SECTION 23 36 00 _ SUMMARY

PART 1 – GENERAL

1.1 SUMMARY
A. Section Includes:
   1. Constant/Variable volume supply terminal units.
   2. Fan powered terminal units.
   3. Exhaust valves
B. Related Sections:
   Section 23 05 29 - Hanger and Supports for HVAC Piping and Equipment (later)
   Section 23 05 48 – Vibration and Seismic Controls (later)
   Section 23 09 00 – Building Automation Systems (later)
   Section 23 30 00 – Air Distribution Systems

1.2 ENGINEERING DESIGN GUIDELINES
A. No content.

1.3 SUBMITTALS
A. Product Data: Submit data indicating configuration, general assembly, and materials used in fabrication. Include catalog performance ratings indicating airflow, static pressure, heating coil capacity and NC designation. Include electrical characteristics and connection requirements. Include schedules listing discharge and radiated sound power level for each of second through sixth octave bands at inlet static pressures of 1 inch to 4 inches wg.
B. Manufacturer's Installation Instructions: Submit support and hanging details, and service clearances required.

1.4 CLOSEOUT SUBMITTALS
A. Operation and Maintenance Data: Submit manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts lists. Include directions for resetting constant volume regulators.

1.5 QUALITY ASSURANCE
A. Test and rate air terminal units’ performance for air pressure drop, flow performance, and acoustical performance in accordance with ARI 880 and ARI 885. Attach ARI seal to each terminal unit.

1.6 FIELD MEASUREMENTS
A. Verify field measurements prior to fabrication.

PART 2 – PRODUCTS

2.1 VARIABLE VOLUME AIR TERMINAL UNITS
A. Acceptable Manufacturers:
   1. Carnes
   2. Krueger
   3. Metal Aire
   4. Titus Model.
   5. The Trane Co.
   6. Tuttle & Bailey
   7. York Inc.

B. Identification: Furnish each air terminal unit with identification label and airflow indicator. Include unit nominal airflow, maximum factory-set airflow and minimum factory-set airflow and coil type.

C. Basic Assembly:
   1. Casings: Casings shall be double wall.
   2. Insulation: Minimum 1 inch thick closed cell insulation, meeting NFPA 90A requirements located between inner and outer casing walls.

D. Basic Unit:
   2. Volume Damper: Construct of galvanized steel with peripheral gasket and self-lubricating bearings; maximum damper leakage: 2 percent of design air flow at 3 inches inlet static pressure.
   3. Mount damper operator to position damper normally open.
   4. Access Door: Provide an access door in VAV terminals that have heating coils.

E. Hot Water Heating Coil:
   1. Construction: Minimum 1/2 inch copper tube mechanically expanded into aluminum plate fins, leak tested under water to 200 psig pressure, factory installed.

F. Automatic Damper Operator:
   1. Electric Actuator: 24 volt with remote temperature read and reset capability.
   2. In laboratory applications the damper shall be fast actuating.

2.2 FAN POWERED VARIABLE VOLUME UNITS

A. Manufacturers:
   1. Carnes
   2. Krueger
   3. Metal Aire
   4. Titus Model.
   5. The Trane Co.
   6. Tuttle & Bailey
   7. York Inc.
B. Identification: Furnish each air terminal unit with identification label and airflow indicator. Include unit nominal airflow, maximum factory-set airflow and minimum factory-set airflow and coil type.

C. Basic Assembly:
   1. Casings: Casing shall be double wall
   2. Lining: Minimum 1 inch thick closed cell insulation, meeting NFPA 90A requirements located between inner and outer casing walls.

D. Basic Unit:
   2. Volume Damper: Construct of galvanized steel with peripheral gasket and self-lubricating bearings; maximum damper leakage: 2 percent of design air flow at 3 inches inlet static pressure.
   3. Mount damper operator to position damper normally open.
   4. Access Door: Provide an access door in VAV terminals that have heating coils.

E. Automatic Damper Operator:
   Electric Actuator: 24 volt with remote temperature read and reset capability.

F. Fan Assembly:
   1. Fan: Forward curved centrifugal type with direct drive permanent-split-capacitor type, thermally protected motor.
   2. Speed Control: Infinitely adjustable through BAS system

G. Hot Water Heating Coil:
   1. Construction: Minimum 1/2 inch copper tube mechanically expanded into aluminum plate fins, leak tested under water to 200 psig pressure, factory installed.

H. Wiring:
   1. Factory mount and wire controls. Mount electrical components in control box with removable cover. Incorporate single point electrical connection to power source.
   2. Factory mount transformer for control voltage on electric and electronic control units. Furnish terminal strip in control box for field wiring of thermostat and power source.
   4. Disconnect Switch: Factory mount non-fused disconnect switch in control panel.

I. Controls: Electronic Controls: Contain in NEMA 250 Type 1 enclosure with access panel sealed from airflow and mounted on side of unit. Factory mount controls.

2.3 LABORATORY AIR EXHAUST VALVES & LABORATORY AIR SUPPLY VALVES

A. Manufacturers:
   1. Phoenix Controls Corp
B. **Product Description:** Airflow volume control units for connection to critical exhaust systems, with electronic controls

C. **Identification:** Furnish each air terminal unit with identification label and airflow indicator. Include unit rated airflow, maximum factory-set airflow and minimum factory-set airflow.

D. **Basic Assembly:**
   1. Casings: 16 gage spun aluminum with continuous welded seam
   2. Composite Teflon shaft bearings
   3. Stainless steel springs and polyester slider assembly

E. **Performance:**
   1. Pressure independent up to 3-0” static pressure drop across valve
   2. Volume control accurate to +/-5% of airflow command signal
   3. No additional straight runs needed before or after valve
   4. Response time to change in command signal less than one second
   5. Response time to change in duct static pressure less than one second

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**PART 3- EXECUTION**

3.1 **EXAMINATION**

   A. Verify ductwork is ready for air terminal installation.

3.2 **INSTALLATION**

   A. Connect to ductwork in accordance with Section 23 30 00.
   B. Install ceiling access doors or locate units above easily removable ceiling components.
   C. Support units individually from structure. Do not support from adjacent ductwork.
   D. Support air terminal units connected by flexible duct independently of flexible duct. Flexible duct shall be no more than 6 feet in length. Connect air terminal unit to flexible duct with stainless steel draw bands. Do not use flexible duct to make 90 degree turns. Rigid elbows shall be used to make 90 degree turns.
   E. Install transition piece to match flexible duct size to inlet or outlet of variable air volume terminal.

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**PART 4 - ATTACHMENTS**

4.1 No content.

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End of Section