



ADDENDUM No. 3

PROJECT: Spartanburg Community College
Tyger River HVAC and Boiler Replacements
OSE Project No. H59-6315-JM
DEVITA Project No. 25531

DATE: **March 2, 2026**

TO: **Prospective Bidders**

This Addendum is hereby made a part of the Contract Documents on the subject work as though originally included therein. The following clarifications, amendments, additions, deletions and/or modifications to the original Bid Documents dated January 19, 2026, change the original documents only in the manner and the extent stated.

Acknowledge receipt of this addendum in the space provided in the Bid Form. Failure to do so may be grounds for rejection of the bid.

The following are **CHANGES OR CLARIFICATIONS** to

GENERAL

None.

PRIOR ADDENDA

None.

PROJECT MANUAL - BID OR CONTRACT REQUIREMENTS

1. Contractors bidding as sole prime are responsible for providing all controls and integration in accordance with the contract documents.
2. Refer to specification section 237313 for Air Rotation Units.

PROJECT MANUAL - TECHNICAL SPECIFICATIONS

1. Specification 237313 – Modular Indoor Central-Station Air-Handling Units
 - o See changes in specification. ~~Strike throughs~~ are deletions. *Italics* are new content.

DRAWINGS

1. The *Tracing and Labeling Scope* noted on Sheets E101 through E106, E300, E301, and E400 through E403 applies to all existing and proposed loads served by panels, switchboards, motor control centers, and other electrical power distribution equipment affected by this renovation. These are generally indicated by Key Note 1 on the Single-Line Diagrams, but also include any such equipment that is being replaced, as well as all items referenced by individual notes that require circuit verification throughout the plans and schedules.

M001

- o Condensing Boiler Schedule
 - Added FULTON EXE-3000 and RAYPAK H7-3007 as approved equals.

ENCLOSURES

Drawings:

- M001

Specifications:

- 237313 – Modular Indoor Central-Station Air-Handling Units

END OF ADDENDUM

FAN SCHEDULE															
MARK	MANUFACTURER MODEL	AREA SERVED	SERVICE	TYPE	CFM	STATIC PRESSURE (IN WG)	NOMINAL RPM	DRIVE TYPE	ELECTRICAL DATA		MOTOR HP	CONTROL	SONES	WEIGHT (LBS)	NOTES
									VOLTAGE	PHASE					
SF-1	GREENHECK SQ-20-M2-VG	8687 WAREHOUSE	OUTSIDE AIR	INLINE	6500	0.5	1108	DIRECT	460	3	3	SPEED CONTROLLER	7.5	220	1-8
SF-2	GREENHECK SQ-12-M1-VG	89 WAREHOUSE	OUTSIDE AIR	INLINE	2550	0.5	1867	DIRECT	460	3	2	SPEED CONTROLLER	7.6	84	1-8
SF-3	GREENHECK SQ-12-M2-VG	92 WAREHOUSE	OUTSIDE AIR	INLINE	1450	0.5	1404	DIRECT	208	1	1/2	SPEED CONTROLLER	6.1	67	1-8
SF-4	GREENHECK SQ-16-M2-VG	94 WAREHOUSE	OUTSIDE AIR	INLINE	5400	0.75	1758	DIRECT	460	3	3	SPEED CONTROLLER	9.3	173	1-8

NOTES:
1. PROVIDE UNIT WITH GRAVITY BACKDRAFT DAMPER.
2. PROVIDE VIBRATION ISOLATION.
3. UNIT SHALL BE UL LISTED AND AMCA CERTIFIED.
4. PROVIDE FACTORY MOUNTED DISCONNECT.
5. PROVIDE SPEED CONTROL.
6. PROVIDE MOTOR WITH THERMAL OVERLOAD PROTECTION.
7. PROVIDE INSULATED HOUSING FOR SOUND ATTENUATION.
8. APPROVED EQUALS INCLUDE LOREN-COOK SON AND TWIN CITY FAN DSI.

GRAVITY HOOD SCHEDULE							
MARK	UNIT SERVED	MANUFACTURER MODEL	TYPE	THROAT	CFM	MAX PRESSURE DROP (IN WG)	NOTES
GHI-1	ARU-1	GREENHECK GRSI-48	INTAKE	48"x48"	6500	0.064	1 - 4

NOTES:
1. PROVIDE WITH INTEGRAL INSECT SCREEN.
2. PROVIDE MANUFACTURER'S STANDARD CORROSION RESISTANT FINISH.
3. PROVIDE WITH ROOF CURB.
4. APPROVED EQUALS INCLUDE LOREN COOK PR AND TWIN CITY FAN GRV.

LOUVER SCHEDULE								
MARK	MANUFACTURER MODEL	UNIT SERVED	OPENING	FREE AREA (FT ²)	MAX VELOCITY (FPM)	PRESSURE DROP (IN WG)	SCREEN TYPE	NOTES
L-1	GREENHECK ESD-635-56x24	AHU-1	56 x 24	4.4	451	0.03	BIRD	1 - 4

NOTES:
1. LOUVER DIMENSIONS ARE 1/4" LESS THAN OPENING DIMENSIONS.
2. LOUVER SHALL BE AMCA CERTIFIED.
3. PROVIDE WITH MANUFACTURER STANDARD CORROSION RESISTANT FINISH. PAINT TO MATCH EXTERIOR WALL.
4. APPROVED EQUALS INCLUDE RUSKIN ELF6350OMP AND UNITED ENERTECH FL-D6.1

VARIABLE AIR VOLUME TERMINAL UNIT SCHEDULE														
MARK	AREA SERVED	MANUFACTURER MODEL	INLET SIZE	VOLUME REGULATION				HEATING				ELECTRICAL DATA	NOTES	
				MAX PRIMARY AIR (CFM)	MIN PRIMARY AIR (CFM)	FAN CFM	FAN HP	MAX HEATING AIR (CFM)	HEATING E.A.T. (°F)	HEATING L.A.T. (°F)	HEATER KW			STAGES
VAV-1-1	VESTIBULE & RESTROOMS	PRICE SDV06	6"	450	65	---	---	275	56.4	90.9	3.0	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-2	OFFICES & CONFERENCE	PRICE SDV06	6"	350	91	---	---	180	56.4	91.5	2.0	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-3	CORRIDOR & BREAKROOM	PRICE SDV06	8"	850	143	---	---	650	56.4	90.4	7.0	2	480V/3Ø	1,2,4,5,7,9-12
FPVAV-1-4	MEETING ROOM 354A	PRICE FDV2010	10"	1200	377	330	1/3	707	62.7	91.8	6.5	2	480V/3Ø	1,3,6,8-12
FPVAV-1-5	MEETING ROOM 354B	PRICE FDV2010	10"	1200	386	330	1/3	716	62.7	91.3	6.5	2	480V/3Ø	1,3,6,8-12
FPVAV-1-6	TRAINING ROOM 354C	PRICE FDV2010	10"	1200	383	380	1/3	763	63.1	90.1	6.5	2	480V/3Ø	1,3,6,8-12
VAV-1-7	OFFICES	PRICE SDV06	6"	250	65	---	---	120	56.4	95.8	1.5	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-8	OFFICES	PRICE SDV06	6"	225	65	---	---	110	56.4	99.5	1.5	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-9	OFFICES & WORKROOMS	PRICE SDV06	8"	550	125	---	---	445	56.4	91.8	5.0	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-10	HALL & BREAKROOM	PRICE SDV06	6"	300	65	---	---	200	56.4	95.8	2.5	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-11	OFFICES	PRICE SDV06	6"	325	65	---	---	165	56.4	94.7	2.0	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-12	OFFICE 320	PRICE SDV06	6"	400	65	---	---	220	56.4	92.3	2.5	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-13	CONFERENCE 323	PRICE SDV06	6"	400	129	---	---	260	56.4	92.8	3.0	2	480V/3Ø	1,2,4,5,7,9-12
VAV-1-14	OFFICES	PRICE SDV06	6"	375	65	---	---	200	56.4	95.8	2.5	2	480V/3Ø	1,2,4,5,7,9-12

NOTES:
1. PROVIDE UNIT WITH 1" THICK FIBERGLASS INSULATION.
2. FULL SHUTOFF TYPE BOX.
3. THE TRUE MINIMUM AIR VOLUME IS THE MINIMUM BOX CAPACITY WHEN THE ZONE IS UNOCCUPIED. MINIMUM VOLUME SHOWN IS THE MINIMUM VENTILATION REQUIREMENT.
4. PROVIDE SIEMENS VAV CONTROLLER MOUNTED AT FACTORY WHICH INTEGRATES WITH SIEMENS DESIGO BUILDING MANAGEMENT SYSTEM.
5. PROVIDE UNIT WITH DOOR INTERLOCK DISCONNECT SWITCH.
6. PROVIDE ECM FAN MOTOR.
7. APPROVED EQUALS SHALL BE TRANE VCEF, GREENHECK XG-TH-500, AND CARRIER 3SE.
8. APPROVED EQUALS SHALL BE TRANE VPEF, GREENHECK XG-FV-500, AND CARRIER 45N.
9. PROVIDE WITH MULTI-POINT, CENTER AVERAGING CROSS FLOW SENSOR.
10. PROVIDE WITH BOTTOM ACCESS DOOR.
11. PROVIDE WITH VIBRATION ISOLATION.
12. PROVIDE WITH FACTORY MOUNTED CONTROL TRANSFORMER.

AIR SEPARATOR SCHEDULE						
MARK	MANUFACTURER MODEL	TYPE	SERVICE	MAX GPM	INLET SIZE (IN)	NOTES
AS-2	BELL AND GOSSETT 5360-08F-12-004	CENTRIFUGAL WITH STRAINER	HOT WATER	1300	8	1-5
AS-3	BELL AND GOSSETT 5360-08F-12-004	CENTRIFUGAL WITH STRAINER	CHILLED WATER	1300	8	1-5

NOTES:
1. PROVIDE WITH HIGH CAPACITY AUTOMATIC AIR VENT.
2. PROVIDE WITH MANUAL BLOW DOWN VALVE.
3. DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH SECTION VIII, DIVISION 1 OF THE ASME BOILER AND PRESSURE VESSEL CODE.
4. STAINLESS STEEL STRAINER.
5. APPROVED EQUALS INCLUDE TACO ACT SERIES AND AMTRLO MODEL AS.

CHEMICAL BYPASS FEEDER SCHEDULE					
MARK	MANUFACTURER MODEL	TYPE	SERVICE	CAPACITY (GAL)	NOTES
CBF-1	NEPTUNE DBF-SHP	VERTICAL	HOT WATER	5	1

NOTES:
1. APPROVED EQUALS INCLUDE J.L. WINGERT DB SERIES AND GWS DB SERIES

EXPANSION TANK SCHEDULE							
MARK	MANUFACTURER MODEL	TYPE	SERVICE	MAX ACCEPTANCE (GAL)	SYSTEM CONNECTION SIZE (IN)	FILL CONNECTION SIZE (IN)	NOTES
EXP-1	BELL AND GOSSETT 8400	BLADDER	HOT WATER	106.0	1 1/2	3/4	1-5
EXP-2	BELL AND GOSSETT B35	BLADDER	CHILLED WATER	10.0	3/4	3/4	1-5

NOTES:
1. DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH SECTION VIII, DIV. 1 OF THE ASME BOILER AND PRESSURE VESSEL CODE.
2. PROVIDE WITH PRESSURE GAUGE, BLADDER INTEGRITY MONITOR, AND AIR CHARGING VALVE.
3. CARBON STEEL SHELL.
4. REPLACEABLE HEAVY DUTY BUTYL RUBBER BLADDER.
5. APPROVED EQUALS INCLUDE TACO CA SERIES AND AMTRLO EXTLROL L-SERIES.

MAGNETIC SEPARATOR SCHEDULE						
MARK	MANUFACTURER MODEL	SERVICE	DESIGN FLOW (GPM)	CAPACITY @ 5 FPS (GPM)	INLET/OUTLET SIZE (IN)	NOTES
MS-1	BOILERMAG BMXT300HF8/ANSI	HOT WATER	576	775	8	1

NOTES:
1. APPROVED EQUALS INCLUDE MAGSTRAINER H2 AND ADEY MAGNACLEAN

MAKEUP WATER APPURTENANCE SCHEDULE				
MARK	MANUFACTURER MODEL	SIZE (IN)	DESCRIPTION	NOTES
RPZ-1	WATTS LF009	3/4"	LEAD FREE BRONZE REDUCED PRESSURE ZONE BACKFLOW PREVENTER, ASSE 1013	1-2
PRV-1	BELL AND GOSSETT 87-12	3/4"	LEAD FREE BRONZE PRESSURE REDUCING VALVE, 10-25 PSI, SET TO 20 PSI	3-4
PRV-2	BELL AND GOSSETT MODEL 7	3/4"	LEAD FREE BRONZE PRESSURE REDUCING VALVE, 25-60 PSI, SET TO 30 PSI	3-4
RV-1	BELL AND GOSSETT 790-50	3/4"	LEAD FREE BRONZE PRESSURE RELIEF VALVE, RELIEF SETTING OF 90 PSI, ASME SECTION IV	3,5

NOTES:
1. PROVIDE WITH AIR GAP FITTING, INLET STRAINER, AND QUARTER TURN BALL VALVES
2. APPROVED EQUALS INCLUDE ZURN WILKINS 97XLS3 AND FEBCO LF860 SMALL
3. A PREASSEMBLED MAKEUP WATER PACKAGE MAY BE USED IN LIEU OF AN INDIVIDUAL PRV AND RELIEF VALVE.
4. APPROVED EQUALS INCLUDE WATTS LF123LP AND ZURN WILKINS 500XL3
5. APPROVED EQUALS INCLUDE WATTS LF174A AND ZURN WILKINS P1000AXL

AIR HANDLING UNIT SCHEDULE																											
MARK	AREA SERVED	NOMINAL TONS	MANUFACTURER	MODEL NUMBER	COOLING										PRE-HEAT						ELECTRICAL DATA		WEIGHT (LBS)	NOTES			
					TOTAL COOLING (MBH)	SENSIBLE COOLING (MBH)	SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	ESP (IN WG)	FAN HP	FLOW (GPM)	EWT (°F)	LWT (°F)	WATER PRESSURE DROP (FT WG)	EAT (°F)	LAT (°F)	TOTAL PRE-HEAT (MBH)	FLOW (GPM)	EWT (°F)	LWT (°F)	WATER PRESSURE DROP (FT WG)	EAT (°F)			LAT (°F)	VOLTAGE	PHASE
AHU-1	SOUTH OFFICES	23.5	TRANE	UCCA17	282.00	209.38	8075	2000	2	7.5	59.77	45.00	54.40	7.38	80.00	54.40	213.41	21.38	140.0	120.0	1.69	59.10	83.47	460	3	1801.6	1-14

NOTES:
1. COOLING CAPACITIES BASED ON 80°F DB / 67°F WB ENTERING COIL.
2. PROVIDE BACNET IP COMMUNICATION WHICH INTEGRATES WITH SIEMENS DESIGO BUILDING MANAGEMENT SYSTEM.
3. PROVIDE FACTORY INSTALLED DIRTY FILTER SWITCH AND BLOWER PROVING SWITCH.
4. PROVIDE 1 YEAR PARTS AND LABOR WARRANTY.
5. FIRE ALARM VENDOR TO FURNISH DUCT SMOKE DETECTOR. MECHANICAL CONTRACTOR TO INSTALL DUCT SMOKE DETECTOR IN THE RETURN AIR DUCT OF THE UNIT. FIRE ALARM VENDOR TO WIRE AND PROGRAM. DUCT SMOKE DETECTOR SHALL SHUT DOWN UNIT UPON ACTIVATION.
6. PROVIDE A SECOND SET OF FILTERS TO BE INSTALLED UPON SUBSTANTIAL COMPLETION.
7. PROVIDE RESTRAINED SPRING VIBRATION ISOLATION.
8. PROVIDE WITH MIXING BOX FROM FACTORY WITH BOTTOM RETURN OPENING AND REAR OUTSIDE AIR OPENING WITH MOTORIZED AIR DAMPERS.
9. CONFIRM ALL UNITS HAVE BEEN PROPERLY STARTED AND CONFIRMED RUNNING PROPERLY.
10. LABEL UNITS WITH MARK OR STENCIL MARK ON SIDE OF OUTSIDE UNIT WITH BLACK EXTERIOR PAINT.
11. PROVIDE WITH BOTTOM FILTER ACCESS.
12. PROVIDE WITH FACTORY MOUNTED DISCONNECT.
13. PROVIDE WITH FACTORY MOUNTED VFD WITH OUTPUT FOR CONNECTION TO SIEMENS DESIGO BMS.
14. APPROVED EQUALS SHALL BE DAIKIN CAHQ17C04C, VTS AVS-08S, AND CARRIER 39MN.

AIR ROTATION UNIT SCHEDULE																										
MARK	AREA SERVED	NOMINAL TONS	MANUFACTURER	MODEL NUMBER	COOLING										HEATING						ELECTRICAL DATA		WEIGHT (LBS)	NOTES		
					SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	FAN HP	TOTAL COOLING (MBH)	SENSIBLE COOLING (MBH)	FLOW (GPM)	EWT (°F)	LWT (°F)	WATER PRESSURE DROP (FT WG)	EAT (°F)	LAT (°F)	TOTAL HEATING (MBH)	FLOW (GPM)	EWT (°F)	LWT (°F)	WATER PRESSURE DROP (FT WG)	EAT (°F)	LAT (°F)			VOLTAGE	PHASE
ARU-1	86/87 WAREHOUSE	85	POWRMATIC	TE-41HC	34000	6500	(2) 7.5	1034.1	762.3	203.1	45.00	55.1	15.69	78.2	53.9	896.7	91.4	140.0	120.1	1.81	59.9	84.4	480	3	6000	1-7,9-12,15
ARU-2	86/87 WAREHOUSE	85	POWRMATIC	TE-41HC	34000	---	(2) 7.5	1034.1	762.3	203.1	45.00	55.1	15.69	80.00	58.8	896.7	91.4	140.0	120.1	1.81	70.0	94.5	480	3	6000	1-7,9-12,15
ARU-3	89 WAREHOUSE	79	POWRMATIC	TE-41HC	31600	2550	(2) 7.5	973.3	711.4	188.8	45.00	55.3	13.13	76.4	55.5	821.2	81.3	140.0	119.5	1.81	64.6	88.7	480	3	6000	1-8,10-12,15
ARU-4	92 WAREHOUSE	45	POWRMATIC	TE-21HC	18000	1450	(2) 3.0	552.2	402.5	107.5	45.00	55.2	19.06	76.4	55.6	507.7	50.8	140.0	119.7	1.38	64.6	90.7	480	3	4000	1-8,10-11,13,15
ARU-5	94 WAREHOUSE	96	POWRMATIC	TE-41HC	38400	5400	(2) 7.5	1169.8	852.9	229.4	45.00	55.2	17.18	77.4	56.7	903.0	91.4	140.0	119.9	1.92	62.1	83.8	480	3	6000	1-7,9-11,14,15
ARU-6	94 WAREHOUSE	96	POWRMATIC	TE-41HC	38400	---	(2) 7.5	1169.8	852.9	229.4	45.00	55.2	17.18	80.00	59.0	903.0	91.4	140.0	119.9	1.92	70.0	91.8	480	3	6000	1-7,9-11,14,15

NOTES:
1. COOLING CAPACITIES BASED ON 80°F DB / 67°F WB ENTERING COIL.
2. PROVIDE BACNET IP COMMUNICATION WHICH INTEGRATES WITH SIEMENS DESIGO BUILDING MANAGEMENT SYSTEM.
3. PROVIDE 1 YEAR PARTS AND LABOR WARRANTY.
4. MECHANICAL CONTRACTOR SHALL PROVIDE A SECOND SET OF FILTERS TO BE INSTALLED UPON SUBSTANTIAL COMPLETION.
5. PROVIDE VIBRATION ISOLATION PADS.
6. MECHANICAL CONTRACTOR SHALL CONFIRM ALL UNITS HAVE BEEN PROPERLY STARTED AND CONFIRMED RUNNING PROPERLY.
7. LABEL UNITS WITH MARK OR STENCIL MARK ON SIDE OF OUTSIDE UNIT WITH BLACK EXTERIOR PAINT.
8. PROVIDE UNIT WITH 3-WAY DISCHARGE PLENUM.
9. PROVIDE UNIT WITH 4-WAY DISCHARGE PLENUM.
10. PROVIDE WITH FACTORY MOUNTED VFD WITH OUTPUT FOR CONNECTION TO SIEMENS DESIGO BMS.
11. PROVIDE WITH FACTORY MOUNTED DISCONNECT.
12. APPROVED EQUALS SHALL BE APPLIED AIR MATO-04SK, TRANE ARUB, AND JOHNSON AIR ROTATION AR-75SI.
13. APPROVED EQUALS SHALL BE APPLIED AIR MATO-030K, TRANE ARUA, AND JOHNSON AIR ROTATION AR-55.SSI.
14. APPROVED EQUALS SHALL BE APPLIED AIR MATO-04SK, TRANE ARUB, AND JOHNSON AIR ROTATION AR-85.SSI.
15. UNIT SHALL BE 24"0" IN HEIGHT.

AIR DISTRIBUTION SCHEDULE							
MARK	TYPE	DESCRIPTION	DESIGN BASIS	FACE SIZE	NECK SIZE	MATERIAL	NOTES
S-1	SUPPLY	SQUARE CONE, 3-CONE, FIXED PATTERN	PRICE	SCD 12"x12"	6"Ø	STEEL	1 - 3
S-2	SUPPLY	SQUARE CONE, 4-CONE, FIXED PATTERN	PRICE	SCD 24"x24"	6"Ø	STEEL	1 - 3
S-3	SUPPLY	SQUARE CONE, 4-CONE FIXED PATTERN	PRICE	SCD 24"x24"	8"Ø	STEEL	1 - 3
R-1	RETURN	PERFORATED FACE, PLENUM RETURN	PRICE	PDDR 24"x24"	22"x22"	STEEL	1-3

NOTES:
1. FINISH SHALL MATCH CEILING AND DIFFUSERS IN ADJACENT, OUT OF SCOPE, AREAS FOR A CONTIGUOUS LOOK.
2. MOUNTING TYPE SHALL BE SUITABLE FOR THE CEILING TYPE INTO WHICH DIFFUSER IS INSTALLED.
3. ACCEPTABLE EQUALS INCLUDE METALARE AND TITUS.

CONDENSING BOILER SCHEDULE										
MARK	MANUFACTURER MODEL	INPUT MBH	OUTPUT MBH	MINIMUM EFF.	FLOW (GPM)	EWT (°F)	LWT (°F)	WATER PRESSURE DROP (FT WG)	ELECTRICAL DATA	NOTES
B-1	LOCHINVAR FB-3001	3000	2507	96.0%	288	120.0	140.0	8.0	208 3	1-9
B-2	LOCHINVAR FB-3001	3000	2507	96.0%	288	120.0	140.0	8.0	208 3	1-9

NOTES:
1. BOILER SHALL BE CSD-1 COMPLIANT.
2. PROVIDE WITH STAINLESS STEEL HEAT EXCHANGER.
3. MINIMUM 10:1 TURNDOWN RATIO.
4. PROVIDE WITH CONDENSATE NEUTRALIZATION KIT.
5. BOILER SHALL BE COMPATIBLE WITH POLYPROPYLENE FLUE/COMBUSTION VENT SYSTEM.
6. PROVIDE BACNET IP COMMUNICATION PROTOCOL COMPATIBLE WITH SIEMENS DESIGO BUILDING MANAGEMENT SYSTEM.
7. PROVIDE 1 YEAR PARTS AND LABOR WARRANTY AND 10 YEAR HEAT EXCHANGER WARRANTY.
8. APPROVED EQUALS INCLUDE PATTERSON-KELLY STORM 3000, BRYAN BFIT-3000, FULTON EXE-3000, AND RAYPAK HT-3007.
9. HEAT EXCHANGER SHALL BEAR THE ASME "H" STAMP.

CONDENSATE PUMP SCHEDULE										
MARK	MANUFACTURER MODEL	UNIT SERVED	FLOW (GPH)	HEAD (FT)	DISCHARGE SIZE (IN)	MOTOR HP	CONTROL	VOLTAGE	PHASE	NOTES
CP-1	LITTLE GIANT VCL-45L5	ARU-1	30	35	3/8"	1/5	FLOAT	230	1	1-3
CP-2	LITTLE GIANT VCL-45L5	ARU-2	30	35	3/8"	1/5	FLOAT	230	1	1-3
CP-3	LITTLE GIANT VCL-45L5	ARU-4	20	20	3/8"	1/18	FLOAT	230	1	1-3
CP-4	LITTLE GIANT VCL-45L5	ARU-5	35	35	3/8"	1/5	FLOAT	230	1	1-3
CP-5	LITTLE GIANT VCL-45L5	ARU-6	35	35	3/8"	1/5	FLOAT	230	1	1-3

NOTES:
1. SINGLE POINT POWER CONNECTION.
2. PROVID

**SECTION 237313
MODULAR INDOOR CENTRAL-STATION AIR-HANDLING UNITS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Casing construction.
- B. Fan section.
- C. Coil section.
- D. Filter and air cleaner section.
- E. Damper section.
- F. Controls.

1.02 RELATED REQUIREMENTS

- A. Section 230513 - Common Motor Requirements for HVAC Equipment.
- B. Section 230548 - Vibration and Seismic Controls for HVAC.
- C. Section 230593 - Testing, Adjusting, and Balancing for HVAC.
- D. Section 233300 - Air Duct Accessories: Flexible duct connections.
- E. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

- A. ABMA STD 9 - Load Ratings and Fatigue Life for Ball Bearings; 2015 (Reaffirmed 2020).
- B. AHRI 410 - Forced-Circulation Air-Cooling and Air-Heating Coils; 2001, with Addenda (2011).
- C. AMCA (DIR) - (Directory of) Products Licensed Under AMCA International Certified Ratings Program; 2015.
- D. AMCA 99 - Standards Handbook; 2025.
- E. AMCA 210 - Laboratory Methods of Testing Fans for Certified Aerodynamic Performance Rating; 2025.
- F. AMCA 300 - Reverberation Room Methods of Sound Testing of Fans; 2024.
- G. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data; 2022.
- H. AMCA 500-D - Laboratory Methods of Testing Dampers for Rating; 2018.
- I. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; 2023.
- J. ASHRAE Std 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size; 2025.
- K. ASHRAE Std 62.1 - Ventilation for Acceptable Indoor Air Quality; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- L. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- M. ASHRAE Std 135 - BACnet - A Data Communication Protocol for Building Automation and Control Networks; 2024, with Errata (2025).
- N. ASTM B177/B177M - Standard Guide for Engineering Chromium Electroplating; 2011 (Reapproved 2021).
- O. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.
- P. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Accept products on site in factory-fabricated protective containers, with factory-installed shipping skids and lifting lugs. Inspect for damage.
- B. Store in clean dry place and protect from weather and construction traffic. Handle carefully to avoid damage to components, enclosures, and finish.
- C. Do not operate units until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

PART 2 PRODUCTS

2.01 CASING CONSTRUCTION

- A. Full Perimeter Base Rail:
 - 1. Construct of galvanized steel.
 - 2. Provide base rail of sufficient height to raise unit for external trapping of condensate drain pans.
- B. Casing:
 - 1. Construct of one piece, insulated, ~~double wall panels.~~
 - 2. Provide mid-span, no through metal, internal thermal break.
 - 3. Construct outer panels of galvanized steel and ~~inner panels of galvanized steel.~~
 - 4. Casing Air Pressure Performance Requirements:
 - a. Able to withstand up to 8 in-wc positive or negative static pressure.
 - b. Not to exceed 0.0042 inches per inch deflection at 1.5 times design static pressure up to a maximum of plus 8 in-wc in positive pressure sections and minus 8 in-wc in negative pressure sections.
- C. Access Doors:
 - 1. Construction, thermal and air pressure performance same as casing.
 - 2. Provide surface mounted handles on hinged, swing doors.
- D. Unit Flooring: Construct with sufficient strength to support expected people and equipment loads associated with maintenance activities.
- E. Casing Leakage: Seal joints and provide airtight access doors so that air leakage does not exceed one percent of design flow at the specified casing pressure.
- F. Insulation:
 - 1. Provide minimum thermal thickness of 12 R throughout.
 - 2. Completely fill panel cavities in each direction to prevent voids and settling.
 - 3. Comply with NFPA 90A.
- G. Drain Pan Construction:
 - 1. Provide cooling coil sections with an insulated, double wall, galvanized steel drain pan complying with ASHRAE Std 62.1 for indoor air quality and sufficiently sized to collect all condensate.
 - 2. Slope in two planes to promote positive drainage and eliminate stagnate water conditions.
 - 3. Locate outlet of sufficient diameter at lowest point of pan to prevent overflow at normal operating conditions.
 - 4. Provide threaded drain connections constructed of drain pan material, extended sufficient distance beyond the base to accommodate field installed, condensate drain trapping.
- H. Louvers: Stationary, of galvanized steel, 4 inches deep with plenum, nylon bearings, 1/2-inch mesh, 0.04-inch galvanized wire bird screen in aluminum frame, and bearing AMCA Certified Ratings Seal in accordance with AMCA 500-L. Furnish adjustable louvers with hollow vinyl bulb edging on blades and foam side stops to limit leakage to maximum 2 percent at 4 in-wc differential pressure when sized for 2000 fpm face velocity.
- I. Finish:
 - 1. Indoor Units:

- a. Provide exterior, galvanized steel panels with painted surface complying with ASTM B177/B177M.
- b. Color: Manufacturer's standard color.

2.02 FAN SECTION

- A. Type: *Propeller-type* fan, in accordance with AMCA 99.
- B. Performance Ratings: Determined in accordance with AMCA 210 and labeled with AMCA Certified Rating Seal.
- C. Sound Ratings: AMCA 301; tested to AMCA 300 and label with AMCA Certified Sound Rating Seal.
- D. Bearings: Self-aligning, grease lubricated, with lubrication fittings extended to exterior of casing with plastic tube and grease fitting rigidly attached to casing.
- E. External Motor Junction Box: Factory mount NEMA 4 external junction box and connect to extended motor leads from internally mounted motors.
- F. Motor Wiring Conduit: Factory wire fan motor wiring to the unit mounted starter-disconnect, variable frequency drive, and external motor junction box.
- G. Fan Accessories:
- H. Drives:
 1. Comply with AMCA 99.
 2. Bearings: Heavy duty pillow block type, ball bearings, with ABMA STD 9 L-10 life at 50,000 hours.
 3. Shafts: Solid, hot rolled steel, ground and polished, with key-way, and protectively coated with lubricating oil.
 4. V-Belt Drive: Cast iron or steel sheaves, dynamically balanced, bored to fit shafts, and keyed. Variable and adjustable pitch sheaves for motors 15 hp and under selected so required rpm is obtained with sheaves set at mid-position; fixed sheave for 20 hp and over, matched belts, and drive rated as recommended by manufacturer or minimum 1.5 times nameplate rating of the motor.
 5. Belt Guard: Fabricate to SMACNA (DCS); 0.106 inch thick, 3/4 inch diamond mesh wire screen welded to steel angle frame or equivalent, prime coated. Secure to fan or fan supports without short circuiting vibration isolation, with provision for adjustment of belt tension, lubrication, and use of tachometer with guard in place.

2.03 COIL SECTION

- A. Casing: Provide access to both sides of coils. Enclose coils with headers and return bends ~~exposed outside casing~~ *fully contained within casing*. Slide coils into casing through removable end panel with blank off sheets and sealing collars at connection penetrations.
- B. Drain Pans: 24 inch downstream of coil and down spouts for cooling coil banks more than one coil high.
- C. Eliminators: Three break of galvanized steel, mounted over drain pan.
- D. Air Coils:
 1. Certify capacities, pressure drops, and selection procedures in accordance with AHRI 410.
- E. Fabrication:
 1. Tubes: 5/8 inch OD seamless copper expanded into fins, brazed joints.
 2. Fins: Aluminum.
 3. Casing: Die formed channel frame of galvanized steel.
- F. Water Heating Coils:
 1. Headers: Cast iron, seamless copper tube, or prime coated steel pipe with brazed joints.
 2. Configuration: Drainable, with threaded plugs for drain and vent; serpentine type with return bends on smaller sizes and return headers on larger sizes.

- G. Water Cooling Coils:
 - 1. Headers: Cast iron, seamless copper tube, or prime coated steel pipe with brazed joints.
 - 2. Configuration: Drainable, with threaded plugs for drain and vent; threaded plugs in return bends and in headers opposite each tube.

2.04 HOSE KITS AND VALVES

- A. Hoses:
 - 1. Provide hoses for all units for connection to main water supply and return headers.
 - 2. Length: 2 feet.
 - 3. Material: Braided stainless steel rated to minimum 400 psi at 265 degrees F.
- B. Automatic Balancing Valves:
 - 1. Brass body for shutoff and hydronic balancing.
- C. Y Strainers:
 - 1. Bronze body.
 - 2. "Y" type configuration with brass cap.
 - 3. Maximum Operating Pressure: Minimum 450 psi.
 - 4. Screen: Stainless steel.

2.05 FILTER AND AIR CLEANER SECTION

- A. General: Provide filter sections with filter racks, minimum of one access door for filter removal, and filter block-offs to prevent air bypass.
- B. Throwaway Filters:
 - 1. Media: 2 inch fiberglass with rigid supporting mesh across the leaving face, capable of operating up to a maximum of 500 fpm without loss of efficiency and holding capacity.
 - 2. Frame: Rigid.
 - 3. Minimum Efficiency Reporting Value: 8 MERV when tested in accordance with ASHRAE Std 52.2.
- C. Differential Pressure Gauge:
 - 1. Provide factory installed dial type differential pressure gauge, flush mounted with casing outer wall, and fully piped to both sides of each filter to indicate status.
 - 2. Maintain plus/minus 5 percent accuracy within operating limits of 20 degrees F to 120 degrees F.

2.06 DAMPER SECTION

- A. Mixing Section: Provide a functional section to support the damper assembly for modulating the volume of outdoor, return, and exhaust air.
- B. Damper Blades:
 - 1. Double-skin airfoil design with metal, compressible jamb seals and extruded-vinyl blade-edge seals on each blade.
 - 2. Self-lubricating stainless steel or synthetic sleeve bearings.
 - 3. Comply with ASHRAE Std 90.1 I-P for rated maximum leakage rate.
 - 4. Provide leakage testing and pressure ratings in compliance with AMCA 500-D test methods.
 - 5. Arrange in parallel or opposed-blade configuration.
- C. Barometric Relief Dampers:
 - 1. Frame: Roll formed galvanized steel.
 - 2. Blades: Roll formed galvanized steel.
 - 3. Blade Seals: Extruded vinyl, mechanically attached to the blade edge.
 - 4. Material:
 - a. Galvanized steel, single tie bar linkage for damper sections up to 24 inches wide.

2.07 CONTROLS

- A. Combination VFD - Disconnects:

1. Provide factory mounted, combination VFD - disconnect for each fan motor.
2. Factory mount in full metal enclosure and wire to fan motor.
3. Include control transformer with sufficient capacity to support the following items:
 - a. VFD and controls.
- B. BAS, SCADA, or other Integrated Automation Link: ASHRAE Std 135 BACnet MS/TP.
- C. External Point Mapping: Provide mapping table for each parameter included in the local visual interface with software-toggle flag to allow reduced mapping of available points.
- D. Control Valves: Field-installed, modulating, ball type with position tracking; manufacturer provided.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Bolt sections together with gaskets.
- C. Provide fixed sheaves required for final air balance.
- D. Make connections to coils with unions or flanges.
- E. Hydronic Coils:
 1. Hydronic Coils: Connect water supply to leaving air side of coil (counterflow arrangement).
 2. Provide shut-off valve on supply line and lockshield balancing valve with memory stop on return line.
 3. Locate water supply at bottom of supply header and return water connection at top.
 4. Provide manual air vents at high points complete with stop valve.
 5. Ensure water coils are drainable and provide drain connection at low points.

3.02 FIELD QUALITY CONTROL

- A. Final Acceptance Requirements:
 1. Use dial indicator gauges to demonstrate fan and motor are aligned.

3.03 SYSTEM STARTUP

- A. Provide manufacturer's field representative to perform systems startup.

3.04 CLOSEOUT ACTIVITIES

- A. See Section 01 70 00 Execution and Closeout Requirements for closeout submittals.
- B. Training: Train Owner's personnel on operation and maintenance of system.
 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 2. Provide minimum of two hours of training.
 3. Location: At project site.

END OF SECTION