means that device is off or closed at 10 volts.

2.5.5. Sample Rates

The **AI Samples** and **AI Sample Rate** properties are used to fine tune the way analog inputs are read and translated into sensor readings. A sensor reading is the average of all read samples.

Refresh Sensor property sets how often sensors will be read. Sensor reading will also be generated when there is a change in the sensor reading. Refreshing sensors on a regular basis prevents us from getting stuck with no sensor readings for a long time when the system is stable.

The **DI Samples** and **DI Sample Rate** properties are used to fine tune the way digital inputs are read and translated into alarms or other inputs. A digital input will signal a state change when all samples are the same and are different from current saved state.

2.5.6. Assignments

These settings are used to assign an input or output signal to a physical input/output on the board. The internal input/output id is being used to reference the physical input/output. A wiring diagram is needed to determine the board terminal.

3. System Control

3.1. Start/Stop Blower Start and stop main blower.

Note that the blower might not come when turning it on. There can be an alarm condition preventing it from starting (e.g. blower overload, voltage monitor fault or firestat).

When selecting Normal Mode at startup, the blower will automatically be started. To not run the blower you will have to go to this menu and turn blower off. There might be up to a minute delay before blower starts due to the voltage monitor fault signal not being cleared.

When selecting Service Mode at startup, the blower will not be started.

3.2. System Restart When selecting System Restart you will see a confirmation screen where you have to confirm that you want to restart the system. Pressing 2 or the Back button will cancel this request.

3.3. System Status The status screen shows the status for different internal system components. It's main purpose is for troubleshooting a running system where the information here can be passed back to tech support.

CommandCenter Operation

The status feature has been grouped into 4 areas. Environment shows status for the environment control (Space Temp, Humidity, Supply Air Control, Air Heater and Heat Recovery).

The ventilation area shows the status of the different ventilation related components.

The network area shows the status for network related components.

The serial ports area show serial port status.

4. Alarms

4.1. Current Alarms

The current alarm lists shows all alarms that have not been cleared. Some alarms has to be cleared by the device that caused the alarm. For instance the blower overload and voltage monitor fault alarms. Other alarms can manually be cleared like Blower Lockout and Freezestat.

Use arrow keys to scroll up and down in alarm list. If pressing the up key on the first page of alarms, current alarm list will be refreshed.

To clear an alarm, select alarm using number keys and press Enter.

4.2. Alarm Log

The alarm log lists all alarms since the alarm log last was cleared (from the Service menu). Most recent alarm at the top. The top line shows the date for selected alarm.

Use arrow keys to select an alarm. Selected alarm is indicated by an arrow in the left margin. The alarm log will scroll one alarm at a time rather than a page at a time. If pressing the up key when the first alarm is selected, alarm log will be refreshed.

5. Service

To reach these settings you need to enter a service password.

5.1. Force Contacts

Force Contacts is used to test all the Analog and Digital Outputs. This overrides any internal control of corresponding features and is just a way to physically test that a contact is working.

Selecting Reset All will reset all contacts back to the Off position.

5.2. Network

5.2.1. Ping

The ping feature is used to test the IP network.

To use ping, set the ping address and then select start. The first result line shows the IP addresses you are pinging from (units IP address) and the second line will show 4 time values in milliseconds.

Ping will send 4 messages to specified address and measure in milliseconds how long it will take to get a reply. If no reply within 5 seconds the result will show Fail for that particular ping request.

5.2.2. Console

The console is currently only used to monitor serial port messages. Select the serial port to monitor by using the arrows keys. Select 1 to start monitoring. To stop/pause messages, you can press key 2 anytime. Press Enter to clear the screen. Select back top stop console or to go back and select another serial port.

5.3. Clear Alarm Log

Selecting Clear Alarm Log will display a confirmation screen where you have to confirm that you want to clear the alarm log. Pressing 2 or the Back button will cancel this request.

5.4. Clear All Logs

Even though you only can look at the alarm log from the control panel, there are several other logs used as well. These logs can be read using WebSentry if the unit is connected to Internet.

CommandCenter Operation

Use Clear All Logs to clear all the logs and not just the alarm log.

5.5.

Commission

When control board initially is configured loaded with the latest control software, unit is prepared to make it safe and easy to use when testing unit before delivery to customer. When test completed, the Tested option is changed to Yes and can never be changed back again.

When unit has been tested, the compressor Enabled property will be changed to No.

When Commissioned option still is set to No, unit will start up in service mode. It is not possible to start the unit in Normal Mode. The blower can be started anytime but to enable the compressors and to be able to change the Commissioned option, a factory password is required.

When changing Commissioned to Yes, all the logs will be cleared and the unit will do a system restart. Now at startup you will see the normal startup screen with 2 selections, Normal Mode and Service Mode.

The Commissioned option can be changed back to No if needed.

System Design

System Design Checklist

Ensuring that all critical system design aspects have been addressed is paramount to obtaining a safe and healthy pool environment. Seresco's name is a useful checklist.

- ❑ **System duct design and air pattern**
- ❑ **Evaporation rate and latent loads**
- ❑ **Required Access Space**
- ❑ **Exhaust Air**
- ❑ **Supply Air flow**
- ❑ **Cooling and Heating loads**
- ❑ **Outdoor Air**

System Duct Design and Air Pattern

The overall duct design will determine whether or not the space will be comfortable and condensation free. Special care must be taken to ensure the entire room sees the required air changes per hour and that all exterior windows have air delivered to them. Stagnant areas, especially where occupants can access (the deck area for example) will suffer from poor air quality and lead to complaints.

Traditional problems in indoor pools are easily predictable and can be avoided by following to models provided here. Figures 1 and 2 illustrate good air distribution practices and layouts.

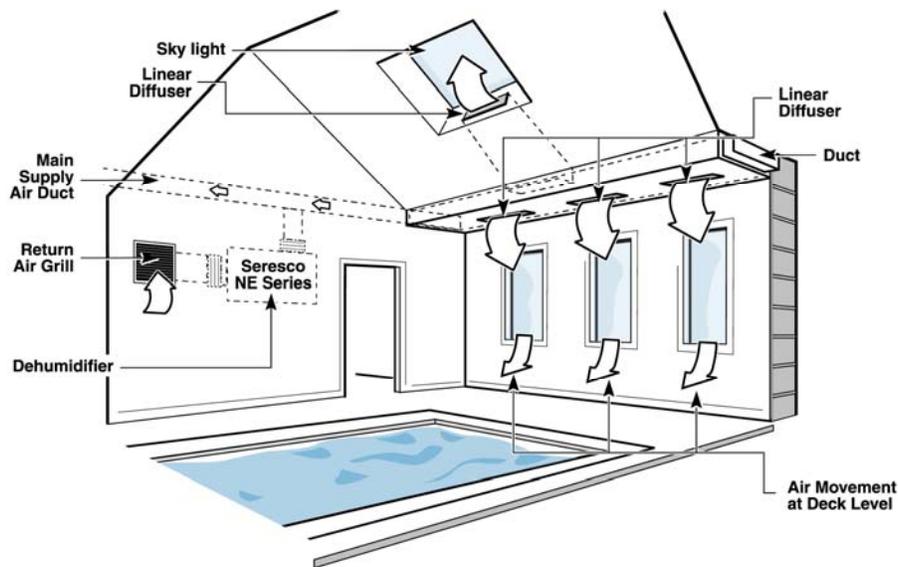


Figure 1 – Perimeter Duct Layout

All air distribution systems should:

- Supply 4-6 volumetric air changes per hour.
- Blanket exterior windows, exterior surfaces prone and other areas prone to condensation with supply air. A good rule of thumb is 3 - 5 CFM per ft² of exterior glass.
- Locate the return grille to enhance the overall air pattern within the room.

System Design

- Prevent air short-circuiting. Avoid installing the return air grille too close to a supply grille.
- Select grilles, registers and diffusers that deliver the required throw distance, and the specified CFM rating.
- Introduced outdoor air per local codes and/or ASHRAE Standards
- Maintain a negative pressure in the space with an exhaust fan

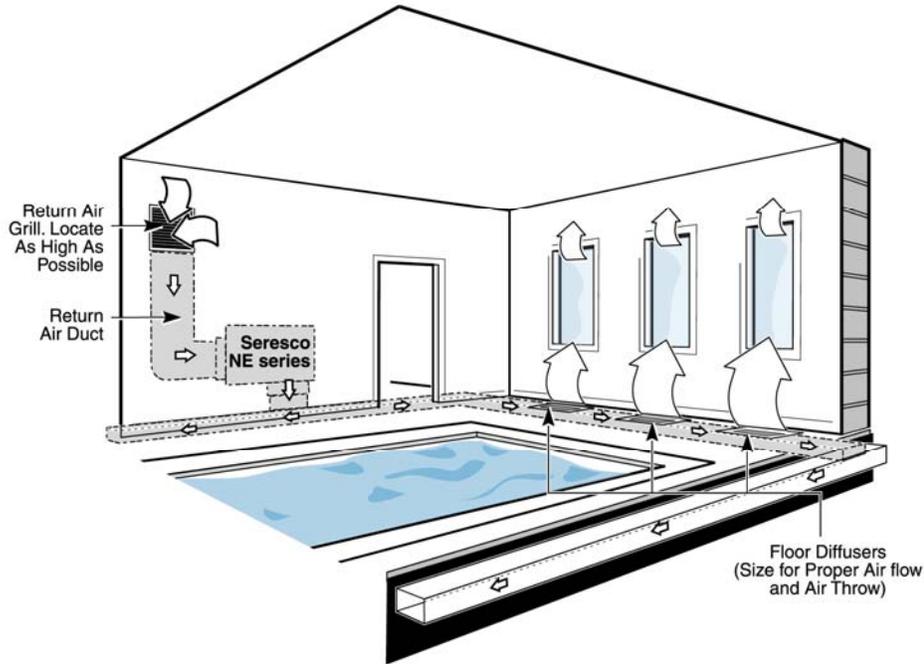


Figure 2 – Perimeter Below Grade Duct Layout

General Recommendations:

- Galvanized sheet metal ducts are acceptable in most installations. A below-grade duct system should use PVC or plastic-coated galvanized spiral pipe to avoid deterioration.
- Ductwork that passes through an unconditioned area should be insulated on the exterior.
- When applicable, locate exhaust fan air intakes as close to the whirlpool as possible.
- To prevent excessive vibration noise, install neoprene flex connectors when attaching ductwork to the dehumidifier.
- Skylights require significant airflow to avoid condensation on their surfaces.

Evaporation and Latent Loads

Every building's moisture (latent) load is calculated in the same way. There are generally three sources of moisture that are considered:

- Internal load; evaporation rate
- Occupants
- Outdoor air load

It is important to be aware of the design criteria used to calculate the total load and reconcile a unit selection. Seresco's Natatorium Design Manual has more information on this subject

System Design

Required Access Space

No Access = no service or maintenance. All OA series dehumidifiers have been designed to require only two sides access. Allow a minimum of 36 inches of clearance on the sides indicated in Figure 3 for piping and service access. Mirror access units are also available.

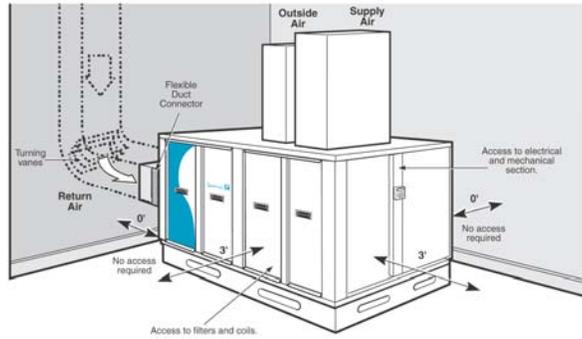


Figure 3 – Recommended Access Space

Exhaust Air

ASHRAE recommends the room be maintained at 0.05-0.15" WC negative pressure relative to surrounding spaces.

Ten percent more exhaust air than outdoor air is a good rule of thumb.

Figure 4 illustrates how the location of the exhaust fan can also significantly improve the air quality in the space. A spa or whirlpool should have the exhaust air intake grille located directly above it. This extracts the highest concentration of pollutants before it can diffuse into the space and negatively impact the room air quality.

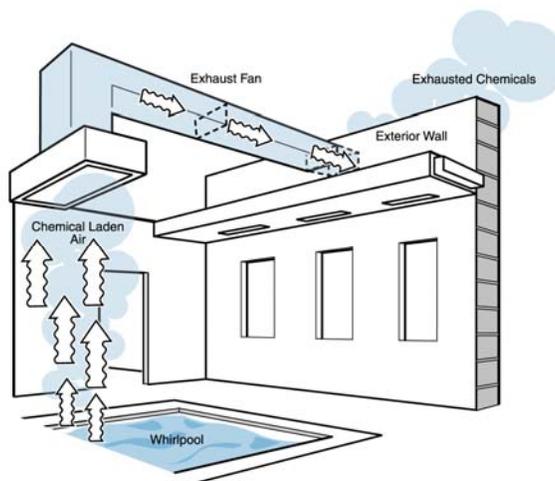


Figure 4 – Exhaust Air Intake recommendation

System Design

Supply Air

ASHRAE recommendations for proper volumetric air changes per hour are important to ensuring that an entire room will see air movement. Stagnant areas must be avoided, as they will be prone to condensation and air quality problems.

Short-circuiting between supply and return air must also be avoided as it significantly reduces the actual air changes within the space.

ASHRAE recommends:

- 4-6 volumetric air changes per hour in a regular natatorium.
- 6-8 volumetric air changes per hour in facilities with spectators

A quick calculation will determine the supply air requirement:

Supply air required (CFM) = [room volume (ft³) x desired air changes] / 60

Cooling and Heating Loads

All buildings should have cooling and heating load calculations done to determine their specific requirements. The room air temperature of an indoor pool facility is generally 10-15 °F warmer than a typical occupied space. Therefore, the heating requirement is larger than a traditional room and the cooling needs are less.

- Rules of thumb do not apply. This is a unique space that requires accurate load calculations.
- Outdoor air must be included in load calculations as it often represents up to 50% of the heating load.

Space cooling is a free byproduct from packaged dehumidifiers. These systems dehumidify by cooling the air below its dew point. The compressor heat can be used to heat the pool water during this time or merely sent outdoors to a condenser as is done with traditional air conditioning systems. If the cooling load exceeds the standard output of a dehumidification unit, a larger unit with compressor staging is often specified.

Condensate Drain

The dehumidifier is a draw through configuration as a result the entire cabinet is under negative pressure. Without a trap, condensate will not drain and the unit will overflow into your mechanical room.

- Per Figure 5 pitch the condensate drain line a minimum of 1/8" per linear foot, and support the pipe with code-approved hangers at least every 5 feet.
- If the drain line passes through an unconditioned space, heat tracing is required to prevent the condensate in the drain from freezing.

When gravity disposal is not possible, a condensate pump can be used. Follow the pump manufacturer's installation instructions

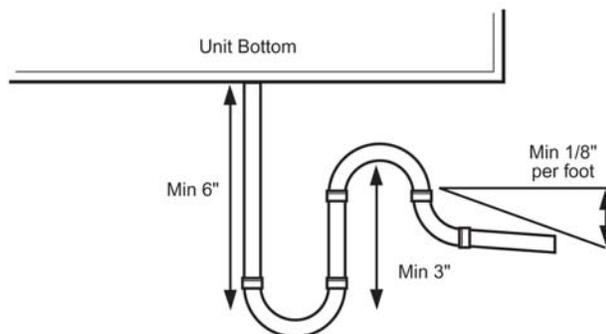


Figure 5 – P Trap

System Design

Outdoor Air Cooled Condenser Installation

This condenser is used in air conditioning mode where it rejects unneeded heat from the space to outdoors. Proper installation is essential to ensure it can function as intended. Proper airflow and refrigerant piping are paramount.

- Ensure an appropriate maximum ambient air temperature has been specified.
- Ensure the unit has proper airflow per Figure 6. A perimeter of free area equal to its width must be provided.
- Use line sizes as specified by Seresco.
- To avoid potential seasonal system charge problems, ensure the installed line lengths are never longer than indicated on the plans and specifications.
- If the condenser is installed above the dehumidifier, ensure the hot gas line has proper oil traps.
- Contact Seresco if the condenser is installed more than eight (8) feet below the dehumidifier.
- The installer must endeavor to ensure that all industry standards for refrigeration component installation are met. This includes but is not limited to; proper line sizing, materials, nitrogen purging, brazing with Silfos 5 or better (NO SOFT SOLDER), evacuation, cleanliness, traps, long radius elbows and system charging.
- Install the remote condenser on a level, hard surface.

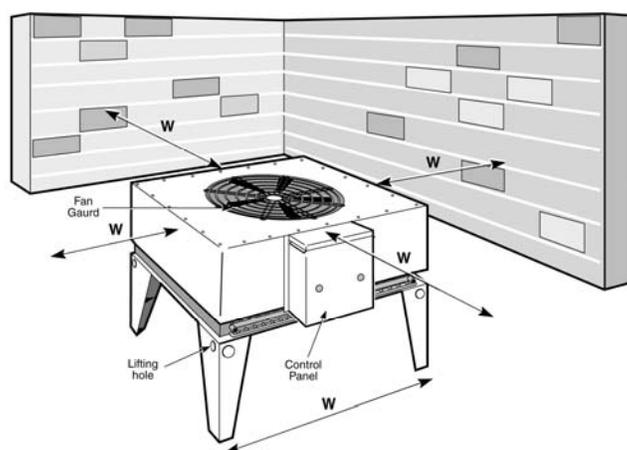


Figure 6 – Typical Outdoor Condenser Installation

Refrigerant Piping of Remote Condensers

OA series dehumidifiers are equipped with isolation valves and access valves located in the blower compartment. Do not open the isolation valves until all exterior piping is leak checked and evacuated. The last outdoor condenser vacuum can be broken with liquid R-410A. Monitor the exact amount of R-410A added, as the total system charge must be per the unit nameplate.

OA series dehumidifiers have refrigerant pipe stubs for the line set connection inside the cabinet.

Use standard commercial refrigeration piping practices when installing the refrigeration piping between the dehumidifier and the remote air-cooled condenser.

- Hot Gas and Liquid line sizes should be per unit nameplate. The stubs inside the OA unit will be the correct sizes for line lengths up to 50'
- Do not exceed 50' total line length or install the condenser more than 8' below the OA unit.
- Per figure 7, install an oil trap at the start of and at every 15 feet of vertical lift in the hot gas discharge line as shown in Figure 18. Pitch horizontal lines a minimum of 1/2" every 5 feet in the direction of flow. All piping must be clean and de-burred. Keep copper chips and foreign materials out of the tubing. A nitrogen purge while brazing is paramount to reduce the chances of oxidation in the pipes.
- Keep the Hot Gas and Liquid lines a minimum of 2" apart to prevent heat transfer. Insulate the hot gas line in all areas where a person may come in contact with the line and be in danger of a burn.
- When all piping work is complete, check for leaks by pressurizing the remote condenser and line set with dry nitrogen. If no leaks are detected, the circuit is ready to be evacuated. Evacuate the condenser and piping to

System Design

a minimum 250 microns. Isolate the piping for ONE HOUR to verify that the system is free from leaks, moisture, and non-condensables.

Consult Seresco before installing the outdoor air-cooled condenser more than 8 feet below or more than 50 feet away from the dehumidifier

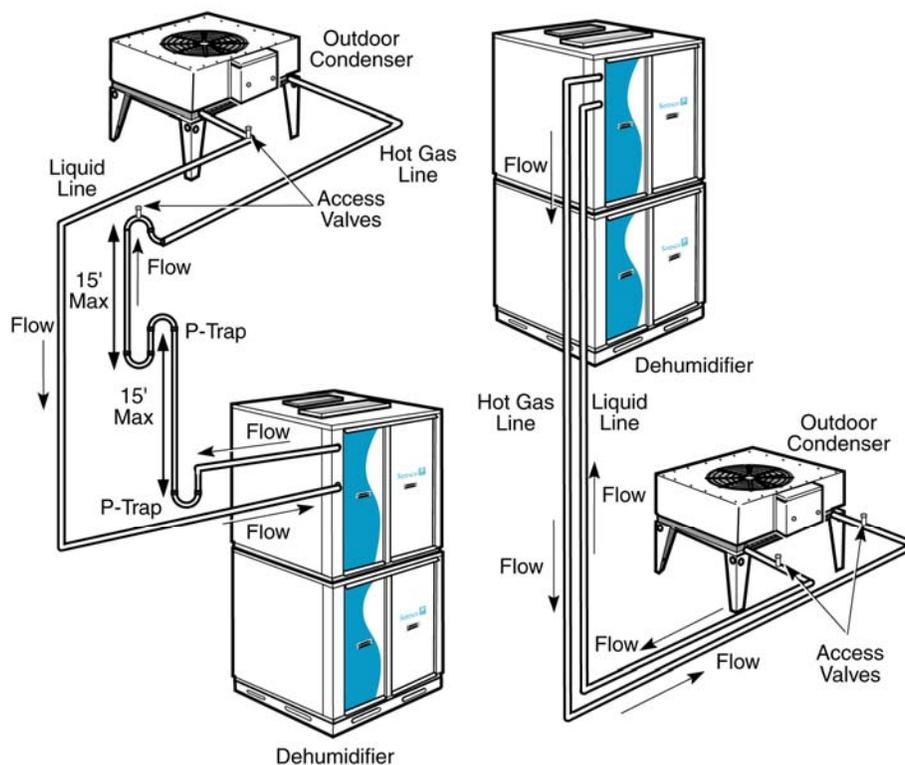


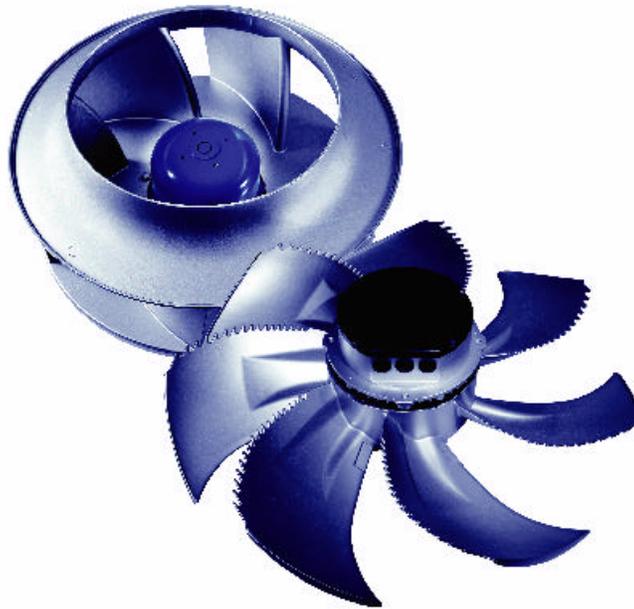
Figure 7 – Typical Outdoor Condenser Installation

Charging of Remote Condensers

Once a proper evacuation has been accomplished the system is ready for charging. The outdoor air-cooled condenser requires a field charge by the installing contractor. The field charge required depends on the size of the condenser and the length of the piping. The unit nameplate will show the exact field charge required.

- The last vacuum can be broken with liquid R-410A. Monitor the exact amount of R-410A added, as the total system charge must be per the unit nameplate.
- Connect the control wiring to the terminals provided inside the electrical compartment of the dehumidifier and outdoor condenser. Refer to the low voltage wiring schematic for details. The condenser fan(s) will not operate until this is complete.
- Once you have charged and checked the condenser and line set for leaks, open the service valves located in the compressor compartment of the dehumidifier
- There is an access valve in the liquid line after the pump down valve. The pump down valve can be manually closed during start-up mode via the controller. Add only as much refrigerant as is needed to get to the total charge indicated on the nameplate. **Never charge liquid into the suction line access valve!**
- The receiver has 2 sight glasses with float balls to help ensure the maximum and minimum refrigerant levels are easily met.

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Diagnostics/Faults

1. Trouble Shooting

Type of error	Possible cause	Remedial measures
Fan does not run (anymore)	Failure line voltage	check line voltage
	Failure of one phase	
	Under - or overvoltage	
	Shortcut Earth	Check motor connection and line voltage
	Short circuit winding	Replace fan
Fan does not start	Thermal motor protection has triggered (motor is overheated)	Check for free air passages; remove foreign bodies if necessary ⇒ "Impeller blocked or dirty" Check temperature of supply air check voltage
	Impeller blocked or dirty	- Switch off power to the motor and secure against switching back on - Check safe isolation from supply - Remove safety grille - Remove foreign bodies or soiling - Remount the safety grille - Further procedure as in the chapter "Start-up"
fan will not start	Temperature too low for bearing grease	Insert bearing with cold greasing
	Air stream wrong direction (Motor turns in wrong direction at high speed)	Check air stream
	⇒ "Fan does not run"	
Fan turns too slowly	Impeller / blade scrapes / brushes	Clear foreign bodies/dirt from the fan

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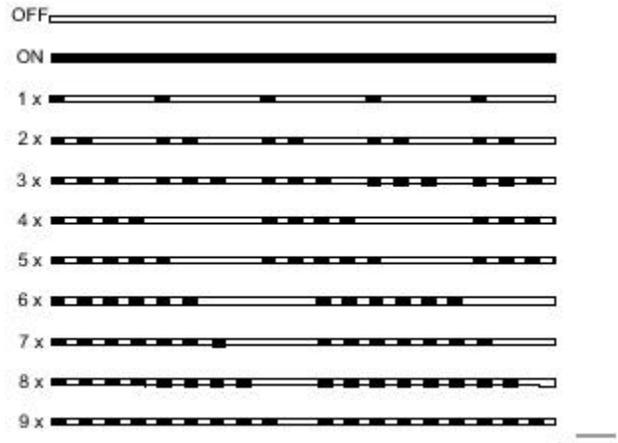
Type of error	Possible cause	Remedial measures
	Active temperature management effective (Motor or electronics overheated)	Check for free air passages; remove foreign bodies if necessary ☞ "Impeller blocked or dirty" Check temperature of supply air Check installation space (air speed over heat sink)
Air flow too low	Fan turns too slowly	☞
	Airways blocked	Check for free air passages (supply/exhaust air vents, filters) ☞ "Impeller blocked or dirty"
	Pressure loss different to planned	Check fan selection
Vibrations	Imbalance	Check blades for damage, soiling or ice ☞ "Impeller blocked or dirty"
	No or wrong vibration dampers (only in radial)	Install correct vibration dampers
Unusual noises	Bearing damaged / worn	Change bearings
	Impeller / blade scrapes / brushes	Clear foreign bodies / dirt from the fan ☞ "Impeller blocked or dirty"
	Operation beyond stall point (for axial fans)	Check for free air passages (supply/exhaust air vents, filters)
	Wrong overlap on nozzle (for centrifugal fans)	Observe the installation instructions

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2. Motor flash codes



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v_led_status_ecblue.vsd

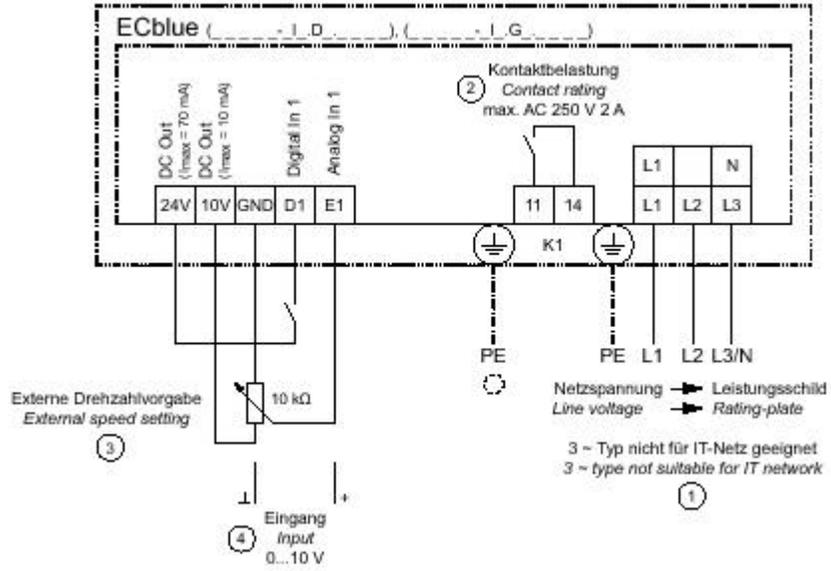


LED Code (only D, G)	Relays K1 (for function factory setting)	Cause Explanation	Reaction of Controller
			Adjustment
OFF	de-energized, 11 - 14 interrupted	no line voltage	Line voltage available? Unit switches OFF and automatically ON when the voltage has been restored
ON	energized, 11 - 14 bridged	Normal operation without fault	
1 x	energized, 11 - 14 bridged	no enable = OFF Terminals "D1" - "24 V / 10 V" (Digital In 1) not bridged.	Switch OFF by external contact (digital input).
2 x	energized, 11 - 14 bridged	Active temperature management The device has an active temperature management to protect it from damage due to too high inside temperatures. In case of a temperature rise above the fixed limits, the modulation is reduced linearly. To prevent the complete system being switched off externally (in this operation permissible for the controller) in case of reduced operation due to too high an internal temperature, no fault message is sent via the relay.	At sinking temperature the modulation rises again linearly. Check cooling of the controller
3 x	de-energized, 11 - 14 interrupted	HALL-IC Incorrect signal from the Hall-ICs, error in the commutation.	Controller turns the motor off. Automatic restart if no more fault is recognized.

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LED Code (only D, G)	Relays K1 (for function factory setting)	Cause Explanation	Reaction of Controller
			Adjustment
4 x	de-energized, 11 - 14 interrupted	<p>Line failure (only for 3 ~ types) The device is provided with a built-in phase-monitoring function for the mains supply. In the event of a mains interruption (failure of a fuse or mains phase) the unit switches off after a delay (approx. 200 ms). Function only when load for the controller is high enough.</p>	<p>Following a shutoff, a startup attempt is made after approximately 15 seconds, if the voltage supply is high enough. This keeps occurring until all 3 supply phases are available again.</p> <p>Checking power supply</p>
5 x	de-energized, 11 - 14 interrupted	<p>Motor blocked If after 8 seconds commutation no speed is measured > 0, the fault "Motor blocked" is released.</p>	<p>EC-Controller switches off, renewed attempt to start after about 2.5 sec. Final shutoff, when fourth starting test fails. It is then necessary to have an enabling reset or to disconnect the power supply.</p> <p>Check if motor is freely rotatable.</p>
6 x	de-energized, 11 - 14 interrupted	<p>IGBT Fault Shortcut earth or shortcut of motor winding.</p>	<p>EC-Controller switches off, renewed attempt to start after about 60 sec. ☞ Code 9 Final shutoff, if - following a second starting test - a second fault detection is detected within a period of 60 seconds.</p> <p>It is then necessary to have an enabling reset or to disconnect the power supply.</p>
7 x	de-energized, 11 - 14 interrupted	<p>DC undervoltage If the intermediate circuit voltage drops below a specified limit, the device is shutoff.</p>	<p>If the intermediate circuit voltage rises again within 75 seconds above the limit, an automatic starting test is run. If the intermediate circuit voltage remains below the limit for more than 75 seconds, the device is shutoff with a fault message.</p>
8 x	de-energized, 11 - 14 interrupted	<p>DC overvoltage If the intermediate circuit voltage increases above the specified limit the motor is switched off. Reason for excessively high input voltage or alternator motor operation.</p>	<p>If the intermediate circuit voltage drops again within 75 seconds below the limit, an automatic starting test is run. If the intermediate circuit voltage remains above the limit for more than 75 seconds, the device is shutoff with a fault message.</p>
9 x	energized, 11 - 14 bridged	<p>IGBT cooling down period IGBT cooling down period for approx. 60 sec. Final shutoff after 2 cooling-off intervals ☞ Code 6</p>	

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Startup Procedure

Basic Unit Start Up Procedure – Seresco OA Series

Start up of Seresco **OA series Dehumidifier** unit generally is not complicated, however **only trained and qualified technician should perform it.**

Follow given instructions, refer to **Seresco Manual** and **StartUp Report**.

- Read this procedure and **Seresco Manual** before attempting unit start up.
- **WARNING:** unit contains refrigerant under pressure and high voltage powered components – **exercise caution** while performing start up or other service work! **Only qualified and trained RVAC/H technicians should perform such work!**
- Seresco Technologies Inc. provides on phone TechSupport – if you need assistance during Start Up or other service work please contact Seresco Technologies at **1-770-457-3392 ext. 2** (for US) or **1-613-680-5301 ext. 2** (for Canada)).

Make sure following paperwork is available/completed:

- **Pre-Start up Check** is completed (see Pre-Start up Check List)
- It is critical to have **design conditions** (room and pool water temperatures etc.) in the premise for proper start up – pool room has to be brought up to design conditions prior.
- **StartUp Report** form – it's shipped from factory with the unit (Warranty/Start Up package); also could be found at www.seresco.net. Complete **Start up Report** and send it to Seresco Technologies to validate warranty, **otherwise warranty could be void.** For Seresco Technologies Warranty please refer to **Seresco Manual**.
- **Seresco Manual** and **Wiring Diagram** - it's shipped from factory with the unit; also could be found at www.seresco.net.

Unit visual inspection – check for following; refer to Start Up Report:

- **External systems/components properly connected/installed and tested (if required) prior to start up (i.e. ductwork, power, OACC and water lines etc).**
 - **If applicable, check for OACC/dry cooler charge according to the unit label (refrigerant/glycol type and amount)**
 - **Verify, if applicable, external pumps performance (pool water, heating/cooling water, GPM etc)**
- **Perform unit internal visual inspection (loose articles, wires etc)**
 - **Check and tighten (if required) wiring terminals (contactors etc.)**
- **Check external components wiring/connection to Seresco unit, verify proper wiring (remote OACC/dry cooler, remote OP, Ethernet cable, auxiliary pool heater, fire alarm etc.), refer to Wiring Diagram shipped with the unit**
- **Record ALL applicable data in Start Up Report.**

Power up the unit (make sure it is safe to do so – exercise caution!):

- Check for proper power supply (phasing, voltage etc) at main distribution block and at transformer secondary lines (24 VAC).
- Check Command Centre KeyPad for response – you should see unit sensors' readings and Main Menu; for KeyPad menu layout refer to Seresco Manual
- Check unit Settings:
 - Current time: **1-Main Menu, 4-User Settings, 2-Date&Time**
 - Setpoints: **1-Main Menu, 1-Setpoints**
- Check Remote OP response (if applicable)
- Record data (refer to Start Up report)

Startup Procedure

Check separate components operation (whatever is applicable): go to 1-Main Menu, 6-Service, 2-Forced Contacts (to activate, switch respective component from OFF/No to ON/Yes, to stop it – switch back to OFF/No).

- 2-Ventilation (insure fan proper rotation, check and record amp reading)
 - Main blower
 - OACC fan
 - Damper(s)
 - Exhaust fan(s)
 - Purge fan(s) (Exhaust fan 2)
- 3-Heating (check space heating option – Staged/Modulated, then activate respectfully: to activate Modulated heating, select Modulated, then with arrows Up and Down select desired heating load, (i.e. 30%) and hit Enter. To stop Modulated heating, reduce setting to 0%, then hit Enter).
- Attention: make sure that main blower is ON while testing heating or compressor!

Enable the compressor(s) – compressors are disabled after testing on factory to prevent their accidental non-supervised start up:

- Go to 1-Main Menu, 5-Factory Settings, 4-Compressor, 1-Enabled: switch to Yes to enable the compressor(s)
- Insure, that:
 - design conditions are established for proper compressor start up
 - main blower is running
 - gauge set is attached to verify compressor rotation and further performance; make sure that gauge readings correspond to unit pressure sensors' readings shown on the KeyPad

Check compressor operation in Forced Demands:

- Go to 1-Main Menu, 6-Service, 1-Forced Demands, 1- Compressor 1:
- Run unit in Dehumidification Mode: Select Dehumidify (check pressure/temperature readings on KeyPad or on gauge set):
 - Insure, that superheat is within 19 – 22 F (allow compressor to run for 20 - 30 min), adjust if needed. Record the data.
- Run unit in both Dehumidification and Pool Heat Modes: while compressor still running, select 3-Pool Heat.
 - Make sure you have design water flow. Record actual waterflow GPM and pressure (if available; check pool water piping external to the unit)
- Confirm superheat value; record the data. De-select Dehumidification and Pool Heat Modes (switch both to OFF/No); allow compressor to pump down.
- Run unit in AC Mode (by selecting 2-A/C) first, then in both A/C and Pool Heat Modes (by selecting 3-Pool Heat, while compressor is still running in AC Mode). Follow instructions above; record the data.
- For two or more compressor units, start up compressor1, than repeat for compressor2 etc. Finally, have all compressors running together.

Restart Unit in Normal mode:

- Go to 1-Main Menu, 6-Service, 6 –Commission: select 2 – Commissioned, switch it to ON/Yes.
- Go to 1-Main Menu, 3-System, 3 – System Restart: select 1 –Yes to initiate System Restart. After system shuts down and restarts, select Normal Mode. System will assume automatic operational mode.

Finish Start Up report, submit it to Seresco Technologies: FAX to 1-613-680-5301 or E-MAIL to service@seresco.net

Startup Procedure

Support

If further support required, please contact Seresco Customer Service at:

- 1-770-457-3392 ext. 2 (for US) or 1-613-741-3603 ext. 2 (for Canada), or
- Email to service@seresco.net

You can also visit our website, www.seresco.net for more information.

Maintenance

Each Seresco unit is built for dependable and safe operation with minimum maintenance. However, certain periodic maintenance is required to ensure continuous safety and maximum operating efficiency. Some suggested procedures are listed below with recommended intervals.

Please be advised, that following recommendations (as well as intervals) are rather general, and should be used where applicable. Given maintenance intervals could vary based on site condition, components' types etc.

Warning!

Danger of moving mechanical parts, high voltage, pressure and/or temperature!
Make sure that ALL power sources/systems are shut down before maintaining or servicing the unit. Make sure that All components within the unit come to complete stop/disenergised before maintenance. Lock out to prevent accidental startup of unit. When service is required call qualified refrigeration mechanic.

Monthly Maintenance

- Check the air filters and replace them if necessary. Filter changing frequency varies from unit to unit, depending on air quality, CFM etc. Use your own judgement, make sure that filters are clean, non-restrictive.
- Check (where applicable) tightness and condition of blower fan belts and pulleys. Belt tension should be such that the belt may be depressed ¼" midway between pulleys with the fingers. When replacing belts where (2) belts are used, replace both belts with a matched set of belts equal in quality to original belts.
- Verify that all setpoints are programmed into the controller as desired by the facility.

Seasonal (semi-annual) Maintenance

- Check that drain pan P-trap is primed (filled with water). It's good practice to pour some water into a drain pan during semi-annual or monthly maintenance to insure that p-trap is primed and operational
- Check and lubricate motor bearings (where and when applicable). Refer to motor's manufacturer instructions.
- Check outdoor air louvers for accumulation of dust and/or lint, etc. Clean as needed

Annual Maintenance

- Check unit for any damage, loose external or internal parts/components (pay special attention to outdoor condenser coils, external components etc.)
- Check and tighten (if needed) all field and factory electrical connections.
- Check and tighten (if or where needed) pool water hoses' clamps and sensor holders.
- Check and tighten (if needed) compressors, motors mountings and bases for being tightly bolted etc.
- Verify that the coils in the dehumidifier and the remote outdoor air-cooled condenser or dry cooler are clean. Use compressed air or a commercial coil cleanser if they are dirty.
- Check all access doors for air leaks
- Verify that the airflow around the remote condenser or dry cooler remains unobstructed.
- Check drain pan and clean out any residue that may have accumulated.
- Check damper linkage for tightness. Check dampers for being properly closed/open, not obstructed by ice, dirt etc. Clean if needed.

If you have any questions or concerns, please contact Seresco Technology Service and TechSupport at service@seresco.net

Maintenance

Compressor Replacement

Compressor failures can be caused by: liquid slugging, air or moisture in the refrigerant circuit, solid contaminants, excessive heat or electrical service malfunctions. To avoid repeated failures, the cause of the failure must be determined and then corrected. If the compressor has failed because its' motor has burned out, the refrigerant, oil, and piping is contaminated. The procedure in section 5.2.1 should be followed to replace the compressor and clean the refrigerant system.

All acid must be removed from the system to avoid future burnouts.

Use an oil test kit to determine the severity of the burnout. Be sure to follow directions provided by the test kit manufacturer for complete system cleansing and acid removal. Make sure you use rubber gloves and eye protection, as contaminated refrigerant and oil can cause severe burns!

Compressor Burnouts

If the compressor has failed due to a burnout, the entire refrigerant charge has been contaminated. In the service mode, all solenoid valves can be opened in order to evacuate the circuit completely. On systems equipped with an optional pool water condenser, take care to avoid freezing the condenser during evacuation

- Verify that the TX Valve and solenoid valves are free of debris. Clean or replace them as necessary.
- Replace the suction filter with a suction line filter-drier designed specifically for cleaning system burnouts (Sporlan "HH" series or equivalent). Select filters that are equipped with a tap for measuring the pressure drop across the filter. Remove the old liquid line filter-drier and replace it with a new filter one size larger than the original.
- Remove the old compressor if you have not already done so. Install the new compressor.
- Evacuate the system to 250 microns or lower.
- Replace all compressor contactors, start capacitors, run capacitors, and starting relays.
- Check the piping and joints for leaks, and recharge the system.
- Operate the unit for an hour in all modes. (The duct heater may have to operate to maintain the space temperature while operating in air conditioning mode. Contact Seresco for instructions.)

It is critical that the unit be run in AC mode for cleaning system burnouts. The entire system must clean and acid free.

- Monitor the pressure drop across the suction filter. If the pressure drop is 3 psi or less after one hour, continue to run the system for 24 hours, then take an oil sample. If the oil sample is dirty or acidic, or if the one-hour pressure drop is greater than 3 psi, then recover the system charge and replace both the suction and liquid filter-driers.
- Repeat the previous step until your oil sample tests negative.

Seresco will require a copy of the acid test result if there is a warranty replacement request.

Maintenance

Mechanical System Troubleshooting

Issue	Possible Cause	Remedy
Supply blower will not start	Firestat contact closure	Check firestat switch
	Loss of main power	Check for tripped circuit breaker or blown fuses
	Manually shut down on controller	Restart
	Faulty control wiring	Check for loose or incorrect wires on system and controller
	Faulty wiring	Check for loose or faulty wiring on system and controller
	Motor windings have shorted	Replace motor
	Blower overload has tripped	reset overload
Compressor will not start	Manually shut down on controller	Restart
	Faulty control wiring	Check for loose or incorrect wires on system and controller
	No demands to run	Adjust setpoints to what is indicated on the unit Nameplate
	Loss of main power	Check for tripped circuit breaker or blown fuses
	Blower not operating	Refer to supply blower problem section
	Faulty wiring	Check for loose or faulty wiring on system and controller
	Compressor thermal protector is open	Allow one hour for compressor to cool off.
	Compressor delay-timer	Wait 3 minutes for timer
	Compressor overload has tripped	Correct cause and reset overload
	Compressor draws locked rotor amps	Replace compressor (or check fuses on three-phase units)
	Motor windings have shorted	Replace compressor
	Compressor starts but does not pump	Replace compressor
Low Suction pressure	Excessive bubbles in sight glass (more than 10% of volume)	Lack of refrigerant. Check receiver sight glasses –level indicators. Is the bottom ball floating?
		Blocked filter drier.
	Return air is below 70°F	Is cold outdoor air mixing upstream of the coil?
		Too much cold outdoor air being introduced to the space. Duct heater not able to accommodate actual load. Review space heating requirement.
Low Suction pressure	Head pressure too low	Keep head pressure above 200 PSI by adjusting head pressure regulator
	Return air % RH level too low	Check register locations for short-cycling of air.
		Check setpoints; unit should not be operating.
Insufficient evaporator air flow	Evaluate system air flow	

Maintenance

		Check for dirty filters or restricted ductwork
		Assure coils are not blocked or dirty.
		Close bypass damper to force additional air across the coil.
	Blocked filter drier	Evaluate filter pressure drop and replace if necessary
	Expansion valve not feeding properly	Evaluate expansion valve setting and performance. Replace if necessary.
	Restriction in refrigeration piping	Check piping for kinks
High Head pressure	Compressor discharge service valves closed or not fully open	Fully open service valves
	Excessive refrigerant charge	Check receiver sight glasses – level indicators. Is the top ball floating? Re-evaluate system charge
	Non-condensables in system	Evacuate or purge system
	Solenoid valve not opening	Check all solenoid valves operation
	Restriction in refrigeration piping	Check coil and tubing for kinks
	Refrigeration system is overloaded	Check operating conditions against the unit design conditions on the nameplate. It may be undersized.
	Too much airflow across evaporator	Verify the bypass damper is open.
Balance the system airflow as directed in section 6.4		
Outdoor Condenser and Dry Cooler related High Head Pressure	Air on condenser temperature above design condition.	If this is a chronic situation a larger condenser or dry cooler may be required.
	Excessive pressure drop in line sets	Re-evaluate remote condenser installation and line sizing
	Fan motor overload tripped.	Reduce fan speed and reset overload
	Contactors faulty	Replace contactor
	Outdoor condenser fan does not run.	Control wiring missing from dehumidifier
	ORI valve setting too high	Adjust ORI in water heating mode so unit delivers 10 degrees of water heating.
Unit operates but windows have condensation	Poor air distribution	Ensure all exterior windows see 3-5 CFM/ft ² of glass over their entire area
	Airflow across evaporator is too high. Coil only doing sensible cooling	Check bypass damper operation. Ensure fully open or recalibrate in Service mode.
	Unit is undersized	Re-evaluate unit sizing. Check for initially neglected sources of humidity
	Air and/or pool water temperature incorrect	Reset controller setpoints to original design specifications

Maintenance

Compressor runs for short periods and shuts off Low Supply Air Temperature rise in Dehumidification Mode	Conditions are being satisfied quickly	Check register locations for short-circuiting of air Unit oversized
	Too much airflow through unit.	Balance the system airflow as directed in section 6.4
High Supply Air Temperature rise in Dehumidification Mode	Too little airflow through unit.	Close bypass plugs until desired target range reached.
		Re-evaluate duct pressure losses to ensure they are within the parameters indicated on the unit nameplate.

Microprocessor Troubleshooting

Issue	Possible Cause	Remedy
Communication fault	Broken or loose wire between controller and IO board	Repair any damaged or loose wires.
	Corrosion on pins or terminals	Clean pins and terminals
	Defective IO board – LED is not on	Replace IO board
	Defective controller	Replace controller
Sensor fault	Sensor wires broken or shorted to ground	Connect sensor directly to IO board. If it functions replace wire.
	Sensor reading outside design parameters	Replace sensor
Setpoint out of range	Setpoint parameters are outside acceptable limits	Reenter setpoint. Replace sensor if problem persists
Emergency operation mode on	Manually selected by user	Replace controller

Warranty

General Policy

This warranty applies to the original equipment owner and is not transferable. Seresco Inc. warrants as set forth and for the time periods shown below that it will furnish, through a Seresco Inc. authorized installing contractor or service organization, a new or rebuilt part for a factory installed part which has failed because of defect in workmanship or material.

Warranty VOID unless Registered

Warranty is void unless upon start-up of the unit the "Warranty Registration and Start-up Report" is completed and sent to the factory within one week of initial start-up. This report will also register the compressor warranty with the compressor manufacturer.

Initial 90-day Warranty

During the first 90 days from initial start-up and prior to the completion of the 24th month from date of shipment, whichever comes first and subject to prior written approval from the factory Seresco Inc. will provide and/or reimburse the required labor, materials, and shipping and handling costs incurred in the replacement or repairing of a factory installed defective part. Only the labor required to replace the defective part is warranted - travel time, diagnostic time, per diems, truck charges etc. are not covered under this warranty.

2 Year Parts Warranty

If any factory installed part supplied by Seresco Inc. fails because of a defect in workmanship or material prior to the completion of the 24th month from date of shipment, Seresco Inc. will furnish a new or rebuilt part F.O.B. factory. No labor reimbursement will be made for expenses incurred in making field adjustments or parts replacement outside the Initial 90-day Warranty. Seresco Inc. reserves the right to have the defective part returned to the factory in order to determine warranty applicability. Parts shipping and handling costs (to and from the factory) are not covered outside of the Initial 90-day Warranty.

Replacement Part Warranty

If a replacement part provided by Seresco Inc. under this warranty fails due to a material defect prior to the end of the 2 Year Parts Warranty (or the end of the extended warranty period if applicable) or 12 months from date of the replacement part shipment whichever comes first, Seresco Inc. will furnish a new or rebuilt part F.O.B. factory.

Applicability

This warranty is applicable only to products that are purchased and installed in the United States and Canada. This warranty is NOT applicable to:

1. Products that have become defective or damaged as a result of the use of a contaminated water circuit or operation at abnormal water temperatures and/or flow rates.
2. Parts that wear out due to normal usage, such as air filters, belts and fuses. Refrigerant lost during the parts warranty will be reimbursed in accordance to the current market price of refrigerant at the time of repair. Seresco Inc. will not be responsible for refrigerant lost from the system due to improperly installed contractor piping to the remote outdoor air cooled condenser.
3. Refrigerant coils that corrode due to improperly balanced pool chemistry or corrosive air quality.
4. Components that have been relocated from their original placement at the factory.
5. Any portion of the system not supplied by Seresco Inc.
6. Products on which the model and/or serial number plates have been removed or defaced.
7. Products which have become defective or damaged as a result of unauthorized opening of refrigeration circuit, improper wiring, electrical supply characteristics, poor maintenance, accidents, transportation, misuse, abuse, fire, flood, alteration and/or misapplication of the product.
8. Products not installed, operated and maintained as per Seresco Inc. Owner's Manual.
9. Products on which payment is in default

Limitations

This warranty is given in lieu of all other warranties. Anything in the warranty notwithstanding, any implied warranties of fitness for particular purpose and merchantability shall be limited to the duration of the express warranty. Manufacturer expressly disclaims and excludes any liability for consequential or incidental damage for breach of any express or implied warranty.

Warranty

Where a jurisdiction does not allow limitations or exclusions in a warranty, the foregoing limitations and exclusions shall not apply to the extent of the legislation, however, in such case the balance of the above warranty shall remain in full force and effect.

This warranty gives specific legal rights. Other rights may vary according to local legislation.

Force Majeure

Seresco Inc. will not be liable for delay or failure to provide warranty service due to government restrictions or restraints, war, strikes, material shortages, acts of God or other causes beyond Seresco Inc. control

Optional 5 Year Compressor Warranty

This extended warranty must be purchased before the shipment of the unit.

Seresco Inc. will provide a replacement compressor for 60 months from the date of shipment provided the factory installed compressor fails as a result of manufacturing defect and is returned to the factory with transportation prepaid. This extended compressor warranty is subject to all the terms of the standard Seresco Inc. warranty but applied to the compressor only.

No charges attributed to the replacement of a component, except as detailed in above Initial 90-day Warranty, will be allowed unless specifically granted in writing beforehand by Seresco Inc.

Optional Five Year Airside Coil Warranty

This extended warranty must be purchased before the shipment of the unit.

Seresco Inc. will provide a replacement Airside Coil for 60 months from the date of shipment provided the failed coil is returned to the factory with transportation prepaid. This extended coil warranty is subject to all the terms of the standard NE Series warranty but applied to the coil only.

No charges attributed to the replacement of a component, except as detailed in above Initial 90-day Warranty, will be allowed unless specifically granted in writing beforehand by Seresco Inc.

This warranty is contingent to the proper maintenance of pool water chemistry including a pH of between 7.2 and 7.6 free chlorine not exceeding 2.0 ppm and combined chlorine maintained at less than 0.3 ppm. These parameters are to be measured and recorded daily and be available for review upon request.

Optional 10 Year Airside Coil Warranty

This extended warranty must be purchased before the shipment of the unit.

Seresco Inc. will provide a replacement Airside Coil for 120 months from the date of shipment provided the failed coil is returned to the factory with transportation prepaid. This extended coil warranty is subject to all the terms of the standard NE Series warranty but applied to the coil only.

No charges attributed to the replacement of a component, except as detailed in above Initial 90-day Warranty, will be allowed unless specifically granted in writing beforehand by Seresco Inc.

This warranty is contingent to the proper maintenance of pool water chemistry including a pH of between 7.2 and 7.6 free chlorine not exceeding 2.0 ppm and combined chlorine maintained at less than 0.3 ppm. These parameters are to be measured and recorded daily and be available for review upon request

Annex

(Includes pertinent information about parts)