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Dry-o-tron Submittal

Project Name: Realstar – 500 Springbank
O'Dell Reference: TDF#12853
O'Dell Contact: Ghaleb Sater
Revision No.: 0
Preparation Date: 18 – OCT - 2018

Engineer: SBM
Contact:

Contractor: Orzech Heating and Cooling
Contact: Victor Orzech

Purchase Order Reference:

Equipment: Dectron DS30 Outdoor Packaged cooling with Gas fired section
Current Estimated Lead Time: 10-13 weeks
Tags: DH-1

Remarks:


Notes:

- Estimated lead times provided is at time of submission. Lead times may vary.
- Receipt of approved submittals **does not** indicate release of equipment.

Representative	Project Info
Ghaleb Sater O'Dell Associates Inc. 1038 Cooke Blvd., Unit 3 ghaleb@odellassoc.com Phone: (519) 652-8280	Date: Jul 5, 2018 Job Name: Realstar - 500 Sprinbank

Natatorium Design				Unit Design	
Pools				Number of Units	1
Pool Name	Surface Area (ft²)	Water Temp (°F)	Activity Factor	Pool Water Heating	Yes
Pool 1	720	84	0.5	Outside Air Required	Yes
Room Conditions				Outside Air CFM	650
Wet Deck Area (ft²)		460		Country	Canada
Pool Room Volume (ft³)		20000		State/Province	Ontario
Number of Spectators		0		City	LONDON INT'L AIRPORT
Air Conditions				Elevation (ft)	912
Room Temp (°F)		86		Summer DB (°F)	86.2
RH Unoccupied (%)		50		Summer WB (°F)	72.2
RH Occupied (%)		60		Winter DB (°F)	3.4

Moisture Load Summary (lb/hr)			Selected Model: DS-030			
Load Source	Occupied	Unoccupied		Occupied	Unoccupied	Total Occupied
Pool 1	15.2	19.8				
Outside Air	-6.7		Moisture Removal Capacity (lb/hr)	38.3	30.1	38.3
Spectators	0		Max AC Moisture Removal Capacity (lb/hr)	39.8	29.8	39.8
Total	8.5	19.8	Total Unit Capacity (MBH)	81.2		81.2
			Sensible Cooling (MBH)	39.8		39.8
			Max AC Sensible Cooling (MBH)	47.2		47.2
			Max AC Total Capacity (MBH)	90.2		90.2
			Compressor Total Heat Rejection (MBH)	101.5		101.5
			Pool Water Heating Capacity (MBH)	51		51
			Standard Unit Supply Air CFM	3000		3000
			CFM Range	1900-3400		
			Room Air Changes (per hr)	9		



Project #: 28617.2
Project Name: Realstar - 500 Sprinbank
Prepared For: Ghaleb Sater
O'Dell Associates Inc.
Dectron Model #: DS-030-VB-X-P3EB4282G2C2AD3

<http://dectron.com>

5685 Rue Cypihot
Saint Laurent, Quebec H4S 1R3
1-514-336-3330

July 5, 2018

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Realstar - 500 Sprinbank
DS-030-VB-X-P3EB4282G2C2AD3

Model	6 Ton compressor dehumidifier
Unit Subseries	Pool Water Heater, Vented
Unit Location	Outdoor
Cabinet	Horizontal 2-in Double Walled - Return Plenum - Bottom
Supply Voltage	208V/3PH
Unit Control	Supervisaire
Refrigerant	R410A
Disconnect	Non Fused Disconnect Unit Mounted
Main Blower Discharge	0.75 inches
Outdoor Air	OA Inlet Motorized Damper & Filter
Exhaust Fan	Unit mounted Exhaust Fan
Space Heating	Unit mounted gas heater (Furnace)
Heat Control	Modulating - factory supplied and wired valve
Air Conditioning	Air Cooled A/C - Packaged Integral Air Cooled Equipment
Roof Curb	18 in shipped knocked down.
Warranty	2 years on driveline, 5 years on compressor, 2 years on coils
Supply Air CFM	2800
Outdoor Air CFM	650
Exhaust Air CFM	715
Supply Air Orientation	Bottom Supply
Outdoor Air Orientation	Left
Pool Water Connection	Bottom
Condensate Drain	Bottom
Heating Capacity (Output)	160 MBH

Realstar - 500 Sprinbank
DS-030-VB-X-P3EB4282G2C2AD3

Design Data	
Outdoor Air (CFM)	650
Room Conditions (°FDB/%RH)	86/60
Unit Total Airflow (CFM)	2800

Electrical Data	
Unit Voltage (V/Ph/Hz)	208V/3PH/60
Unit Full Load Amps - FLA (A)	38.0
Unit MCA (A) (min circuit ampacity)	44
Unit MOP (A) (max overcurrent protect)	60

Supply Air Blower	
Airflow (CFM)	2800
Type	Plenum
Unit ESP (in WC)	0.75
Number of Motors	1
Motor HP	2.2
Motor FLA (A)	5.0
Motor Drive	Direct Drive

Exhaust Fans	
Exhaust Air (CFM)	715
Type	Plenum
ESP	0.5
Number of Motors	1
Motor HP	1.2
Motor FLA (A)	4.2

Compressor

Type Scroll
Number of compressors 1
Refrigerant R410A
Motor RLA/LRA (A) 23.2/164.0

Evaporator Coil

Total Cooling Capacity (MBH) 81.2
Sensible Capacity (MBH) 39.8
Max AC Sensible Capacity (MBH) 47.2
Max AC Total Capacity (MBH) 90.2
Latent Capacity (Lbs/h) 38.3
Circuits 1

Reheat Coil

Total Heat Rejection (MBH) 101.5

Pool Heating

Type Cupro-nickel Co-axial Vented
Capacity (MBH) 51
Water Flow Rate (GPM) 10
Water Pressure Drop (PSI) 4
Connection Size (in) 3/4
Connection Type FTP
Connection Stub Material PVC
Maximum Circuit Pressure Rating (PSI) 60.0

Auxiliary Heat

Location	Unit Mounted
Type	Gas Heater: Unit mounted gas heater (Furnace)
Capacity, Input (MBH)	200
Capacity, Output (MBH)	160
Max/Min Gas Pressure (in WC)	14/7
Connection Size (in)	
Connection Type	FPT
Control	Modulated

Packaged Outdoor Air-Cooled Condenser

Model	NC-Z-1V
Design Air On Temp (°F)	95 F
Number of Motors	1
Motor HP	1.4
Motor FLA (A)	5.6

DESCRIPTION

MODEL: RS/RA5
020/025/030/035/040
GAS FURNACE

CAD FILE

SLX-S-BB-PGE1P0-SOA

DATE

01/08/18

REV

0

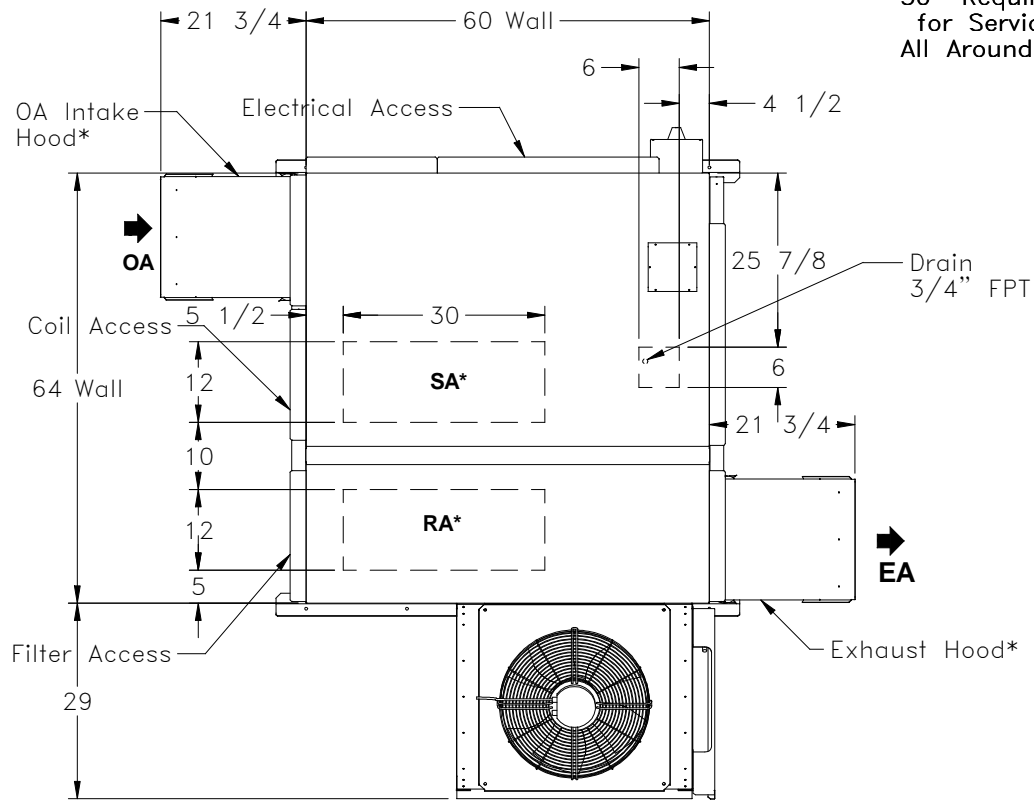
DRAWN BY

Eric Hatin

SHEET

1 OF 1

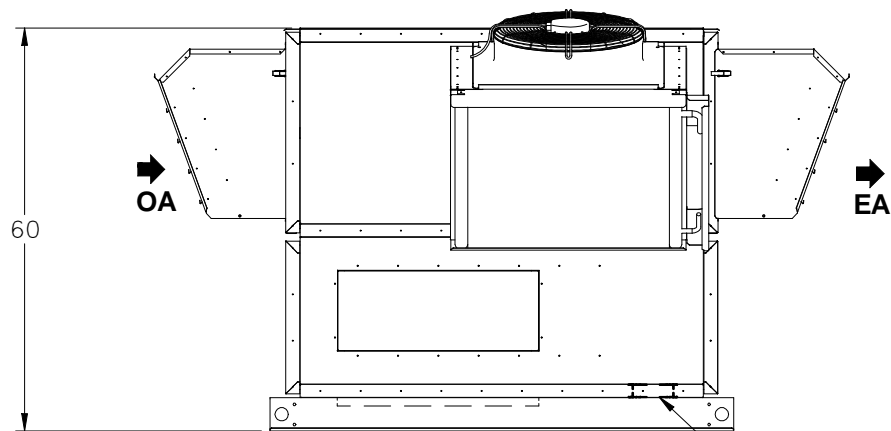
30" Required
for Service
All Around Unit



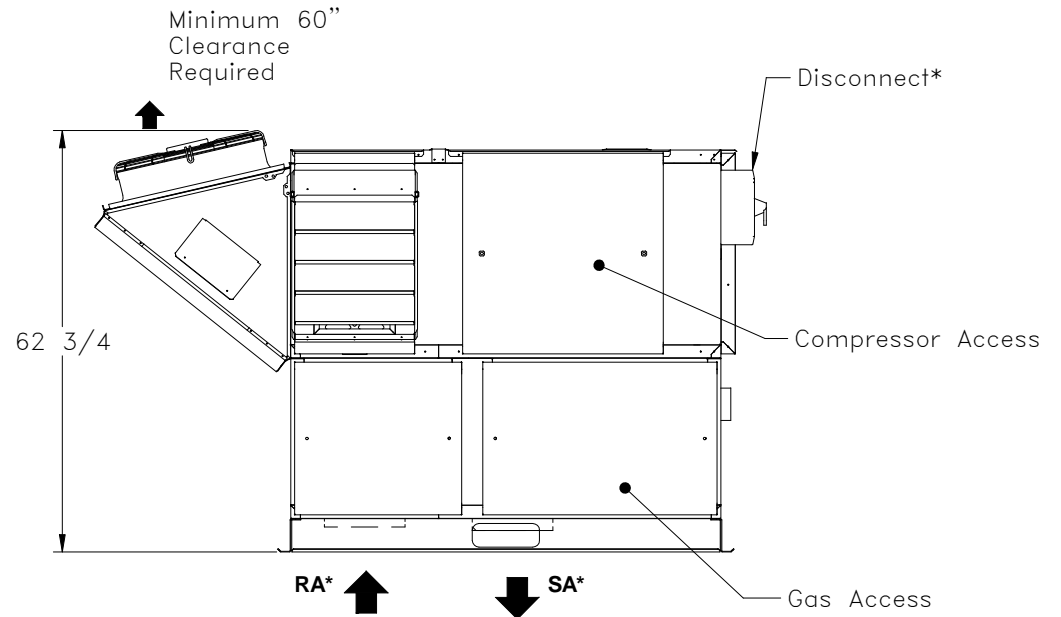
* Refer to unit summary sheet for options selected
Roof curb outer dimensions: 59" x 63"



Unit operating weight: 2000 LBS
(A=20%, B=25%, C=30% & D=25%)



Pipe Chase
- Pool
- HWC
- Electrical



DECTRON VISION 2.0 – EASY TO USE INTERFACE & PRECISE READINGS

Vision 2.0 provides our customers with full control over their Dectron dehumidifier. Providing a powerful array of capabilities designed to ensure peak operating performance while minimizing down time and instant access to performance data. Every aspect of the dehumidifier's performance can be personalized, monitored, analyzed and adjusted at any time. Dectron Vision 2.0 has been designed to detect and protect each and every dehumidifier with real time monitoring, 24 hours a day, 365 days a year.



Should an alarm occur, Dectron Vision 2.0 will automatically notify a service contractor of the customer's choice via email. Additional notification can also be personalized to include any additional contacts the client selects. Upon notification, authorized service technicians can login to the system, to observe, adjust and control important parameters in real time using the web or smart phone interface.

Dectron Vision 2.0 provides piece of mind by providing a proactive approach to service and dehumidifier maintenance. Fewer service calls and minimum down time result in direct cost savings for clients all while adding value to the initial investment.

Dectron Vision 2.0 Advantages

- Premium extended 1st year warranty – parts and labor
- Fully monitored remote factory start-up capability
- Comprehensive installing contractor support
- Smart phone interface

Dectron Vision 2.0 Capabilities

- Remote monitoring for lifetime of dehumidifier
- Live monitoring and alarm service
- Secure online access to real time data
- Secure access for personalized setting adjustments



SUPERVISAIRE – EFFICIENTLY CONTROLLED SYSTEM

Supervisaire Capabilities

- Remote system control that is automated and programmable,
- Allows for personalized control of hundreds of operating parameters
- Real time clock including battery back-up
- Programmable interface with web and smart phone control capability for easy use
- Optional remote operator panel unit can be located up to 1,000 ft. away from unit
- Secure remote control via the Internet or smart phone with Dectron Vision 2.0 that monitors real time, performance data and analysis.

Supervisaire Specifications

- Control for space dehumidification, heating and cooling (staged and modulated)
- 24 digital outputs and 4 analog outputs used for controlling components
- Sensors for that monitor the space, refrigerant pressures and pool conditions
- 2 RS-485 serial ports and 1 RS-232 serial port
- 1 Ethernet port (RJ45)
- LON, Modbus, BACnet building automation options available

Sensor Information

- Refrigerant high pressure
- Refrigerant suction pressure
- Outside air temperature
- Outside air humidity
- Air temperature leaving the evaporator
- Supply air temperature
- Compressor superheat temperature
- Compressor compartment temperature

Technician Mode for Service

- History log of sensor data including date/time
- Log of all alarms and status (past and current)
- Operations history log
- Force modes of operation
- Damper adjustment
- Damper Calibration
- Internal and External Contacts Testing

Alarms

- Communication fault, Sensor fault, Dirty filter, High refrigerant pressure fault, Low refrigerant pressure fault, No airflow, Blower overload, Firestat, High supply air temperature

INDUSTRY LEADING FEATURES

Dectron dehumidifiers match or exceed the specifications of every other competitor in the marketplace.

Fully Dipped Coils

- Provide 100% protection against corrosion (not just the fins)

Service Vestibule Outside Air Stream

- Protects critical components from chlorinated air stream, maximizes AC efficiency, and allows unit servicing while in operation

Ultra Compact Designs

- Up to 14 tons of dehumidification fitting through a 30 inch door

Built-in Refrigerant Pressure Transducers

- Allow 24-7 Monitoring of critical suction and discharge pressures to ensure optimal system performance

Superior Compressor Protection

- Advanced monitoring and control technologies to protect compressors including sight glasses on receivers

Direct Driven, Backward Inclined Airfoil Plenum Fans

- Provide powerful, quiet, efficient, reliable performance with no belts to adjust, wear out or replace
- These fans also allow factory installed auxiliary air heating while providing maximum flexibility for supply air duct options

Ultra Compact Designs

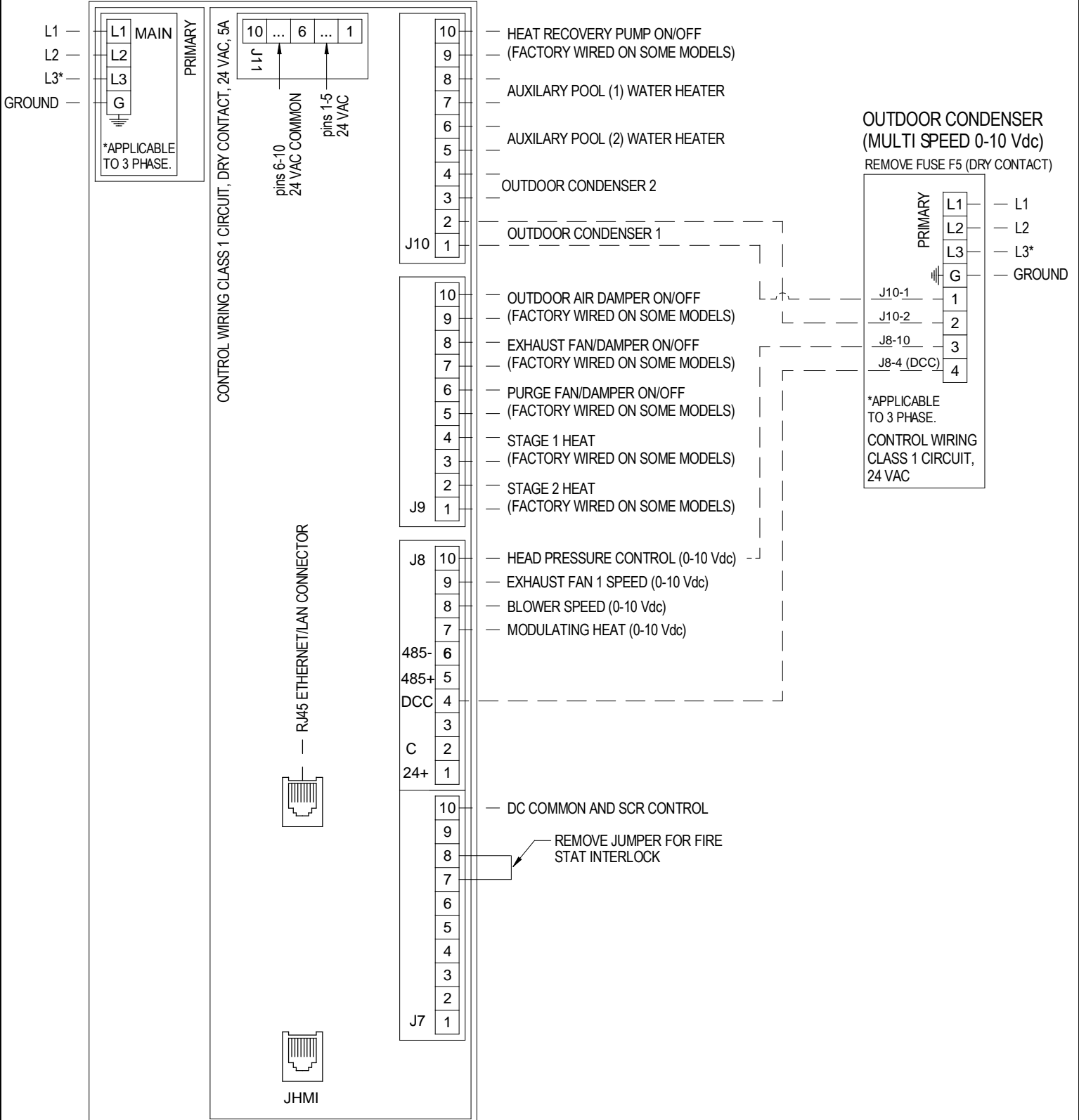
- Up to 14 tons of dehumidification fitting through a 30 inch door



DRAWING NUMBER			REV	COMMENTS	DATE	APPROVED
FWD-DS-Z-00			1			
FILE: Dectron-FWD-DS-Z-00			2			
			3			
DFTN	DATE	REV #: 0.0	4			
bsimpson	08/31/17	SHEET 1 OF 1	5			
			6			

DS Series Field Wiring Diagram with NC-Z/NC-B/NG-Z Remote Condenser

DEHUMIDIFICATION UNIT



Part 1 - General

1. Scope

Furnish and install where indicated, factory-assembled, enclosed swimming pool environmental control/ energy recovery system. System shall include,

Packaged system designed for natatorium environment control including:

- A. Dehumidification
- B. Unit mounted indirect fired natural gas heater for space heating
- C. Cooling mode with heat rejection to an integral unit mounted outdoor air cooled condenser
- D. Pool water heating from vented heat exchanger from reclaimed compressor waste heat
- E. Unit mounted minimum Exhaust Fan
- F. Unit mounted minimum Outdoor Air Connection

2. Quality and Safety Assurance

- A. The unit shall be ETL listed.
- B. Unit shall be completely factory assembled, wired, piped, and test run prior to shipping. All controls shall be factory adjusted and preset to the design conditions. A factory test report shall be available upon request.
- C. Live remote monitoring of the unit during factory testing shall be available via the Internet.
- D. The unit shall have a mechanical vestibule where the electrical panel, compressors, pool water heat exchangers, receivers and most of the refrigeration controls are out of the process air stream.
- E. Warranty: The entire system shall have a 24 month limited parts warranty from ship date.
 - 1. The system shall be covered by an additional 1-year labour warranty when it is connected to the factory via live internet monitoring system from date of initial start-up.
 - 2. The compressor(s) shall have a 5 year warranty from ship date.
- F. The unit shall have live remote service capability via the internet with the ability for field service technicians to receive service and trouble alerts via email and make adjustments via smart-phone application remote control.

Part 2 - Product

3. General

The natatorium control system shall include:

- A. Mechanical process dehumidification
- B. Outdoor configuration
- C. Integral packaged outdoor air-cooled condenser for AC heat rejection.
- D. The unit shall have an indirect fired natural gas heater installed downstream of the blower, sized to meet the skin losses and outdoor air heating loads or as specified by the design engineer.
- E. Pool water heating type: potable water rated coaxial
- F. Air filtration type: MERV 8 2-inch filters for return and outdoor air.
- G. Minimum Outdoor Air connection.
- H. Minimum Exhaust Fan.
- I. Unit shall have a service vestibule where the compressor, refrigeration specialties and control valves and all electronics are outside of process air stream.

4. Sequence of Operation

Unit shall be designed and sized to maintain the specified conditions. The unit operation shall be as follows:

A. Unit Startup

- 1. Power is turned on or system is restarted.
- 2. After a short initial delay to allow sensors to stabilize, the blower starts and operates continuously.
- 3. Based on unit mounted sensor feedback the unit shall begin/resume operation and will operate based on the sequence described below.

B. Airside Configuration

- 1. The unit delivers specified supply air continuously to the Natatorium.
- 2. The minimum exhaust air volume is set to meet the engineer's schedule.
- 3. The minimum outdoor air volume is set to meet the engineer's schedule.

C. Dehumidification Mode

- 1. Return air relative humidity is above humidity setpoint.
- 2. Compressor starts using Compressor Start sequence.
- 3. The reheat coil has full (0-100%) modulating capabilities. The reheat output will modulate to maintain the space temperature at set point year round

D. Air Conditioning Mode

- 1. Return air temperature is above room temperature setpoint.
- 2. Compressor starts if not already operating in dehumidification mode.
- 3. Unneeded compressor hot gas is diverted to the outdoor air cooled condenser for up to 100% heat rejection at summer design ambient conditions.

E. Space Heating Mode

- 1. Return air temperature is below room temperature setpoint.
- 2. The Microprocessor space heating output signal (0-10 volt) is sent to the heating coil controller. The signal output will regulate based on the return air temperature.

F. Pool Water Heating Mode

- 1. Return pool water temperature is below pool water setpoint.
- 2. If compressor is already operating from a Dehumidification or Air Conditioning demand, the control valves divert the compressor hot gas through the coaxial heat exchanger/pool water heater and the rest of the compressor heat is rejected at either the reheat coil or the AC heat exchanger.

3. If there is no pre-existing demand for the compressor to operate, the microprocessor sends a signal to the auxiliary pool water heater (remote by others) to operate. The compressor will not normally operate solely for a pool water heating demand unless configured to do so at the controller.

G. Freeze Protection

1. Supply air temperature falls below freezestat setpoint or optional freezestat sensor indicates a freezestat condition.
2. All exhaust fans are stopped and all outdoor air dampers are fully closed.
3. Freezestat alarm is tripped. Alarm has to be manually cleared by operator.

5. **Cabinet**

A. The Cabinet shall be designed for Outdoor installation and shall be 2" double walled with painted inner liner.

B. Cabinet Construction: All cabinet 16, 20, 24 gauge sheet metal shall be galvanized G90 steel or Galvalume™ alloy, mill applied zinc phosphate primer followed by an exterior grade white silicone modified polyester top coat. The sheet metal is engineered to form a cabinet with maximum strength and rigidity. Panels shall be fastened to the frame with stainless steel hardware. Panels shall be isolated from the steel frame with dielectric gaskets to prevent galvanic corrosion. All seams shall be caulked with silicone inside and out to prevent air and water leakage.

1. Base Rails: The cabinet shall have a base frame formed using formed 12 gauge mill galvanized G90 steel and allow access to the drain connection through forklift slots.
2. The cabinet walls shall be 20 gauge pre-painted steel, 2-inch double-wall construction with a fully painted inner metal liner and 2-inch fiberglass insulation.
3. The cabinet floor shall be 20-gauge pre-painted steel, 2-inch double wall engineered with structural bending for maximum rigidity and be mechanically fastened to the base frame of the unit.
4. The cabinet roof shall be 20-gauge pre-painted steel, 2-inch double wall engineered with structural bending for maximum rigidity and be mechanically fastened to the base walls of the unit.
5. The cabinets shall be mechanically assembled with stainless steel 5/32" sealed pop rivets. Where bolts are required bright zinc plated bolts shall be used.
6. Access doors shall be supported on multiples hinges and have multiple compression latches to provide quick access. Doors shall be provided for entrance to all sections housing components requiring routine maintenance. Full height access doors have "hold back" latches to prevent door closure during the performance of service procedures.
7. The unit shall have non-corroding protective mesh screens on all air intake openings.

C. Outdoor Air Intake:

1. Minimum Outdoor Air connection: motorized damper, filter and time clock

D. Insulation: The unit shall be insulated per the following standards:

1. All exterior cabinet sections shall be insulated with two (2) inch thick fiberglass inside the double walled cabinet.
2. Fire resistant rating to conform to NFPA Standard 90A and 90B.
3. Sound attenuation coefficient shall not be less than 1.02 at a frequency of 1,000 Hz as per ASTM Standard C423.
4. Thermal conductivity shall not exceed 0.26 Btu/in-h-sqft-F at 75 F.

E. Cabinet configuration shall include:

1. A filter rack with separate access doors shall be provided for the return air and minimum outdoor air streams.
2. Unit shall be equipped with duct collars to admit the minimum outdoor air as scheduled. The outdoor air intake assembly shall have a built in air filter rack with separate access door, manual air balancing device and motorized 2 position extruded aluminum, Insulated, silicone side-sealed damper operated by 24-hour time clock.
3. Mechanical vestibule: The unit shall have the compressor, receiver, solenoid valves and the electrical panel in a separate compartment out of the processed air stream. All components shall be serviceable while the unit is in operation without disturbing the airflow.
4. Electrical panel: The unit shall have a built-in electrical control panel in a separate compartment in order not to disturb the airflow within the dehumidifier during electrical servicing. All electrical components shall be mounted on a 16 gauge

galvanized sub-panel.

6. Filters

Filters shall be standard sized, replaceable, off-the-shelf filters used throughout including:

- A. Return Air: 2-Inch MERV 8, 30% pleated filters with rust-free non-metallic structure on a face loading rack.
- B. Outside Air: 2-Inch MERV 8, 30% pleated filters with rust-free non-metallic structure

7. Coils

A. Evaporator/dehumidifier coils shall be designed for maximum moisture removal capacity.

- 1. Coils shall be fully dipped and coated with a polyester/enamel coating for maximum corrosion protection. Coating shall comply with ASTM B117/D1654 and ASTM D2126 for corrosion resistance against common acids, salt and gases.
- 2. Coil shall have galvanized casing and end plates.
- 3. Aluminum fin and copper tubes mechanically bonded to assure high heat transfer.

B. Air reheat condenser coils shall be sized for variable heat transfer into the air with a capacity of 100% of the compressors total required heat of rejection.

- 1. Coils shall be fully dipped and coated with a polyester/enamel coating for maximum corrosion protection. Coating shall comply with ASTM B117/D1654 and ASTM D2126 for corrosion resistance against common acids, salt and gases.
- 2. Coil shall have galvanized casing and end plates.
- 3. Aluminum fin and copper tube joints mechanically bonded to assure high heat transfer

8. Drain Pans

Each evaporator coil shall be provided with a positive draining, compound-sloped, baked powder paint coated aluminum drain pan with fully-welded corners to ensure zero water retention.

9. Blowers and Blower Motors

A. Supply blowers:

- 1. The Supply blower shall be impeller plenum fan complete with backward curved, three-dimensional, profiled blades made of high performance composite material. The blower shall be completely corrosion resistant and be maintenance free and is direct drive via a direct current (DC) electronic commuted (EC) motor. The EC-Motor shall have zero slippage design and have continuously variable speed control when connected to the unit's controller.
- 2. The EC motor shall have maintenance-free electronic circuitry, a rotor with permanent magnets, and an integral controller to provide the windings with electrical current so that, the motor rotates continuously and quietly.
- 3. The fan assembly shall be suitable for a maximum temperature of 60°C.
- 4. The fan shall be statically and dynamically balanced on precision electronic balancers.

B. Exhaust blowers:

- 1. The exhaust blower (EF1) sized to maintain the Natatorium's negative pressure requirement during normal operation shall be unit mounted and its operation tied to the unit's occupancy scheduler.
- 2. The blower shall be impeller plenum fan complete with backward curved, three-dimensional, profiled blades made of high performance composite material. The blower shall be completely corrosion resistant and be maintenance free a direct drive via a direct current (DC) electronic commuted (EC) motor. The EC-Motor shall have zero slippage design and have continuously variable speed control when connected to the unit's controller.
- 3. The fan assembly shall be balanced in Class G 6.3 acc DIN ISO 1940, dynamic on two levels.
- 4. The fan assembly shall be suitable for ambient temperatures of -40°C to max. +70°C.
- 5. Thermal contacts installed in the windings compliant with THCL 155.
- 6. Drive motor in external rotor principle, sealed in protection class IP54 with moisture protection impregnation of the windings, topical protection.
- 7. High corrosion resistance design with high quality and reliability.
- 8. The exhaust fan shall be controlled from an end switch on the power open of the exhaust air damper. The exhaust

dampers shall be protected by louvers to divert rain from the face of the dampers.

10. Dampers

Internal dampers shall be parallel blade and made from extruded anodized Aluminum with neoprene double seal tips to minimize leakage. Damper blades shall be mounted on steel rods which rotate on nylon bushings. All damper hardware shall be corrosion resistant.

- A. Unit shall be provided with a power open and spring return outside air and exhaust air dampers. Dampers adjust between 0% to 100% open position.
- B. Outdoor air and exhaust air dampers shall be opposed blade, power open and spring return. Dampers blades shall be 3/4" insulated type made from extruded anodized Aluminum with neoprene double seal tips to minimize leakage. Damper leakage shall be less than 1% of maximum flow at 4-inch W.C. differential. Damper blades shall be mounted on steel rods which rotate on nylon bushings. All damper hardware shall be corrosion resistant.

11. Pool Water Heater

Potable water rated coaxial type with corrosion resistant cupro-nickel water circuit tubing.

- A. Coaxial type with corrosion resistant cupro-nickel water circuit tubing.
- B. Self-purging and self-draining counter flow design.
- C. Water circuit piping shall be transparent braided hose, for visual water flow confirmation.
- D. Terminating connections are PVC schedule 40 NPT fittings located at the cabinet wall for easy connection.
- E. Maximum loop operating pressure: 60 psig

12. Compressors

- A. Type: Scroll type, suction gas cooled, suitable for refrigerant R-410A
- B. The compressors shall be mounted on rubber in shear isolators to prevent transmission of any noise and vibration to the space below.
- C. Removable crankcase heater for liquid migration protection.
- D. Compressors shall be located outside the conditioned air stream in the unit's service vestibule.
- E. Compressors shall have a 3-year warranty extension for a total of 5 years coverage.
- F. Compressor manufacturer must have a wholesale outlet for replacement parts in the nearest major city.

13. Refrigeration Circuit

- A. The unit shall consist of one factory sealed refrigeration circuit for humidity and/or air conditioning control. No site refrigeration work shall be required.
- B. Refrigeration circuit shall have pressure transducers monitoring the refrigerant high and low pressures. The refrigeration circuit shall be accessible for diagnostics, adjustment and servicing without the need of service manifold gauges.
- C. Shall have solenoid control valves, check valves, a liquid line filter drier, liquid and moisture indicator, thermostatic expansion valve and pump down solenoid valve.
- D. Unit shall have an externally adjustable balanced port design mechanical thermostatic expansion valve. The valve shall have a removable power head.
- E. Tamper proof, hermetically sealed non-adjustable high and low pressure controls and refrigeration service valves shall be installed using Schrader type valves. Refrigeration service valves shall be located outside of the airstream.
- F. Receiver shall have two refrigerant level (maximum and minimum) indicating sight glasses.
- G. Suction line shall be fully insulated with ½ inch closed cell insulation.

14. Control Panel

- A. Electrical contractor shall be responsible for external power wiring and disconnect switch fusing. Power block terminals shall be provided.
- B. Factory-installed non-fused disconnect
- C. Shall be mounted inside the service vestibule outside of the process air stream.

- D. Blower motors shall be protected with thermal trip overloads.
- E. Unit shall have a voltage monitor with phase protection.
- F. Available dry contacts shall include:
 - 1. Alarm
 - 2. Blower interlock
 - 3. Stage 1 & 2 heating
 - 4. Outdoor air damper control
 - 5. Remote exhaust fan #1
 - 6. Remote exhaust fan #2
 - 7. Outdoor-air cooled equipment
 - 8. System on
 - 9. Auxiliary pool heater 1
 - 10. Heat recovery
- G. Terminals shall be provided for 24 volt power to the outdoor air cooled condenser fan contactor.
- H. All wiring shall be installed in accordance with UL or CSA safety electrical code regulations, and shall be in accordance with NFPA. All components used shall be UL or CSA listed.
- I. Color-coding and wire numbering shall be provided for easy troubleshooting. All wires shall be in a wire duct. Wiring diagrams located near electrical panels on unit.
- J. Compressors shall have a time delay start to prevent short cycling.
- K. Airflow switch and dry contact for alarm shall be provided.

15. Air Heating

Unit-mounted indirect fired natural gas heater shall be sized to meet the scheduled heating capacity and have the following characteristics:

- A. Modulating control.
- B. The heater shall be spark ignition natural gas indirect fired type with capacity as shown in this submittal and is installed 'blow through' or downstream from the blower. The heat exchanger tubes are constructed of formed and welded series 409 stainless steel, 16 gauge suitable for installation downstream of the cooling coil and satisfactory for air inlet temperatures below 40 F. The burner is the power firing type and incorporates a primary combustion air blower and spark ignition transformer.
- C. The heater shall be spark ignition propane gas indirect fired type with capacity as shown in this submittal and is installed 'blow through' or downstream from the blower. The heat exchanger tubes are constructed of formed and welded series 409 stainless steel, 16 gauge suitable for installation downstream of the cooling coil and satisfactory for air inlet temperatures below 40 F. The burner is the power firing type and incorporates a primary combustion air blower and spark ignition transformer.
- D. Standard controls shall include a modulating gas valve, intermittent spark ignition, overheat control, rollout flame supervision, combustion air flow proving switch, positive burner safety switch, pilot cock, main gas cock with 100% shut off, adjustable main and pilot pressure regulators.
- E. The natural gas heater section shall be an ETL recognized component. The gas train shall be complete with all controls factory mounted to comply with requirements of ETL. The gas train is complete with a modulating main gas valve and is ready for connection to a natural gas supply with pressure between 7 in and 14 in WC.
- F. The liquid propane heater section shall be an ETL recognized component. The gas train shall be complete with all controls factory mounted to comply with requirements of ETL. The gas train is complete with a modulating main gas valve and is ready for connection to a propane gas supply with pressure between 7 in and 14 in WC.
- G. The complete unit shall be test fired and preliminary adjustments made prior to leaving the factory.

16. Air Conditioning

Air-cooled air conditioning via condenser

- A. Unit shall be equipped with air conditioning mode where excess compressor heat is rejected to a factory packaged integral outdoor air-cooled condenser. The outdoor air-cooled condenser shall be capable of rejecting 100% of the compressor heat rejection with an air on temperature at summer design conditions. The outdoor condenser shall be equipped with a 24VAC control including contactor for fan motor.
- B. Unit shall be provided with a dry contact rated for 24VAC/5A to operate the remote outdoor condenser control.
- C. Refrigeration circuit shall include refrigerant valves, receiver with pressure relief valve set at 650 psig, pressure control valve and pressure differential valve, and two manual shutoff valves to isolate the outdoor condenser.
- D. Coils shall be tested at 600 PSIG and mounted vertically for complete surface utilization. Coils shall be counter flow with a minimum of 10 degrees of liquid sub-cooling and have adequate capacity to dissipate the total heat rejection of the system at design conditions. Condensers shall have guards to protect the coils from vandalism and weather related damage.
- E. The fan shall be a direct driven axial fan made of high-strength composite material in which the motor and controller are integrated. It includes FE2owlet blades combined with guide vanes and EC commutated direct-current external rotor motors provides maximum efficiency the quietest performance. The EC motor shall have maintenance-free electronic circuitry, a rotor with permanent magnets, and an integral controller to provide the windings with electrical current so that, the motor rotates continuously and quietly. The fan is aerodynamically-optimised, sickle-blade profile, patterned with serrated trailing edge and winglets on the blade outer edge for energy and noise-optimised operation.
 - 1. The fan assembly shall be balanced in Class G 6.3 acc DIN ISO 1940, dynamic on two levels.
 - 2. The fan assembly shall be suitable for ambient temperatures of -40°C to max. +70°C.
 - 3. Thermal contacts installed in the windings compliant with THCL 155.
 - 4. Drive motor in external rotor principle, sealed in protection class IP54 with moisture protection impregnation of the windings, topical protection.
 - 5. High corrosion resistance design with high quality and reliability.

17. Factory Performance Testing

- A. The unit shall be thoroughly tested under factory test conditions. A copy of the test report shall be available to the engineer upon request.
- B. Microprocessor controls shall be factory adjusted and preset to the design conditions during testing.
- C. The unit shall be accessible for real-time monitoring while in the QC test chamber upon request.

Part 3 - Execution**18. Product Delivery, Acceptance, Storage and Handling**

- A. Perform a thorough physical inspection of the unit upon delivery from the shipment carrier.
- B. Identify and report any physical damage immediately to manufacturer.
- C. If unit is to be stored prior to installation store in a clean, dry place. Protect from weather, dirt, fumes, water, construction, and physical damage.
- D. Handle unit carefully during installation to prevent damage, breaking, denting and scoring.
- E. Damaged units or damaged components shall not be installed. Contact manufacturer for RMA instructions.
- F. Comply with manufacturer's rigging and installation instructions for unloading the unit and moving it to the final location.

19. Connections

- A. Where installing piping adjacent to units, allow space for service and maintenance.
- B. Duct connections: Drawings indicate the general arrangements of the ducts. Connect units to ducts with flexible duct connectors. Comply with requirements for flexible duct connectors.
- C. Electrical connections: Comply with requirements for power wiring, switches and motor controls in electrical sections.

20. Installation

The agency responsible for start-up should work in accordance with the specifications and in accordance with the manufacturer's instructions and only by workers experienced in this type of work.

21. Start Up

- A. Detailed instructions for start up as provided by the manufacturer must be followed.
- B. Installing contractor must contact the manufacturer prior to start up to confirm start up procedures.
- C. Remote internet access and control must be initiated and confirmed by the factory prior to start up for extended labour warranty to be in effect.

General Policy

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

Warranty Void Unless Registered

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

Initial 90-day Warranty

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

Vision 2.0 Conditional One Year Extended Labor Warranty

The initial 90-day warranty shall be extended for a total of 12 months from initial start-up and prior to the completion of the 24th month from date of shipment, whichever comes first and **subject to prior written approval from the factory**. The provided equipment must be connected and communicating to Dectron's Vision 2.0 online control and monitoring service from start-up for the entire term of the warranty extension. Dectron will provide and/or reimburse the required labor, materials, and shipping and handling costs incurred in the replacement or repair of a factory installed defective part. The labor required to replace the defective part is under warranty. Travel time, diagnostic time, per diems, truck charges, etc. are not covered under this warranty.

Two Year Parts Warranty

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

Replacement Part Warranty

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

Applicability

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

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

Limitations

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

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

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

Force Majeure

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

Extended Five Year Compressor Warranty

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

No charges attributed to the replacement of a component, will be allowed unless specifically granted in writing beforehand by Dectron (Except as detailed above if the compressor fails within the Initial 90-Day Warranty)

Optional Extended Warranties

The following extended warranties are available to purchase before the shipment of the unit:

- Extended Five Year Airside Coil Warranty
- Extended 10 Year Airside Coil Warranty
- Extended Five Year Driveline Warranty