

---

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1    Section 23 05 00 – Common Work Results for HVAC.
- .2    Section 23 05 49.01 – Seismic Protection Systems
- .3    Section 25 30 02 – EMCS – Field Control Devices

**1.2                REFERENCES**

- .1    American National Standards Institute/Air Movement and Control Association (ANSI/AMCA)
  - .1    ANSI/AMCA Standard 210/(ANSI/ASHRAE 51-07), Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
- .2    International Organization of Standardization (ISO)
  - .1    ISO 3741, Acoustics-Determination of Sound Power Levels of Noise Sources Using Sound Pressure - Precision Methods for Reverberation Rooms.
- .3    National Fire Protection Association (NFPA)
  - .1    NFPA 90A, Standard for the Installation of Air Conditioning and Ventilating Systems.
- .4    Underwriter's Laboratories (UL)
  - .1    UL 181, Factory-Made Air Ducts and Air Connectors.

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1    Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2    Product Data:
  - .1    Submit manufacturer's instructions, printed product literature and data sheets for air terminal units and include product characteristics, performance criteria, physical size, finish and limitations.
- .3    Shop Drawings:
  - .1    Submit drawings stamped and signed by professional engineer registered or licensed in Canada, member of OIQ.
  - .2    Indicate the following:
    - .1    Capacity.
    - .2    Pressure drop.
    - .3    Noise rating.
    - .4    Leakage.
- .4    Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.5 Test and Evaluation Reports:

- .1 Test data: to ANSI/AMCA Standard 210.
  - .1 Submit published test data on DIN (Direct Internal Noise), in accordance with ISO 3741 made by independent testing agency for 0, 2.5 and 6 m/s branch velocity or inlet velocity.
  - .2 Sound power level with minimum inlet pressure of 0.5 kPa in accordance with ISO 3741 for 2nd through 7th octave band, also made by independent testing agency.
  - .3 Pressure loss through silencer shall not exceed 60% of inlet velocity pressure maximum.

**1.4 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for air terminal units for incorporation into manual.

**1.5 MATERIALS/PRODUCT REPLACEMENT**

- .1 Where materials or products are specified by their trademark, consult the Instructions to Tenderers document for the procedures to follow regarding the request for approval for materials or product replacement.

**1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground, ideally indoors or in a clean, dry, well ventilated area and in accordance with manufacturer's recommendations.
  - .2 Store and protect air terminal units from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

**Part 2 Products**

**2.1 SYSTEM DESCRIPTION**

- .1 Performance Requirements:
  - .1 Catalogued or published ratings for manufactured items: obtained from tests carried out by manufacturer or those ordered by manufacturer from certified ADC (Air Diffusion Council) testing agency signifying adherence to codes and standards.

---

## **2.2 MANUFACTURED UNITS**

- .1 Terminal units of the same type to be product of one manufacturer.

## **2.3 ELECTRONIC VARIABLE AIR VOLUME BOXES**

- .1 Pressure independent, reset to air flow between zero and maximum air volume.
- .2 At inlet velocity of 10 m/s, differential static pressure for unit with attenuator section not to exceed 25 Pa.
- .3 Noise level shall not exceed NC 30 on normal condition system operations.
- .4 Air velocity sensor pitot rack as standard to manufacturer.
- .5 Signals between temperature sensing device, velocity controller, velocity sensor and damper actuator analogue as indicated. Shielded or twisted wire requirements is not acceptable.
- .6 Electronic control package factory calibrated and set at factory. Features to accommodate field calibration and readjustment of air volume settings to include:
  - .1 Metre taps for balancing with digital DC voltmeter.
  - .2 Adjustable flow settings at thermostat.
- .7 Factory installed 20 VA transformer, 115 V to 24 V. Power consumption of terminal not to exceed 15 VA.
- .8 Terminal unit to be CSA certified.
- .9 Casing: 0.8 mm thick galvanized steel, internally coated with 25 mm of fiberglass insulation having the required density to ensure the relevant noise level. Control devices / regulation system mounted within a metal shield case.
- .10 Damper: steel with peripheral gasket and self lubricating bearings. Air leakage past closed damper not to exceed 2% of nominal rating at 750 Pa inlet static pressure, in accordance with Air Diffusion Council test procedure.
- .11 Sizes and capacity: as indicated.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for air terminal units installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

**3.2           INSTALLATION**

- .1       Install in accordance with manufacturers recommendations.
- .2       Support independently of ductwork.
- .3       Install with at least 1000 mm of flexible inlet ducting and minimum of four duct diameters of straight inlet duct, same size as inlet.
- .4       Locate controls, dampers and access panels for easy access.

**3.3           CLEANING**

- .1       Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1       Leave Work area clean at end of each day.
- .2       Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3       Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1       Remove recycling containers and bins from site and dispose of materials at appropriate facility.

**END OF SECTION**