



**Submittal**

**Job:** 1403  
Nathan Clifford  
180 Falmouth Street  
Portland, ME

**Spec Section No:** 230000 2.06  
**Submittal No:** 1  
**Revision No:** 0  
**Sent Date:** 3/24/2014  
**Due Date:** 3/31/2014

**Spec Section Title:**

**Submittal Title:** Roof Top Unit


**Contractor:**  
Ranor Mechanical  
Wes Sirois

Contractor's Stamp

CCB, Inc

Architect's Stamp

Engineer's Stamp



Digitally signed by  
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Date: 2014.04.30  
12:04:18 -04'00'



### Submittal Information Form

Specifications Dated: 2/21/14

Drawings Dated (if applicable): 2/21/14

1 Project: Nathan Clifford School

2 Specification Title: na

3 Description: RTU-1

4 Section: na

5 Page/Sheet #: na

6 Article/Paragraph: \_\_\_\_\_

7 Basis of Design: Yes No (if no please fill out 8-12)

8 Proposed Substitution: \_\_\_\_\_

9 Manufacturer: York

10 Trade Name: York

11 Model #: ZJ102N15P2PZZ5

12 Please list SPECIFICALLY the deviations from the basis of design:  
8 1/2 TON PER Aaron  
\_\_\_\_\_  
\_\_\_\_\_

13 Equipment Lead Time  
(after approved  
submittals) 6 WEEK



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# SUBMITTAL DATA

For: Approval

**Order #:** 1403-005                      **Date:** 03/21/2014  
**Project:** Nathan Clifford School  
**Project #:**  
**Location:** Portland Me  
  
**Engineer:** Ranor  
  
**Submitter:** Ed Bonenfant  
FW Webb

**Date**

03/21/2014

**Project Name**

Nathan Clifford School

**Project Number****Client / Purchaser**

## Submittal Summary Page

Qty	Tag #	Model #	Description
1		ZJ102N15P2PZZ50001	8.5 Ton, York Predator Single Packaged R-410A Air Conditioner, 12.0 EER / 12.8 IEER, Two Stage Cooling, 150 MBH Output Aluminized Steel, Two Stage Gas Heat, 3 HP High Static Belt Drive Blower, 208/230-3-60, Microchannel Condenser Coil, Composite Drain Pan <ul style="list-style-type: none"> <li>• Dry Bulb Economizer w/Barometric Relief and Hoods (Bottom Return Only)</li> <li>• Return Air Smoke Detector (Bottom return only)</li> <li>• Non Powered Convenience Outlet</li> <li>• 2" Pleated Filters (MERV 7)</li> <li>• Constant Volume Controller {CV} YCCS System includes Outdoor Air, Return Air, Supply Air Sensors and Air Proving Switch</li> <li>• IntelliSpeed Control with VFD</li> <li>• Coil Guard</li> <li>• Hot Gas Bypass</li> </ul>
1		1RC0471	Roof Curb - 14" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down)
1		2AQ04700424C	CO2 Control Kit - Unit Mounted with Mounting Hardware
1		2SH0401	Humidity Sensor (All units with Simplicity Intelli-Comfort Control) for Enthalpy Economizer and Humidity Control
1		S1-02815208000	Blower Sheave for 8.5 and 10 Ton High Static Field Installed Drive
1		S1-A52	Belt for 8.5 and 10 Ton High Static Field Installed Drive
1		TE-68NT-1NN0S	Zone Sensor with W/C Adjust and Occupancy Override

Equipment start-up and commissioning by a factory trained technician is recommended.  
 Contact your supplying distributor or sales representative for additional information & guidance.

Project Name: **Nathan Clifford School**

 Unit Model #: **ZJ102N15P2PZZ50001**

 Quantity: **1**

 System: **ZJ102N15P2PZZ50001**

### Cooling Performance

Total capacity	109.2 MBH
Sensible capacity	84.7 MBH
Refrigerant type	R-410A
Efficiency (at ARI)	12.00 EER
Integrated eff. (at ARI)	12.80 IEER
Ambient DB temp.	95.0 °F
Entering DB temp.	80.0 °F
Entering WB temp.	67.0 °F
Leaving DB temp.	60.4 °F
Leaving WB temp.	58.4 °F
Part load efficiency	13.6 IPLV
Power input (w/o blower)	7.34 kW
Sound power	90 dB(A)

### Gas Heating Performance

Entering DB temp.	60 °F
Heating output capacity (Max)	144 MBH
Supply air	4000 CFM
Heating input capacity (Max)	180 MBH
Leaving DB temp.	93.3 °F
Air temp. rise	33.3 °F
SSE	80.0 %
Stages	2

### Supply Air Blower Performance

Supply air	4000 CFM
Ext. static pressure	0.6 IWG
Unit static resistance	0.56 IWG
Blower speed	1176 RPM
Max BHP of Motor (including service factor)	3.45 HP
Duct location	Bottom
Motor rating	3.00 HP
Actual required BHP	2.92 HP
Power input	2.72 kW
Elevation	0 ft.
Drive type	BELT
Requires field-supplied drive	true

### Electrical Data

Power supply	230-3-60
Unit min circuit ampacity	44.1 Amps
Unit max over-current protection	50 Amps

### Dimensions & Weight

Hgt	51 in.	Len	89 in.	Wth	59 in.
Weight with factory installed options					1250 lbs.

### Clearances

Right	12 in.	Front	36 in.	Back	36 in.
Top	72 in.	Bottom	0 in.	Left	36 in.

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



### 8.5 Ton

- York Predator 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
- Full perimeter base rails with built in rigging capabilities
- Hinged Access Panels
- Slide-Out Condensate Drain Pan
- Reciprocating Compressor
- Two Stage Cooling
- Solid Core Liquid Line Filter Driers
- Microchannel Condenser Coil
- Hot Gas Bypass
- 150 MBH Output Aluminized Steel, Two Stage Gas Heat
- Slide-out Blower/3 HP Belt Drive Motor Assembly
- Unit Ships with 2" Pleated Filters (MERV 7) with a Standard Filter Rack that will Accept up to 4" Filters
- Single Point Power Connection
- Non-Powered Convenience Outlet
- Return Air Smoke Detector
- Dry Bulb Economizer w/Barometric Relief and Hoods (Bottom Return Only)
- Coil Guard
- Short Circuit Current: 5kA RMS Symmetrical

### Standard Unit Controller: Simplicity Control Board

- 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

- Constant Volume Controller {CV} YCCS System includes Outdoor Air, Return Air, Supply Air Sensors and Air Proving Switch
- IntelliSpeed VFD Supply Fan Operation Factory Configured

### Warranty

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

Project Name: **Nathan Clifford School**

 Unit Model #: **ZJ102N15P2PZZ50001**

 Quantity: **1**

 System: **ZJ102N15P2PZZ50001**

## Factory Installed Options

### ZJ102N15P2PZZ50001

<b>Product Category:</b>	<b>Z</b>	York Predator Single Packaged R-410A Air Conditioner
<b>Product Identifier:</b>	<b>J</b>	12.0 EER / 12.8 IEER
<b>Nominal Cooling Capacity:</b>	<b>102</b>	8.5 Ton Two Stage Cooling
<b>Heat Type and Nominal Heat Capacity:</b>	<b>N15</b>	150 MBH Output Aluminized Steel, Two Stage Gas Heat
<b>Airflow:</b>	<b>P</b>	3 HP High Static Belt Drive Blower Dry Bulb Economizer w/Barometric Relief and Hoods (Bottom Return Only)
<b>Voltage:</b>	<b>2</b>	208/230-3-60
<b>Installation Options:</b>	<b>P</b>	Return Air Smoke Detector (Bottom return only) Non Powered Convenience Outlet
<b>Additional Options:</b>	<b>ZZ</b>	2" Pleated Filters (MERV 7) Microchannel Condenser Coil IntelliSpeed Control with VFD Constant Volume Controller {CV} YCCS System includes Outdoor Air, Return Air, Supply Air Sensors and Air Proving Switch Composite Drain Pan Coil Guard Hot Gas Bypass
<b>Product Generation:</b>	<b>5</b>	

## Field Installed Accessories

- 1RC0471 - Roof Curb - 14" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs)
- 2AQ04700424C - CO2 Control Kit - Unit Mounted with Mounting Hardware (5.0 lbs)
- 2SH0401 - Humidity Sensor (All units with Simplicity Intelli-Comfort Control) for Enthalpy Economizer and Humidity Control (1.0 lbs)
- S1-02815208000 - Blower Sheave for 8.5 and 10 Ton High Static Field Installed Drive (3.0 lbs)
- S1-A52 - Belt for 8.5 and 10 Ton High Static Field Installed Drive (0.4 lbs)
- TE-68NT-1NN0S - Zone Sensor with W/C Adjust and Occupancy Override (3.0 lbs)

Project Name: **Nathan Clifford School**

Unit Model #: **ZJ102N15P2PZZ50001**

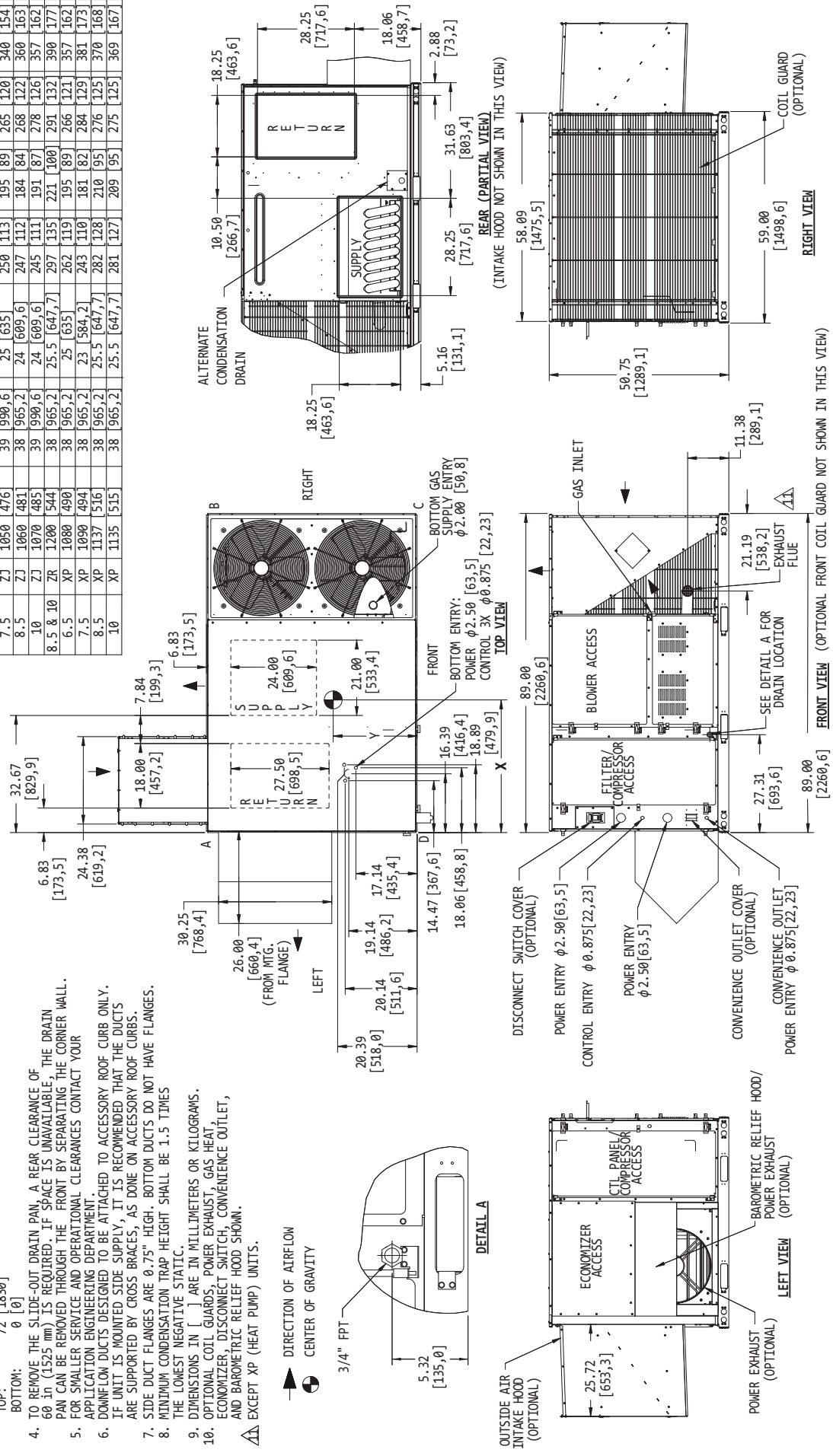
Quantity: **1**

System: **ZJ102N15P2PZZ50001**

### Consolidated Drawing

- FOR OUTDOOR USE ONLY.
- WEIGHTS SHOWN ARE FOR COOLING ONLY UNITS.
- MIN. CLEARANCES TO BE:  
RIGHT SIDE: 12 [305]  
LEFT SIDE: 36 [915]  
FRONT: 36 [915]  
REAR: 36 [915]  
TOP: 72 [1830]  
BOTTOM: 0 [0]
- TO REMOVE THE SLIDE-OUT DRAIN PAN, A REAR CLEARANCE OF 60 in (1525 mm) IS REQUIRED. IF SPACE IS UNAVAILABLE, THE DRAIN PAN CAN BE REMOVED THROUGH THE FRONT BY SEPARATING THE CORNER WALL.
- FOR SMALLER SERVICE AND OPERATIONAL CLEARANCES CONTACT YOUR APPLICATION ENGINEERING DEPARTMENT.
- DOWNFLOW DUCTS DESIGNED TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY. IF UNIT IS MOUNTED SIDE SUPPLY, IT IS RECOMMENDED THAT THE DUCTS ARE SUPPORTED BY CROSS BRACES, AS DONE ON ACCESSORY ROOF CURBS.
- SIDE DUCT FLANGES ARE 0.75" HIGH. BOTTOM DUCTS DO NOT HAVE FLANGES.
- MINIMUM CONDENSATION TRAP HEIGHT SHALL BE 1.5 TIMES THE LOWEST NEGATIVE STATIC.
- DIMENSIONS IN [ ] ARE IN MILLIMETERS OR KILOGRAMS.
- OPTIONAL COIL GUARDS, POWER EXHAUST, GAS HEAT, ECONOMIZER, DISCONNECT SWITCH, CONVENIENCE OUTLET, AND BAROMETRIC RELIEF HOOD SHOWN.
- EXCEPT XP (HEAT PUMP) UNITS.

TONNAGE	UNIT	OPERATING WEIGHT (LBS) (BASE UNIT)	CENTER OF GRAVITY LOCATION (BASE UNIT)			4 POINT CORNER LOADS (LBS) (BASE UNIT)							
			X	Y	A	B	C	D					
8.5	ZF	1007	458	24	609,6	235	107	175	79	255	116	342	155
10	ZF	1103	501	24	609,6	257	117	192	87	279	127	375	170
8.5	ZH	1030	467	24	609,6	240	109	179	81	261	118	350	159
10	ZH	1090	494	24	609,6	254	115	189	86	276	125	371	168
6.5	ZJ	1030	467	25	635	254	115	191	87	260	118	333	151
7.5	ZJ	1050	476	25	635	250	113	195	89	265	120	340	154
8.5	ZJ	1060	481	24	609,6	247	112	184	84	268	122	360	163
10	ZJ	1070	485	24	609,6	245	111	191	87	278	126	357	162
8.5 & 10	ZR	1200	544	25.5	647,7	297	135	221	100	291	132	390	177
6.5	XP	1080	490	25	635	262	119	195	89	266	121	357	162
7.5	XP	1090	494	23	584,2	243	110	181	82	284	129	381	173
8.5	XP	1137	516	25.5	647,7	282	128	210	95	276	125	370	168
10	XP	1135	515	25.5	647,7	281	127	209	95	275	125	369	167



Project Name: **Nathan Clifford School**

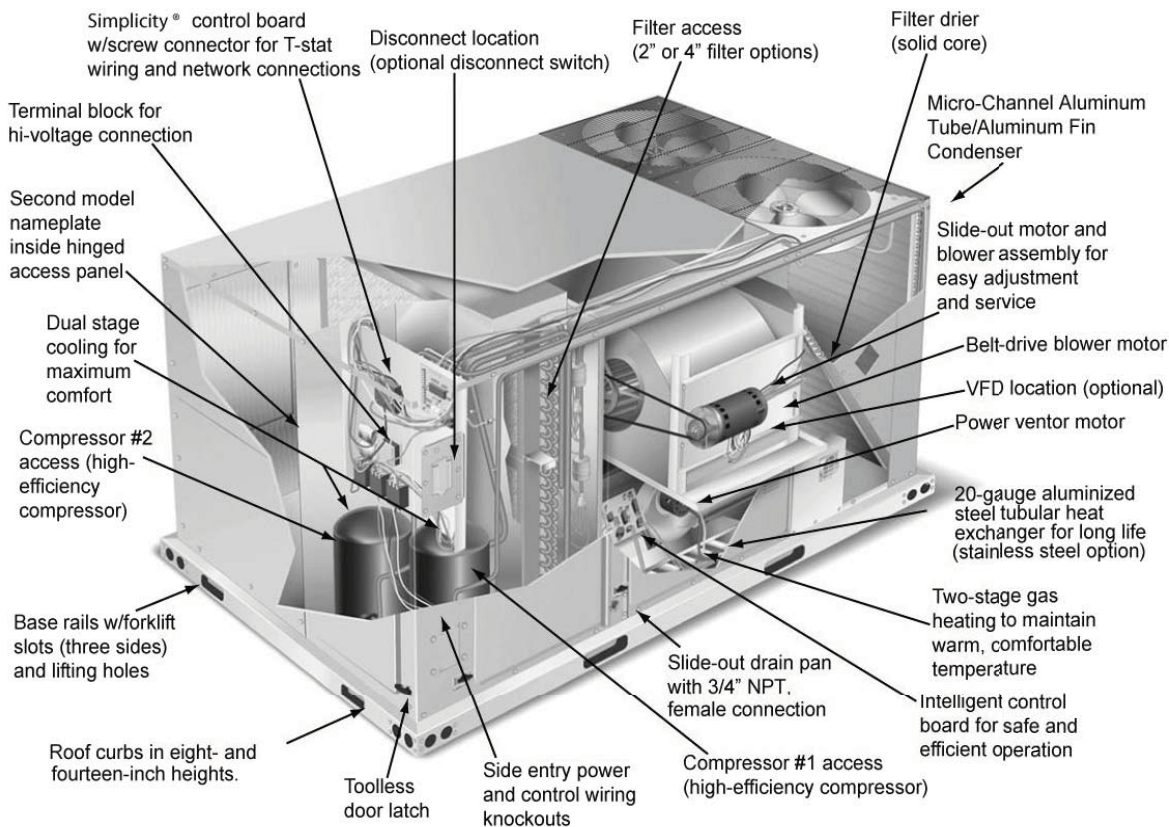
 Unit Model #: **ZJ102N15P2PZZ50001**

 Quantity: **1**

 System: **ZJ102N15P2PZZ50001**

## Component Location

### 6 1/2 Through 10 Tons





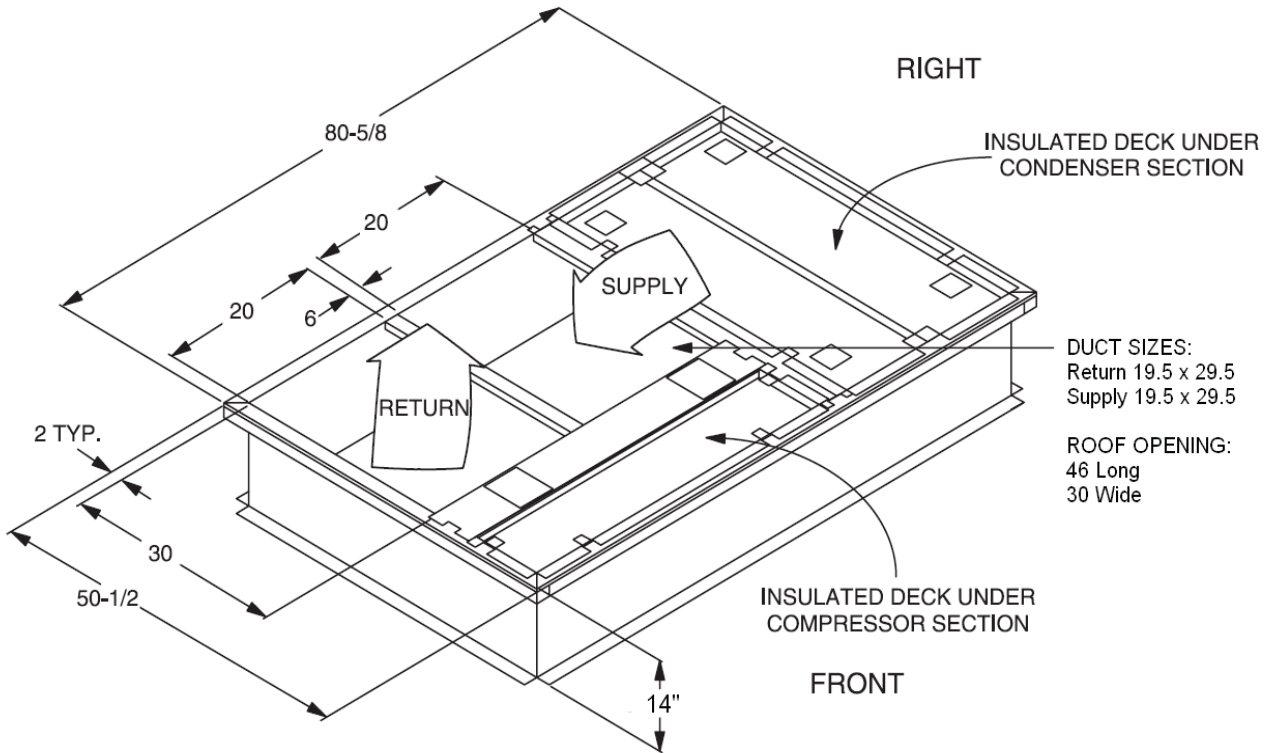
Project Name: **Nathan Clifford School**

Unit Model #: **ZJ102N15P2PZZ50001**

Quantity: **1**

System: **ZJ102N15P2PZZ50001**

**1RC0471 Roof Curb**



\* Supply and Return Air (Including duct support rails) as shown, are typical for bottom duct applications.  
For location of horizontal duct applications (On rear of unit), refer to Unit Dimensions details.

1RC0471 Roof Curb Dimensions

**Date**

03/21/2014

**Project Name**

Nathan Clifford School

**Project Number**

**Client / Purchaser**



**Guide Specification Summary Page**

Product Series	Models and Unit Tags
Predator	ZJ102N15P2PZZ50001

## GENERAL

Units shall be manufactured by Unitary Products in an ISO 9001 certified facility. York Predator 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:

- 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.
- Shall have internal spring isolation and sound muffling to minimize vibration and noise, and be externally isolated on a dedicated, independent mounting.

### Coils:

- 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.
- Evaporator coils shall be of the direct expansion, draw-thru design.
- 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.
- Condenser coils shall be of the draw-thru design.

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

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

- 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-protection thermostat, evaporator coil. If any of the above safety devices trip, an LED (light-emitting diode) indicator shall flash a diagnostic code that indicates which safety switch has tripped.
- 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 code display.
- f. Standard controls shall include anti-short cycle and low voltage protection, and permit cooling operation down to 0 °F.
- g. Control board shall monitor each refrigerant safety switch independently.
- h. 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**

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):

- **ELECTRONIC ENTHALPY AUTOMATIC ECONOMIZER** – Outdoor and return air dampers that are interlocked and positioned by a fully-modulating, spring-return damper actuator. The maximum leakage rate for the outdoor air intake dampers shall not exceed 2% when dampers are fully closed and operating against a pressure differential of 0.5 IWG. A unit-mounted potentiometer shall be provided to adjust the outdoor and return air damper assembly to take in outdoor air to meet the minimum ventilation requirement of the conditioned space during normal operation. During economizer operation, a mixed-air temperature control shall modulate the outdoor and return air damper assembly to prevent the supply air temperature from dropping below 55 °F. Changeover from compressor to economizer operation shall be provided by an integral electronic enthalpy control that feeds input into the basic module. The outdoor intake opening shall be covered with a rain hood that matches the exterior of the unit. Water eliminator/filters shall be provided. Simultaneous economizer/compressor operation is also possible. Dampers shall fully close on power loss. Available with barometric relief or power exhaust.
- **Roof Curb** – 14" high, full perimeter knockdown curb, with hinged design for quick assembly.

#### **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.
- **IntelliSpeed™ Supply Fan Control Option (ASHRAE 90.1 compliant, section 6.4.3.10)** – Units configured with the IntelliSpeed™ Supply Fan Option will contain a VFD for variable volume supply fan operation. This option allows the supply fan RPM to vary based on the number of compressors or heating stages energized. The economizer's minimum position will also be configurable to vary based on the supply fan VFD frequency output.
- **Non-Powered Convenience Outlet** – Unit is provided with a non-powered 120VAC GFCI outlet with cover on the corner of the unit housing the compressors.
- **Coil Guard** – Designed to prevent condenser coil damage.
- **BAS Controls** – Include supply air sensor, return air sensor, dirty filter indicator and air proving switch.

#### **FIELD INSTALLED OPTIONS**

**Date**

03/21/2014

**Project Name**

Nathan Clifford School

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**Control Summary Page**

<b>Control</b>	<b>Models and Unit Tags</b>
CCS Single Zone	ZJ102N15P2PZZ50001