DESIGN GUIDELINE 230021
TERMINAL AIRFLOW UNITS

Scope

Variable and constant volume non-fan powered terminal airflow units for general HVAC.

Related Sections

U-M Design Guideline Technical Sections:
230030 Laboratory Ventilation Design

U-M Master Specification:
233600 - Air Terminal Units

U-M Standard Details:
15896001 – Supply Air TAU Clearance Detail

General

This guideline covers conventional VAV/CAV terminal airflow units (TAU). It does not cover fan powered boxes. U-M master specification 233600 – Air Terminal Units shall be used as the basis for the VAV/CAV box specification on all projects. The A/E shall edit the U-M specification to make it project specific. Turn on hidden text and read all spec. editors notes when editing the specification.

Commercial grade VAV/CAV boxes shall not be used in laboratories, vivariums, or other spaces requiring accurate room pressurization control. See design guideline 230030 - Laboratory Ventilation Design for the terminal units required for those areas.

Specification Requirements

VAV & CAV Boxes

Lining: dual density thermal/acoustic insulation with a cleanable foil liner is standard at U-M, and is specified in the U-M master specification 233600.

Access panel: Access panels to allow up or downstream access to the reheat coil are not required.

Controls: VAV and CAV box control shall normally be by direct digital control (DDC) with electronic actuators.

For a standard DDC VAV/CAV boxes:

The box manufacturer shall provide the flow sensor and the damper.

The controls contractor shall furnish the following (all specified in U-M's master control specification 230900):

- Electronic damper motor actuator
- Electronic reheat coil valve actuator (if applicable)
- DDC controller enclosure (dust cover)

The box DDC controller, known as the "TEC" (terminal equipment controller) and the room temperature sensor, or "RTS" (thermostat), are provided by U-M to the controls contractor.

For atypical boxes (pressure/tracking control, etc.), carefully review the TEC section of U-M's master control specification 230900 for information about which trade provides specific components related to controls.

The controls contractor *may* elect to ship the controller, cover, and actuator(s) to the box manufacturer for mounting (or may choose to field mount the components), however this construction coordination issue does not need to be covered in the AE's specification provided U-M's master control specification 230900 is utilized on the project.

For the rare instances when a pneumatic controller is required, the *box manufacturer* shall provide a Krueter CSC-3011 controller, a controller dust cover, and a normally open damper with a damper operator. This information is specified in the U-M master specification 233600 - Air Terminal Units.

Design

On the plan views, for each terminal airflow unit, indicate the minimum and maximum CFM setting.

DDC controlled boxes require a minimum of 3' clearance in front of and the width of the DDC controller. DDC boxes shall be labeled with a unique identifier. Use U-M's terminal airflow unit clearance detail, 15896001 – Supply Air TAU Clearance Detail, which identifies clearance and labeling requirements. It is preferred the AE assign the unique identifier (per the detail's nomenclature system) for each box and indicate it on the design drawings.

Boxes should be located in corridors directly above suspended ceilings whenever possible, with unobstructed access for maintenance and removal.

Do not oversize boxes by more than 20%.

Attention shall be given to the take-off size and construction technique at the branch duct to assure sufficient supply air is available at actual branch duct static pressure. The A/E shall provide a take-off detail on the design drawings.