

DIVISION 15 - MECHANICAL

Section 15850 - Ductwork Accessories Introduction

Equipment associated with:

AIR HANDLING SYSTEMS INCLUDING TERMINAL BOXES

Part 1 - General

- Terminal Box test submittal data shall be in accordance with ADC/ARI Standard 880.
- Terminal Box controllers to be compatible with Campus EMCS. (See Section 15970)

Part 2 - Products

- Terminal Unit selection criteria is presented in table 1. Only unit sizes listed are to be used on University projects (no odd size inlet ducts are used)

Table 1

DSS Terminal Units Selection Criteria					
Primary Air (CFM)				Reheat	
inlet Size	Max flow Range		Min Flow (1)	min gpm (4)	min LAT
4(2)	100	180	40	0.50	80
6	185	340	90	0.50	80
8	330	640	160	0.75	80
10	530	1,000	250	1.00	80
12	780	1,500	360	1.00	80
14	1,100	2,200	490	2.00	80
16	1,450	2,900	640	2.00	80
24x16 (3)	2,900	6,000	1,215	6.00	80

Table Notes:

1. This flow is the minimum for stable control
2. Temperature control zones this small should be avoided
3. This box size should be avoided whenever possible - consider multiple units as this unit typically requires higher inlet static pressure
4. CAUTION - the specified minimum gpm does not guarantee a leaving air temperature equal to 80 for all airflows within the specified range.

Box selection guidance:

- The Design professional must consider the space noise criteria when selecting the specific box for their project.
- Using these selections should reduce the need for sound attenuators. It desirable to not install sound attenuators unless it is required for room performance.
- Emphasis should be on efficient duct designs both inlet and outlet configurations

Reheat coil guidance

- Heating water system supply to be 170 F. (specify a reset schedule based on OA temperature)
- All coils to be 10 fins per inch maximum (standard coils)

- 1 row coils provide the least air pressure drop and should be the priority coil selected unless space load requires higher
- No more than 2 rows should be specified without UA approval (it is recommended the water flow and temperature drop be adjusted rather than specify more rows)
- Scheduling and selection of reheat coils shall be based on LAT and GPM initial GPM to be based on 30 degree drop typically (use room heating load to determine the required coil leaving air temperature)
- Reheat coils should have a minimum LAT of 80 F (to support morning warm up)
- The minimum heating water flow to a given coil shall be as scheduled base design flow on 30 degree delta T (under no circumstances should the scheduled flow be lower than 0.5 gpm.
- Control water flow with pressure independent control valves (PICV) match PICV sizes to the required gpm. PICV's shall have integral pressure test ports.
- The airflow required for heating is not required to be the same as minimum primary airflow or an arbitrary percentage of max flow. Digital controllers have provisions to specify a heating cfm separately from the min cooling airflow and should be considered in the scheduling of box performance.
- The DP should recognize that using an arbitrary percentage of design flow may not result in providing the maximum heat to the space. A strategy that has proven effective is using a variable flow in heating mode with the heating valve modulating to 100% and then the airflow increased to the flow corresponding to maximum heat output to the space

Specification items

- Generally, the manufacturers standard 22-gauge construction is acceptable with the following options/clarifications:
 - Units to be tested and AHRI 880 certified
 - Coils to be rated per AHRI 410
 - **NO fibrous duct liner** - Unit casing shall be lined with 1/2", 1 1/2 lb. density, smooth surface, polyolefin, closed-cell foam insulation for fiber free application. Cellular insulation meets UL 181 and NFPA 90A and does not support mold or bacteria growth. Insulation shall be attached to the unit casing by adhesive and weld pins.
 - Provide access door upstream of heating coil attached with screws
 - Coils shall be max 10 fins per inch
 - Unit casing leakage to be tested per ASHRAE standard 130 and not exceed 2% of the maximum rated airflow at 3 iwg pressure
 - Provide enclosure for unit mounted controls
 - Controllers to be same manufacturer as the EMCS system. Factory mounting is preferred but should be left as a contractor /project option

Coordination Items

- Design drawings to show location of 24v power supplies (by EMCS) – electrical drawings to show power connection and to provide feeder
- Preference is to **not** bring 120 V to each box but to feed with low voltage
- Controls must comply with DSS section 15970
- Show location of reheat coil connections as well as control box location.
- Locate boxes so that they can be accessed by a ladder
- Only locate above accessible ceilings (accessible requires the ceiling to be non-progressive or to not require disassembly for access)

Part 3 - Execution

- Do not reuse existing pneumatic terminal boxes when designing a space remodel.
- Install terminal boxes with minimum of 18" clearance access for service and maintenance.
- Fire dampers and fire-smoke dampers to be installed in accordance with manufacturers installation instructions.

End of Section 15850