

FACILITIES BUILDING STANDARDS

Section 23 0000 Heating, Ventilating and Air Conditioning (HVAC)

Revision date: **06/24/2021**

HVAC, General

1. HVAC components requiring frequent maintenance/service, such as reheat boxes, dampers, faces of coils, shall be accessible.
2. All mechanical equipment shall be accessible for maintenance.
3. Provide reheat valves with feedback (no floating control), to prohibit valve from being lost and aids in diagnostics.
4. Reheat valves require unions and at least 8" of clean pipe for change-outs.
5. Provide direct drive fan coil units and exhaust fans. Any deviation must be verified with Shands.
6. No HVAC piping shall be permitted to lay on ceiling grid or HVAC service points.
7. Provide an end switch at every section of fire/smoke damper.
8. All dampers shall be DDC electronic control, not pneumatic mix, due to coordination of speed.
9. If hydraulic elevators are used, provide exhaust to control odor.
10. Provide at least one 3-way valve at the end of each terminal hot water reheat loop to prevent stagnation.
11. Air flow meters must be accessible.
12. Provide single duct supply with air terminal and reheat.
13. Access must be provided to both sides of a cooling coil to facilitate cleaning. The access space must be large enough to allow a person to stand or kneel in front of the coil from both sides.
14. All dampers exposed to outside air shall be stainless steel or aluminum construction.
15. Identify all valves w/ labels, including shut-off, balancing, pressure reducing and relief valves.
16. HVAC components requiring frequent service, such as reheat boxes and dampers, shall have access doors installed and be labeled. Access shall be installed upstream to facilitate ability to clean face of coil.
17. Pipe hangers and supports shall not penetrate vapor barrier of pipe insulation. Pipe insulation shall be continuous across/through partitions.
18. Piping and ductwork shall not be supported from other piping/ductwork.
19. Belimo is only acceptable manufacturer for actuators.
20. Belimo energy valves shall be used at the chilled water coil of each air handler 5 tons and larger.
21. Contractor must provide verification of proper flushing of hot and chilled water systems, prior to use.
22. Contractors must provide owner training for all major equipment installations.
23. Commissioning must be provided for all AHUs and VAV boxes that are impacted by a project (new and existing).
24. For ATU single duct systems, Belimo is only acceptable manufacturer for valves.
25. New louver locations shall be coordinated with owner to provide adequate distances from any potential odor intake issues.
26. Test and balance must be taken prior to the start of any renovation work (walls relocation, new equipment, etc), as well as at the end of a project to ensure correct settings.
27. All air-cooled chillers shall have security screens.
28. Phoenix or Price valves shall be provided at locations determined by owner. Unoccupied setbacks shall be designed into critical air flow areas where allowed by code and where practical. Coordinate with owner.
29. All ductwork shall follow SMACNA standards on all materials and installation.
30. Contractor shall provide three sets of filters for construction project: one set to be used during construction; one set post-construction for final T+B that remains in place; and one spare set for attic stock.
31. Fire/smoke and smoke dampers shall have proof open and proof closed end switches. One switch for open status and one switch for closed status.
32. For multiple section dampers (fire/smoke dampers, smoke dampers, or control dampers) with end switches, each section of the damper shall be provided with an individual end switch, wired in series.

33. For fire/smoke dampers or smoke dampers installed in a wall, contractor shall confirm with owner which side of the wall they would prefer the actuator on.
34. **Each fire damper that has been disabled will have permanent label that shall read:
FIRE DAMPER DISABLED ON MM/DD/YYYY
UNDER UF HEALTH PROJECT NUMBER XXXX-XXX**
35. Fan Coil Unit operation shall be confirmed with owner. Some units may serve critical areas and should continue to run even when in alarm.
36. Minimum access door size for access of fire dampers shall be 10"x10". Ductwork shall transition as required for access door and duct size shall be maintained through fire damper.
37. Floor level communications cable jacket shall be green. Instrumental signal cable jacket shall be white.
38. For VAV box upgrades and new installs; where possible mount multi-circuit 24VAC transformers in TR or mechanical rooms to power up VAV box controls. This will allow J-hook and cable tray power distribution to the VAV boxes and do away with the need for 120 VAC to each box.

Variable Frequency Drives (VFDs)

1. All VFD cabinets shall be protected from dust/dirt during storage, construction and operation. If VFDs are not furnished with internal air filter racks, provide temporary filter media to protect the unit from dust/dirt/moisture during construction.
2. Provide full owner training for all specific drives submitted and approved.
3. Mechanical bypass shall be provided, not electric.

Air Handling Units (AHUs)

1. Access to all components of the AHU (coil, drain pan, filters, motor, dampers, controls, louvers, etc) shall be considered in the design. Space shall be provided to ensure any technician can have adequate access to work on any component. Walk-in spaces are preferred.
2. AHU doors shall be specified large enough to remove all components within the AHU compartments. They shall also be located with no objects impeding access to the doors; clear flow of movement.
3. Aluminum interior and fan cube areas shall be provided in AHUs.
4. An ultraviolet light shall be included as a standard component with a chilled water coil, since such lights prohibit mold growth on coils.
5. There shall be no perforated surfaces, such as perforated sound-absorption panels, before the final filters inside of AHUs. Perforated panels in sound attenuators after the final filters is acceptable.
6. A hoist/track for removing the AHU motor (10hp and higher) in and out shall be included.
7. No internal duct sealer shall be provided within 100' of AHU cold deck discharge.
8. Provide 15% excess capacity in coil and airflow.
9. While air handlers may not use HEPA filtration (per project basis), they shall be designed to accept HEPA filtration that serve all operating rooms.
10. Concrete pads/curbs and isolation springs shall be provided, as required, to reduce sound/vibration transmission into interior spaces.
11. Maximum motor horsepower on any fan wall fan array shall be 15 hp.

Fans

1. BOD: Greenheck or Cook Direct Drive
2. Provide factory access hinged doors installed on each fan; bolt-on gasketed doors are not permitted on direct drive units.

Room Pressurization

1. Ball-n-tube shall be installed per Room Pressurization table shown below.

Negative Red Ball	Positive Green Ball	Pressure Relationship	Monitor Y/N	Humidistat & Temp	Design % Rel Humidity	Design Temp (F)	Comments
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Surgery and Critical Care							
Operating room (Class B & C)	Positive	Yes	Yes	20-60	68-75		
Operating/surgical cystoscopic rooms	Positive	Yes	Yes	20-60	68-75		
Delivery room (Caesarean) (m), (n), (o)	Positive	Yes	Yes	20-60	68-75		
Substerile service area	NR	No	No	NR	NR		
Recovery Room	NR	No	No	20-60	70-75		
Critical and intensive care	NR	No	No	20-60	70-75		
Intermediate care (s)	NR	No	No	Max 60	70-75		
Wound intensive care (burn unit)	NR	No	No	40-60	70-75		
Newborn intensive care	Positive	No	No	30-60	72-78		
Treatment room (p)	NR	No	No	20-60	70-75		
Trauma Room (crisis or shock) (c)	Positive	Yes	Yes	20-60	70-75		
Medical/anesthesia gas storage [r]	Negative	No	No	NR	NR		
Laser eye room	Positive	Yes	No	20-60	70-75		
ER waiting rooms	Negative	No	No	Max 65	70-75		
Triage	Negative	Yes	No	Max 60	70-75		
ER decontamination	Negative	Yes	No	NR	NR		
Radiology waiting rooms	Negative	No	No	Max 60	70-75		
Procedure Room (Class A surgery) (o), (d)	Positive	Yes	Yes	20-60	70-75		
Emergency department exam/treatment room (p)	NR	No	No	Max 60	70-75		
Inpatient Nursing							
Patient room	NR	No	No	Max 60	70-75		
Nourishment area or room	NR	No	No	NR	NR		
Toilet room	Negative	No	No	NR	NR		
Newborn nursery suite	NR	No	No	30-60	72-78		
Protective environment room (t)	Positive	Yes	No	max 60	70-75		
All room (u)	Negative	Yes	No	max 60	70-75		
Combination All/PE room. Not applicable	Positive	Yes	No	max 60	70-75		
All anteroom (u). Not applicable	Section 7.2	No	No	NR	NR		
PE anteroom (t). Not applicable	Section 7.2	No	No	NR	NR		
Combination All/PE anteroom. Not applicable	Section 7.2	No	No	NR	NR		
Labor/delivery/recovery/postpartum (LDRP) (s)	NR	No	No	Max 60	70-75		
Labor/delivery/recovery (LDR) (s)	NR	No	No	Max 60	70-75		
Patient Corridor	NR	No	No	NR	NR		

Nursing Facility	Pressure Relationship	Monitor Y/N	Humidistat & Temp	Design % Rel Humidity	Design Temp (F)	Comments
Resident room	NR	No	No	NR	70-75	
Resident gathering/activity/dining	NR	No	No	NR	70-75	
Resident unit corridor	NR	No	No	NR	NR	
Physical therapy	Negative	No	No	NR	70-75	
Occupational therapy	NR	No	No	NR	70-75	
Bathing room	Negative	No	No	NR	70-75	
Radiology (v)	Pressure Relationship	Monitor Y/N	Humidistat & Temp	Design % Rel Humidity	Design Temp (F)	Comments
X-ray (diagnostic and treatment)	NR	No	No	max 60	72-78	
X-ray (surgery/critical care and catheterization)	Positive	Yes	Yes	max 60	70-75	
Diagnostic and Treatment	Pressure Relationship	Monitor Y/N	Humidistat & Temp	Design % Rel Humidity	Design Temp (F)	Comments
Bronchoscopy, sputum collection, and pentamidine administration (n)	Negative	Yes	No	NR	68-73	
Laboratory, general (v). Core Lab, Level 1	Negative	Yes	No	NR	70-75	
Laboratory, general (v). Core Lab, Electropherisis, Level 1	Negative	Yes	No	NR	70-75	
Laboratory, bacteriology (v). Micro, Level 2	Negative	Yes	No	NR	70-75	
Laboratory, bacteriology (v). Micro, TB, Level 3	Negative	Yes	No	NR	70-75	
Laboratory, biochemistry (v). Core Lab, Level 1	Negative	Yes	No	NR	70-75	
Laboratory, cytology (v). RPL	Negative	Yes	No	NR	70-75	
Laboratory, histology (v). RPL	Negative	Yes	No	NR	70-75	
Laboratory, microbiology (v). Level 2	Negative	Yes	No	NR	70-75	
Laboratory, microbiology (v), TB, Level 3	Negative	Yes	No	NR	70-75	
Laboratory, pathology (v), surgical. Gross Lab, Level 2	Negative	Yes	No	NR	70-75	
Laboratory, serology (v). Core Lab, Level 1	Negative	Yes	No	NR	70-75	
Laboratory, media transfer (v). Micro, Level 2	Positive	Yes	No	NR	70-75	
Nonrefrigerated body-holding room (h)	Negative	No	No	NR	70-75	
Autopsy room (n)	Negative	No	No	NR	70-75	
Pharmacy (b)	Positive	No	No	NR	NR	
Pharmacy compounding	Varies	Yes	No			
Examination room	NR	No	No	Max 60	70-75	
Medication room	NR	No	No	Max 60	70-75	
Gastrointestinal endoscopy procedure room (x)	NR	Yes	No	20-60	68-73	Verify CMS
Endoscope cleaning	Negative	Yes	No	NR	NR	
Treatment room (x)	NR	No	No	Max 60	70-75	
Hydrotherapy	Negative	No	No	NR	72-80	
Physical therapy	Negative	No	No	Max 65	72-80	
Dialysis treatment area	NR	No	No	NR	72-78	

Nuclear medicine hot lab	Negative	Yes	Temp only	NR	70-75	Verify lead wall
Nuclear medicine treatment room	Negative	Yes	Temp only	NR	70-75	
Sterilizing	Pressure Relationship	Monitor Y/N	Humidistat & Temp	Design % Rel Humidity	Design Temp (F)	Comments
Sterilizer equipment room	Negative	Yes	No	NR	NR	
Central Medical and Surgical Supply	Pressure Relationship	Monitor Y/N	Humidistat & Temp	Design % Rel Humidity	Design Temp (F)	Comments
Soiled or decontamination room	Negative	Yes	No	NR	72-78	Rated Walls
Clean workroom	Positive	Yes	No	max 60	72-78	
Sterile storage	Positive	Yes	No	max 60	72-78	
Service	Pressure Relationship	Monitor Y/N	Humidistat & Temp	Design % Rel Humidity	Design Temp (F)	Comments
Food preparation center (i)	NR	No	Temp only	NR	72-78	
Warewashing	Negative	No	No	NR	NR	
Dietary storage	NR	No				
Soiled linen sorting and storage	Negative	No	No	NR	NR	
Clean linen storage	Positive	No				
Linen and trash chute room	Negative	No	No	NR	NR	Rated Walls
Bedpan room	Negative	No	No	NR	NR	
Bathroom	Negative	No				
Janitor's closet	Negative	No	No	NR	NR	
Support Service	Pressure Relationship	Monitor Y/N	Humidistat & Temp	Design % Rel Humidity	Design Temp (F)	Comments
Soiled workroom or soiled holding	Negative	Yes	No	NR	NR	Rated Walls
Clean workroom or clean holding	Positive	Yes	No	NR	NR	Rated Walls
Hazardous material storage	Negative	Yes	No	NR	NR	Rated Walls