



DEDICATED OUTDOOR AIR SYSTEM (DOAS) INSTALLATION AND OPERATION MANUAL



Variable Refrigerant Flow DOAS Units
ARND20BDAT2
ARND20BDAR2 (no preheat)

Do not throw away or destroy this manual.

Please read carefully and store in a safe place for future reference.

The instructions included in this manual must be followed to prevent product malfunction, property damage, injury, or death to the user or other people. Incorrect operation due to ignoring any instructions will cause harm or damage.

A list of safety precautions begins on page 4.

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SAFETY PRECAUTIONS



The instructions below must be followed to prevent product malfunction, property damage, injury or death to the user or other people. Incorrect operation due to ignoring any instructions will cause harm or damage. The level of seriousness is classified by the symbols below.

TABLE OF SYMBOLS

DANGER	<i>This symbol indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.</i>
WARNING	<i>This symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.</i>
CAUTION	<i>This symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.</i>
Note:	<i>This symbol indicates situations that may result in equipment or property damage accidents only.</i>
	<i>This symbol indicates an action that should not be performed.</i>

INSTALLATION

DANGER

Don't use or store flammable gas or combustibles near the unit.
There is risk of fire, explosion, and physical injury or death.

WARNING

Do not install, remove, or re-install the unit by yourself (end-user). Ask the dealer or an LG trained technician to install the unit.

Improper installation by the user may result in water leakage, fire, explosion, electric shock, physical injury or death.

For replacement of an installed unit, always contact an LG trained service provider.

There is risk of fire, electric shock, explosion, and physical injury or death.

Periodically check that the outdoor unit is not damaged.

There is risk of explosion, physical injury, or death.

Replace all control box and panel covers.

If cover panels are not installed securely, dust, water and animals may enter the unit, causing fire, electric shock, and physical injury or death.

Always check for system refrigerant leaks after the unit has been installed or serviced.

Exposure to high concentration levels of refrigerant gas may lead to illness or death.

Do not install the unit using defective hanging, attaching, or mounting hardware.

There is risk of physical injury or death.

Wear protective gloves when handling equipment.

Sharp edges may cause personal injury.

Dispose of the packing materials safely.

- *Packing materials, such as nails and other metal or wooden parts may cause puncture wounds or other injuries.*
- *Tear apart and throw away plastic packaging bags so that children may not play with them and risk suffocation and death.*

Do not install the unit in any location exposed to open flame or extreme heat. **Do not touch the unit with wet hands.**

There is risk of fire, electric shock, explosion, and physical injury or death.

Install the unit considering the potential for earthquakes.

Improper installation may cause the unit to fall, resulting in physical injury or death.

Do not change the settings of the protection devices.

If the pressure switch, thermal switch, or other protection device is shorted and forced to operate improperly, or parts other than those specified by LG are used, there is risk of fire, electric shock, explosion, and physical injury or death.

If the unit is installed in a small space, take measures to prevent the refrigerant concentration from exceeding safety limits in the event of a refrigerant leak.

Consult the latest edition of ASHRAE (American Society of Heating, Refrigerating, and Air Conditioning Engineers) Standard 15. If the refrigerant leaks and safety limits are exceeded, it could result in personal injuries or death from oxygen depletion.



INSTALLATION – CONTINUED

⚠ CAUTION

Be very careful when transporting the product.

- ⓧ Do not attempt to carry the product without assistance.
- Some products use polypropylene bands for packaging. ⓧ Do not use polypropylene bands to lift the unit.
- Suspend the unit from the base at specified positions.
- Support the unit at a minimum of four points to avoid slippage from rigging apparatus.
- Failure to follow these directions may result in minor or moderate physical injury.

Note:

Properly insulate all cold surfaces to prevent “sweating.”

Cold surfaces such as uninsulated pipe can generate condensate that may drip and cause a slippery floor condition and/or water damage to walls.

When installing the unit in a hospital, mechanical room, or similar electromagnetic field (EMF) sensitive environment, provide sufficient protection against electrical noise.

Inverter equipment, power generators, high-frequency medical equipment, or radio communication equipment may cause the air conditioner to operate improperly. The unit may also affect such equipment by creating electrical noise that disturbs medical treatment or image broadcasting.

ⓧ **Do not use the product for special purposes such as preserving foods, works of art, wine coolers, or other precision air conditioning applications. This equipment is designed to provide comfort cooling and heating.**

There is risk of property damage.

ⓧ **Do not make refrigerant substitutions. Use R410A only.**

If a different refrigerant is used, or air mixes with original refrigerant, the unit will malfunction and become damaged.

ⓧ **Do not install the unit in a noise sensitive area.**

When connecting refrigerant tubing, remember to allow for pipe expansion.

Improper piping may cause refrigerant leaks and system malfunction.

Take appropriate actions at the end of HVAC equipment life to recover, recycle, reclaim or destroy R410A refrigerant according to applicable U.S. Environmental Protection Agency (EPA) rules.

Install the unit in a safe location where no one can step on or fall onto it. ⓧ Do not install the unit with defective hanging, attaching, or mounting hardware.

There is risk of unit and property damage.

Install the drain hose to ensure adequate drainage.

There is a risk of water leakage and property damage.

ⓧ **Don't store or use flammable gas / combustibles near the unit.**

There is risk of product failure.

Always check for system refrigerant leaks after the unit has been installed or serviced.

Low refrigerant levels may cause product failure

The unit is shipped with a nitrogen charge and the coil connections are capped. ⓧ Do not remove coil caps on the unit until all non-condensibles have been removed from the piping system and authorization to do so has been obtained from the commissioning agent.

There is a risk of refrigerant contamination, refrigerant loss and equipment damage.

Ductwork and other installed airflow restriction devices such as filters shall not exceed the rated maximum static pressure limits of the DOAS fan assembly.

Doing so may cause product malfunction.

SAFETY PRECAUTIONS



WIRING

⚠ DANGER

High voltage electricity is required to operate this system. Adhere to the National Electrical Codes and these instructions when wiring.

Improper connections and inadequate grounding can cause accidental injury or death.

Always ground the unit following local, state, and National Electrical Codes.

Turn the power off at the nearest disconnect before servicing the equipment.

Electric shock can cause physical injury or death.

Properly size all circuit breakers or fuses.

There is risk of fire, electric shock, explosion, physical injury or death.

⚠ WARNING

The information contained in this manual is intended for use by an experienced, trained electrician familiar with the U.S. National Electric Code (NEC) who is equipped with the proper tools and test instruments.

Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury or death.

Ensure the unit is connected to a dedicated power source that provides adequate power.

If the power source capacity is inadequate or the electric work is not performed properly, it may result in fire, electric shock, physical injury or death.

Refer to local, state, and federal codes, and use power wires of sufficient current capacity and rating.

Wires that are too small may generate heat and cause a fire.

Secure all field wiring connections with appropriate wire strain relief.

Improperly securing wires will create undue stress on equipment power lugs. Inadequate connections may generate heat, cause a fire and physical injury or death.

Properly tighten all power connections.

Loose wiring may overheat at connection points, causing a fire, physical injury or death.

Note:

⊘ Do not cut, lengthen or shorten the communications and power cable between any dry contact unit and its connected indoor unit. ⊘ Do not install the unit in a location where the communications and power cable cannot be safely and easily connected between the two units. ⊘ Do not allow strain on this cable.

Poor cable connections can cause equipment malfunction.

OPERATION

⚠ DANGER

⊘ Do not provide power to or operate the unit if it is flooded or submerged.

There is risk of fire, electric shock, physical injury or death.

Use a dedicated power source for this product.

There is risk of fire, electric shock, physical injury or death.

⊘ Do not operate the disconnect switch with wet hands.

There is risk of fire, electric shock, physical injury or death.

Periodically verify the hanging bolts and other hardware securing the unit have not deteriorated.

If the unit falls from its installed location, it can cause physical injury or death.

If refrigerant gas leaks out, ventilate the area before operating the unit.

If the unit is mounted in an enclosed, low-lying, or poorly ventilated area and the system develops a refrigerant leak, it may cause fire, electric shock, explosion, physical injury or death.

⚠ WARNING

⊘ Do not allow water, dirt, or animals to enter the unit.

There is risk of unit failure, fire, electric shock, physical injury or death.

Avoid excessive cooling and periodically perform ventilation to the unit.

Inadequate ventilation is a health hazard.

⊘ Do not touch refrigerant piping during or after operation.

It can cause burns or frostbite.

⊘ Do not operate the unit with the panel(s) or protective cover(s) removed; keep fingers and clothing away from moving parts.

The rotating, hot, cold, and high-voltage parts of the unit can cause physical injury or death.

Periodically check power cable and connection for damage.

Cable must be replaced by the manufacturer, its service agent, or similar qualified persons in order to avoid physical injury and/or electric shock.

Securely attach the electrical cover to the unit.

Non-secured electrical covers can result in burns or electric shock due to dust or water in the service panel.

⊘ Do not open the inlet grille of the unit during operation.

⊘ Do not operate the unit with the panels or guards removed. ⊘ Do not insert hands or other objects through the inlet or outlet when the unit is powered. ⊘ Do not touch the electrostatic filter, if the unit includes one.

The unit contains sharp, rotating, hot, and high voltage parts that can cause personal injury and/or electric shock.

Ensure no power is connected to the unit other than as directed in this manual. Remove power from the unit before removing or servicing the unit.

There is risk of unit failure, fire, electric shock, physical injury or death.

⚠ CAUTION

To avoid physical injury, use caution when cleaning or servicing the air conditioner.

Note:

Clean up the site after installation is finished, and check that no metal scraps, screws, or bits of wiring have been left inside or surrounding the unit.

⊘ Do not use this equipment in mission critical or special-purpose applications such as preserving foods, works of art, wine coolers or refrigeration. This equipment is designed to provide comfort cooling and heating.

Provide power to the compressor crankcase heaters at least six (6) hours before operation begins.

Starting operation with a cold compressor sump(s) may result in severe bearing damage to the compressor(s). Keep the power switch on during the operational season.

⊘ Do not block the inlet or outlet.

Unit may malfunction.

Securely attach the electrical cover to the indoor unit.

Non-secured covers can result in fire due to dust or water in the service panel.

Periodically verify the equipment mounting hardware has not deteriorated.

If the base collapses, the unit could fall and cause property damage or product failure.

⊘ Do not allow water, dirt, or animals to enter the unit.

There is risk of unit failure.

Table 1: Dedicated Outdoor Air System General Data

	Dedicated Outdoor Air System	
	ARND20BDAT2	ARND20BDAR2
<i>Cooling Mode Performance</i>		
Capacity (Btu/h)	143,100	143,100
<i>Heating Mode Performance</i>		
Capacity (Btu/h) (Main Coil)	59,900	59,900
Capacity (Btu/h) (Reheat Coil)	45,900	45,900
<i>Entering Air</i>		
Cooling Max (°F DB/WB)	122/78	122/78
Heating Min (°F DB)	2.5	41
<i>Unit Data</i>		
Refrigerant Type ¹	R410A	R410A
Refrigerant Control	EEV	EEV
Sound Power dB(A)	84	84
Net Unit Weight (lbs)	725	600
Shipping Weight (lbs)	825	700
Communication Cable ²	4 x 18	4 x 18
<i>Fan</i>		
Type	Backward Curved Plenum	Backward Curved Plenum
Motor	1	1
Motor/Drive	ECM/Direct	ECM/Direct
Airflow Rate (CFM)	2000	2000
External Static Pressure (in wg)	1.65	1.65
Airflow Range (CFM)	1200 - 2000	1200 - 2000
<i>Piping (Main Coil)</i>		
Liquid Line (in, OD)	1/2	1/2
Vapor Line (in, OD)	1-1/8	1-1/8
<i>Piping (Reheat Coil)</i>		
Liquid Line (in, OD)	1/2	1/2
Vapor Line (in, OD)	1-1/8	1-1/8
<i>Condensate</i>		
Condensate Line (in, OD)	1 NPT	1 NPT

EEV - Electronic Expansion Valve ECM - Electronically Commutated Motor

Power wiring is field supplied and must comply with the applicable local and national codes.

This data is rated 0 ft. above sea level, with 25 ft. of refrigerant piping per coil.

Main Coil Cooling capacity rating obtained with entering air of 95°F DB/75°F WB and leaving air of 52.9°F DB, 52.5°F WB.

Main Coil Heating capacity rating obtained with entering air of 44°F DB and leaving air of 75°F DB.

Reheat Coil Heating capacity rating obtained with entering air of 54°F DB and leaving air of 86°F DB.

¹Take appropriate actions at the end of HVAC equipment life to recover, recycle, reclaim or destroy R410A refrigerant according to applicable regulations (40 CFR Part 82, Subpart F) under section 608 of CAA.

²All communication cable to be minimum 18 AWG, 4-conductor, stranded, shielded and must comply with applicable and national code.

Power Supply (V/Hz/Ø): 208-230/60/3.

Note:

Actual discharge air temperatures may vary from discharge air temperature set-point due to changes in outdoor air processing loads.

ASHRAE Standards 15-2010 and 34-2010 offer guidelines that address refrigerant safety and the maximum allowable concentration of refrigerant in an occupied space. Refrigerant will dissipate into the atmosphere, but a certain volume of air is required for this to occur safely. For R410A refrigerant, the maximum allowable concentration of refrigerant is twenty-six (26) lbs. per 1,000 cubic feet of an occupied space. Buildings with twenty-four (24) hour occupancy allow half of that concentration.

ASHRAE Standards 15 and 34 assume that if a system develops a leak, its entire refrigerant charge will dump into the area where the leak occurs. To meet ASHRAE Standards 15 and 34, calculate the refrigerant concentration that may occur in the smallest room volume on the system, and compare the results to the maximum allowable concentration number. Also consult state and local codes in regards to refrigerant safety.

Note:

Verify the maximum refrigerant concentration level for spaces served by DOAS meets the concentration limit for the application.

LOCATION SELECTION

Clearance Requirements

Selecting the Best Location

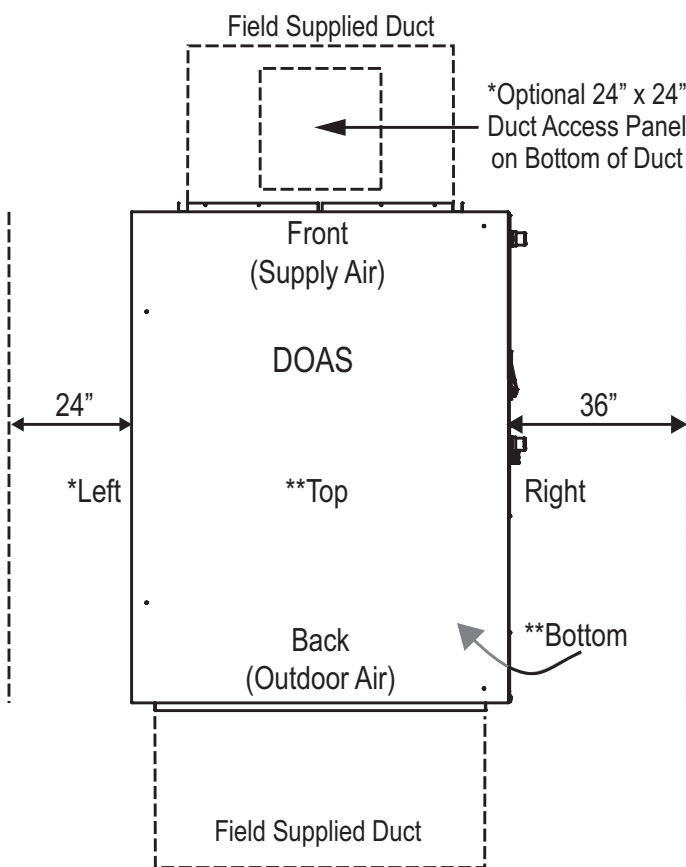
Placement of the unit relative to ductwork, electrical and plumbing must be carefully considered. Use flexible gasket material to seal the duct to the unit.

Verify floor, foundation or suspension support can sustain the total unit weight, including accessories. The unit must be level on both horizontal axis to support the unit and reduce noise and vibration.

Allow adequate space for piping access and panel removal. To ensure proper access for field service, maintain minimum clearances for field piping and other obstructions. Refer to Figure 1. Condensate drain connections are located on the access side of the unit.

Follow local building codes for additional service clearance requirements.

Figure 1: Minimum Clearance Required for Unit Access



*Left access clearance may be reduced to 6" if optional 24" x 24" access panel is included on duct as shown.

**Top and Bottom clearances are both 6"

Suspended Unit Mounting Details

DOAS units are equipped for suspended installations. The unit should be lifted into position by supporting the unit with skid used for shipping. Carefully install the DOAS unit to prevent damage to the cabinet and ensure the unit is installed level. Additional installation provisions may be necessary depending on the job specifications. The specifying engineer or installing contractor are responsible for ensuring the installation of the DOAS is structurally sound. Refer to Figure 2 and Figure 3 for recommended suspended installation methods.

DOAS unit can be installed using either platform suspension (Figure 2) or parallel beam suspension (Figure 3) as shown below.

Figure 2: Series Platform Suspension Installation

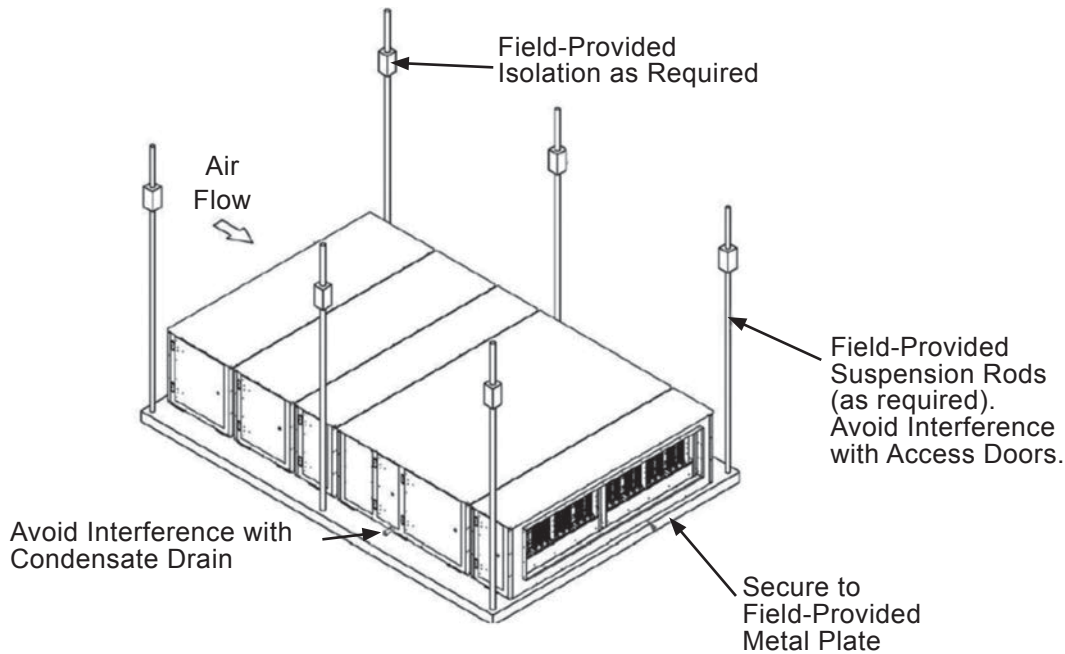
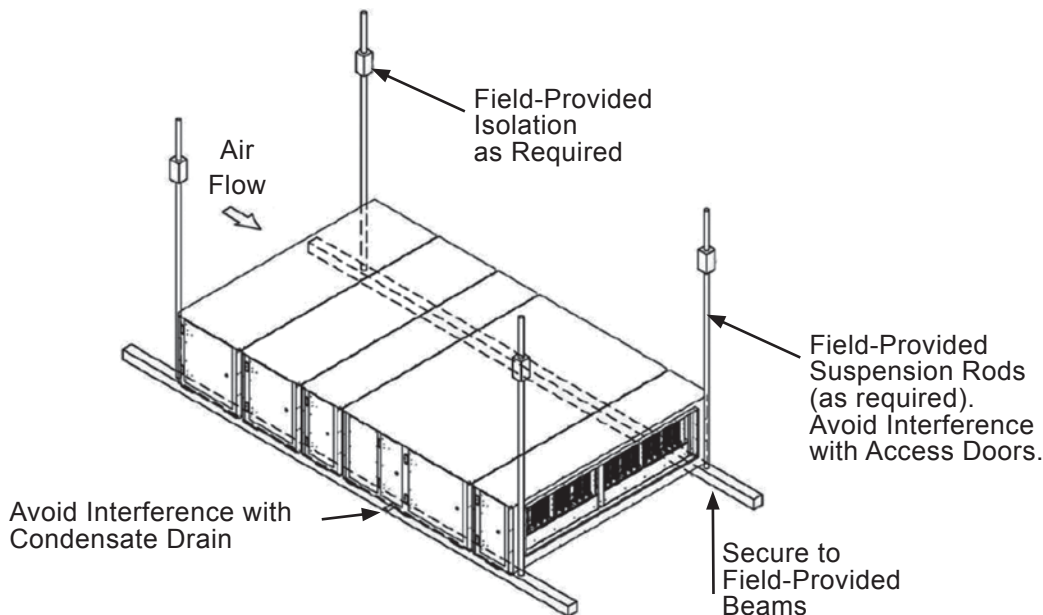


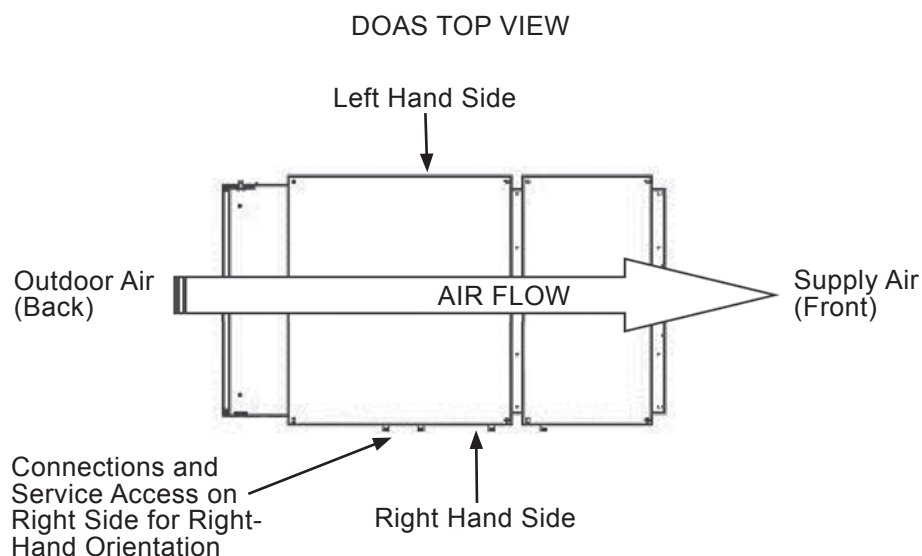
Figure 3: Series Parallel Beam Suspension Installation



LOCATION SELECTION

Unit Orientation and Control Component Location

Figure 4: Unit Orientation



Note:

Filter, coil and wiring access doors are on the right side as designated by the unit orientation and fan access door is on the left side. The back will always be the same side as the filter and outdoor air opening. The front will always be the side opposite the filter and outdoor air opening.

Note:

Failure to observe the following instructions will result in premature failure of the DOAS and possibly void your warranty.

Receiving the Unit

- Check the unit for damage that may have occurred during transit.
- If damage is found, note it on the carrier's freight bill and request an inspection by the carrier's agent immediately.
- Check the name plate to ensure the correct model sizes and voltages were received and match and satisfy the job requirements.
- In order to protect the limited warranty, if repairs need to be made to damaged goods, then the factory should be notified before any repair action is taken. Certain equipment alterations, repairs and manipulation of equipment without consent from the manufacturer may void the product's limited warranty.

Note:

Upon receipt, check the shipment for items that ship loose such as filters and remote sensors. Review order and shipment documentation to identify potentially loose shipped items. These items may have been placed inside the unit cabinet for security. Installers and owners should secure all doors with locks or nuts and bolts to prevent unauthorized access.

Storage

The DOAS cannot be stored outdoors. If installation does not occur immediately following delivery, store the equipment in a dry protected area away from construction traffic and in the proper orientation as marked by the packaging. Prior to storing the unit, secure all loose-shipped items.

Handling the Unit

Before lifting the unit, ensure all shipping material has been removed. If spreader bars, blocking or other lifting devices are used, take extra care to ensure the cabinet, coil and fans are not damaged.

Figure 5: Lockable Handle



PIPING

Condensate Drain Piping

Condensate Drain Piping

Condensate drain trapping and piping must conform to all applicable codes. A p-trap and drain line must be installed. The p-trap cannot exceed 6 inches from the drain connection. The lines need to be the same pipe size or larger than the drain connection, include a p-trap, and pitch downward toward the drain. An air break should be used with long condensate line runs.

Note:

Failure to install p-traps can result in an overflow of condensate water. This can lead to product damage or property damage. Draw-through cooling coils will have a negative static pressure in the drain pan area. This can cause an un-trapped drain to back up due to the air being pulled up through the condensate drain piping.

The value of pressure in the drain pipe should be at least equal to the absolute value of the negative static pressure in the drain pan plus one inch. Follow the procedure below to calculate the static pressure.

Calculating Static Pressure

1. Add the pressure drops of all components upstream of the drain plan. This includes the cooling coil.
2. Add the return duct static pressure. Include the dirt allowance pressure drop for the filters to account for the worst-case scenario.

Figure 6: Drain Trap

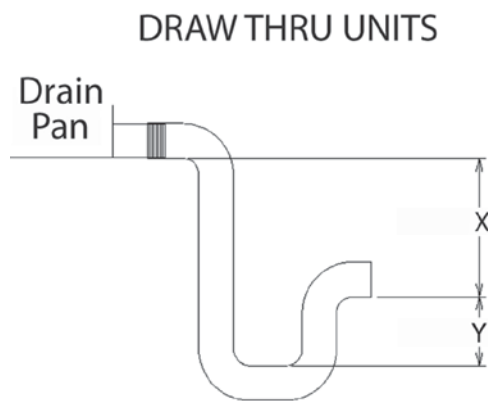


Table 2:DOAS Drain Trap Dimensions

Draw-Through		
Drain Pan Pressure	Trap Dimensions	
Negative Static	X	Y
(inches of water)	(inch)	(inch)
-0.50	1.50	0.75
-1.00	2.00	1.00
-1.50	2.50	1.25
-2.00	3.00	1.50
-2.50	3.50	1.75
-3.00	4.00	2.00
-3.50	4.50	2.25
-4.00	5.00	2.50

Note:

The absolute value of the fan inlet pressure will always be greater than or equal to the absolute value of the static pressure in the drain pan or draw-through units so the fan inlet pressure is a safe value to use for the drain pan static pressure.

Refrigerant Piping

The installing contractor is responsible for piping the condensing unit to the air handling unit. Acceptable piping sizes can be determined by using LATS software.

Refrigerant Piping Guidelines

- Pipe sizes must be selected to meet installation conditions and not based on the connection sizes at the evaporator or condensing unit.
- Only clean ACR tubing should be used and all piping should follow any applicable codes.
- The air handling unit coils are pressurized and the copper caps must be punctured to permit a gradual escape of pressure prior to unsweating the caps.
- To avoid exposing the coils to moisture, immediately couple the tubing to the DOAS unit.
- When making solder connections, ensure the dry nitrogen flows through the lines when the copper is heated to prevent oxidization inside of the copper.
- When piping is complete, the interconnecting piping and the air handling unit must be leak checked and evacuated to 500 microns or less. This will allow condenser shutoff valves to open and allow refrigerant to flow to the air handling unit.
- The DOAS should be charged based on the manual calculation of refrigerant charge, based on coil refrigerant volumes.
- The refrigerant reheat coil is to be connected to a separate outdoor unit than the main coil outdoor unit. Ensure not to cross circuits in the reheat systems.

Piping Guidelines/Duct Connections/Temp and Humidity Sensors

A properly installed pipe system will have sufficient support so that pipes will not sag during the life of the system. As necessary, place supports closer for segments where potential sagging could occur. Maximum spacing of pipe supports shall meet local codes.

Refrigerant Pipe Connections

- DOAS units come with brazed connections.

While brazing, ALWAYS follow these guidelines:

- Keep pipe supplies capped, clean, and store in a dry location.
- Cut pipe with a tubing cutter, not a saw. De-burr and clean cuts before assembly. Use dry nitrogen to blow the pipe clean before assembly.
- Do not use flux, soft solder, or anti-oxidant agents. Use a 15% silver phosphorous copper brazing alloy to avoid overheating and produce good flow.
- Protect refrigerant shut-off valves electronic expansion valves, unit case, insulation, and control components from excessive heat by using a wet rag or a heat barrier spray product while brazing.
- While brazing, always use a dry nitrogen purge operating at a minimum pressure of three (3) psig and maintain a steady flow.

Figure 7: Pipe Support at DOAS Unit

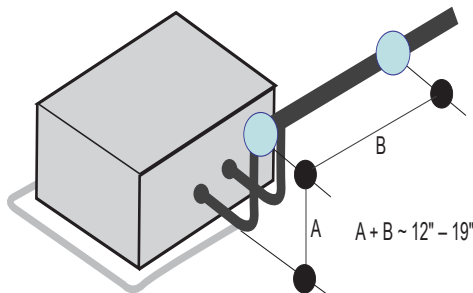
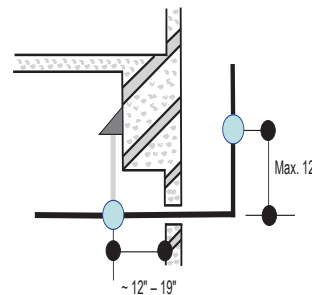


Figure 8: Typical Pipe Support Location - Change in Pipe Direction



Note: Refrigeration system components contain very small capillary tubes, small orifices, electronic expansion valves, oil separators, and heat exchangers that can easily become blocked.

Pipe Insulation

- Sufficiently insulate all cold surfaces to prevent moisture forming. Insulate all pipes. Wrap each pipe separately.
- Use field-provided half (1/2) inch thick (or more) closed cell insulation. Ambient conditions and local codes may require increased insulation.
- Wrap all refrigerant and condensate piping including field-provided isolation ball valves and flexible pipe connection kits provided by LG.
- Glue all insulation joints with no air gaps between insulation segments, and between insulation segments and the unit case. Insulation material shall fit snugly against the refrigeration pipe with no air space between the pipe surface and the surrounding insulation.

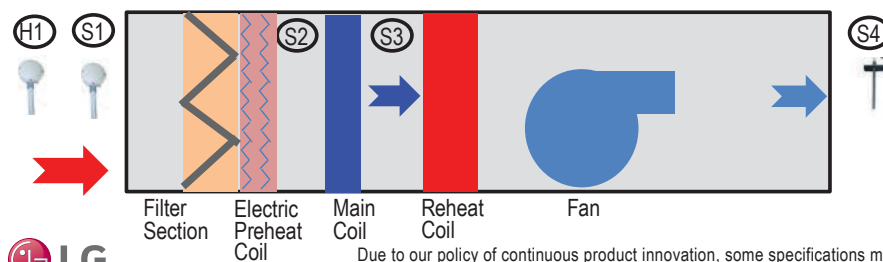
Duct Connections

- Attach duct to flanges provided on the unit. The installer is responsible for sealing ducts to the flanges to prevent water leaks.
- Ductwork should be sized in accordance with the ASHRAE Handbook. Ductwork should be installed in accordance with NFPA Standard 90A.
- When attaching duct to the unit, use a flexible/compressible material rated for duct connections. A three inch flexible connector for both outdoor air and supply duct connections is recommended.

Temperature and Humidity Sensors

Temperature and humidity sensors are shipped uninstalled inside the control compartment. Install the outside air temperature sensor (S1), the outside air humidity sensor (H1) and the discharge air temperature sensor (S4) as shown in Figure 9.

Figure 9: Temperature and Humidity Sensors



PIPING

Typical Piping Applications

DOAS System Configurations

Figure 10 through Figure 13 show typical outdoor unit/DOAS system configurations. Heat pump system configurations can have up to four DOAS units. Heat recovery system configurations can have a maximum of one DOAS unit. ⚠ Do not connect any other indoor units to an outdoor unit used in a DOAS system.

Figure 10: Typical Piping Diagram for Heat Pump Application

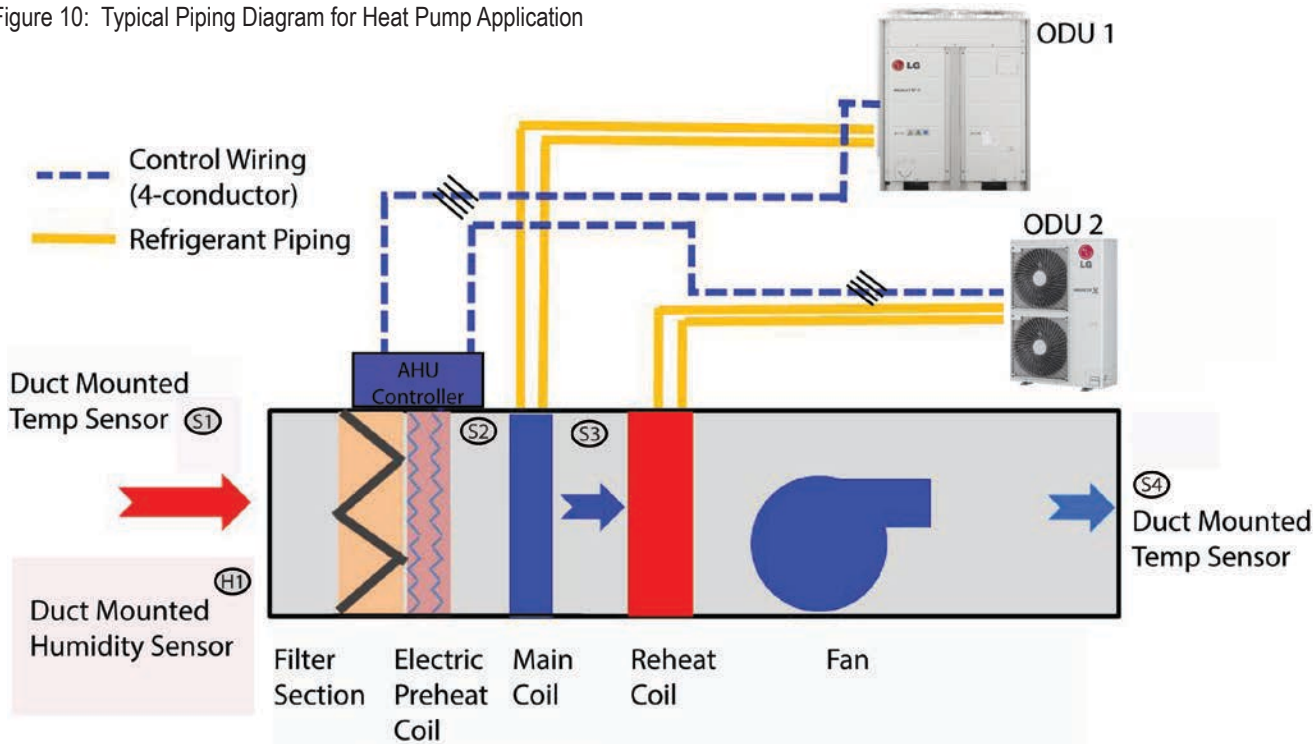


Figure 11: Typical Piping Diagram for Heat Recovery Application

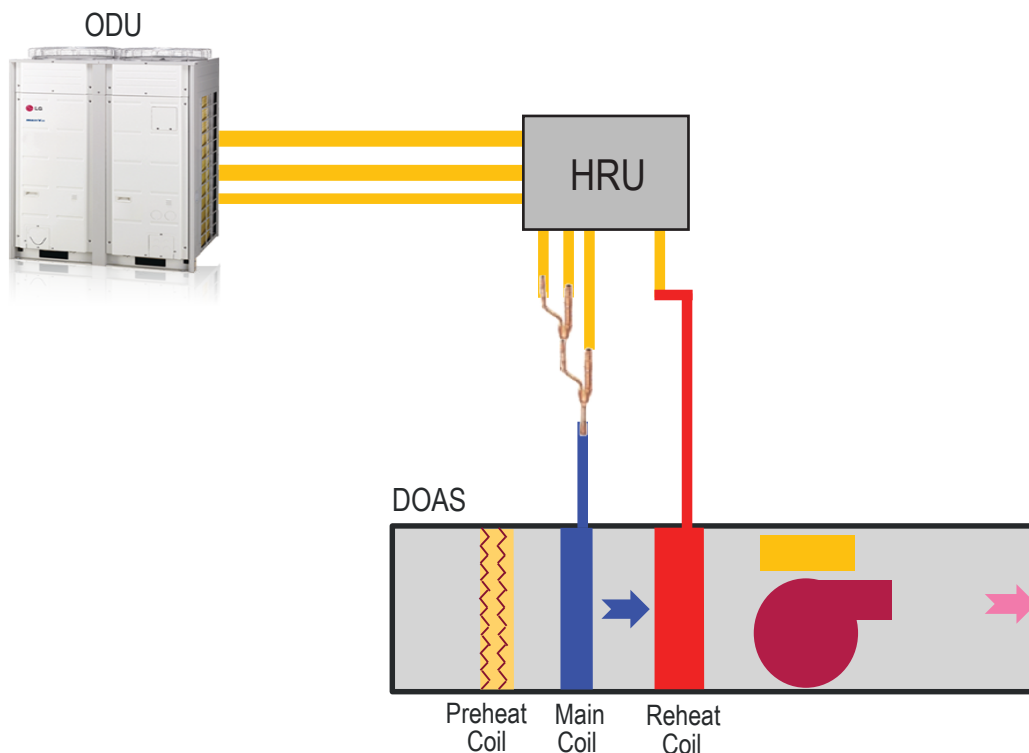


Figure 12: Typical Piping Diagram for Two DOAS Units with Two ODU in a Heat Pump Application

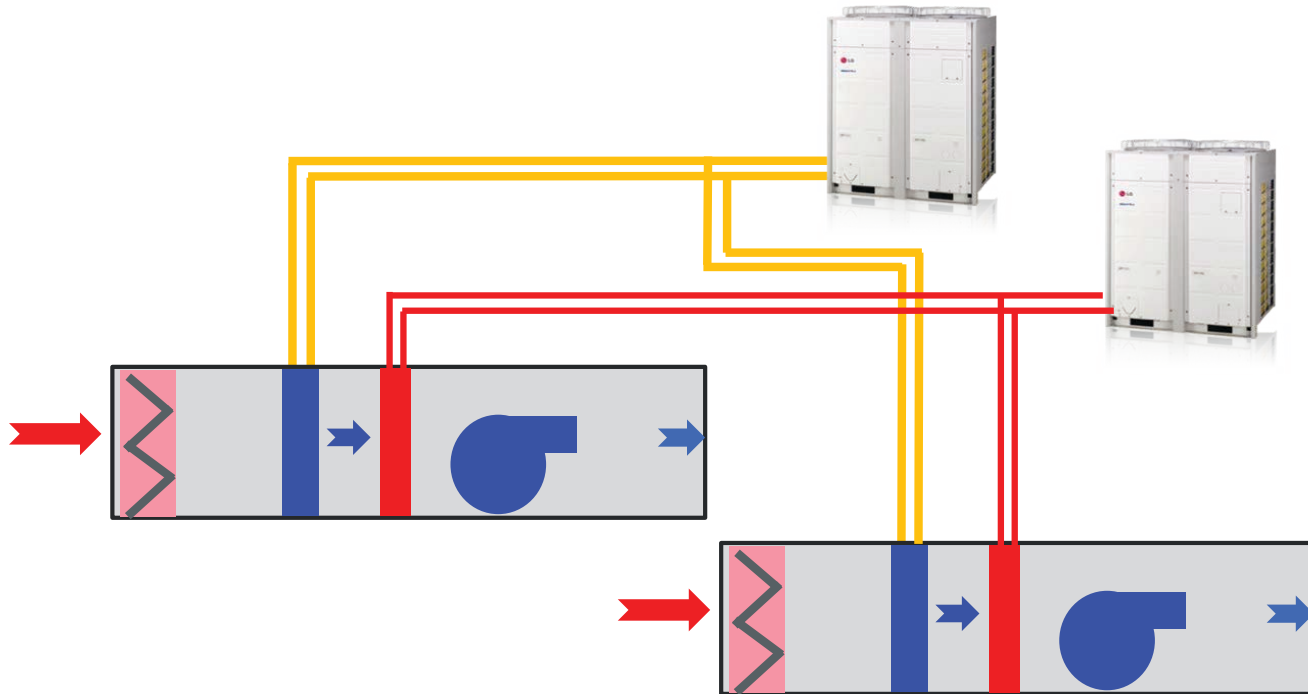
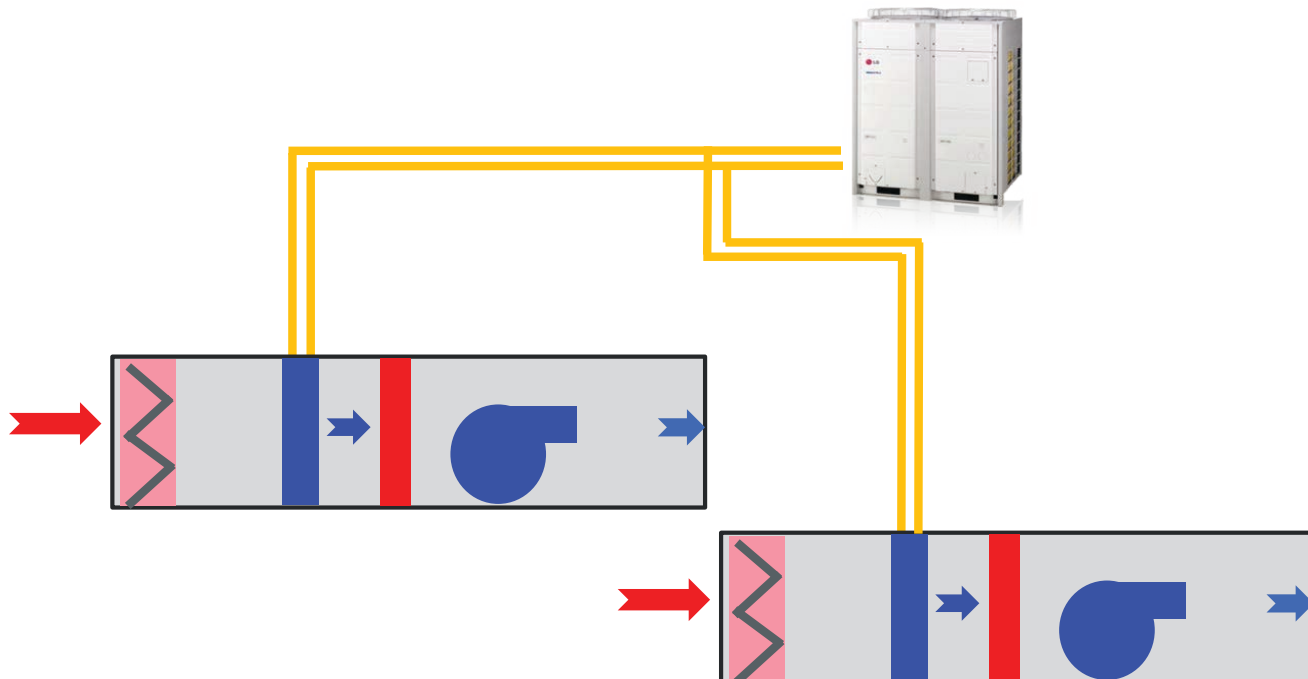


Figure 13: Typical Piping Diagram for Two DOAS Units with One ODU in a Heat Pump Application



PIPING

Refrigerant Charge

LATS software can calculate the required refrigerant trim charge or the charge can be manually calculated using Table 3.

Table 3: System Refrigerant Charge Calculator (lbs.).

System Tag or ID _____		Job Name _____		
		Project Manager _____		
		Date _____		
Line #	Description	Refrigerant Charge per Feet of Pipe	Quantity (ft)	Total (lbs.)
Main Coil Volume			1	7.5
1	Linear feet of 1/4" liquid line	0.015		
2	Linear feet of 3/8" liquid line	0.041		
3	Linear feet of 1/2" liquid line	0.079		
4	Linear feet of 5/8" liquid line	0.116		
5	Linear feet of 3/4" liquid line	0.179		
6	Linear feet of 7/8" liquid line	0.238		
7	Linear feet of 1" liquid line	0.323		
8	Total Trim (additional charge)			
Reheat Coil Volume			1	2.9
1	Linear feet of 1/4" liquid line	0.015		
2	Linear feet of 3/8" liquid line	0.041		
3	Linear feet of 1/2" liquid line	0.079		
4	Linear feet of 5/8" liquid line	0.116		
5	Linear feet of 3/4" liquid line	0.179		
6	Linear feet of 7/8" liquid line	0.238		
7	Linear feet of 1" liquid line	0.323		
8	Total Trim (additional charge)			

Outdoor Unit/DOAS Unit Communications Cable Installation Guidelines

⚠ WARNING

High voltages are used in this equipment. Ensure input power is not connected before beginning wiring procedures. Failure to observe this warning can result in death or severe injury.

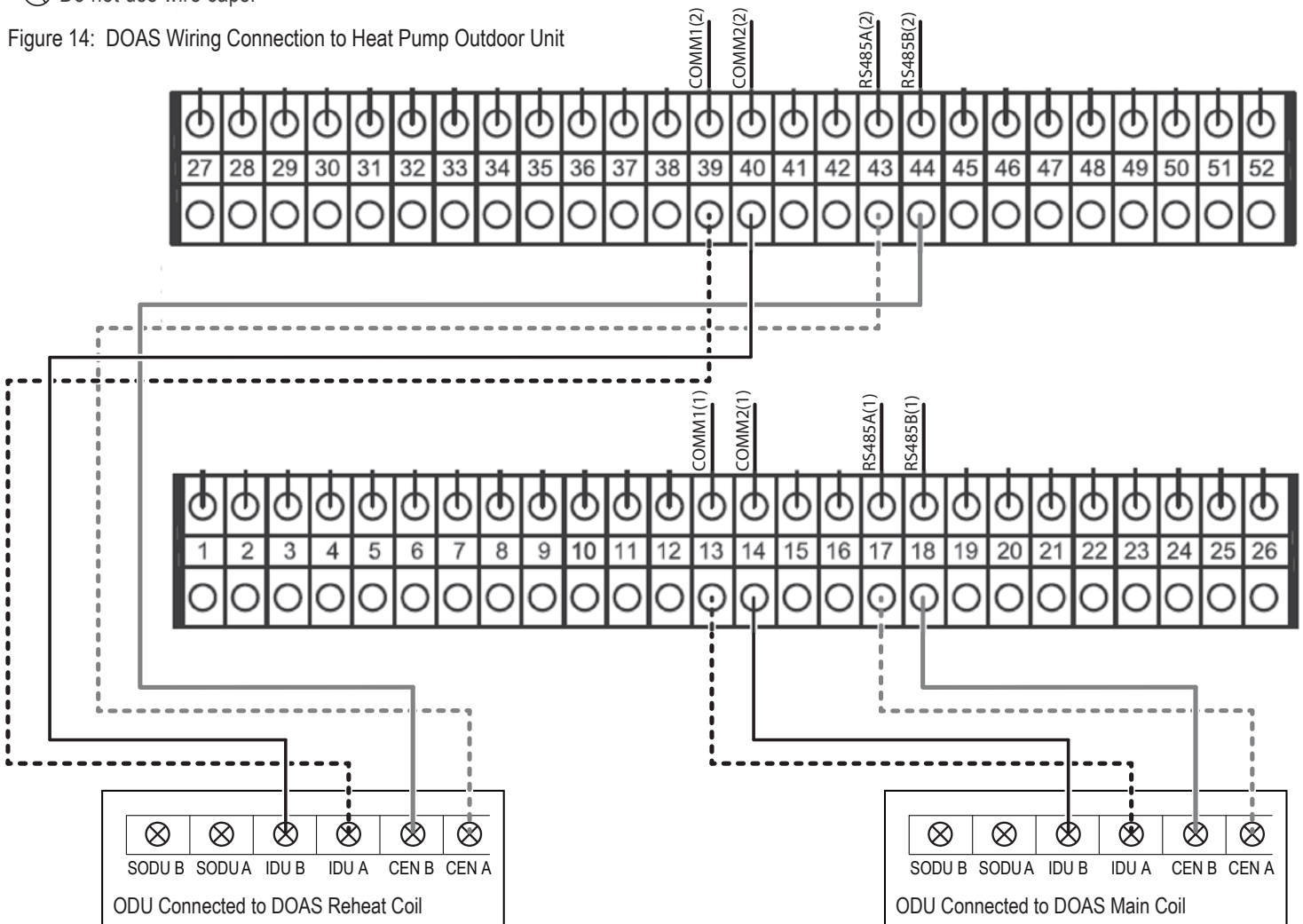
Note: Three phase voltage imbalance will cause motor overheating and premature failure. The maximum allowable imbalance is 2.0%. Voltage imbalance is defined as 100 times the maximum deviation from the average voltage divided by the average voltage.

Connect the communication cables as shown in Figure 14 (for heat pump systems) or Figure 15 (for heat recovery systems). If these connections are incorrect, the DOAS will not operate.

Note: The minimum distance required between power wires and the communications cable is voltage/ampere dependent and in cases where either are relatively high the minimum distance may be more than two (2) inches. Refer to the respective LG Multi V Outdoor Unit Engineering Manual on www.lg-vrf.com for detailed information.

- Keep communications cables away from line voltage wiring, lighting ballasts, and other devices emitting EMF energy. Maintain a minimum of two (2) inches between line voltage wires and communications cables.
- Field provide a minimum of 18-4 AWG, stranded and shielded, PVC or vinyl jacket communications wiring between the DOAS units and outdoor units.
- The outdoor/DOAS unit communications cable must be run between components in a daisy chain configuration.
- Ground the shield of the communications cable at the OUTDOOR UNIT END ONLY.
- ⓧ Do not use Star and Wye communications cable configurations.
- ⓧ Do not splice communication cables.
- ⓧ Do not use wire caps.

Figure 14: DOAS Wiring Connection to Heat Pump Outdoor Unit

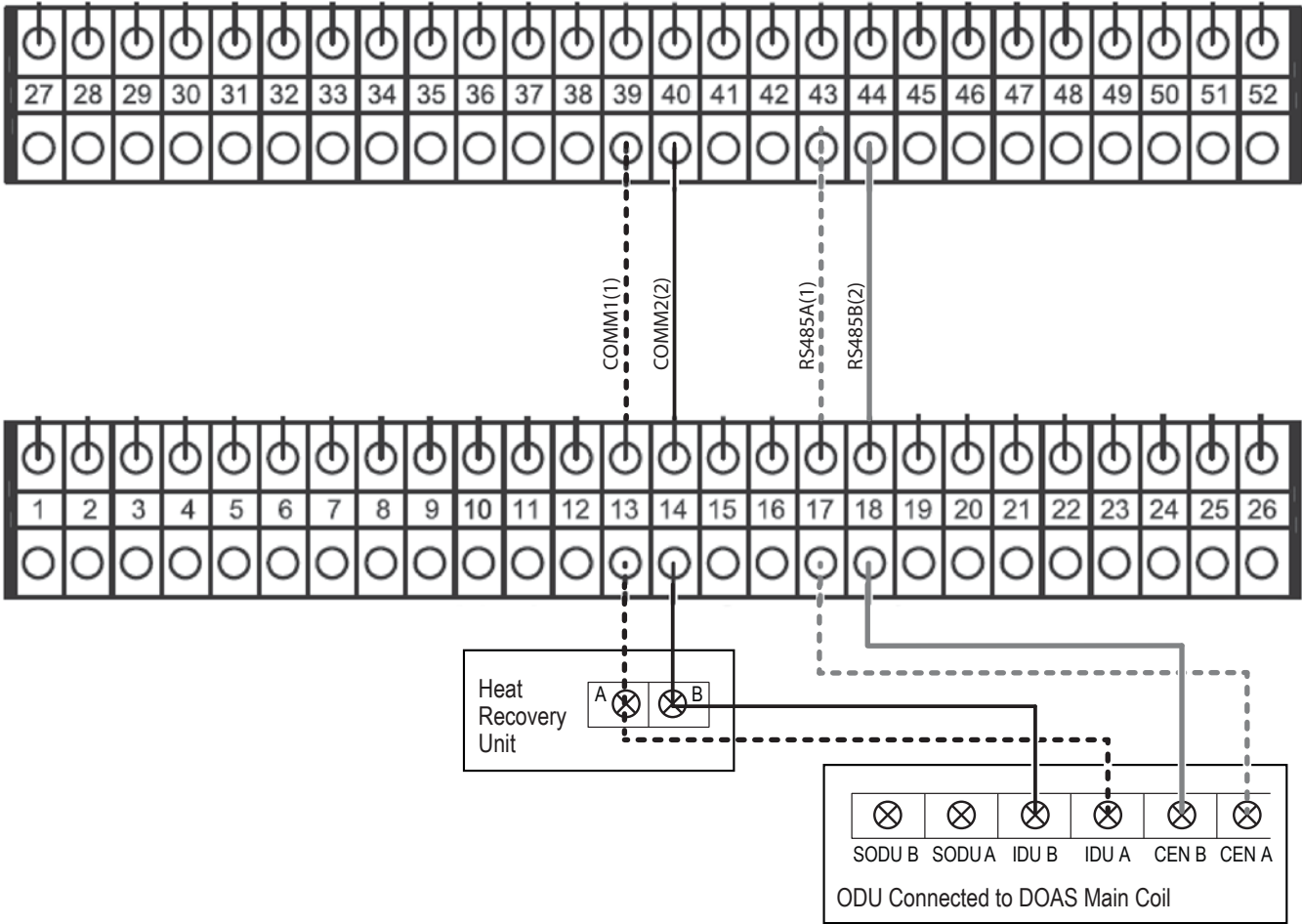


LOW VOLTAGE COMMUNICATIONS



Outdoor/DOAS Unit Communications Cable Installation Guidelines

Figure 15: DOAS Wiring Connection to Heat Recovery Outdoor Unit



DOAS Unit Capacity

The capacity (Btu/h) of the main and reheat DOAS coils are set by an option PCB installed on the DOAS IDU communication PCBs. The DOAS IDU communication PCBs are installed on the inner side of the swing-out door inside the DOAS control compartment (Figure 16). The upper PCB is for the DOAS main coil and the lower PCB is for the DOAS reheat coil.

The default capacity option PCBs installed are 76 kBtu for the main coil and 36 kBtu for the reheat coil. Additional capacity option PCBs for the capacities listed in Table 4 are in a small bag in the bottom of the swing-out door.

Figure 17 shows where the capacity option PCBs are installed on the communication PCBs. Ensure the correct capacity selection PCBs are installed.

⚠ WARNING

High voltages are used in this equipment. Ensure input power is not connected before installing capacity PCBs.

Failure to observe this warning can result in death or severe injury.

Table 4: DOAS Capacity Option PCBs

Option PCB Part Number	Capacity (Btu/h)
EBR52358907	28 k
EBR52358908	36 k
EBR52358909	42 k
EBR52358910	48 k
EBR52358911	76 k
EBR52358912	96 k
EBR52358914	115 k
EBR52358915	134 k
EBR52358916	155 k
EBR52358917	172 k
EBR52358913	192 k

Figure 16: DOAS Control Components Locations

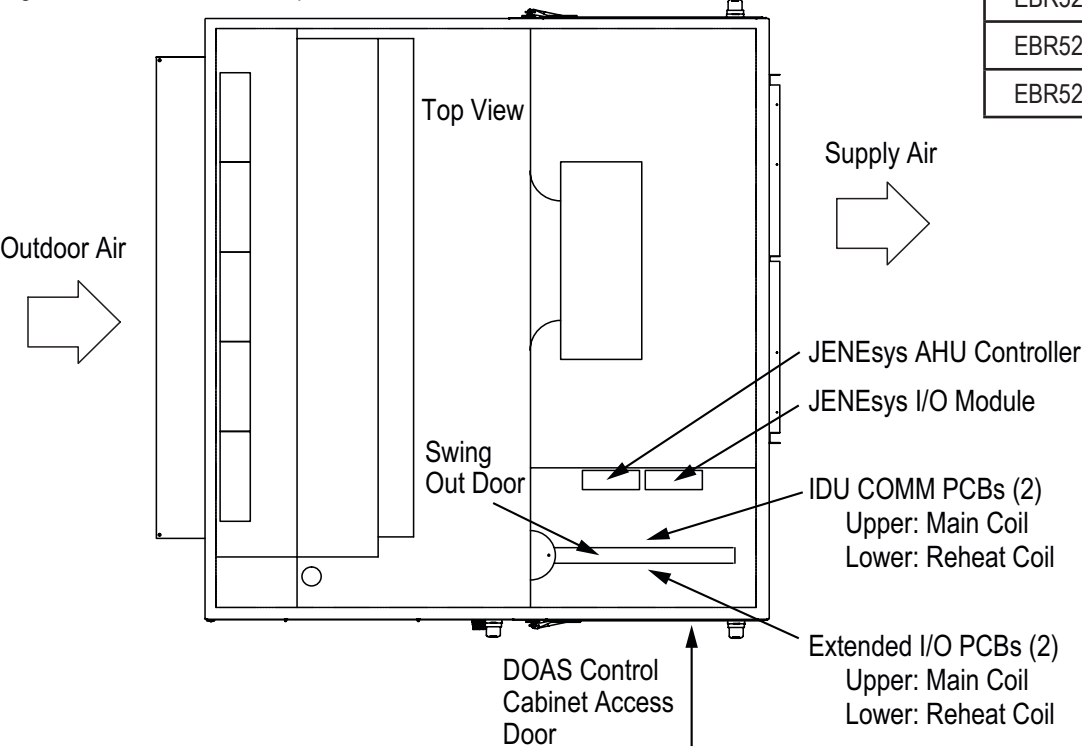
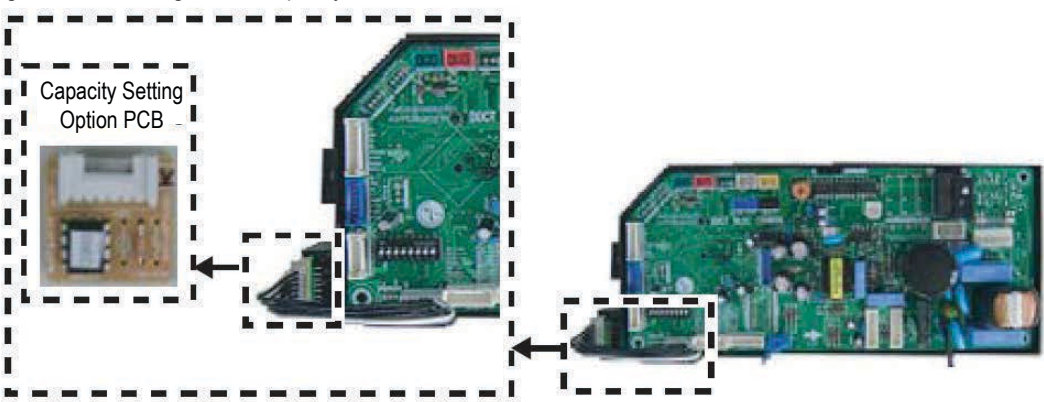


Figure 17: Installing DOAS Capacity Selection PCB



COMMUNICATION PCB CONFIGURATION

Resistor Installation

Install fixed resistors in the CN-ROOM connector on both IDU communications PCBs.

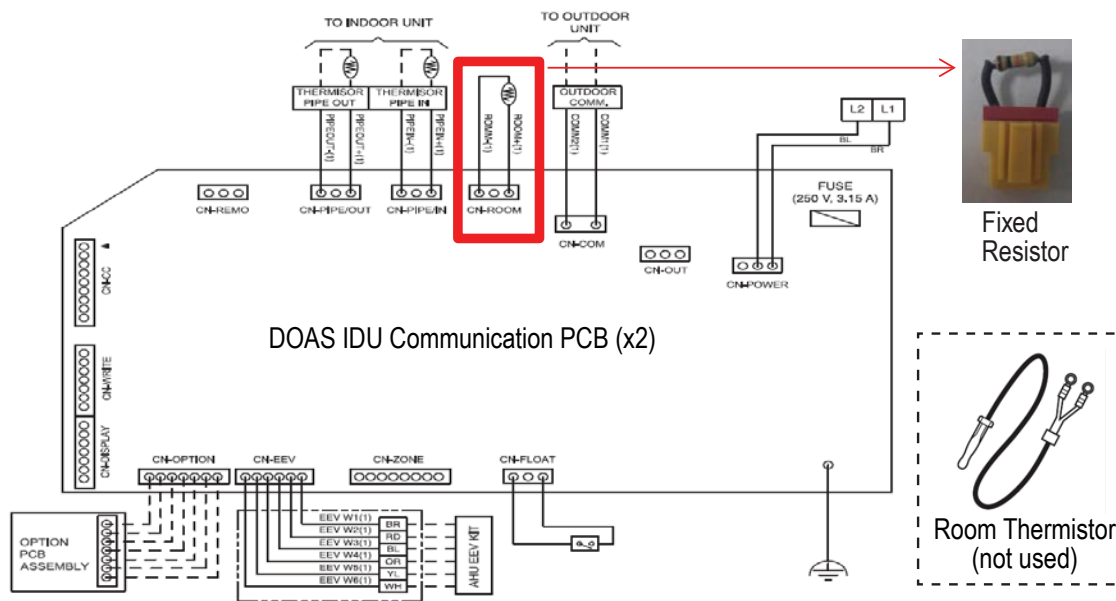
⚠ WARNING

High voltages are used in this equipment. Ensure input power is not connected before installing the fixed resistors.

Failure to observe this warning can result in death or severe injury.

1. Locate the two room thermistors (part number EBG61106821) coiled in the bottom of the control compartment. Remove and discard the two room thermistors.
2. Locate the two DOAS IDU Communication PCBs on the swing out door in the control compartment.
3. Install a fixed resistor (10 kohm at 77°) in the CN-ROOM connector of both of the DOAS IDU Communication PCBs (Figure 18).

Figure 18: Installing Fixed Resistors



Input Power

- Table 5 lists electrical specifications for the DOAS unit and required input power supply.
- The unit is provided with a single point power wiring connection. The power connection terminals are on the main terminal block. A complete wiring diagram including factory and field wiring can be found inside the control compartment door.
- Route power and control wiring separately. Do not run the power and control signal wires in the same conduit.
- All units require field supplied electrical overcurrent and short circuit protection. The device must not be sized larger than the maximum overcurrent protection (MOP) shown on the nameplate.
- Local codes may require a disconnect switch to be within sight of the unit. ⚡ Do not install the disconnect switch on the DOAS unit.
- The electrical supply can enter the unit through the bottom or the side of the controls compartment.
- A single point connection to a terminal block is provided with the unit. High voltage conductors must be placed in the control panel in a separate opening and separate conduit from low voltage conductors.
- To pass a wire through the wall or roof of the unit, cut an opening and pass the conduit through it. Follow the procedure below to safely cut an electrical opening.

Table 5: Dedicated Outdoor Air System Electrical Data

Model	Voltage Range	MCA	MOP	Power Supply		
				Hz	Volts	Phase
ARND20BDAT2	187 – 253	96	100	60	208 ±10% OR 230 ±10%, switch selectable	3
ARND20BDAR2 (no preheat)	187 – 253	8	15	60	208 ±10% OR 230 ±10%, switch selectable	1

MCA = Minimum Circuit Ampacity MOP = Maximum Overcurrent Protection

Power wiring cable is field provided and must comply with the applicable local and national codes.

Cutting an Electrical Opening

1. Select the location for the opening. Ensure the conduit will not interfere with the operation of any components, prevent door access or prevent a panel from being removed.

Note: Field cut openings must be a minimum of 6 inches away from all components and wiring to prevent damage caused by drilling or cutting.

2. Drill a pilot opening all the way through the foam panel.
3. Using a hole saw, cut the opening through the metal on both sides of the foam area.

Note: If a reciprocating saw is used to make the cut-out, ensure that the metal shavings from the foam part do not separate from the foam. If the foam is separated, it can result in structural damage of the part.

4. Using a knife, cut the foam from the opening.
 5. Install the conduit.
 6. After the conduit is installed in the opening, caulk the sides with an industrial grade silicone sealant or a duct seal compound.
- If a larger opening is needed for additional duct connections not provided by the factory, it is imperative that the foam be completely sealed. Insulation covers must be fabricated from sheet metal to cover the foam at the cut. The edges and corners that are not covered need to be sealed using silicone caulking or a duct seal compound.

- Size supply conductors based on the unit minimum current ampacity (MCA). Supply conductors must be rated at a minimum of 75°C.
- Wire power leads to the unit's terminal block or main disconnect. All wiring beyond this point has been completed by the factory and cannot be modified without affecting the unit's agency and/or safety certification.
- The supply voltage must be within the minimum and maximum range displayed on the unit nameplate. The available short circuit current should not exceed the short circuit current rating (SCCR) shown on the unit nameplate.
- Check the voltage imbalance at the unit disconnect. Contact your local power company for line voltage corrections.
- The installing contractor must check for proper motor rotation and ensure blower motor amperage on the motor nameplate is not exceeded.

Note: Three phase voltage imbalance will cause motor overheating and premature failure. The maximum allowable imbalance is 2.0%. Voltage imbalance is defined as 100 times the maximum deviation from the average voltage divided by the average voltage.

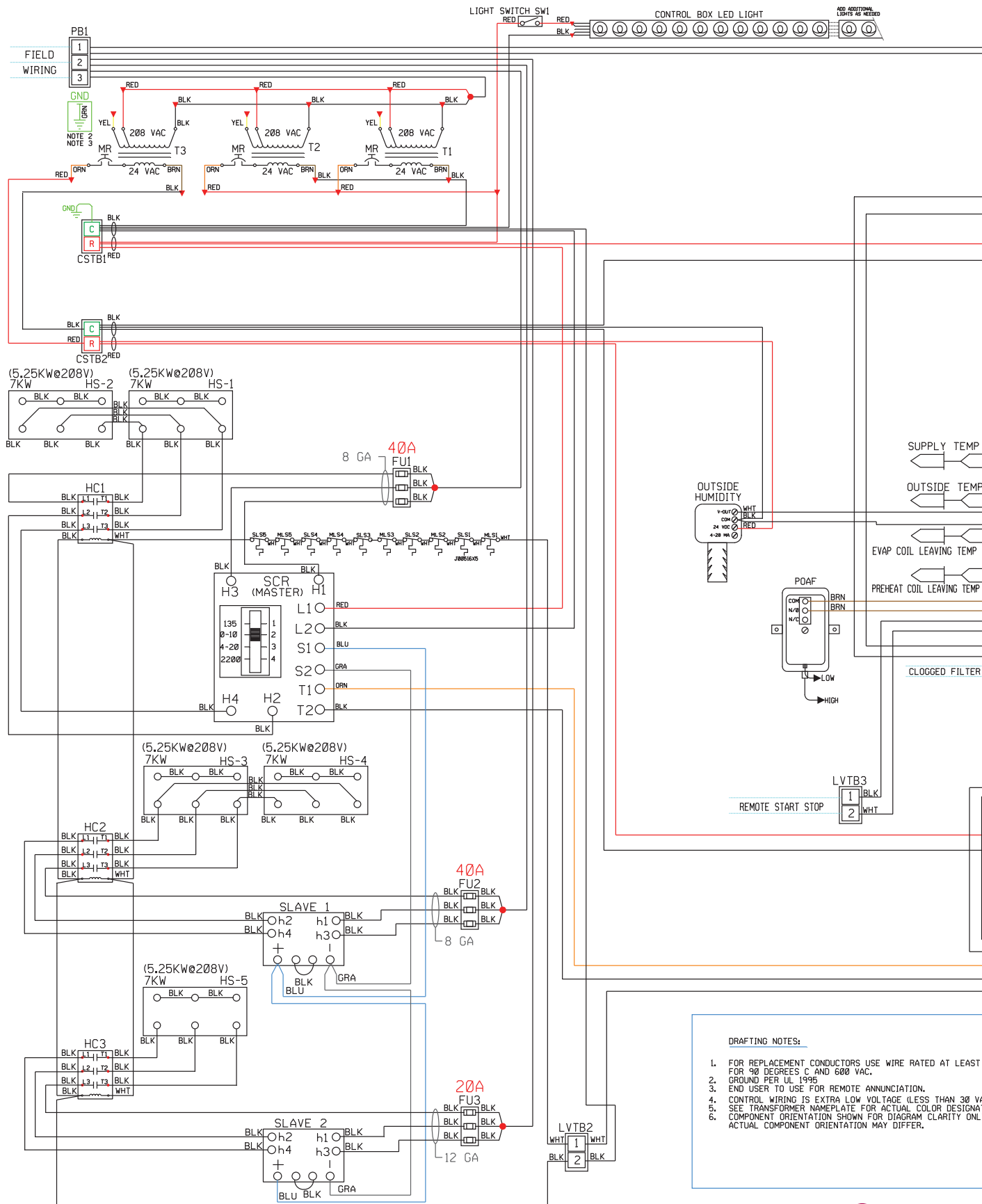
⚠ WARNING

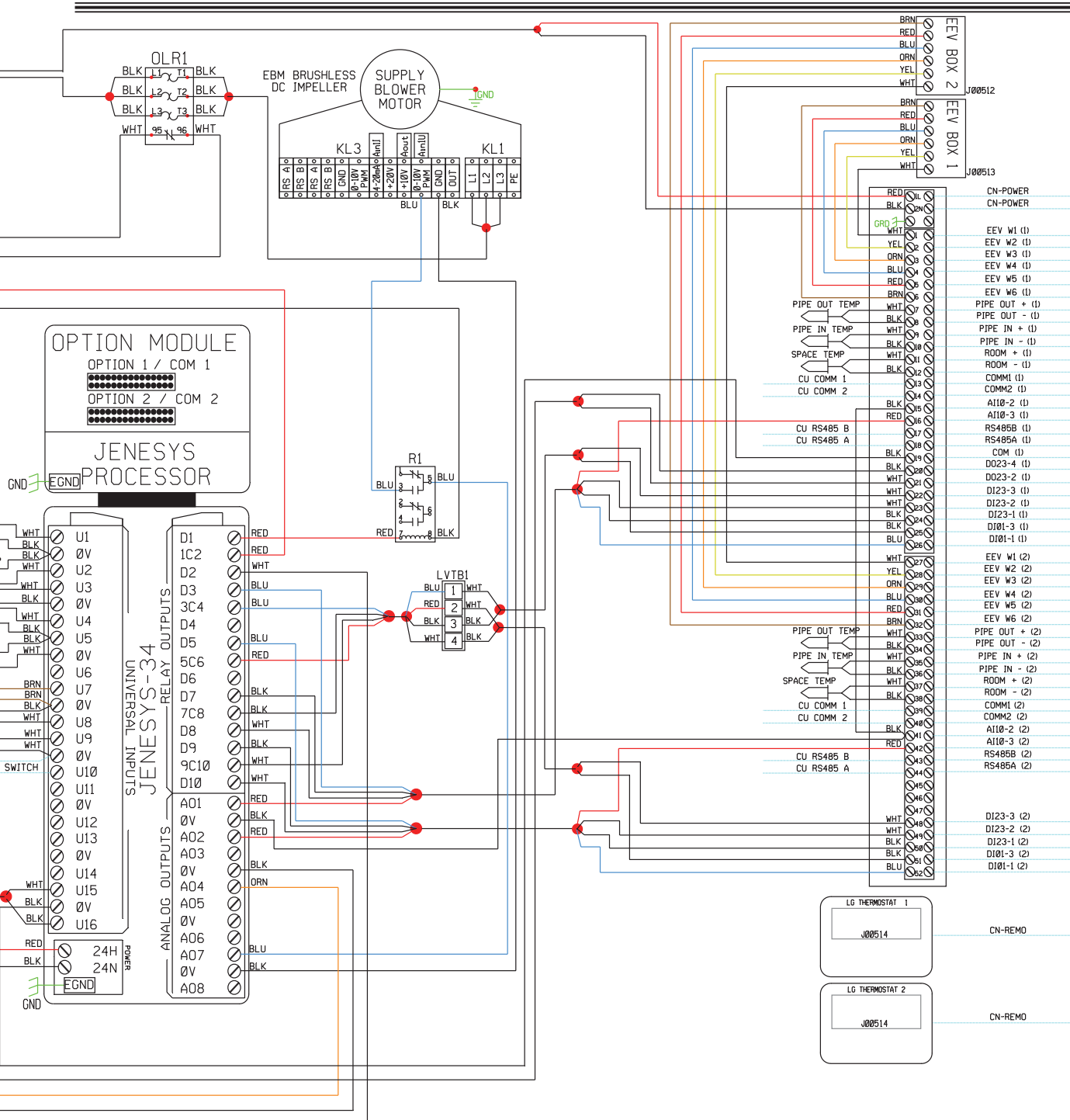
High voltages are used in this equipment. Ensure input power is not connected before installing the power cable.
Failure to observe this warning can result in death or severe injury.

1. Ensure no power is connected to the DOAS power input cable.
2. Refer to the wiring diagrams and securely connect the input power cable to the power terminals in the control compartment.

WIRING DIAGRAM

DOAS Model ARND20BDAT2 with Preheat



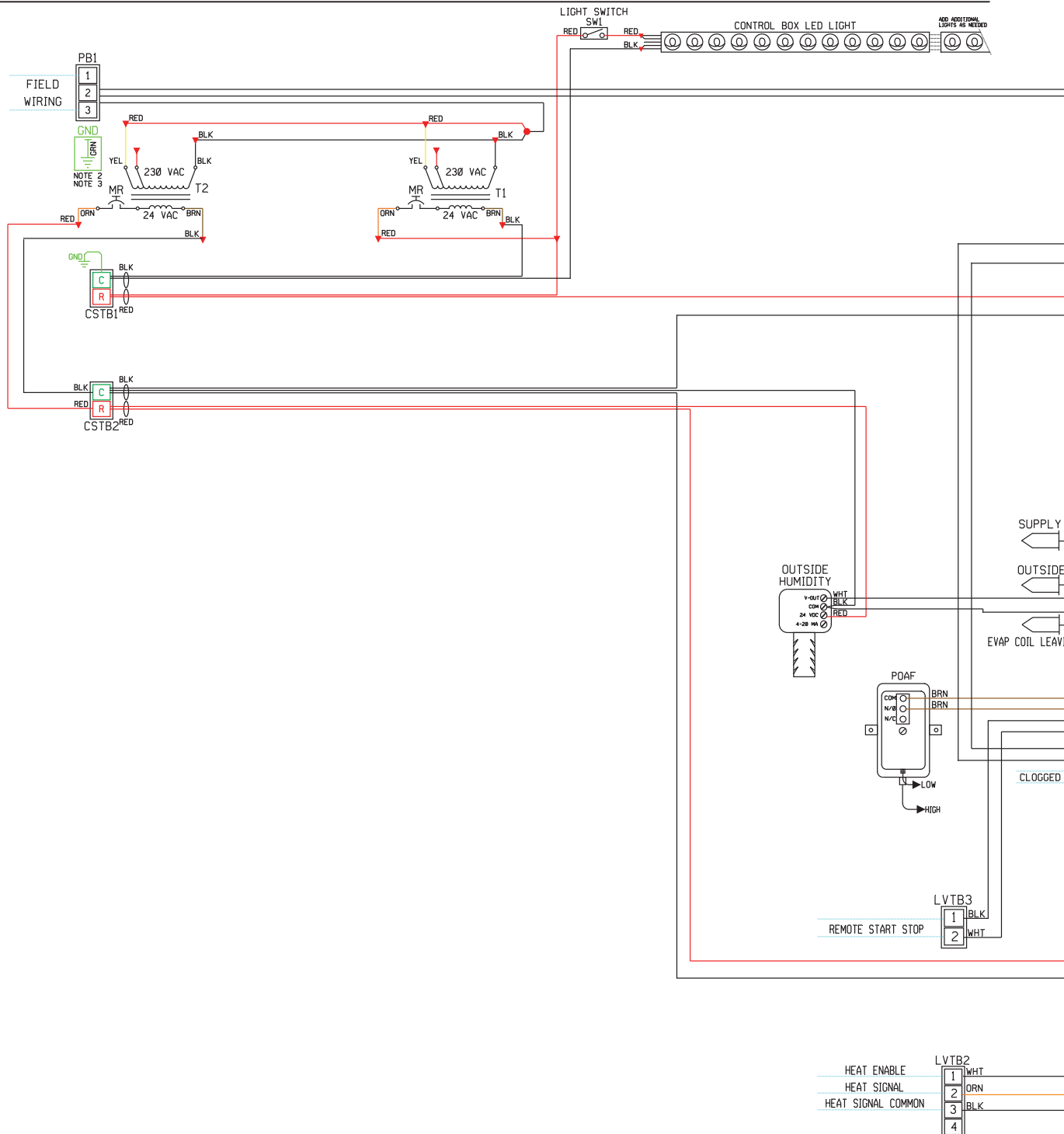


Electrical

COMPONENT LEGEND			
DIAGRAM DESIGNATIONS			
▼	SPLICE POINT	FU	FUSE
—	CONTRACTORS WIRING	GND	GROUND
—	OPTIONAL ITEMS	HC	HEATER CONTACTOR
—	OPTIONAL ITEMS	HR	HEAT RELAY
—	OPTIONAL ITEMS	HS	HEAT STRIP
AUX C	AUXILIARY CONTACT	LS	LIMIT SWITCH
BC	BLOWER CONTACTOR	LVTB	LOW VOLTAGE TB
BR	BLOWER RELAY	MLS	MAIN LIMIT SWITCH
ALS	AUXILIARY LIMIT SWITCH	MR	MANUAL RESET
CAP	CAPACITOR	OLR	OVERLOAD RELAY
CFS	CLOSED FILTER SWITCH	PBO	PHASE BROWN OUT
CSTB	COMMON SIDE TERMINAL BLK	PS	POWER SUPPLY
DI	DOOR INTERLOCK	SW	SWITCH
DPS	DIFFERENTIAL PRESSURE SW.	TB	TERMINAL BLOCK
FCS	FAN CYCLE SWITCH	T-STAT	THERMOSTAT
		SLS	SECONDARY LIMIT SWITCH

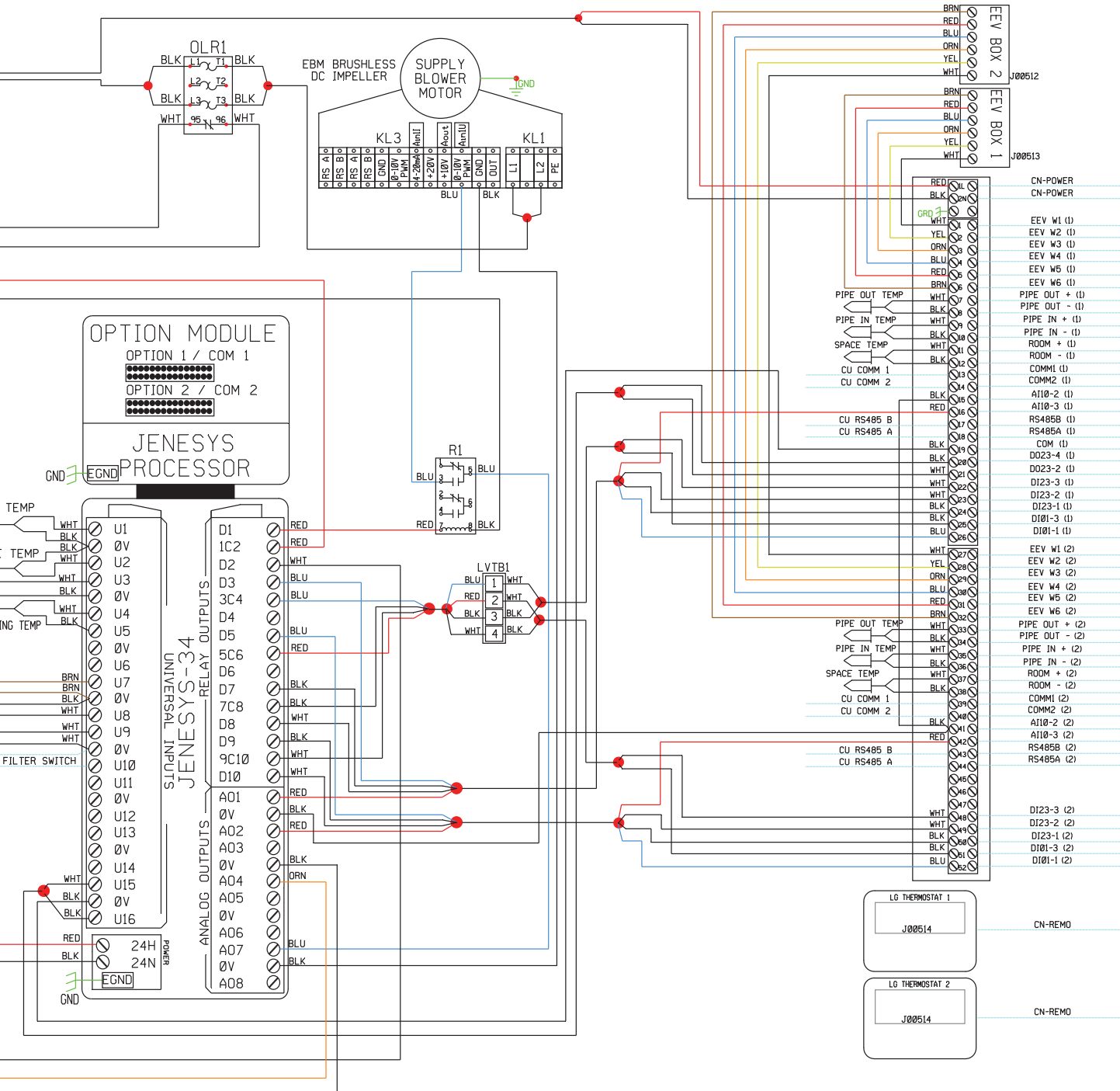
WIRING DIAGRAM

DOAS Model ARND20BDAR2 without Preheat



DRAFTING NOTES:

1. FOR REPLACEMENT CONDUCTORS USE WIRE RATED AT LEAST FOR 90 DEGREES C AND 600 VAC.
2. GROUND PER UL 1995
3. END USER TO USE FOR REMOTE ANNUNCIATION.
4. CONTROL WIRING IS EXTRA LOW VOLTAGE (LESS THAN 30 VAC.)
5. SEE TRANSFORMER NAMEPLATE FOR ACTUAL COLOR DESIGNATIONS.
6. COMPONENT ORIENTATION SHOWN FOR DIAGRAM CLARITY ONLY. ACTUAL COMPONENT ORIENTATION MAY DIFFER.



COMPONENT LEGEND

DIAGRAM DESIGNATIONS		FUSE	
▼	SPLICE POINT	GROUND	GROUND
—	STRIPED WIRING	HC	HEATER CONTACTOR
—	CONTRACTOR'S WIRING	HR	HEAT RELAY
*	OPTIONAL ITEMS	HS	HEAT STRIP
*	OPTIONAL ITEMS	LS	LIMIT SWITCH
AUX C	AUXILIARY CONTACT	LVTB	LOW VOLTAGE TB
BC	BLOWER CONTACTOR	MLS	MAIN LIMIT SWITCH
BR	BLOWER RELAY	MR	MANUAL RESET
ALS	AUXILIARY LIMIT SWITCH	OLR	OVERLOAD RELAY
CAP	CAPACITOR	PBO	PHASE BROWN OUT
CFS	CLOGGED FILTER SWITCH	PS	POWER SUPPLY
CSTB	COMMON SIDE TERMINAL BLK	SW	SWITCH
DI	DOOR INTERLOCK	T	TRANSFORMER
DPS	DIFFERENTIAL PRESSURE SW.	TB	TERMINAL BLOCK
FCS	FAN CYCLE SWITCH	T-STAT	THERMOSTAT
		VFD	VARIABLE FREQUENCY DRV

DOAS HEAT RECOVERY STARTUP

Configuring the Outdoor Unit

DOAS Heat Recovery Startup

Follow these procedures to start up a DOAS unit in a heat recovery system. For heat pump procedures, refer to “DOAS Heat Pump Startup” on page 45.

Outdoor Air Units or Water Source Units

DOAS units can be used with either Multi V IV Air Outdoor Units or Multi V IV Water Source Units. Unless otherwise noted, the ODU configuration steps apply to both air and water source units.

ODU/WSU Software Versions

For DOAS applications, the Multi V IV Air Source Outdoor Unit must have software version 17.0 or higher and a production date of April 2015 or later. To determine production date, locate the unit serial number. The first three digits of the serial number indicate the production date. For example, the serial number 507XXXXXXXXX indicates a production date of July, 2015. If the outdoor unit requires software update, contact LG technical support.

All Multi V IV water source units require a software upgrade to be used in a DOAS application. Contact LG technical support.

DOAS Internal Power Switch

There is an internal power selector switch inside the DOAS control compartment. This switch selects between 208 and 230 volts input power.

Apply Power to the System

⚠ WARNING

High voltages are used in this equipment. Ensure all power cables are properly connected before applying power.

Failure to observe this warning can result in death or severe injury.

1. Apply power to the outdoor unit(s). Refer to the appropriate outdoor unit manual.
2. Ensure the DOAS power cable is correctly connected as described in this manual.
3. Ensure the DOAS internal power switch in the control compartment is positioned as appropriate for your system, 208V or 230V
4. Apply power to the DOAS unit(s).
5. Wait at least five (5) minutes for the DOAS unit to finish its bootup routine.

Outdoor Unit DIP Switch Settings

⊘ Do not use the auto pipe detection feature. Use manual pipe detection only.

1. Carefully remove the maintenance panel to gain access to the ODU control board.

⚠ WARNING

High voltages are used in this equipment. ⊘ Do not touch exposed circuits or terminals.

Failure to observe this warning could result in death or severe injury.

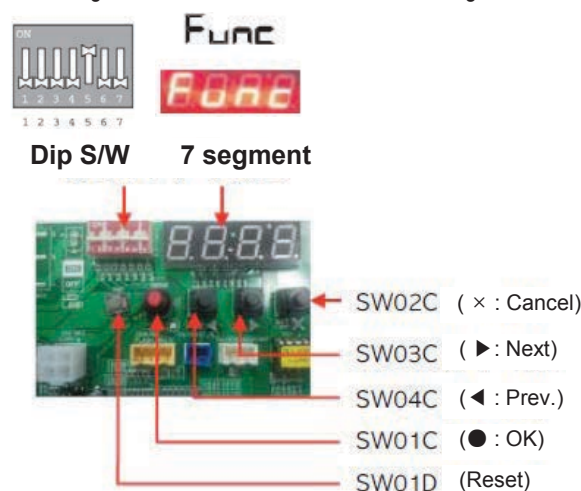
Note:

⊘ Do not short circuit components on the control board.

The outdoor unit could be damaged and not function properly.

2. Set ODU DIP switch 5 to ON (Figure 19).
3. Press the ► (next) or ◄ (previous) key until **Func** is displayed.
4. Press the ● (OK) key.
5. Press the ► (next) or ◄ (previous) key until **Fn16** is displayed.
6. Press the ● (OK) key.
7. Set ODU DIP switch 5 to OFF.
8. Press and hold the red SW01C button for about five seconds. Release the button when the LED displays “88.”
9. Wait three (3) to seven (7) minutes. The LED will flash a number for about ten (10) seconds indicating how many indoor units the system successfully communicated with. For DOAS units, each coil (main and reheat) counts as one “indoor unit.” For example, a system with one DOAS unit that uses both main and reheat coils will report two “indoor units.”

Figure 19: Outdoor Unit DIP Switch settings



Locate the two LG thermostats on the end of the control compartment swing-out door. Follow these procedures to configure the thermostats.

⚠ WARNING

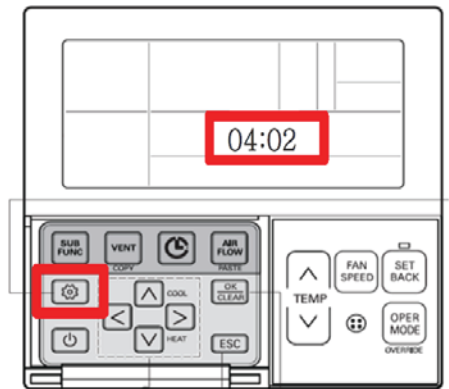
High voltages are used in this equipment. Be extremely careful when working inside the control compartment.
Failure to observe this warning can result in death or severe injury.

Temperature Sensing Adjustment

Perform this procedure for each thermostat. Refer to Figure 20.

1. Press and hold the gear icon button until the function code **01:01** is displayed.
2. Press and release the gear icon button until the function code **04:01** is displayed.
3. Press and release either the up or down arrow on the **TEMP** button until the function code **04:02** is displayed.
4. Press the **OK/CLEAR** button.
5. Repeat this procedure for the second thermostat.

Figure 20: Thermostat Temperature Sensing Adjustment



Central Control Address

Perform this procedure for each thermostat. Ensure the master (top) thermostat address is set to 02:00 and the slave (bottom) thermostat address is set to 02:10. Refer to Figure 21.

1. On the master (top) thermostat, press and hold the gear icon button until the function code **01:01** is displayed.
2. Press and release the gear icon button until the function code **02:01** is displayed.
3. Press and release either the up or down arrow on the **TEMP** button until the function code **02:00** is displayed.
4. Press the **OK/CLEAR** button.
5. On the slave (bottom) thermostat, press and hold the gear icon button until the function code **01:01** is displayed.
6. Press and release the gear icon button until the function code **02:01** is displayed.
7. Press and release either the up or down arrow on the **TEMP** button until the function code **02:10** is displayed.
8. Press the **OK/CLEAR** button.
9. Connect a PC with LGMV software to the ODU. Mobile LGMV is not recommended.
10. Confirm the central control addresses on the LGMV display (Figure 22). Click the More IDU info tab to confirm the central control addresses, IDU 1 is 00 and IDU 2 is 10.

Figure 21: Thermostat Central Control Address

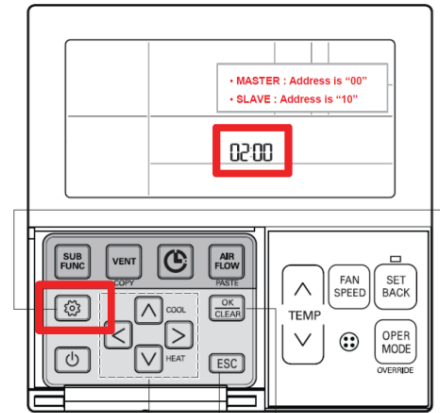
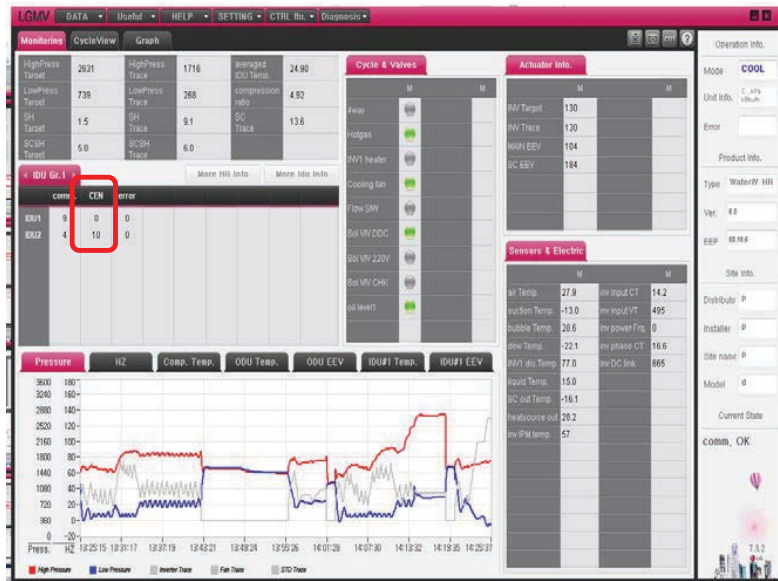


Figure 22: Central Control Address on LGMV Display



DOAS HEAT RECOVERY STARTUP

Extended I/O PCB Software Upgrade

DOAS units manufactured in 2014 require a software upgrade to the extended I/O PCBs. DOAS units manufactured in 2015 and later do not require this upgrade. To determine DOAS date of manufacture, locate the unit serial number. The first three digits of the serial number indicate the date of manufacture. For example, 405 indicates a manufacture date of May, 2014.

A second method of determining if this upgrade is required is to observe the LEDs on the extended I/O PCB. If they flash in order left to right, the upgrade is required. If they flash randomly, the upgrade is not required. If your DOAS unit requires this upgrade, contact LG technical support for the software.

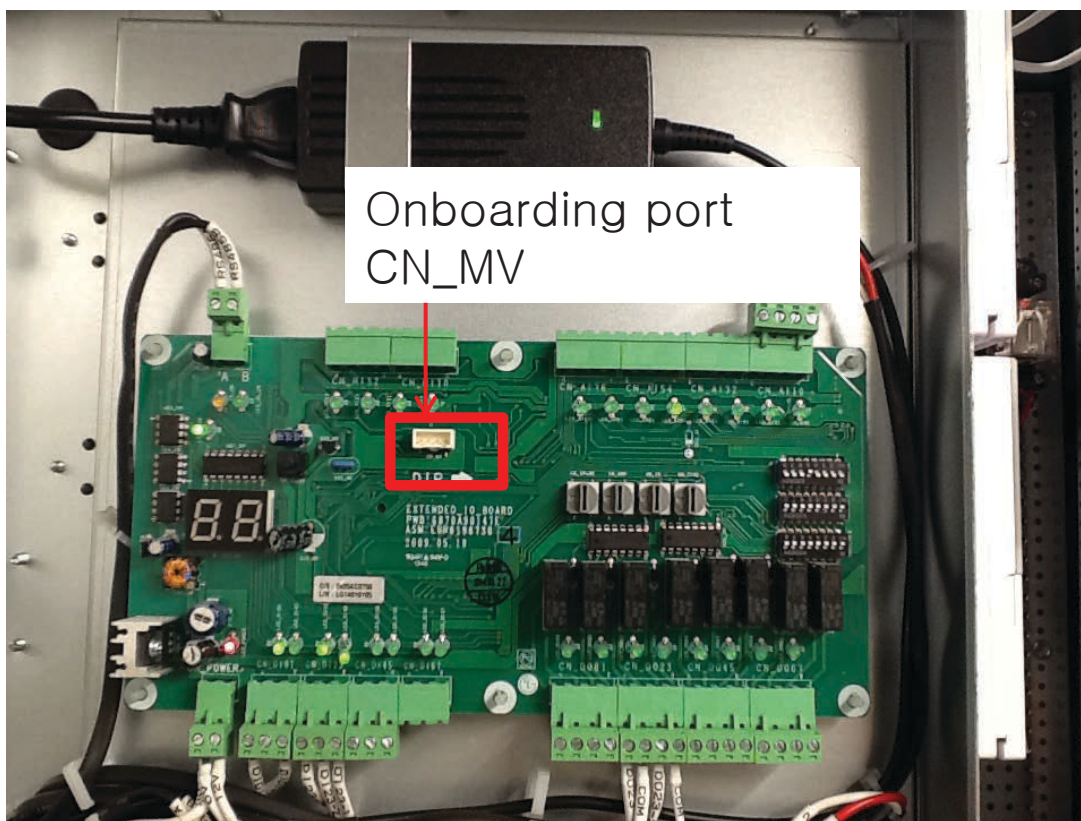
If upgrade is necessary, locate the extended I/O PCBs on the swing-out door in the control compartment. Connect to the CN_MV port (Figure 23) on the extended I/O PCB. Upgrade the software on both extended I/O PCBs.

⚠ WARNING

High voltages are used in this equipment. Be extremely careful when working inside the control compartment.

Failure to observe this warning can result in death or severe injury.

Figure 23: Extended I/O PCB



Rotary and DIP Switch Settings for Heat Recovery Systems

The DIP switches on the extended I/O PCBs must be set as necessary for your system configuration. The settings are different for heat pump and heat recovery applications, and for the number of ODU's connected. The extended I/O PCBs are located on the outer side of the swing-out door in the control compartment. Follow the procedure that applies to your system.

⚠ WARNING

High voltages are used in this equipment. Be extremely careful when working inside the control compartment.

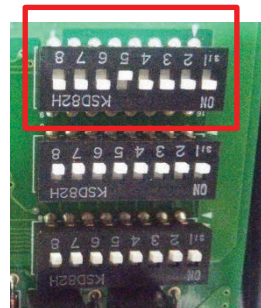
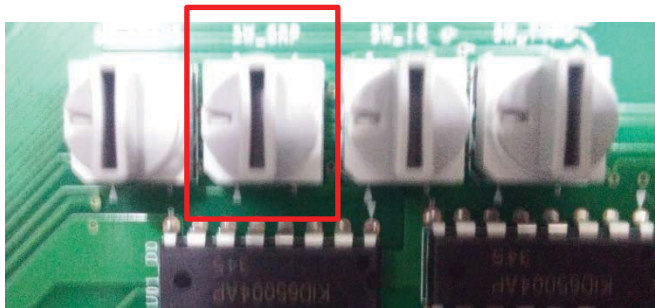
Failure to observe this warning can result in death or severe injury.

1. Locate the extended I/O PCBs on the outer side of the swing-out door in the control compartment.
2. Set the rotary switches and DIP switches as shown in Figure 24.
3. DOAS input power must be cycled off and on before these settings will take effect. Power can be cycled now or can wait until after the heat recovery unit DIP switch settings are made in the next procedure.

Figure 24: Extended I/O PCB Rotary and DIP Switch Settings for Heat Recovery Systems

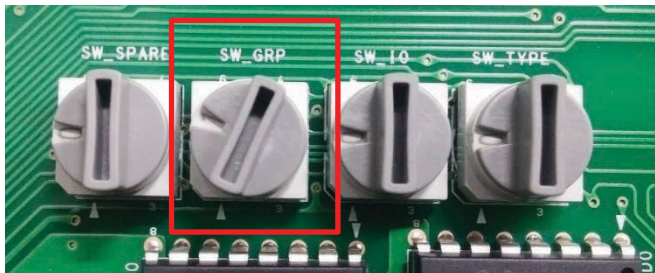
[MASTER – Top board]

- Rotary S/W : 'SW_GRP' is setting up the '0' address.
- Dip S/W : NO. 5 of 'SW03_SW' is off.



[SLAVE – Bottom board]

- Rotary S/W : 'SW_GRP' is setting up the '1' address.
- Dip S/W : NO. 5 and 2 of 'SW03_SW' is off.



DOAS HEAT RECOVERY STARTUP

Heat Recovery Unit DIP Switch Setup

Heat Recovery Unit DIP Switch Settings

This procedure applies to heat recovery systems only. The heat recovery unit (HRU) DIP switches must be set as necessary for your system configuration. HRU software must be version 2.0 or higher. HRU manufactured April 2015 and later have version 2.0. To determine date of manufacture of your HRU, locate the unit serial number. The first three digits of the serial number indicate the date of manufacture. For example, 505 indicates a manufacture date of May 2015. If the HRU requires software upgrade, contact LG technical support.

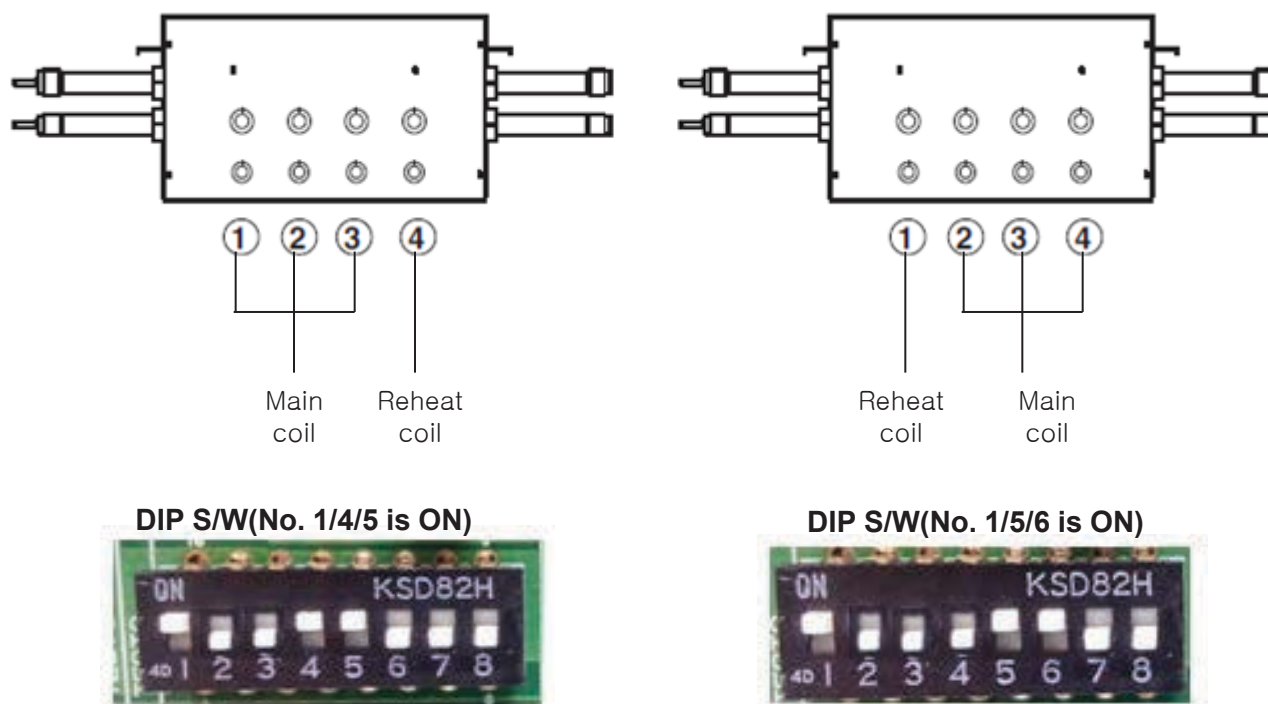
⚠ WARNING

High voltages are used in this equipment. Be extremely careful when working inside the control compartment.

Failure to observe this warning can result in death or severe injury.

1. Determine how your HRU is piped to the DOAS unit main and reheat coils. It will be one of these two configurations:
 - Ports 1-3 to the main coil and port 4 to the reheat coil
 - Port 1 to the reheat coil and ports 2-4 to the main coil
2. Remove the HRU access panel.
3. Set the DIP switches as shown in Figure 25 for your system configuration.
4. HRU input power must be cycled off and on before these settings will take effect. Turn off HRU power at the power disconnect switch, wait approximately ten seconds, and then turn on HRU power.
5. If DOAS power was not cycled in the previous DOAS DIP switch setting procedure, cycle DOAS power now. Turn off DOAS power at the power disconnect switch, wait approximately ten seconds, and then turn on DOAS power.

Figure 25: Heat Recovery Unit DIP Switch Settings



Heat Recovery Unit Manual Pipe Search

This procedure applies to heat recovery systems only. Use this manual pipe search procedure to set the main and reheat DOAS coils' central control addresses in the HRU EEPROM. The DOAS coil addresses must be:

- Main Coil: 00
- Reheat Coil: 10

Use the 4-pin DIP switch and the two Tact buttons on the HRU PCB to set these addresses. How the DIP switch is set will vary according to how your system is piped. Follow step 4 OR step 5 below, not both.

⚠ WARNING

High voltages are used in this equipment. Be extremely careful when working inside the control compartment.

Failure to observe this warning can result in death or severe injury.




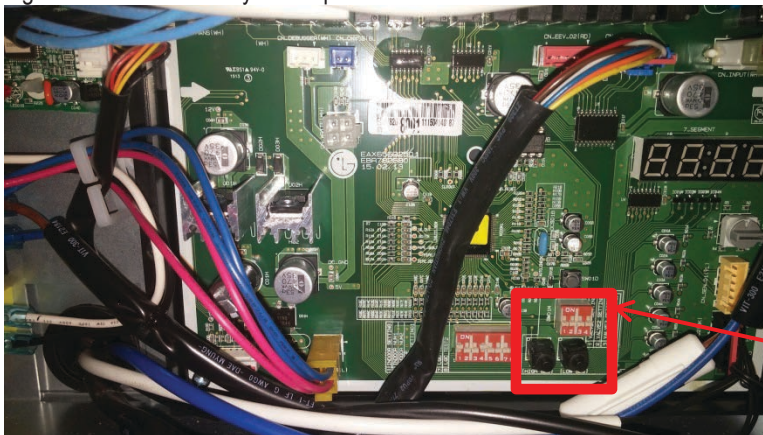



1. Determine how your HRU is piped to the DOAS unit main and reheat coils. It will be one of these two configurations:
 - Ports 1-3 to the main coil and port 4 to the reheat coil
 - Port 1 to the reheat coil and ports 2-4 to the main coil
2. If necessary, remove the HRU access panel.
3. Locate the 4-pin DIP switch and two Tact buttons shown in Figure 26.
4. If your system is piped with HRU ports 1-3 to the main coil and HRU port 4 to the reheat coil, perform these steps and **skip step 5**.
 - a. Set switch 1 of the 4-pin DIP switch to ON (up). 
 - b. The 7-segment display shows the central control address stored in EEPROM. If no address is stored, FF will display. 
 - c. Press the left or right Tact button until the display shows an address of 00 for the main coil.
 - d. Set switch 1 of the DIP switch back to OFF (down). Main coil address is complete.
 - e. Set switch 4 of the DIP switch to ON (up). 
 - f. Press the left or right Tact button until the display shows an address of 10 for the reheat coil.
 - g. Set switch 4 of the DIP switch back to OFF (down). Reheat coil address is complete.

Figure 26: Heat Recovery Unit 4-pin DIP Switch and Tact Buttons



4 pin DIP Switch and
Tact buttons (2)

5. If your system is piped with HRU port 1 to the reheat coil and ports 2-4 to the main coil, perform these steps and **skip step 4**.
 - a. Set switch 1 of the 4-pin DIP switch to ON (up). 
 - b. The 7-segment display shows the central control address stored in EEPROM. If no address is stored, FF will display. 
 - c. Press the left or right Tact button until the display shows an address of 10 for the reheat coil.
 - d. Set switch 1 of the DIP switch back to OFF (down). Reheat coil address is complete.
 - e. Set switch 2 of the DIP switch to ON (up). 
 - f. Press the left or right Tact button until the display shows an address of 00 for the main coil.
 - g. Set switch 2 of the DIP switch back to OFF (down). Main coil address is complete.

DOAS HEAT RECOVERY STARTUP

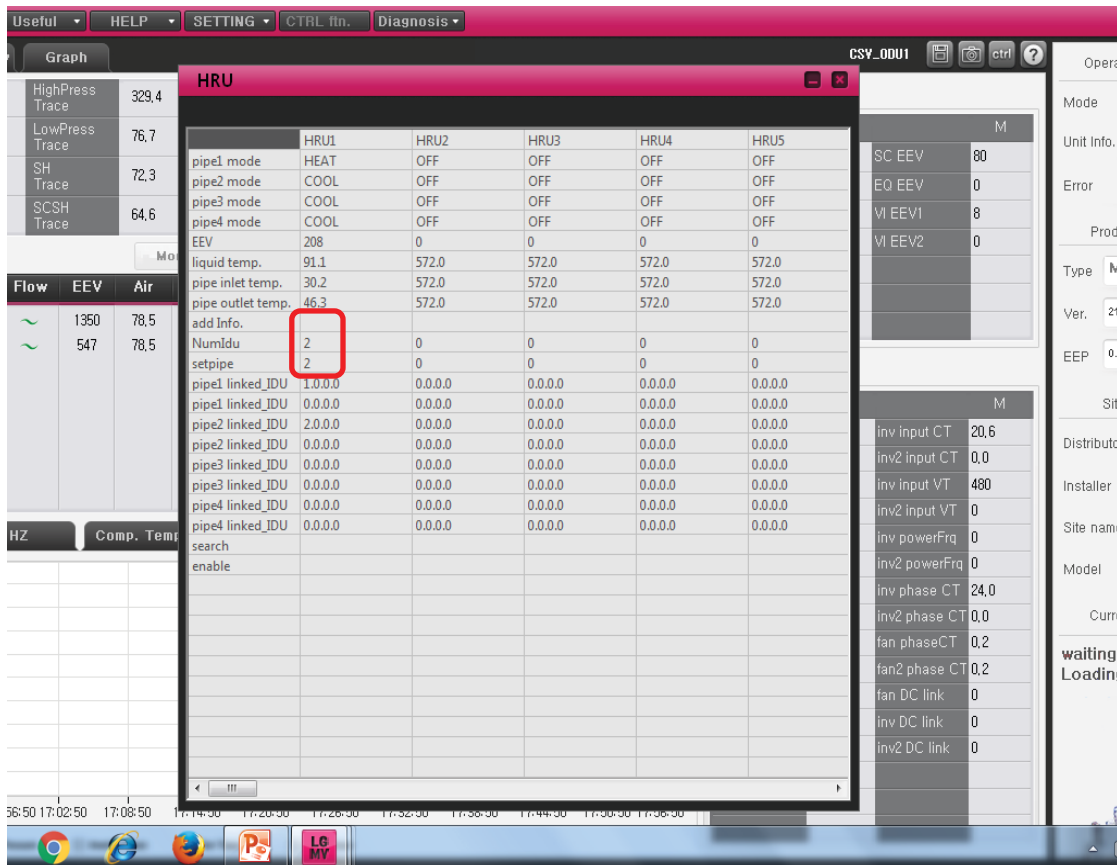
Heat Recovery Unit Setup Confirmation

Heat Recovery Unit Setup Confirmation

This procedure applies to heat recovery systems only.

1. Connect a PC with LGMV software to the ODU. Mobile LGMV is not recommended.
2. Confirm the HRU setup is correct on the LGMV display as shown in Figure 27. Confirm **NumIDU** and **setpipe** both indicate 2.

Figure 27: HRU Configuration Displayed on LGMV

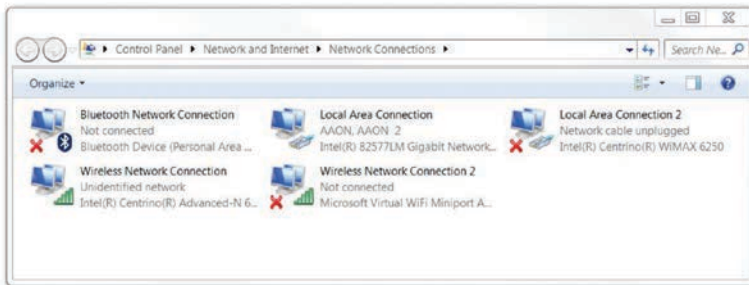


Computer Configuration

You must configure your computer to communicate with the JENEsys controller.

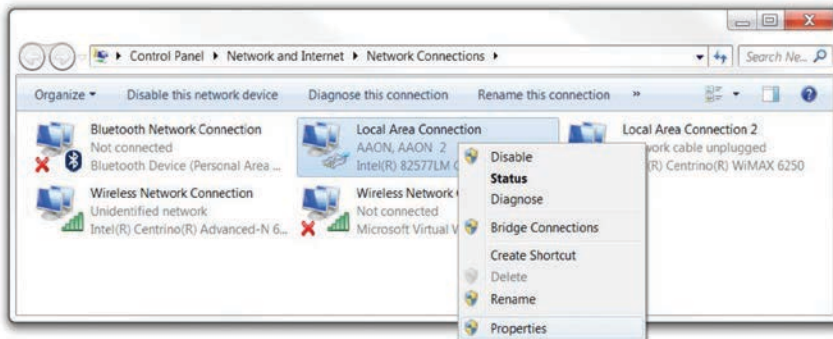
1. Open Network Connections window (Figure 28).
 - For Windows XP and older, open the Control Panel and then select Network Connections.
 - For Windows Vista and later, type Network Connections in the search field at the bottom of the Start menu and click Enter.

Figure 28: Network Connections Window



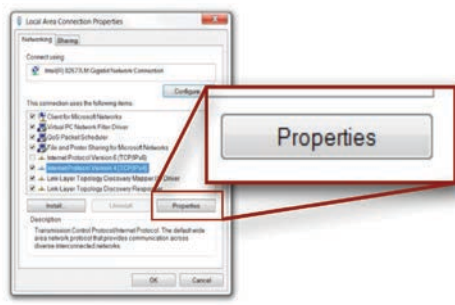
2. Right-click Local Area Connection and select Properties (Figure 29).

Figure 29: Local Area Connection Properties Window



3. To change the IP address for the JENEsys controller, select Internet Protocol Version 4 (TCP/IP) (Figure 30).
4. Click the Properties button (Figure 30). The internet protocol version 4 properties allow you to change the IPv4 address of the PC you are working on.

Figure 30: Local Area Connection Properties

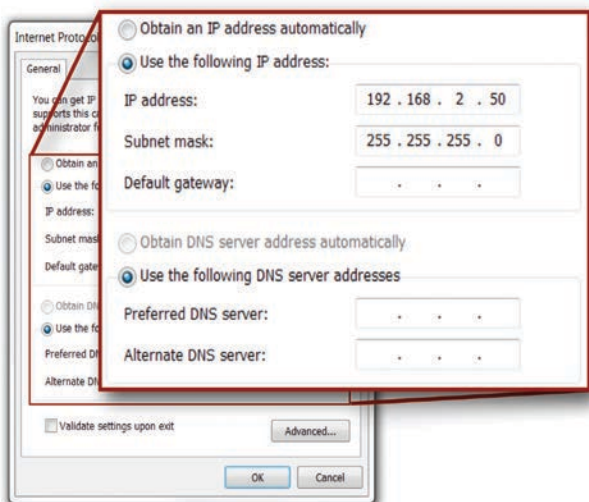


DOAS HEAT RECOVERY STARTUP

Laptop PC Configuration

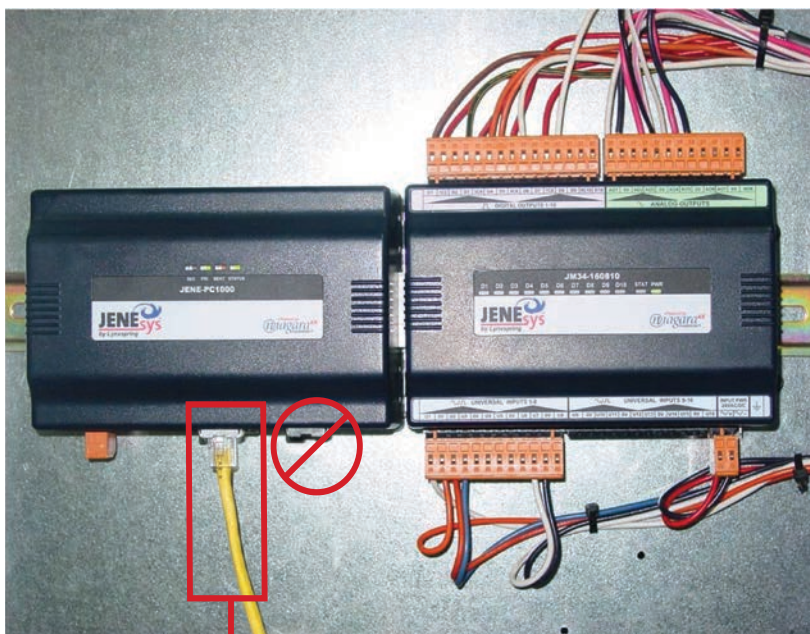
- Record the current settings so you can return the network adapter to its previous address after the JENEsys controller is connected.
- Enter an appropriate IPv4 address to connect the JENEsys controller (Figure 31).
- Enter 255.255.255.0 in the Subnet Mask field (Figure 31).
- Click the OK button. The computer's network address will be set-up correctly to directly access the JENEsys controller with a Cat5 Ethernet cable connected from your computer to the controller.
- Close the Network Properties window. The JENEsys controller can now be accessed through a web browser.

Figure 31: Internet Protocol



- Connect a Cat5 Ethernet cable from your computer to port 2 of the JENEsys controller (Figure 32).
- Turn off DOAS power at its power disconnect switch. Wait at least 10 seconds and reapply power.

Figure 32: Connecting a JENEsys AHU Controller



Connect Cat5 Ethernet Cable between JENEsys and Computer

Web User Interface

You access the JENEsys web user interface with an internet browser. Use Google Chrome or Mozilla Firefox. Do not use Internet Explorer. Internet Explorer will not work with the JENEsys controller.

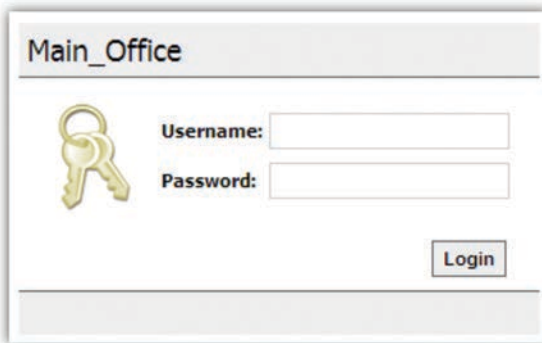
1. Open a web browser. The browser must have the latest java drivers installed. If you need to update java drivers, visit www.java.com.
2. Navigate to the controller address (Figure 33). For factory default controllers, the IP address is 192.168.2.101 (LAN2).

Figure 33: Accessing the Web User Interface



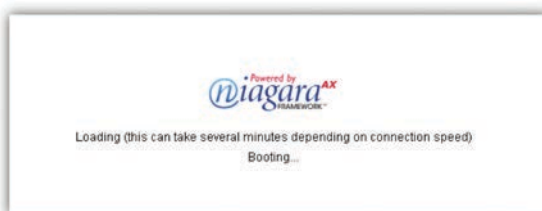
3. After several minutes (up to 10-15), the login page opens.
4. Enter your Username and Password and click the Login button (Figure 34).
 - Username - admin
 - Password - doasvrf2

Figure 34: Web User Interface Login Screen



5. The first time you login, the system will load the niagaraAX platform (Figure 35). This may take several minutes because several java modules will be downloaded in order to properly display the web user interface screens. Once the niagaraAX platform is loaded, the controller will load the Web User Interface home page.

Figure 35: niagaraAX Platform



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DOAS HEAT RECOVERY STARTUP



JENEsys Controller

JENEsys Settings

The JENEsys software must be version 14a or higher. If software upgrade is necessary, contact LG Technical Support.

1. After logging into the web user interface, the JENEsys home screen displays (Figure 36).
2. Right-click on **System Enable** and set to **Enabled**.
3. Right-click on **Supply Fan Command** and set to **Active**. The DOAS fan should start.
4. Adjust the supply fan motor as needed by air balancer to achieve the design air flow for your system.
Fan motor adjustment range is from 0 to 100%.
5. Click **Setpoints** to display the Setpoints screen.
6. If necessary, change **Dehum Application** to match your system, either Heat Pump or Heat Recovery.

Figure 36: JENEsys Home Screen

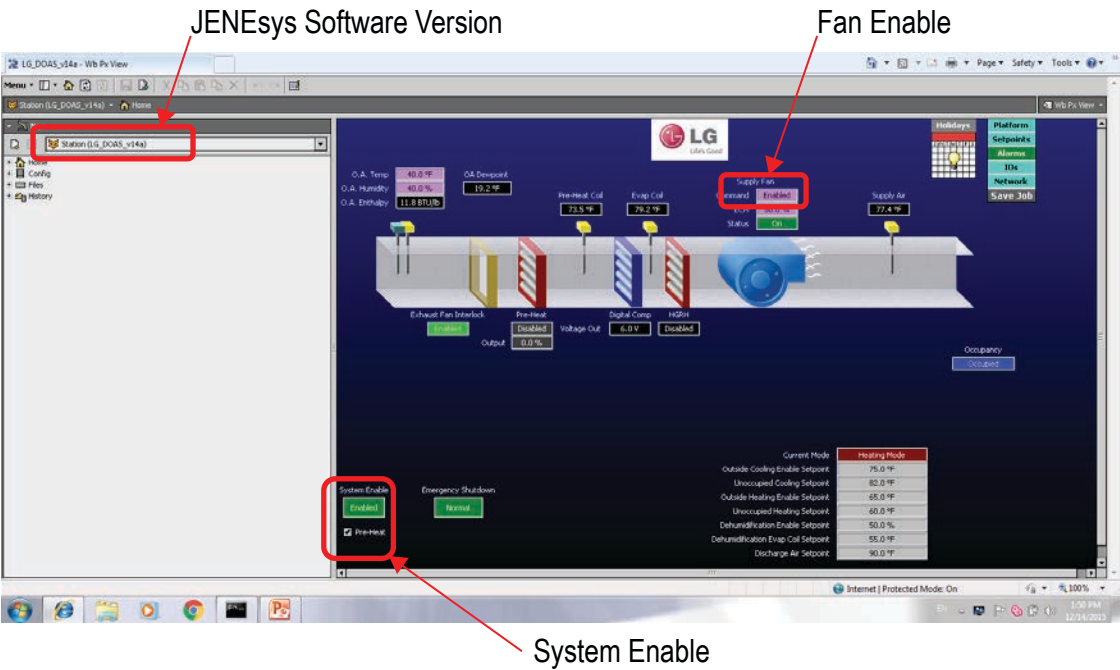
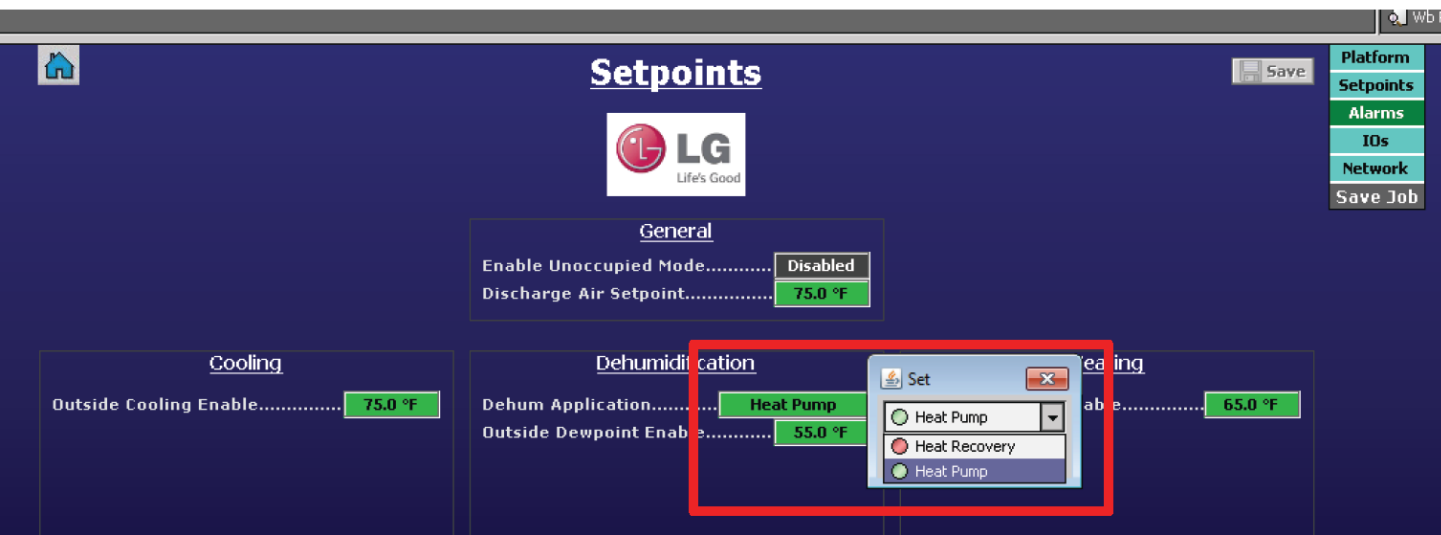


Figure 37: JENEsys Setpoints Screen



Use LGMV software to verify correct DOAS installation and configuration.

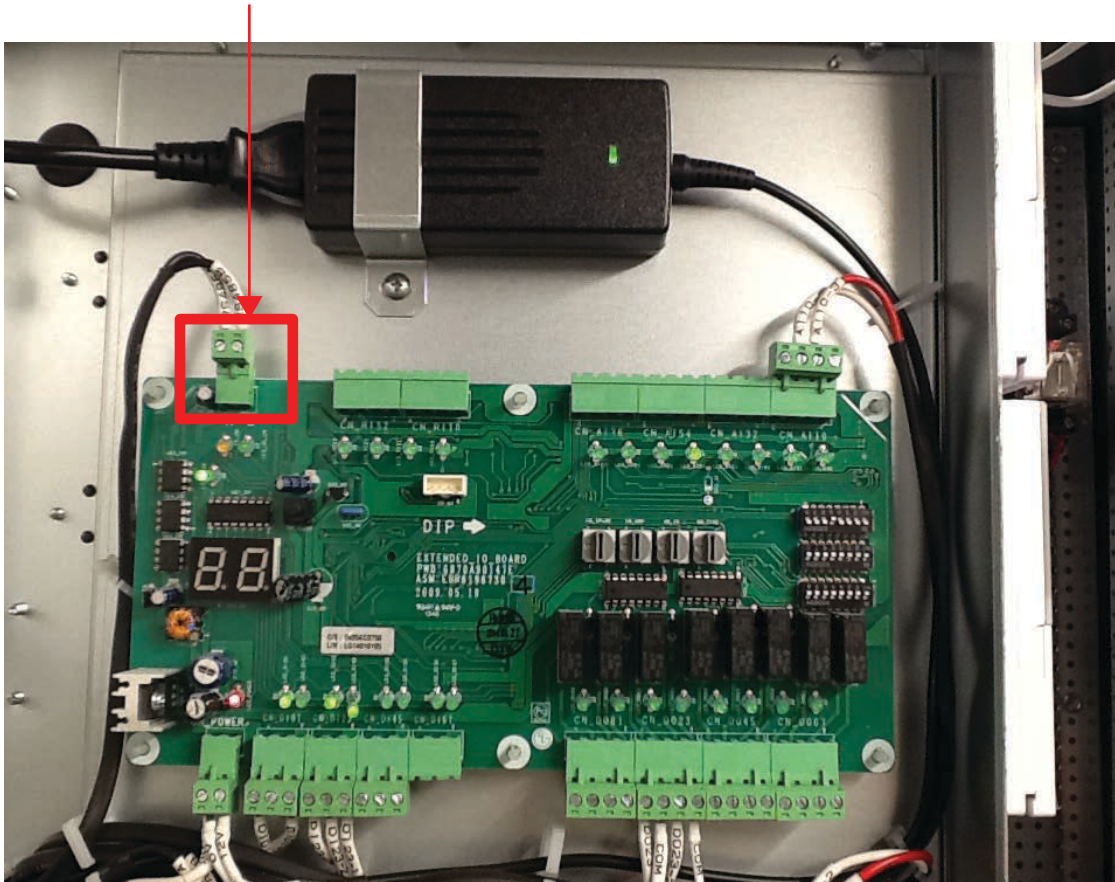
⚠ WARNING

High voltages are used in this equipment. Be extremely careful when working inside the control compartment.
Failure to observe this warning can result in death or severe injury.

1. Carefully disconnect the RS485 connection from both Extended I/O PCBs.
2. Position the disconnected cables so they will not contact powered components.

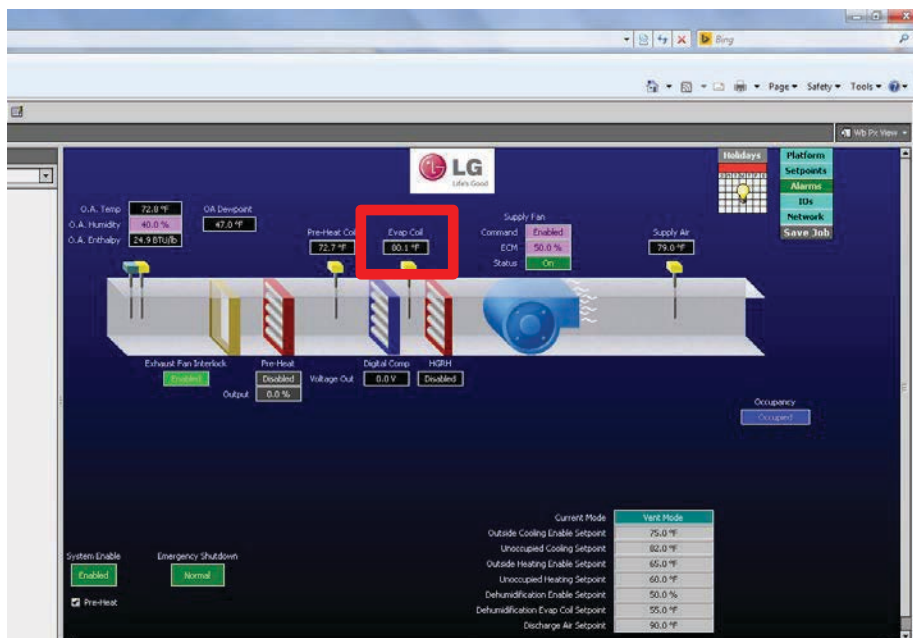
Figure 38: Disconnect RS485 Connections

Disconnect RS-485 connection on both I/O PCBs



Dedicated Outdoor Air System (DOAS) Installation and Operation Manual

- Figure 39: Set Main Coil to Cooling in LGMV



6. Use LGMV to control the main coil to cooling mode and the reheat coil to heat mode.
7. Verify cooling mode is working by checking on the JENesys home screen that Evap Coil temperature is lower than the outside air temperature (Figure 41).
8. Verify heating mode is working by checking on the JENesys home screen that supply air temperature is higher than Evap Coil temperature (Figure 42).

Figure 41: Set Main Coil to Cooling and Reheat Coil to Heat in LGMV

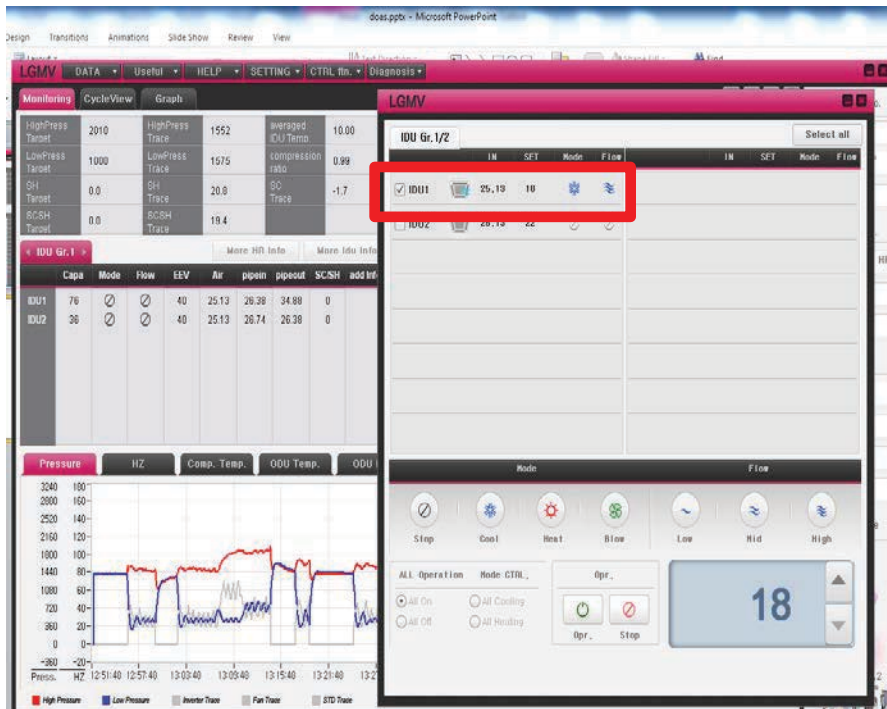
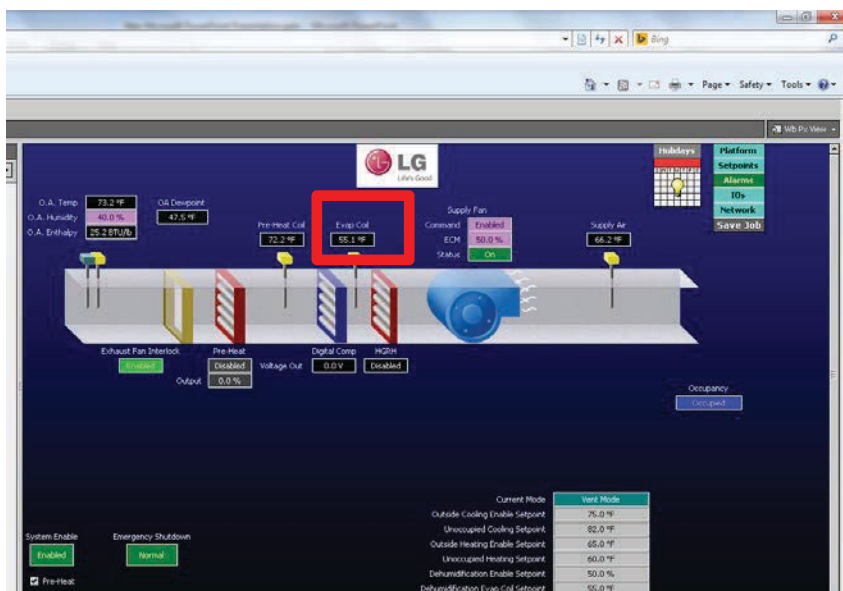


Figure 42: Verify Main Coil Cooling and Reheat Coil Heating on JENEsys Home Screen

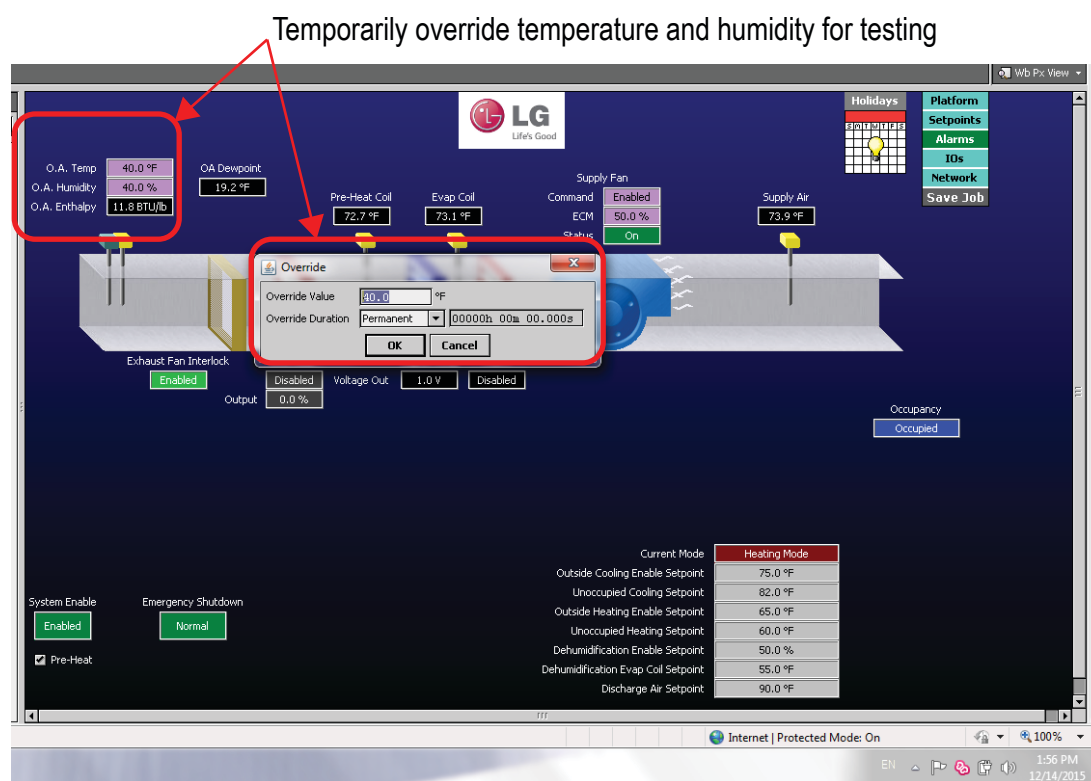


DOAS HEAT RECOVERY STARTUP

LGMV Testing

9. Reconnect the RS485 connection on both Extended I/O PCBs. These are the cables that were disconnected in step 1 (Figure 38).
10. On the JENEsys home screen, right click on **O.A. Temp** to override the actual outside air temperature for testing (Figure 43).
11. Verify proper operation of cooling, heating, and dehumidification modes by changing the actual outside air temperature and outside air humidity values to higher values.
12. Verify proper operation of cooling, heating, and dehumidification modes by changing the actual outside air temperature and outside air humidity values to lower values.

Figure 43: Override Temperature and Humidity Settings for Test



Remote Start/Stop Connection

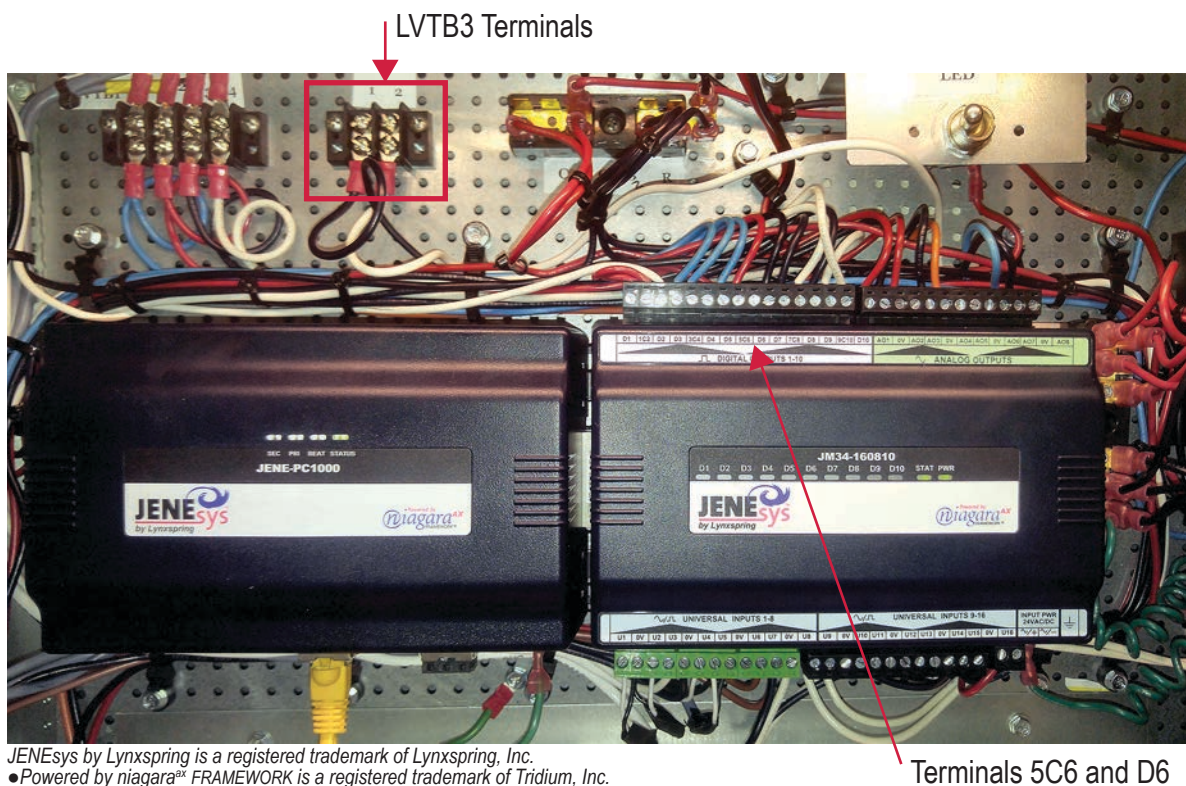
Connect a field-supplied contact relay or other On/Off control signal to the JENEsys controller. The contacts are normally open. Refer to the DOAS wiring diagram in this manual as necessary.

⚠ WARNING

High voltages are used in this equipment. Be extremely careful when working inside the control compartment.
Failure to observe this warning can result in death or severe injury.

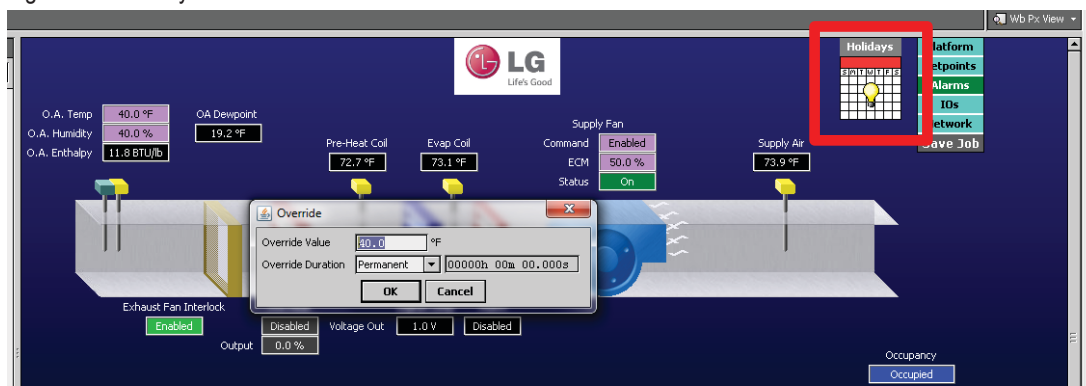
1. Locate low voltage terminal board 3 (LVTB3) in the control compartment (Figure 44).
2. Connect a field-supplied contact relay or other On/Off control signal to low voltage terminal board 3 contacts.
3. On the JENEsys controller display, navigate to the calendar.
4. Select Sunday and right-click to delete the schedule for the week. If the schedule is not deleted, the DOAS will be on at all times.

Figure 44: LVTB3 in DOAS Control Compartment



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Figure 45: JENEsys Calendar Schedule



DOAS HEAT RECOVERY STARTUP

Exhaust Fan Interlock

Exhaust Fan Interlock Connection

Connect a field-supplied contact relay or other On/Off control signal to the JENEsys controller. The contacts are normally open. Refer to the DOAS wiring diagram in this manual as necessary.

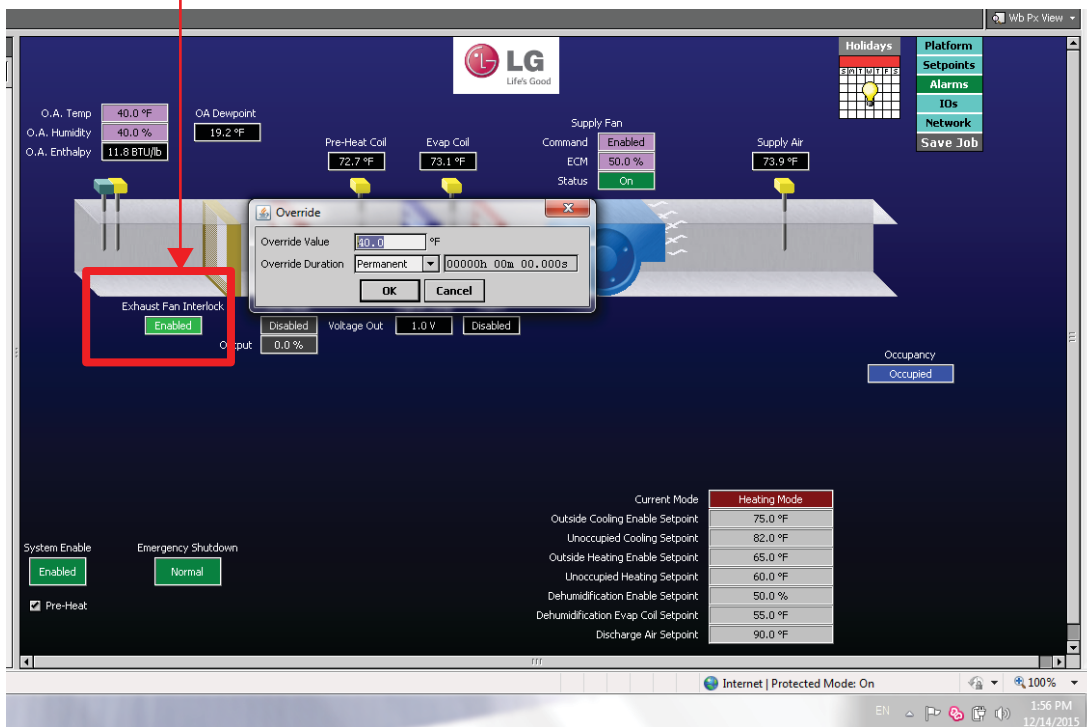
⚠ WARNING

High voltages are used in this equipment. Be extremely careful when working inside the control compartment. Failure to observe this warning can result in death or severe injury.

1. Locate terminals 5C6 and D6 on the JENEsys I/O module in the control compartment (Figure 44 on page 43).
2. Connect a field-supplied contact relay or other On/Off control signal to terminals 5C6 and D6.
3. On the JENEsys controller home screen (Figure 46), right-click **Exhaust Fan Interlock** and select **Enabled**.

Figure 46: Enable Exhaust Fan Interlock

Right click and enable Exhaust Fan Interlock



DOAS Heat Recovery Startup Complete

Startup of the DOAS heat recovery system is now complete.

DOAS Heat Pump Startup

Follow these procedures to start up a DOAS unit in a heat pump system. For heat recovery system procedures, refer to "DOAS Heat Recovery Startup" on page 28

Outdoor Air Units or Water Source Units

DOAS units can be used with either Multi V IV Air Outdoor Units or Multi V IV Water Source Units. Unless otherwise noted, the ODU configuration steps apply to both air and water source units.

ODU/WSU Software Versions

For DOAS applications, the Multi V IV Air Source Outdoor Unit must have software version 17.0 or higher and a production date of April 2015 or later. To determine production date, locate the unit serial number. The first three digits of the serial number indicate the production date. For example, the serial number 507XXXXXXXXX indicates a production date of July, 2015. If the outdoor unit requires software update, contact LG technical support.

All Multi V IV water source units require a software upgrade to be used in a DOAS application. Contact LG technical support.

DOAS Internal Power Switch

There is an internal power selector switch inside the DOAS control compartment. This switch selects between 208 and 230 volts input power.

Apply Power to the System

⚠ WARNING

High voltages are used in this equipment. Ensure all power cables are properly connected before applying power.

Failure to observe this warning can result in death or severe injury.

1. Apply power to the outdoor unit(s). Refer to the appropriate outdoor unit manual.
2. Ensure the DOAS power cable is correctly connected as described in this manual.
3. Ensure the DOAS internal power switch in the control compartment is positioned as appropriate for your system, 208V or 230V.
4. Apply power to the DOAS unit(s).
5. Wait at least five (5) minutes for the DOAS unit to finish its bootup routine.

Outdoor Unit DIP Switch Settings

⊘ Do not use the auto pipe detection feature. Use manual pipe detection only.

1. Carefully remove the maintenance panel to gain access to the ODU control board.

⚠ WARNING

High voltages are used in this equipment. ⊘ Do not touch exposed circuits or terminals.

Failure to observe this warning could result in death or severe injury.

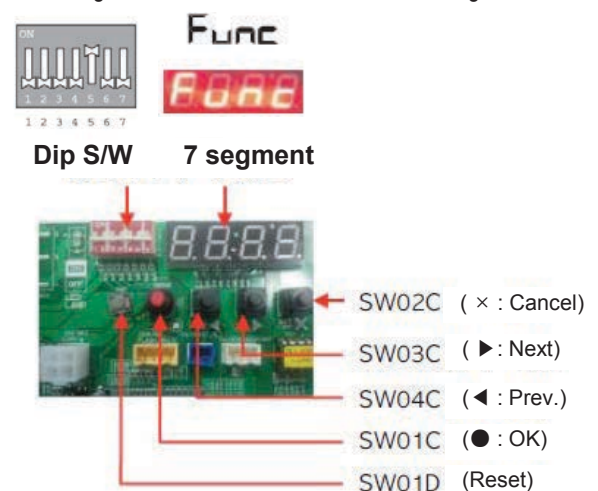
Note:

⊘ Do not short circuit components on the control board.

The outdoor unit could be damaged and not function properly.

2. Set ODU DIP switch 5 to ON (Figure 47).
3. Press the ► (next) or ◄ (previous) key until **Func** is displayed.
4. Press the ● (OK) key.
5. Press the ► (next) or ◄ (previous) key until **Fn16** is displayed.
6. Press the ● (OK) key.
7. Set ODU DIP switch 5 to OFF.
8. Press and hold the red SW01C button for about five seconds. Release the button when the LED displays "88."
9. Wait three (3) to seven (7) minutes. The LED will flash a number for about ten (10) seconds indicating how many indoor units the system successfully communicated with. For DOAS units, each coil (main and reheat) counts as one "indoor unit." For example, a system with one DOAS unit that uses both main and reheat coils will report two "indoor units."

Figure 47: Outdoor Unit DIP Switch settings



DOAS HEAT PUMP STARTUP

Thermostats Setup

Locate the two LG thermostats on the end of the control compartment swing-out door. Follow these procedures to configure the thermostats.

⚠ WARNING

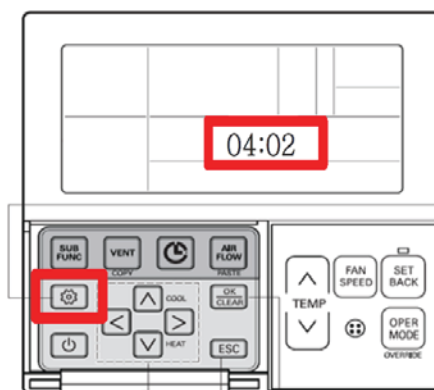
High voltages are used in this equipment. Be extremely careful when working inside the control compartment.
Failure to observe this warning can result in death or severe injury.

Temperature Sensing Adjustment

Perform this procedure for each thermostat. Refer to Figure 48.

1. Press and hold the gear icon button until the function code **01:01** is displayed.
2. Press and release the gear icon button until the function code **04:01** is displayed.
3. Press and release either the up or down arrow on the **TEMP** button until the function code **04:02** is displayed.
4. Press the **OK/CLEAR** button.
5. Repeat this procedure for the second thermostat.

Figure 48: Thermostat Temperature Sensing Adjustment



Central Control Address – One DOAS with Two ODU

Use this procedure when your system has one DOAS unit and two outdoor units. Perform this procedure for each thermostat. Ensure the main coil (top) thermostat address is set to 02:00 and the reheat (bottom) thermostat address is also set to 02:00. Refer to Figure 21Figure 49.

1. On the main coil (top) thermostat, press and hold the gear icon button until the function code **01:01** is displayed.
2. Press and release the gear icon button until the function code **02:01** is displayed.
3. Press and release either the up or down arrow on the **TEMP** button until the function code **02:00** is displayed.
4. Press the **OK/CLEAR** button.
5. On the reheat coil (bottom) thermostat, press and hold the gear icon button until the function code **01:01** is displayed.
6. Press and release the gear icon button until the function code **02:01** is displayed.
7. Press and release either the up or down arrow on the **TEMP** button until the function code **02:00** is displayed.
8. Press the **OK/CLEAR** button.
9. Connect a PC with LGMV software to the main coil ODU. Mobile LGMV is not recommended.
10. Confirm the central control addresses on the LGMV display (Figure 22). Click the More IDU info tab to confirm the central control address of IDU 1 is 00.
11. Connect LGMV to the reheat coil ODU and confirm the address is also 00.

Figure 49: Thermostat Central Control Address

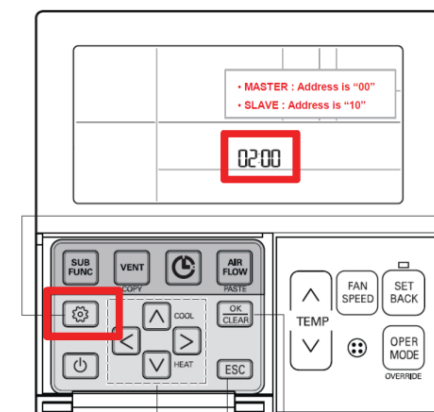
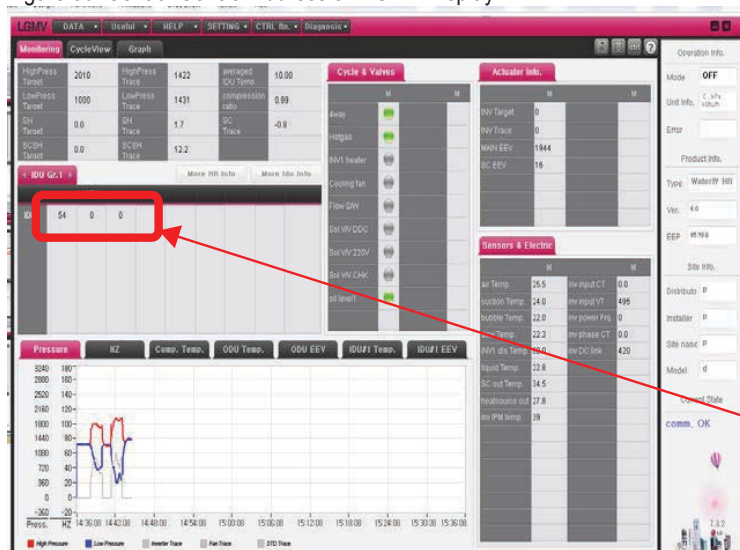


Figure 50: Central Control Address on LGMV Display



Display shows
IDU1 (Main Coil)
address is 00

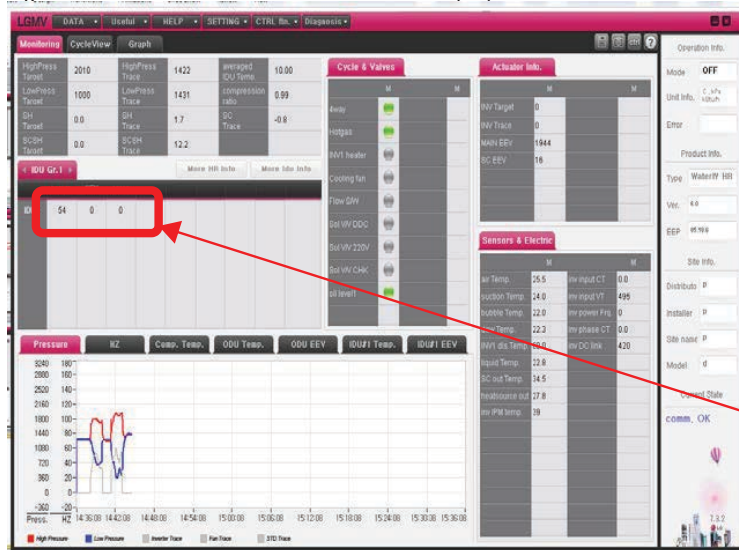
Central Control Address – Two DOAS with Two ODU

Use this procedure when your system has two DOAS units and two outdoor units. Perform this procedure for both thermostats on both DOAS units. Refer to Figure 51.

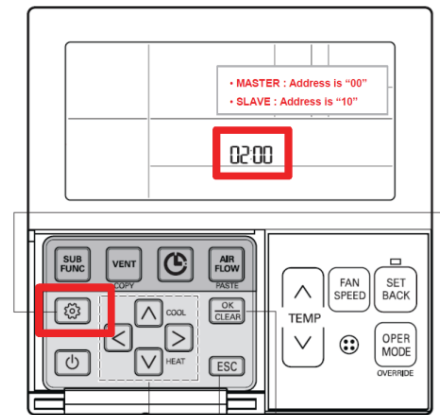
- For the master DOAS unit, ensure the main coil (top) thermostat address is set to 02:00 and the reheat (bottom) thermostat address is also set to 02:00.
 - For the slave DOAS unit, ensure the main coil (top) thermostat address is set to 02:10 and the reheat (bottom) thermostat address is also set to 02:10.
1. On the main coil (top) thermostat of the master DOAS unit, press and hold the gear icon button until function code **01:01** is displayed.
 2. Press and release the gear icon button until the function code **02:01** is displayed.
 3. Press and release either the up or down arrow on the **TEMP** button until the function code **02:00** is displayed.
 4. Press the **OK/CLEAR** button.
 5. On the reheat coil (bottom) thermostat of the master DOAS unit, press and hold the gear icon button until function code **01:01** is displayed.
 6. Press and release the gear icon button until the function code **02:01** is displayed.
 7. Press and release either the up or down arrow on the **TEMP** button until the function code **02:00** is displayed.
 8. Press the **OK/CLEAR** button.
 9. Connect a PC with LGMV software to the master DOAS ODU. Mobile LGMV is not recommended.
 10. Confirm the central control addresses on the LGMV display (Figure 51). Click the More IDU info tab to confirm the central control address of IDU 1 (main coil) is 00 and the address of IDU 2 (reheat coil) is also 00.

Figure 51: Thermostat Central Control Address

Figure 52: Central Control Address on LGMV Display



Display shows
IDU1 (Main Coil)
address is 00



11. On the main coil (top) thermostat of the slave DOAS unit, press and hold the gear icon button until function code **01:01** is displayed.
12. Press and release the gear icon button until the function code **02:01** is displayed.
13. Press and release either the up or down arrow on the **TEMP** button until the function code **02:10** is displayed.
14. Press the **OK/CLEAR** button.
15. On the reheat coil (bottom) thermostat of the slave DOAS unit, press and hold the gear icon button until function code **01:01** is displayed.
16. Press and release the gear icon button until the function code **02:01** is displayed.
17. Press and release either the up or down arrow on the **TEMP** button until the function code **02:10** is displayed.
18. Press the **OK/CLEAR** button.
19. Connect a PC with LGMV software to the slave DOAS ODU. Mobile LGMV is not recommended.
20. Confirm the central control addresses on the LGMV display. Click the More IDU info tab to confirm the central control address of IDU 1 (main coil) is 10 and the address of IDU 2 (reheat coil) is also 10.

DOAS HEAT PUMP STARTUP

Extended I/O PCB Software Upgrade

DOAS units manufactured in 2014 require a software upgrade to the extended I/O PCBs. DOAS units manufactured in 2015 and later do not require this upgrade. To determine DOAS date of manufacture, locate the unit serial number. The first three digits of the serial number indicate the date of manufacture. For example, 405 indicates a manufacture date of May, 2014.

A second method of determining if this upgrade is required is to observe the LEDs on the extended I/O PCB. If they flash in order left to right, the upgrade is required. If they flash randomly, the upgrade is not required. If your DOAS unit requires this upgrade, contact LG technical support for the software.

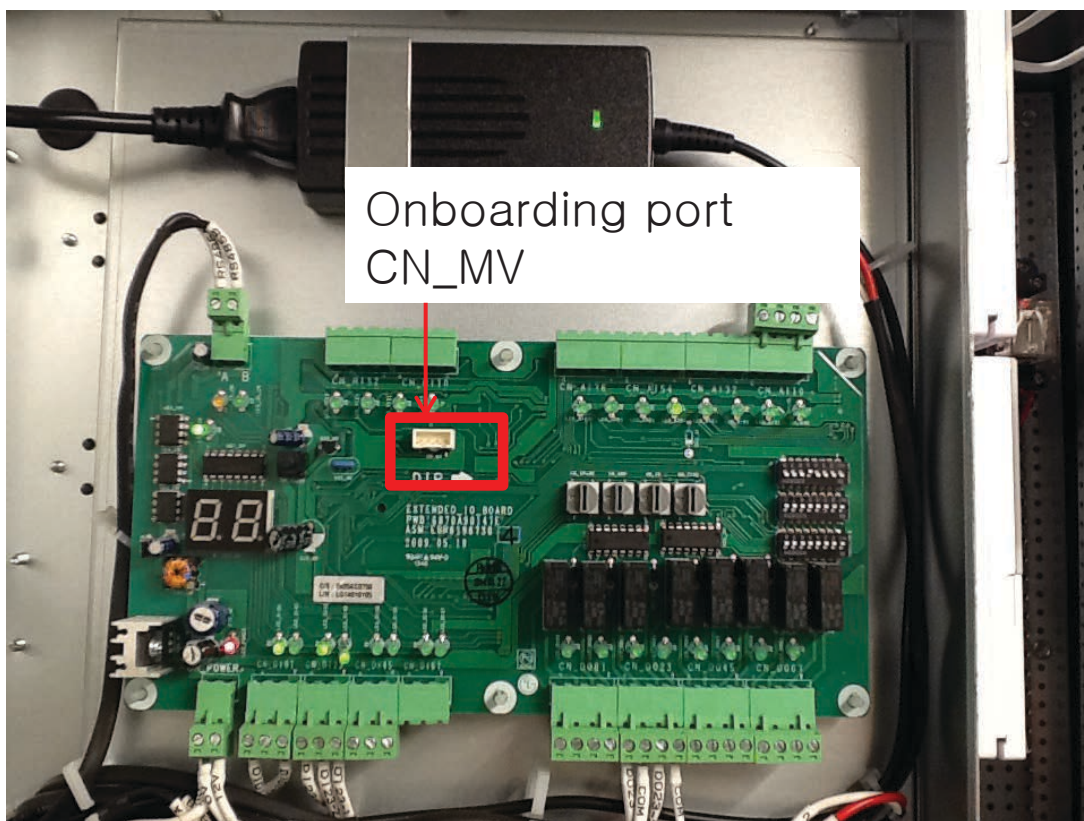
If upgrade is necessary, locate the extended I/O PCBs on the swing-out door in the control compartment. Connect to the CN_MV port (Figure 53) on the extended I/O PCB. Upgrade the software on both extended I/O PCBs.

⚠ WARNING

High voltages are used in this equipment. Be extremely careful when working inside the control compartment.

Failure to observe this warning can result in death or severe injury.

Figure 53: Extended I/O PCB



Rotary and DIP Switch Settings for Heat Pump Systems with One DOAS Unit and Two ODUs

The DIP switches on the extended I/O PCBs must be set as necessary for your system configuration. The settings are different for heat pump systems with one ODU and systems with two ODUs. The extended I/O PCBs are located on the outer side of the swing-out door in the control compartment. Follow the procedure that applies to your system.

⚠ WARNING

High voltages are used in this equipment. Be extremely careful when working inside the control compartment.

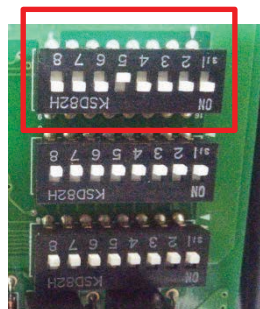
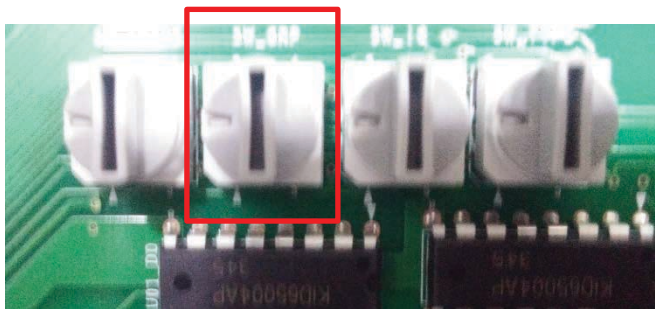
Failure to observe this warning can result in death or severe injury.

1. Locate the extended I/O PCBs on the outer side of the swing-out door in the control compartment.
2. Set the rotary switches and DIP switches as shown in Figure 54.
3. DOAS input power must be cycled off and on before these settings will take effect. Turn off DOAS power at the power disconnect switch, wait approximately ten seconds, and then turn on DOAS power.

Figure 54: Extended I/O PCB Rotary and DIP Switch Settings for Heat Pump Systems with One DOAS and Two ODU

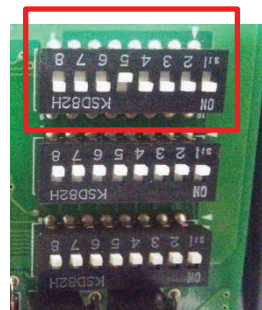
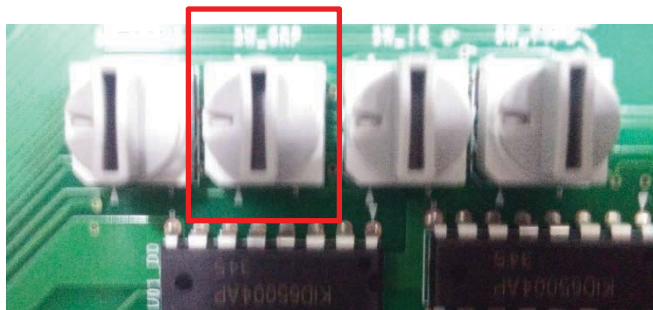
[Main Coil – Top board]

- Rotary S/W : 'SW_GRP' is setting up the '0' address.
- Dip S/W : NO. 5 of 'SW03_SW' is off.



[Reheat Coil – Bottom board]

- Rotary S/W : 'SW_GRP' is setting up the '0' address.
- Dip S/W : NO. 5 of 'SW03_SW' is off.



DOAS HEAT PUMP STARTUP

Extended I/O PCB Rotary and DIP Switch Setup

Rotary and DIP Switch Settings for Heat Pump Systems with Two DOAS Units and Two ODUs

The DIP switches on the extended I/O PCBs must be set as necessary for your system configuration. The settings are different for heat pump systems with one ODU and systems with two ODUs. The extended I/O PCBs are located on the outer side of the swing-out door in the control compartment. Follow the procedure that applies to your system.

⚠ WARNING

High voltages are used in this equipment. Be extremely careful when working inside the control compartment.

Failure to observe this warning can result in death or severe injury.

1. Locate the extended I/O PCBs on the outer side of the swing-out door in the control compartment.
2. Set the rotary switches and DIP switches as shown in Figure 55.
3. DOAS input power must be cycled off and on before these settings will take effect. Turn off DOAS power at the power disconnect switch, wait approximately ten seconds, and then turn on DOAS power.

Figure 55: Extended I/O PCB Rotary and DIP Switch Settings for Heat Pump Systems with Two DOAS and Two ODU

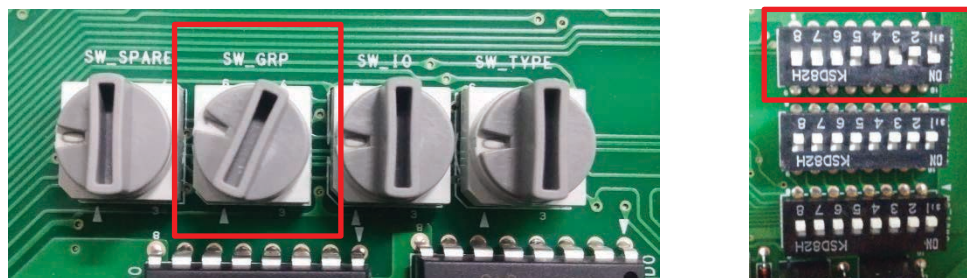
[Master DOAS – Top and bottom boards]

- Rotary S/W : 'SW_GRP' is setting up the '0' address.
- Dip S/W : NO. 5 of 'SW03_SW' is off.



[SLAVE DOAS – Top and bottom boards]

- Rotary S/W : 'SW_GRP' is setting up the '1' address.
- Dip S/W : NO. 5 and 2 of 'SW03_SW' is off.



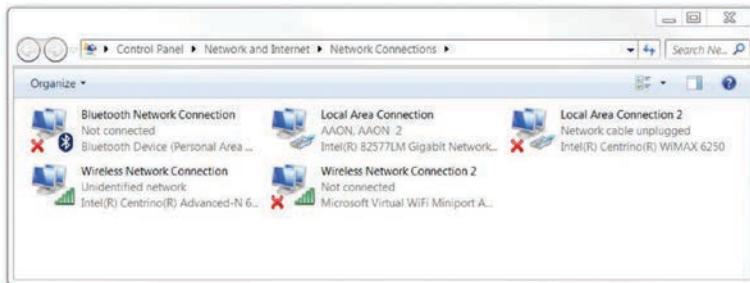
Computer Configuration

You must configure your computer to communicate with the JENESys controller.

1. Open Network Connections window (Figure 56).

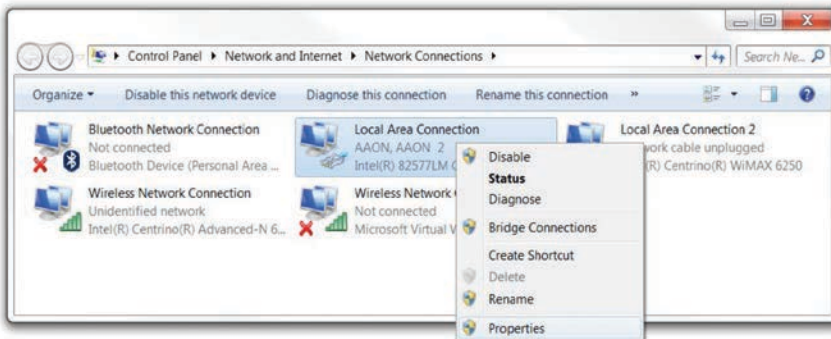
- For Windows XP and older, open the Control Panel and then select Network Connections.
- For Windows Vista and later, type Network Connections in the search field at the bottom of the Start menu and click Enter.

Figure 56: Network Connections Window



2. Right-click Local Area Connection and select Properties (Figure 57).

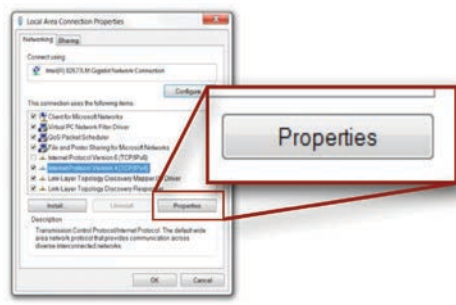
Figure 57: Local Area Connection Properties Window



3. To change the IP address for the JENESys controller, select Internet Protocol Version 4 (TCP/IP) (Figure 58).

4. Click the Properties button (Figure 58). The internet protocol version 4 properties allow you to change the IPv4 address of the PC you are working on.

Figure 58: Local Area Connection Properties

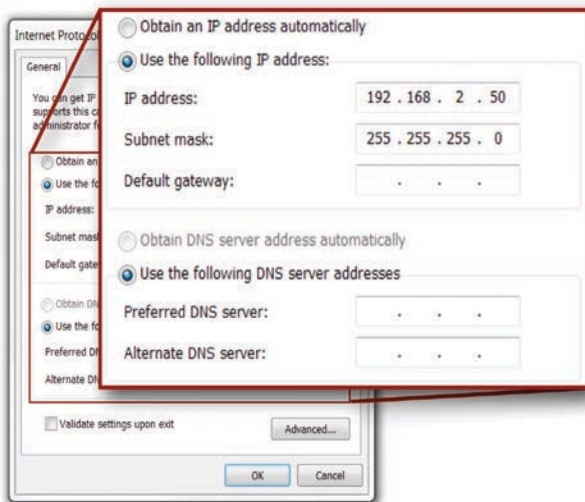


DOAS HEAT PUMP STARTUP

Laptop PC Configuration

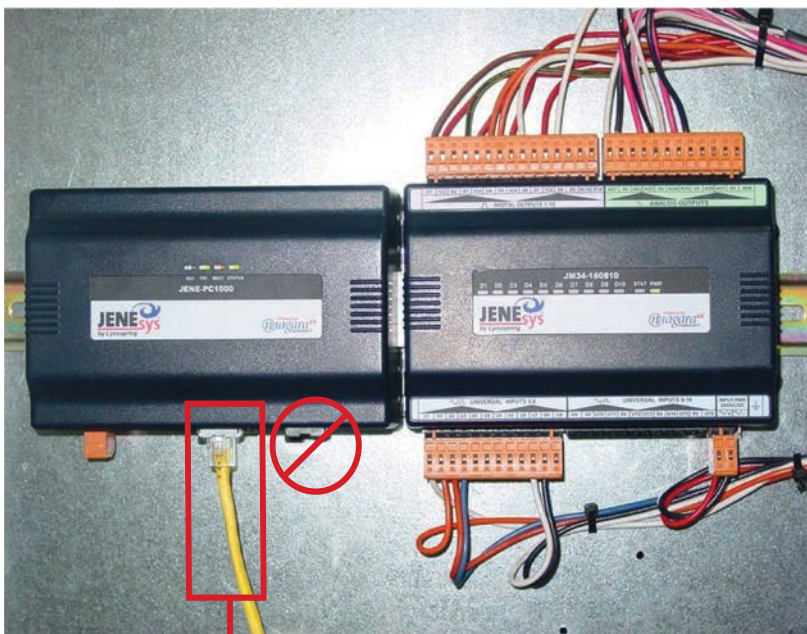
5. Record the current settings so you can return the network adapter to its previous address after the JENEsys controller is connected.
6. Enter an appropriate IPv4 address to connect the JENEsys controller (Figure 59).
7. Enter 255.255.255.0 in the Subnet Mask field (Figure 31).
8. Click the OK button. The computer's network address will be set-up correctly to directly access the JENEsys controller with a Cat5 Ethernet cable connected from your computer to the controller.
9. Close the Network Properties window. The JENEsys controller can now be accessed through a web browser.

Figure 59: Internet Protocol



10. Connect a Cat5 Ethernet cable from your computer to port 2 of the JENEsys controller (Figure 60).
11. Turn off DOAS power at its power disconnect switch. Wait at least 10 seconds and reapply power.

Figure 60: Connecting a JENEsys AHU Controller



Connect Cat5 Ethernet Cable between JENEsys and Computer

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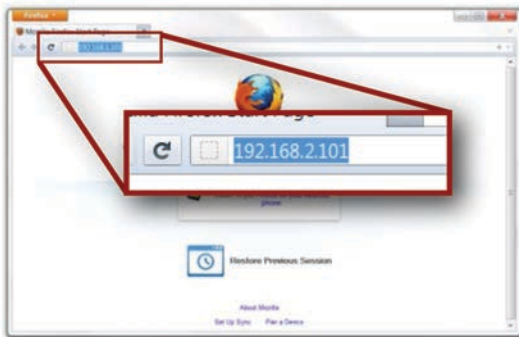
• Powered by niagara^{ax} FRAMEWORK is a registered trademark of Tridium, Inc.

Web User Interface

You access the JENESys web user interface with an internet browser. Use Google Chrome or Mozilla Firefox. Do not use Internet Explorer. Internet Explorer will not work with the JENESys controller.

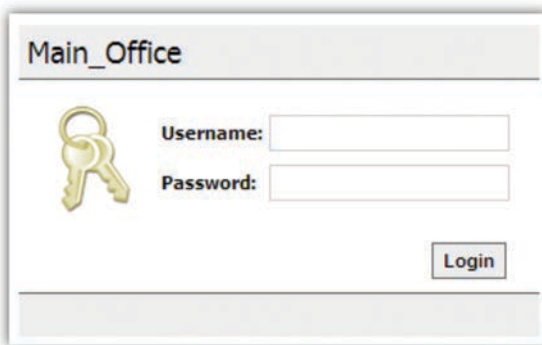
1. Open a web browser. The browser must have the latest java drivers installed. If you need to update java drivers, visit www.java.com.
2. Navigate to the controller address (Figure 61). For factory default controllers, the IP address is 192.168.2.101 (LAN2).

Figure 61: Accessing the Web User Interface



3. After several minutes (up to 10-15), the login page opens.
4. Enter your Username and Password and click the Login button (Figure 62).
 - Username - admin
 - Password - doasvrf2

Figure 62: Web User Interface Login Screen



5. The first time you login, the system will load the niagaraAX platform (Figure 63). This may take several minutes because several java modules will be downloaded in order to properly display the web user interface screens. Once the niagaraAX platform is loaded, the controller will load the Web User Interface home page.

Figure 63: niagaraAX Platform



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DOAS HEAT PUMP STARTUP

JENEsys Controller

JENEsys Settings

The JENEsys software must be version 14a or higher. If software upgrade is necessary, contact LG Technical Support.

1. After logging into the web user interface, the JENEsys home screen displays (Figure 64).
2. Right-click on **System Enable** and set to **Enabled**.
3. Right-click on **Supply Fan Command** and set to **Active**. The DOAS fan should start.
4. Adjust the supply fan motor as needed by air balancer to achieve the design air flow for your system.
Fan motor adjustment range is from 0 to 100%.
5. Click **Setpoints** to display the Setpoints screen.
6. If necessary, change **Dehum Application** to Heat Pump.

Figure 64: JENEsys Home Screen

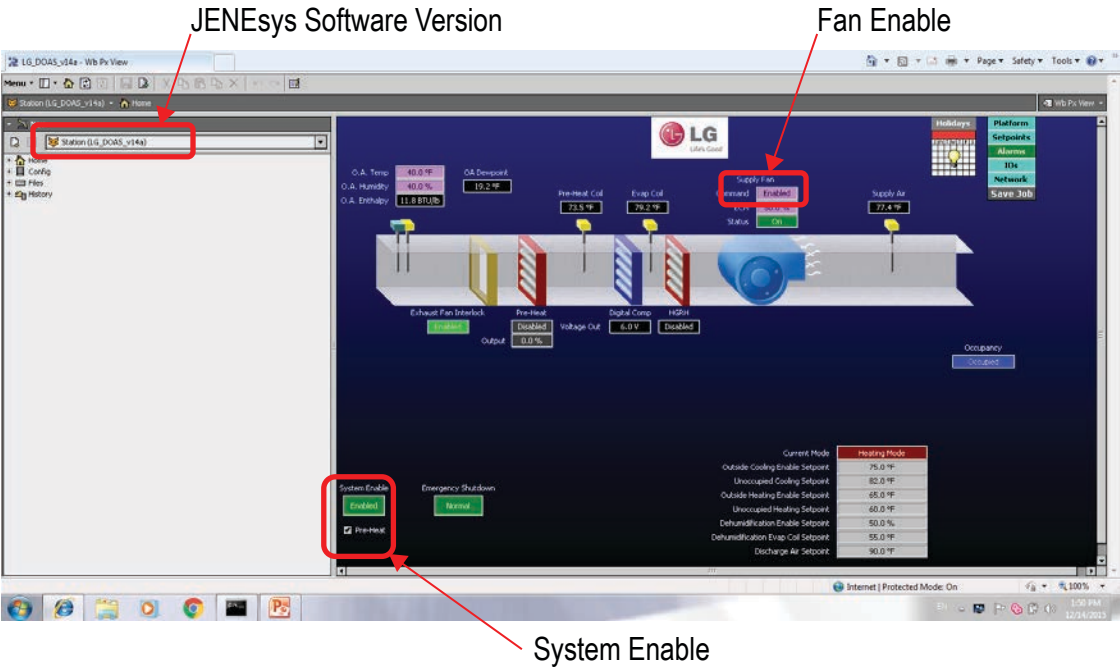
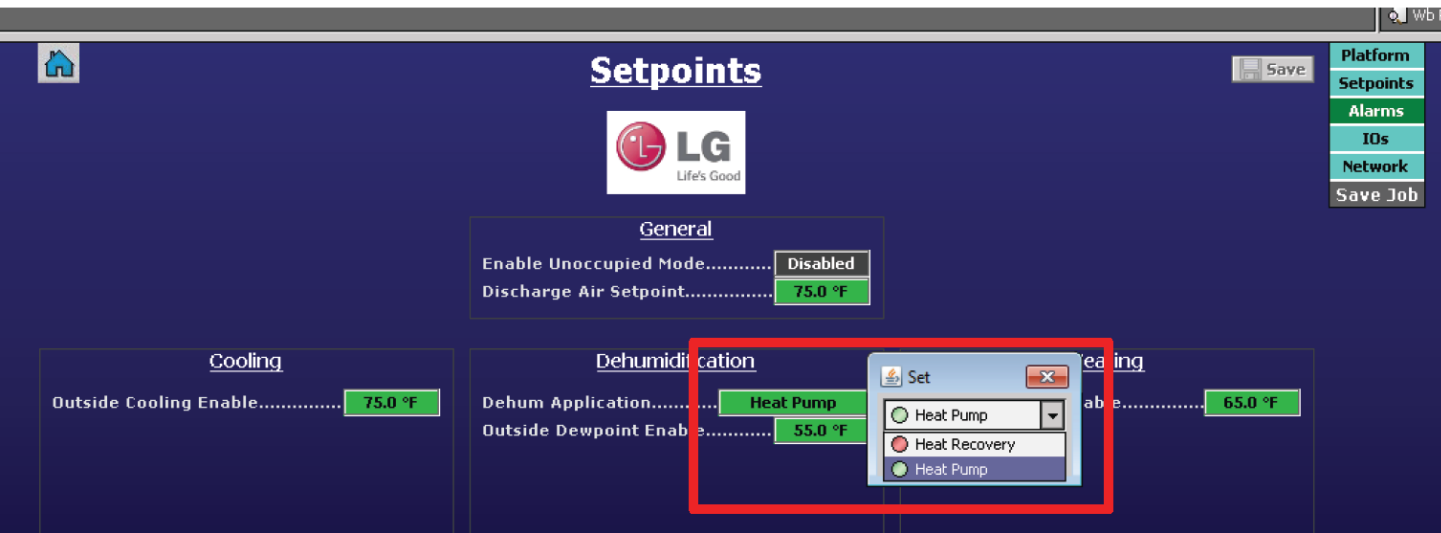


Figure 65: JENEsys Setpoints Screen



Use LGMV software to verify correct DOAS installation and configuration.

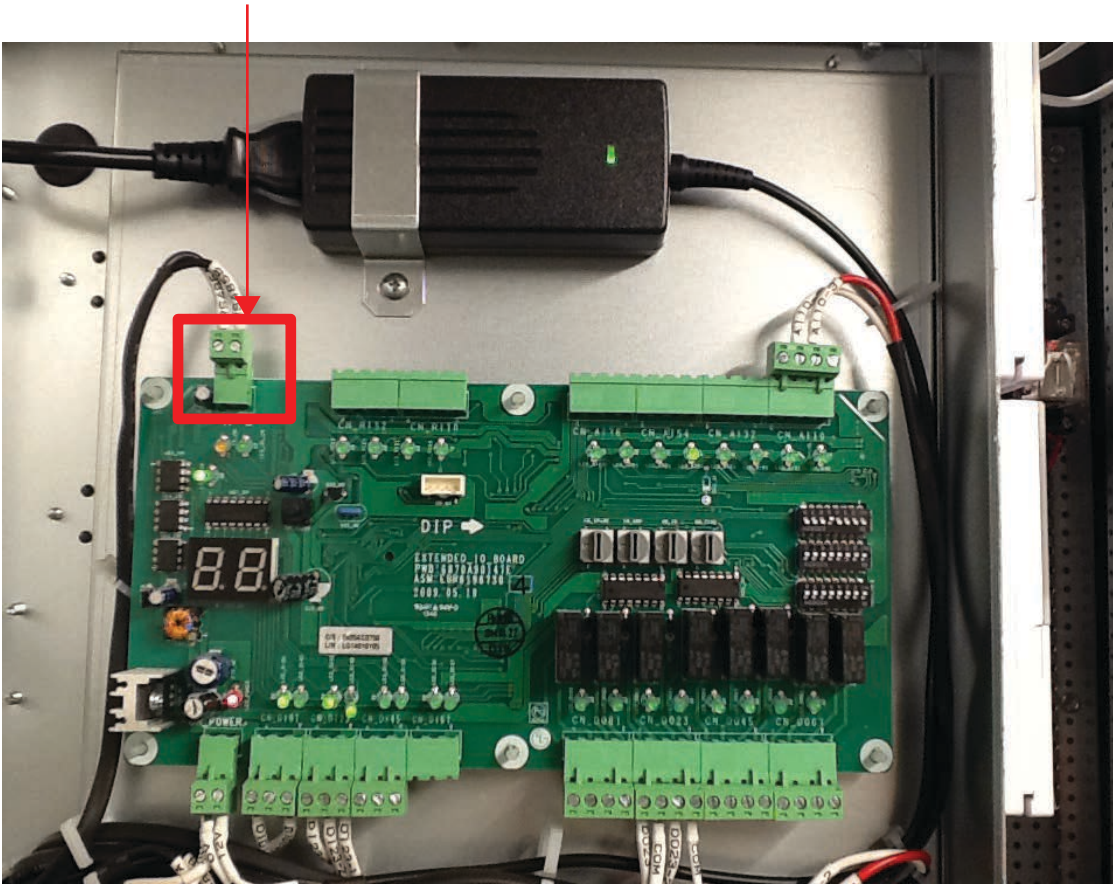
⚠ WARNING

High voltages are used in this equipment. Be extremely careful when working inside the control compartment.
Failure to observe this warning can result in death or severe injury.

1. Carefully disconnect the RS485 connection from both Extended I/O PCBs (Figure 66).
2. Position the disconnected cables so they will not contact powered components.

Figure 66: Disconnect RS485 Connections

Disconnect RS-485 connection on both I/O PCBs



DOAS HEAT PUMP STARTUP

LGMV Testing

3. If not already connected, connect a computer with LGMV software to the master DOAS ODU.
4. Use LGMV to control the main coil to heat mode (Figure 67)
5. Verify heat mode is working by checking on the JENEsys home screen that Evap Coil temperature is higher than the outside air temperature (Figure 68).

Figure 67: Set Main Coil to Heat Mode in LGMV

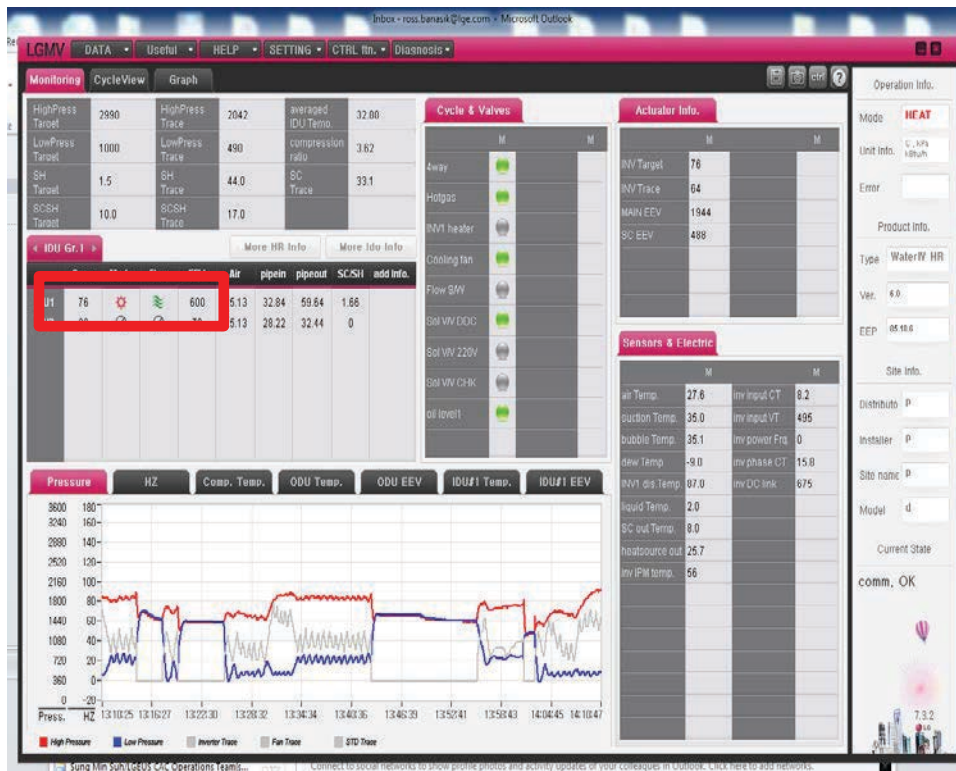
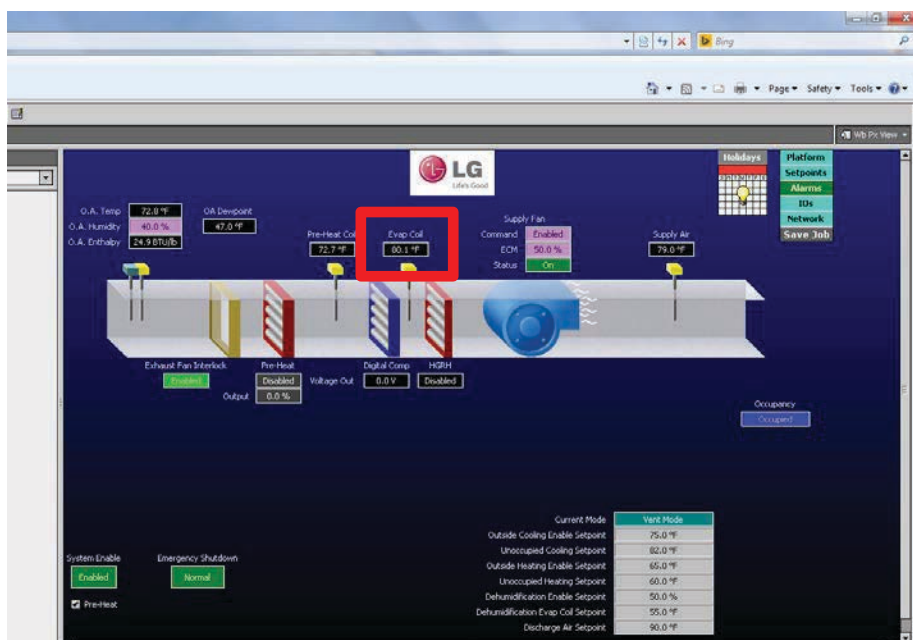


Figure 68: Verify Main Coil Cooling on JENEsys Home Screen



6. Use LGMV to control the main coil to cooling mode.
7. Verify cooling mode is working by checking on the JENEsys home screen that Evap Coil temperature is lower than the outside air temperature (Figure 69).
8. Verify cooling mode is working by checking on the JENEsys home screen that Evap Coil temperature is lower than outside air temperature (Figure 70).

Figure 69: Set Main Coil to Cooling and Reheat Coil to Heat in LGMV

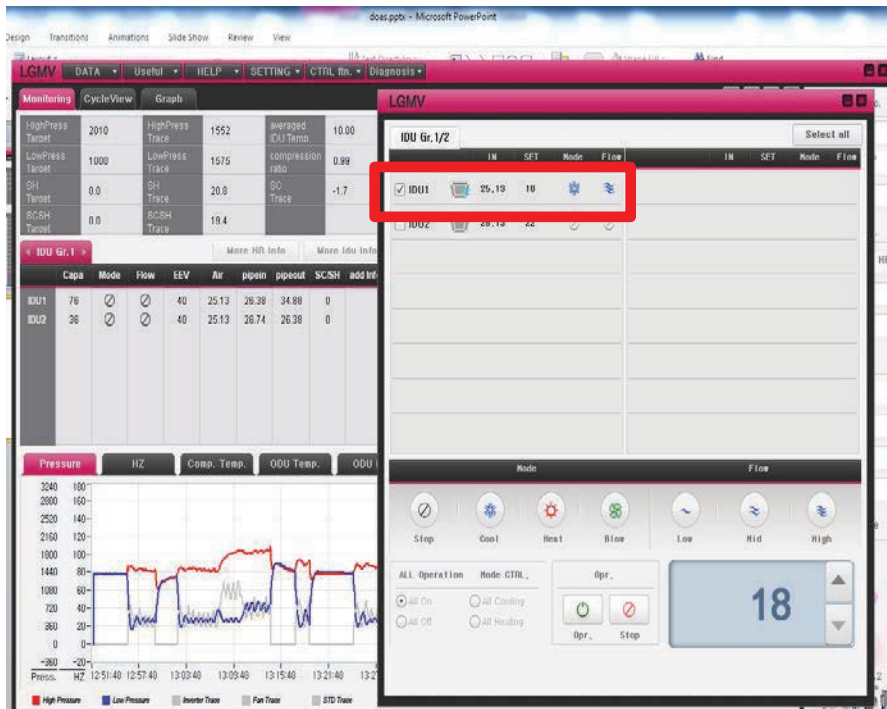
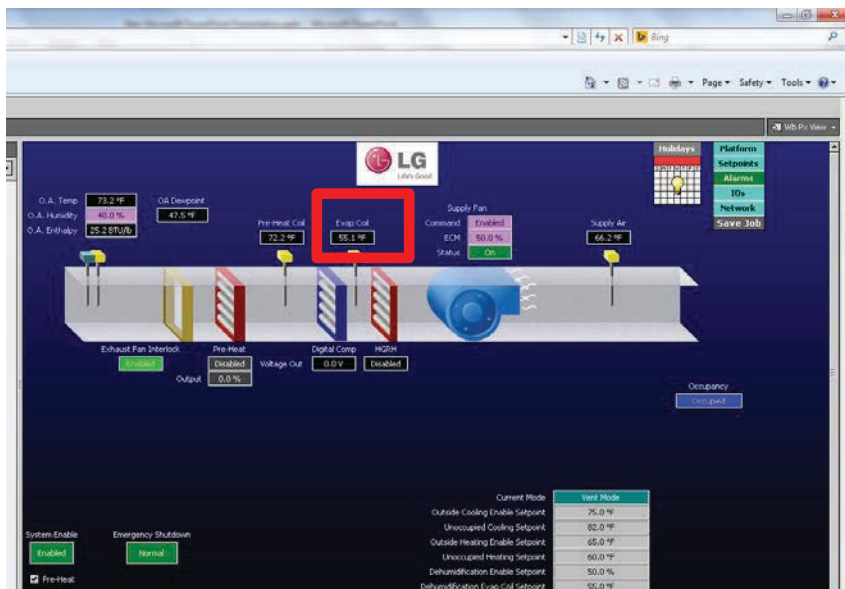


Figure 70: Verify Main Coil Cooling JENEsys Home Screen



DOAS HEAT PUMP STARTUP

LGMV Testing

- Use LGMV to control the reheat coil to heat mode (Figure 71).
- Verify reheat mode is working by checking on the JENEsys home screen that Evap Coil temperature is higher than outside air temperature (Figure 72).

Figure 71: Verify Main Coil Cooling on JENEsys Home Screen

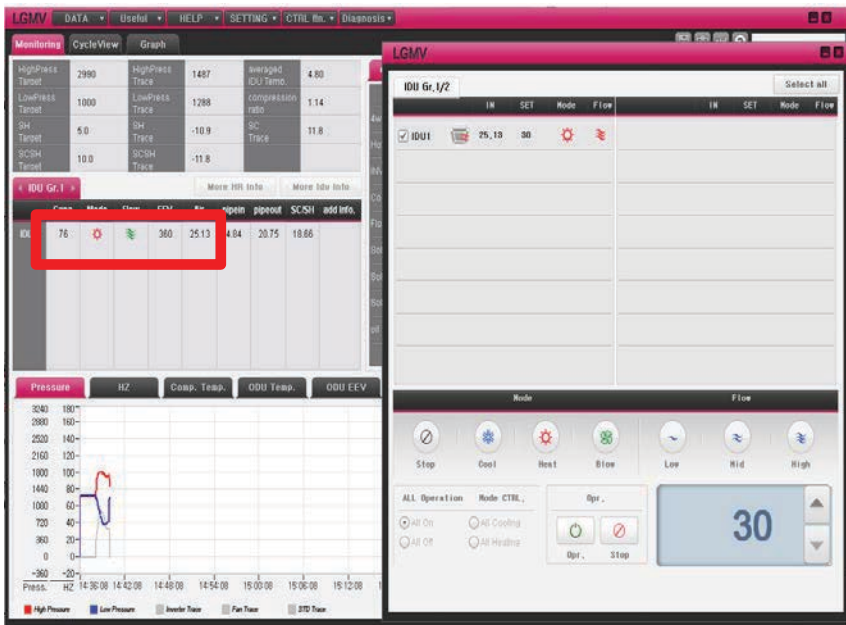
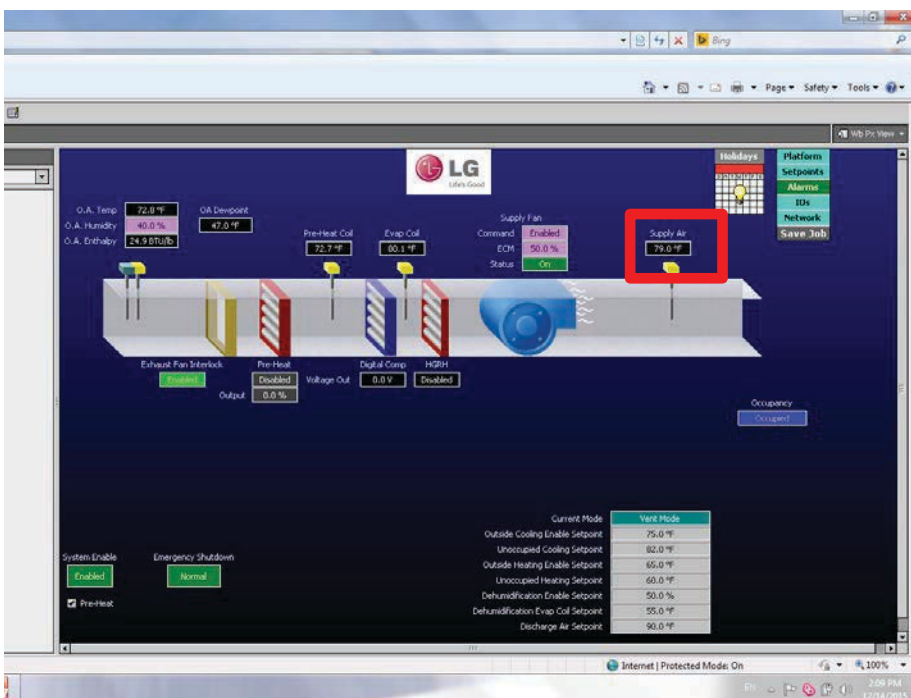
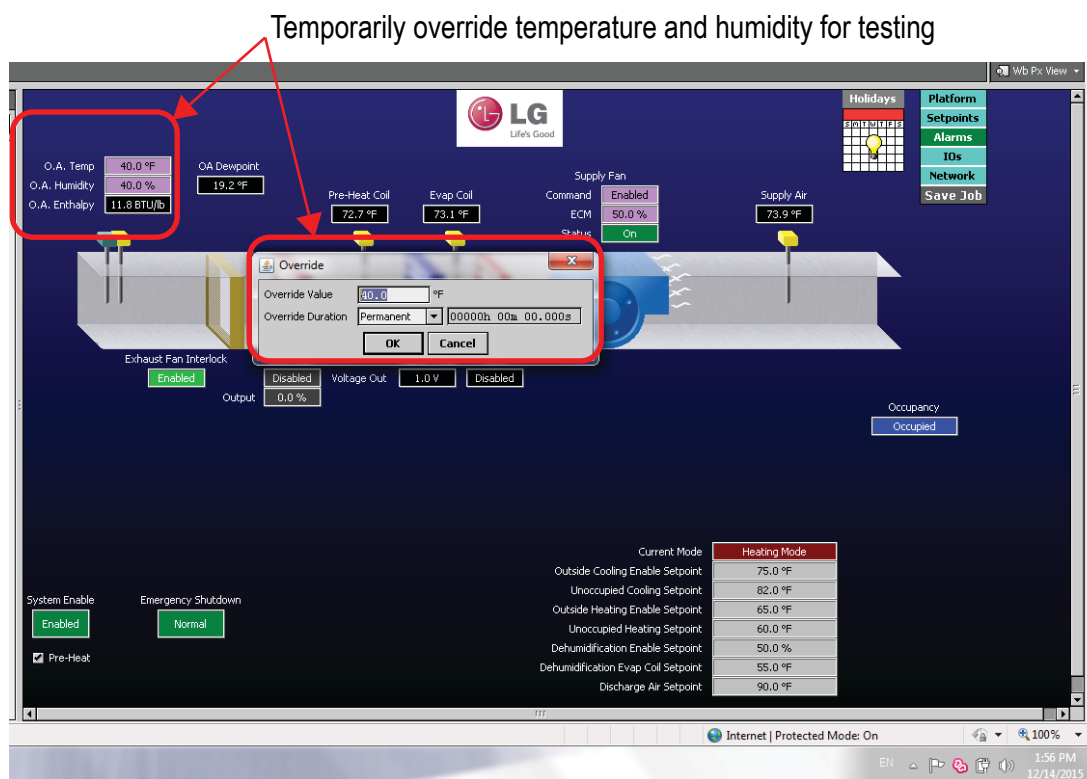


Figure 72: Verify Main Coil Cooling on JENEsys Home Screen



11. Reconnect the RS485 connection on both Extended I/O PCBs. These are the cables that were disconnected in step 1 (Figure 66).
12. On the JENESys home screen, right click on **O.A. Temp** to override the actual outside air temperature for testing (Figure 43).
13. Verify proper operation of cooling, heating, and dehumidification modes by changing the actual outside air temperature and outside air humidity values to higher values.
14. Verify proper operation of cooling, heating, and dehumidification modes by changing the actual outside air temperature and outside air humidity values to lower values.

Figure 73: Override Temperature and Humidity Settings for Test



DOAS HEAT PUMP STARTUP



Remote Start/Stop

Remote Start/Stop Connection

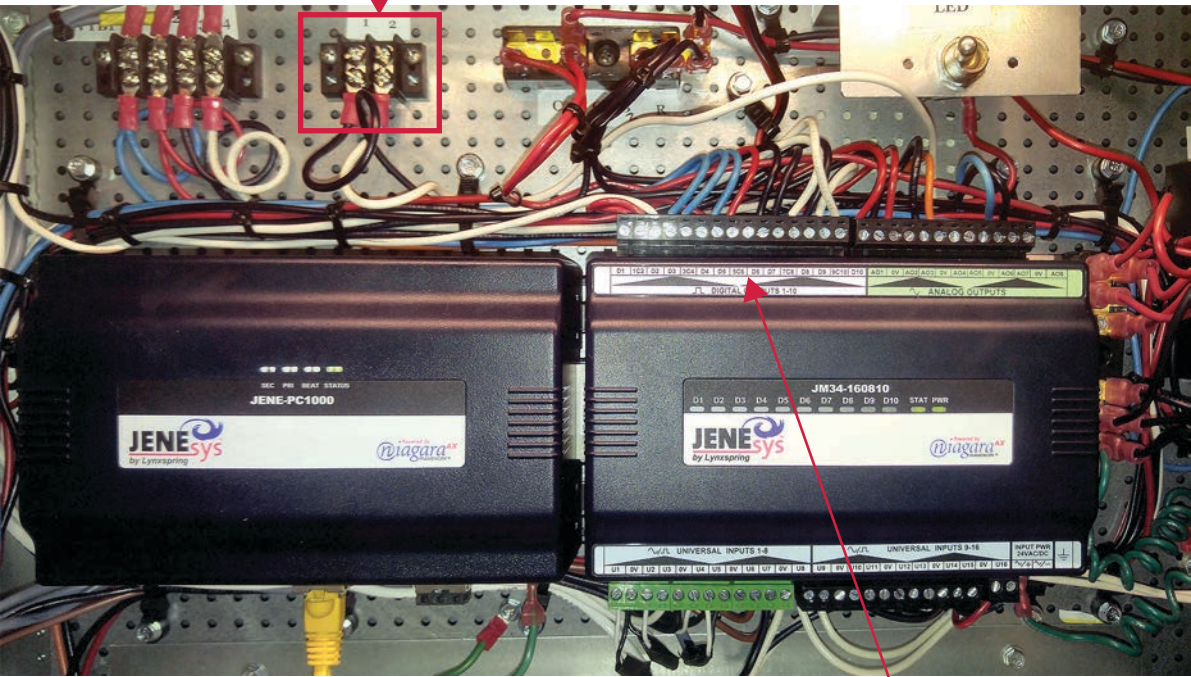
Connect a field-supplied contact relay or other On/Off control signal to the JENEsys controller. The contacts are normally open. Refer to the DOAS wiring diagram in this manual as necessary.

⚠ WARNING

High voltages are used in this equipment. Be extremely careful when working inside the control compartment. Failure to observe this warning can result in death or severe injury.

1. Locate low voltage terminal board 3 (LVTB3) in the control compartment (Figure 74).
2. Connect a field-supplied contact relay or other On/Off control signal to low voltage terminal board 3 contacts.
3. On the JENEsys controller display, navigate to the calendar.
4. Select Sunday and right-click to delete the schedule for the week (Figure 75). If the schedule is not deleted, the DOAS will be on at all times.

Figure 74: LVTB3 in DOAS Control Compartment



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 •Powered by niagara[®] FRAMEWORK is a registered trademark of Tridium, Inc.

Figure 75: JENEsys Calendar Schedule



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Exhaust Fan Interlock Connection

Connect a field-supplied contact relay or other On/Off control signal to the JENEsys controller. The contacts are normally open. Refer to the DOAS wiring diagram in this manual as necessary.

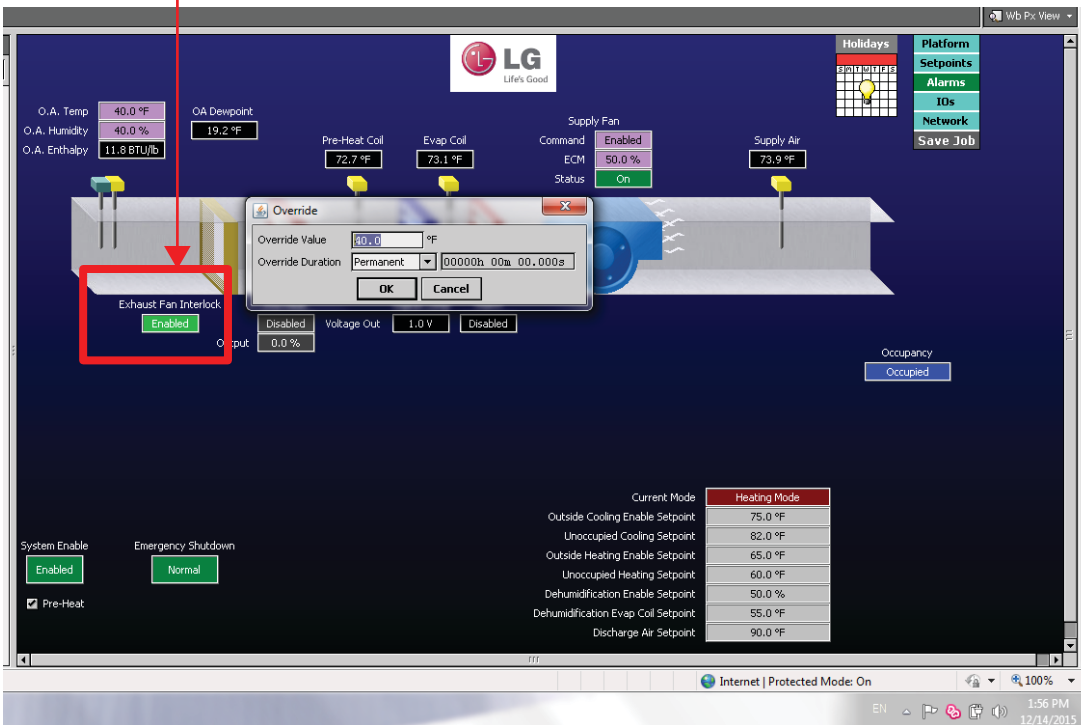
⚠ WARNING

High voltages are used in this equipment. Be extremely careful when working inside the control compartment.
Failure to observe this warning can result in death or severe injury.

1. Locate terminals 5C6 and D6 on the JENEsys I/O module in the control compartment (Figure 44 on page 43).
2. Connect a field-supplied contact relay or other On/Off control signal to terminals 5C6 and D6.
3. On the JENEsys controller home screen (Figure 46), right-click **Exhaust Fan Interlock** and select **Enabled**.

Figure 76: Enable Exhaust Fan Interlock

Right click and enable Exhaust Fan Interlock



DOAS Heat Pump Startup Complete

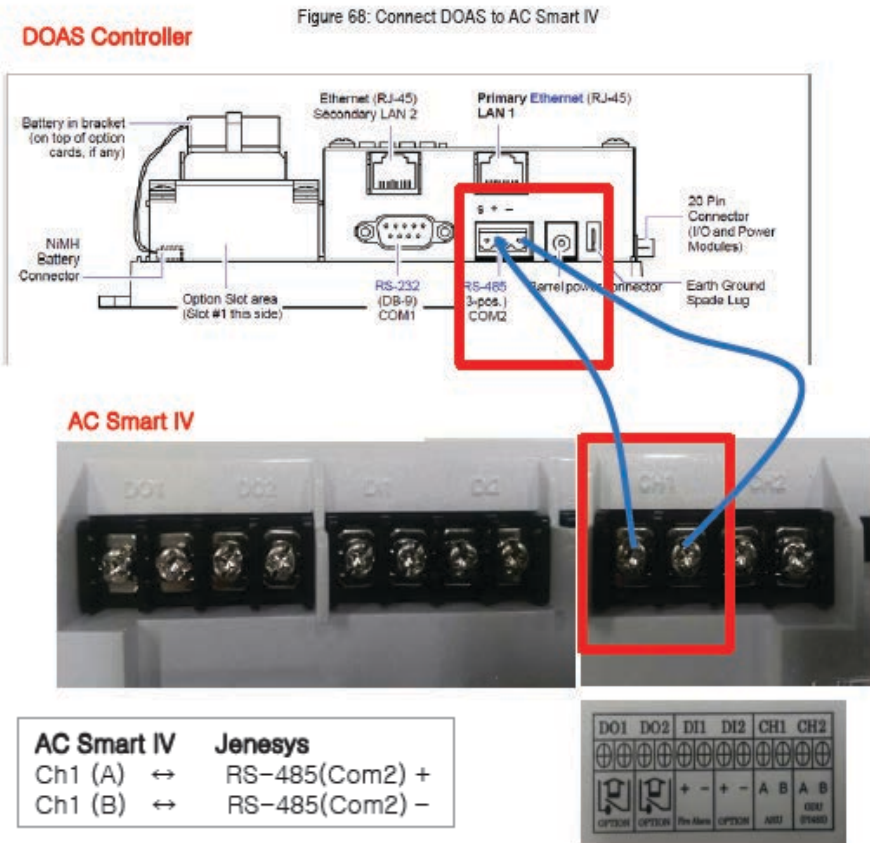
Startup of the DOAS heat pump system is now complete.

DOAS AC SMART IV STARTUP

Follow this procedure to configure an AC Smart IV controller to work with a DOAS unit.

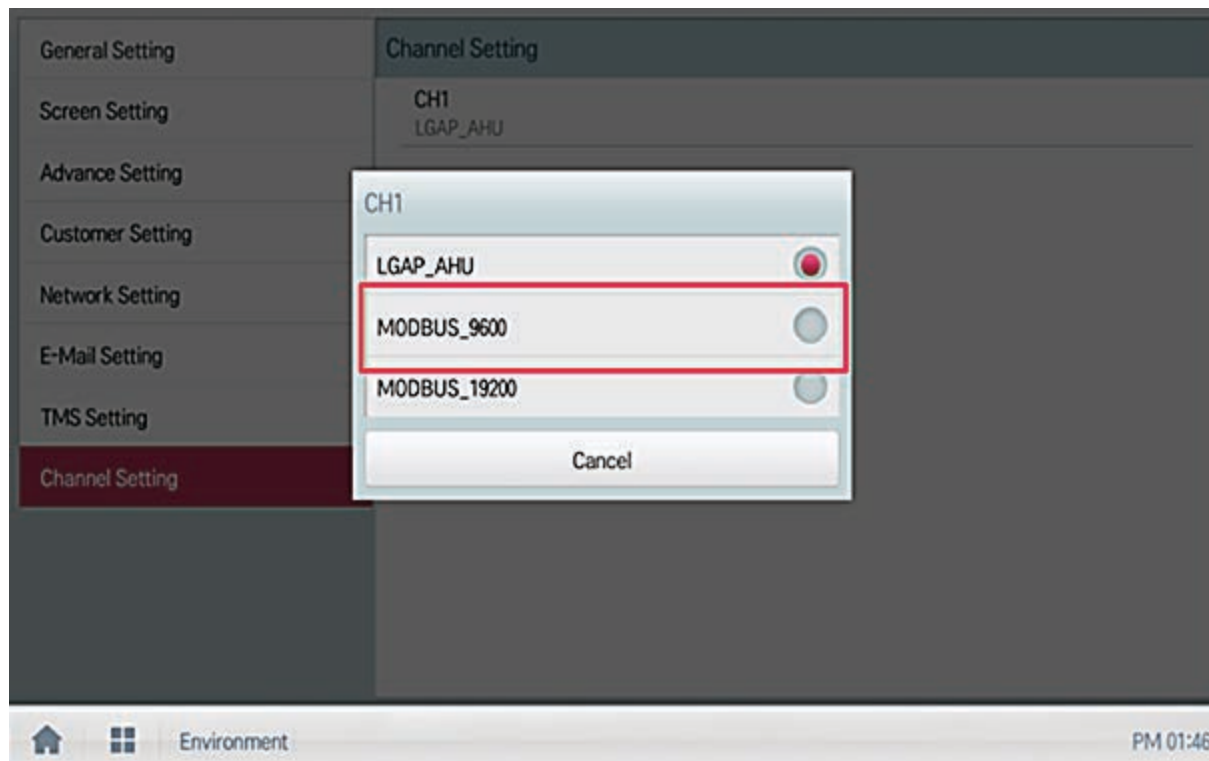
1. Connect the control wiring between the DOAS JENEsys controller and AC Smart IVchannel 1 as shown in Figure 77.

Figure 77: AC Smart IV to JENEsys Controller Wiring



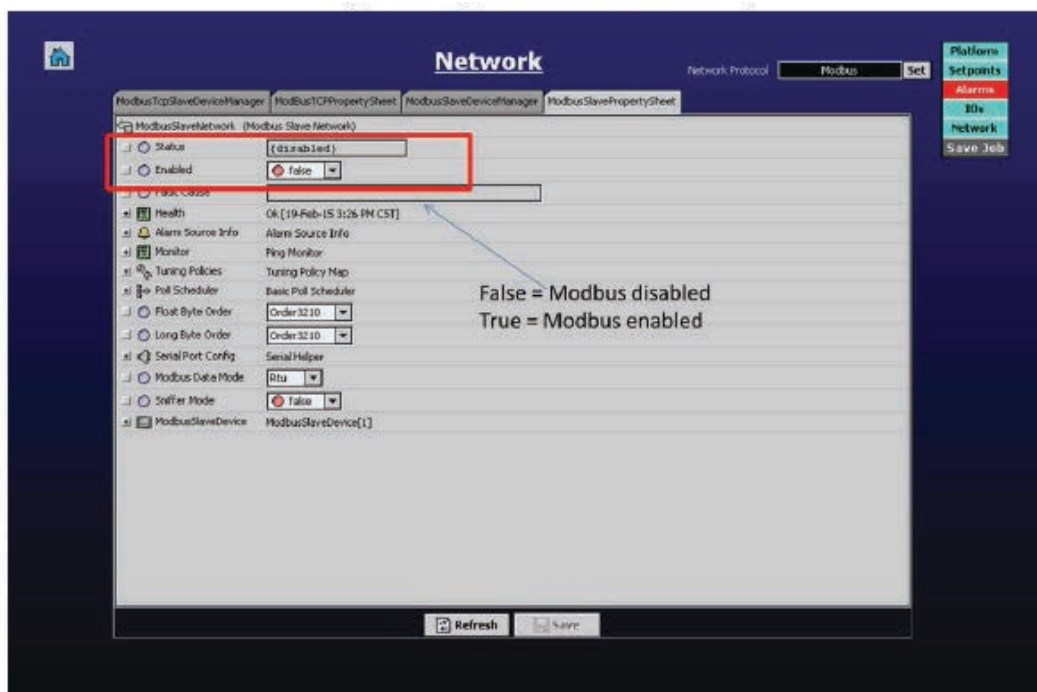
2. Verify the AC Smart IV software version is 1.15.2 or higher. If an upgrade is necessary, contact LG Technical Support.
3. Verify the JENEsys controller software is version 14a or higher. If an upgrade is necessary, contact LG Technical Support.
4. Change the AC Smart IV channel setting to MODBUS_9600 (Figure 78).

Figure 78: AC Smart IV Modbus Setting



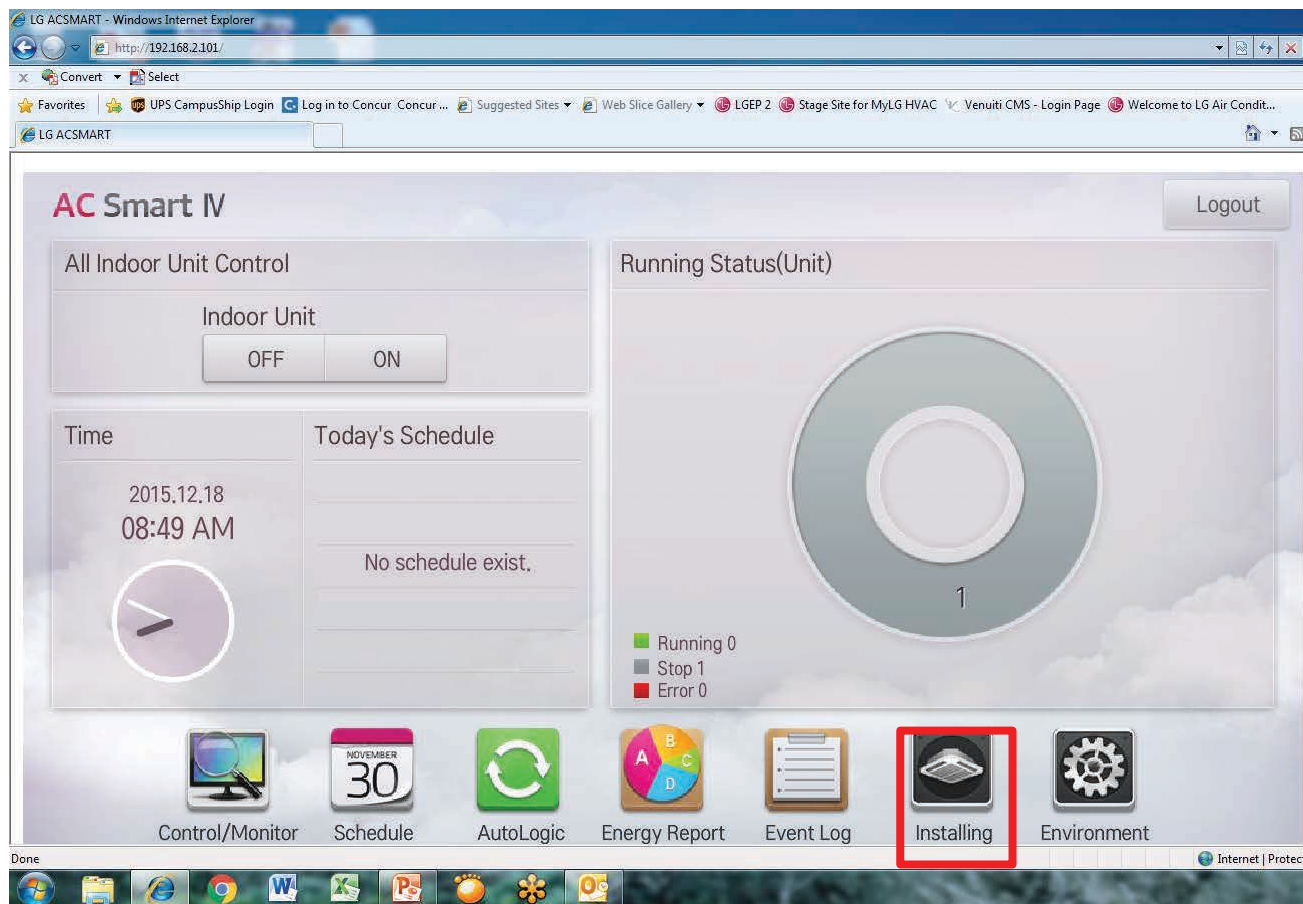
5. If not already connected, connect a computer to the JENEsys controller.
6. From the JENEsys home screen, click **Network** on the menu in the upper right of the screen (Figure 79).
7. On the Network screen, select the **ModbusSlavePropertySheet** tab.
8. Change **Enabled** from **false** to **true**.
9. Click the **Save** button.

Figure 79: JENEsys Setup



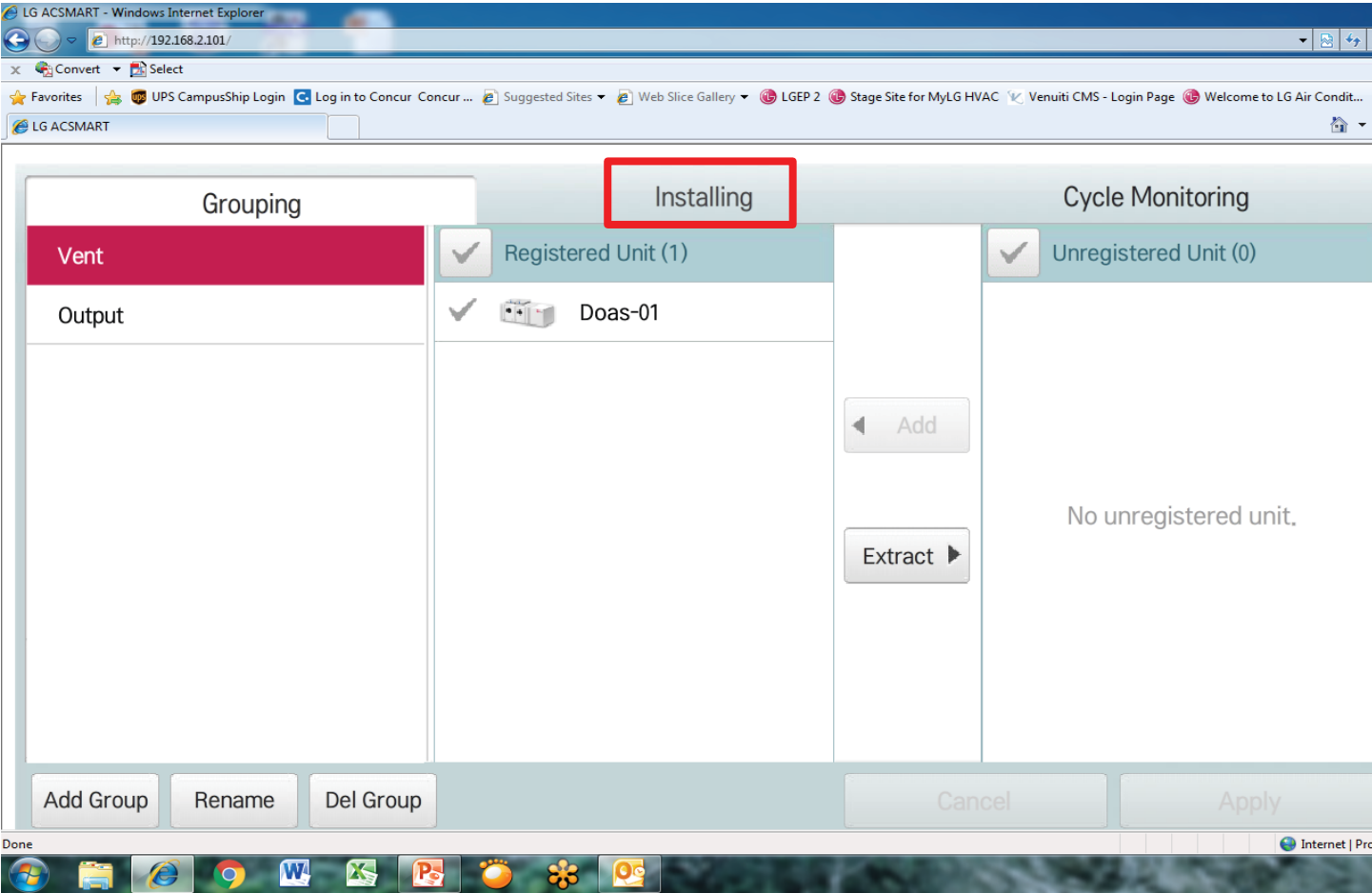
10. On the AC Smart IV home screen, press the **Installing** button (Figure 80).

Figure 80: AC Smart IV Home Screen



11. Press the **Installing** tab on the AC Smart IV screen (Figure 81).

Figure 81: AC Smart IV Installing Tab



12. Press **Auto Search** on the AC Smart IV screen (Figure 82).

Figure 82: AC Smart IV Auto Search

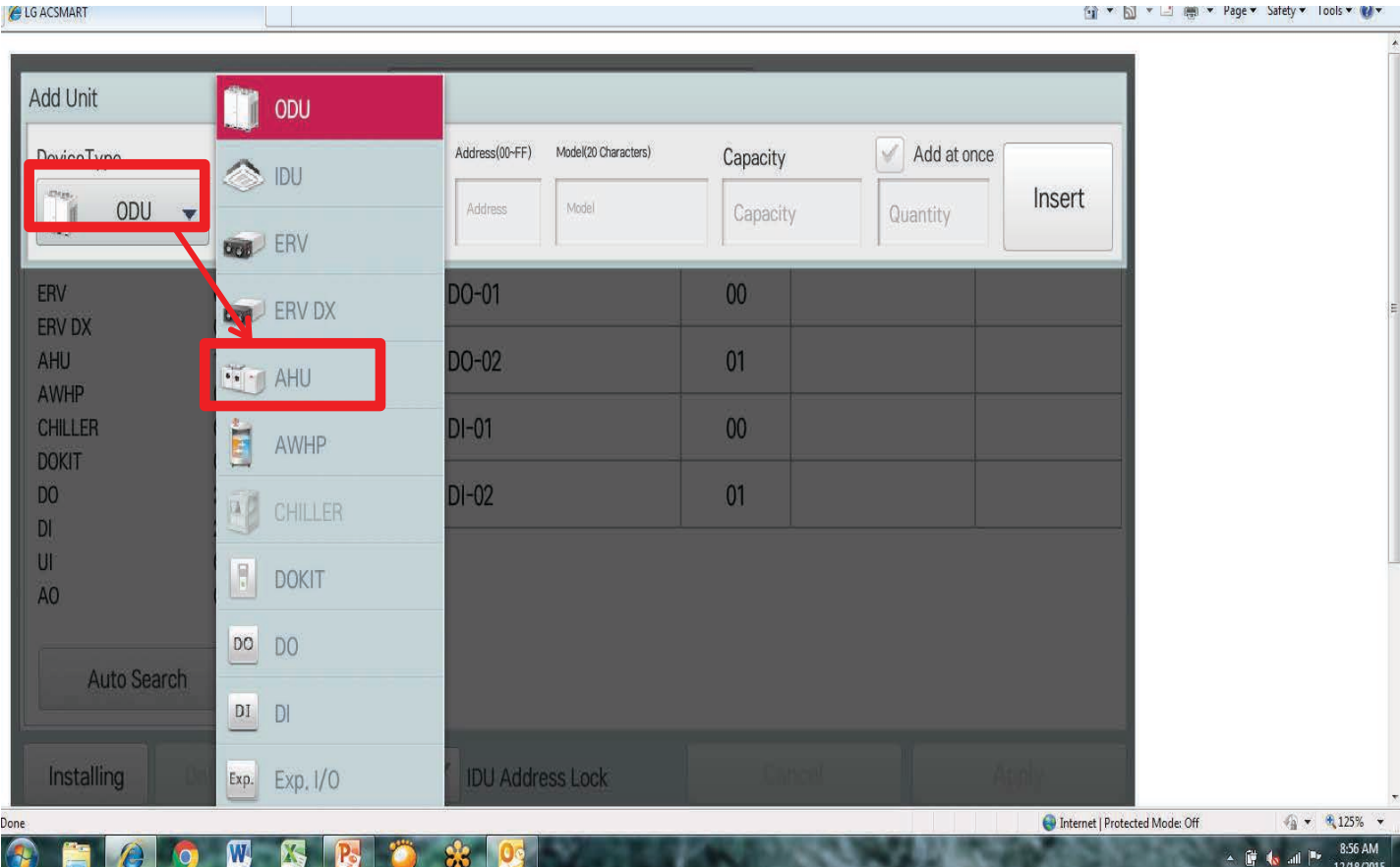
The screenshot shows the LG ACSMART web interface in Internet Explorer. The 'Installing' tab is active. On the left, the 'Unit Status' list shows the following counts: Total Unit (5), ODU (0), IDU (0), ERV (0), ERV DX (0), AHU (1), AWHP (0), CHILLER (0), DOKIT (0), DO (2), DI (2), UI (0), and AO (0). The 'Auto Search' button is highlighted with a red box. The 'Installing' table contains the following data:

DeviceType	Unit Name	Addr/Port	Model	Capacity
<input checked="" type="checkbox"/> AHU	Doas-01	01	@@0n	96
<input checked="" type="checkbox"/> DO	DO-01	00		
<input checked="" type="checkbox"/> DO	DO-02	01		
<input checked="" type="checkbox"/> DI	DI-01	00		
<input checked="" type="checkbox"/> DI	DI-02	01		

At the bottom, there are buttons for 'Installing', 'Del Unit', 'Edit Unit', 'IDU Address Lock' (checked), 'Cancel', and 'Apply'.

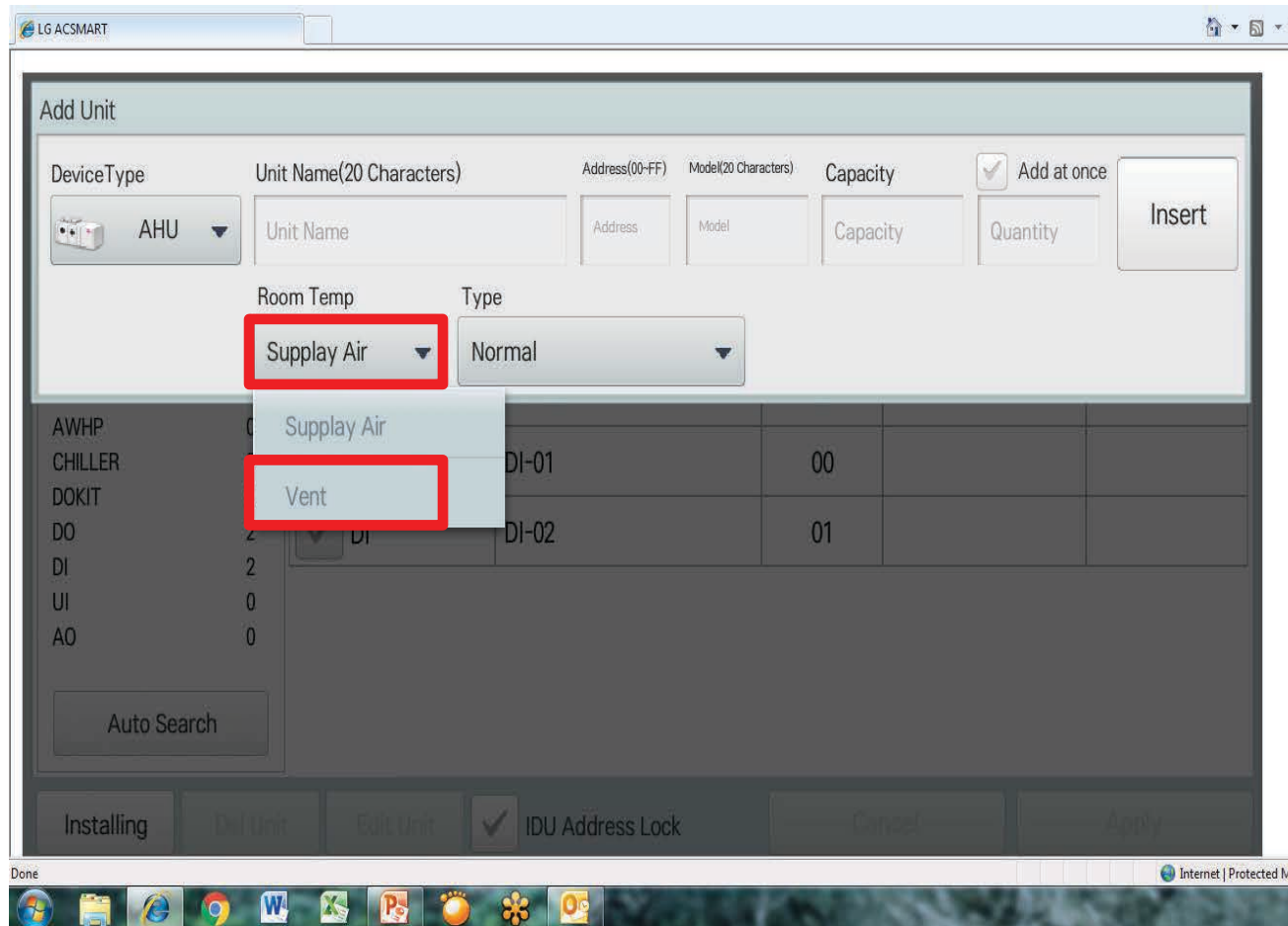
13. On the **Device Type** drop down menu, select **AHU** (Figure 83).

Figure 83: AC Smart IV Device Type Selection



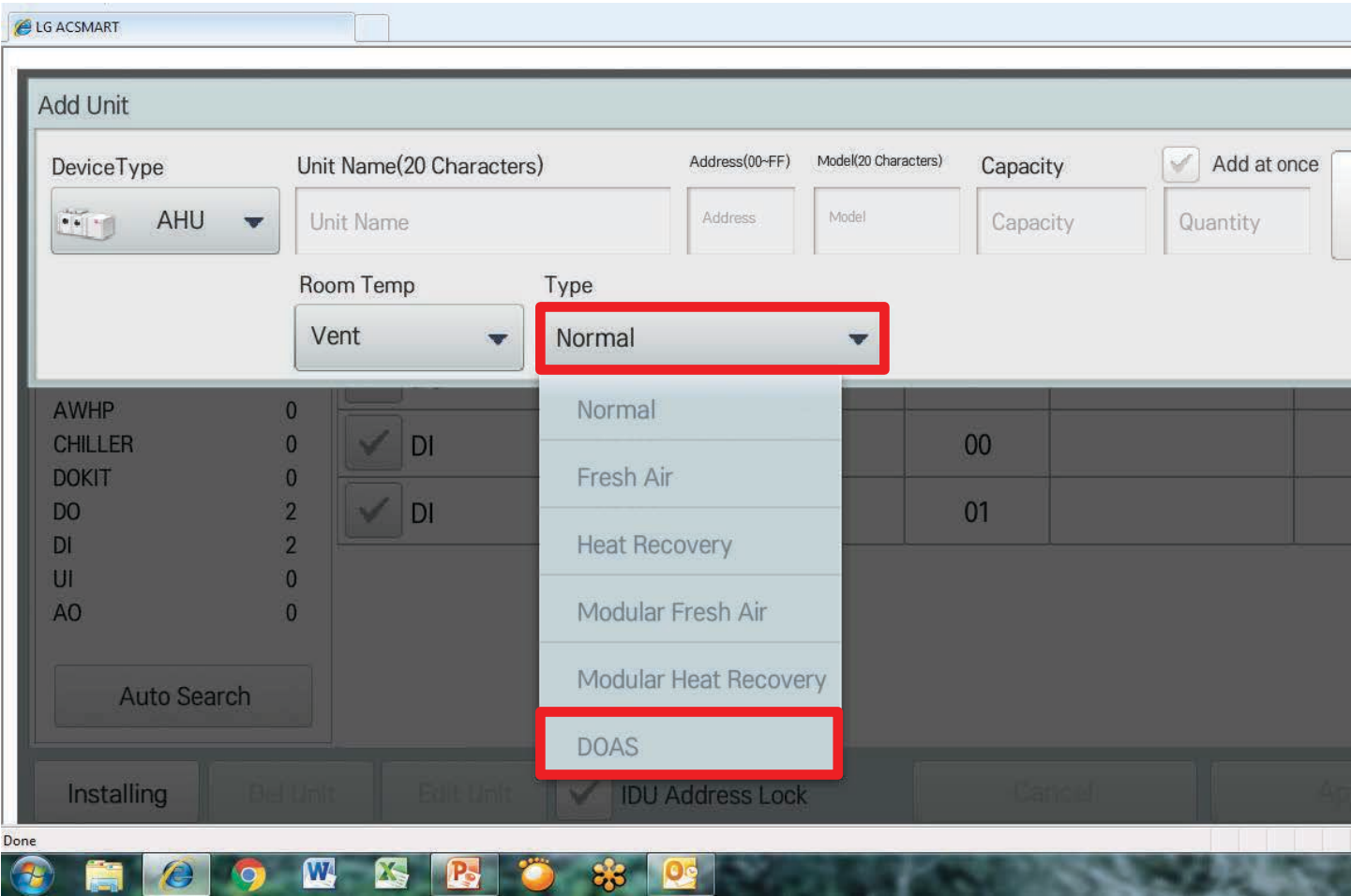
14. On the **Room Temp** drop down menu, select **Vent** (Figure 84).

Figure 84: AC Smart IV Room Temp Selection



15. On the **Type** drop down menu, select **DOAS** (Figure 85).

Figure 85: AC Smart IV Type Selection



16. On the Add Unit screen, enter the **Unit Name**, **Address (01)**, and **Model** for the DOAS and then press **Insert** (Figure 86).

Figure 86: AC Smart IV DOAS Unit Identification

Add Unit

DeviceType

AHU

Unit Name(20 Characters)

DOAS test

Address(00-FF)

Address

Model(20 Characters)

Model

Capacity

Capacity

☒ Add at once

Quantity

Insert

Room Temp

Supply Air

Type

DOAS

AWHP

0

☐

CHILLER

0

☒

DI

DI-01

00

DOKIT

0

☐

DO

2

☒

DI

DI-02

01

DI

2

☐

UI

0

☐

AO

0

☐

Auto Search

Installing

Get Unit

Edit Unit

☒ IDU Address Lock

Cancel

Apply

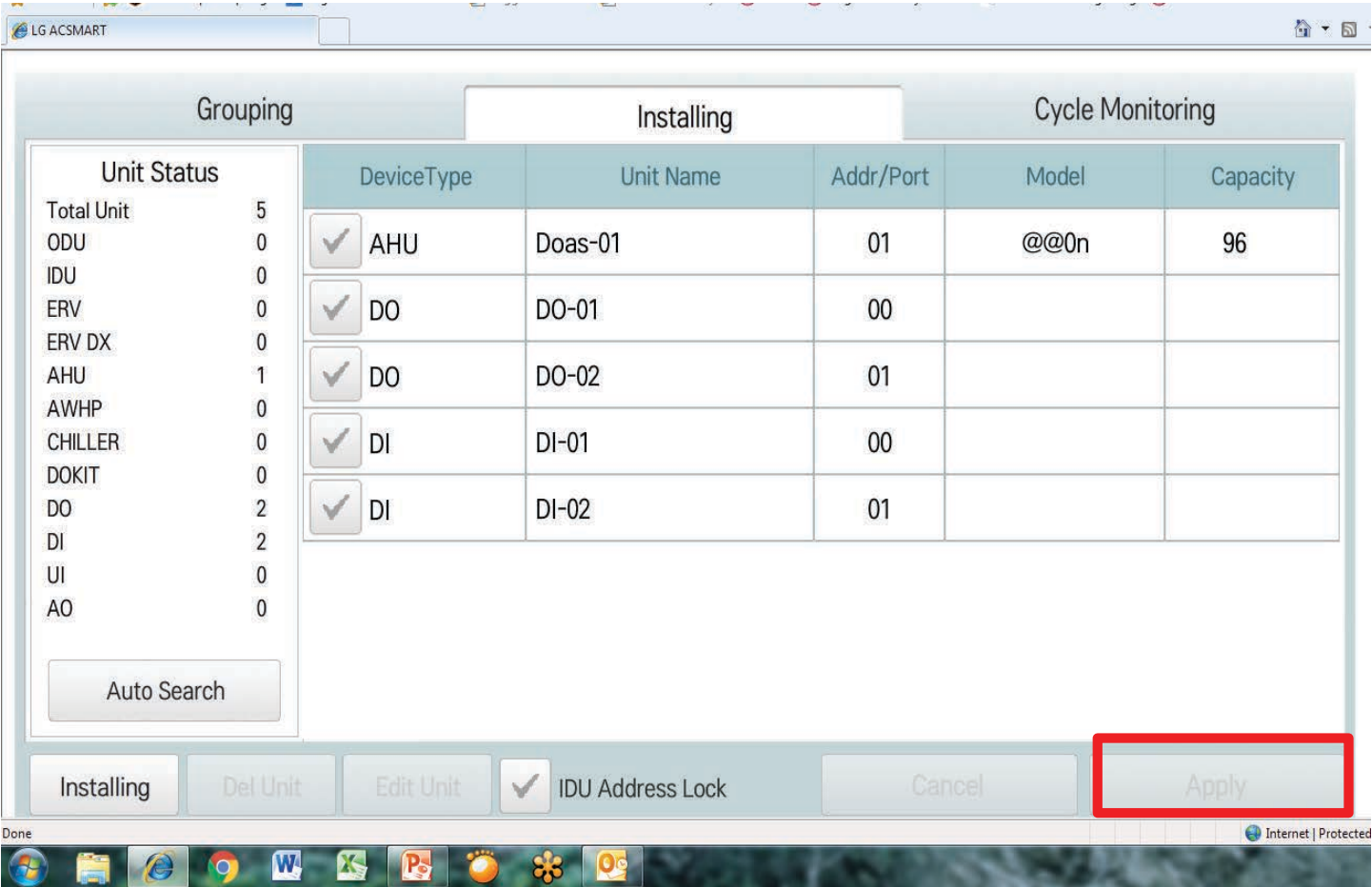
Done

Internet | Protect

Start-Up

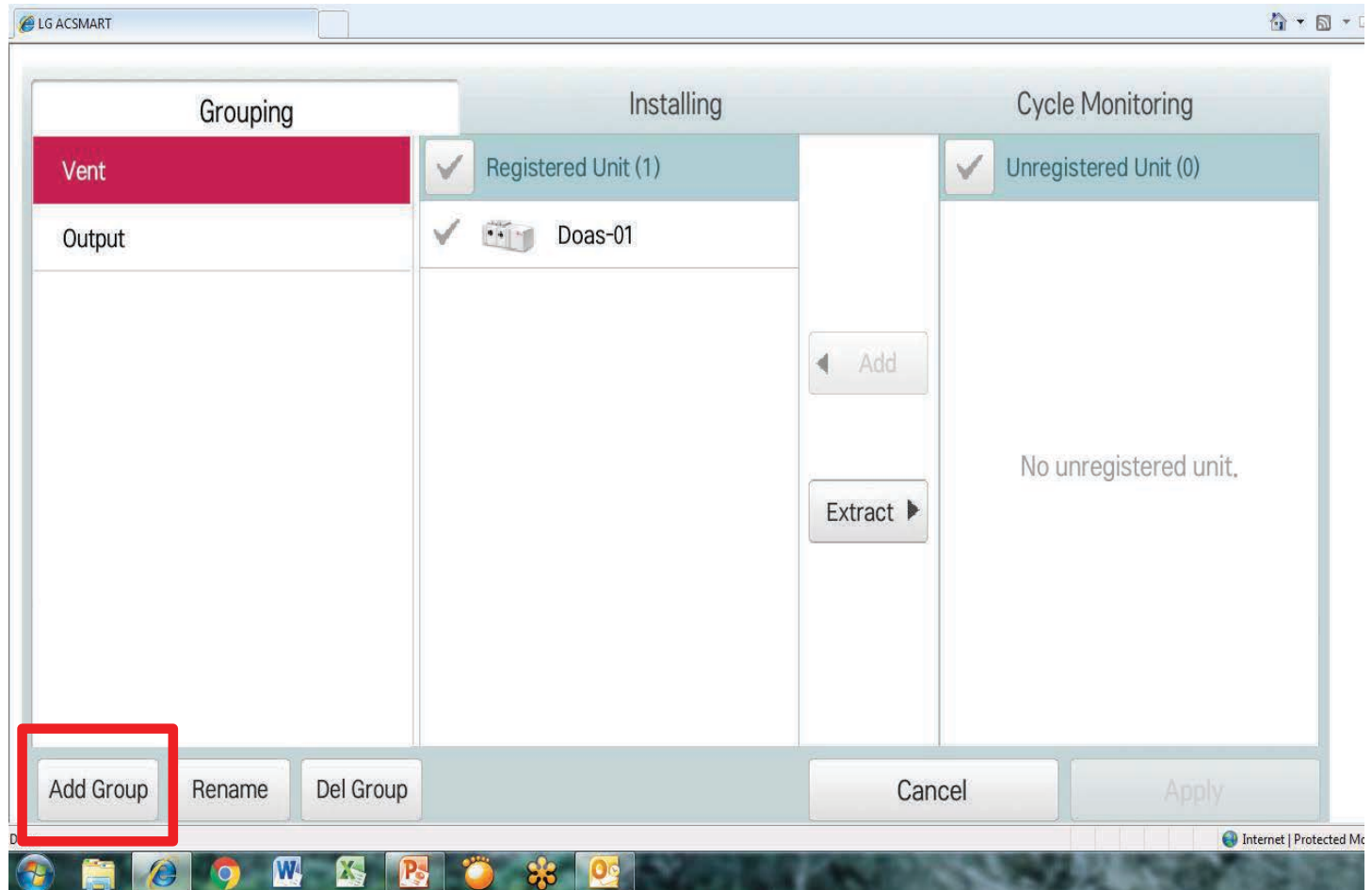
17. Press **Apply** at the bottom of the AC SMART screen (Figure 87).

Figure 87: LG ACSMART Screen Apply Button



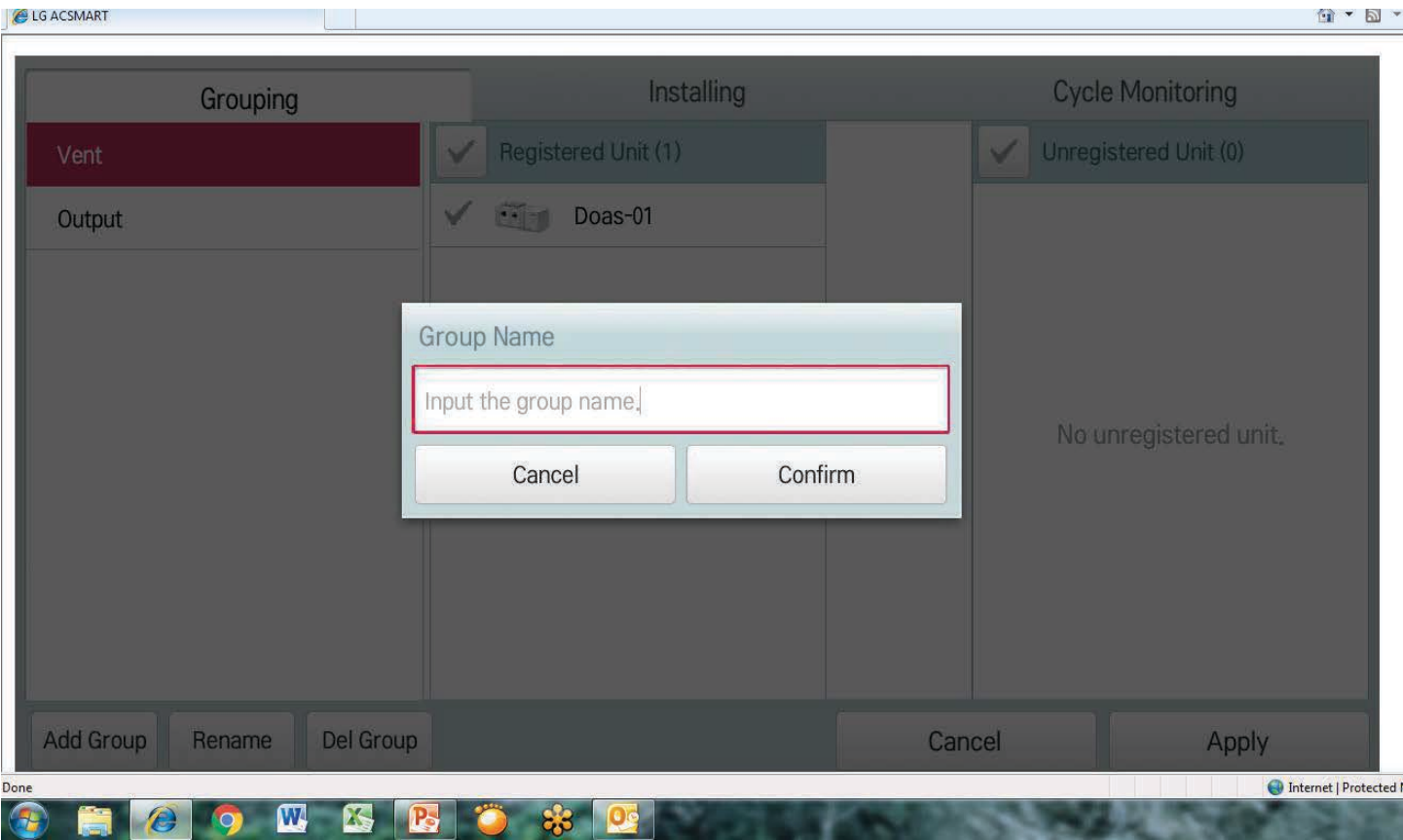
18. Press **Add Group** at the bottom of the AC SMART screen (Figure 88).

Figure 88: LG ACSMART Screen Add Group Button



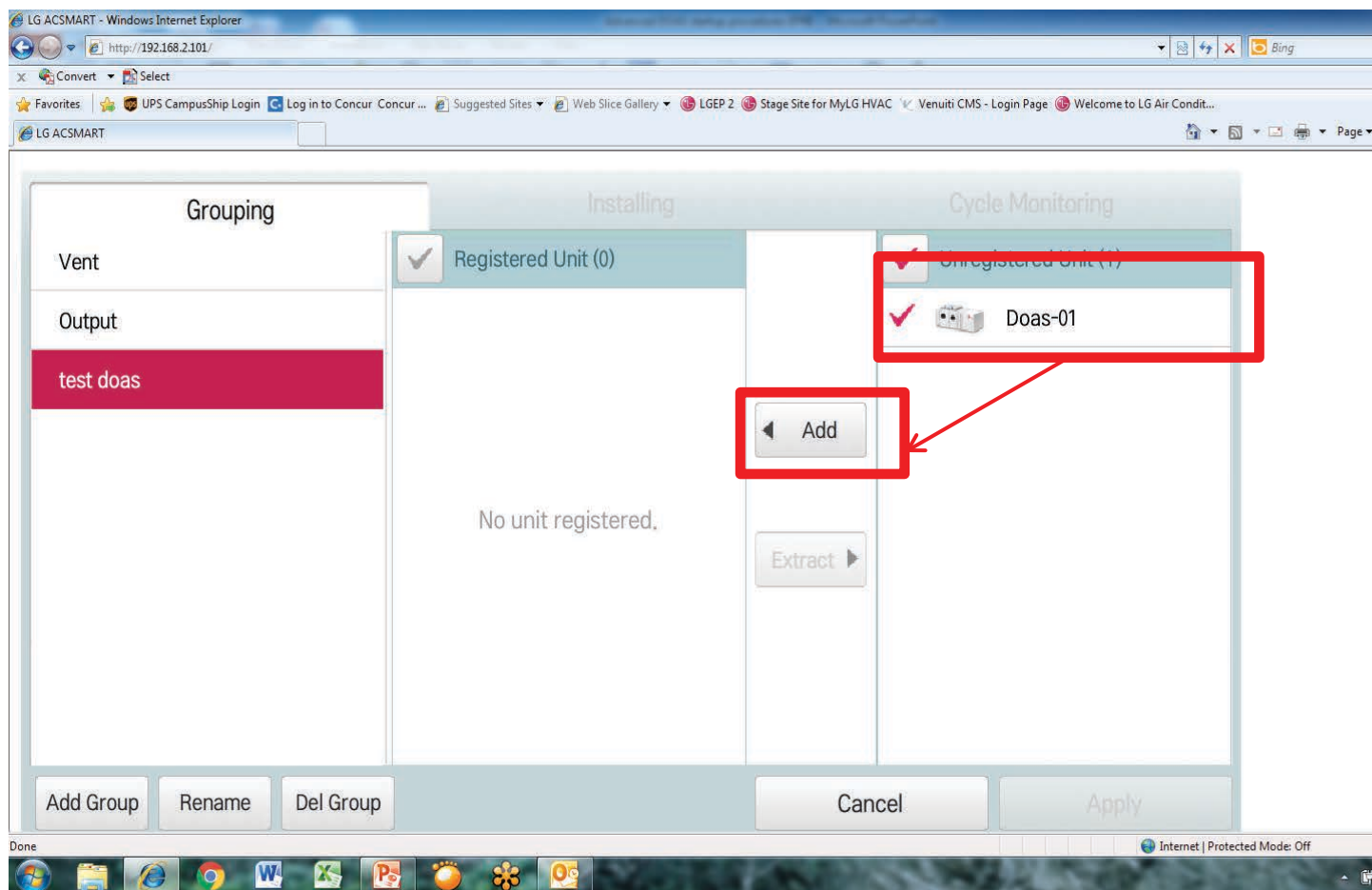
19. Enter the **Group Name** and then press **Confirm** (Figure 89).

Figure 89: LG ACSMART Group Name



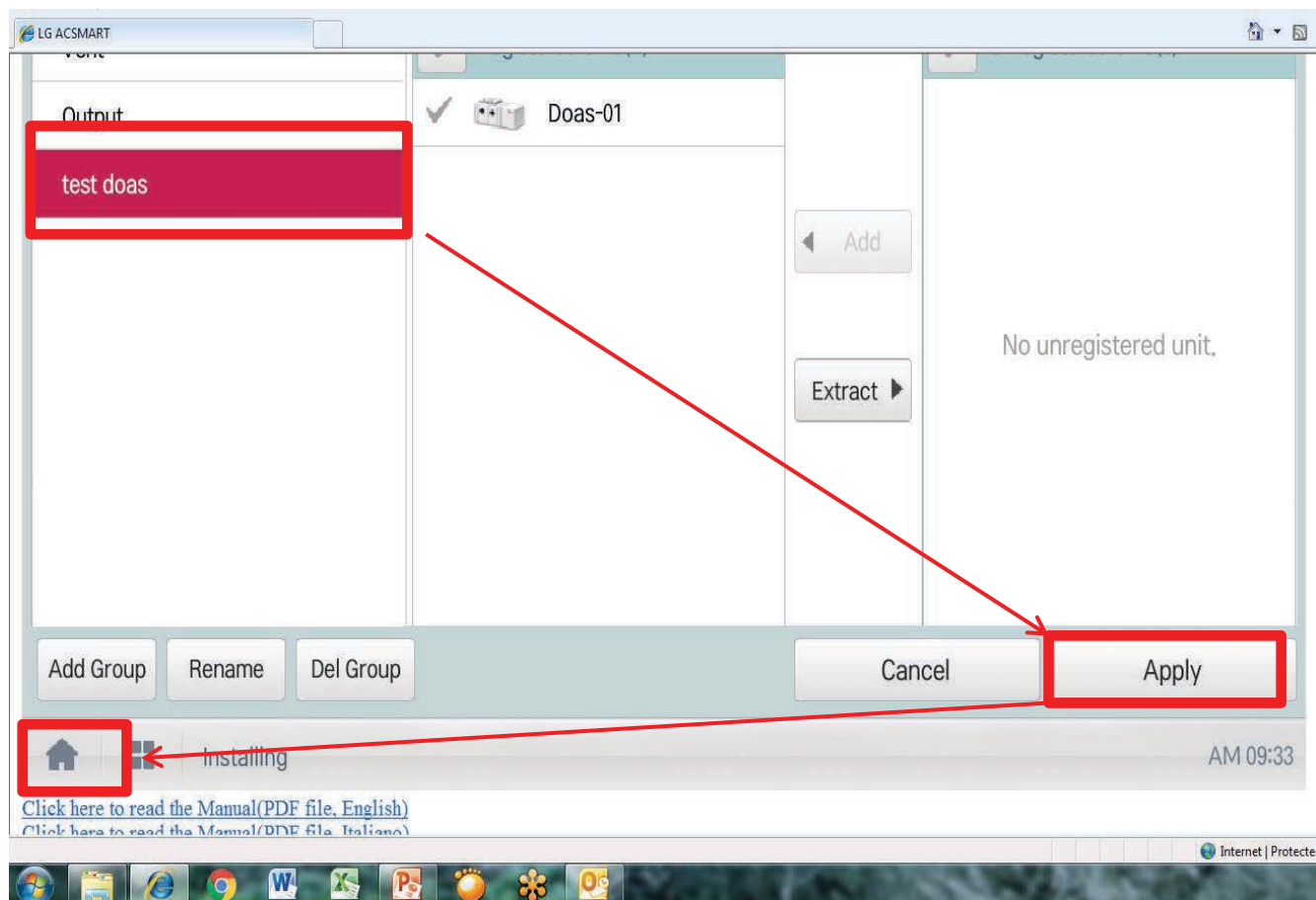
20. Press **Doas-01** and then press the **Add** button (Figure 90).

Figure 90: LG ACSMART Group Add DOAS-01



21. Press Group Name **test doas** (or other name you gave your unit) and then press **Apply** (Figure 91).
22. Press **Home** at bottom of screen.

Figure 91: LG ACSMART Group Selection



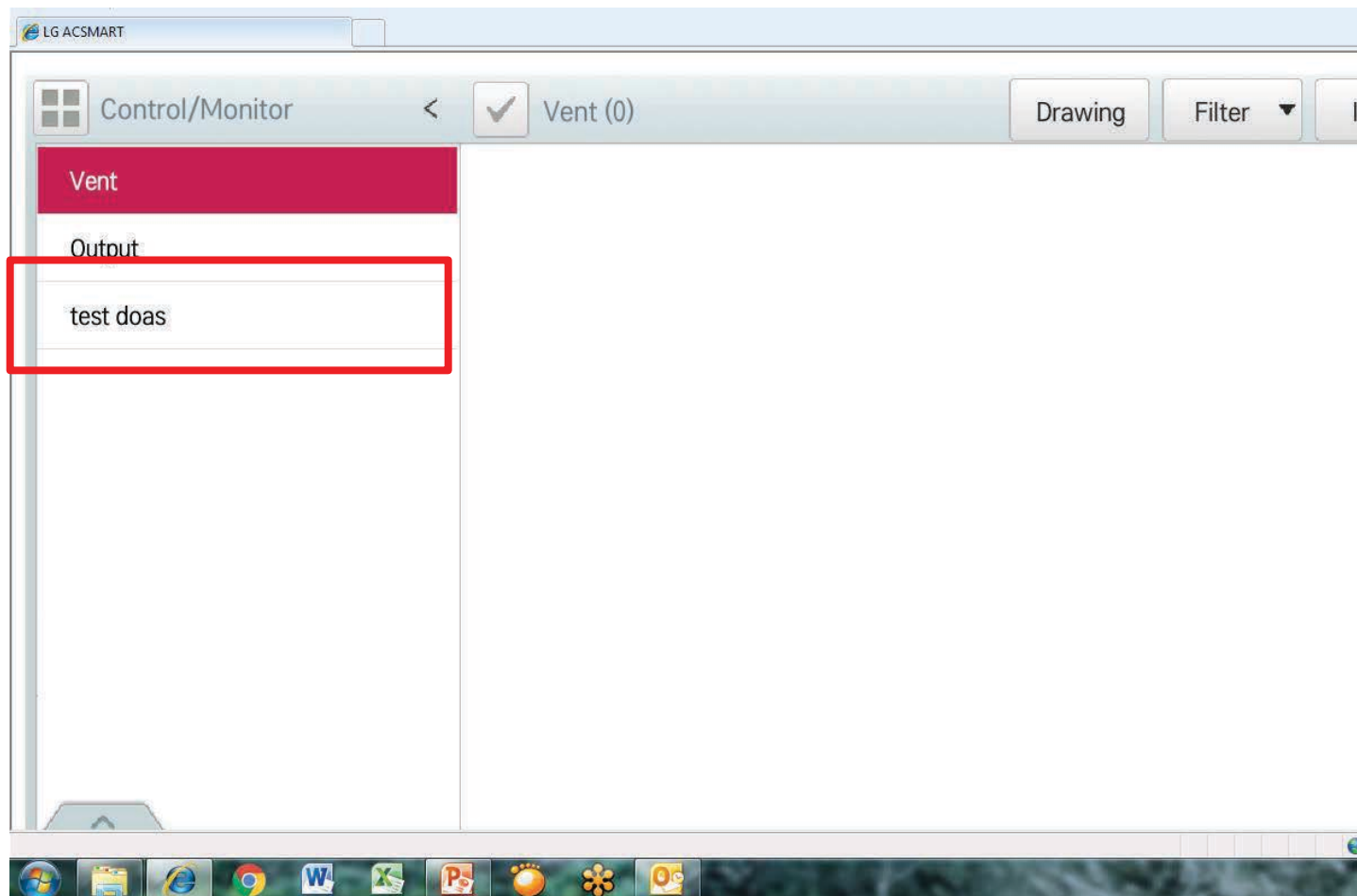
23. On the AC SMART home screen press **Control/Monitor** (Figure 92).

Figure 92: LG ACSMART Control/Monitor



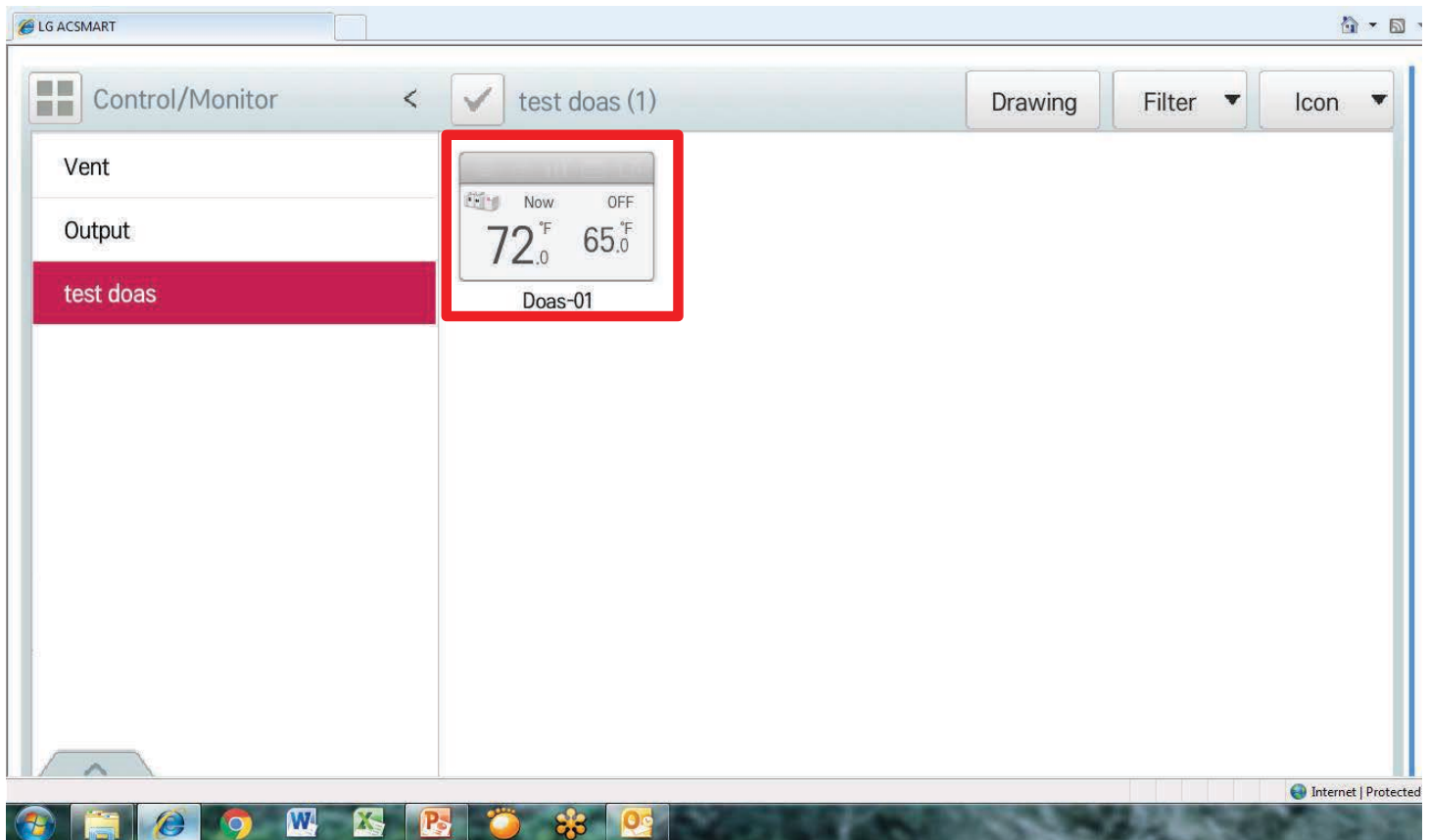
24. On the AC SMART screen press the group name **test doas** (or whatever name you gave your unit) (Figure 93).

Figure 93: LG ACSMART Group Name Selection



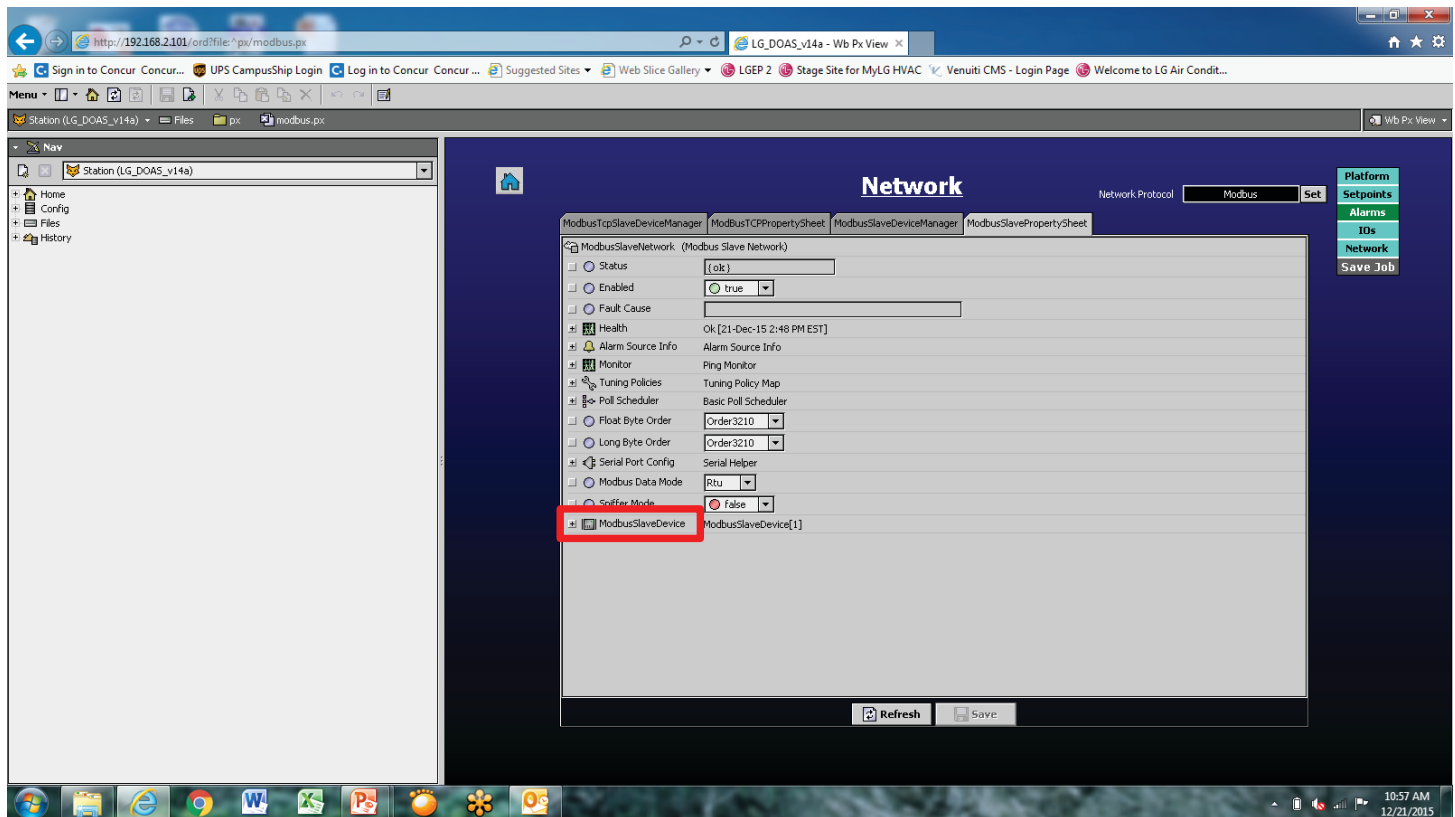
25. Observe the DOAS status displayed on the AC SMART screen.
26. If an error message displays, wait 3 to 5 minutes, return to the AC SMART home screen, and then display this DOAS status screen again.

Figure 94: LG ACSMART DOAS Status Display



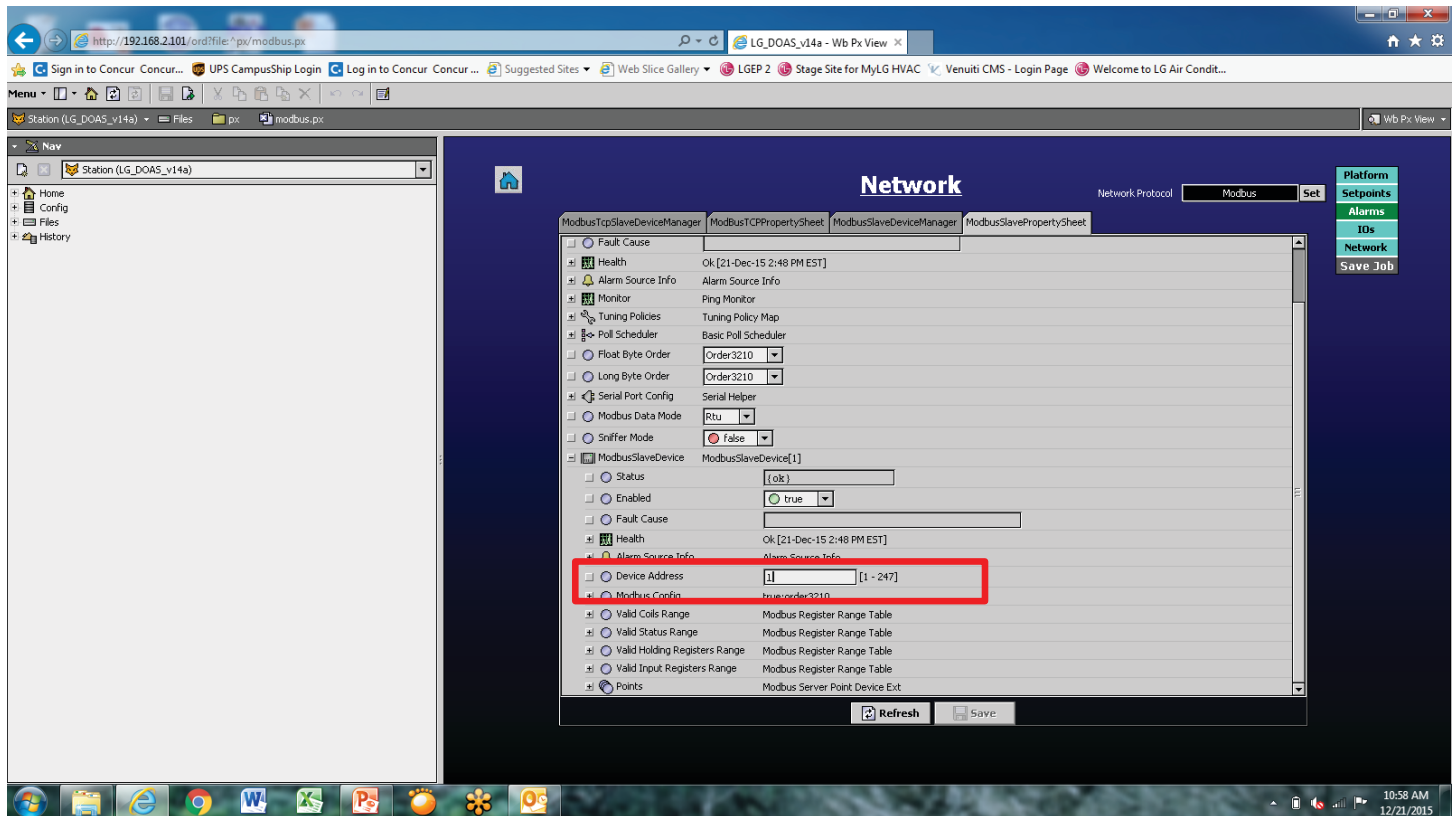
27. To connect multiple DOAS units to an AC Smart IV controller, the Modbus addressed must be changed on the second, third, and fourth DOAS units. On the JENEsys controller home screen, click Network on the menu in the upper right of the screen.
28. On the Network screen, click the **ModbusSlavePropertySheet** tab.
29. Click the + sign next to **ModbusSlaveDevice**.

Figure 95: Connecting Multiple DOAS Units to AC Smart



30. In the **Device Address** data entry window, change the address to 2, 3, or 4, as appropriate.

Figure 96: Setting Device Address of Additional DOAS Units




31. As you add each additional DOAS unit to the AC Smart, enter the appropriate DOAS address on the Add Unit screen (Figure 97). The address entered here must match the address previously entered on the **Device Address** data entry window (Figure 96).
32. AC Smart setup is complete.

Figure 97: AC Smart IV Add Unit Screen

Add Unit

DeviceType

 AHU

Unit Name(20 Characters)

DOAS test

Address(00-FF)

Address

Model(20 Characters)

Model

Capacity

Capacity

☒ Add at once

Quantity

Insert

Room Temp

Supply Air

Type

DOAS

AWHP	0				
CHILLER	0	<input checked="" type="checkbox"/> DI	DI-01	00	
DOKIT	0				
DO	2	<input checked="" type="checkbox"/> DI	DI-02	01	
DI	2				
UI	0				
AO	0				

Auto Search

Error Codes

Below is a list of possible error codes that will appear on an LG Programmable Thermostat if the DOAS is not communicating with the outdoor unit.

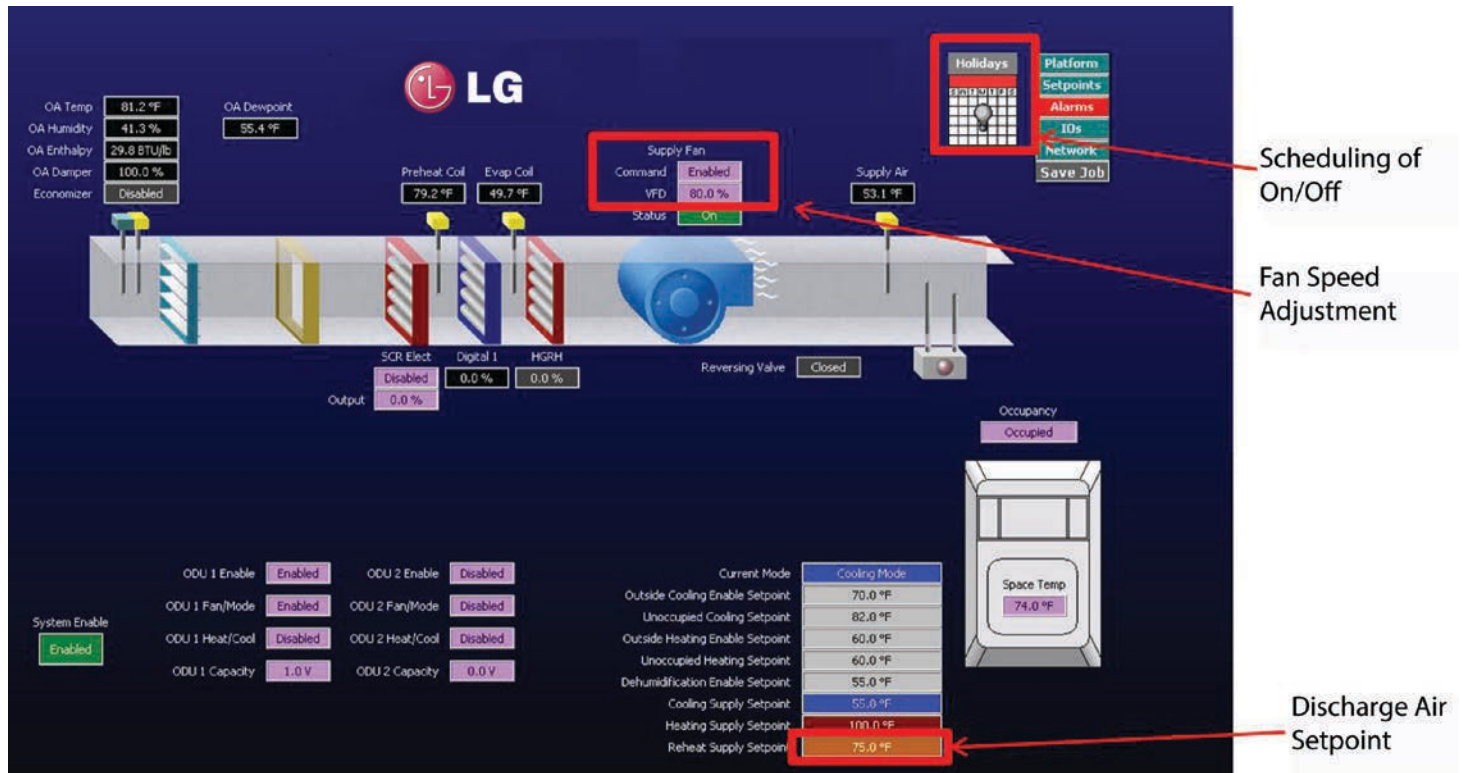
Table 6: Error Codes

Error Code		Error	Error Cause
CH	01	Room Temperature	Temperature sensor disconnection or short circuit
CH	02	Pipe In Temperature Sensor Error	Temperature sensor disconnection or short circuit on pipe inlet of DOAS unit
CH	03	Communication Error Between Wired Remote Controller and Communication Kit	No communication signal for more than 3 minutes from wired remote controller to the communication kit
CH	05	Communication Error Between Communication Kit and Outdoor Unit	No communication signal for 5 minutes continuously from communication kit to outdoor unit
CH	06	Pipe Out Temperature Sensor Error	Temperature sensor disconnection or short circuit on pipe outlet of DOAS unit
CH	09	Option PCB EEPROM Error	No signal reading 5 continuous times from EEPROM to communication kit

Web System Interface

Home Page

Figure 100: Web User Interface Home Page



Web User Interface Home Page Overview

The Web User Interface Home page provides a quick view of the current status of the system including major mode enable setpoints, supply air temperature and control setpoints for heating, cooling and dehumidification mode. The home page also shows an indication for the system enable, occupancy and current mode. From the home page, you can override input and output values to manually control the equipment.

The main menu is always displayed in the top right corner of the Web User Interface Home page. The main menu provides links to the following pages and/or functions:

- Platform - Change IP addresses, time, date and other pertinent system information.
- Setpoints - View and adjust setpoints.
- IOs - View and troubleshoot I/O modules connected to the controller.
- Network - View, enable and edit network protocol settings.
- Save - Save changes made to the station.

The home button is displayed on the top left corner of the web user interface. This button will return you back to the web user interface home page.

Figure 98: Main Menu



Figure 99: Home Button

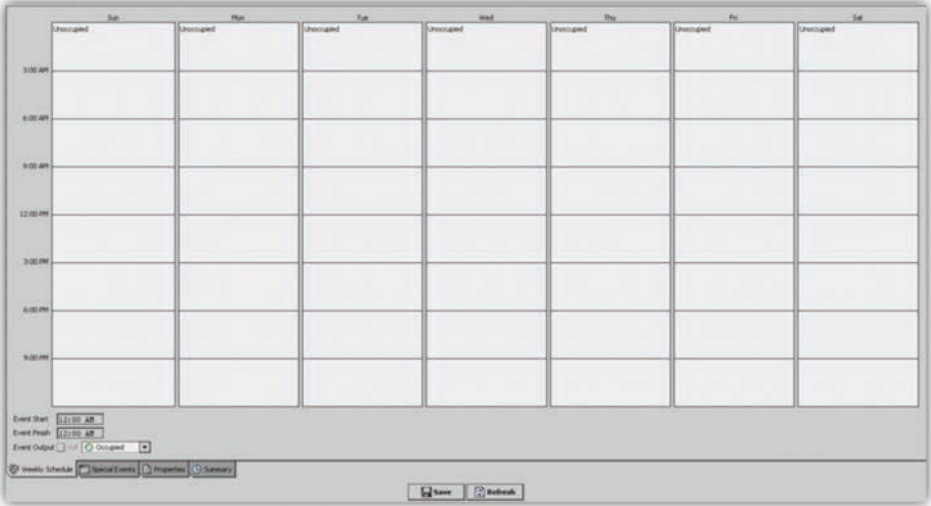


Viewing and Changing Schedules

The unit occupancy can be set up to enable and disable occupied operation based on a stand-alone unit schedule. Follow the instructions below to create a stand-alone schedule.

1. Left-click the calendar icon on the Web Interface Home page. The stand-alone schedule editor opens.

Figure 101: Calendar Icon Figure 102: Stand-Alone Schedule Editor



2. Left-click one of the days and drag your mouse along the times the unit will be occupied.
3. Click the scheduled time block to edit the start time, finish time or event output.

Copying a Weekly Schedule

The Weekly Editor makes it easy to copy a schedule from one day to the rest of the week. It allows you to copy one day and paste it to each individual day it matches or copy an individual day from Monday through Friday. To copy a schedule, follow the instructions below.

1. Right-click an occupied schedule block. A pop-up window opens.
2. Select Copy Day.

Figure 103: Scheduled Time Block Figure 104: Scheduled Time Block

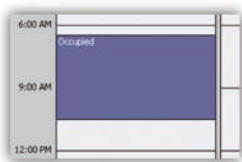
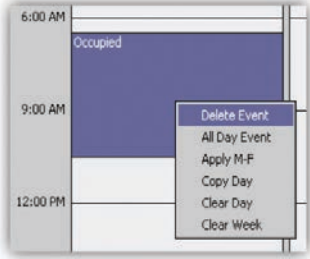


Figure 105: Scheduled Time Block



Holiday and Special Event Schedule

The Holiday Special Events Editor allows you to add special events or holidays that do not fit the normal weekly occupancy schedule. Follow the instructions below to open and make changes to the holiday and special event editor.

1. Click the gray Holiday bar on the calendar icon. The Holiday Special Events Editor opens.

Web System Interface

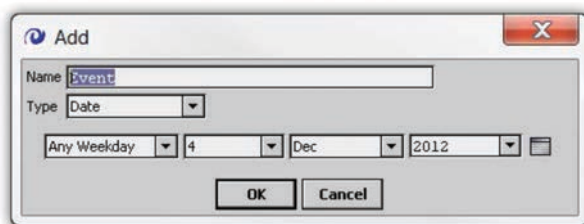
Home Page

Figure 106: Holiday Special Events Editor



2. Click the Add button (at the bottom of the editor). The Add Dialog window opens.

Figure 107: Add Dialog Window



3. Enter a Name for the holiday or special event.
4. Select an event Type from the drop-down menu. Some holidays occur on the same date each year and can be added using the Date type. Some events occur on specific weekdays during a specific month and can be added using the Week and Day type.
5. Once the holiday or event is created, click the OK button.

Overriding Values

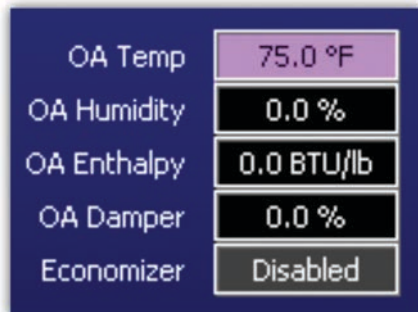
If a piece of equipment needs to be replaced or tested, the value from the controller may need to be overridden. Overriding values consist of locking a temperature sensor to a particular value, or turning a fan or other piece of equipment off/on for a particular length of time.

Overriding Numeric Values

On the Web Interface Home page, the inputs are displayed as black labels with white writing and outputs are displayed as gray labels with white text. The colors can change based on their status. Follow the instructions below to override numeric values.

1. Right-click the value input. A pop-up window opens.
2. Select Override. The Override Action Menu window opens. The value can be overridden for a particular duration. The default duration is permanent.
3. Once a value is entered the color changes to pink to indicate that an override is present and it is not being controlled by the JENEsys controller.

Figure 110: Overridden Value



Overriding Binary Values

On the Web Interface Home page, the inputs have a gray background when they are false and when its true it is either green, blue or red to indicate it is active. Occasionally a binary input will have a red background when the input is false to denote a failure (for example, no flow from a water flow sensor). Follow the instructions below to override a binary signal.

1. Right-click the output value. A pop-up window opens.
2. Select the appropriate action.
 - Auto - Clears and overrides actions that are currently in place.
 - Active - Overrides the value to true and opens the active menu to set a duration for the override.
 - Inactive - Overrides the value to false and opens the inactive menu to set a duration for the override.

The default duration is permanent, but any period of time can be entered for the override duration.

Figure 108: Override Menu

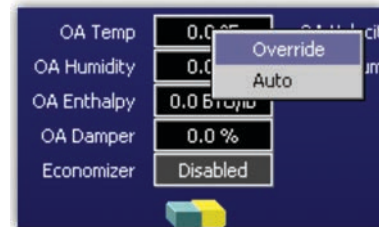


Figure 109: Override Duration

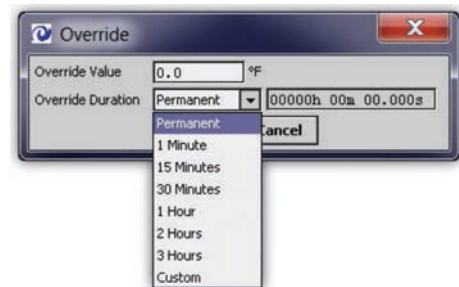


Figure 111: Binary Signal Action

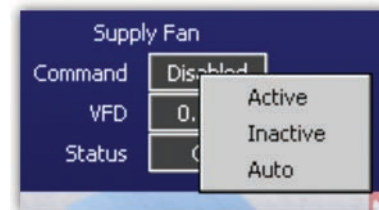


Figure 112: Binary Signal Overridden Value

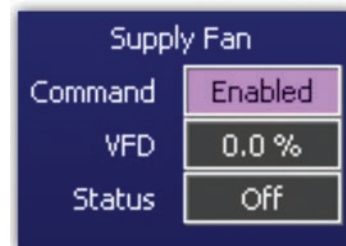
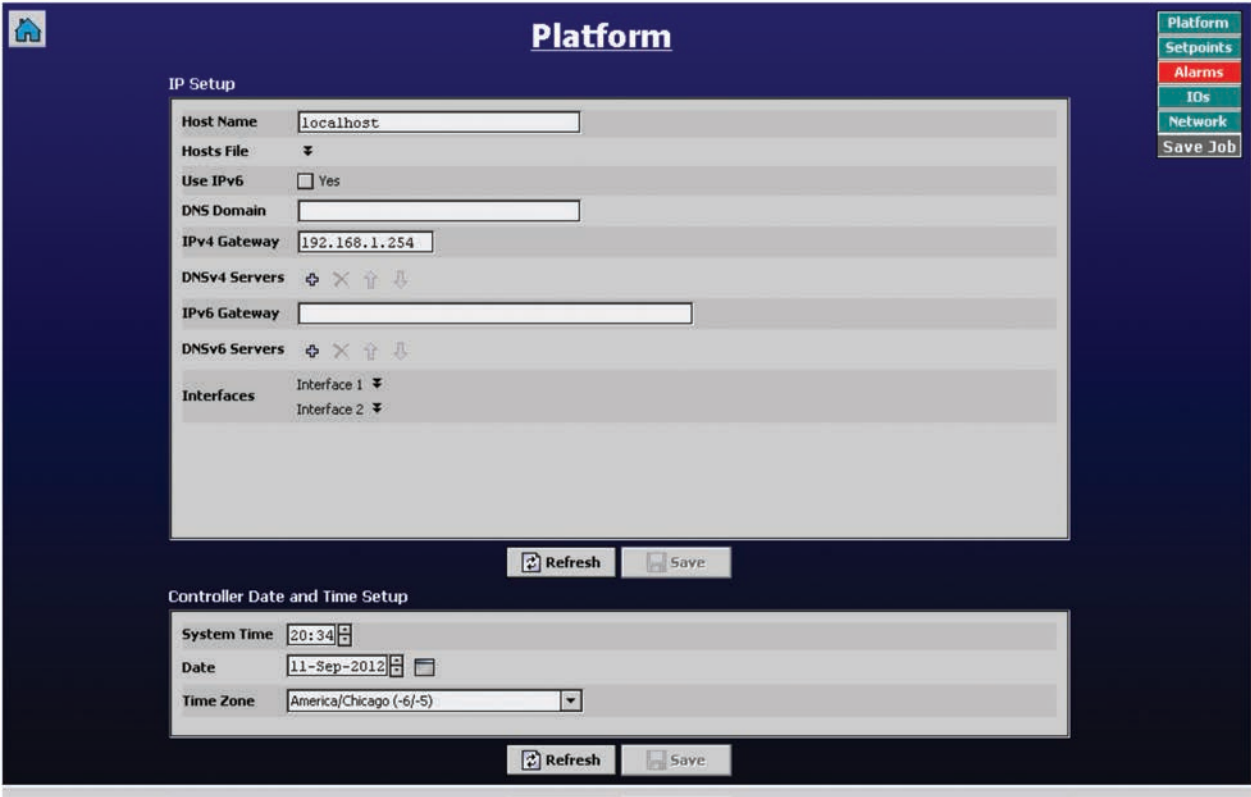


Figure 113: Web User Interface Platform Page



Web User Interface Platform Page

The Web User Interface Platform page allows you to alter the hardware platform.

- Displays LAN port settings for both primary and secondary ethernet adapters. Users can change the IP address information for both ethernet adapters. Interface 1 corresponds to the settings of the primary ethernet adapter and Interface 2 corresponds to the secondary adapter settings.
- From this page, users can set the system date and time to the unit’s geographical time zone.
- Click the Save button to save any changes made.

Note:
Changing the adapter settings will cause the JENEsys controller to reboot.

Figure 114: IP Address Settings

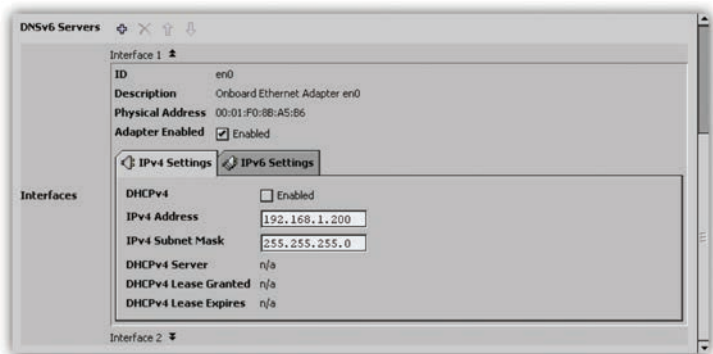


Figure 115: Web User Interface Setpoints Page



Web User Interface Setpoints Page Overview

The Web User Interface Setpoints page allows users to modify control and enable setpoints.

- Displays every adjustable setpoint being used to control the unit including mode enable setpoints and more detailed setpoints like stage timing, PID loop adjustments and supply temperature reset setpoints.
- Save any changes made to this page (save button is in the top right corner).

Viewing and Changing Setpoints

There are a number of different setpoints. Setpoints can be numeric values (temperatures or percentage), binary values (enabled/disabled) or time values consisting of a certain time period.

Numeric and Binary Setpoints

Numeric and binary setpoints are displayed as a box with a green background and black text. Follow the instructions below to edit numeric and binary setpoints.

1. Right-click the setpoint value.
2. Click Set to change the setpoint value. The Set window opens. The Set window displays the acceptable range for numeric setpoints and the true and false values for binary setpoints.
3. Enter an appropriate setpoint value.
4. Click the OK button.

Figure 116: Editing Setpoints



Figure 117: Set Window



Once the OK button is selected, the setpoint value is changed. However, it's a good idea to save immediately in case of a power failure.

Web System Interface

Setpoints Page

Timing Setpoints

The timing setpoints are different from the binary and numeric setpoints because they do not use the set action to change their values. Follow the instructions below to change a timing setpoint.

1. Click the value you want to change.
2. Enter an appropriate setpoint value.
3. Click the Save button (top right corner of Setpoints page).

Figure 118: Timing Setpoints

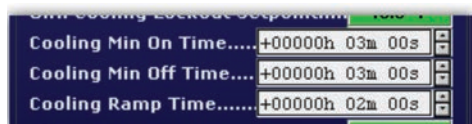


Figure 119: Web User Interface Alarms Page

Alarms

Time Range: [Dropdown] [Clock Icon]

Open Alarm Sources 13 Sources / 77 Alarms

Timestamp	Source State	Ack State	Source	Alarm Class	Priority	Message Text
21-Oct-13 4:26:49 AM CDT	Normal	0 Acked / 16 Unacked	SupplyFanAlarm	defaultAlarmClass	255	Supply Fan Failure Alarm
21-Oct-13 4:26:44 AM CDT	Normal	0 Acked / 14 Unacked	PowerMonitorService	defaultAlarmClass	255	Primary Power Restored
21-Oct-13 3:58:21 AM CDT	Normal	0 Acked / 1 Unacked	PowerMonitorService	defaultAlarmClass	255	Battery Test Passed
20-Oct-13 7:13:41 AM CDT	Normal	0 Acked / 9 Unacked	HPLockoutAlarmActive	defaultAlarmClass	255	HP Lockout alarm
20-Oct-13 7:13:27 AM CDT	Normal	0 Acked / 11 Unacked	SupplySensorShortAlarm	defaultAlarmClass	255	Supply Fault Short Alarm
20-Oct-13 7:13:25 AM CDT	Normal	0 Acked / 1 Unacked	SupplySensorOpenAlarm	defaultAlarmClass	255	Supply Fault Open Alarm
20-Oct-13 6:39:40 AM CDT	Normal	0 Acked / 3 Unacked	SpaceSensorOpenAlarm	defaultAlarmClass	255	Space Fault Open Alarm
13-Oct-13 11:29:18 AM CDT	Normal	0 Acked / 7 Unacked	CoolFailureAlarm	defaultAlarmClass	255	Cool Failure Alarm
09-Oct-13 12:03:26 PM CDT	Alert	0 Acked / 10 Unacked	NdioNetwork JM34	defaultAlarmClass	255	Ping Failed (ndio reboot)
09-Oct-13 12:01:17 PM CDT	Normal	0 Acked / 1 Unacked	SpaceSensorShortAlarm	defaultAlarmClass	255	Space Fault Short Alarm
09-Oct-13 12:01:17 PM CDT	Normal	0 Acked / 1 Unacked	SpaceTemperature	defaultAlarmClass	255	
09-Oct-13 12:01:14 PM CDT	Normal	0 Acked / 1 Unacked	FanShutdownLowLimitAlarm	defaultAlarmClass	255	Supply Low Limit Alarm
26-Aug-13 10:45:51 AM CDT	Normal	0 Acked / 2 Unacked	NdioNetwork	defaultAlarmClass	255	Ping Success

Acknowledge Hyperlink Notes Silence Filter

Web User Interface Alarms Page Overview

The Web User Interface Alarms page displays a log of all the unit's alarms.

- Displays alarm status and time and date of the alarms.
- Acknowledge alarms and view detailed alarm information including where the alarm was generated and what steps can be taken to check the alarm.
- If an alarm is old but has not yet been acknowledged, the bell icon will be green.
- If an alarm is current and has not been acknowledged, the bell icon will be red.
- If an alarm is current and has been acknowledged, the bell icon will be yellow.
- The right section of the page shows the Source and Msg Text. The source is the point in the logic where the alarm generated. The Msg Text provides the commonly used name for the alarm.

Figure 120: Alarm Status

Open Alarm Sources		
Timestamp	Source State	Ack State
04-Dec-12 3:38:49 PM CST	Offnormal	1 Acked / 0 Unacked
04-Dec-12 3:37:44 PM CST	Offnormal	0 Acked / 3 Unacked
19-Apr-12 3:23:48 PM CDT	Normal	0 Acked / 1 Unacked

Figure 121: Source and Msg Text

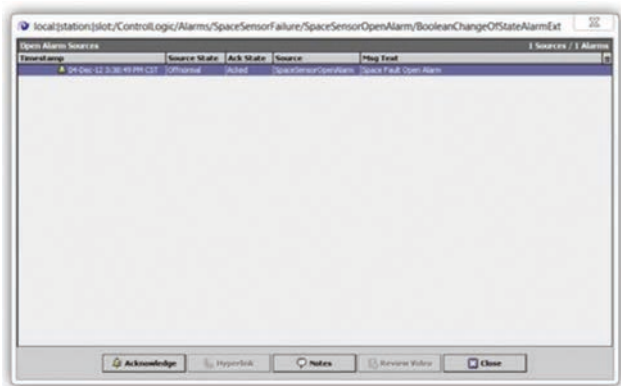
Source	Msg Text
SpaceSensorOpenAlarm	Space Fault Open Alarm
SupplySensorOpenAlarm	Supply Fault Open Alarm
CoolFailureAlarm	Cool Failure Alarm

Viewing and Acknowledging Alarms

Follow the instructions below to view alarm detail and acknowledge an alarm.

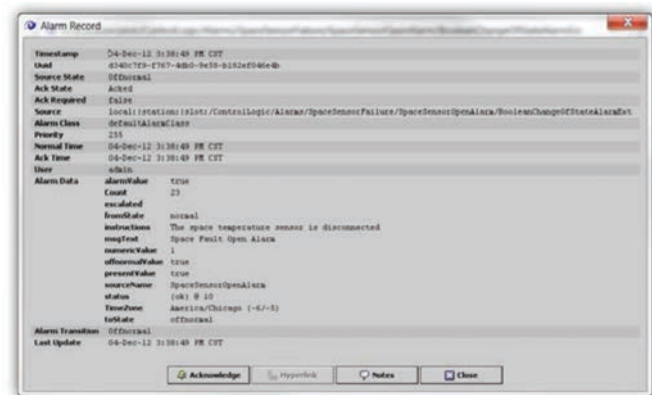
- 1. Double-click an alarm. The Open Alarm Source window opens. The Open Alarm Source window displays each individual alarm for a specific alarm source.

Figure 122: Open Alarm Sources Window



- 2. Double-click an individual alarm. The Alarm Record window opens.

Figure 123: Alarm Record Window



The Alarm Record displays all details associated with an alarm including the time the alarm occurred, the time an alarm was acknowledged, the total number of alarms and instructions for the alarm. The alarm instructions provide a brief description of what could cause the alarm.

- 3. Once the alarm has been reviewed, right-click the alarm in the main alarm console window. A pop-up window opens.
- 4. Select Acknowledge to acknowledge every alarm in the group or select Acknowledge Most Recent to acknowledge only the most recent alarm in the group.

Figure 124: Acknowledging an Alarm

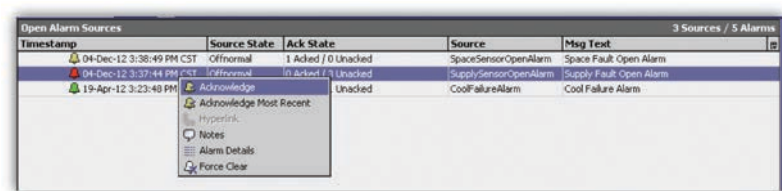


Figure 125: Web User Interface IOs Page



Web User Interface IOs Page Overview

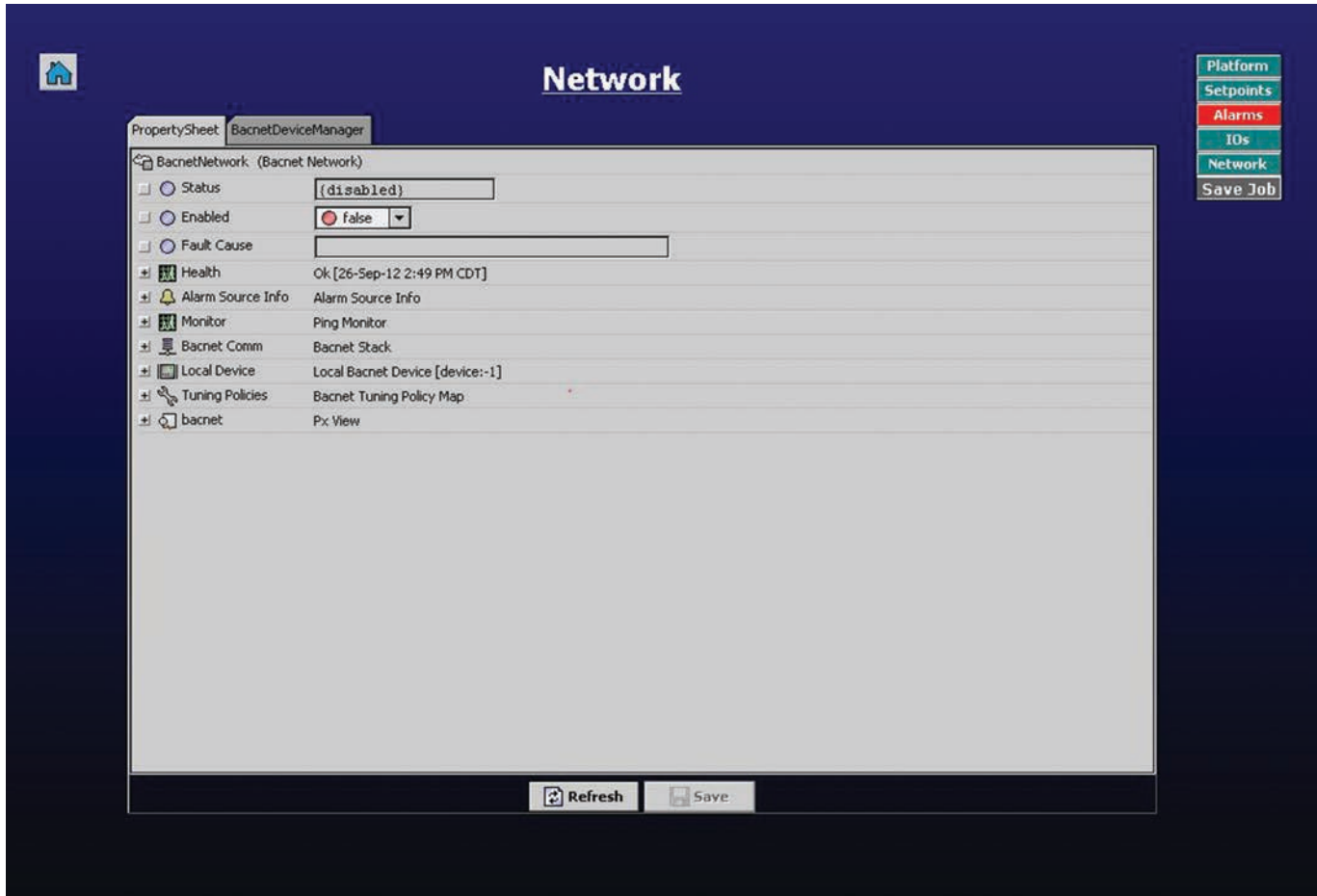
The Web User Interface IOs page has a tabbed window that displays all inputs and outputs for each possible IO module.

- Displays Not Used for modules that are not in use.
- Each value comes directly from the input or output on the associated IO module.
- Indicates if any of the inputs or outputs are in a fault position and not working properly. Faults are indicated with orange shading (shown below).

Figure 126: Web Interface Page IO Fault



Figure 127: Web User Interface Network Page



Web User Interface Network Page Overview

The Web User Interface Network page is used to configure the network.

- Network address and connection speeds can be modified as needed to connect with the building management system.
- The network page is configured to use whichever network was selected when the unit was ordered. For information on changing the default network protocol for the unit, contact LG Technical Support.
- Each network has a slightly different set of properties so it is important to ensure users match the network they are working with in the unit with the network the BMS is using.
- By default, each network is shipped disabled.
- In order for the networks to operate properly they need to be enabled through their property sheets at system start-up.

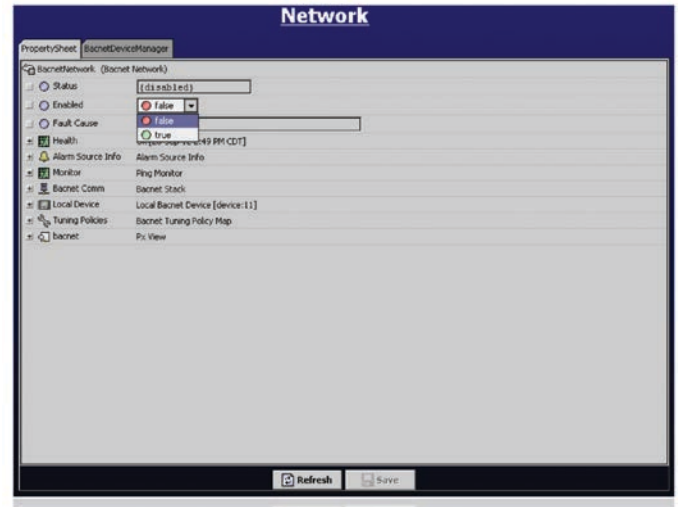
Configuring the BACnet Network

1. Login to the web user interface.
2. Navigate to the network page. If the unit has been properly configured for BACnet, the network page will display the property sheet for the BACnet network.
3. Select true from the Enabled drop-down menu.
4. Click the Save button.

Once the BACnet network is enabled, the unit needs to be addressed properly in order to be accessed through the BACnet network. There are two protocols that can be used to transfer BACnet network data; MSTP or IP. The MSTP protocol uses the RS485 port on the front of the controller and an MSTP address. The IP protocol uses the ethernet port and the IP address.

BACnet is a registered trademark of ASHRAE

Figure 128: BACnet Network

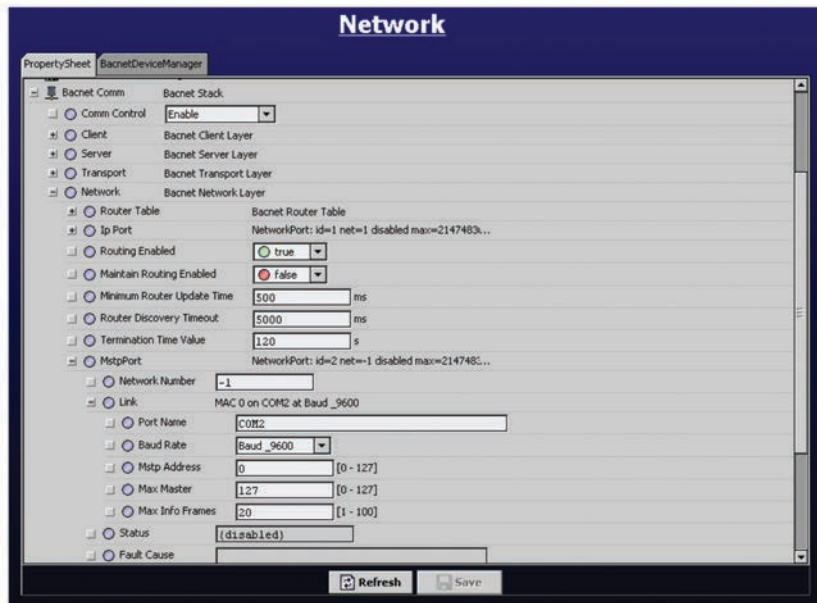


BACnet MSTP Addressing

The MSTP set-up for the BACnet network will require setting the MSTP network number, MSTP address and the appropriate baud rate. Follow the instructions below to set the MSTP data.

1. Expand the BACnet Comm group (click the + next to BACnet Comm). The MSTP properties display.
2. Right-click Mspt Port, move the mouse to Actions and select Enable.

Figure 129: MSTP Port Properties



Note:

Either the MSTP Port or the IP Port can be enabled on the BACnet network, but they cannot both be enabled at the same time.

3. Enter the proper Network Number for the BACnet network in the Network Number field. The network number is determined by the contractor integrating the unit into the BACnet network.
4. Enter the MSTP address.
5. Select the appropriate Baud Rate from the drop-down menu.

BACnet IP Addressing

BACnet over IP can be set-up on either of the two available ethernet ports.

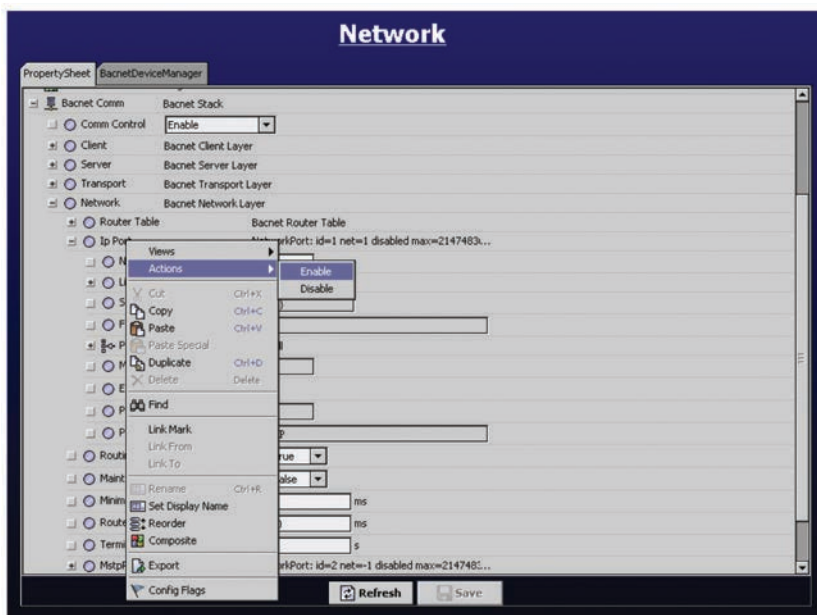


We recommend using the secondary port for BACnet IP communications and reserving the primary port for connecting to the web user interface.

The IP addresses for the unit can be changed on the platform page of the web user interface.

1. Navigate to the platform page.
2. Enable the secondary ethernet port.
3. Set the secondary ethernet adapter settings to the desired BACnet IP settings. The BACnet IP network can also be run from the primary ethernet adapter. Once the ethernet adapter has been set-up correctly the BACnet network and the network page of the web user interface can be used to enable the BACnet IP network and to ensure that the ethernet adapter is selected.
4. Right-click on the Ip Port field, highlight Actions and then select Enable. This will enable the IP port for the BACnet network.

Figure 130: IP Port Properties



Note

Either the MSTP Port or the IP Port can be enabled on the BACnet network, but they cannot both be enabled at the same time.

5. Enter the proper Network Number for the BACnet network in the Network Number field. The network number is determined by the contractor integrating the unit into the BACnet network.
6. Select the appropriate Ethernet Adapter. The en0 adapter is the primary ethernet adapter and the en1 adapter is the secondary ethernet adapter. If the desired adapter displays [DISABLED] or [DISCONNECTED], it may need to be enabled. This can be done on the platform page.

Using the JENESys Controller as a BBMD

With BACnet over IP, there is an option to use the JENESys controller as a BBMD for BACnet networks that are split across different IP subnets.

1. Enter the IP address of a known BBMD in the Bbmd Address field on the IP Port Properties page.
2. Change the Ip Device Type to BBMD.

Once you enter the BBMD address of a known BBMD on a different subnet, the JENESys controller will connect to that BBMD and populate the Broadcast Distribution Table with entries from the known BBMD.

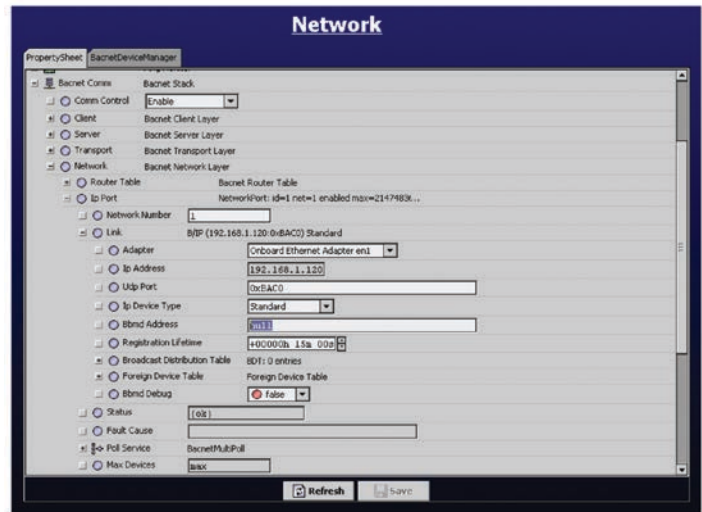
BACnet Local Device Properties

The BACnet local device properties define the JENESys controller as a device on the BACnet network. After configuring the proper network protocol, the local device properties may need to be configured in order to view the JENESys controller as the correct BACnet device. The Object ID is sometimes used by the BACnet network to uniquely identify devices on the network. In addition, the Location and Description can also help identify BACnet devices.

1. Enter the Object ID.
2. Enter a Location.
3. Enter a Description.
4. Click the Save button.

BACnet is a registered trademark of ASHRAE

Figure 131: BACnet Local Device Properties

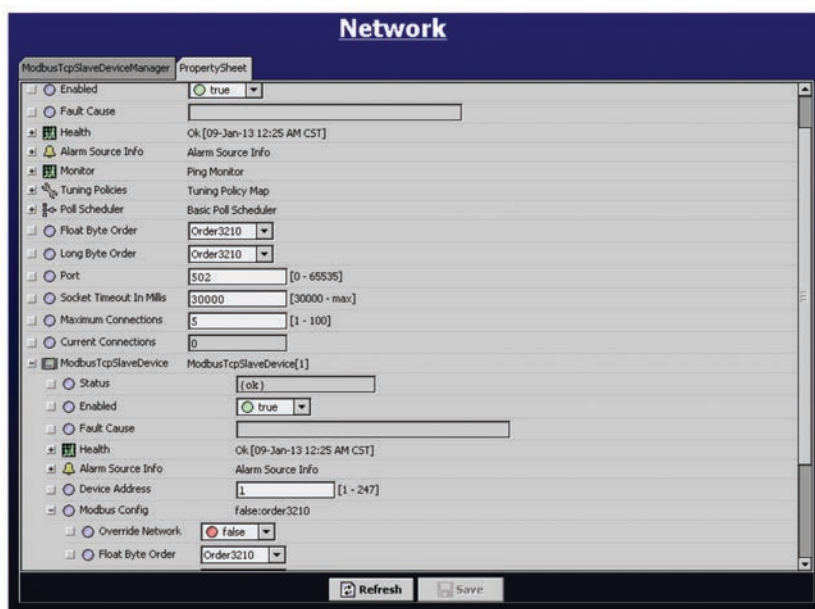


Modbus

The Modbus network needs to be enabled and the device address must be set-up. These are the only requirements to initialize the Modbus network on the JENESys controller. Other properties may need to be adjusted based on the desired arrangement of the network.

1. Navigate to the network page of the web user interface. There are two tabs of information for the Modbus network.
2. Select true from the Enabled drop-down menu.
3. Expand the ModbusTopSlaveDevice property group.
4. Set the Modbus address to the desired address.
5. Configure any other Modbus config items that need to be changed to match the specific network on the site.
6. Click the Save button.

Figure 132: Modbus Properties

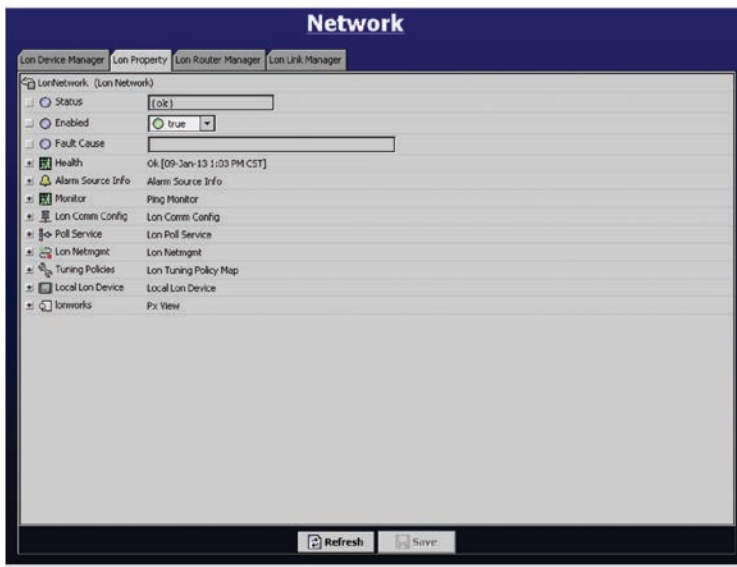


Modbus is a registered trademark of Modbus Organization, Inc.

Configuring the LonWorks Network

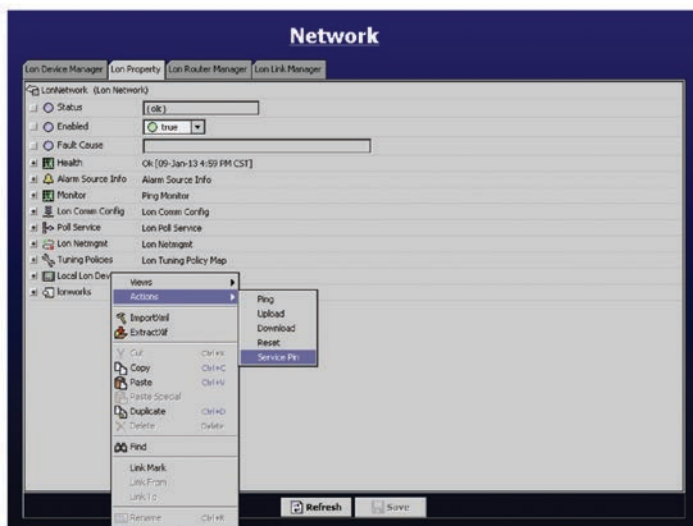
1. Login to the web user interface.
2. Navigate to the network page. The network page contains four tabs for a LonWorks configured unit. The Lon Device Manager holds a database of Lon devices with one entry (local Lon device). The local Lon device contains the definition of the Lon driver properties for the JENESys controller.
3. Double-click the local Lon device to display a quick view of some of the most important properties for the JENESys controller and a Lon device.

Figure 133: Lon Device Properties



4. The Channel ID, Subnet and Node need to be changed to the appropriate value desired by the network supervisor.
5. Click the Save button.
6. Click the Lon Property tab. The Lon Property tab allows you to enable or disable the Lon network. By default, the unit is shipped with the network disabled.
7. Change the Service Pin.
 - Right-click Local Lon Device and click Actions.
 - Select Service Pin from the Actions menu.

Figure 134: Service Pin

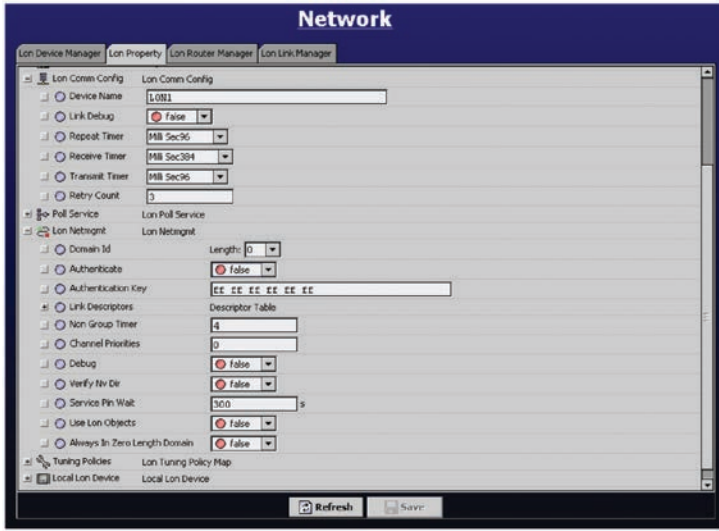


LonWorks is a registered trademark of Echelon Corporation

Due to our policy of continuous product innovation, some specifications may change without notification.
 LG Electronics U.S.A., Inc., Englewood Cliffs, NJ. All rights reserved. "LG Life's Good" is a registered trademark of LG Corp.

8. Expand the Lon Comm Config property group. The Lon Comm Config group contains properties for synchronizing the timing of the Lon driver with the timing of the network.
9. Edit any necessary Lon configurations.
10. Expand the Lon Netmgmt property group. This property group contains the Domain ID which needs to be configured based on how the network is identified. The integration engineer needs to properly address the Lon Netmgmt properties.

Figure 135:Lon Device Properties - Comm Config and Lon Netmgmt



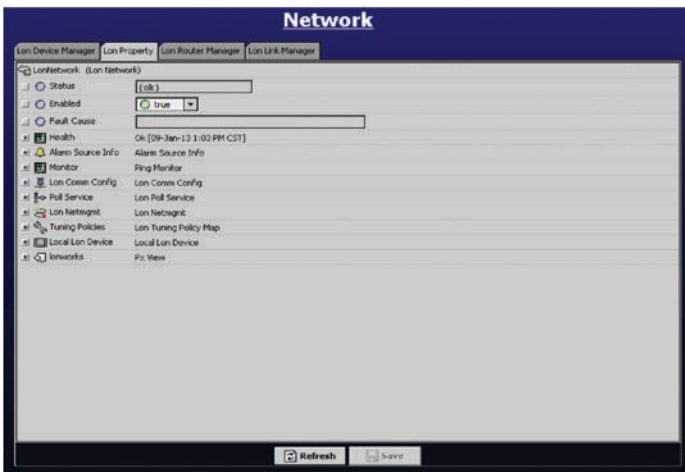
11. Expand the Local Lon Device property group. The Local Lon Device properties contains additional details about Lon device properties.
12. Expand the Device Data properties group. The Device Data group properties contain the Neuron Id, Program Id and Node State.

Note

⊗ The Neuron Id and Program Id are populated by the Lon card in the controller and **SHOULD NOT** be changed.

13. Select Config Online from the Node State drop-down menu.
14. Ensure the Subnet Node Id matches the desired node address. The Subnet Node Id defines the node address based on the subnet and node that were entered on the editing dialog on the Lon Device Manager tab. Each device on the network must have a unique Subnet Node Id.
15. Select true from the Has Node Object drop-down menu.
16. If desired, enter a Location and Self Doc. These fields are used for identification purposes only.
17. Click the Save button.

Figure 136:Lon Device Data Properties



TROUBLESHOOTING

Possible Causes

There are many possible causes of a DOAS installation that does not operate correctly. This section discusses some of the more common issues. If your problem is not solved with these procedures, contact LG Technical Support.

Confirm Correct Installation

Installation issues are a common cause of problems. Verify the following items are correctly connected or configured. Refer to the installation procedures in this manual as necessary.

⚠ WARNING

High voltages are used in this equipment. Ensure facility power is correct and all power cables are properly connected before applying power to the DOAS. ⓧ Do not touch exposed electrical components or terminals. Be extremely careful when working inside the control compartment when power is applied.

Failure to observe this warning can result in death or severe injury.

The information contained in this manual is intended for use by an experienced, trained electrician familiar with the U.S. National Electric Code (NEC) who is equipped with the proper tools and test instruments.

Failure to carefully read and follow all instructions in this manual can result in death or severe injury.

Input Power Checks

1. Refer to "High Voltage Electrical" on page 23
2. Position the DOAS power input power disconnect switch to off.
3. Ensure correct facility power is present at the DOAS disconnect switch.
4. Ensure power cable is correctly connected and that the connections at the DOAS terminal block are secure.
5. Ensure the power cable is installed with sufficient distance between it and any communication wiring. ⓧ Do not run power cable and communication wiring through the same access port into the DOAS.

Communication Wiring Checks

1. For heat recovery systems, confirm the communication wiring is installed as shown in Figure 15 on page 20. Ensure the communication cable is a minimum of 18 AWG, stranded, shielded, and the shield is grounded at the outdoor unit only.
2. For heat pump systems, confirm the communication wiring is installed as shown in Figure 14 on page 19. Ensure the communication cable is a minimum of 18 AWG, stranded, shielded, and the shield is grounded at the outdoor unit only.

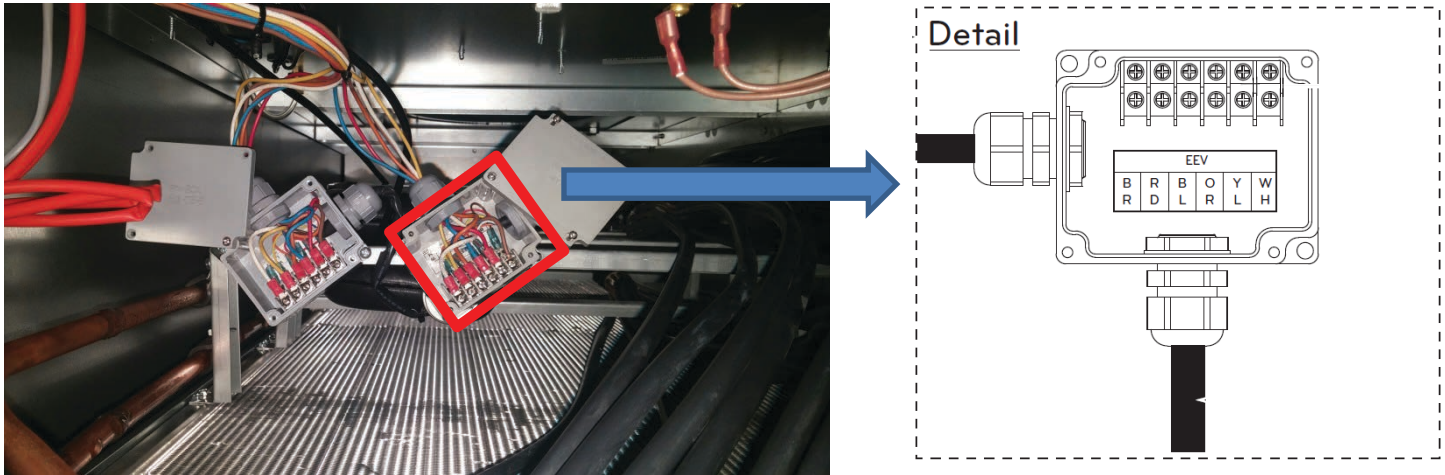
Temperature and Humidity Sensor Checks

1. Verify that outside air temperature sensor S1, outside air humidity sensor H1, and discharge air temperature sensor S4 have been correctly mounted in the entering air ductwork and the discharge air ductwork. Refer to "Temperature and Humidity Sensors" on page 15.
2. Ensure these sensors' electrical cables are correctly connected and are not routed near power cables.

EEV Junction Box Wiring Checks

1. Open the two EEV junction boxes located behind the coil access door. Verify wiring is connected to the correct terminals (Figure 137).
 - a. Brown wire is connected to the BR terminal.
 - b. Red wire is connected to the RD terminal.
 - c. Blue wire is connected to the BL terminal.
 - d. Orange wire is connected to the OR terminal.
 - e. Yellow wire is connected to the YL terminal.
 - f. White wire is connected to the WH terminal.
2. Correct wiring if necessary. Ensure all terminals are securely tightened.
3. Replace junction box covers.

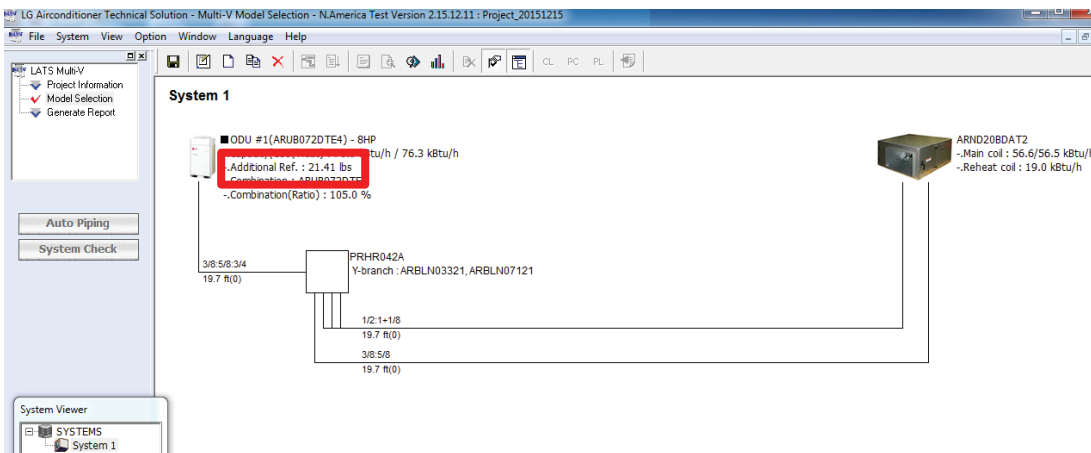
Figure 137:EEV Junction Box Connections



Refrigerant Trim Charge Check

1. Confirm the refrigerant trim charge was calculated correctly and that the trim charge was added.
2. LATS software will provide the refrigerant trim charge value (Figure 138) or a manual calculation ("Refrigerant Charge" on page 18) can be performed.

Figure 138: DOAS Refrigerant Trim Charge in LATS



DOAS Capacity PCB Check

1. Verify the capacity PCBs installed on the IDU communication PCBs are the correct value for your DOAS system. Refer to "Capacity Selection" on page 21

DOAS Terminal Board Wiring Check

1. Locate the 52 connection terminal board in the DOAS control compartment
2. Verify the wiring is connected as shown on the DOAS wiring diagram and that all connections are secure. There is a wiring diagram on the inside of the control compartment door as well as in this manual.
 - a. "DOAS Model ARND20BDAT2 with Preheat" on page 24
 - b. "DOAS Model ARND20BDAR2 without Preheat" on page 26

DOAS START-UP CHECKLIST

System ID No.: _____ DOAS Unit ID No.: _____

Checked By: _____ Date: _____ Signature: _____

Rough-In	N/A	Complete	Not Complete
Packing materials and literature removed from fan discharge.			
Airflow direction correct.			
Fan wheels spin without obstruction.			
Unit is properly supported - mounting bolts tight.			
Unit is level.			
Recommended minimum service clearances followed.			
Air filter is clean and properly installed.			
Ductwork	N/A	Complete	Not Complete
All seams sealed - no air leaks.			
Ductwork is properly sized considering the available external static pressure rating of the DOAS unit fan.			
No kinks present in the flexible ductwork. Ductwork is properly supported.			
Ductwork balancing dampers have been installed and are correctly adjusted or open.			
Grilles and registers are properly sized and installed.			
Refrigerant Piping	N/A	Complete	Not Complete
A dry nitrogen purge rate of three (3) psig was maintained during all brazing activity.			
Refrigerant pipe is properly supported to keep lateral pressure off unit connections.			
Refrigerant charge calculated manually and added to each outdoor unit system.			
Condensate System	N/A	Complete	Not Complete
Condensate traps were installed.			
Insulation	N/A	Complete	Not Complete
All pipes are independently insulated. All insulation seams and joints are airtight. Insulation is not compressed. Double layer insulation is provided at pipe supports and wall penetrations.			
Electrical	N/A	Complete	Not Complete
Power provided in three phase, \pm 10% of DOAS unit nameplate specifications.			
Power wires properly sized and protected per NEC and local codes. DOAS unit is properly grounded.			
Power and communications conductors are separated by the recommended minimum distance.			
Terminal block screws are tight.			
Power wires are properly secured to the control box case to prevent wire tension at the terminal block.			
Wires are protected from chaffing at control box and conduit pipe penetrations.			
Low voltage control cables are properly secured to the control panel case. Terminal block screws are tight.			
Four communication wires are connected to each outdoor unit (ODU) at the following ODU terminals: Internet A, Internet B, IDU A and IDU B.			
Field provided communications cable is 18-2 stranded and shielded. All terminations are made at the terminal block. No in-line splices or wire caps are present.			
Communications cable shield is tied back and is grounded at only ONE end.			

DOAS Operation

The microprocessor control will operate the air handler using one of the five operating modes:

- Cooling
- Heating
- Dehumidification
- Ventilation
- Defrost

Cooling Mode

Cooling mode is activated when the outdoor air temperature sensor detects a temperature increase above the outside air cooling enable set-point. Outdoor unit compressors modulate to meet the cooling demand by the main coil and maintain discharge air temperature set point.

Heating Mode

Heating mode is activated when the outdoor air temperature sensor detects a temperature decrease below the outside air heating enable set-point. Electric preheat coil is activated and the SCR controller modulates the percentage output of the heater to maintain minimum discharge air of 44°F. Outdoor unit compressors modulate to meet the heating demand by the main coil and maintain discharge air temperature set point.

Dehumidification Mode

Dehumidification mode is activated when the outdoor air humidity sensor detects an outdoor humidity set point. Outdoor unit compressors will modulate to maintain a coil discharge air set point of 55°F. Reheat coil outdoor unit compressors will modulate to increase the main coil discharge air up to the discharge air set point.

Ventilation Mode

Ventilation mode (occupied mode) is activated when the air handling unit is turned on and the supply fan runs at constant speed.

Defrost Mode

Defrost mode is activated upon receiving a signal from the main coil outdoor unit that defrost is required. Supply fan remains on and the discharge air temperature is maintained by the electric preheat coil until the main coil defrost cycle is completed.

Record all DOAS maintenance or service in the maintenance log on the next page.

At least once per year, a trained service technician should check the unit. Supply fans, evaporator coils and air filters should be inspected once per month.

Supply Fan Lubrication

All original blower motors and bearings are furnished with factory lubrication. Some applications will require bearings be re-lubricated periodically. The schedule will depend on the operating duty, temperature variations or other severe atmospheric conditions.

Bearings should be re-lubricated at normal operating temperatures, but not when the unit is running. Rotate the fan shaft by hand and add

Note

Recommended greases are as follows; Shell Oil - Dolium R, Chevron Oil - SRI No. 2 and Texaco Inc. - Premium RB.

Use only enough grease to purge the seals. ⓧ DO NOT OVER LUBRICATE.

⚠ WARNING

Prior to rotating parts, shut off all electrical power to the unit to avoid electrical shock which could result in product damage, personal injury or death.

Note

It is strongly recommended that filter media be replaced monthly.

Filter Replacement

Monthly filter inspection is required to maintain optimum unit efficiency.

Filters are located upstream from the evaporator coil. Follow the instructions below to access the filter:

1. Open the access panel.
2. Pull filters straight out and inspect them.
3. Replace filters with the appropriate size (indicating on the filter).

The arrow on the replacement filters must point towards the blower.

MAINTENANCE LOG

This log must be kept with the unit. It is the responsibility of the owner and/or maintenance/service contractor to document any service, repair, or adjustments. LG Air Conditioning Support is available to advise and provide technical support for proper operation and replacement parts. The responsibility for proper start-up, maintenance and servicing equipment falls to the owner and qualified licensed technician.

[illegible]

WHO TO CALL FOR ASSISTANCE

Freight Damage and Unit Replacements.....	Your LG Manufacturer Representative
Missing Parts.....	Your LG Manufacturer Representative
Received Wrong DOAS Unit Model.....	Your LG Manufacturer Representative
Installation, Startup, and Commissioning Technical Assistance.....	1-888-865-3026



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Commercial Air Conditioning Division
4300 Northpoint Parkway, Suite 100
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www.lghvac.com

LG Electronics Commercial Products Support
1-888-865-3026 USA
Follow the prompts for commercial A/C products.

IM_DOAS_5_16
Supersedes: IM_DOAS_2_16
Supersedes: IM_DOAS_5_15
Supersedes: IM-DOAS-06-14A
Supersedes: IM-DOAS-06-14