

Project: 1694 - Asylum
 121 Center Street
 Portland, Maine 04103



Submittal #237416.13-001.0
237416.13 - PACKAGED LARGE-CAPACITY ROOFTOP AIR-CONDITIONING UNITS

P/D: Large Capacity RTU (Para 1.4A,2)

APPROVERS: Miranda Jones (WBRC Architects and Engineers) **CREATED BY:** Jason Goggin (Consigli Construction Co., Inc.)
 Jason Goggin (Consigli Construction Co., Inc.)
RESPONSIBLE CONTRACTOR: Damon Refrigeration Co, Inc. **STATUS:** Pending
CONTRACTOR: Mike Lowe (Damon Refrigeration Co, Inc.)
TYPE: Material Delivery **SPEC SECTION:** 237416.13 - PACKAGED LARGE-CAPACITY ROOFTOP AIR-CONDITIONING UNITS

COPIES TO:
 Jason Goggin (Consigli Construction Co., Inc.)

DESCRIPTION:
 Note the specified product is not available. See included substitution options 1 and 2 with additional information. Please advise which option to proceed with.

ATTACHMENTS:
 237416.13 Large RTU with Substitution Sheet.pdf

ARCHITECT'S STAMP

<input type="checkbox"/> 1 - Reviewed, No Exception Taken	
<input type="checkbox"/> 2 - Reviewed, Revise as Noted	
<input checked="" type="checkbox"/> 3 - Revise and Resubmit	
<input type="checkbox"/> 4 - Rejected	
<input type="checkbox"/> 5 - Other, Held for Record, Not Reviewed	
<p>This review is only for general conformance with the design concept and the information given in the Contract Documents. Corrections or comments made on the shop drawings during this review do not relieve the Contractor from compliance with the requirements of the Contract Documents and applicable laws, codes and regulations. Review of a specific item shall not include review of an assembly of which the item is a component. The Contractor is responsible for: dimensions to be confirmed and correlated at the jobsite; information that pertains solely to the fabrication; quantities, processes, means, methods, techniques, sequences and procedures of construction; coordination of the Work with that of all trades and performing all Work in a safe and satisfactory manner.</p>	
REVIEWER: Dan Monroe	DATE: 8.11.2016

CONTRACTOR'S STAMP

Consigli Construction Co., Inc.	
<input type="checkbox"/> Approved for A/E Review	<input type="checkbox"/> Revise & Resubmit
<input checked="" type="checkbox"/> Approved as Noted for A/E Review	<input type="checkbox"/> Rejected
Spec. Section: 237416.13	Submittal No.: 237416.13-001
Date:	By: Jason Goggin
<p>If so marked, approval is given for design only. It does not relieve the subcontractor from complying with the requirements of the contract, contract drawings and specifications. The subcontractor shall be responsible for all dimensions, quantities, schedules and field conditions.</p>	

See marked review comments on substitution request forms

SUBMITTAL WORKFLOW

#	NAME	SUBMITTER/APPROVER	SENT DATE	DUE DATE	RETURNED DATE	RESPONSE	ATTACHMENTS	COMMENTS
1	Jason Goggin	Approver		8/8/2016		Pending		
2	Miranda Jones	Approver		8/23/2016		Pending		

BY

DATE

COPIES TO



BRIGGS

EQUIPMENT SALES, INC.

16 NorthBrook Drive, P.O. Box 1375 Gray, ME 04039
(207) 657-7123 / (207) 657-7124 fax

August 4, 2016

Damon Mechanical
1250 Turner St
Auburn, ME 04210

RE: Asylum
Substitutions

Dear Mike,

Please see my summary below.

Small RTUs
submitted under
separate cover

~~RTU-4, 5~~

~~These (2) units are scheduled as 3 Ton units with 108 MBH gas heat, 700 CFM. While the fans can operate at this low cfm (during economizer mode for example), with such a low face velocity across the DX coil there is danger of freezing the coil. Also, the furnace has a maximum 70F temp rise, with 108 MBH it would require much higher CFM to keep the unit from exceeding the 70F max temp rise, the unit would trip on high limit. The heat load for the spaces served by these units is less than the 3 tons and 108 MBH specified. I believe the 3 ton units were scheduled as model LGH036 units to keep all of the units in the same series, the Emergence series, which starts at 3 tons. The Landmark series has a 2 ton unit that can more closely meet the heat and cooling load requirements and provide 700 CFM as needed.~~

RTU-7

This unit is specified as a variable air volume unit with Humiditrol, hot gas reheat. Due to a glitch in the Lennox selection and pricing program, I was able to select this unit. While trying to generate submittals, I could not get the technical data to come out correctly. After speaking with the factory, I was told that no Lennox units can be built with both variable air volume and Humiditrol hot gas reheat, you can select VAV without Humiditrol or constant air volume with Humiditrol. I have spoken with several people at Lennox and they can not make any exceptions on this.

We worked with WBRC in selecting RTU-7 on this project. When the plans and specifications came out I contacted WBRC about changes made from the preliminary selections to the plans and specs but it was past the deadline for asking any questions and and legally they could not discuss it. In this email I did not address the problem with RTU-7 and VAV and Humiditrol because I did not know there was an issue until later in the process.

Sincerely,

Ann Marie Juliano



Specified Product not available. Substitution option 1

SUBSTITUTION REQUEST (After the Bidding Phase)

Project: Asylum Substitution Request Number:
From: Briggs Equipment Sales, Inc.
To: Damon Mechanical, Mike Lowe Date: August 4, 2016
Re: RTU-7 A/E Project Number: 4071.10
Contract For:

Specification Title: 237416.13 Description: PACKAGED, LARGE-CAPACITY, ROOFTOP AIR-CONDITIONING UNITS
Section: Page: Article/Paragraph:

Proposed Substitution: Daikin Applied Model RPS035
Manufacturer Address: Minneapolis, MN Phone:
Trade Name: Daikin Applied Roofpak Model No.: RPS035
Installer: Damon Mechanical Address: 840 Washington St, Auburn ME 04210 Phone (207) 784-7461

History: [] New product [] 2-5 years old [X] 5-10 years old [X] More than 10 years old

Differences between proposed substitution and specified product: The RPS035C is an applied rooftop unit, not a commercial rooftop as specified. It is a 2" double wall unit. The RPS has a return fan and NOT an exhaust fan as scheduled. It is approx. 5 ft longer than the specified unit and approx 2000# heavier. It can provide VAV with hot gas reheat, the sound is better than specified.

X [] Point-by-point comparative data attached

Reason for not providing specified item: RTU-7 is scheduled as a Lennox LGH420 with both variable air volume and Humiditrol hot gas reheat. Lennox will not allow both, you can have VAV or Humiditrol but not both.

Similar Installation: Project: York Community College Architect: Stantec
Address: 112 College Dr, Wells, ME 04090 Owner: Maine Community College System
Date Installed: 2015

Proposed substitution affects other parts of Work: X [] No [X] Yes; explain Unit is longer and heavier, the SA and RA drops are not in the same location as the specified Lennox unit. The electrical requirement is smaller.

Savings to Owner for accepting substitution: No Additional Cost for Equipment (\$)

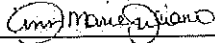
Proposed substitution changes Contract Time: [X] No [] Yes [Add] [Deduct] days.

Supporting Data Attached: [X] Drawings [X] Product Data [] Samples [] Tests [] Reports []

**SUBSTITUTION
REQUEST
(Continued)**

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: Ann Marie Juliano
Signed by: 
Firm: Briggs Equipment Sales, Inc.
Address: PO Box 1375
Gray, ME 04039
Telephone: 207-657-7123 ext. 202
Attachments: RTU submittal

A/E's REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01330.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: Dan Monroe, P.E. Date: 8.11.2016

Additional Comments: Contractor Subcontractor Supplier Manufacturer A/E _____

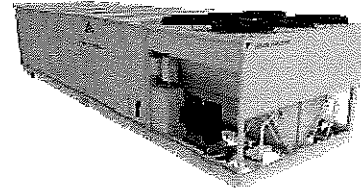
→ Revise and Resubmit RPS035 package including roof curb drawing and controls product data.

Packaged Rooftop System



Job Information Technical Data Sheet

Job Name RTU-7
Date 8/4/2016
Submitted By Briggs Equipment Sales, Inc.
Software Version 04.20
Unit Tag RTU-7



Unit Overview

Model Number	Voltage V/Hz/Phase	Design Cooling Capacity Btu/hr	AHRI 360 Standard Efficiency EER	AHRI 360 Standard Efficiency IEER	ASHRAE 90.1
RPS035D	208/60/3	436671	10.1 @ AHRI 10.6 @ Design	13.2	2013 Compliant

Unit

Model Number:	RPS035D
Altitude:	0 ft
Heat Type:	Gas
Hot Gas Reheat:	Factory mounted, Blow thru
Condenser Type:	Air-Cooled
Condenser Sound:	Quiet Condenser Fans
Approval	ETL/MEA-USA unit

Physical

Unit				
Length	Height	Width	Weight	
339 in	55.5 in	94.0 in	9586 lb	

Electrical

Voltage	MCA	MROPD	SCCR
208/60/3	194.3 A	225 A	10 kAIC

Return/Outside/Exhaust Air

Outside Air Option			
Type	Pressure Drop	Damper Actuator	
0-100% Economizer	0.37 inH ₂ O	Electric Actuator	
Return Air Option			
Return Air Location:	Bottom		
Fan			
Type	Fan Diameter	Vibration Isolation	Drive Type
SWSI AF	40 in	Spring Isolation	Standard Service Factor, Fixed Drive
Motor			
Horsepower	Type	Full Load Current	
3.0 HP	ODP, Premium Efficiency	9.3 A	
Performance			
Air Flow CFM	External Static Pressure inH ₂ O	Fan Speed rpm	Brake Horsepower HP
13000	1.0	531	2.73

Packaged Rooftop System



Filter Section

Physical				
Type	(Quantity) Height x Width x Depth	Face Area	Face Velocity	Air Pressure Drop
30% Nominal Efficiency (MERV 8)	(10) 16 in x 20 in x 2 in (10) 16 in x 25 in x 2 in	50.0 ft ²	260.0 ft/min	0.11 inH ₂ O

DX Cooling Coil Electro-Fin Coated

Physical							
Fins per Inch	Rows	Face Area	Face Velocity	Air Pressure drop	Drain Pan Material		
10	6	27.0 ft ²	481.5 ft/min	0.97 inH ₂ O	Stainless Steel		
Cooling Performance							
Capacity	Refrigerant Type	Indoor Air Temperature				Ambient Air Temperature	
		Entering Dry Bulb °F	Entering Wet Bulb °F	Leaving Dry Bulb °F	Leaving Wet Bulb °F	Dry Bulb °F	Wet Bulb °F
436671	R410A	80.0	67.0	56.9	56.3	95.0	75.0

Hot Gas Reheat Coil Electro-Fin Coated

Type	Air Pressure Drop	Total Capacity	Air Temperature Dry Bulb	
			Entering	Leaving
Aluminum Tube Micro-Channel	0.22 inH ₂ O	177824 Btu/hr	56.9 °F	70.0 °F
Coil Location: Mounted to entering air uprights of Discharge section				

Fan Section

Fan			
Type	Fan Wheel Diameter	Fan Isolation	
AF DWDI	24 in	Spring	
Performance			
Airflow	Total Static Pressure	Fan Speed	Brake Horsepower
13000 CFM	3.26 inH ₂ O	1420 rpm	9.01 HP
Motor		Drive	
Type	Horsepower	FLA	Type
ODP, Premium Efficiency	10.0 hp	29.2 A	Standard service factor, Fixed drive

Gas Heat Section

Physical		Performance					
Gas Heat Size	Input Capacity Btu/hr	Output Capacity Btu/hr	Air Temperature Dry Bulb		Air Pressure Drop inH ₂ O	Gas Pressure	
			Entering °F	Leaving °F		Minimum In WC	Maximum psi
500 MBH	625000	500000	20.0	55.4	0.08	7.0	0.5
Heat Exchanger Material:		Type 321 Stainless Steel					
Modulation:		Modulating					

Discharge Plenum

Discharge Location:	Bottom
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Packaged Rooftop System



Condensing Section –Coil Electro-Fin Coated

Compressor				
Type	Quantity	Total Power	Capacity Control	Compressor Isolation
Scroll	4	27.6 kW	4 stage	Resilient
Compressor Amps:				
Fixed Speed Compressor 1			34.6 A	
Fixed Speed Compressor 2			31.6 A	
Fixed Speed Compressor 3			31.6 A	
Fixed Speed Compressor 4			31.6 A	
Condenser Coil				
Type	Fins per Inch	Fin Material	Refrigerant Charge	
Aluminum tube MicroChannel	18	Aluminum with Electro-Fin Coating	83.0 lb	
Condenser Coil Options: Build in Hail Protection				
Condenser Fan Motors				
Number of Motors			Full Load Current (each)	
4			3.4 A	
AHRI 360 Certified Data at AHRI 360 Standard Conditions				
EER	IEER	ASHRAE 90.1		
10.1	13.2	2013 Compliant		
10.6 EER at Design Conditions				

Sound

Frequency	Sound Power (db)							
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Return	79	76	73	70	68	63	55	47
Discharge	75	71	67	63	59	53	45	37
Radiated	-	91	81	81	83	77	74	67

Supply Fan Total Pressure Drop Calculation

External Static Pressure:	1.50 inH ₂ O
Filter:	0.11 inH ₂ O
Outside Air:	0.37 inH ₂ O
DX Coil:	0.97 inH ₂ O
Hot Gas Reheat:	0.22 inH ₂ O
Gas Heat:	0.08 inH ₂ O
Total Static Pressure:	3.26 inH₂O

Return/Exhaust Fan Total Pressure Drop Calculation

External Static Pressure:	1.00 inH ₂ O
Total Static Pressure:	1.00 inH₂O

Packaged Rooftop System



Options

Unit	
Unit Exterior:	Prepainted Galvanized Steel
Insulation and Liners:	2", 1 1/2# nominal insulation, full solid liners
Electrical	
Electrical Connection Option:	Single thru door disconnect switch
GFI 115v Receptacle:	Field powered
Controls	
Controller:	MicroTech III Unit Controller – Stand Alone Operation
Application:	Variable Volume - Discharge Air Control
Temperature Control:	DAC, No communication card
Fan Speed Control:	Factory mounted Inverter
Inverter Manufacturer:	Daikin
Inverter Location:	Inverter(s) in fan section
Airflow Control:	1 duct sensor
Economizer Control:	Outside Air Dry Bulb and Enthalpy Control
Low Ambient:	Fantrol, operation to 45 deg F (7.22 deg C)

Warranty

Entire Unit:	Extended 2 year 3 year total entire unit parts only
Compressor:	Extended 4 year, 5 year total compressor parts only
Gas Heat Exchanger:	Additional 9 year heat exchanger warranty, 10 year total parts only

AHRI Certification



All equipment is rated and certified in accordance with AHRI 360.

Notes

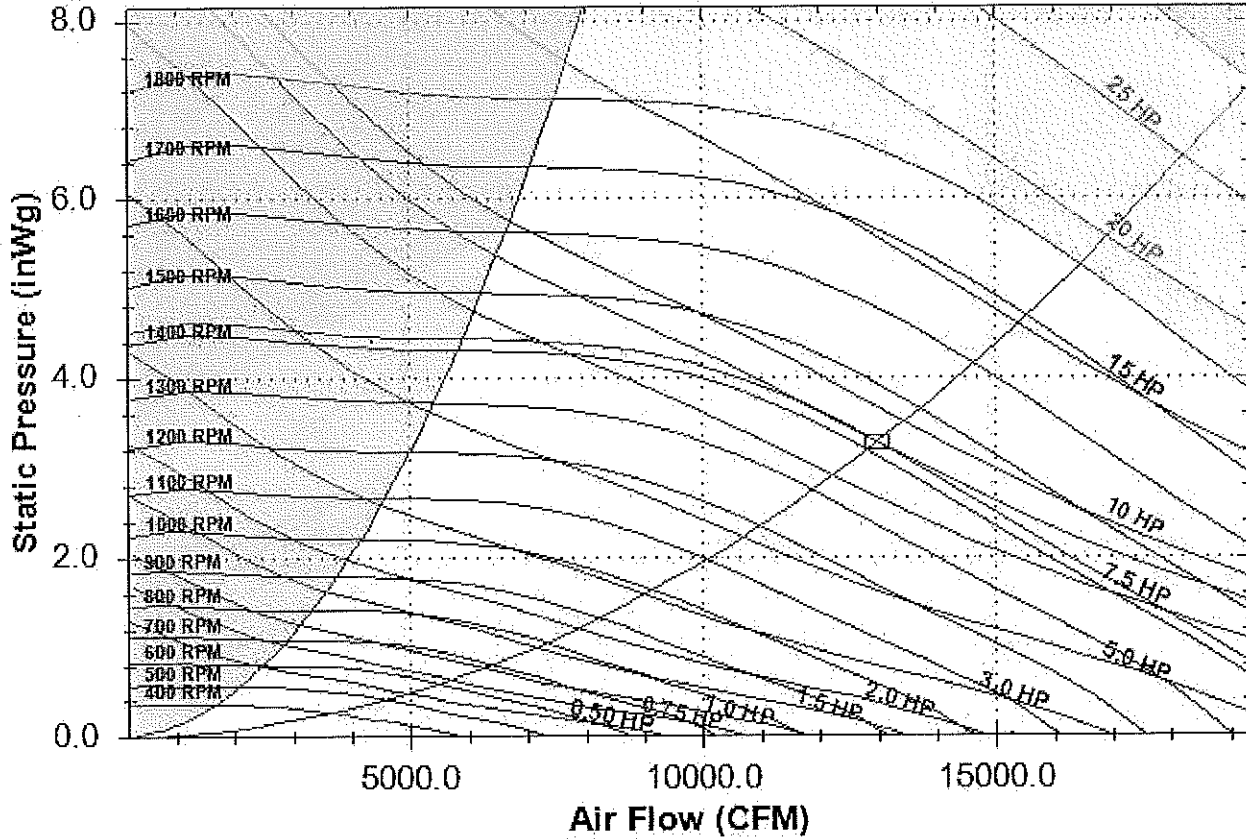
As a standalone component, unit meets or exceeds the requirements of ASHRAE 90.1.2010. The approving authority is responsible for compliance of multi-component building systems.

Accessories

Part Number	Optional	Description
107287002		CO2 sensor, Telaire, Duct sensor
0067295001		HUMIDITY SENSOR, DUCT MOUNTED, 0-5VDC

TAG: RTU-7 Supply Fan

Daikin Rooftop Packaged Fan Selection



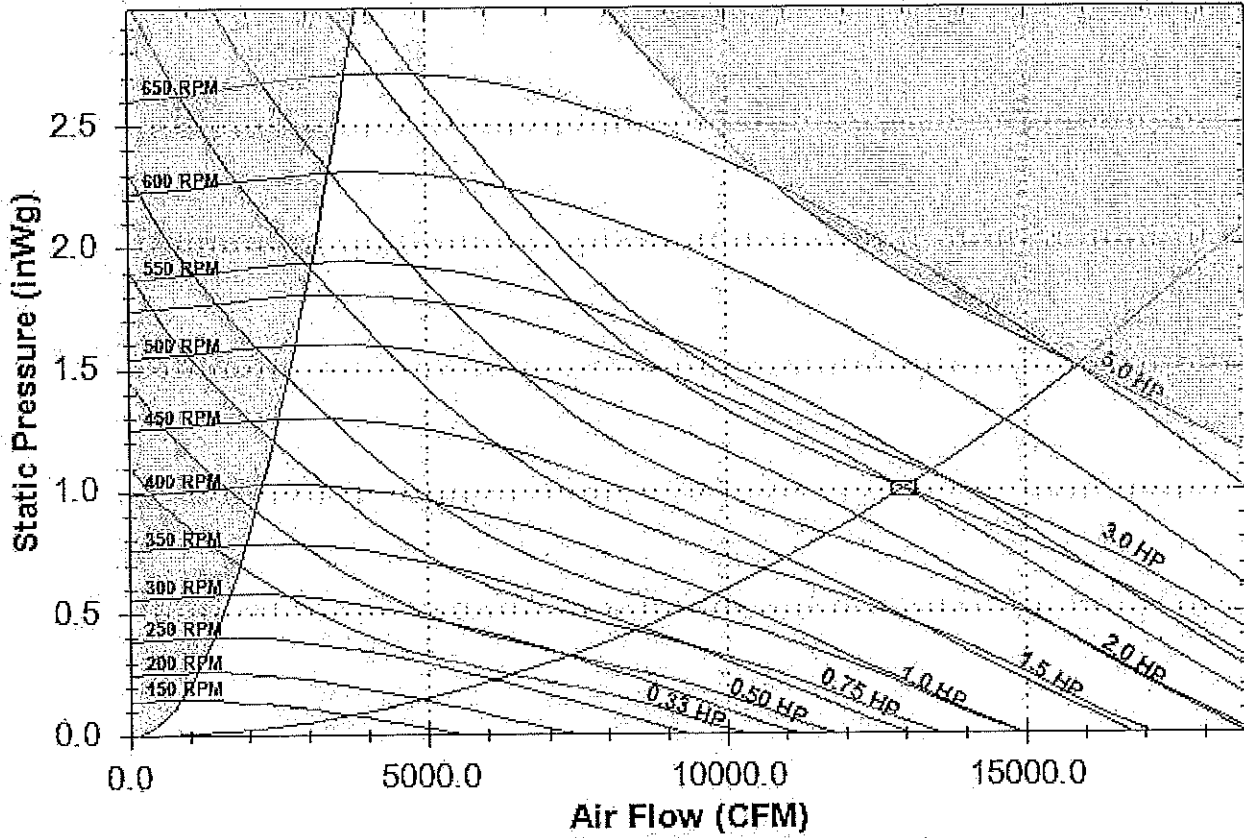
24.0 DWDI - Airfoil Supply Fan at Standard Conditions

Base Tag	RPS RTU-7		Date	Aug-03-2016					
Job Name	Asylum RTU-7		Time	2:09 PM					
Air Volume	13000	CFM	Fan Speed	1420	RPM				
Total Static	3.26	inWg	Max Speed	1800	RPM				
Brake Horsepower	9.01	HP	Efficiency	74	%				
Unit Sound Power	63hz	125hz	250hz	500hz	1000hz	2000hz	4000hz	8000hz	
Inlet Sound Power	79	76	73	70	68	63	55	47	
Outlet Sound Power	75	71	67	63	59	53	45	37	
Radiated Sound Power	0		81	81	83	77	74	67	



TAG: RTU-7 Return Fan

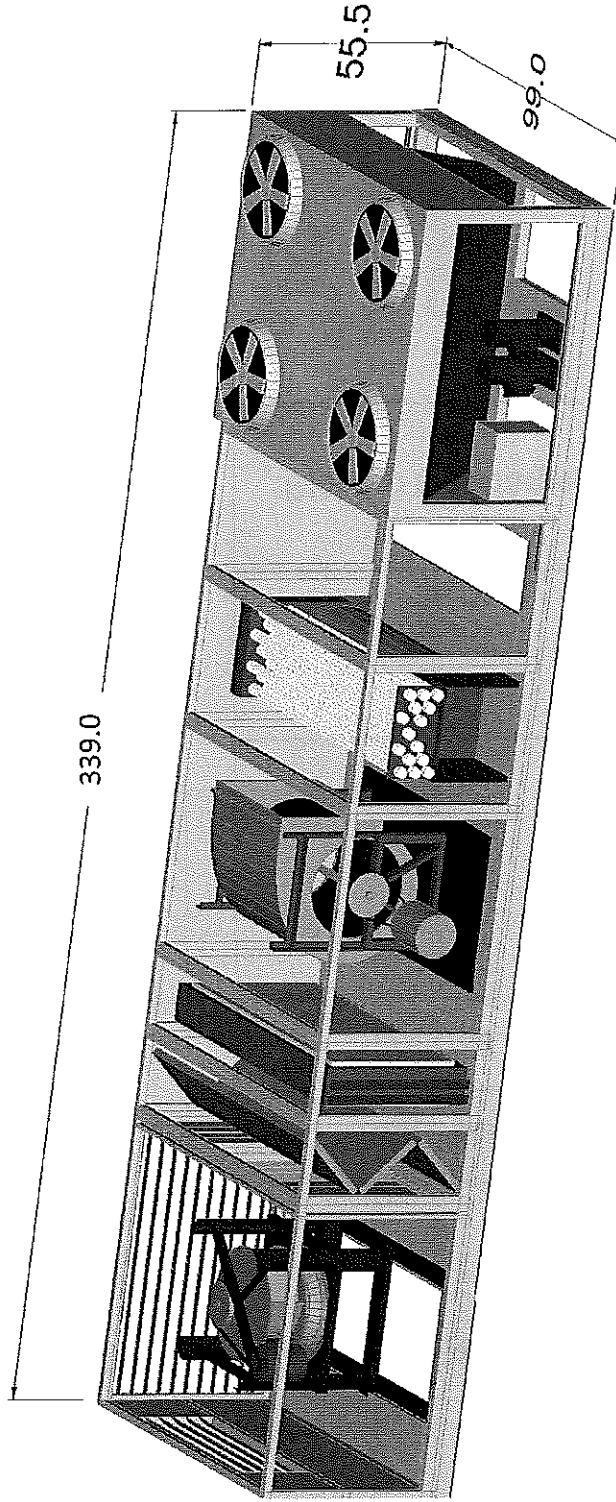
Daikin Rooftop Packaged Fan Selection




40.0 SWSI - Plenum Return Fan at Standard Conditions									
Base Tag	RPS RTU-7				Date	Aug-03-2016			
Job Name	Asylum RTU-7				Time	2:09 PM			
Air Volume	13000	CFM			Fan Speed	531	RPM		
Total Static	1.00	inWg			Max Speed	650	RPM		
Brake Horsepower	2.73	HP			Efficiency	75	%		
Unit Sound Power	63hz	125hz	250hz	500hz	1000hz	2000hz	4000hz	8000hz	
Inlet Sound Power	79	76	73	70	68	63	55	47	
Outlet Sound Power	75	71	67	63	59	53	45	37	
Radiated Sound Power	0	91	81	81	83	77	74	67	



RTU-7 Drawing

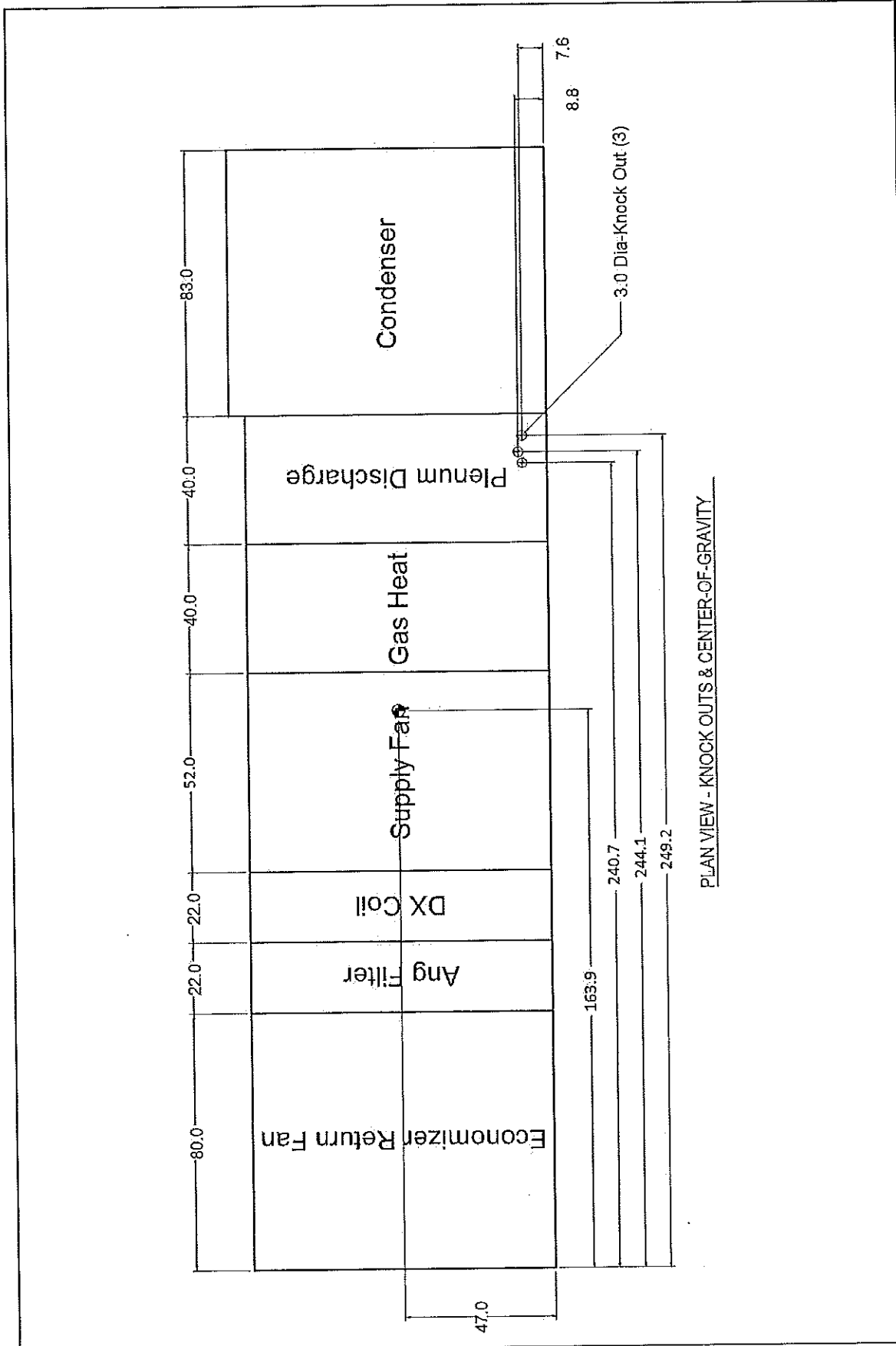


Product Drawing		Unit Tag: RTU-7		Sales Office: Briggs Equipment Sales	
Product: Packaged Rooftop Unit		Project Name: RTU-7		Sales Engineer: Ann Marie Juliano	
Model: RPS035D		Aug. 03, 2016		Scale: NTS	
		Ver/Rev:		Tolerance: +/- 0.25"	
		Sheet: 1 of 1		Dwg Units: in [mm]	



 13600 Industrial Park Blvd. Minneapolis, MN 55441
 www.DaikinApplied.com Software Version: 04.20

No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.



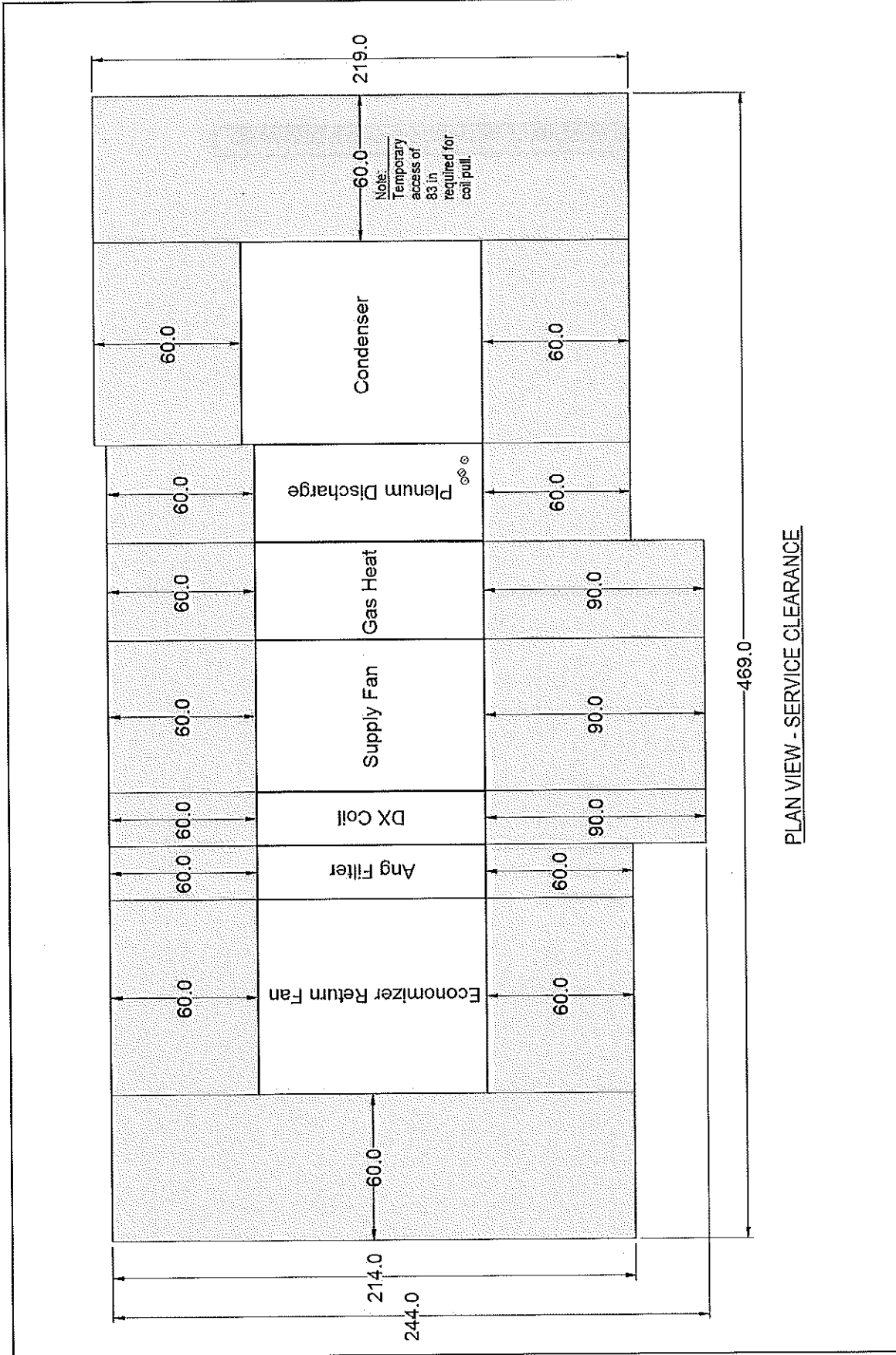
PLAN VIEW - KNOCK OUTS & CENTER-OF-GRAVITY

Product Drawing	Unit Tag: RPS RTU-7	Sales Office: Briggs Equipment Sales
Product:	Project Name: Asylum RTU-7	Sales Engineer:
Model: RPS035D	Aug. 03, 2016 Ver/Rev:	Scale: NTS
Sheet: 1 of 1		Tolerance: +/- 0.25"
Dwg Units: in [mm]		Software Version: 04.20

13600 Industrial Park Blvd. Minneapolis, MN 55441
www.DaikinApplied.com

No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.





PLAN VIEW - SERVICE CLEARANCE

Product Drawing		Unit Tag: RTU-7		Sales Office: Brieggs Equipment Sales	
Product: Packaged Rooftop Unit		Project Name: RTU-7		Sales Engineer: Ann Marie Juliano	
Model: RPS035D		Aug. 03, 2016 Ver/Rev:		Scale: NTS	
		Sheet: 1 of 1		Dwg Units: in [mm]	
				Tolerance: +/- 0.25"	

No change to this drawing may be made unless approved in writing by Daikin Applied. Purchaser must determine that the equipment is fit and sufficient for the job specifications.
DAIKIN
 13600 Industrial Park Blvd. Minneapolis, MN 55441
 www.DaikinApplied.com Software Version: 04.20

Roof Curb Drawing Not Available at This Time.

→ **REVISE AND RESUBMIT WITH ROOF CURB DRAWING**



Substitution option 2

SUBSTITUTION REQUEST (After the Bidding Phase)

Project: Asylum
To: Damon Mechanical, Mike Lowe
Re: RTU-7

Substitution Request Number:
From: Briggs Equipment Sales, Inc.
Date: August 4, 2016
A/E Project Number: 4071.10
Contract For:

Specification Title: 237416.13
Section:
Page:

Description: PACKAGED, LARGE-CAPACITY, ROOFTOP AIR-CONDITIONING UNITS
Article/Paragraph:

Proposed Substitution: Lennox Model LGH420 Rooftop Units

Manufacturer Address: Dallas, TX Phone:
Trade Name: Lennox Emergence Rooftop Units Model No.: LGH420
Installer: Damon Mechanical Address: Phone:

History: [] New product [] 2-5 years old [X] 5-10 years old [X] More than 10 years old

Differences between proposed substitution and specified product: Lennox Model LGH420, CAV with Humiditrol Hot Gas Reheat
Same exact, unit footprint electrical, sound etc, approx 20# lighter in weight.

X [] Point-by-point comparative data attached

Reason for not providing specified item: RTU-7 is scheduled as a Lennox LGH420 with both variable air volume and Humiditrol hot gas reheat.
Lennox will not allow both, you can have VAV or Humiditrol but not both.

Similar Installation: (Many over many many years and across the state and country)
Project: Architect:
Address: Owner:
Date Installed:

Proposed substitution affects other parts of Work: X [X] No [] Yes; explain

Savings to Owner for accepting substitution: One thousand dollars (\$ 1,000.00).

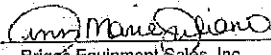
Proposed substitution changes Contract Time: [X] No [] Yes [Add] [Deduct] days.

Supporting Data Attached: [X] Drawings [X] Product Data [] Samples [] Tests [] Reports []

SUBSTITUTION REQUEST (Continued)

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: Ann Marie Juliano
 Signed by: 
 Firm: Briggs Equipment Sales, Inc.
 Address: PO Box 1375
Gray, ME 04039
 Telephone: 207-657-7123 ext. 202
 Attachments: RTU submittal

A/E's REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01330.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
- Substitution rejected - ~~Use specified materials.~~ **Refer to comments on Substitution Request "Option 1"**
- Substitution Request received too late - Use specified materials.

Signed by: Dan Monroe, P.E. Date: 8.11.2016

Additional Comments: Contractor Subcontractor Supplier Manufacturer A/E _____

Lennox Industries Inc. - Product Submittal

System ID: RTU-7 CAV

Package Model: LGH420H4B

Description: PKGGG/35TON/CONFIGURABLE

HEATING PERFORMANCE

Unit Type	Packaged Gas Electric	Gas Supply Connection	1.25 (in.)
H/E LowInput	125000 (Btuh)	H/E Heat Rise	28.5 (°F)
H/E LowOutput	100000 (Btuh)	AFUE/ ThermalEff	80
H/E HighInput	500000 (Btuh)	Gas Supply Pressure	7 (in.WC)
H/E HighOutput	400000 (Btuh)		
System HeatOutput	400000 (Btuh)		

COOLING PERFORMANCE

Refrigerant	R-410A	Number Compressors	4
ARI EER	10.8	Number of Cooling Stages	2
ARI IEER	11.3	Condensate Drain Size	1.00 (in.)
ARI Total Power	38900 (W)	Cooling OutdoorDB	95.0 (°F)
ARI GrossTotalCool	443000 (Btuh)	Cooling CondenserDB	95.0 (°F)
ARI NetTotalCool	420000 (Btuh)	Cooling MixedDB	80.0 (°F)
Coil GrossTotalCool	436886 (Btuh)	Cooling MixedWB	67.0 (°F)
Unit NetTotalCool	405433 (Btuh)	Coil DischargeDB	56.1 (°F)
Coil GrossSensCool	327040 (Btuh)	Coil DischargeWB	55.8 (°F)
Unit NetSensCool	295587 (Btuh)	Unit DischargeDB	58.3 (°F)
Environ Refrigerant Charge	0	Unit DischargeWB	56.7 (°F)
Tube/Fin Refrigerant Charge	120 LBS. 0 OZ.	Coil MoistureRemoval	103.5 (lb/hr)
Tube/Fin Humiditrol Refrigerant Charge	126 LBS. 0 OZ.	System MoistRemoval	103.5 (lb/hr)

HUMIDITROL PERFORMANCE

Humid-1st CoilDischDB	80.0 (°F)	Humiditrol OutdoorDB	95.0 (°F)
Humid-1st CoilDischWB	65.1 (°F)	Humiditrol MixedDB	80.0 (°F)
Humid-All CoilDischDB	70.6 (°F)	Humiditrol MixedWB	67.0 (°F)
Humid-All CoilDischWB	60.8 (°F)	Humid-1st MoistRemoval	78.6 (lb/hr)
		Humid-All MoistRemoval	121.0 (lb/hr)

SUPPLY FAN PERFORMANCE

Supply AirFlow	13000 (cfm)	TotalStaticPress	2.04 (in.WC)
ExtStaticPress Supply	1.50 (in.WC)	Wet Coil Static Press	0.37 (in.WC)
SupplyFan Req'dPower	11.26 (hp)	Economizer Static Press	0.17 (in.WC)
SupplyFan NomPower	15.00 (hp)	Air Filter Qty	11
Supply Fan Type	CAV Belt Drive	Air Filter Length	25.0 (in.)
SupplyDriveReq'd RPM	895 (rpm)	Air Filter Width	16.0 (in.)
SupplyDrive Min RPM	745 (rpm)	Air Filter Thickness	2.0 (in.)
SupplyDrive Max RPM	900 (rpm)	Number Exhaust Fans	2
		ExhaustFan NomPower	3.0 (hp)
		ExhaustDrive Min RPM	690 (rpm)
		ExhaustDrive Max RPM	845 (rpm)

ELECTRICAL

Voltage	208V 3Ph	SupplyFan FLA	48.2 (amp)
Frequency	60 (Hz)	CondensingUnit FLA	28.8 (amp)
System MCA	229.0 (amp)	CondenserFan Power	5000 (W)
System MOCP	250 (amp)		
Compressors RLA	118.0 (amp)		
Cooling FLA Total	216.2 (amp)		
Unit Oper Range-Nom Voltage	+/- 10%		

Lennox Industries Inc. - Product Submittal

System ID: RTU-7 CAV Package Model: LGH420H4B	Description: PKGGE/35TON/CONFIGURABLE
--	---------------------------------------

DIMENSIONS

Cabinet Width	90.0 (in.)	Downflow Supply Length	68.0 (in.)
Cabinet Length	286.0 (in.)	Downflow Supply Width	26.0 (in.)
Cabinet Height	68.0 (in.)	Downflow Return Length	68.0 (in.)
Total Weight	7840 (lb)	Downflow Return Width	26.0 (in.)

SOUND

Outdoor Sound Rating	91 (db)
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SYSTEM FEATURES

Durable Outdoor Enamel Paint Finish	Crankcase Heater Test
Scroll Compressor	Timed Off Control
Pre-charged Refrigeration System	AGA-CGA Certified
Expansion Valves	Units will operate cooling down to 0 degrees F (-17.7 degrees C) without additional controls.
High Capacity Driers	Redundant Comb. Gas Control Valve
Auto reset high & low pressure switch with strike 3 lockout feature in Prodigy unit controller	Electronic Flame Sensor
Totally Enclosed Fan Motor	Direct Spark Ignition
PVC Coated Fan Guard	Separate Compressor and Controls Compartment
Fan and Limit Controls	Advanced controls with Prodigy Control System
Factory Test Operated	Limited compressor warranty of 5 years
Bonded for Grounding	Limited warranty on Prodigy Unit Controller of 3 years
Internal Pressure Relief Valve	Limited warranty on all other components of 1 year
Overload Protection	See Limited Warranty Certificate included with unit for details

INCLUDED SYSTEM OPTIONS - FACTORY INSTALLED

SA SMOKE DETECTOR
STAINLESS DRAIN PAN
CONDENSER LOUVERED PANEL
2 IN MERV4 FILTER
100% HIGH STATIC PEF W/VFD
MOD GAS - STAIN STEEL HEAT CORROSION PROTECTION
DIRTY FILTER SWITCH
DISCONNECT - WEATHERPROOF
SPRING ISOLATION-SUPPLY FAN
DOUBLE WALL CONSTRUCTION
CO2 SENSOR MOUNTING BRACKET
GFCI - FACTORY INSTALLED/NON-POWERED
DRAIN PAN OVERFLOW SW
HUMIDITROL
DUAL ENTHALPY ECONOMIZER
CONSTANT AIR VOLUME
100% HIGH STATIC PEF W/VFD
RA SMOKE DETECTOR

INCLUDED SYSTEM OPTIONS - FIELD INSTALLED

87N54	1	EG T8100-B-LN CO2 DETECTOR/BLACK/DUCT
85L43	1	COMISC19AE1- CO2 DWNFLW DUCT MTNG KIT
76M31	1	COSNSR30AE1- SENSOR, DUCT RH
13H15	1	CS7500 COMM'L PROGRAMMABLE THERMOSTAT

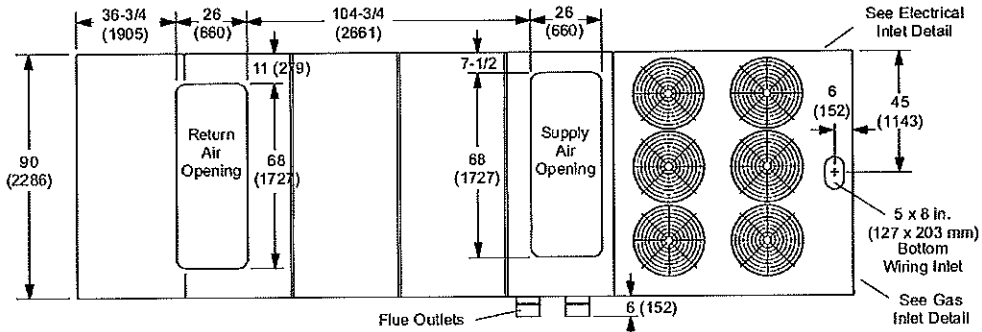
Lennox Industries Inc. - Product Submittal

System ID: RTU-7 CAV

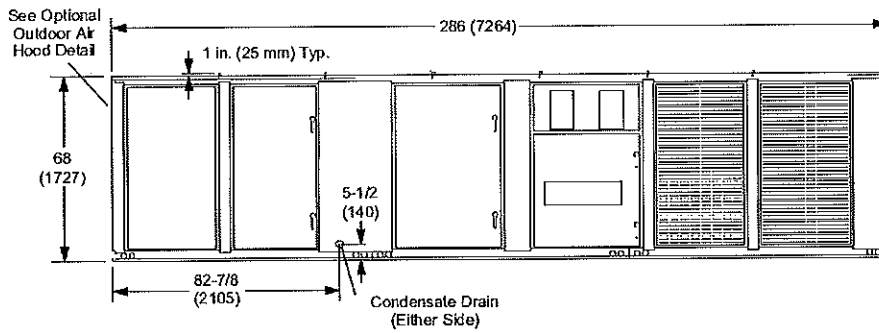
Package Model: LGH420H4B

Description: PKGGE/35TON/CONFIGURABLE

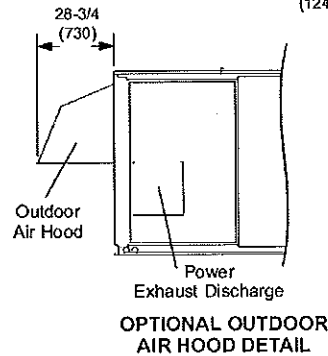
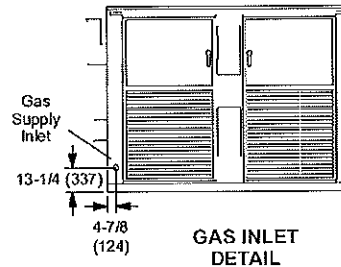
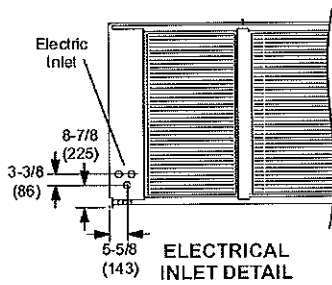
DIMENSIONS - INCHES (MM) - VERTICAL AIRFLOW



TOP VIEW - Base Section



SIDE VIEW

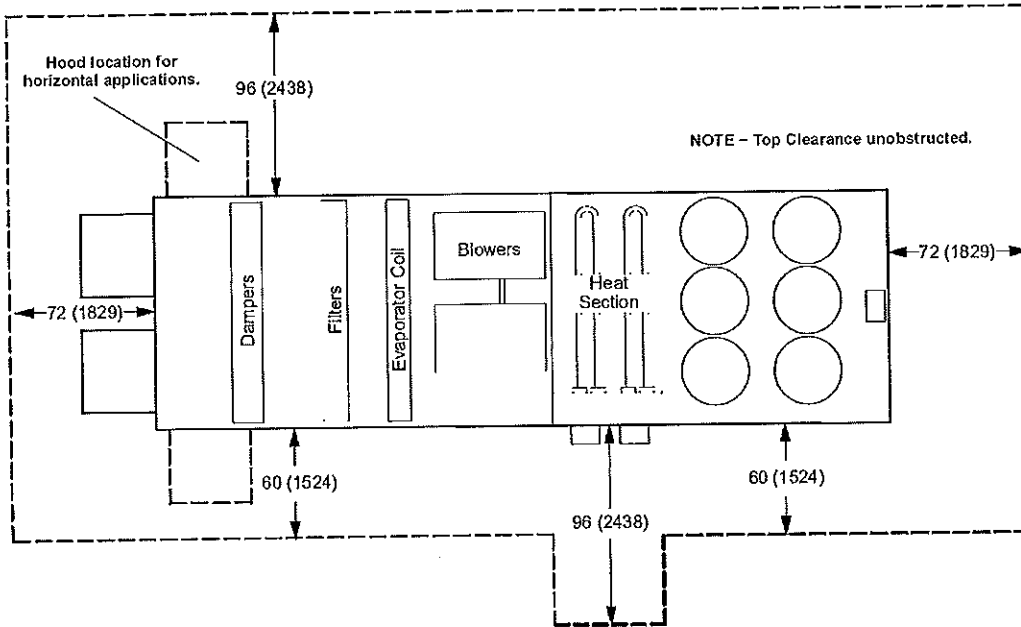


Lennox Industries Inc. - Product Submittal

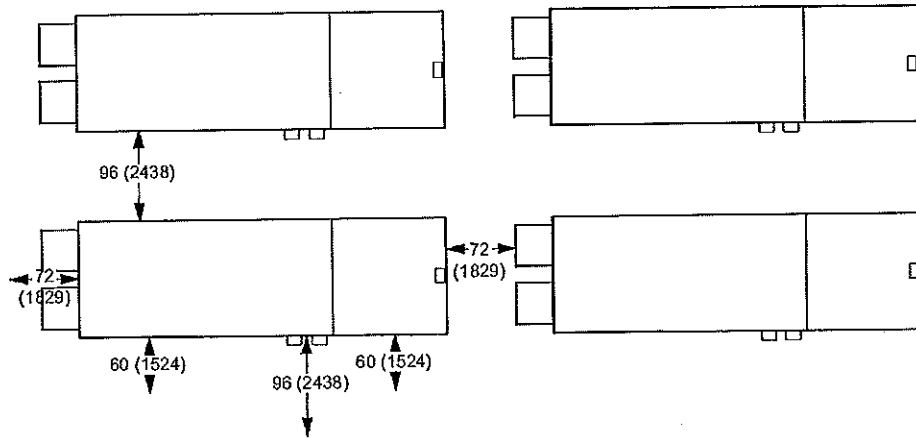
System ID: RTU-7 CAV
 Package Model: LGH420H4B

Description: PKGGE/35TON/CONFIGURABLE

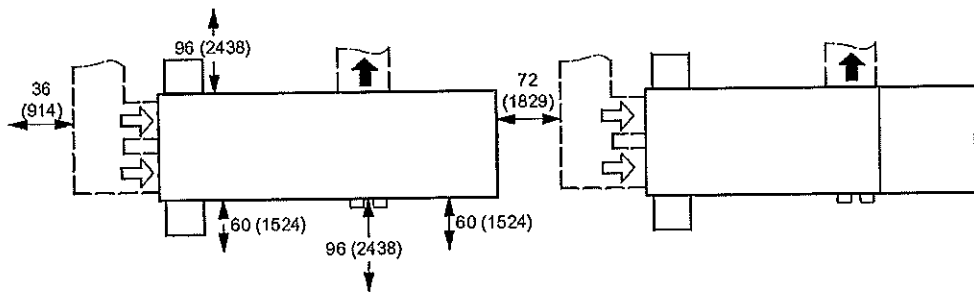
INSTALLATION/SERVICE CLEARANCES - INCHES (MM)



Vertical Airflow Applications - Service clearances can be shared by multiple units.



Horizontal Airflow Applications - Service clearances can be shared by multiple units.

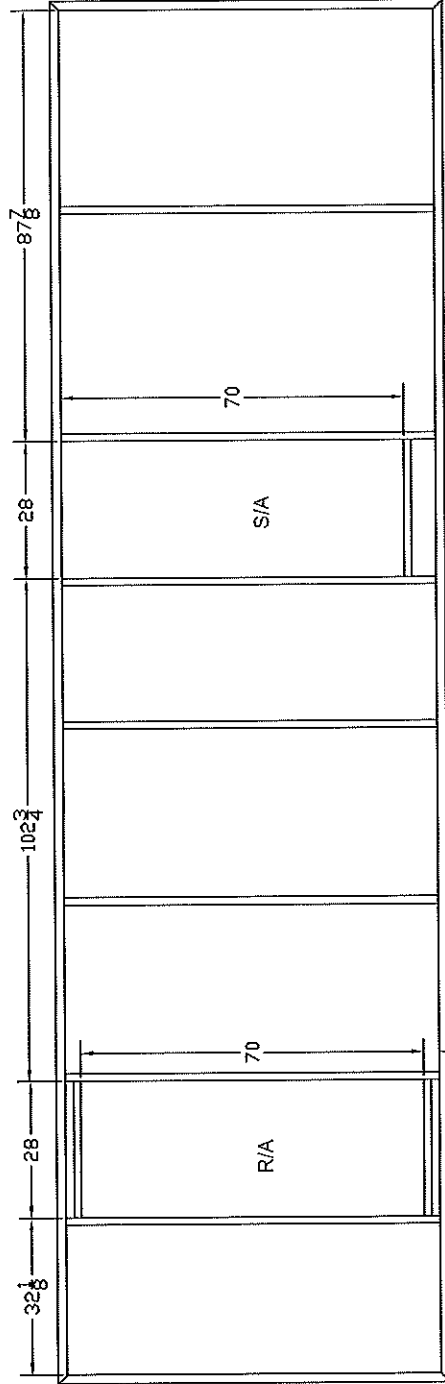


SUBMITTAL

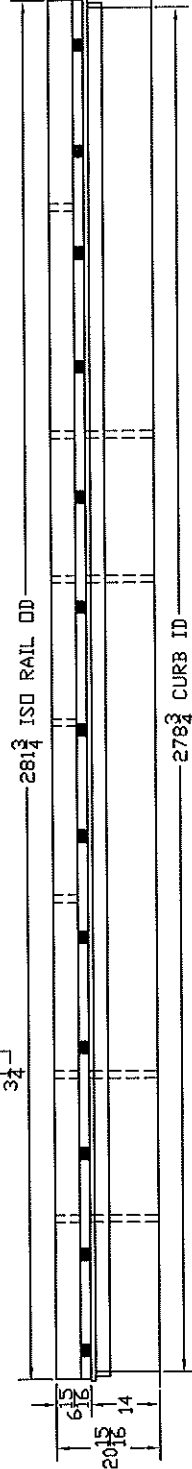
REVISIONS

REV	EDN #	DESCRIPTION	APP	CHKD	DATE

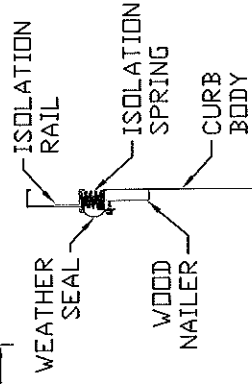
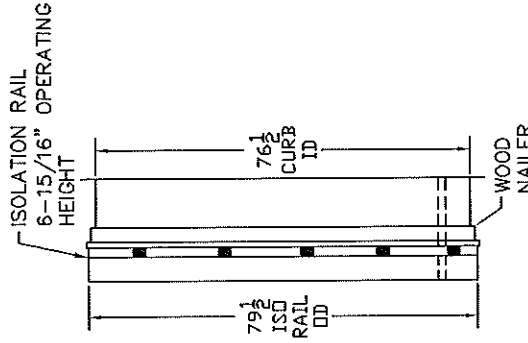
TOP VIEW



FRONT VIEW



RIGHT VIEW



2" Thick Insulation Provided

- FEATURES:
1. CURB AND ISOLATION RAIL SHIPPED FULLY ASSEMBLED
 2. ISOLATION CURB FABRICATED OF ALUMINUM EXTRUSION
 3. CURB FABRICATED OF HEAVY GAUGE GALVANIZED STEEL
 4. MITERED TOP CORNERS
 5. FULL PERIMETER WOOD NAILER
 6. FULL PERIMETER WEATHER SEAL
 7. DUCT SUPPORT INCLUDED
 8. CANVAS DUCT NOT INCLUDED

LENNOX LGH420
2" DEFLECTION

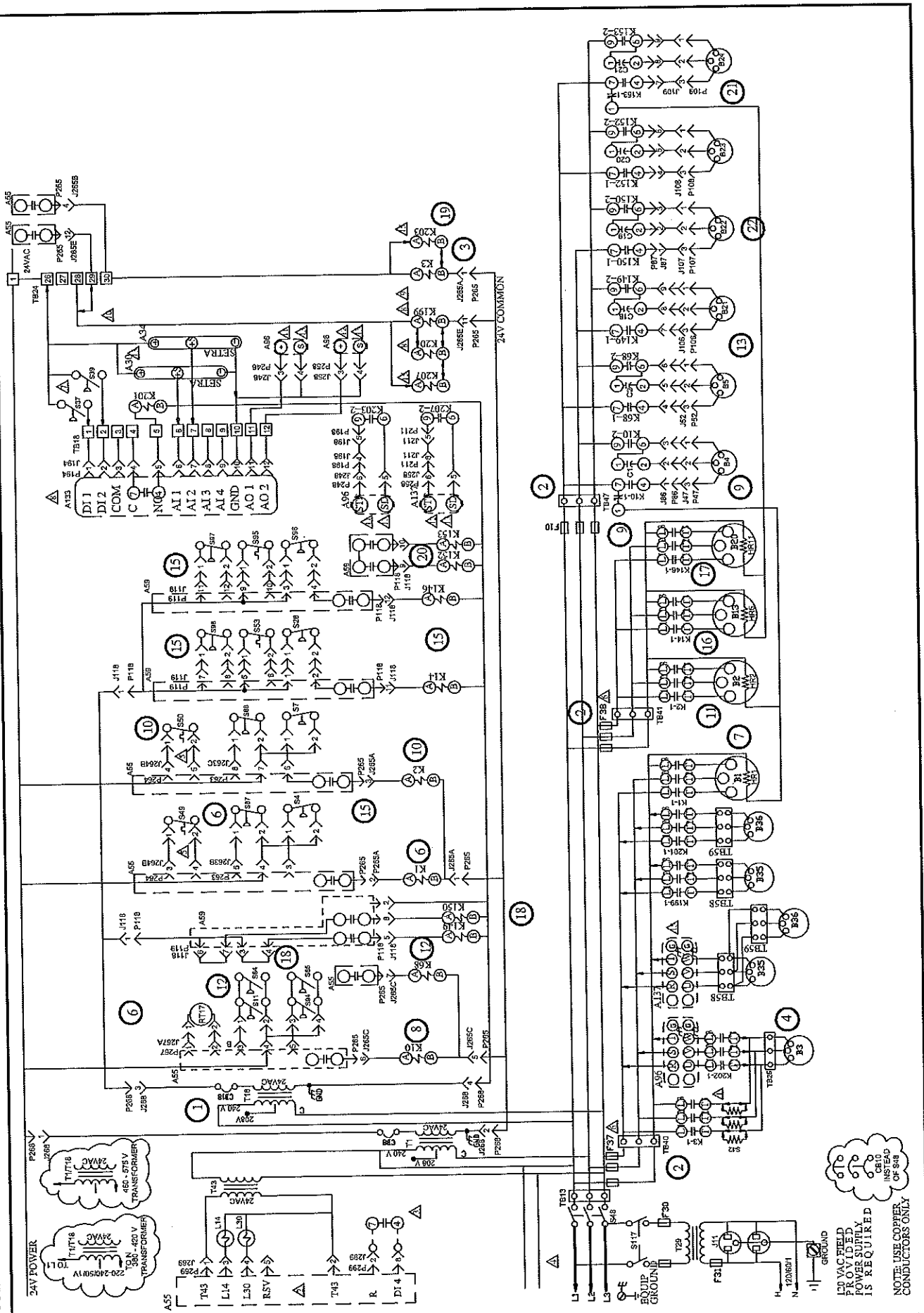
CambridgeportTM
1-800-648-2872

HVAC Accessories & Engineered Systems	
CURB, ISOLATION SUBMITTAL	
DESCRIPTION	DATE: 7/28/15
CUSTOMER/JOB NAME	PAGE
JOB	DRAWN BY
SCALE	JOB #
BRIGGS EQUIPMENT SALES / ASYLUM	CHECKED BY
38429-A1	

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TOLERANCES: DECIMALS: .000 = +/- .063, .00 = +/- .063, .0 = +/- .063, .0 = +/- .063 ANGLES: +/- 1 DEG FRACTIONS: +/- 1/16"

WIRING DIAGRAMS



KEY	COMPONENT	DESCRIPTION
A30	SENSOR PRESSURE DISCHARGE AIR	
A34	SENSOR PRESSURE RETURN AIR	
A35	PANEL MAIN PANEL LENNOX	
A36	PANEL COMPRESSORS 3 AND 4	
A37	CONTROL INVERTER SUPPLY	
A38	PANEL GP BOARD LENNOX	
A39	CONTROL INVERTER RETURN	
B1	COMPRESSOR 3	
B2	COMPRESSOR 4	
B3	MOTOR BLOWER	
B4	MOTOR OUTDOOR FAN 1	
B5	MOTOR OUTDOOR FAN 2	
B13	COMPRESSOR 3	
B20	COMPRESSOR 4	
B21	MOTOR OUTDOOR FAN 3	
B22	MOTOR OUTDOOR FAN 4	
B23	MOTOR OUTDOOR FAN 5	
B24	MOTOR OUTDOOR FAN 6	
B35	MOTOR EXHAUST BLOWER 1	
B36	MOTOR EXHAUST BLOWER 2	
C1	CAPACITOR OUTDOOR FAN 1	
C2	CAPACITOR OUTDOOR FAN 2	
C18	CAPACITOR OUTDOOR FAN 4	
C19	CAPACITOR OUTDOOR FAN 5	
C20	CAPACITOR OUTDOOR FAN 6	
C21	CAPACITOR OUTDOOR FAN 6	
C80	CIRCUIT BREAKER T1	
C810	CIRCUIT BREAKER MAIN DISCONNECT UNIT	
C818	CIRCUIT BREAKER T18	
F10	FUSE OUTDOOR FAN MOTOR	
F30	FUSE TRANSFORMER T29 PRIMARY	
F31	FUSE TRANSFORMER T29 SECONDARY	
F37	FUSE COMPRESSOR GROUP 1	
F38	FUSE COMPRESSOR GROUP 2	
H1	HEATER COMPRESSOR 1	
H2	HEATER COMPRESSOR 2	
H3	HEATER COMPRESSOR 3	
H4	HEATER COMPRESSOR 4	
H11	JACK GFI RECEPTACLE	
L47	JACK OUTDOOR FAN 1	
L52	JACK OUTDOOR FAN 2	
L55	JACK OUTDOOR FAN INTERFACE	
L57	JACK OUTDOOR FAN INTERFACE 2	
L106	JACK OUTDOOR FAN 3	
L107	JACK OUTDOOR FAN 4	
L108	JACK OUTDOOR FAN 5	
L109	JACK OUTDOOR FAN 6	
J103	JACK COMPRESSOR 3 AND 4 CONTROL	
J108	JACK COMPRESSOR 3 AND 4 CONTROL	
J116	JACK INVERTER EXHAUST BLOWER	
J119	JACK BLOWER EXHAUST FAN MOTOR 1	
J122	JACK BLOWER EXHAUST FAN MOTOR 2	
J133	JACK EXHAUST FAN 2	
J138	JACK EXHAUST FAN 2	
J139	JACK EXHAUST FAN 2	
J184	JACK I/O FOR A133 LENNOX A133 BOARD	
J248	JACK VFD CONTROL EXHAUST AIR	
J258	JACK HIGH AND LOW PRESSURE SWITCHES	
J259	JACK HIGH AND LOW PRESSURE SWITCHES	

△ S42 USED ON "M" VOLTAGE UNITS, AND UNITS WITH HIGH EFFICIENCY MOTORS OPTION

△ ONLY ON UNITS WITH HUMIDITROL

△ EXTERNAL HUMIDITROL CONTACTS CONNECTS TO SECTION "A" HEATING DIAGRAM, MAY BE LOCATED IN HEATING COMPARTMENT

△ S48 AND S60 ARE PART OF 5VDC CIRCUIT

△ F37 AND F38 ARE NOT USED ON UNITS LESS ELECTRIC HEAT, 480 AND 600 V

△ S37 AND S39 PRESSURE SWITCH CONTROL

△ VOLTAGE CONTROL SINGLE STAGE

△ VOLTAGE CONTROL TWO STAGE

REMOVE JUMPER BETWEEN TB24-28 AND TB24-29 WHENEVER ALC CONTROL IS USED REFER TO SECTION C DIAGRAM

△ A30 SENSOR AND A36 INVERTER CONTROL FOR B3 SUPPLY AIR BLOWER

△ REMOVE JUMPER BETWEEN TB24-28 AND TB24-29 WHENEVER ALC CONTROL IS USED REFER TO SECTION C DIAGRAM

△ A34 SENSOR AND A137 INVERTER CONTROL FOR B35 AND B36 EXHAUST AIR BLOWERS

△ A30 MAY BE USED WITH OR WITHOUT A34

△ A34 MAY BE USED WITH OR WITHOUT A30

△ A30 MAY BE USED WITH OR WITHOUT A34

△ A34 MAY BE USED WITH OR WITHOUT B3

△ A34 MAY BE USED WITH EITHER A86 VFD OR B9

△ MITSUBISHI VFD

△ K202-1 CONTACTOR MAY BE OMITTED ON UNITS WITH VFD OPERATION ONLY

△ USED ON VFD APPLICATIONS.

NOTE: IF ANY WIRE IN THIS APPLIANCE IS REPLACED IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING, TERMINATION AND INSULATION THICKNESS.

WARNING - ELECTRIC SHOCK HAZARD CAN CAUSE INJURY WITH NATIONAL AND LOCAL CODES. DISCONNECT ALL POWER BEFORE SERVICING.

— DENOTES OPTIONAL COMPONENTS

— LINE VOLTAGE FIELD INSTALLED

L264	JACK BLOWER DECK	
L265	JACK CONTACTORS AND RELAYS	
L267	JACK OUTDOOR FAN AREA	
L268	JACK TRANSFORMER 1 POWER	
L269	JACK HUMIDITROL	
K1-1	CONTACTOR COMPRESSOR 1	
K2-1	CONTACTOR COMPRESSOR 2	
K3-1	CONTACTOR BLOWER	
K10-1,2	RELAY OUTDOOR FAN 1	
K14-1	CONTACTOR COMPRESSOR 3	
K18-1	RELAY OUTDOOR FAN 2	
K145-1	CONTACTOR COMPRESSOR 4	
K149-1	RELAY OUTDOOR FAN 4	
K150-1	RELAY OUTDOOR FAN 4	
K159-1	RELAY OUTDOOR FAN 5	
K159-1,2	RELAY OUTDOOR FAN 5	
K199-1,2	CONTACTOR EXHAUST BLOWER 1	
K201-1	CONTACTOR EXHAUST BLOWER 2	
K202-1	CONTACTOR INVERTER BLOWER	
K203-2	RELAY SUPPLY BLOWER AUX	
K207-2	RELAY EXHAUST BLOWER AUX	
L14	VALVE SOLENOID REHEAT COIL 1	
L30	VALVE SOLENOID REHEAT COIL 2	
P47	PLUG OUTDOOR FAN 1	
P52	PLUG OUTDOOR FAN 2	
P66	PLUG OUTDOOR FAN INTERFACE	
P87	PLUG OUTDOOR FAN INTERFACE 2	
P106	PLUG OUTDOOR FAN 3	
P107	PLUG OUTDOOR FAN 4	
P108	PLUG OUTDOOR FAN 5	
P109	PLUG OUTDOOR FAN 6	
P118	PLUG COMPRESSOR 3 AND 4 CONTROL	
P119	PLUG COMPRESSOR 3 AND 4 INPUT	
P211	PLUG INVERTER EXHAUST BLOWER	
P194	PLUG I/O FOR A133 LENNOX A133 BOARD	
P248	PLUG VFD CONTROL	
P258	PLUG VFD CONTROL EXHAUST AIR	
P263	PLUG HIGH AND LOW PRESSURE SWITCHES	
P264	PLUG BLOWER DECK	
P265	PLUG CONTACTORS AND RELAYS	
P267	PLUG OUTDOOR FAN AREA	
P268	PLUG TRANSFORMERS	
P269	PLUG HUMIDITROL	
P299	SENSOR OUTDOOR AIR	
R117	SENSOR OUTDOOR AIR	
S4	SWITCH LIMIT HI PRESS COMPRESS 1	
S7	SWITCH LIMIT HI PRESS COMPRESS 2	
S11	SWITCH LOW PRESS. LOW AMBIENT KIT COMP 1	
S12	SWITCH LIMIT HI PRESS COMPRESS 3	
S24	SWITCH PRESSURE EXHAUST FAN	
S37	SWITCH PRESSURE EXHAUST FAN	
S39	SWITCH OVERLOAD RELAY BLOWER MOTOR	
S43	SWITCH DISCONNECT	
S45	SWITCH FREEZE STAT COMPRESS 1	
S49	SWITCH FREEZE STAT COMPRESS 2	
S53	SWITCH FREEZE STAT COMPRESS 3	
S54	SWITCH LOW PRESS. LOW AMBIENT KIT COMP 2	
S65	SWITCH LOW PRESS. LOW AMBIENT KIT COMP 3	
S67	SWITCH LOW PRESS. COMP 1	
S68	SWITCH LOW PRESS. COMP 2	
S84	SWITCH LOW PRESS. LOW AMBIENT KIT COMP 4	
S95	SWITCH LIMIT HI PRESS COMPRESS 4	
S96	SWITCH LOW PRESS. COMP 4	
S97	SWITCH LOW PRESS. COMP 3	
S98	SWITCH GFI	
T1	TRANSFORMER CONTROL	
T18	TRANSFORMER GFI	
T29	TRANSFORMER GFI	
TB13	TERMINAL STRIP POWER DISTRIBUTION	
TB18	TERMINAL STRIP CYCLE CONTROL	
TB23	TERMINAL STRIP BLOWER SPEED	
TB24	TERMINAL STRIP UNIT ADDER	
TB40	TERMINAL STRIP COMPRESSOR 1	
TB41	TERMINAL STRIP COMPRESSOR 2	
TB47	TERMINAL STRIP COMPRESSOR 3	
TB58	TERMINAL STRIP EXHAUST FANS	
TB59	TERMINAL STRIP INVERTER BY-PASS	

WIRING DIAGRAM



12/09

COOLING

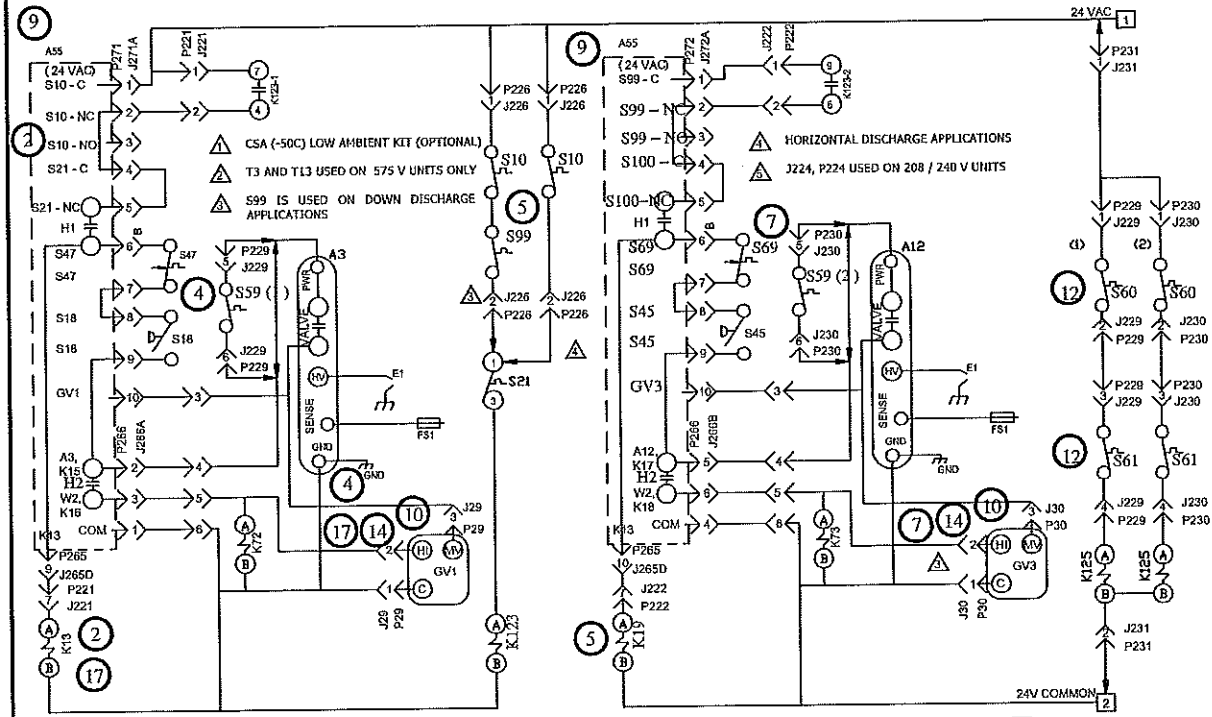
LCH1LGH 420S, 480S, 540S 1-G,J,M,Y

SECTION B

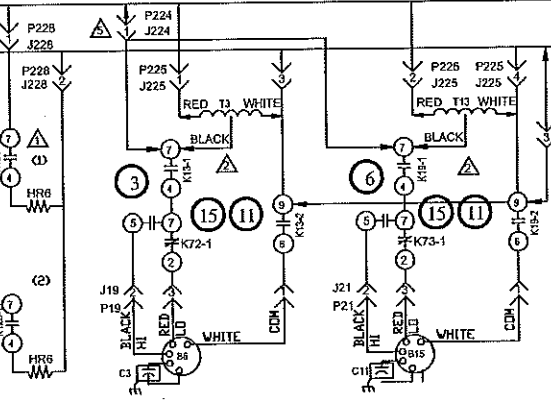
Supersedes New Form No. 537223-01

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GAS HEAT FOR "S" SERIES



KEY	DESCRIPTION
A3	CONTROL, BURNER 1
A12	CONTROL, BURNER 2
A55	PANEL, MAIN
B6	MOTOR COMBUSTION AIR BLOWER 1
B15	MOTOR COMBUSTION AIR BLOWER 2
C3	CAPACITOR, COMB AIR BLOWER 1
C11	CAPACITOR, COMB AIR BLOWER 2
E1	SPARK
FS1	SENSOR, FLAME
GV1	VALVE, GAS 1
GV3	VALVE, GAS 2
HR6	HEATER, -50C LOW AMBIENT KIT
J19	JACK, COMBUSTION AIR BLOWER 1
J21	JACK, COMBUSTION AIR BLOWER 2
J29	JACK, GAS 1 HONEYWELL VALVE
J30	JACK, GAS 2 HONEYWELL VALVE
J221	JACK, HARNESS BURNER 1
J222	JACK, HARNESS BURNER 2
J224	JACK, CAB POWER 208/240V
J225	JACK, CAB POWER 480/600V
J226	JACK, S10 HORIZONTAL DISCHARGE LIMIT
J228	JACK, VESTIBULE HEATER
J229	JACK, VESTIBULE HEATER CONTROL 1
J230	JACK, VESTIBULE HEATER CONTROL 2
J231	JACK, VESTIBULE HEATER CONTROL PWR
J265	JACK, CONTACTOR RELAY
J266A	JACK, HEATING CONTROL STG 1
J266B	JACK, HEATING CONTROL STG 2



J271A,B	JACK, HEATING SENSORS STG 1
J272A,B	JACK, HEATING SENSORS STG 2
K13,-1	RELAY, COMBUSTION AIR BLOWER 1
K19,-1	RELAY, COMBUSTION AIR BLOWER 2
K72,-1	RELAY, GAS 3
K73,-1	RELAY, GAS 4
K123,-1,2	RELAY, PRIMARY LIMIT
K125,-1	RELAY, HEAT SHUT OFF
P19	PLUG, COMBUSTION AIR BLOWER 1
P21	PLUG, COMBUSTION AIR BLOWER 2
P29	PLUG, GAS 1 HONEYWELL VALVE

P30	PLUG, GAS 2 HONEYWELL VALVE
P221	PLUG, HARNESS BURNER 1
P222	PLUG, HARNESS BURNER 2
P224	PLUG, CAB POWER 208/240V
P225	PLUG, CAB POWER 480/600V
P226	PLUG, S10 HORIZONTAL DISCHARGE LIMIT
P228	PLUG, VESTIBULE HEATER
P229	PLUG, VESTIBULE HEATER CONTROL 1
P230	PLUG, VESTIBULE HEATER CONTROL 2
P231	PLUG, VESTIBULE HEATER CONTROL PWR
P265	PLUG, CONTACTOR RELAY

P266	PLUG, HEATING CONTROL
P271A,B	PLUG, HEATING SENSORS STG 1
P272A,B	PLUG, HEATING SENSORS STG 2
S10	SWITCH, LIMIT PRIMARY GAS
S18	SWITCH, COMB AIR BLOWER 1 PROOF
S21	SWITCH, LIMIT SECONDARY GAS HEAT
S45	SWITCH, COMB AIR BLOWER 2 PROOF
S47	SWITCH, FLAME ROLLOUT BURNER
S59	TSTAT, OPEN -20F, CLOSE 10F
S60	TSTAT, OPEN 20F, CLOSE -10F
S61	TSTAT, OPEN 50F, CLOSE 20F
S69	SWITCH, FLAME ROLLOUT 2
S99	SWITCH, LIMIT PRIMARY BURNER 2
T3	TRANSFORMER, COMB AIR BLOWER 1
T13	TRANSFORMER, COMB AIR BLOWER 2
TB47	TERMINAL STRIP, EXHAUST FANS

← DENOTES OPTIONAL COMPONENTS

WIRING DIAGRAM 08/09

HEATING

GAS HEAT
EMERGENCY 500 AND 800 UNITS
SECTION A

Supersedes: New Form No. 537218-01

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