

DESIGNATION	VAV-1	VAV-2	VAV-3	VAV-4
MANUFACTURER	TITUS	TITUS	TITUS	TITUS
MODEL	DESV-12	DESV-12	DESV-10	DESV-12
INLET SIZE (IN)	12	12	10	12
OUTLET SIZE (IN)	16x16	16x16	14x12	16x16
DESIGN MINIMUM CFM	-	-	-	-
DESIGN MAXIMUM CFM	1300	1400	1000	1600
CATALOG MINIMUM CFM	0	0	0	0
CATALOG MAXIMUM CFM	2000	2000	1400	2000
ELEC HEATING COIL (KW)	-	-	-	-

**NOTES:**

- VAV BOXES SHALL BE SINGLE DUCT COOLING/HEATING, WITH DIGITAL ELECTRONIC PRESSURE INDEPENDENT CONTROLS.
- VAV BOX CONTROLLER SHALL BE CAPABLE OF "DUAL" MAXIMUM CONTROL SEQUENCE, I.E. HEATING & COOLING MAXIMUMS.
- MAXIMUM RADIATED NC<30, MAXIMUM DISCHARGE NC<28, UNLESS OTHERWISE NOTED IN SCHEDULE ABOVE.
- MAXIMUM DESIGN AIRFLOW FOR EACH VAV BOX SHALL NOT EXCEED 80% OF MANUFACTURER'S LISTED MAXIMUM AIRFLOW FOR THAT BOX SIZE, UNLESS OTHERWISE NOTED IN SCHEDULE ABOVE.
- VAV BOXES SHALL HAVE 1" ACOUSTIC LINING.
- VAV BOXES SHALL BE U.L. LISTED AND LABELED.
- VAV BOXES SHALL BE PROVIDED WITH SHEETMETAL CONTROL ENCLOSURE BY TERMINAL MANUFACTURER.
- FURNISH AND INSTALL ALL VAV BOX CONTROLS.

INDOOR UNIT DESIGNATION	ACCU-1	ACCU-2	ACCU-3	ACCU-4	ACCU-5	ACCU-6	ACCU-7	ACCU-8	ACCU-9
LOCATION	ROOF	ROOF	ROOF	ROOF	ROOF	ROOF	ROOF	ROOF	ROOF
MODEL	ARUM192BTE5	ARUM168BTE5	ARUM241BTE5	ARUM144BTE5	ARUM144BTE5	ARUM144BTE5	ARUM144BTE5	ARUM144BTE5	ARUM144BTE5
TYPE	HEAT RECOVERY	HEAT RECOVERY	HEAT RECOVERY	HEAT RECOVERY	HEAT RECOVERY	HEAT RECOVERY	HEAT RECOVERY	HEAT RECOVERY	HEAT RECOVERY
UNITS SERVED	SEE RISER	SEE RISER	SEE RISER	SEE RISER	SEE RISER	SEE RISER	SEE RISER	SEE RISER	SEE RISER
REFRIGERANT TYPE	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
NOMINAL COOLING / HEATING CAPACITY (MBH)	192/216	168/189	233/243	144/162	144/162	144/162	144/162	144/162	144/162
HEATING CAPACITY @10F (MBH)	216	189	243	162	162	162	162	162	162
No. FANS	2	2	2	2	2	2	2	2	2
No. COMPRESSORS	2	2	2	2	2	2	2	2	2
REFRIGERANT PIPE SIZES	SEE RISER	SEE RISER	SEE RISER	SEE RISER	SEE RISER	SEE RISER	SEE RISER	SEE RISER	SEE RISER
VOLTS/Ø/Hz	208/3/60	208/3/60	208/3/60	208/3/60	208/3/60	208/3/60	208/3/60	208/3/60	208/3/60
FLA/MCA/MOCP	52.1/57.9/80	48.3/53.6/70	56.8/63.2/80	46.1/51.1/70	46.1/51.1/70	46.1/51.1/70	46.1/51.1/70	46.1/51.1/70	46.1/51.1/70
EER / IEER	12.4 / 25.9	12.4 / 25.9	12.4 / 25.9	12.4 / 25.9	12.4 / 25.9	12.4 / 25.9	12.4 / 25.9	12.4 / 25.9	12.4 / 25.9
WEIGHT (LBS.)	659	639	666	666	666	666	666	666	666
HEIGHT x WIDTH x LENGTH (INCHES)	66.5 x 29.9 x 48.8	66.5 x 29.9 x 48.8	66.5 x 29.9 x 48.8	66.5 x 29.9 x 48.8	66.5 x 29.9 x 48.8	66.5 x 29.9 x 48.8	66.5 x 29.9 x 48.8	66.5 x 29.9 x 48.8	66.5 x 29.9 x 48.8
<b>NOTES:</b> 1. UNITS BASED ON LG. 2. MECHANICAL CONTRACTOR SHALL PROVIDE BASE PAN HEATER MODEL ZPLT1A52A FOR EACH UNIT. ELECTRICAL CONTRACTOR SHALL INSTALL THE BASE PAN HEATER. 3. PROVIDE RUBBER VIBRATION ISOLATION FOR EACH OUTDOOR UNIT. 4. PROVIDE SYSTEM CONTROLLER MODEL PACSA000 AC SMART 5 CONTROLLER FOR GRAPHICAL INTERFACE, REMOTE MONITORING AND CONTROL. 5. CONDENSING UNIT VRF SYSTEMS SHALL MAINTAIN CONTINUOUS HEATING DURING DEFROST OPERATION. REVERSE CYCLE (COOLING MODE) DEFROST OPERATION SHALL NOT BE PERMITTED DUE TO THE POTENTIAL REDUCTION IN SPACE TEMPERATURE. 6. MULTIPLE CONDENSING UNIT VRF SYSTEMS SHALL MAINTAIN CONTINUOUS HEATING DURING OIL RETURN OPERATION. REVERSE CYCLE (COOLING MODE) OIL RETURN DURING HEATING OPERATION SHALL NOT BE PERMITTED DUE TO THE POTENTIAL REDUCTION IN SPACE TEMPERATURE. 7. THE OPERATING RANGE IN COOLING WILL BE 5°F TO 122°F. 8. THE OPERATING RANGE IN HEATING WILL BE -22°F TO 61°F. 9. WARRANTY SHALL BE 10 YEARS PARTS AND 10 YEARS ON THE COMPRESSORS. 10. CONTRACTOR SHALL HIRE THE MANUFACTURER'S INSTALLATION TECHNICIAN FOR INSTALLATION AND STARTUP. PROVIDE STARTUP REPORTS TO THE ENGINEER FOR REVIEW AND APPROVAL.									

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NOTES:

1. UNITS BASED ON LG.
2. PROVIDE MULTISITE CRC1 CONTROLLER MODEL #PREMTBVC0 FOR EACH UNIT. CONTROLLER HAS DIGITAL DISPLAY AND IS BACNET COMPATIBLE.
3. INTEGRAL CONDENSATE PUMP CAPABLE OF 27" LIFT. CONDENSATE DRAIN PIPE SIZE SHALL BE 3/4" FOR ALL UNITS.
4. PROVIDE GRILLE KIT FOR EACH 4-WAY CEILING CASSETTE.
5. PROVIDE AUXILIARY HEATER KIT - PRARH1 FOR ALL UNITS SHOWN ON PLAN TO CONTROL AN EXISTING HOT WATER CONTROL VALVE.

## EQUIPMENT NOTES

3. **SUPPLY AIR REGISTERS (TYPE A):** SHALL BE TITUS MODEL 300FL, ALUMINUM CONSTRUCTION, WITH 3/4" SPACING, DOUBLE DEFLECTION AIRFOIL BLADES, OPPOSED BLADE VOLUME DAMPER IN NECK, SIZE AND CFM AS NOTED ON PLANS. FINISH SHALL BE BAKED ON ENAMEL. SUBMIT COLOR CHART FOR APPROVAL. FRAME SHALL BE SUITABLE FOR SURFACE MOUNTING. COORDINATE WITH ARCHITECTURAL PLANS.
2. **SIDEWALL RETURN AIR REGISTERS (TYPE B):** SHALL BE TITUS MODEL 355FL, ALUMINUM CONSTRUCTION, WITH 1/2" SPACING, 35° FIXED DEFLECTION AIRFOIL BLADES, OPPOSED BLADE VOLUME DAMPER IN NECK, SIZE AND CFM AS NOTED IN TABLE ON PLANS. FINISH SHALL BE BAKED ON ENAMEL. SUBMIT COLOR CHART FOR APPROVAL. FRAME SHALL BE SUITABLE FOR SURFACE MOUNTING. COORDINATE WITH REFLECTED CEILING PLANS.
3. **HEAVY DUTY RETURN GRILLE (TYPE C):** SHALL BE TITUS MODEL 30RL. A STEEL HEAVY DUTY RETURN GRILLE WITH 3/8" BLADE SPACING, 0 DEGREE DEFLECTION, BLADES PARALLEL TO LONG DIMENSION. SIZE AND CFM AS NOTED ON PLANS. FINISH SHALL BE BAKED ON ENAMEL. SUBMIT COLOR CHART FOR APPROVAL. COORDINATE WITH ARCHITECTURAL PLANS.
4. **SUPPLY CEILING DIFFUSER (TYPE D):** SHALL BE TITUS MODEL TMS, STEEL CONSTRUCTION, 24"x24", NECK SIZE AND CFM AS NOTED ON PLANS. FINISH SHALL BE BAKED ON ENAMEL. SUBMIT COLOR CHART FOR APPROVAL. FRAME SHALL BE SUITABLE FOR GRID CEILING MOUNTING. COORDINATE WITH REFLECTED CEILING PLANS.
5. **EGGCRATE RETURN CEILING GRILLE (TYPE E):** SHALL BE TITUS MODEL 50F, ALUMINUM CONSTRUCTION, 24"x24" UNLESS OTHERWISE NOTED, CFM AS NOTED ON PLANS. FINISH SHALL BE BAKED ON ENAMEL. SUBMIT COLOR CHART FOR APPROVAL. FRAME SHALL BE SUITABLE FOR GRID CEILING MOUNTING. COORDINATE WITH RCP.
6. **OUTDOOR DUCT JACKET:** SHALL BE INSULATED AS PER THE SPECIFICATIONS AND COVERED WITH POLYGUARD INSUL-WRAP 50W MEMBRANE FOR WATERPROOF INSULATION JACKET. USE ONLY MATERIALS AND ADHESIVES COMPATIBLE WITH POLYGUARD INSULATION SYSTEM. INSTALL AS PER MANUFACTURERS RECOMMENDATIONS.
7. **REFRIGERANT PIPE INSULATION:** SHALL BE AN ARMAFLEX PIPE INSULATION, 3/4" THICK UNSUIT, TO BE INSTALLED BEFORE FINAL CONNECTION. FIELD FABRICATE FITTING INSULATION WITH MITER-CUTS. ALL BUTT JOINTS AND SEAMS ARE TO BE SEALED WITH ARMSTRONG 520 ADHESIVE. ALL INSULATION INSTALLED OUTDOORS SHALL BE COATED WITH ARMSTRONG ARMAFLEX FINISH, AS PER THE MANUFACTURERS RECOMMENDATIONS.
8. **PIPE INSULATION JACKETING FOR INDOOR EXPOSED PIPES:** SHALL BE WHITE ZESTON 2000 PVC COVERS FOR PIPING AND FITTINGS. JACKET ALL PIPING AND FITTING THAT ARE EXPOSED IN ANY ROOM. JACKET ALL PIPING EXPOSED TO VIEW IN CLASSROOMS, EQUIPMENT ROOMS ETC.
9. **DOMESTIC COLD & HOT WATER PIPING:** COPPER TYPE L ACCORDING TO STANDARD ASTM B88 WITH 95/5 SOLDERED FITTINGS ACCORDING TO STANDARD ASME B16.9. PIPING SHALL BE INSULATED WITH 1-1/2" THICK GLASS FIBER INSULATION WITH A K VALUE OF 0.23 AT 75°F, NON COMBUSTIBLE, AND A MINIMUM DENSITY OF 3.5 LBS/CU FT.
10. **SANITARY PIPING:** CAST IRON ACCORDING TO STANDARD ASTM A888 AND CISPI 301 WITH HUBLESS COUPLINGS ACCORDING TO STANDARD CISPI 310 AND ASTM C-1277.

## ADD ALTERNATE NOTES

**ADD ALTERNATE #1**

THE CONTRACTOR SHALL PROVIDE AN ADD ALTERNATE PRICE FOR THE FULL INSTALLATION OF THE FOLLOWING SYSTEMS INCLUDING ALL RELATED INDOOR HEAT PUMP UNITS, REFRIGERANT AND CONDENSATE PIPING, DUCTWORK AND ACCESSORIES, REGISTERS, POWER, FIRE ALARM AND CONTROLS & ANY & ALL DEMOLITION & PATCHING. COORDINATE WITH ARCHITECTURAL AND ELECTRICAL PLANS.

- DASF UNIT #3, #4, #5 AND ASSOCIATED ACCUS #6, #7, #8
- VRFS SYSTEMS ACCUS #2 & #3 AND ALL ASSOCIATED INDOOR HEAT PUMP UNITS

**ADD ALTERNATE #2**

THE CONTRACTOR SHALL PROVIDE AN ADD ALTERNATE PRICE FOR THE FULL INSTALLATION OF THE FOLLOWING SYSTEMS INCLUDING ALL RELATED INDOOR HEAT PUMP UNITS, REFRIGERANT AND CONDENSATE PIPING, DUCTWORK AND ACCESSORIES, REGISTERS, POWER, FIRE ALARM AND CONTROLS & ANY & ALL DEMOLITION & PATCHING. COORDINATE WITH ARCHITECTURAL AND ELECTRICAL PLANS.

- DOAS UNIT #1 & #2 AND ASSOCIATED ACCUs #4 & #5
- VRF SYSTEM ACCU #1 AND ALL ASSOCIATED INDOOR HEAT PUMP UNITS

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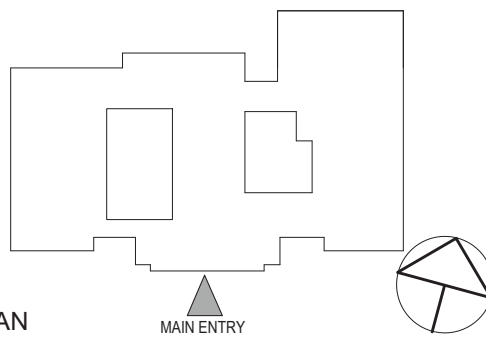
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1	03/31/2022	ISSUED FOR BID
No.	Date	Issue

## SCHEDULES & EQUIPMENT NOTES

Job No. NKGD0239.00	Date 09/10/2021
Scale AS NOTED	Drawn / Checked NW / RS

# M601