

NORTHWESTERN UNIVERSITY
PROJECT NAME _____
JOB # _____

FOR: _____
ISSUED: 03/29/2017

SECTION 23 3314 - DUCTWORK SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1.

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- D. For duct sound attenuators, they shall be tested in accordance with ASTM E-477-99 silencer test standard in a certified test facility which is NVLAP accredited for the testing.

2. Controllers, Electrical Devices, and Wiring: Comply with requirements for electrical devices and connections specified in [Division 25 Section "Integrated Automation."] [Division 26 Sections.]
3. Permanent-Split-Capacitor or Shaded-Pole Motors: With oil-immersed and sealed gear trains.
4. Spring-Return Motors: Equip with an integral spiral-spring mechanism where indicated. Enclose entire spring mechanism in a removable housing designed for service or adjustments. Size for running torque rating of 150 in. x lbf and breakaway torque rating of 150 in. x lbf.
5. Outdoor Motors and Motors in Outdoor-Air Intakes: Equip with O-ring gaskets designed to make motors weatherproof. Equip motors with internal heaters to permit normal operation at minus 40 deg F.
6. Nonspring-Return Motors: For dampers larger than 25 sq. ft., size motor for running torque rating of 150 in. x lbf and breakaway torque rating of 300 in. x lbf.
7. Electrical Connection: 115 V, single phase, 60 Hz.

J. Dampers shall be supplied/installed with access panels (with UL 181 rated viewports), for installation on both sides of damper.

K. Accessories:

1. Auxiliary switches for [signaling] [fan control] [or] [position indication].
2. [Momentary test switch] [Test and reset switches], [damper] [remote] mounted.

2.7 COMBINATION FIRE/SMOKE DAMPERS

- A. Type: Dynamic; rated and labeled according to UL 555 and UL 555S by an NRTL, multiple blade, not curtain type. Basis of Design Prefco Model 5010.
- B. Closing rating in ducts up to 4-inch wg (1-kPa) static pressure class and minimum 4000-fpm velocity.
- C. Fire Rating: 3 hours.
- D. Frame: Hat-shaped, 0.094-inch- (2.4-mm-) thick, galvanized sheet steel, with welded or mechanically attached corners and mounting flange.
- E. Heat-Responsive Device: Re-u c

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1. Clamps: Stainless-steel band with hex screw to tighten band with a worm-gear action or Nylon strap in sizes 3 through 18 inches, to suit duct size.

2.14 DUCT ACCESSORY HARDWARE

- A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.
- B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

2.15 LOUVERS

- A. Horizontal, Drainable-Blade Louvers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Air Balance Inc.; a division of MESTEK, Inc.
 - b. Airolite Company, LLC (The), Basis of Design, Model K6856.
 - c. Cesco Products; a division of MESTEK, Inc.
 - d. Greenheck Fan Corporation.
 - e. Ruskin Company.
2. Louver Depth, Blade Angle, and Free Area: 6 inch depth, blades at 45° angle, and minimum free area of 49.4%.
3. Frame and Blade Materials of Construction and Nominal Thickness: Not less than 0.081 inch, and constructed of ASTM B221 aluminum extrusions, Alloy 6063-T5.
4. Fabrication: Welded.
5. Frame Type: XXXXXXXXX
6. Sill Type: numhXXLC6.r ()0.7(C)-002 Tc50.001(pe(an)-12.3(d F))3.2(l)3.1((r)-6.4(e(i)3.)-12.2(e:)-1.1()10.

2.16 DUCT SOUND ATTENUATORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Aerocoustic.
 2. Aerosonics.
 3. Commercial Acoustics, Metalform Corp.
 4. Industrial Acoustics.
 5. McGill AirFlow LLC.
 6. Pottorff/Dynasonics.
 7. Ruskin Sound..
 8. Semco.
 9. Vibro-Acoustics.
- B. General Requirements:
1. Factory fabricated.
 2. Fire-Performance Characteristics: Adhesives, sealants, packing materials, and accessory materials shall have flame-spread index not exceeding 25 and smoke-developed index not exceeding 50 when tested according to ASTM E 84.
 3. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
- C. Shape:
1. Rectangular straight with splitters or baffles.
 2. Round straight with center bodies or pods.
 3. Rectangular elbow with splitters or baffles.
 4. Round elbow with center bodies or pods.
 5. Rectangular transitional with splitters or baffles.
- D. Rectangular Silencer Outer Casing: ASTM A 653/A 653M, G90 (Z275) galvanized sheet steel minimum 22 ga.
- E. Round Silencer Outer Casing: ASTM A 653/A 653M, G90 (Z275) galvanized sheet steel.
1. Sheet Metal Thickness for Units up to 24 Inches (600 mm) in Diameter: 0.034 inch (0.85 mm) thick.
 - 2.

- H. Connection Sizes: Match connecting ductwork unless otherwise indicated.
- I. Principal Sound-Absorbing Mechanism:
1. [Select type from 1 and 2]
 - a. Reactive type (No Media) Controlled impedance membranes and broadly tuned resonators without absorptive media.
 - b. Dissipative Film-lined type with fill material for Hospital use.
 - 1) Fill Material: Inert and vermin-proof fibrous material
 - 2) Erosion Barrier: Polymer bag enclosing fill, and heat sealed before assembly.
 - 3) Lining : Mylar film
- J. Fabricate silencers to form rigid units that will not pulsate, vibrate, rattle, or otherwise react to system pressure variations. Do not use mechanical fasteners for unit assemblies.
1. Joints: slip or flanged connections.
 2. Suspended Units: Factory-installed suspension hooks or lugs attached to frame in quantities and spaced to prevent deflection or distortion.
 3. Reinforcement: Cross or trapeze angles for rigid suspension.
- K. Accessories:**
1. Factory-installed end caps to prevent contamination during shipping.
- L. Source Quality Control: Test according to ASTM E 477.
1. Testing to be witnessed by [Architect].
 2. Record acoustic ratings, including dynamic insertion loss and generated-noise power levels p_3 T_c n

- D. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts. Where dampers are installed in ducts having duct liner, install dampers with hat channels of same depth as liner, and terminate liner with nosing at hat channel.
1. Install steel volume dampers in steel ducts.
 2. Install aluminum volume dampers in aluminum ducts.
- E. Set dampers to fully open position before testing, adjusting, and balancing.
- F. All dampers to be accessible and labeled, and are to have at least 24" around them for servicing, adding up to and including valves, actuators, and other devices that need service or need to be accessed to provide service.
- G. Install test holes at fan inlets and outlets and elsewhere as indicated.
- H. Install fire **[and smoke]** dampers according to UL Listing.
- I. Install combination fire/smoke dampers according to UL Listing.
- J. Install duct access doors on sides of ducts to allow for inspecting, adjusting, and maintaining accessories and equipment at the following locations:
1. On both sides of duct coils and VAV box reheat coils.
 2. Upstream from duct filters.
 3. At outdoor-air intakes and mixed-air plenums.
 4. At drain pans and seals.
 5. Upstream from manual volume dampers, modulating dampers, backdraft dampers, humidifiers, and equipment.
 6. Adjacent to and close enough (and on both sides of) to fire, smoke, and combination fire/smoke dampers, to reset or reinstall fusible links. Access doors for access to fire or smoke dampers having fusible links shall be pressure relief access doors; and shall be outward operation for access doors installed upstream from dampers and inward operation for access doors installed downstream from dampers.
 7. Maximum 20-foot spacing.
 8. Upstream from turning vanes.
 9. Maximum 10-feet from every 90° elbow.
 10. Control devices requiring inspection.
 11. Up and down stream of airflow measuring stations.
 12. Elsewhere as indicated.
- K. Install access doors with swing against duct static pressure.
- L. Access Door Sizes:
1. Hand Access: 24" x 24", or 24" by the duct height/width.
 2. Head and Hand Access: 18 by 16 inches.
 3. Head and Shoulders Access: 21 by 16 inches.
 4. Body Access: 25 by 16 inches.
 5. Body plus Ladder Access: 25 by 17 inches.
 6. Where fusible links are located, there must be a 24" access panel installed.
- M. Label access doors according to Division 23 Section "Identification for HVAC Piping and Equipment" to indicate the purpose of access door.

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