

Project Name: Luxaire Subs

Unit Model #: ZS-15N40NTAA3

Quantity: 1

System: ZS-15N40NTAA3

**Cooling Performance**

Total capacity	180.9 MBH
Sensible capacity	143.7 MBH
Refrigerant type	R-410A
Efficiency (at ARI)	11.00 EER
Integrated eff. (at ARI)	12.10 IEER
Ambient DB temp.	89.4 °F
Entering DB temp.	78.6 °F
Entering WB temp.	65.1 °F
Leaving DB temp.	56.4 °F
Leaving WB temp.	55.0 °F
Power input (w/o blower)	12.70 kW
Sound power	92 dB(A)

**Gas Heating Performance**

Entering DB temp.	60 °F
Heating output capacity (Max)	300 MBH
Supply air	6000 CFM
Heating input capacity (Max)	375 MBH
Leaving DB temp.	106.3 °F
Air temp. rise	46.3 °F
SSE	80.0 %
Stages	2

**Supply Air Blower Performance**

Supply air	6000 CFM
Ext. static pressure	1.0 IWG
Blower speed	1058 RPM
Max BHP of Motor (including service factor)	5.75 HP
Duct location	Bottom
Motor rating	5.00 HP
Actual required BHP	4.42 HP
Power input	3.97 kW
Elevation	804 ft.
Drive type	BELT

**Outside/Mixed Air**

Outside Air Cfm	1500 CFM
Outside Air DB temp.	89.4 °F
Outsided Air WB temp.	73.9 °F
Outside Air RH	48.6 %
Return Air CFM	4500 CFM
Return Air DB temp.	75 °F
Return Air WB temp.	61.7 °F
Return Air RH	47.6 %

**Electrical Data**

Power supply	230-3-60
Unit min circuit ampacity	79.3 Amps
Unit max over-current protection	100 Amps

**Dimensions & Weight**

Hgt	49 in.	Len	126 in.	Wth	92 in.
Weight with factory installed options					2120 lbs.

**Clearances**

Right	36 in.	Front	36 in.	Back	24 in.
Top	72 in.	Bottom	0 in.	Left	24 in.

Note: Please refer to the tech guide for listed maximum static pressures



**15 Ton**

- Luxaire Optimum Units are Manufactured at an ISO 9001 Registered Facility and each Rooftop is Completely Computer-Run Tested Prior to Shipment.

**Unit Features**

- Unit Cabinet Constructed of Powder Painted Steel, Certified At 1000 Hours Salt Spray Test (ASTM B-117 Standards).
- Through-the-Curb and Through-The-Base Utility Connections
- Either Supply and/or Return can be Field Converted from Vertical to Horizontal Configuration without Cutting Panels
- Full Perimeter Base Rails with Built in Rigging Capabilities
- Galvanized Steel Drain Pan
- Dual Refrigerant Circuits for Efficient Part Load Operation with Scroll Compressors
- Two Stage Cooling
- Solid Core Liquid Line Filter Driers
- 375 MBH Input Aluminized Steel, Two Stage Gas Heat
- 5 HP High Static Belt Drive Blower
- Unit Ships with 2" Throwaway Filters with a Standard Filter Rack That Will Accept up to 4" Filters
- Replacement Filters: 5 - (18" x 24" x 2" or 4"). Unit accepts 2" or 4" wide filters.
- Single Point Power Connection
- Field Installed 0 - 25% Manual Outside Air Damper Shipped Inside Unit
- Short Circuit Current: 5kA RMS Symmetrical

**Standard Unit Controller: Simplicity Control Board**

- An Integrated Low-Ambient Control, Anti-Short Cycle Protection, Lead-Lag, Fan On and Fan off Delays, Low Voltage Protection, On-Board Diagnostic and Fault Code Display. Allows all units to operate in the cooling mode down to 0 °F outdoor ambient without additional components or intervention.
- Safety Monitoring - Monitors the High and Low-Pressure Switches, the Freezestats, the Gas Valve, if Applicable, and the Temperature Limit Switch on Gas and Electric Heat Units. The Unit Control Board will Alarm on Ignition Failures, Safety Lockouts and Repeated Limit Switch Trips.

**BAS Controller**

- Simplicity SE Controller with Discharge Air, Return Air, and Outside Air Sensor

**Warranty**

- One (1) Year Limited Warranty on the Complete Unit
- Five (5) Year Warranty - Compressors and Electric Heater Elements
- Ten (10) Year Warranty - Aluminized Steel Tubular Heat Exchangers

Project Name: Luxaire Subs

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Quantity: 1

System: ZS-15N40NTAAA3

**Factory Installed Options**

**ZS-15N40NTAAA3**

Product Category:	<b>Z</b>	Single Packaged R-410A Air Conditioner
Product Identifier:	<b>S</b>	11.0 EER / 12.1 IEER
Nominal Cooling Capacity:	<b>-15</b>	15 Ton Two Stage Cooling
Heat Type and Nominal Heat Capacity:	<b>N40</b>	375 MBH Input Aluminized Steel, Two Stage Gas Heat
Airflow:	<b>N</b>	Manual Fresh Air Damper 5 HP High Static Belt Drive Blower 2" Throwaway Filters
Voltage:	<b>T</b>	208/230-3-60
Installation Options:	<b>A</b>	
Additional Options:	<b>AA</b>	Galvanized Steel Drain Pan Simplicity® SE Controller with Discharge Air, Return Air, and Outside Air Sensor
Product Generation:	<b>3</b>	

**Field Installed Accessories**

- 1RC0436 - Roof Curb - 14" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (175.0 lbs)

### GENERAL

Units shall be manufactured by Unitary Products in an ISO 9001 certified facility. Luxaire Ovation units are convertible single packages with a common footprint cabinet and common roof curb for all 6-1/2 through 12-1/2 ton models. All units have two compressors with independent R-410A refrigeration circuits to provide 2 stages of cooling. The units were designed for light commercial applications and can be easily installed on a roof curb, slab, or frame. All units are self-contained and assembled on rigid full perimeter base rails allowing for 3-way forklift access and overhead rigging. Every unit is completely charged with R-410A, wired, piped, and tested at the factory to provide a quick and easy field installation. All units are convertible between side and down airflow. Independent economizer designs are used on side and down discharge applications, as well as all tonnage sizes. Units are available in the following configurations: cooling only, cooling with electric heat, cooling with gas heat, reheat only, reheat with electric heat, reheat with gas heat, heat pump and heat pump with electric heat. Electric heaters are available as factory-installed options or field-installed accessories.

### DESCRIPTION

Units shall be factory assembled, single package, (Elec/Elec, Gas/ Elec), designed for outdoor installation. They shall have built in field convertible duct connections for down discharge supply/return or horizontal discharge supply/return and be available with factory installed options or field installed accessories. The units shall be factory wired, piped and charged with R-410A refrigerant and factory tested prior to shipment. All unit wiring shall be both numbered and color coded. The cooling performance shall be rated in accordance with DOE and AHRI test procedures. Units shall be CSA certified to ANSI Z21.47 and UL 1995/CAN/CSA No. 236-M90 standards.

### UNIT CABINET

Unit cabinet shall be constructed of galvanized steel with exterior surfaces coated with a non-chalking, powder paint finish, certified at 1000 hour salt spray test per ASTM-B117 standards. Indoor blower sections shall be insulated with up to 1" thick insulation coated on the airside. Either aluminum foil faced or elastometric rubber insulation shall be used in the unit's compartments and be fastened to prevent insulation from entering the air stream. Cabinet doors shall be hinged with toolless access for easy servicing and maintenance. Full perimeter base rails shall be provided to assure reliable transit of equipment, overhead rigging, fork truck access and proper sealing on roof curb applications. Disposable 2" filters shall be furnished as standard and be accessible through hinged access door. Fan performance measuring ports shall be provided on the

outside of the cabinet to allow accurate air measurements of evaporator fan performance without removing panels or creating bypass of the coils. Condensate pan shall be slide out design, constructed of a non corrosive material, internally sloped and conforming to ASHRAE 62-B9 standards. Condensate connection shall be a minimum of 3/4" I.D. female and be rigid mount connection.

### OUTDOOR (CONDENSER) FAN ASSEMBLY

The outdoor fans shall be of the direct drive type, discharge air vertically, have aluminum blades riveted to corrosion resistant steel spider brackets and shall be dynamically balanced for smooth operation. The outdoor fan motors shall have permanently lubricated bearings internally protected against overload conditions and staged independently. A cleaning window shall be provided on two sides of the units for coil cleaning.

### REFRIGERANT COMPONENTS

#### Compressors:

- a. Shall be fully hermetic type, direct drive, internally protected with internal high-pressure relief and over temperature protection. The hermetic motor shall be suction gas cooled and have a voltage range of + or - 10% of the unit nameplate voltage.
- b. Shall have internal spring isolation and sound muffling to minimize vibration and noise, and be externally isolated on a dedicated, independent mounting.

#### Coils:

- a. Evaporator coils shall have aluminum plate fins mechanically bonded to seamless internally enhanced copper tubes with all joints brazed. Special Phenolic coating shall be available as a factory option.
- b. Evaporator coils shall be of the direct expansion, draw-thru design.
- c. Condenser coils shall have aluminum plate fins mechanically bonded to seamless internally enhanced copper tubes with all joints brazed or Micro-Channel aluminum tube, aluminum fins. Special Phenolic coating shall be available as a factory option.
- d. Condenser coils shall be of the draw-thru design.

#### Refrigerant Circuit and Refrigerant Safety Components shall include:

- a. Independent fixed-orifice or thermally operated expansion devices.
- b. Solid core filter drier/strainer to eliminate any moisture or foreign matter.

## Guide Specification for Optimum 15-25 Ton Single Package

### GENERAL

Units shall be manufactured by Johnson Controls Unitary Products in an ISO 9001 certified facility.

Luxaire Optimum units are convertible single package units. ZK/ZS models have dual independent refrigerant circuits for efficient part load operation and maximum comfort control. Although the units are primarily designed for curb mounting on a roof, they can also be slab-mounted at ground level or set on steel beams above a finished roof. Cooling only, cooling with gas heat and cooling with electric heat models are available with a wide variety of factory-mounted options and field-installed accessories to make them suitable for almost every application. All units are self-contained and assembled on full perimeter base rails with holes in the four corners for overhead rigging. Every unit is completely piped, wired, charged and tested at the factory to simplify the field installation and to provide years of dependable operation. All models (including those with an economizer) are suitable for either bottom or horizontal duct connections. Models with power exhaust are suitable for bottom duct connections only. For bottom duct, remove the sheet metal panels from the supply and return air openings through the base of the unit. For horizontal duct, replace the supply and return air panels on the rear of the unit with a side duct flange accessory. All supply air blowers are equipped with a belt drive that can be adjusted to meet exact requirements of the job. A high static drive option is available for applications with a higher CFM and/or static pressure requirement.

ZS/XA180 models have 2 condenser fan motors. All compressors include crankcase heat and internal pressure relief. Every refrigerant circuit includes an expansion valve, a liquid line filter-drier, a discharge line high pressure switch and a suction line with a freeze-stat and low pressure/loss of charge switch. The unit control circuit includes a 75 VA transformer, a 24-volt circuit breaker and a relay board with two compressor lockout circuits, a terminal strip for thermostat wiring, plus an additional set of pin connectors to simplify the interface of additional field controls. All units have long lasting powder paint cabinets with 1000 hour salt spray test approval under ASTM-B117 procedures. All models are CSA approved. All models include a 1-year limited warranty on the complete unit. Compressors and electric heater elements carry an additional 4-year warranty. Aluminumized steel tubular heat exchangers carry an additional 9-year warranty.

### DESCRIPTION

ZS units shall be factory-assembled, single packaged, ZS\*\*\*N Electric Cooling/Gas Heat, ZS\*\*\*C/E Electric Cooling/Optional Electric Heat, designed for outdoor

mounted installation. The 15 and 17.5 ton units shall have a minimum EER rating of 11.0.

They shall have built-in field convertible duct connections for down discharge supply/return or horizontal discharge supply/return, and be available with factory installed options or field installed accessories. The units shall be factory wired, piped, charged with R-410A refrigerant and factory tested prior to shipment. All unit wiring shall be both numbered and color coded. All units shall be manufactured in a facility certified to ISO 9001 standards and the cooling performance shall be rated in accordance with DOE and AHRI test procedures. Units shall be CSA listed, classified to ANSI Z21.47 standards, UL 1995/CAN/CSA No. 236-M90 conditions.

### UNIT CABINET

Unit cabinet shall be constructed of galvanized steel, with exterior surfaces coated with a non-chalking, powdered paint finish, certified at 1000 hours salt spray test per ASTM-B117 standards. Indoor blower section shall be insulated with a minimum 1/2" thick insulation, coated on the airside. Aluminum foil faced insulation shall be used in the furnace compartment and be fastened with ridged fasteners to prevent insulation from entering the air stream. Cabinet panels shall be "large" size, easily removable for servicing and maintenance. Full perimeter base rails shall be provided to assure reliable transit of equipment, overhead rigging and proper sealing on roof curb applications. Disposable 2" filters shall be furnished and be accessible through a removable access door, sealed airtight. Units filter track shall be designed to accommodate either 2" or 4" filters. Fan performance measuring ports shall be provided on the outside of the cabinet to allow accurate air measurements of evaporator fan performance without removing panels or creating air by-pass of the coils. Condensate pan shall be internally sloped and conform to ASHRAE 62-89 self-draining standards. Condensate connection shall be a minimum of 1" I.D. female and be a ridged mount connection. Unit shall incorporate a fixed outdoor air damper with an outdoor air intake opening covered with a bird screen and a rain hood painted to match the exterior of the unit.

### INDOOR (EVAPORATOR) FAN ASSEMBLY

Fan shall be a belt drive assembly and include an adjustable-pitch motor pulley. Job site selected (B.H.P.) brake horsepower shall not exceed the motors nameplate horsepower rating, plus the service factor. Units shall be designed not to operate above service factor. Fan wheel shall be double-inlet type with forward-curved blades, dynamically balanced to operate smoothly throughout the entire range of operation. Airflow design shall be constant air volume.

### OUTDOOR (CONDENSER) FAN ASSEMBLY

The outdoor fans shall be of the direct-driven propeller type, discharge air vertically, have aluminum blades riveted to corrosion resistant steel spider brackets and shall be dynamically balanced for smooth operation. The 4 outdoor fan motors shall be totally enclosed with permanently lubricated bearings, internally protected against overload conditions and staged independently.

### REFRIGERANT COMPONENTS

#### Compressors:

- a. Shall be Scroll compressors internally protected with internal high-pressure relief and over temperature protection.
- b. Shall have internal spring isolation and sound muffling to minimize vibration and noise, and be externally isolated on a dedicated, independent mounting.

#### Coils:

- a. Evaporator and condenser coils shall have aluminum plate fins mechanically bonded to seamless internally enhanced copper tubes with all joints brazed. Special Phenolic coating shall be available as a factory option
- b. Evaporator and Condenser coils shall be of the direct expansion, draw-thru, design

#### Refrigerant Circuit and Refrigerant Safety Components shall include:

- Balance-port thermostatic expansion valve with independent circuit feed system.
- Filter drier/strainer to eliminate any moisture or foreign matter.
- Accessible service gage connections on both suction and discharge lines to charge, evacuate, and measure refrigerant pressure during any necessary servicing or troubleshooting, without losing charge.
- The refrigeration system shall provide at least 15° F of sub-cooling at design conditions.

#### Unit Controls:

- a. Unit shall be complete with self-contained low-voltage control circuit protected by a resettable circuit breaker on the 24-volt transformer side
- b. Unit shall incorporate a lockout circuit which provides reset capability at the space thermostat or base unit, should any of the following standard safety devices trip and shut off compressor

- c. Loss-of-charge/Low-pressure switch. (1) High-pressure switch, (2) Freeze-protection thermostat, evaporator coil. If any of the above safety devices trip, a LED (light-emitting diode) indicator shall flash a diagnostic code that indicates which safety switch has tripped
- d. Unit shall incorporate "AUTO RESET" compressor over temperature, over current protection
- e. Unit shall operate with conventional thermostat designs and have a low voltage terminal strip for easy hook-up
- f. Unit control board shall have on-board diagnostics and fault code display
- g. Standard controls shall include anti-short cycle and low voltage protection, and permit cooling operation down to 0 °F
- h. Control board shall monitor each refrigerant safety switch independently
- i. Control board shall retain last 5 fault codes in non volatile memory, which will not be lost in the event of a power loss

### GAS HEATING SECTION

Shall be designed with induced draft combustion with post purge logic and energy saving direct spark ignition, redundant main gas valve. Ventor wheel shall be constructed of stainless steel for corrosion resistance. The heat exchanger shall be of the tubular type, constructed of T1-40 aluminized steel for corrosion resistance and allowing minimum mixed air entering temperature of 25 °F. Burners shall be of the in-shot type, constructed of aluminum coated steel and contain air mixture adjustments. All gas piping shall enter the unit cabinet at a single location through either the side or curb, without any field modifications. An integrated control board shall provide timed control of evaporator fan functioning and burner ignition. Heating section shall be provided with the following minimum protection:

- a. Primary and auxiliary high-temperature limit switches.
- b. Induced draft motor speed sensor.
- c. Flame roll out switch (automatic reset).
- d. Flame proving controls. Unit shall have two independent stages of capacity.

### UNIT OPERATING CHARACTERISTICS

Unit shall be capable of starting and running at 125° F outdoor temperature, exceeding maximum load criteria of AHRI Standard 340/360. The compressor, with standard controls, shall be capable of operation down to 25° F outdoor temperature. Accessory low ambient kit shall be available for operation to 0° F. Unit shall be provided with

fan time delay to prevent cold air delivery before heat exchanger warms up.

#### **ELECTRICAL REQUIREMENTS**

All unit power wiring shall enter unit cabinet at a single factory provided location and be capable of side or bottom entry, to minimize roof penetrations and avoid unit field modifications. Separate side and bottom openings shall be provided for the control wiring.

#### **STANDARD LIMITED WARRANTIES**

- Compressor 5 Years
- Heat Exchanger 10 Years
- Electric Heat Element 5 Years
- Other Parts 1 Year

#### **OPTIONAL OUTDOOR AIR**

Shall be made available by either/or:

#### **OTHER FACTORY INSTALLED OPTIONS**

- High Static Drive

#### **FIELD INSTALLED OPTIONS**

- **Roof Curb** – Fourteen-inch high roof curbs provide a water-tight seal between the unit and the finished roof. These full perimeter curbs meet the requirements of the National Roofing Contractors Association (NRCA) and are shipped knocked-down for field assembly. They're designed to fit inside the base rails of the unit and include both a wood nailing strip and duct hanger supports.

- c. Accessible service gage connections on both suction and discharge lines to charge, evacuate, and measure refrigerant pressure during any necessary servicing or troubleshooting, without losing charge.
- d. The unit shall have two independent refrigerant circuits, equally split in 50% capacity increments.

**Unit Controls:**

- a. Unit shall be complete with self-contained low-voltage control circuit protected by a resettable circuit breaker on the 24-volt transformer side.
- b. Unit shall incorporate a lockout circuit which provides reset capability at the space thermostat or base unit should any of the following standard safety devices trip and shut off compressor:
  - Loss-of-charge/Low-pressure switch.
  - High-pressure switch.
  - Freeze condition sensor on evaporator coil. If any of these safety devices trip, the LCD screen will display the alarm message.
- c. Unit shall incorporate "AUTO RESET" compressor over temperature, over current protection.
- d. Unit shall operate with conventional thermostat designs and have a low voltage terminal strip for easy hook-up.
- e. Unit control board shall have on-board diagnostics and fault message display.
- f. Standard controls shall include anti-short cycle and low voltage protection, and permit cooling operation down to a selectable value as low as 0 °F.
- g. Control board shall monitor each refrigerant safety switch independently.

**GAS HEATING SECTION**

Heat exchanger and exhaust system shall be constructed of aluminized steel and shall be designed with induced draft combustion with post purge logic, energy saving direct spark ignition, and redundant main gas valve. The heat exchanger shall be of the tubular type, constructed of T1-40 aluminized steel for corrosion resistance and allowing minimum mixed air entering temperature of 40 °F. Burners shall be of the in-shot type, constructed of aluminum-coated steel. All gas piping shall enter the unit cabinet at a single location, through either the side or bottom, without any field modifications. An integrated control board shall provide timed control of evaporator fan functioning and burner ignition. Heating section shall be provided with the following minimum protection:

- a. Primary and auxiliary high-temperature limit switches.
- b. Induced draft pressure sensor.
- c. Flame proving controls.

- d. All two stage gas units shall have two independent stages of capacity (70% or 75% 1st stage, 100% 2nd stage) 3 through 5 ton and (60% 1st stage, 100% 2nd stage) 6-1/2 through 12-1/2 ton.

**UNIT OPERATING CHARACTERISTICS**

Unit shall be capable of starting and running at 125 °F outdoor temperature, exceeding maximum load criteria of AHRI Standard 340/360. The compressor, with standard controls, shall be capable of operation down to 0 °F outdoor temperature. Unit shall be provided with fan time delay to prevent cold air delivery before heat exchanger warms up. (Gas heat only)

**ELECTRICAL REQUIREMENTS** - All unit power wiring shall enter unit cabinet at a single factory provided location and be capable of side or bottom entry to minimize roof penetrations and avoid unit field modifications. Separate side and bottom openings shall be provided for the control wiring.

**STANDARD LIMITED WARRANTIES** - Compressor – 5 Years, Heat Exchanger – 10 Years, Stainless Steel Heat Exchanger – 15 Years, Elect. Heat Elem. – 5 Years, Parts – 1 Year.

**FACTORY INSTALLED OPTIONAL OUTDOOR AIR**  
(Shall be made available by either/or):

**ADDITIONAL FACTORY INSTALLED OPTIONS**

- **Alternate Indoor Blower Motor** – For applications with high restrictions, units are available with optional indoor blower motors that provide higher static output and/or higher airflow.

**FIELD INSTALLED OPTIONS**

- **Roof Curb** – 14" high, full perimeter knockdown curb, with hinged design for quick assembly.