



Oregon State University

DRYDEN HALL ROOF REPLACEMENT RE-BID

PROJECT NUMBER: 2296-21

ITB #2022-007214

ADDENDUM NO. TWO (2)

ISSUE DATE: November 18, 2021

CONTRACT ADMINISTRATOR:

Matt Hausman, Construction Contracts Officer

Construction Contracts Administration

Email: ConstructionContracts@oregonstate.edu

This Addendum is hereby issued to inform you of the following revisions and or clarifications to the above-referenced solicitation and/or the Contract Documents for the Project, to the extent they have been modified herein. Any conflict or inconsistency between this Addendum and the Solicitation Document or any previous addenda will be resolved in favor of this Addendum. Proposals shall conform to this Addendum. Unless specifically changed by this Addendum, all other requirements, terms and conditions of the Solicitation Document and or Contract Documents, and any previous addenda, remain unchanged and can be modified only in writing by OSU. The following changes are hereby made:

MODIFICATIONS AND SUBSTITUTION REQUEST RESPONSES:

Item 1 Included with this Addendum are modifications to the Specifications, Drawings as well as responses to Substitution Requests received as provided by Oh Planning+Design (dated 11/18/2021)

END OF ADDENDUM NO. TWO (2)

115 NW First Ave, Suite 300
Portland, OR 97209
tel 503.280.8000
fax 503.224.5442



OH PLANNING+DESIGN, ARCHITECTURE

ADDENDUM

Project Name: OSU Dryden Hall Roof Replacement Re-Bid

Addendum # 2

Date of Issuance: 11/18/2021

Description:

Item # 1 SPECIFICATIONS

1. Section 01 10 00 – Summary of Work; 1.01 Project – **REVISE** E.6a to read: “Owner will arrange for removal or abatement of lead-based paint from surfaces to remain. GC is to remove other lead-containing components.”
2. Section 01 50 00 – Temporary Facilities and Controls; 1.16 Safety – **ADD** the following item:
 - “H. Welding, cutting or other Hot Work such as heat treating, grinding, and similar applications producing or using sparks, flames, or heat shall be performed in accordance with NFPA 51B.”
3. Section 07 52 00 – Modified Bituminous membrane roofing; 2.04 Insulation – **REVISE** the following items as indicated:
 - A.3: “Board thickness: 2.6 inches per layer. Provide 2 layers for a total thickness of 5.2 inches.”
 - A.6: “Thermal Conductivity: R-Value of 30 for total insulation thickness based on PIMA LTTR 2014 values.”
 - B.3: “Board thickness: 2.6 inches per layer. Provide 2 layers for a total thickness of 5.2 inches.”
 - B.6: “Thermal Conductivity: R-Value of 30 for total insulation thickness based on PIMA LTTR 2014 values.”
 - C.3: “Board slope: As needed to achieve final slope indicated on drawings or ¼” per foot if not indicated”
 - C.6: **DELETE** item in its entirety.

Item # 2 DRAWINGS

1. Sheet G-001 COVER SHEET - **REVISE** Item 6a under Project Description to read: "Owner will arrange for removal or abatement of lead-based paint from surfaces to remain. GC is to remove other lead-containing components."
2. Sheet S-001 GENERAL NOTES – **ADD** Item G to 1. General: "Welding, cutting or other Hot Work such as heat treating, grinding, and similar applications producing or using sparks, flames, or heat shall be performed in accordance with NFPA 51B."
3. Sheet S-001 GENERAL NOTES – **REVISE** Note 2.D.1 under Deferred Submittals to read: "Seismic and gravity restraint of MEP equipment, machinery, and associated piping, including equipment curbs and guy wire bracing. Wind restraint of MEP equipment per FM Datasheet 1-28, Section 2.6. Restraint systems and connections to structure shall conform to ASCE 7-16 Chapter 13, shall be designed by engineer registered in the State of Oregon, and shall be submitted to the architect prior to fabrication."

Item # 3 SUBSTITUTION REQUESTS

	Spec Section	Description	Vendor	Approved
1.	09 22 16	Steel Studs – approved manufacturer	SCAFCO Steel Stud Co.	Yes
2.	23 74 00	Rooftop ACUs (1, 2, 3, 4, 5, 6, A)	Fraser-Johnston	Yes

See Addendum attachments for completed Substitution Request forms with additional information.

Attachments: (Documents supporting description)

- Substitution Request Forms for the items listed above

End of Addendum #2

SUBSTITUTION REQUEST FORM

TO: Matt Hausman - Construction Contracts Officer
PROJECT: Dryden Hall Roof Replacement, Corvallis, Or.

SPECIFIED ITEM:

092216 2 2.01 Manufacturers

Section Page Paragraph Description

The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: To be added as Approved Manufacturer

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes description of changes to Contract Documents which proposed substitution will require for its proper installation.

The undersigned states that the following paragraphs, unless modified on attachments, are correct:

1. The proposed substitution does not affect dimensions shown on Drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the Proposed Substitution are equivalent or superior to the Specified Item.

Submitted by: DAN JAEGER
 Signature: [Signature]
 Firm: SCAFCO STEEL STUD COMPANY
 Address: 2800 E MAIN AVE.
SPOKANE, WA 99220-3949
 Date: 11/5/2021
 Telephone: 509-343-9053

For use by Design Consultant:

- Accepted Accepted as noted
 Not Accepted Received too late

By Andrew Pearson - Oh planning+design, architecture

Date 11/17/2021

Remarks _____

Attachments:

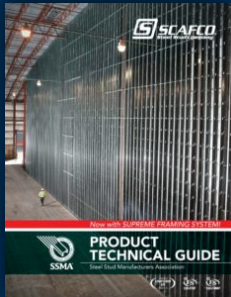


DAN JAEGER

Project Leads & Architectural Sales Coordinator
Office 509-343-9053 • Cell 509-389-0995
DanJaeger@SCAFCO.com

SCAFCO Steel Stud Company is a manufacturer and supplier of steel framing products and accessories for today's construction industry.

CLICK ON A LINK BELOW TO SEE OUR EXTENSIVE STEEL FRAMING LIBRARY



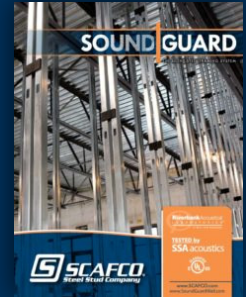
Product Technical Guide



Steel Framing Connections



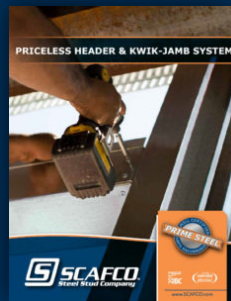
I-Stud



SoundGuard



Steel vs. Wood



*Priceless Headers &
Kwik Jamb System*



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Perfect Curve

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www.SCAFCO.com

SUBSTITUTION REQUEST FORM

TO: constructioncontracts@oregonstate.edu

PROJECT: OSU Dryden Hall Roof Replacement Re-Bid

SPECIFIED ITEM:

23 74 00 2 Part 2, 2.01, A. 5. ACU-1,2,3,4,5,6, and A Rooftop Package Air Conditioning Units

Section Page Paragraph Description

The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: Fraser-Johnston Model Z^J manufactured in same facility and to same spec as York, Part 2, 2.01, A. 2.

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes description of changes to Contract Documents which proposed substitution will require for its proper installation.

The undersigned states that the following paragraphs, unless modified on attachments, are correct:

1. The proposed substitution does not affect dimensions shown on Drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse effect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the Proposed Substitution are equivalent or superior to the Specified Item.

Submitted by:

Signature Dave Havelick

Firm Sustainable Mechanical Systems

Address 7412 SW Beaverton Hillsdale Hwy., Ste. 203
Portland, OR 97225

Date 11/10/2021

Telephone 503-703-2042

Attachments: Preliminary Submittal

For use by Design Consultant:

Accepted Accepted as noted

Not Accepted Received too late

By Rick Silenzi - Interface Engineering

Date 11-17-2021

Remarks Approval contingent upon a max. roof insulation thickness of 5.25" as specified.

SUBMITTAL DATA

Order #: **Date:** 11/10/2021
Project: OSU Dryden Hall Roofing
Project #:

Submitter: David Havelick
Sustainable Mechanical Systems Inc.
7412 SW Beaverton Hillsdale Hwy. Suite 203,
Portland, Oregon 97225
503-703-2042
dhavelick@sustainmech.com

Notes:

1. Fraser Johnston manufactured by JCI in same Norman, OK factory as York with same configuration, materials, performance, etc.
2. M-002 schedule Notes do not include options called out per SS 23 74 00 Rooftop Air Conditioning Units. **Please confirm some or all options are required;** Phenolic epoxy corrosion-protection coating to both evap and con coils, lead refrigeration circuit digital scroll compressor, stainless steel drain pan, refrigerant reversing valve and defrost control (Typical for heat pumps not as packs), dehumidification control with dehumidistat, service outlets, dirty filter switch, power exhaust.

Date

11/10/2021

Project Name

OSU Dryden Hall Roofing

Project Number**Client / Purchaser**

Submittal Summary Page

Qty	Tag #	Model # / Material #	Description
2	ACU-1,4	ZJ078N12D2B1ACA3A2	<p>6.5 Ton, Single Packaged R-410A Air Conditioner, High Efficiency, Two Stage Cooling, 11.8 EER, 120 MBH Input Aluminized Steel, Two Stage Gas Heat, 208/230-3-60</p> <ul style="list-style-type: none"> • Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511). • 2 HP High Static Belt Drive Blower • 4" Pleated Filters (MERV 13) • Smart Equipment Controller including Discharge Air, Return Air, and Outdoor Air Temperature Sensors. BACNet MS/TP, Modbus and N2 Communication Card. • Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil • Composite Drain Pan - Front Connection
2	ACU-1,4	1RC0471	Roof Curb - 14" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down)
1	ACU-2	ZJ090N18D2B1ACA3A2	<p>7.5 Ton, Single Packaged R-410A Air Conditioner, High Efficiency, Two Stage Cooling, 12.0 EER, 180 MBH Input Aluminized Steel, Two Stage Gas Heat, 208/230-3-60</p> <ul style="list-style-type: none"> • Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511). • 3 HP High Static Belt Drive Blower • 4" Pleated Filters (MERV 13) • Smart Equipment Controller including Discharge Air, Return Air, and Outdoor Air Temperature Sensors. BACNet MS/TP, Modbus and N2 Communication Card. • Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil • Composite Drain Pan - Front Connection
1	ACU-2	1RC0471	Roof Curb - 14" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down)
1	ACU-3	ZJ049N08B2B1ACA3A2	<p>4 Ton, Single Packaged R-410A Air Conditioner, High Efficiency, Single Stage Cooling, 15.0 SEER / 12.2 EER, 80 MBH Input Aluminized Steel, Two Stage Gas Heat, 208/230-3-60</p> <ul style="list-style-type: none"> • Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511).

Qty	Tag #	Model # / Material #	Description
			<ul style="list-style-type: none"> • 1.5 HP Standard Static Belt Drive Blower • 4" Pleated Filters (MERV 13) • Smart Equipment Controller including Discharge Air, Return Air, and Outdoor Air Temperature Sensors. BACNet MS/TP, Modbus and N2 Communication Card. • Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil • Composite Drain Pan - Front Connection
1	ACU-3	1RC0471	Roof Curb - 14" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down)
2	ACU-5,A	ZJ037N08D2B1ACA3A3	<p>3 Ton, Single Packaged R-410A Air Conditioner, High Efficiency, Single Stage Cooling, 14.50 SEER / 12.20 EER, 80 MBH Input Aluminized Steel, Two Stage Gas Heat, 208/230-3-60</p> <ul style="list-style-type: none"> • Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511). • 1.5 HP High Static Belt Drive Blower • 4" Pleated Filters (MERV 13) • Smart Equipment Controller including Discharge Air, Return Air, and Outdoor Air Temperature Sensors. BACNet MS/TP, Modbus and N2 Communication Card. • Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil • Composite Drain Pan - Front Connection
2	ACU-5,A	1RC0471	Roof Curb - 14" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down)
1	ACU-6	ZJ102N18D2B1ACA3A2	<p>8.5 Ton, Single Packaged R-410A Air Conditioner, High Efficiency, Two Stage Cooling, 12.0 EER, 180 MBH Input Aluminized Steel, Two Stage Gas Heat, 208/230-3-60</p> <ul style="list-style-type: none"> • Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511). • 3 HP High Static Belt Drive Blower • 4" Pleated Filters (MERV 13) • Smart Equipment Controller including Discharge Air, Return Air, and Outdoor Air Temperature Sensors. BACNet MS/TP, Modbus and N2 Communication Card. • Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil • Composite Drain Pan - Front Connection
1	ACU-6	1RC0471	Roof Curb - 14" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down)
1	ACU-6	S1-A52	Belt for 8.5 and 10 Ton High Static Field Installed Drive

Qty	Tag #	Model # / Material #	Description
1	ACU-6	S1-02815208000	Blower Sheave for 8.5 and 10 Ton High Static Field Installed Drive

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



WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ078N12D2B1ACA3A2**

Quantity: **2** Tag #: **ACU-1,4**

System: **ZJ078N12D2B1ACA3A2**

Cooling Performance

Total gross capacity	74.6 MBH
Sensible gross capacity	50.7 MBH
Total net capacity	70.5 MBH
Sensible net capacity	46.6 MBH
Efficiency (at ARI)	11.80 EER
Integrated eff. (at ARI)	13.20 IEER
Ambient DB temp.	95.0 °F
Entering DB temp.	80.0 °F
Entering WB temp.	67.0 °F
Leaving DB temp.	57.2 °F
Leaving WB temp.	55.4 °F
Leaving air temp dew point	54.20 °F
Power input (w/o blower)	5.73 kW
Sound power	85 dB(A)

Refrigerant

Refrigerant type	R-410A
Sys1	5 lbs 12 oz
Sys2	5 lbs 12 oz

Gas Heating Performance

Entering DB temp.	60 °F
Heating output capacity (Max)	96 MBH
Supply air	2060 CFM
Heating input capacity (Max)	120 MBH
Leaving DB temp.	103.1 °F
Air temp. rise	43.1 °F
SSE	80.0 %
Stages	2

Supply Air Blower Performance

Supply air	2060 CFM
Ext. static pressure	1.0 IWG
Addl. Unit Losses (Options/Accessories)	0.15 IWG
Blower speed	928 RPM
Max BHP of Motor (including service factor)	2.30 HP
Duct location	Bottom
Motor rating	2.00 HP
Actual required BHP	1.29 HP
Power input	1.20 kW
Elevation	0 ft.
Drive type	BELT

Electrical Data

Power supply	208-3-60	230-3-60
Unit min circuit ampacity	35.3 Amps	35.3 Amps
Unit max over-current protection	45 Amps	45 Amps

Dimensions & Weight

Hgt	51 in.	Len	89 in.	Wth	59 in.
Weight with factory installed options	1225 lbs.				

Clearances

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

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



6.5 Ton

- Fraser Johnston units are manufactured at an ISO 9001 registered facility and each rooftop is completely computer-run tested prior to shipment.

Unit Features

- Two Stage Cooling
- 120 MBH Input Aluminized Steel, Two Stage Gas Heat
- Full perimeter base rails with built in rigging capabilities
- Unit Cabinet Constructed of Powder Painted Steel, Certified At 750 Hours Salt Spray Test (ASTM B-117 Standards)
- Scroll Compressor[s]
- Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511).
- 2 HP High Static Belt Drive Blower
- Unit Ships with 4" Pleated Filters (MERV 13)
- Solid Core Liquid Line Filter Driers
- Replacement Filters: 4 - (24" x 20"). Unit accepts 2" or 4" wide filters.
- Single Point Power Connection
- Short Circuit Current: 5kA RMS Symmetrical
- Through-the-Curb and Through-the-Base Utility Connections
- Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil
- Composite Drain Pan - Front Connection
- Tool-free maintenance with features like hinged doors for all-access panels, slide-out blower and blower motor tray

Standard Unit Controller: Smart Equipment 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.

Warranty

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



Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ078N12D2B1ACA3A2**

Quantity: **2** Tag #: **ACU-1,4**

System: **ZJ078N12D2B1ACA3A2**

Additional Electrical Data

Power supply	208-3-60
Unit min circuit ampacity	35.3 Amps
Unit max over-current protection	45 Amps
Min Voltage	187 V
Max Voltage	252 V
Comp #1 RLA	11.2
Comp #1 LRA	84.0
Comp #2 RLA	11.2
Comp #2 LRA	84
Indoor Mtr Voltage	208-3-60
Indoor Mtr FLA	6.8
Outdoor Mtr Qty	2
Outdoor Fan Voltage	208-1-60
OD Fan Mtr FLA (ea.)	1.65
Power Ex Mtr Qty	1
Powered Ex Voltage	208-1-60
Power Ex Mtr FLA (ea)	5.5

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ078N12D2B1ACA3A2**

Quantity: **2** Tag #: **ACU-1,4**

System: **ZJ078N12D2B1ACA3A2**

Factory Installed Options

ZJ078N12D2B1ACA3A2

Equipment Options	Option(s) Selected
Product Category:	ZJ Single Packaged R-410A Air Conditioner, High Efficiency 11.8 EER
Nominal Cooling Capacity:	078 6.5 Ton Two Stage Cooling
Heat Type and Nominal Heat Capacity:	N12 120 MBH Input Aluminized Steel, Two Stage Gas Heat
Blower Option:	D 2 HP High Static Belt Drive Blower
Voltage:	2 208/230-3-60
Outside Air Option:	B Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511).
Service Options:	1
Sensor Options:	A
Controls:	C Smart Equipment Controller including Discharge Air, Return Air, and Outdoor Air Temperature Sensors. BACNet MS/TP, Modbus and N2 Communication Card.
Refrigeration:	A Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil
Additional Options:	3 4" Pleated Filters (MERV 13)
Cabinet Options:	A Composite Drain Pan - Front Connection
Product Generation:	2

Field Installed Accessories

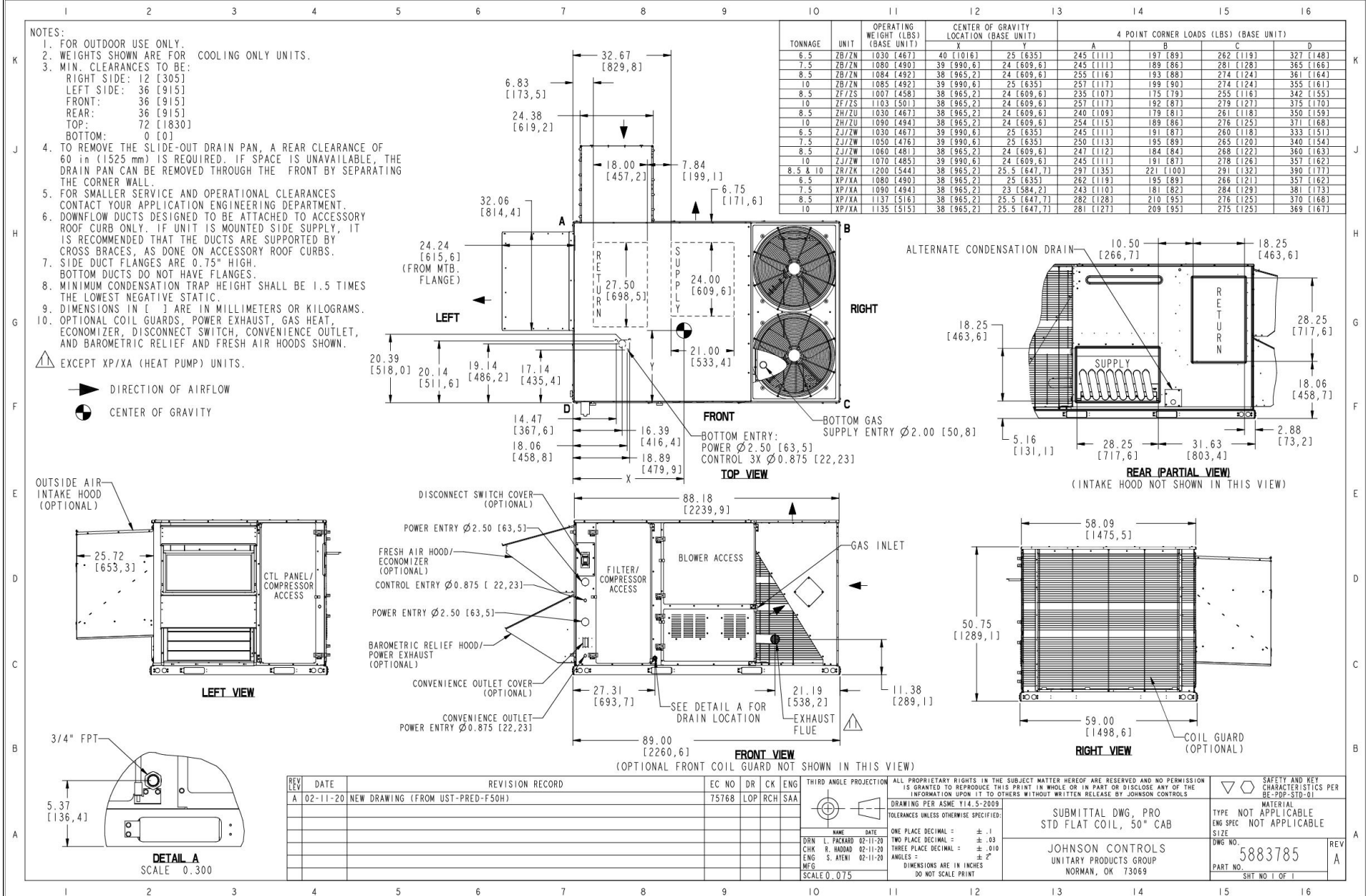
- 1BD0408 - Burglar Bars (32.0 lbs)
- 1CG0420 - Coil Guard (27.0 lbs)
- 1CV0403 - Concentric Diffuser, Flush Mount, 20RD
- 1CV0412 - Concentric Diffuser, Side Discharge, 20RD
- 1FE0412 - Flue Exhaust Extension Kit (14.0 lbs)
- 1FF0414 - 2" Only Metal Filter Frame Kit (16.0 lbs)
- 1GP0405 - Gas Piping Kit for Bottom Gas Supply Connection with External Shut-Off (includes: Internal gas pipe, fittings, gas cock & panel gaskets) (10.0 lbs)
- 1HA0442 - High Altitude Kit for Natural Gas - For applications between 2000 and 6000 feet altitude (1.0 lbs)
- 1HA0443 - High Altitude Kit for Propane - For applications between 2000 and 6000 feet altitude (1.0 lbs)
- 1HG0411 - Hail Guard Kit-Diamond Pattern (37.0 lbs)
- 1HG0432 - Hail Guard Kit-Provent Style (25.0 lbs)
- 1NP0459 - Natural Gas to Propane Conversion Kit (2-Stage)
- 1RC0470 - Roof Curb - 8" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs)
- 1RC0471 - Roof Curb - 14" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs)

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ078N12D2B1ACA3A2**

Quantity: **2** Tag #: **ACU-1,4**

Consolidated Drawing



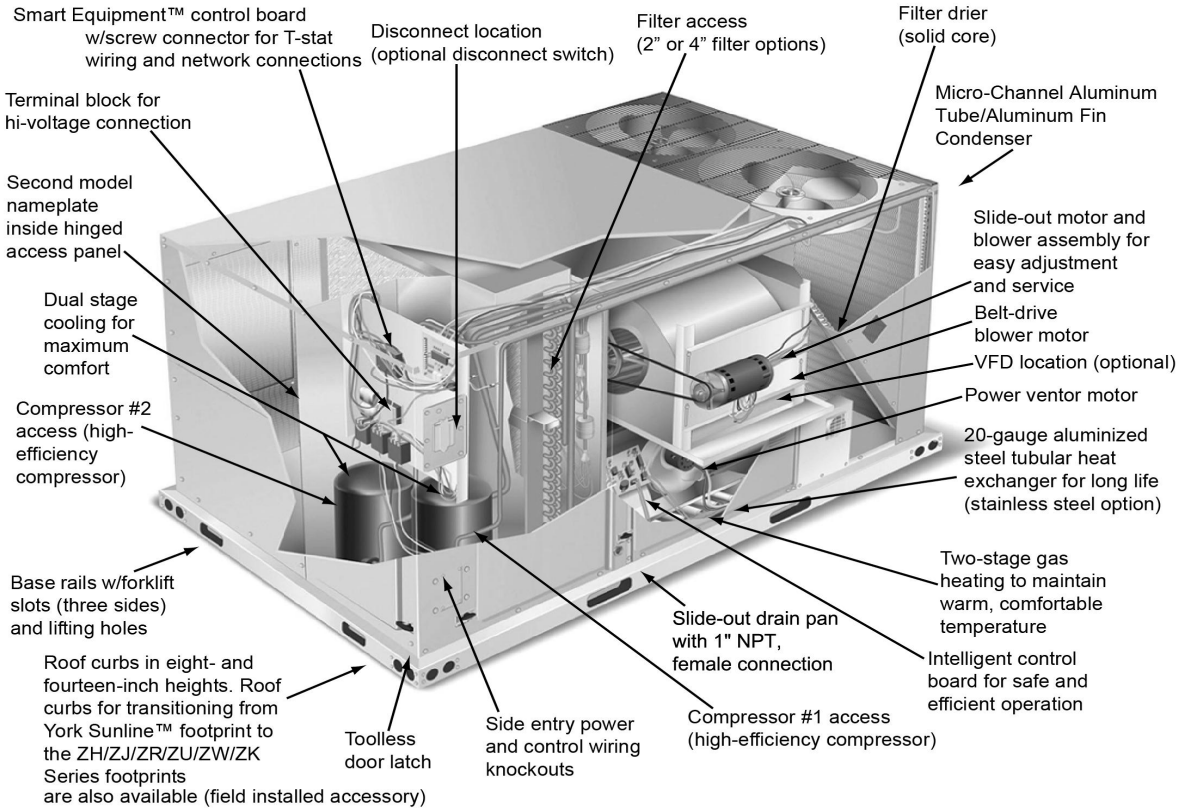
Project Name: **OSU Dryden Hall**
Roofing

Unit Model #: **ZJ078N12D2B1ACA3A2**

Quantity: **2** Tag #: **ACU-1,4**

Component Locations

Cooling With Gas Heat (6.5 Through 10 Tons)



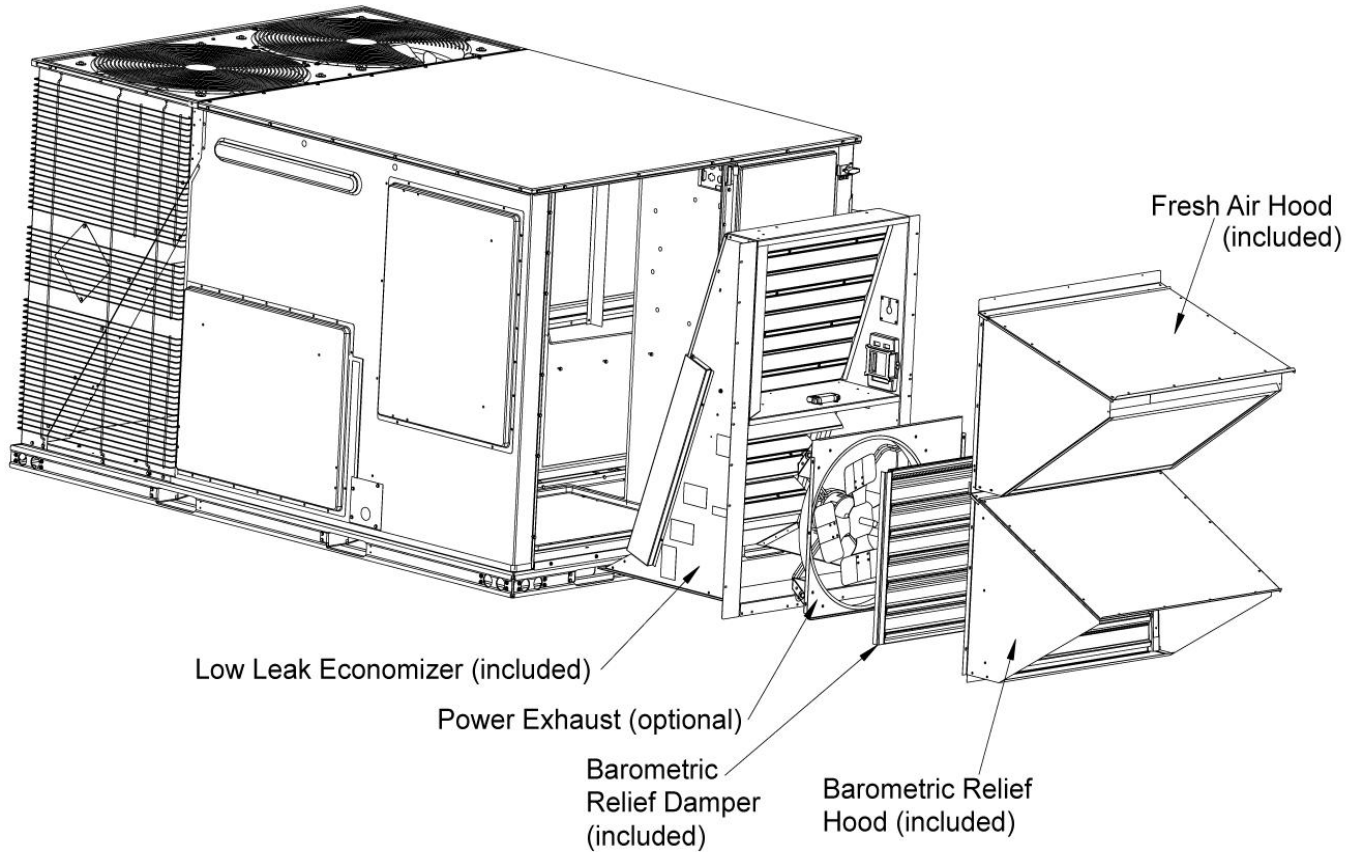
Project Name: OSU Dryden Hall
Roofing

Unit Model #: ZJ078N12D2B1ACA3A2

Quantity: 2 Tag #: ACU-1,4

Low Leak Downflow Economizer

Low Leak Downflow Economizer (shown with optional Power Exhaust)



Low leak economizers are capable achieving low leakage rates of 3 cfm/sq. ft at 1" of static pressure, meeting or exceeding the following standards:

- ASHRAE 90.1-2010
- ASHRAE 62
- AMCA 511 (licensed as Class 1A damper)
- International Energy Conservation Code (IECC)
- California Title 24

The outdoor intake opening shall be covered with a rain hood that matches the exterior of the unit. Water eliminator/filters shall be provided.

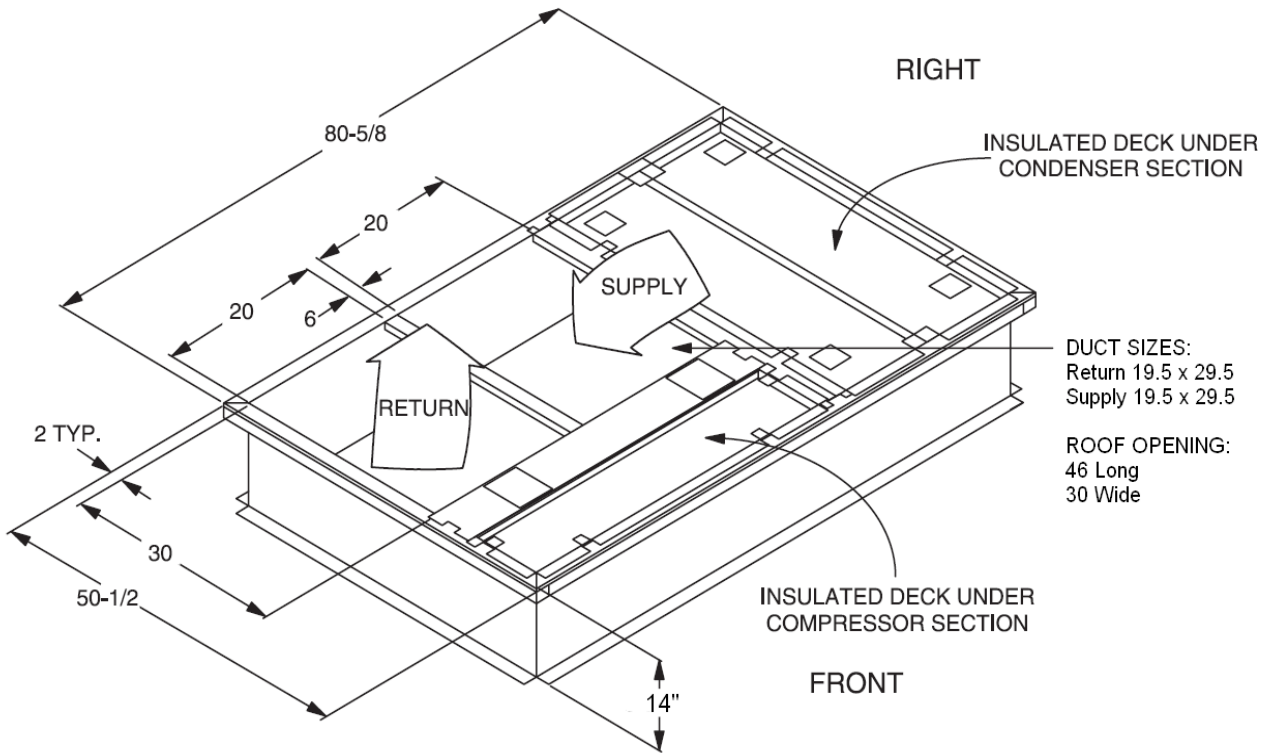
Simultaneous economizer/compressor operation is also possible. Dampers shall fully close on power loss.

Project Name: **OSU Dryden Hall**
Roofing

Unit Model #: **ZJ078N12D2B1ACA3A2**

Quantity: **2** Tag #: **ACU-1,4**

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

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ090N18D2B1ACA3A2**

Quantity: **1** Tag #: **ACU-2**

System: **ZJ090N18D2B1ACA3A2**

Cooling Performance

Total gross capacity	93.1 MBH
Sensible gross capacity	69.0 MBH
Total net capacity	86.1 MBH
Sensible net capacity	62.0 MBH
Efficiency (at ARI)	12.00 EER
Integrated eff. (at ARI)	13.00 IEER
Ambient DB temp.	95.0 °F
Entering DB temp.	80.0 °F
Entering WB temp.	67.0 °F
Leaving DB temp.	57.4 °F
Leaving WB temp.	56.6 °F
Leaving air temp dew point	56.10 °F
Power input (w/o blower)	6.25 kW
Sound power	90 dB(A)

Refrigerant

Refrigerant type	R-410A
Sys1	7 lbs 12 oz
Sys2	7 lbs 5 oz

Gas Heating Performance

Entering DB temp.	60 °F
Heating output capacity (Max)	144 MBH
Supply air	2830 CFM
Heating input capacity (Max)	180 MBH
Leaving DB temp.	107.1 °F
Air temp. rise	47.1 °F
SSE	80.0 %
Stages	2

Supply Air Blower Performance

Supply air	2830 CFM
Ext. static pressure	1.0 IWG
Addl. Unit Losses (Options/Accessories)	0.44 IWG
Blower speed	1095 RPM
Max BHP of Motor (including service factor)	3.45 HP
Duct location	Bottom
Motor rating	3.00 HP
Actual required BHP	2.21 HP
Power input	2.06 kW
Elevation	0 ft.
Drive type	BELT

Electrical Data

Power supply	208-3-60	230-3-60
Unit min circuit ampacity	45.8 Amps	45.8 Amps
Unit max over-current protection	50 Amps	50 Amps

Dimensions & Weight

Hgt	51 in.	Len	89 in.	Wth	59 in.
Weight with factory installed options	1245 lbs.				

Clearances

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

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



7.5 Ton

- Fraser Johnston units are manufactured at an ISO 9001 registered facility and each rooftop is completely computer-run tested prior to shipment.

Unit Features

- Two Stage Cooling
- 180 MBH Input Aluminized Steel, Two Stage Gas Heat
- Full perimeter base rails with built in rigging capabilities
- Unit Cabinet Constructed of Powder Painted Steel, Certified At 750 Hours Salt Spray Test (ASTM B-117 Standards)
- Scroll Compressor[s]
- Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511).
- 3 HP High Static Belt Drive Blower
- Unit Ships with 4" Pleated Filters (MERV 13)
- Solid Core Liquid Line Filter Driers
- Replacement Filters: 4 - (24" x 20"). Unit accepts 2" or 4" wide filters.
- Single Point Power Connection
- Short Circuit Current: 5kA RMS Symmetrical
- Through-the-Curb and Through-the-Base Utility Connections
- Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil
- Composite Drain Pan - Front Connection
- Tool-free maintenance with features like hinged doors for all-access panels, slide-out blower and blower motor tray

Standard Unit Controller: Smart Equipment 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

- Smart Equipment Controller including Discharge Air, Return Air, and Outdoor Air Temperature Sensors. BACNet MS/TP, Modbus and N2 communication card.

Warranty

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

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ090N18D2B1ACA3A2**

Quantity: **1** Tag #: **ACU-2**

System: **ZJ090N18D2B1ACA3A2**

Additional Electrical Data

Power supply	208-3-60
Unit min circuit ampacity	45.8 Amps
Unit max over-current protection	50 Amps
Min Voltage	187 V
Max Voltage	252 V
Comp #1 RLA	13.6
Comp #1 LRA	83.1
Comp #2 RLA	13.6
Comp #2 LRA	83.1
Indoor Mtr Voltage	208-3-60
Indoor Mtr FLA	9.6
Outdoor Mtr Qty	2
Outdoor Fan Voltage	208-1-60
OD Fan Mtr FLA (ea.)	2.8
Power Ex Mtr Qty	1
Powered Ex Voltage	208-1-60
Power Ex Mtr FLA (ea)	5.5

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ090N18D2B1ACA3A2**

Quantity: 1 Tag #: **ACU-2**

System: **ZJ090N18D2B1ACA3A2**

Factory Installed Options

ZJ090N18D2B1ACA3A2

Equipment Options	Option(s) Selected
Product Category:	ZJ Single Packaged R-410A Air Conditioner, High Efficiency 12.0 EER
Nominal Cooling Capacity:	090 7.5 Ton Two Stage Cooling
Heat Type and Nominal Heat Capacity:	N18 180 MBH Input Aluminized Steel, Two Stage Gas Heat
Blower Option:	D 3 HP High Static Belt Drive Blower
Voltage:	2 208/230-3-60
Outside Air Option:	B Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511).
Service Options:	1
Sensor Options:	A
Controls:	C Smart Equipment Controller including Discharge Air, Return Air, and Outdoor Air Temperature Sensors. BACNet MS/TP, Modbus and N2 Communication Card.
Refrigeration:	A Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil
Additional Options:	3 4" Pleated Filters (MERV 13)
Cabinet Options:	A Composite Drain Pan - Front Connection
Product Generation:	2

Field Installed Accessories

- 1BD0408 - Burglar Bars (32.0 lbs)
- 1CG0420 - Coil Guard (27.0 lbs)
- 1CV0403 - Concentric Diffuser, Flush Mount, 20RD
- 1CV0404 - Concentric Diffuser, Flush Mount, 18X28
- 1CV0412 - Concentric Diffuser, Side Discharge, 20RD
- 1CV0413 - Concentric Diffuser, Side Discharge, 18X28
- 1CV0420 - Concentric Diffuser, Specialty, 24X24
- 1FE0412 - Flue Exhaust Extension Kit (14.0 lbs)
- 1FF0414 - 2" Only Metal Filter Frame Kit (16.0 lbs)
- 1GP0405 - Gas Piping Kit for Bottom Gas Supply Connection with External Shut-Off (includes: Internal gas pipe, fittings, gas cock & panel gaskets) (10.0 lbs)
- 1HA0442 - High Altitude Kit for Natural Gas - For applications between 2000 and 6000 feet altitude (1.0 lbs)
- 1HA0443 - High Altitude Kit for Propane - For applications between 2000 and 6000 feet altitude (1.0 lbs)
- 1HG0411 - Hail Guard Kit-Diamond Pattern (37.0 lbs)
- 1HG0432 - Hail Guard Kit-Provent Style (25.0 lbs)
- 1NP0459 - Natural Gas to Propane Conversion Kit (2-Stage)
- 1RC0470 - Roof Curb - 8" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs)

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ090N18D2B1ACA3A2**

Quantity: **1** Tag #: **ACU-2**

System: **ZJ090N18D2B1ACA3A2**

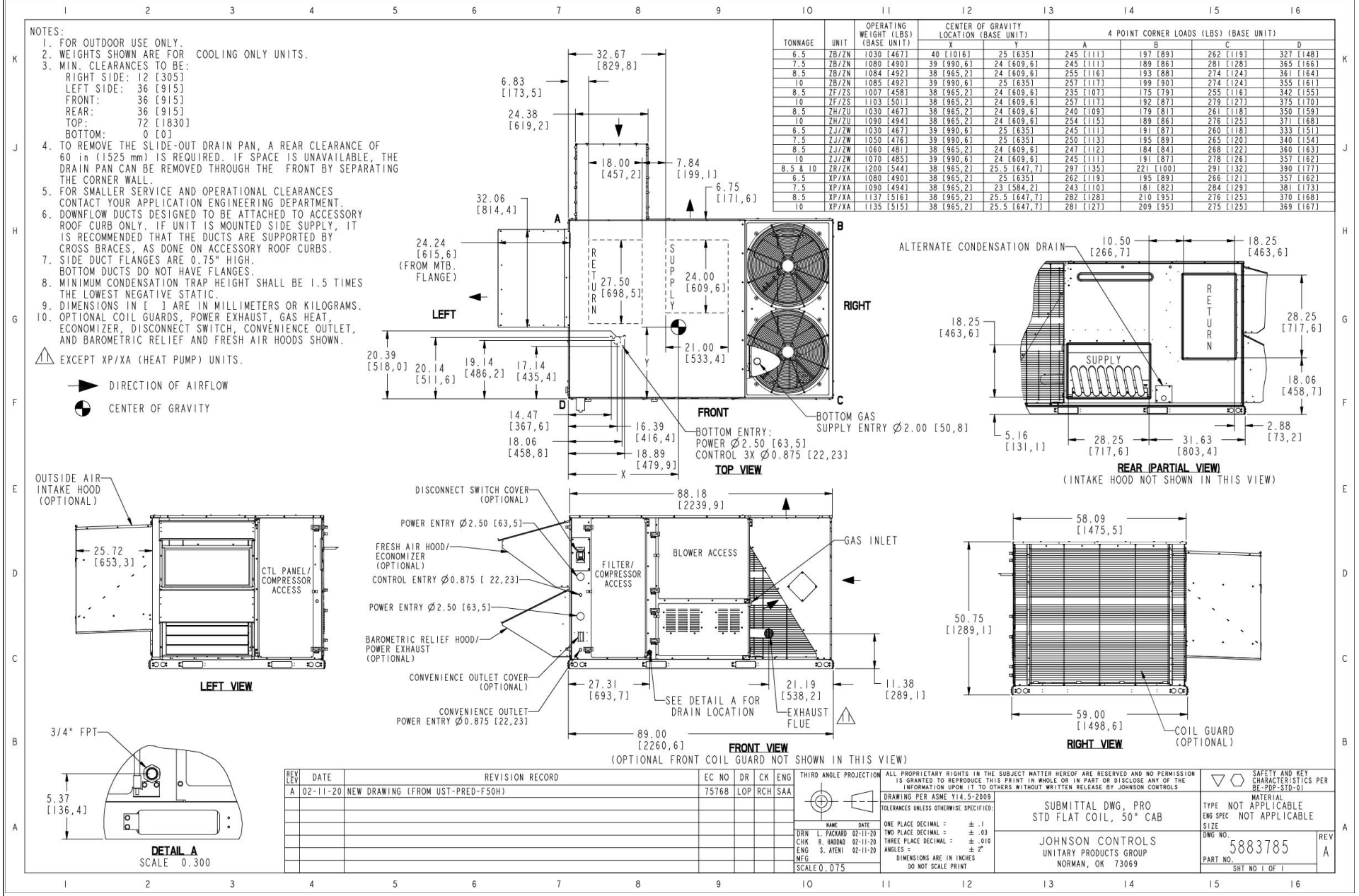
- 1RC0471 - Roof Curb - 14" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs)
- 1RC0472 - Roof Curb, Transition-Sunline 7.5T thru 12.5T to Pro 3.0T thru 12.5T (Shipped Assembled) (200.0 lbs)
- 1RC0476 - Roof Curb - 24" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs)
- 1WC0412 - Wooden Crate (445.0 lbs)
- 2AP0402 - Air Proving Switch (1.0 lbs)
- 2AQ04700524 - CO² Space Sensor - Wall Mount Accessory (5.0 lbs)
- 2AQ04700624 - CO² Unit Mount Accessory (4.6 lbs)
- 2EC0401 - Kit, Single Enthalpy Field Installed (1.0 lbs)
- 2EC0402 - Kit, Dual Enthalpy Field Installed (Includes two humidity sensors) (1.0 lbs)
- 2LA04702412 - Low Ambient Kit - ICM 333 (2.2 lbs)
- 2PE04704706 - Power Exhaust 230V without Baro Relief Downflow or Horizontal (19.0 lbs)
- 2SD04700824 - Smoke Detector Kit w/ Mounting Hardware for Supply Air (Horizontal/Downflow) Only (9.4 lbs)
- 2SD04700924 - Smoke Detector Kit w/ Mounting Hardware for Return Air (Downflow Only) Only (10.0 lbs)
- 2SD04701024 - Smoke Detector Kit w/ Mounting Hardware for Supply (Horizontal/Downflow) and Return Air (Downflow Only) (8.0 lbs)
- S1-03102529100 - Non-Networking Wall Sensor – Allows remote sensing and control from single or multiple zones. (0.0 lbs)
- S1-03102529104 - Non-Networking Wall Sensor with Over-ride button – Allows remote sensing and control from single or multiple zones. Override allows setpoint to be overridden for 2 hour time period. (0.2 lbs)
- S1-03102529106 - Non-Networking Wall Sensor with Setpoint Adjustment and Over-ride Button – Allows remote sensing and control from single or multiple zones. Allows setpoint to be adjusted ± 5° F. Override allows setpoint to be overridden for 2 hour time period. (0.2 lbs)
- S1-ADDWIRE - Add-a-Wire allows 5-wire thermostats to use only 4 wires. (0.3 lbs)
- S1-CTS DTS - CTS Wired Temperature Sensor for thermostat | Duct *Also works for LX Series (0.3 lbs)
- S1-CTS HTS - CTS Hardwired Temperature Sensor for CTS Thermostats *Works with LX series as well (0.2 lbs)
- S1-CTS PLATE - Wall Plate for CTS Thermostats *Also works for new platform LX series models below (0.0 lbs)
- S1-CTS WFTS - CTS Temperature Sensor with WiFi for CTS Thermostats *Also works with LX Series (0.1 lbs)
- S1-LX LOCK - Locking Ring For LX-Series Thermostats (0.4 lbs)
- S1-LX PLATE - Wall Plate For LX-Series Thermostats (0.0 lbs)
- S1-LX WFM - For LX Series Thermostats - WiFi Communication (1.0 lbs)
- S1-MP-PRTKIT-0P - MAP (Multiple Access Portal) Gateway Kit- Replacement MAP gateway protective case, lanyard and communication cable. Use only to replace worn or damaged components. (0.3 lbs)
- S1-NSB8BHN041-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, No Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN043-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, No Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN141-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Warmer/Cooler Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN143-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Warmer/Cooler Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN240-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, WHITE, JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN241-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN243-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BPN240-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, WHITE, JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BPN241-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BPN243-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN041-0 - Wall Temperature Sensor, No Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN043-0 - Wall Temperature Sensor, No Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN141-0 - Wall Temperature Sensor, Warmer/Cooler Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN143-0 - Wall Temperature Sensor, Warmer/Cooler Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN240-0 - Wall Temperature Sensor, Full Display, WHITE, JCI LOGO, NS8000 Series (0.4 lbs)

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ090N18D2B1ACA3A2**

Quantity: **1** Tag #: **ACU-2**

Consolidated Drawing



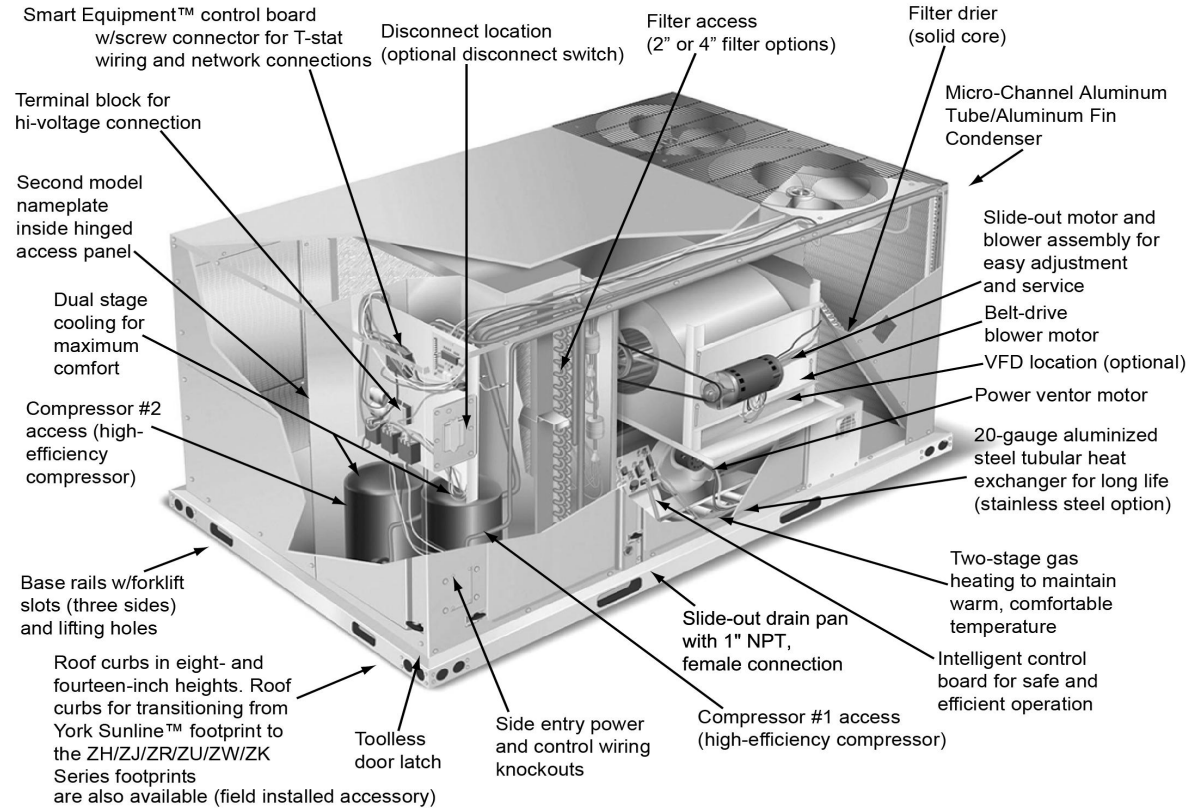
Project Name: **OSU Dryden Hall**
Roofing

Unit Model #: **ZJ090N18D2B1ACA3A2**

Quantity: 1 Tag #: **ACU-2**

Component Locations

Cooling With Gas Heat (6.5 Through 10 Tons)



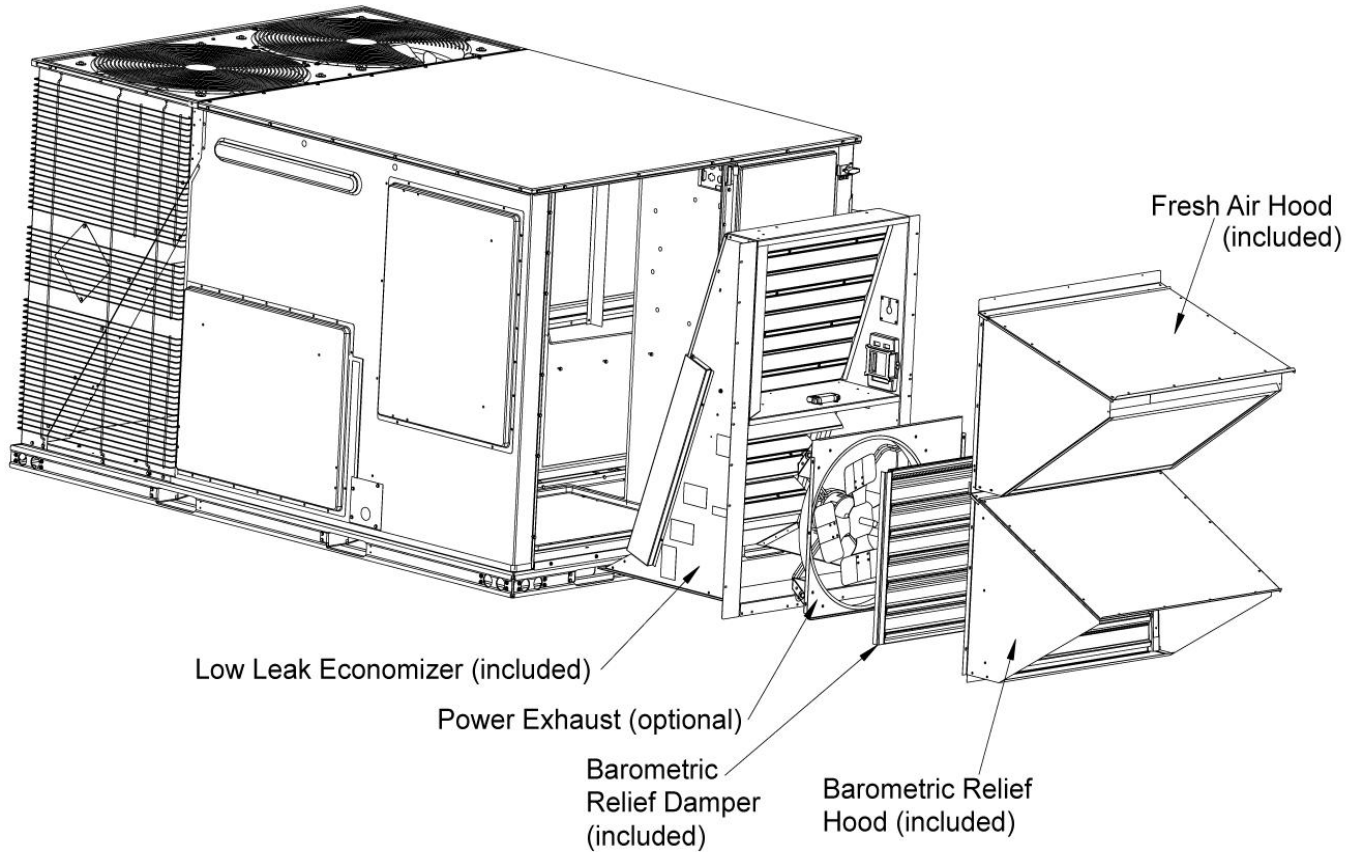
Project Name: OSU Dryden Hall
Roofing

Unit Model #: ZJ090N18D2B1ACA3A2

Quantity: 1 Tag #: ACU-2

Low Leak Downflow Economizer

Low Leak Downflow Economizer (shown with optional Power Exhaust)



Low leak economizers are capable achieving low leakage rates of 3 cfm/sq. ft at 1" of static pressure, meeting or exceeding the following standards:

- ASHRAE 90.1-2010
- ASHRAE 62
- AMCA 511 (licensed as Class 1A damper)
- International Energy Conservation Code (IECC)
- California Title 24

The outdoor intake opening shall be covered with a rain hood that matches the exterior of the unit. Water eliminator/filters shall be provided.

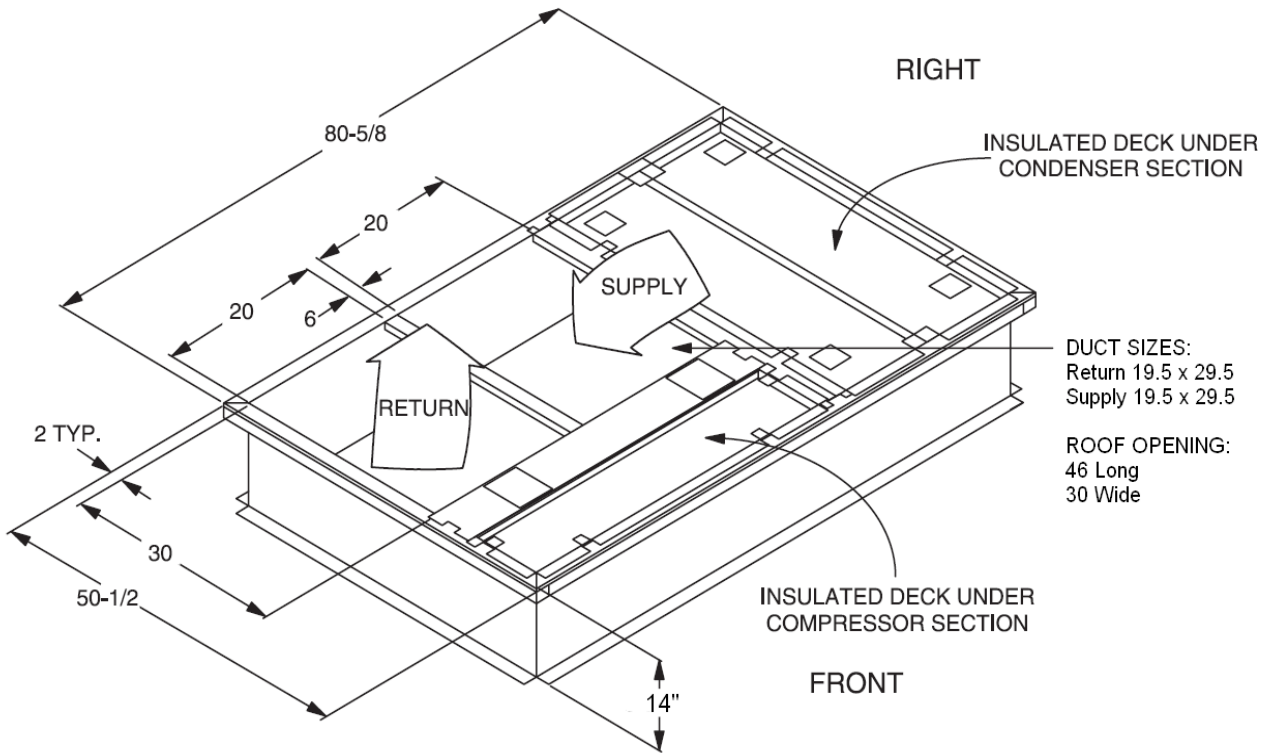
Simultaneous economizer/compressor operation is also possible. Dampers shall fully close on power loss.

Project Name: **OSU Dryden Hall**
Roofing

Unit Model #: **ZJ090N18D2B1ACA3A2**

Quantity: **1** Tag #: **ACU-2**

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

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ049N08B2B1ACA3A2**

Quantity: **1** Tag #: **ACU-3**

System: **ZJ049N08B2B1ACA3A2**

Cooling Performance

Total gross capacity	49.7 MBH
Sensible gross capacity	33.6 MBH
Total net capacity	47.5 MBH
Sensible net capacity	31.4 MBH
Seasonal Efficiency (at ARI)	15.00 SEER
Efficiency (at ARI)	12.20 EER
Ambient DB temp.	95.0 °F
Entering DB temp.	80.0 °F
Entering WB temp.	67.0 °F
Leaving DB temp.	57.8 °F
Leaving WB temp.	55.6 °F
Leaving air temp dew point	54.10 °F
Power input (w/o blower)	3.20 kW
Sound power	80 dB(A)

Refrigerant

Refrigerant type	R-410A
Sys1	8 lbs 6 oz

Gas Heating Performance

Entering DB temp.	60 °F
Heating output capacity (Max)	65 MBH
Supply air	1400 CFM
Heating input capacity (Max)	80 MBH
Leaving DB temp.	103.0 °F
Air temp. rise	43.0 °F
SSE	81.0 %
Stages	2

Supply Air Blower Performance

Supply air	1400 CFM
Ext. static pressure	0.75 IWG
Addl. Unit Losses (Options/Accessories)	0.18 IWG
Blower speed	897 RPM
Max BHP of Motor (including service factor)	1.73 HP
Duct location	Bottom
Motor rating	1.50 HP
Actual required BHP	.68 HP
Power input	0.64 kW
Elevation	0 ft.
Drive type	BELT

Electrical Data

Power supply	208-3-60	230-3-60
Unit min circuit ampacity	24.2 Amps	24.2 Amps
Unit max over-current protection	35 Amps	35 Amps

Dimensions & Weight

Hgt	42 in.	Len	89 in.	Wth	59 in.
Weight with factory installed options	960 lbs.				

Clearances

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

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



4 Ton

- Fraser Johnston units are manufactured at an ISO 9001 registered facility and each rooftop is completely computer-run tested prior to shipment.

Unit Features

- Single Stage Cooling
- 80 MBH Input Aluminized Steel, Two Stage Gas Heat
- Full perimeter base rails with built in rigging capabilities
- Unit Cabinet Constructed of Powder Painted Steel, Certified At 750 Hours Salt Spray Test (ASTM B-117 Standards)
- Scroll Compressor[s]
- Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511).
- Slide-Out Blower/1.5 HP Belt Drive Motor Assembly
- Unit Ships with 4" Pleated Filters (MERV 13)
- Solid Core Liquid Line Filter Driers
- Replacement Filters: 4 - (24" x 16"). Unit accepts 2" or 4" wide filters.
- Single Point Power Connection
- Short Circuit Current: 5kA RMS Symmetrical
- Through-the-Curb and Through-the-Base Utility Connections
- Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil
- Composite Drain Pan - Front Connection
- Tool-free maintenance with features like hinged doors for all-access panels, slide-out blower and blower motor tray

Standard Unit Controller: Smart Equipment 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.
- 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.

Warranty

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

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ049N08B2B1ACA3A2**

Quantity: **1** Tag #: **ACU-3**

System: **ZJ049N08B2B1ACA3A2**

Additional Electrical Data

Power supply	208-3-60
Unit min circuit ampacity	24.2 Amps
Unit max over-current protection	35 Amps
Min Voltage	187 V
Max Voltage	252 V
Comp #1 RLA	13.8
Comp #1 LRA	83.1
Indoor Mtr Voltage	208-3-60
Indoor Mtr FLA	5.2
Outdoor Mtr Qty	1
Outdoor Fan Voltage	208-1-60
OD Fan Mtr FLA (ea.)	1.65
Power Ex Mtr Qty	1
Powered Ex Voltage	208-1-60
Power Ex Mtr FLA (ea)	5.5

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ049N08B2B1ACA3A2**

Quantity: **1** Tag #: **ACU-3**

System: **ZJ049N08B2B1ACA3A2**

Factory Installed Options

ZJ049N08B2B1ACA3A2

Equipment Options	Option(s) Selected
Product Category:	ZJ Single Packaged R-410A Air Conditioner, High Efficiency 15.0 SEER / 12.2 EER
Nominal Cooling Capacity:	049 4 Ton Single Stage Cooling
Heat Type and Nominal Heat Capacity:	N08 80 MBH Input Aluminized Steel, Two Stage Gas Heat
Blower Option:	B 1.5 HP Standard Static Belt Drive Blower
Voltage:	2 208/230-3-60
Outside Air Option:	B Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511).
Service Options:	1
Sensor Options:	A
Controls:	C Smart Equipment Controller including Discharge Air, Return Air, and Outdoor Air Temperature Sensors. BACNet MS/TP, Modbus and N2 Communication Card.
Refrigeration:	A Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil
Additional Options:	3 4" Pleated Filters (MERV 13)
Cabinet Options:	A Composite Drain Pan - Front Connection
Product Generation:	2

Field Installed Accessories

- 1BD0408 - Burglar Bars (32.0 lbs)
- 1CG0428 - Coil Guard (20.0 lbs)
- 1CV0402 - Concentric Diffuser, Flush Mount, 18RD
- 1CV0411 - Concentric Diffuser, Side Discharge, 18RD (55.0 lbs)
- 1CV0419 - Concentric Diffuser, Specialty, 18X18
- 1FE0412 - Flue Exhaust Extension Kit (14.0 lbs)
- 1FF0415 - 2" Only metal Filter Frame Kit (16.0 lbs)
- 1GP0405 - Gas Piping Kit for Bottom Gas Supply Connection with External Shut-Off (includes: Internal gas pipe, fittings, gas cock & panel gaskets) (10.0 lbs)
- 1HA0450 - High Altitude Kit for Natural Gas - For applications between 2000 and 6000 feet altitude (1.0 lbs)
- 1HA0452 - High Altitude Kit for Propane - For applications between 2000 and 6000 feet altitude (1.0 lbs)
- 1HG0415 - Hail Guard Kit-Diamond Pattern (50.0 lbs)
- 1HG0431 - Hail Guard Kit-Provent Style (20.0 lbs)
- 1LN0407 - Low NOx Kit
- 1NP0460 - Natural Gas to Propane Conversion Kit
- 1RC0470 - Roof Curb - 8" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs)

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ049N08B2B1ACA3A2**

Quantity: **1** Tag #: **ACU-3**

System: **ZJ049N08B2B1ACA3A2**

- 1RC0471 - Roof Curb - 14" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs)
- 1RC0476 - Roof Curb - 24" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs)
- 1WC0412 - Wooden Crate (445.0 lbs)
- 2AP0402 - Air Proving Switch (1.0 lbs)
- 2AQ04700524 - CO² Space Sensor - Wall Mount Accessory (5.0 lbs)
- 2AQ04700624 - CO² Unit Mount Accessory (4.6 lbs)
- 2EC0401 - Kit, Single Enthalpy Field Installed (1.0 lbs)
- 2EC0402 - Kit, Dual Enthalpy Field Installed (Includes two humidity sensors) (1.0 lbs)
- 2LA04702412 - Low Ambient Kit - ICM 333 (2.2 lbs)
- 2PE04704706 - Power Exhaust 230V without Baro Relief Downflow or Horizontal (19.0 lbs)
- 2SD04700824 - Smoke Detector Kit w/ Mounting Hardware for Supply Air (Horizontal/Downflow) Only (9.4 lbs)
- 2SD04700924 - Smoke Detector Kit w/ Mounting Hardware for Return Air (Downflow Only) Only (10.0 lbs)
- 2SD04701024 - Smoke Detector Kit w/ Mounting Hardware for Supply (Horizontal/Downflow) and Return Air (Downflow Only) (8.0 lbs)
- S1-03102529100 - Non-Networking Wall Sensor – Allows remote sensing and control from single or multiple zones. (0.0 lbs)
- S1-03102529104 - Non-Networking Wall Sensor with Over-ride button – Allows remote sensing and control from single or multiple zones. Override allows setpoint to be overridden for 2 hour time period. (0.2 lbs)
- S1-03102529106 - Non-Networking Wall Sensor with Setpoint Adjustment and Over-ride Button – Allows remote sensing and control from single or multiple zones. Allows setpoint to be adjusted ± 5° F. Override allows setpoint to be overridden for 2 hour time period. (0.2 lbs)
- S1-ADDWIRE - Add-a-Wire allows 5-wire thermostats to use only 4 wires. (0.3 lbs)
- S1-CTS DTS - CTS Wired Temperature Sensor for thermostat | Duct *Also works for LX Series (0.3 lbs)
- S1-CTS HTS - CTS Hardwired Temperature Sensor for CTS Thermostats *Works with LX series as well (0.2 lbs)
- S1-CTS PLATE - Wall Plate for CTS Thermostats *Also works for new platform LX series models below (0.0 lbs)
- S1-CTS WFTS - CTS Temperature Sensor with WiFi for CTS Thermostats *Also works with LX Series (0.1 lbs)
- S1-LX LOCK - Locking Ring For LX-Series Thermostats (0.4 lbs)
- S1-LX PLATE - Wall Plate For LX-Series Thermostats (0.0 lbs)
- S1-LX WFM - For LX Series Thermostats - WiFi Communication (1.0 lbs)
- S1-MP-PRTKIT-0P - MAP (Multiple Access Portal) Gateway Kit- Replacement MAP gateway protective case, lanyard and communication cable. Use only to replace worn or damaged components. (0.3 lbs)
- S1-NSB8BHN041-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, No Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN043-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, No Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN141-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Warmer/Cooler Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN143-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Warmer/Cooler Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN240-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, WHITE, JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN241-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN243-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BPN240-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, WHITE, JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BPN241-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BPN243-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN041-0 - Wall Temperature Sensor, No Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN043-0 - Wall Temperature Sensor, No Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN141-0 - Wall Temperature Sensor, Warmer/Cooler Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN143-0 - Wall Temperature Sensor, Warmer/Cooler Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN240-0 - Wall Temperature Sensor, Full Display, WHITE, JCI LOGO, NS8000 Series (0.4 lbs)

Project Name: **OSU Dryden Hall Roofing**

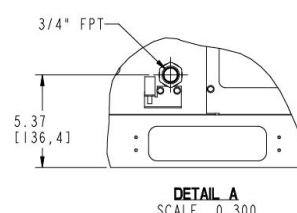
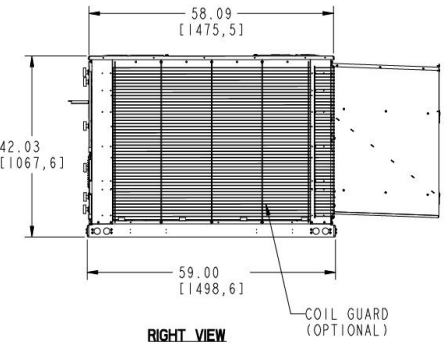
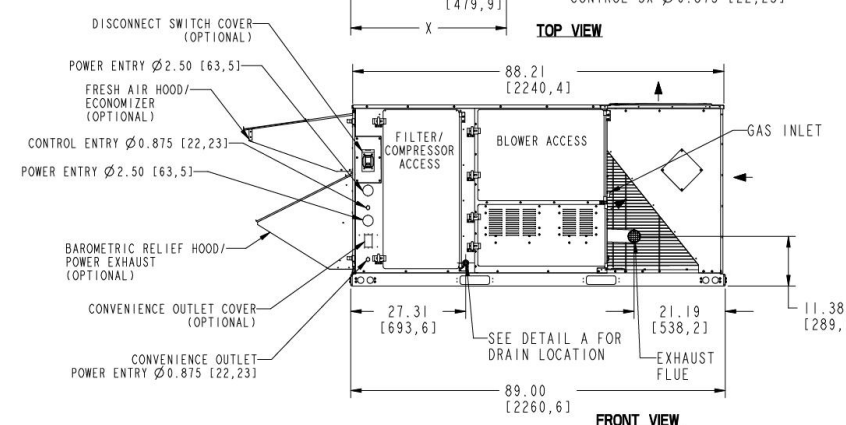
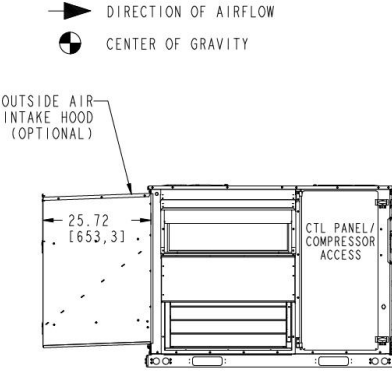
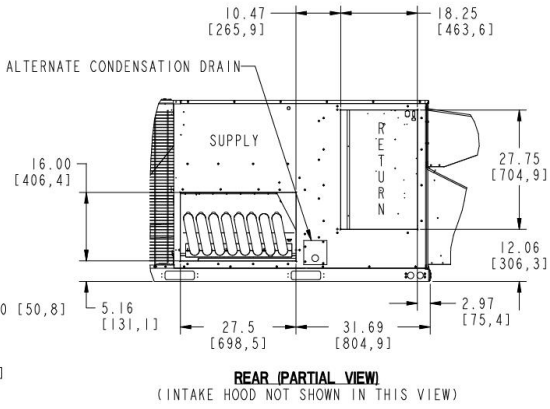
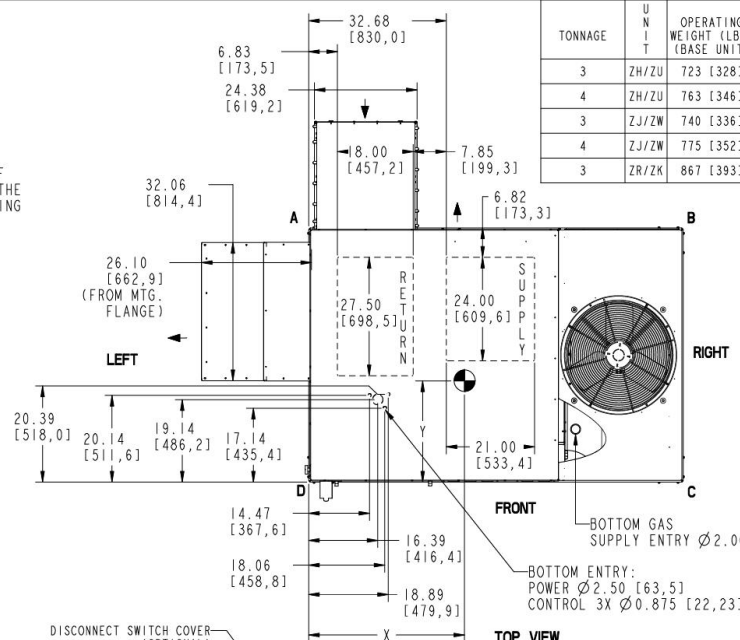
Unit Model #: **ZJ049N08B2B1ACA3A2**

Quantity: **1** Tag #: **ACU-3**

Consolidated Drawing

- NOTES:**
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 - 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.
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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
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REV	DATE	REVISION RECORD
A	02-11-20	NEW DRAWING (FROM UST-PRED-10DF42H)

EC NO	DR	CK	ENG	THIRD ANGLE PROJECTION
75768	LOP	RCH	SAA	

NAME	DATE
DRN L. PACKARD	02-11-20
CHK R. MADAD	02-11-20
ENG S. AYENI	02-11-20
MFG	

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DRAWING PER ASME Y14.5-2009

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 TWO PLACE DECIMAL = ± .03
 THREE PLACE DECIMAL = ± .010
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 DIMENSIONS ARE IN INCHES
 DO NOT SCALE PRINT

SAFETY AND KEY CHARACTERISTICS PER BE-209-STD-01	TYPE	ENG SPEC	NOT APPLICABLE
	SUBMITTAL DWG, PRO, STD FLAT COIL, 1 ODF, 42" CAB		
	JOHNSON CONTROLS UNITARY PRODUCTS GROUP NORMAN, OK 73069		
	DWG NO. 5883781		
	REV A		

Project Name: **OSU Dryden Hall**
Roofing

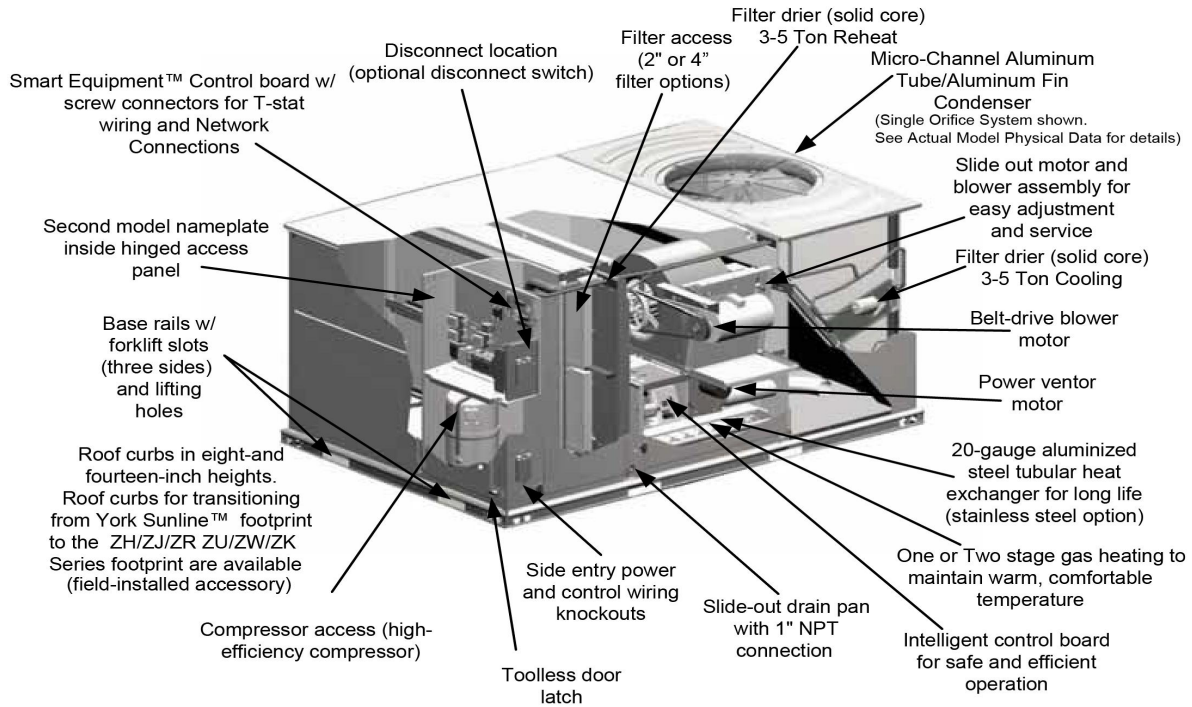
Unit Model #: **ZJ049N08B2B1ACA3A2**

Quantity: 1 Tag #: **ACU-3**

Component Locations

Component Location

Cooling With Gas Heat (3 Through 5 Ton)



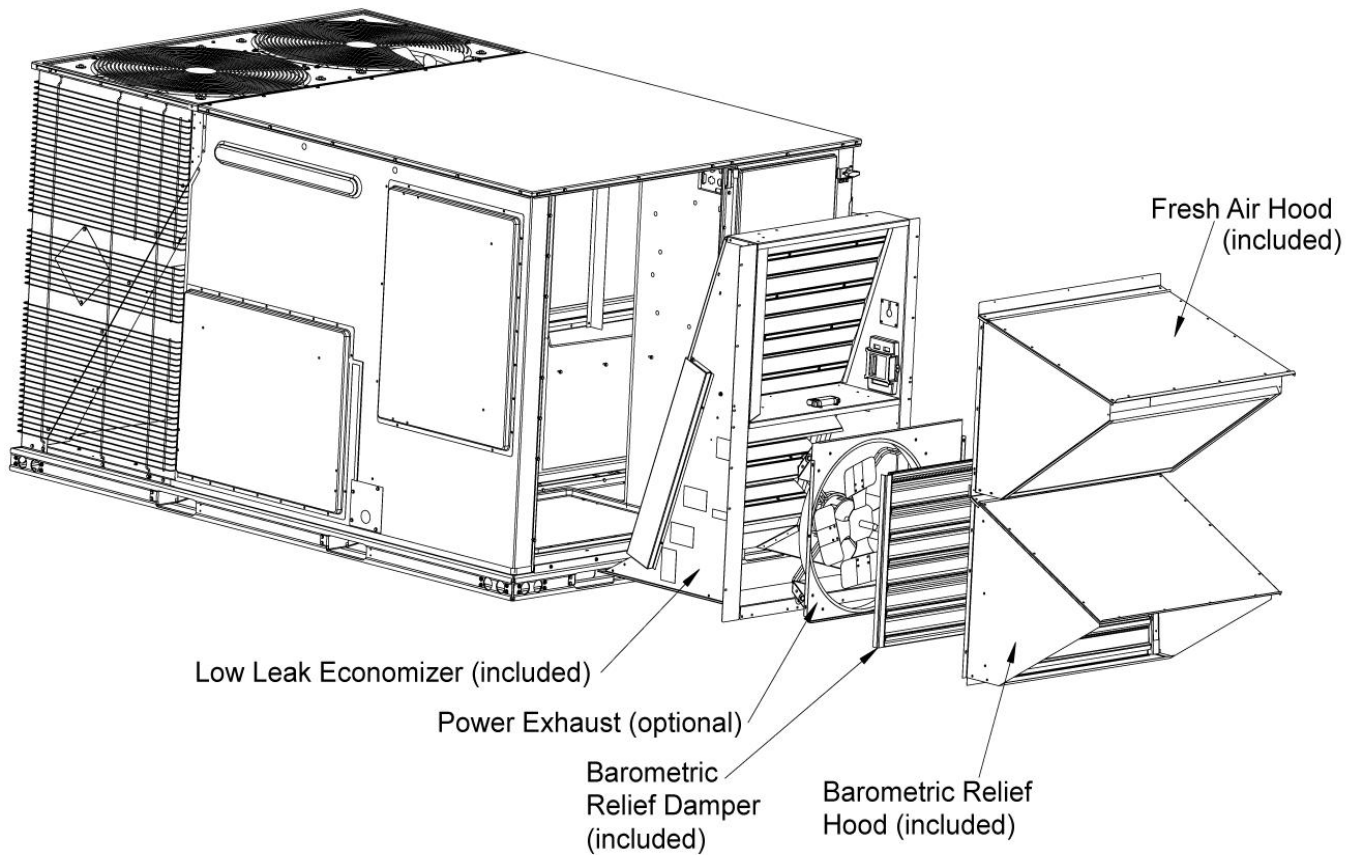
Project Name: **OSU Dryden Hall**
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Unit Model #: **ZJ049N08B2B1ACA3A2**

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Low Leak Downflow Economizer

Low Leak Downflow Economizer (shown with optional Power Exhaust)



Low leak economizers are capable achieving low leakage rates of 3 cfm/sq. ft at 1" of static pressure, meeting or exceeding the following standards:

- ASHRAE 90.1-2010
- ASHRAE 62
- AMCA 511 (licensed as Class 1A damper)
- International Energy Conservation Code (IECC)
- California Title 24

The outdoor intake opening shall be covered with a rain hood that matches the exterior of the unit. Water eliminator/filters shall be provided.

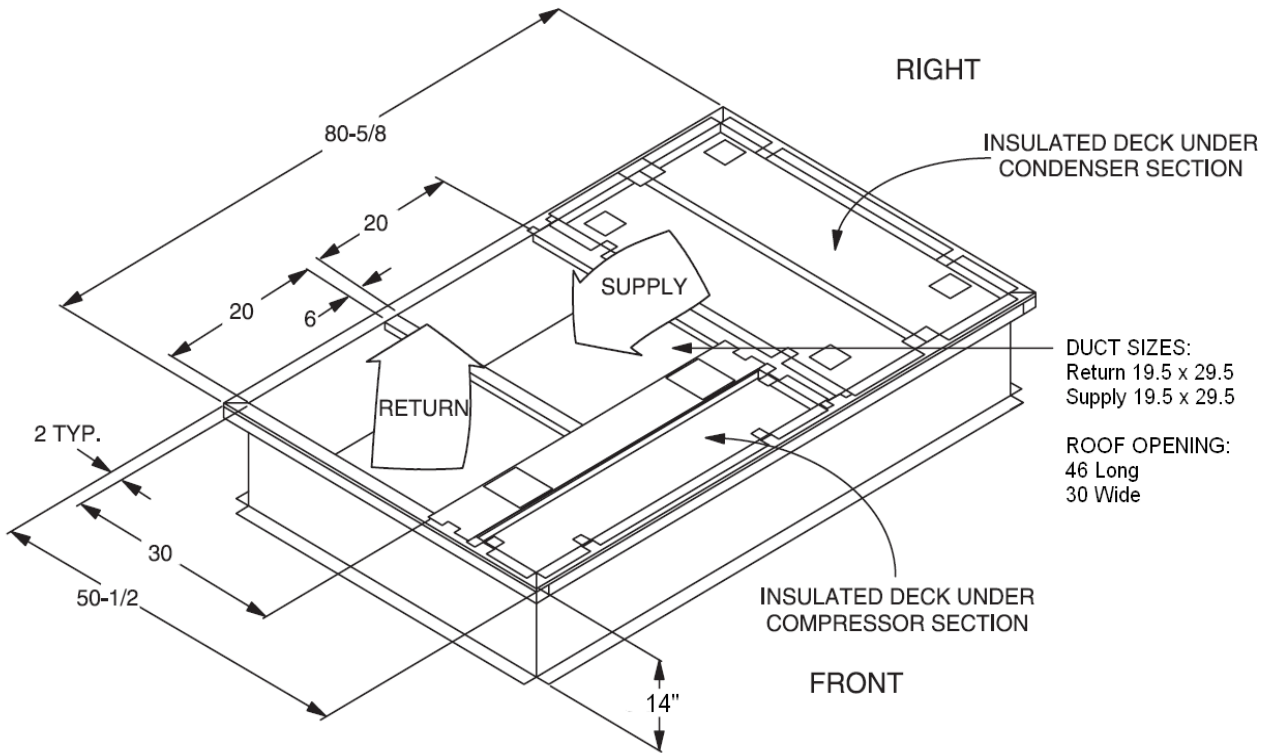
Simultaneous economizer/compressor operation is also possible. Dampers shall fully close on power loss.

Project Name: **OSU Dryden Hall**
Roofing

Unit Model #: **ZJ049N08B2B1ACA3A2**

Quantity: 1 Tag #: **ACU-3**

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

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ037N08D2B1ACA3A3**

Quantity: **2** Tag #: **ACU-5,A**

System: **ZJ037N08D2B1ACA3A3**

Cooling Performance

Total gross capacity	37.6 MBH
Sensible gross capacity	26.6 MBH
Total net capacity	35.8 MBH
Sensible net capacity	24.8 MBH
Seasonal Efficiency (at ARI)	14.50 SEER
Efficiency (at ARI)	12.20 EER
Ambient DB temp.	95.0 °F
Entering DB temp.	80.0 °F
Entering WB temp.	67.0 °F
Leaving DB temp.	59.5 °F
Leaving WB temp.	57.1 °F
Leaving air temp dew point	55.60 °F
Power input (w/o blower)	2.30 kW
Sound power	73 dB(A)

Refrigerant

Refrigerant type	R-410A
Sys1	6 lbs 8 oz

Gas Heating Performance

Entering DB temp.	60 °F
Heating output capacity (Max)	65 MBH
Supply air	1200 CFM
Heating input capacity (Max)	80 MBH
Leaving DB temp.	110.2 °F
Air temp. rise	50.2 °F
SSE	81.0 %
Stages	2

Supply Air Blower Performance

Supply air	1200 CFM
Ext. static pressure	0.75 IWG
Addl. Unit Losses (Options/Accessories)	0.04 IWG
Blower speed	846 RPM
Max BHP of Motor (including service factor)	1.73 HP
Duct location	Bottom
Motor rating	1.50 HP
Actual required BHP	.58 HP
Power input	0.54 kW
Elevation	0 ft.
Drive type	BELT

Electrical Data

Power supply	208-3-60	230-3-60
Unit min circuit ampacity	18.4 Amps	18.4 Amps
Unit max over-current protection	25 Amps	25 Amps

Dimensions & Weight

Hgt	42 in.	Len	89 in.	Wth	59 in.
Weight with factory installed options	925 lbs.				

Clearances

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

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



3 Ton

- Fraser Johnston units are manufactured at an ISO 9001 registered facility and each rooftop is completely computer-run tested prior to shipment.

Unit Features

- Single Stage Cooling
- 80 MBH Input Aluminized Steel, Two Stage Gas Heat
- Full perimeter base rails with built in rigging capabilities
- Unit Cabinet Constructed of Powder Painted Steel, Certified At 750 Hours Salt Spray Test (ASTM B-117 Standards)
- Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511).
- Slide-Out Blower/1.5 HP Belt Drive Motor Assembly
- Unit Ships with 4" Pleated Filters (MERV 13)
- Solid Core Liquid Line Filter Driers
- Replacement Filters: 4 - (24" x 16"). Unit accepts 2" or 4" wide filters.
- Single Point Power Connection
- Short Circuit Current: 5kA RMS Symmetrical
- Through-the-Curb and Through-the-Base Utility Connections
- Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil
- Composite Drain Pan - Front Connection
- Tool-free maintenance with features like hinged doors for all-access panels, slide-out blower and blower motor tray

Standard Unit Controller: Smart Equipment 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.

Warranty

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

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ037N08D2B1ACA3A3**

Quantity: **2** Tag #: **ACU-5,A**

System: **ZJ037N08D2B1ACA3A3**

Additional Electrical Data

Power supply	208-3-60
Unit min circuit ampacity	18.4 Amps
Unit max over-current protection	25 Amps
Min Voltage	187 V
Max Voltage	252 V
Comp #1 RLA	9.2
Comp #1 LRA	70.0
Indoor Mtr Voltage	208-3-60
Indoor Mtr FLA	5.2
Outdoor Mtr Qty	1
Outdoor Fan Voltage	208-1-60
OD Fan Mtr FLA (ea.)	1.65
Power Ex Mtr Qty	1
Powered Ex Voltage	208-1-60
Power Ex Mtr FLA (ea)	5.5

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ037N08D2B1ACA3A3**

Quantity: **2** Tag #: **ACU-5,A**

System: **ZJ037N08D2B1ACA3A3**

Factory Installed Options

ZJ037N08D2B1ACA3A3

Equipment Options	Option(s) Selected
Product Category:	ZJ Single Packaged R-410A Air Conditioner, High Efficiency 14.50 SEER / 12.20 EER
Nominal Cooling Capacity:	037 3 Ton Single Stage Cooling
Heat Type and Nominal Heat Capacity:	N08 80 MBH Input Aluminized Steel, Two Stage Gas Heat
Blower Option:	D 1.5 HP High Static Belt Drive Blower
Voltage:	2 208/230-3-60
Outside Air Option:	B Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511).
Service Options:	1
Sensor Options:	A
Controls:	C Smart Equipment Controller including Discharge Air, Return Air, and Outdoor Air Temperature Sensors. BACNet MS/TP, Modbus and N2 Communication Card.
Refrigeration:	A Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil
Additional Options:	3 4" Pleated Filters (MERV 13)
Cabinet Options:	A Composite Drain Pan - Front Connection
Product Generation:	3

Field Installed Accessories

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> <input type="radio"/> 1BD0408 - Burglar Bars (32.0 lbs) <input type="radio"/> 1CG0428 - Coil Guard (20.0 lbs) <input type="radio"/> 1CV0402 - Concentric Diffuser, Flush Mount, 18RD <input type="radio"/> 1CV0411 - Concentric Diffuser, Side Discharge, 18RD (55.0 lbs) <input type="radio"/> 1CV0419 - Concentric Diffuser, Specialty, 18X18 <input type="radio"/> 1FE0412 - Flue Exhaust Extension Kit (14.0 lbs) <input type="radio"/> 1FF0415 - 2" Only metal Filter Frame Kit (16.0 lbs) | <ul style="list-style-type: none"> <input type="radio"/> 1GP0405 - Gas Piping Kit for Bottom Gas Supply Connection with External Shut-Off (includes: Internal gas pipe, fittings, gas cock & panel gaskets) (10.0 lbs) <input type="radio"/> 1HA0450 - High Altitude Kit for Natural Gas - For applications between 2000 and 6000 feet altitude (1.0 lbs) <input type="radio"/> 1HA0452 - High Altitude Kit for Propane - For applications between 2000 and 6000 feet altitude (1.0 lbs) | <ul style="list-style-type: none"> <input type="radio"/> 1HG0415 - Hail Guard Kit-Diamond Pattern (50.0 lbs) <input type="radio"/> 1HG0431 - Hail Guard Kit-Provent Style (20.0 lbs) <input type="radio"/> 1LN0407 - Low NOx Kit <input type="radio"/> 1NP0460 - Natural Gas to Propane Conversion Kit <input type="radio"/> 1RC0470 - Roof Curb - 8" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs) |
|---|---|---|

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ037N08D2B1ACA3A3**

Quantity: **2** Tag #: **ACU-5,A**

System: **ZJ037N08D2B1ACA3A3**

- 1RC0471 - Roof Curb - 14" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs)
- 1RC0476 - Roof Curb - 24" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs)
- 1WC0412 - Wooden Crate (445.0 lbs)
- 2AP0402 - Air Proving Switch (1.0 lbs)
- 2AQ04700524 - CO² Space Sensor - Wall Mount Accessory (5.0 lbs)
- 2AQ04700624 - CO² Unit Mount Accessory (4.6 lbs)
- 2EC0401 - Kit, Single Enthalpy Field Installed (1.0 lbs)
- 2EC0402 - Kit, Dual Enthalpy Field Installed (Includes two humidity sensors) (1.0 lbs)
- 2LA04702412 - Low Ambient Kit - ICM 333 (2.2 lbs)
- 2PE04704706 - Power Exhaust 230V without Baro Relief Downflow or Horizontal (19.0 lbs)
- 2SD04700824 - Smoke Detector Kit w/ Mounting Hardware for Supply Air (Horizontal/Downflow) Only (9.4 lbs)
- 2SD04700924 - Smoke Detector Kit w/ Mounting Hardware for Return Air (Downflow Only) Only (10.0 lbs)
- 2SD04701024 - Smoke Detector Kit w/ Mounting Hardware for Supply (Horizontal/Downflow) and Return Air (Downflow Only) (8.0 lbs)
- S1-02812384700 - Blower Sheave AK54 High Static Field Installed Drive (2.0 lbs)
- S1-03102529100 - Non-Networking Wall Sensor – Allows remote sensing and control from single or multiple zones. (0.0 lbs)
- S1-03102529104 - Non-Networking Wall Sensor with Over-ride button – Allows remote sensing and control from single or multiple zones. Override allows setpoint to be overridden for 2 hour time period. (0.2 lbs)
- S1-03102529106 - Non-Networking Wall Sensor with Setpoint Adjustment and Over-ride Button – Allows remote sensing and control from single or multiple zones. Allows setpoint to be adjusted ± 5° F. Override allows setpoint to be overridden for 2 hour time period. (0.2 lbs)
- S1-ADDWIRE - Add-a-Wire allows 5-wire thermostats to use only 4 wires. (0.3 lbs)
- S1-CTS DTS - CTS Wired Temperature Sensor for thermostat | Duct *Also works for LX Series (0.3 lbs)
- S1-CTS HTS - CTS Hardwired Temperature Sensor for CTS Thermostats *Works with LX series as well (0.2 lbs)
- S1-CTS PLATE - Wall Plate for CTS Thermostats *Also works for new platform LX series models below (0.0 lbs)
- S1-CTS WFTS - CTS Temperature Sensor with WiFi for CTS Thermostats *Also works with LX Series (0.1 lbs)
- S1-LX LOCK - Locking Ring For LX-Series Thermostats (0.4 lbs)
- S1-LX PLATE - Wall Plate For LX-Series Thermostats (0.0 lbs)
- S1-LX WFM - For LX Series Thermostats - WiFi Communication (1.0 lbs)
- S1-MP-PRTKIT-0P - MAP (Multiple Access Portal) Gateway Kit- Replacement MAP gateway protective case, lanyard and communication cable. Use only to replace worn or damaged components. (0.3 lbs)
- S1-NSB8BHN041-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, No Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN043-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, No Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN141-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Warmer/Cooler Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN143-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Warmer/Cooler Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN240-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, WHITE, JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN241-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN243-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BPN240-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, WHITE, JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BPN241-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BPN243-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN041-0 - Wall Temperature Sensor, No Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN043-0 - Wall Temperature Sensor, No Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
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Project Name: **OSU Dryden Hall Roofing**

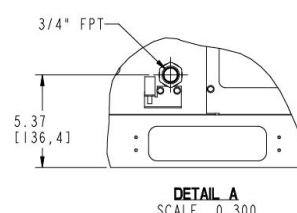
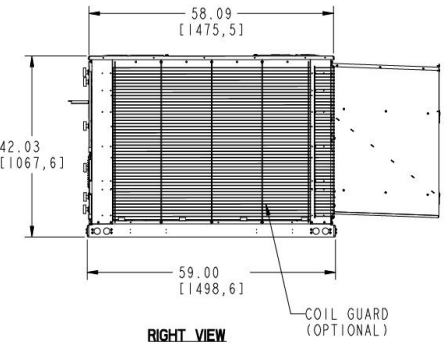
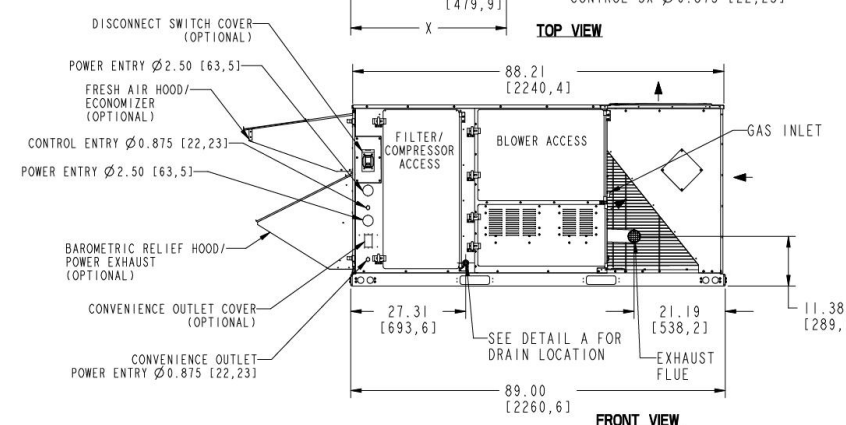
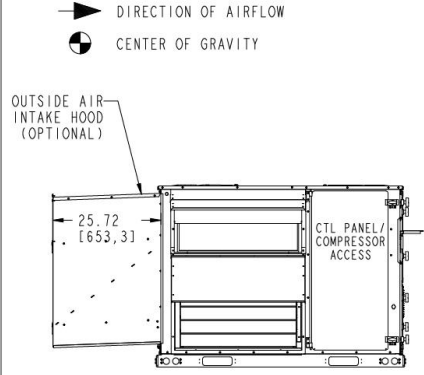
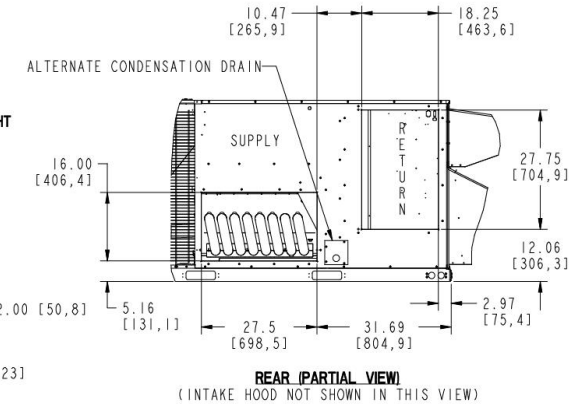
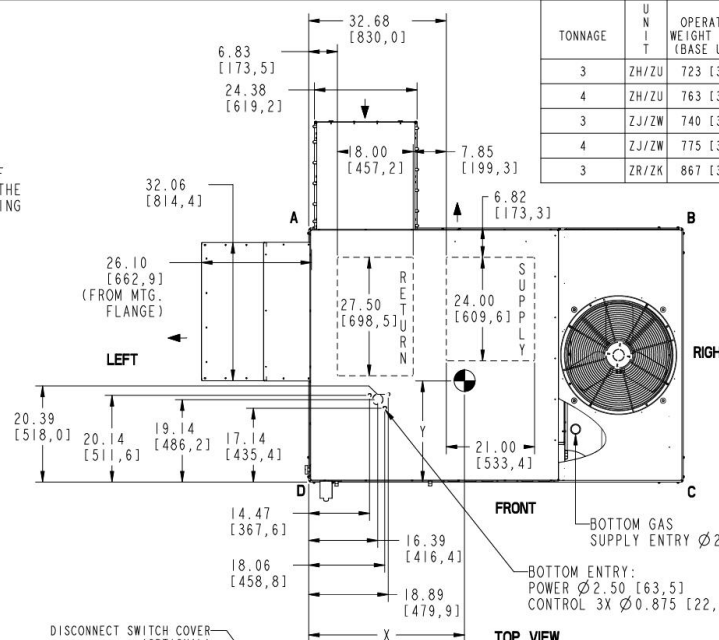
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EC NO	DR	CK	ENG	THIRD ANGLE PROJECTION
75768	LOP	RCH	SAA	

NAME	DATE
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CHK R. HADDAD	02-11-20
ENG S. AYENI	02-11-20
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DRAWING PER ASME Y14.5-2009

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SUBMITTAL DWG, PRO, STD FLAT COIL, 1 ODF, 42" CAB

JOHNSON CONTROLS
UNITARY PRODUCTS GROUP
NORMAN, OK 73069

SAFETY AND KEY CHARACTERISTICS PER BE-209-STD-01	TYPE	ENG SPEC	NOT APPLICABLE
	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
DWG NO. 5883781	REV A		
SHT NO. 1 OF 1			

Project Name: **OSU Dryden Hall**
Roofing

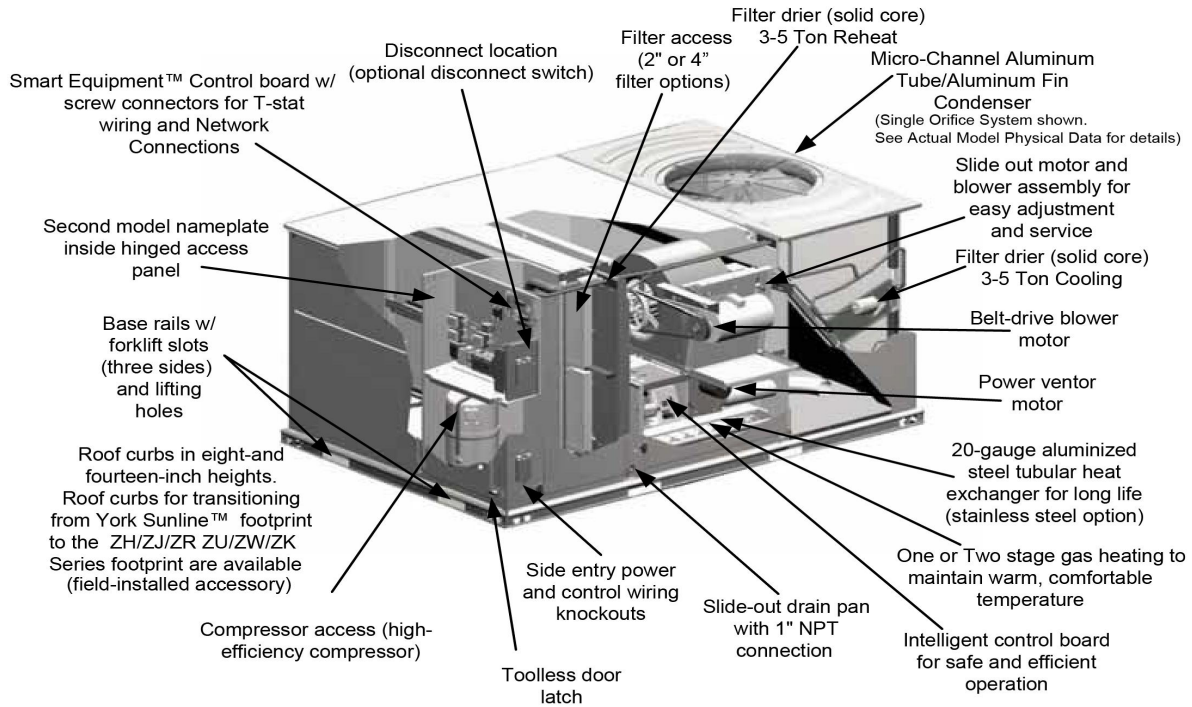
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Quantity: 2 Tag #: **ACU-5,A**

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Component Location

Cooling With Gas Heat (3 Through 5 Ton)



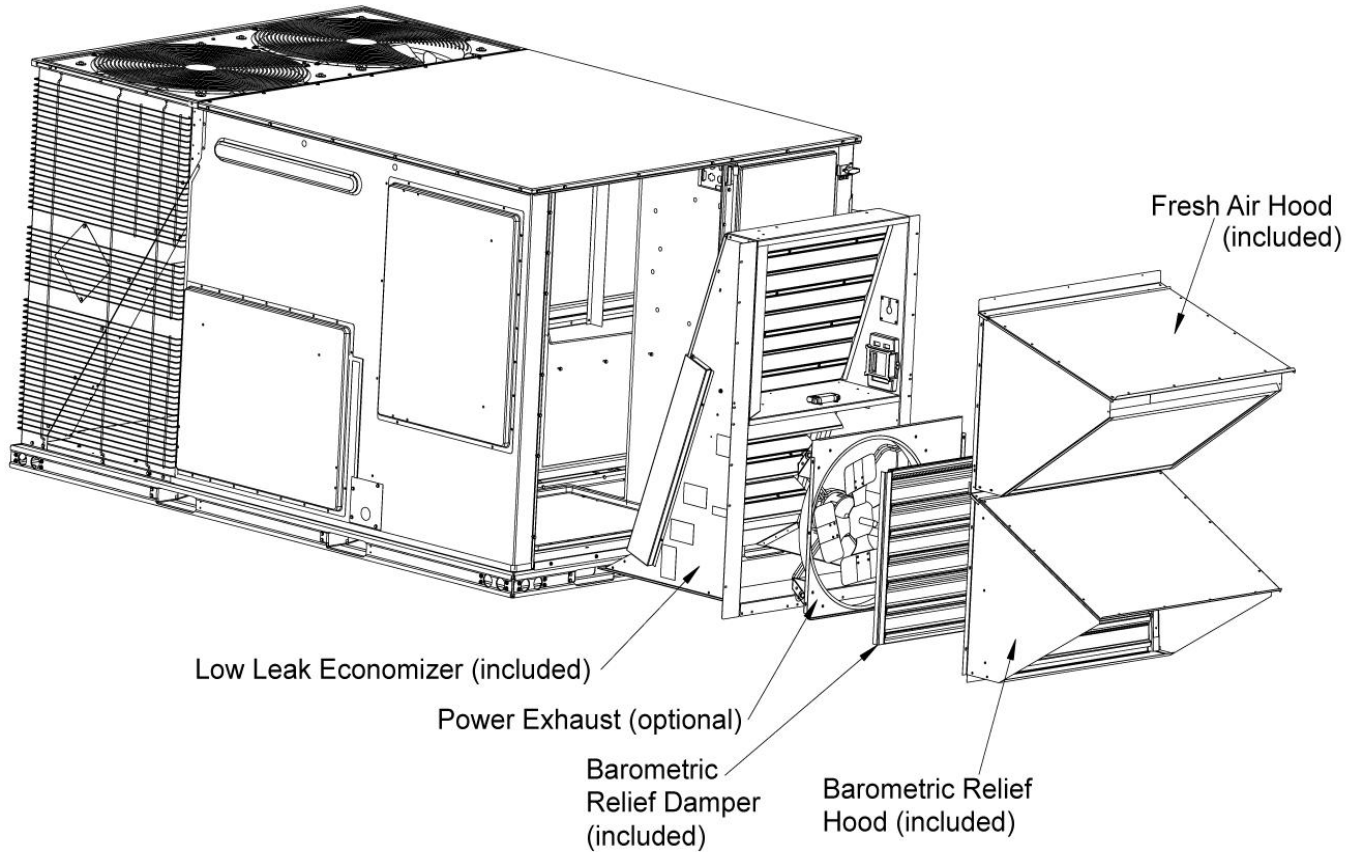
Project Name: OSU Dryden Hall
Roofing

Unit Model #: ZJ037N08D2B1ACA3A3

Quantity: 2 Tag #: ACU-5,A

Low Leak Downflow Economizer

Low Leak Downflow Economizer (shown with optional Power Exhaust)



Low leak economizers are capable achieving low leakage rates of 3 cfm/sq. ft at 1" of static pressure, meeting or exceeding the following standards:

- ASHRAE 90.1-2010
- ASHRAE 62
- AMCA 511 (licensed as Class 1A damper)
- International Energy Conservation Code (IECC)
- California Title 24

The outdoor intake opening shall be covered with a rain hood that matches the exterior of the unit. Water eliminator/filters shall be provided.

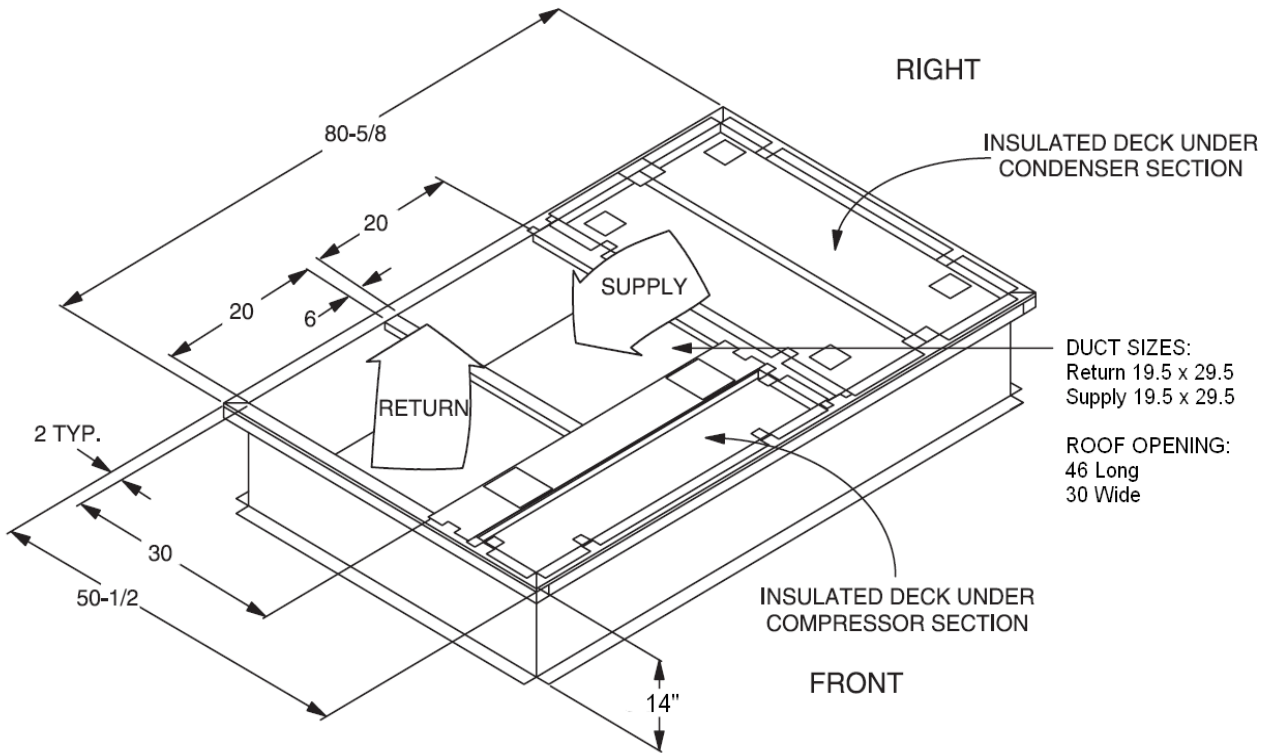
Simultaneous economizer/compressor operation is also possible. Dampers shall fully close on power loss.

Project Name: **OSU Dryden Hall**
Roofing

Unit Model #: **ZJ037N08D2B1ACA3A3**

Quantity: **2** Tag #: **ACU-5,A**

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

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ102N18D2B1ACA3A2**

Quantity: **1** Tag #: **ACU-6**

System: **ZJ102N18D2B1ACA3A2**

Cooling Performance

Total gross capacity	105.2 MBH
Sensible gross capacity	73.4 MBH
Total net capacity	98.1 MBH
Sensible net capacity	66.3 MBH
Efficiency (at ARI)	12.00 EER
Integrated eff. (at ARI)	13.00 IEER
Ambient DB temp.	95.0 °F
Entering DB temp.	80.0 °F
Entering WB temp.	67.0 °F
Leaving DB temp.	58.8 °F
Leaving WB temp.	56.5 °F
Leaving air temp dew point	55.00 °F
Power input (w/o blower)	6.75 kW
Sound power	92 dB(A)

Refrigerant

Refrigerant type	R-410A
Sys1	8 lbs 2 oz
Sys2	7 lbs 14 oz

Gas Heating Performance

Entering DB temp.	60 °F
Heating output capacity (Max)	144 MBH
Supply air	3200 CFM
Heating input capacity (Max)	180 MBH
Leaving DB temp.	101.7 °F
Air temp. rise	41.7 °F
SSE	80.0 %
Stages	2

Supply Air Blower Performance

Supply air	3200 CFM
Ext. static pressure	1.0 IWG
Addl. Unit Losses (Options/Accessories)	0.59 IWG
Blower speed	1135 RPM
Max BHP of Motor (including service factor)	3.45 HP
Duct location	Bottom
Motor rating	3.00 HP
Actual required BHP	2.22 HP
Power input	2.07 kW
Elevation	0 ft.
Drive type	BELT
Requires field-supplied drive	true

Electrical Data

Power supply	208-3-60	230-3-60
Unit min circuit ampacity	48.3 Amps	48.3 Amps
Unit max over-current protection	60 Amps	60 Amps

Dimensions & Weight

Hgt	51 in.	Len	89 in.	Wth	59 in.
Weight with factory installed options	1245 lbs.				

Clearances

Right	12 in.	Front	36 in.	Rear	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

- Fraser Johnston units are manufactured at an ISO 9001 registered facility and each rooftop is completely computer-run tested prior to shipment.

Unit Features

- Two Stage Cooling
- 180 MBH Input Aluminized Steel, Two Stage Gas Heat
- Full perimeter base rails with built in rigging capabilities
- Unit Cabinet Constructed of Powder Painted Steel, Certified At 750 Hours Salt Spray Test (ASTM B-117 Standards)
- Scroll Compressor[s]
- Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511).
- Slide-out Blower/3 HP Belt Drive Motor Assembly
- Unit Ships with 4" Pleated Filters (MERV 13)
- Solid Core Liquid Line Filter Driers
- Replacement Filters: 4 - (24" x 20"). Unit accepts 2" or 4" wide filters.
- Single Point Power Connection
- Short Circuit Current: 5kA RMS Symmetrical
- Through-the-Curb and Through-the-Base Utility Connections
- Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil
- Composite Drain Pan - Front Connection
- Tool-free maintenance with features like hinged doors for all-access panels, slide-out blower and blower motor tray

Standard Unit Controller: Smart Equipment 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.

Warranty

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



Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ102N18D2B1ACA3A2**

Quantity: **1** Tag #: **ACU-6**

System: **ZJ102N18D2B1ACA3A2**

Additional Electrical Data

Power supply	208-3-60
Unit min circuit ampacity	48.3 Amps
Unit max over-current protection	60 Amps
Min Voltage	187 V
Max Voltage	252 V
Comp #1 RLA	14.5
Comp #1 LRA	98
Comp #2 RLA	14.5
Comp #2 LRA	98
Indoor Mtr Voltage	208-3-60
Indoor Mtr FLA	9.6
Outdoor Mtr Qty	2
Outdoor Fan Voltage	208-1-60
OD Fan Mtr FLA (ea.)	3.0
Power Ex Mtr Qty	1
Powered Ex Voltage	208-1-60
Power Ex Mtr FLA (ea)	5.5
Combustion Mtr Qty	1
Combustion Motor Voltage	208/230-1-60
Combustion Mtr FLA (ea)	0.5

Project Name: OSU Dryden Hall Roofing

Unit Model #: ZJ102N18D2B1ACA3A2

Quantity: 1 Tag #: ACU-6

System: ZJ102N18D2B1ACA3A2

Factory Installed Options

ZJ102N18D2B1ACA3A2

Equipment Options	Option(s) Selected
Product Category:	ZJ Single Packaged R-410A Air Conditioner, High Efficiency 12.0 EER
Nominal Cooling Capacity:	102 8.5 Ton Two Stage Cooling
Heat Type and Nominal Heat Capacity:	N18 180 MBH Input Aluminized Steel, Two Stage Gas Heat
Blower Option:	D 3 HP High Static Belt Drive Blower
Voltage:	2 208/230-3-60
Outside Air Option:	B Dry Bulb Low Leak Economizer w/Barometric Relief and Hoods (Bottom or Horizontal End Return Only) with Economizer Fault Detection & Diagnostic (Meets ASHRAE 90.1-2013, IECC 2015, California Title 24, AMCA 511).
Service Options:	1
Sensor Options:	A
Controls:	C Smart Equipment Controller including Discharge Air, Return Air, and Outdoor Air Temperature Sensors. BACNet MS/TP, Modbus and N2 Communication Card.
Refrigeration:	A Micro-Channel "all-aluminum" condenser coil, Copper tube/aluminum fin evaporator coil
Additional Options:	3 4" Pleated Filters (MERV 13)
Cabinet Options:	A Composite Drain Pan - Front Connection
Product Generation:	2

Field Installed Accessories

- 1BD0408 - Burglar Bars (32.0 lbs)
- 1CG0420 - Coil Guard (27.0 lbs)
- 1CV0403 - Concentric Diffuser, Flush Mount, 20RD
- 1CV0404 - Concentric Diffuser, Flush Mount, 18X28
- 1CV0412 - Concentric Diffuser, Side Discharge, 20RD
- 1CV0413 - Concentric Diffuser, Side Discharge, 18X28
- 1CV0420 - Concentric Diffuser, Specialty, 24X24
- 1CV0426 - Concentric Diffuser, Specialty, 24X24
- 1FE0412 - Flue Exhaust Extension Kit (14.0 lbs)
- 1FF0414 - 2" Only Metal Filter Frame Kit (16.0 lbs)
- 1GP0405 - Gas Piping Kit for Bottom Gas Supply Connection with External Shut-Off (includes: Internal gas pipe, fittings, gas cock & panel gaskets) (10.0 lbs)
- 1HA0442 - High Altitude Kit for Natural Gas - For applications between 2000 and 6000 feet altitude (1.0 lbs)
- 1HA0443 - High Altitude Kit for Propane - For applications between 2000 and 6000 feet altitude (1.0 lbs)
- 1HG0411 - Hail Guard Kit-Diamond Pattern (37.0 lbs)
- 1HG0432 - Hail Guard Kit-Provent Style (25.0 lbs)
- 1NP0459 - Natural Gas to Propane Conversion Kit (2-Stage)

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ102N18D2B1ACA3A2**

Quantity: **1** Tag #: **ACU-6**

System: **ZJ102N18D2B1ACA3A2**

- 1RC0470 - Roof Curb - 8" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs)
- 1RC0471 - Roof Curb - 14" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs)
- 1RC0472 - Roof Curb, Transition-Sunline 7.5T thru 12.5T to Pro 3.0T thru 12.5T (Shipped Assembled) (200.0 lbs)
- 1RC0476 - Roof Curb - 24" High, Flat, Uninsulated, Full Perimeter (Shipped Knocked Down) (135.0 lbs)
- 1WC0412 - Wooden Crate (445.0 lbs)
- 2AP0402 - Air Proving Switch (1.0 lbs)
- 2AQ04700524 - CO² Space Sensor - Wall Mount Accessory (5.0 lbs)
- 2AQ04700624 - CO² Unit Mount Accessory (4.6 lbs)
- 2EC0401 - Kit, Single Enthalpy Field Installed (1.0 lbs)
- 2EC0402 - Kit, Dual Enthalpy Field Installed (Includes two humidity sensors) (1.0 lbs)
- 2LA04702412 - Low Ambient Kit - ICM 333 (2.2 lbs)
- 2PE04704706 - Power Exhaust 230V without Baro Relief Downflow or Horizontal (19.0 lbs)
- 2SD04700824 - Smoke Detector Kit w/ Mounting Hardware for Supply Air (Horizontal/Downflow) Only (9.4 lbs)
- 2SD04700924 - Smoke Detector Kit w/ Mounting Hardware for Return Air (Downflow Only) Only (10.0 lbs)
- 2SD04701024 - Smoke Detector Kit w/ Mounting Hardware for Supply (Horizontal/Downflow) and Return Air (Downflow Only) (8.0 lbs)
- S1-02815208000 - Blower Sheave for 8.5 and 10 Ton High Static Field Installed Drive (2.8 lbs)
- S1-03102529100 - Non-Networking Wall Sensor – Allows remote sensing and control from single or multiple zones. (0.0 lbs)
- S1-03102529104 - Non-Networking Wall Sensor with Over-ride button – Allows remote sensing and control from single or multiple zones. Override allows setpoint to be overridden for 2 hour time period. (0.2 lbs)
- S1-03102529106 - Non-Networking Wall Sensor with Setpoint Adjustment and Over-ride Button – Allows remote sensing and control from single or multiple zones. Allows setpoint to be adjusted ± 5° F. Override allows setpoint to be overridden for 2 hour time period. (0.2 lbs)
- S1-ADDWIRE - Add-a-Wire allows 5-wire thermostats to use only 4 wires. (0.3 lbs)
- S1-CTS DTS - CTS Wired Temperature Sensor for thermostat | Duct *Also works for LX Series (0.3 lbs)
- S1-CTS HTS - CTS Hardwired Temperature Sensor for CTS Thermostats *Works with LX series as well (0.2 lbs)
- S1-CTS PLATE - Wall Plate for CTS Thermostats *Also works for new platform LX series models below (0.0 lbs)
- S1-CTS WFTS - CTS Temperature Sensor with WiFi for CTS Thermostats *Also works with LX Series (0.1 lbs)
- S1-LX LOCK - Locking Ring For LX-Series Thermostats (0.4 lbs)
- S1-LX PLATE - Wall Plate For LX-Series Thermostats (0.0 lbs)
- S1-LX WFM - For LX Series Thermostats - WiFi Communication (1.0 lbs)
- S1-MP-PRTKIT-0P - MAP (Multiple Access Portal) Gateway Kit- Replacement MAP gateway protective case, lanyard and communication cable. Use only to replace worn or damaged components. (0.3 lbs)
- S1-NSB8BHN041-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, No Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN043-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, No Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN141-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Warmer/Cooler Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN143-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Warmer/Cooler Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN240-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, WHITE, JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN241-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BHN243-0 - Wall Temperature and 3% Relative Humidity Combined Sensor, Full Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BPN240-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, WHITE, JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BPN241-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BPN243-0 - Wall Temperature and 2% Relative Humidity Combined Sensor, Full Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN041-0 - Wall Temperature Sensor, No Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN043-0 - Wall Temperature Sensor, No Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ102N18D2B1ACA3A2**

Quantity: **1** Tag #: **ACU-6**

System: **ZJ102N18D2B1ACA3A2**

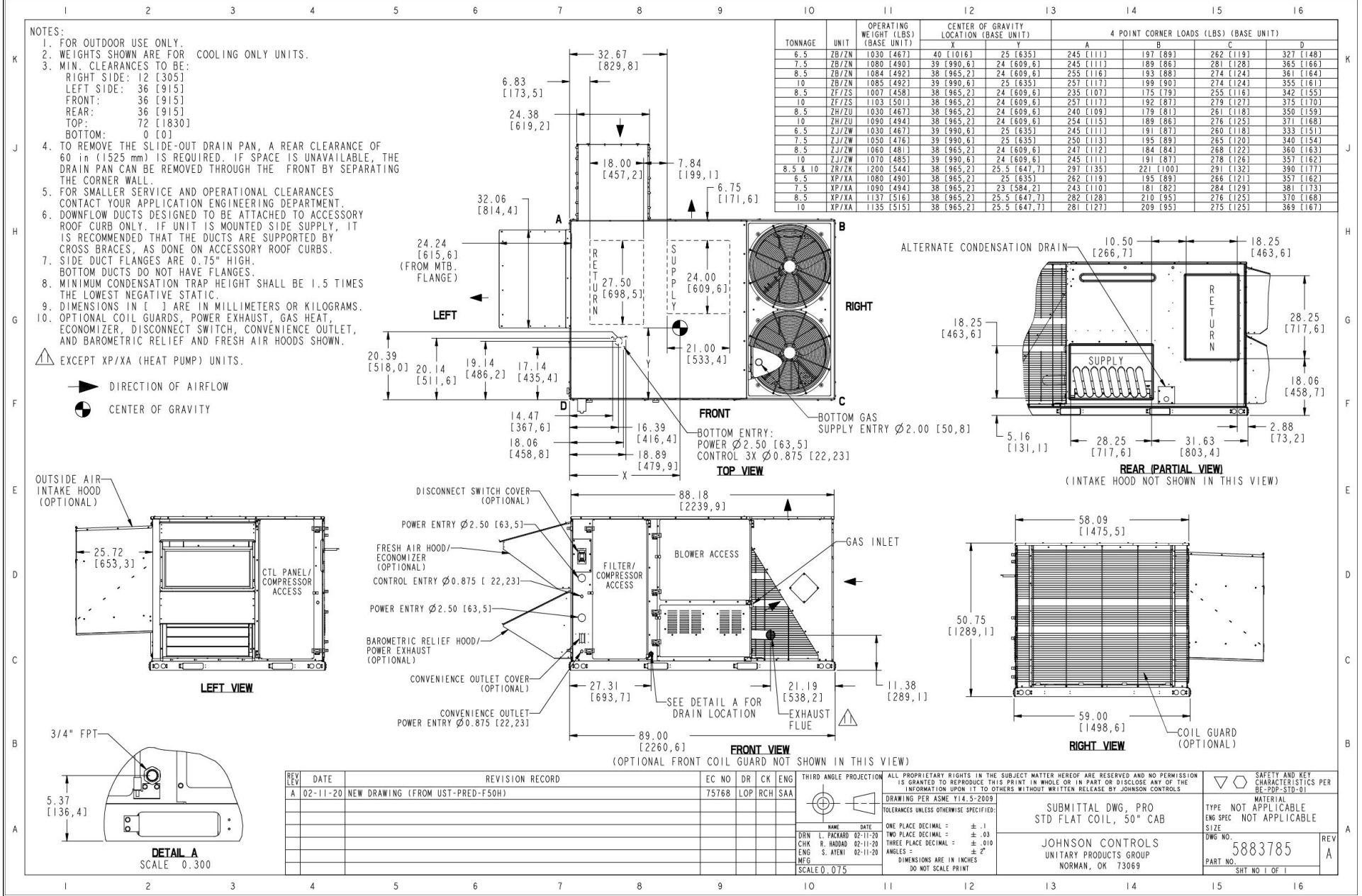
- S1-NSB8BTN141-0 - Wall Temperature Sensor, Warmer/Cooler Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN143-0 - Wall Temperature Sensor, Warmer/Cooler Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN240-0 - Wall Temperature Sensor, Full Display, WHITE, JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN241-0 - Wall Temperature Sensor, Full Display, WHITE, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-NSB8BTN243-0 - Wall Temperature Sensor, Full Display, BLACK, NO JCI LOGO, NS8000 Series (0.4 lbs)
- S1-TEC3030-14-000 - 7 DAY PROGRAMMABLE THERMOSTAT, ZIGBEE PRO WIRELESS COMMUNICATION, RTU/HEAT PUMP WITH ECON,FULL COLOR, WHITE, JCI LOGO (0.8 lbs)
- S1-TEC3030-16-000 - 7 DAY PROGRAMMABLE THERMOSTAT, ZIGBEE PRO WIRELESS COMMUNICATION, RTU/HEAT PUMP WITH ECON, AND FULL COLOR, WHITE, NO LOGO (0.8 lbs)
- S1-TEC3031-14-000 - 7 DAY PROGRAMMABLE THERMOSTAT, ZIGBEE PRO WIRELESS COMMUNICATION, RTU/HEAT PUMP WITH ECON, OCC SENSOR, FULL COLOR, WHITE, JCI LOGO (0.8 lbs)
- S1-TEC3031-16-000 - 7 DAY PROGRAMMABLE THERMOSTAT, ZIGBEE PRO WIRELESS COMMUNICATION, RTU/HEAT PUMP WITH ECON, OCC SENSOR, FULL COLOR, WHITE, NO LOGO (0.8 lbs)
- S1-TEC3630-14-000 - 7 DAY PROGRAMMABLE THERMOSTAT, OPTIONAL MSTP OR N2 COMMUNICATION, RTU/HEAT PUMP WITH ECON,FULL COLOR, WHITE, JCI LOGO (0.8 lbs)
- S1-TEC3630-16-000 - 7 DAY PROGRAMMABLE THERMOSTAT, OPTIONAL MSTP OR N2 COMMUNICATION, RTU/HEAT PUMP WITH ECON,FULL COLOR, WHITE, NO LOGO (0.8 lbs)
- S1-TEC3631-14-000 - 7 DAY PROGRAMMABLE THERMOSTAT, OPTIONAL MSTP OR N2 COMMUNICATION, RTU/HEAT PUMP WITH ECON, OCC SENSOR, FULL COLOR, WHITE, JCI LOGO (0.8 lbs)
- S1-TEC3631-16-000 - 7 DAY PROGRAMMABLE THERMOSTAT, OPTIONAL MSTP OR N2 COMMUNICATION, RTU/HEAT PUMP WITH ECON, OCC SENSOR, FULL COLOR, WHITE, NO LOGO (0.8 lbs)
- S1-YK-MAP1810-0P - MAP (Multiple Access Portal) Gateway- For use with SimplicitySE Control. (0.2 lbs)
- S1-YK-MAP1810-0S - Stationary MAP Gateway (Includes MAP Gateway, Field Bus Adapter, Mounting Bracket and 100 to 240 VAC Power Supply). US-compatible counties. (1.9 lbs)
- S1-A52 - Belt for 8.5 and 10 Ton High Static Field Installed Drive (0.4 lbs)

Project Name: **OSU Dryden Hall Roofing**

Unit Model #: **ZJ102N18D2B1ACA3A2**

Quantity: **1** Tag #: **ACU-0**

Consolidated Drawing



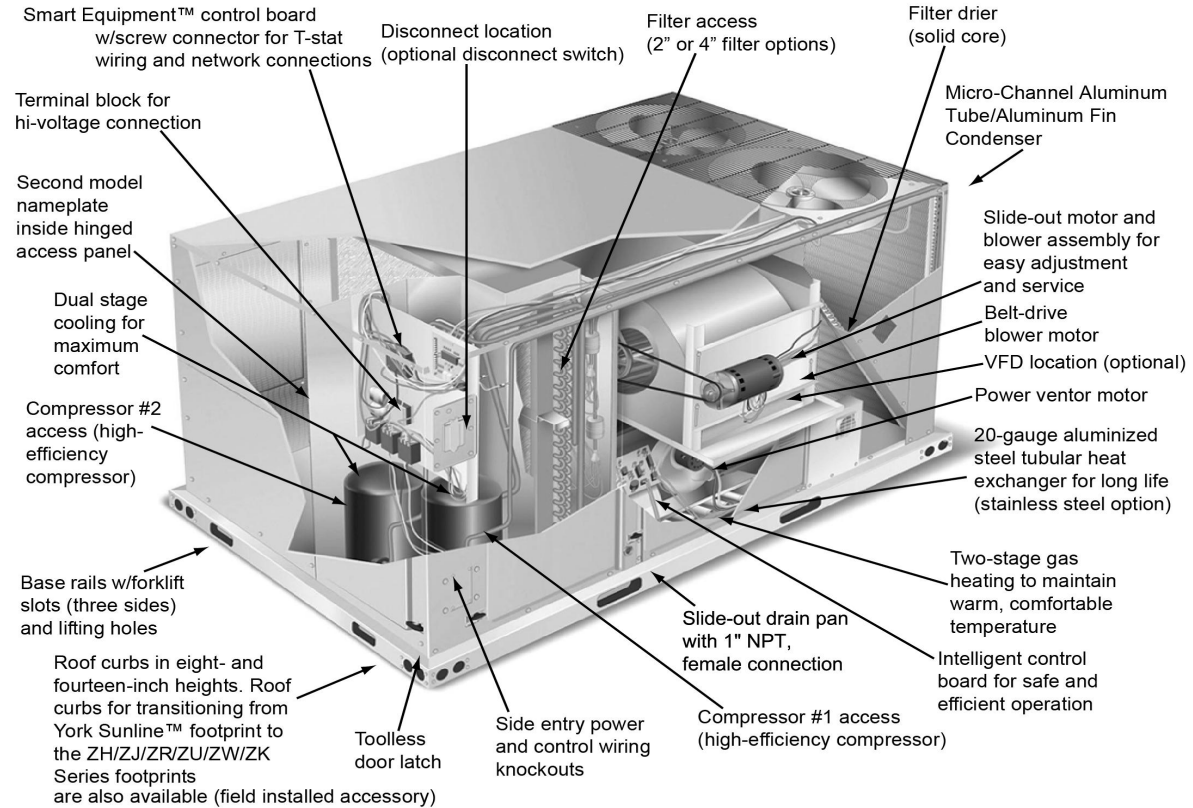
Project Name: **OSU Dryden Hall**
Roofing

Unit Model #: **ZJ102N18D2B1ACA3A2**

Quantity: 1 Tag #: **ACU-6**

Component Locations

Cooling With Gas Heat (6.5 Through 10 Tons)



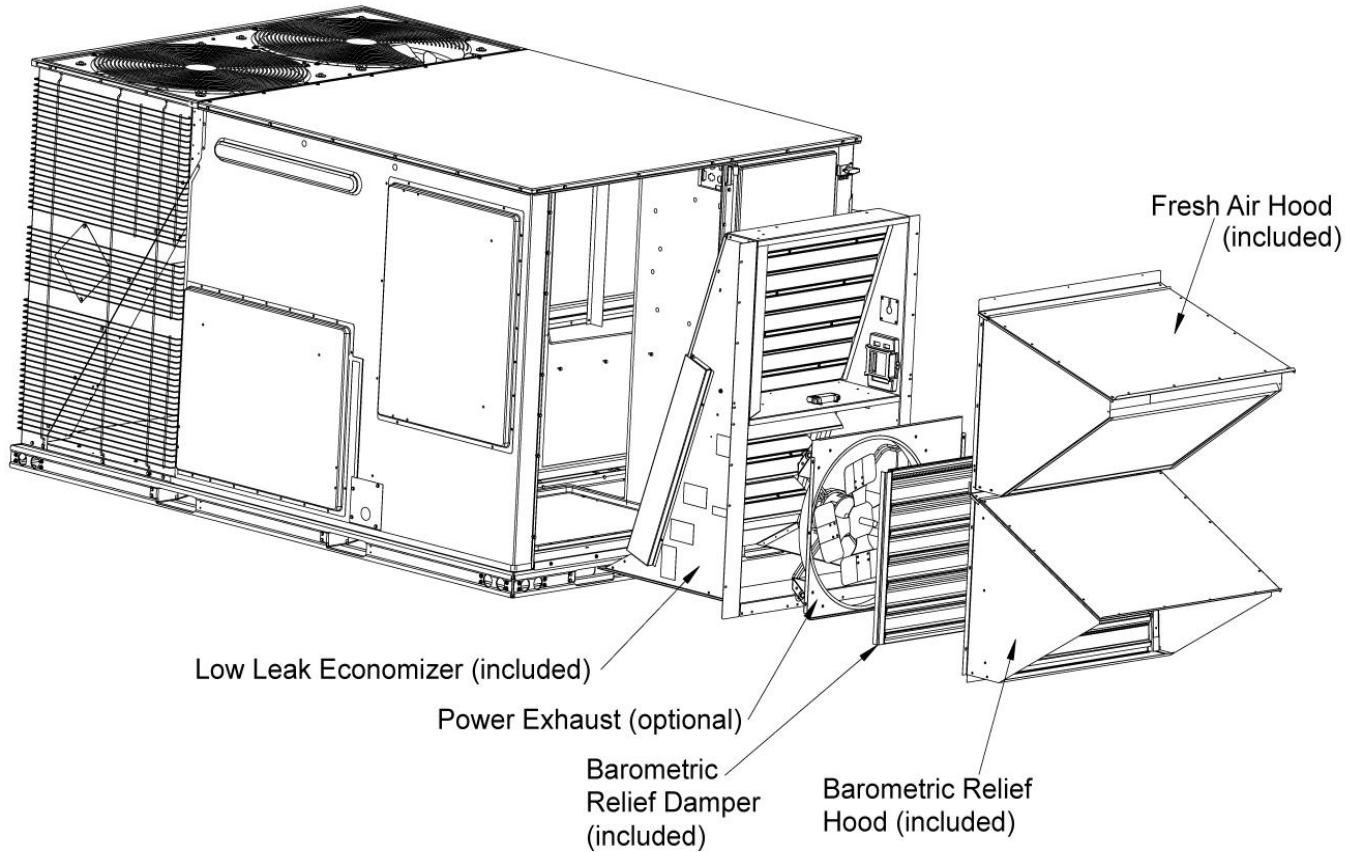
Project Name: OSU Dryden Hall
Roofing

Unit Model #: ZJ102N18D2B1ACA3A2

Quantity: 1 Tag #: ACU-6

Low Leak Downflow Economizer

Low Leak Downflow Economizer (shown with optional Power Exhaust)



Low leak economizers are capable achieving low leakage rates of 3 cfm/sq. ft at 1" of static pressure, meeting or exceeding the following standards:

- ASHRAE 90.1-2010
- ASHRAE 62
- AMCA 511 (licensed as Class 1A damper)
- International Energy Conservation Code (IECC)
- California Title 24

The outdoor intake opening shall be covered with a rain hood that matches the exterior of the unit. Water eliminator/filters shall be provided.

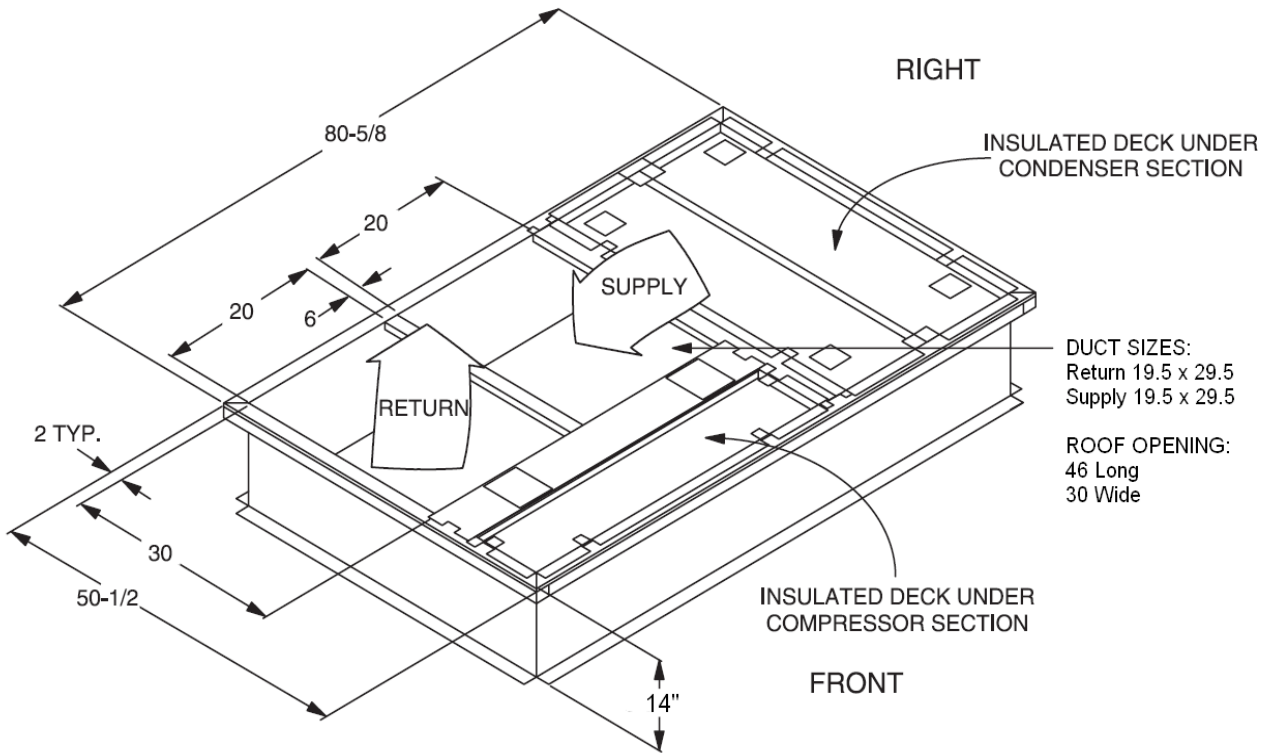
Simultaneous economizer/compressor operation is also possible. Dampers shall fully close on power loss.

Project Name: **OSU Dryden Hall**
Roofing

Unit Model #: **ZJ102N18D2B1ACA3A2**

Quantity: 1 Tag #: **ACU-6**

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

11/10/2021

Project Name

OSU Dryden Hall Roofing

Project Number**Client / Purchaser**

Guide Specification Summary Page

Product Series	Models and Unit Tags	
3-12.5 Fraser-Johnston® Relia™ Pro	ZJ078N12D2B1ACA3A2	ACU-1,4
	ZJ090N18D2B1ACA3A2	ACU-2
	ZJ049N08B2B1ACA3A2	ACU-3
	ZJ037N08D2B1ACA3A3	ACU-5,A
	ZJ102N18D2B1ACA3A2	ACU-6

GENERAL

Fraser-Johnston® Relia™ Pro units are convertible single packages with a common footprint cabinet and common roof curb for all 3 through 12-1/2 ton models. All 6-1/2 through 12-1/2 ton 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. Predator® units are available in the following configurations: cooling only, cooling with electric heat, cooling with gas heat, reheat only, reheat with electric heat and reheat with gas 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 a 750-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.

INDOOR (EVAPORATOR) FAN ASSEMBLY

Fan shall be a belt drive assembly and include an adjustable pitch motor pulley. Job site selected brake horsepower shall not exceed the motors nameplate horsepower rating plus the service factor. Units shall be designed to operate within the service factor. Fan wheel shall be double inlet type with forward curve blades, dynamically balanced to operate smoothly throughout the entire range of operation. Airflow design shall be constant volume. Bearings shall be sealed and permanently lubricated for longer life and no maintenance. Entire blower assembly and motor shall be slide out design.

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 COMPONENTSCompressors:

- 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.
- 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.
- 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 6-1/2 through 12-1/2 ton 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 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 roll out switch (manual reset).
- d. Flame proving controls.
- e. 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, Elect. Heat Elem. – 5 Years, Parts – 1 Year.

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

- **DRY BULB 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 be designed to meet ASHRAE 90.1, AMCA 511 Class 1A damper, and the International Energy Conservation Code (IECC) certification requirements by achieving leakage rates of 3 CFM/sq. ft. at 1" of static pressure. 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.

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.
- **BAS Controls** – Include supply air sensor, return air sensor, dirty filter indicator and air proving switch.

FIELD INSTALLED OPTIONS

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