# PRODUCT SPECIFICATION GUIDE

## MODEL: COMBINATION FIRE SMOKE DAMPERS – AIRFOIL BLADES (MODULATING)

# DIVISION 23 - Heating, Ventilation, and Air Conditioning (HVAC)

# (PREVIOUSLY DIVISION 15)

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**Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) Format.**

**The section must be carefully reviewed and edited by the Engineer to meet the requirements of the project and local building code. Coordinate with other specification sections and the drawings.**

**Delete all "Specifier Notes" when editing this section.**

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**SECTION 233313 – DAMPERS (PREVIOUSLY 15820)**

1. **GENERAL**
   * + 1. **SECTION INCLUDES**
          1. Combination fire smoke dampers (Modulating Actuator) with Airfoil blades meeting the requirements of the latest edition of UL Standard 555 and UL Standard 555S.
       2. **SUMMARY**
          1. Section 233100 – HVAC Ducts and Casings (Previously 15810).
          2. Section 230913.13 – Actuators and Operators (Previously 15900).
       3. **REFERENCES**
2. AMCA 500-D – Laboratory Test Methods for Testing Dampers for Ratings.
3. IBC – International Building Code.
4. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
5. NFPA 92A - Smoke-Control Systems.
6. NFPA 92B – Smoke Control Systems in Atria, Covered Malls, and Large Areas.
7. NFPA 101 – Life Safety Code.
8. UL 555 - Standard for Safety; Fire Dampers.
9. UL 555S - Standard for Safety; Leakage Rated Dampers for Use in Smoke Control Systems.
   * + 1. **SUBMITTALS**
10. Comply with requirements of Section 013300 - Submittal Procedures.
11. Product Data: Submit manufacturer's product data.
    1. Include UL ratings, fire resistance, leakage, velocity, differential pressure, and elevated temperature.
    2. Indicate materials, construction, dimensions, and installation details.
    3. Verify conformance to NFPA, UL, and applicable building code.
    4. Include damper pressure drop data based on tests and procedures performed in accordance with AMCA 500-D.
    5. Include a copy of UL approved installation instructions.
       * 1. **QUALITY ASSURANCE**
            1. Dampers shall be warranted against manufacturing defects for a period of 1 years.
            2. Dampers shall be tested, rated and labeled in accordance with the latest UL-555 and UL-555S requirements
            3. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
            4. Damper pressure drop ratings shall be based on tests and procedures performed in accordance with AMCA 500-D.
            5. Welding shall not be allowed on dampers to avoid distortion and corrosion.
         2. **DELIVERY, STORAGE, AND HANDLING**
            1. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer, material, and location of installation.
            2. Storage: Store materials in a dry area indoor and protected from damage and in accordance with manufacturer’s instructions.
            3. Handling: Handle and lift dampers by sleeve or frame only. Do not lift damper by blades, actuator, or jackshaft. Protect materials and finishes during handling and installation to prevent damage.
12. **PRODUCTS**
    * + 1. **MANUFACTURER**
           1. Combination fire smoke dampers (Modulating Actuator) with Airfoil blades shall be in compliance and labelled to UL-555 and UL-555S standard with the specific model reflecting on the UL certificate of the supplier, e.g., Central Ventilation Systems (R27700) and approved by Civil Defense.
        2. **COMBINATION FIRE AND SMOKE DAMPERS**
           1. Model: F/S-AFM-PB/OB-xx series combination fire smoke damper (“xx” represents hourly fire rating and leakage class in that order with PB – Parallel Blades & OB – Opposed Blades).
           2. Ratings:

Fire Rating:

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**Specifier Notes: UL 555 provides for classification of fire dampers with fire resistance ratings of either 1 ½ or 3 hours. NFPA 90A requires that HVAC penetrations through barriers with fire resistance ratings less than 3 hours be protected by 1 ½ hour rated dampers. Penetrations through barriers with fire resistance ratings of 3 hours or more require 3 hour rated dampers. NFPA 90A also requires that all fire damper locations and their hourly rating requirements be shown on the project plans. Specifier, select from the following:**

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* 1½ hours in accordance with UL-555.
* 3 hours in accordance with UL-555.

Smoke Rating: Leakage in accordance with UL-555S.

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**Specifier Notes: Leakage Class ratings of I & II are allowed by UL Standard 555S. All codes require a minimum of Leakage Class II. Specifier, select from the following:**

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1½ Hour Fire Rated

F/S-AFM-PB/OB-I – Leakage Class-1 (8 cfm/ft2 (0.04 m3/ s/m2) at 4 in.wg. (1.0 kPa)

F/S-AFM-PB/OB-II – Leakage Class-2 (20 cfm/ft2 (0.10 m3/ s/m2) at 4 in.wg. (1.0 kPa)

3 Hour Fire Rated

F/S-AFM-PB/OB-3-I – Leakage Class-1 (8 cfm/ft2 (0.04 m3/ s/m2) at 4 in.wg. (1.0 kPa)

F/S-AFM-PB/OB-3-II – Leakage Class-2 (20 cfm/ft2 (0.10 m3/ s/m2) at 4 in.wg. (1.0 kPa)

Elevated Temperature Rating: 250ºF (121 ºC)

Air Flow Rating: 2000 fpm (10.2 m/s)

Differential Pressure Rating: 4 in.wg. (1.0 kPa)

* + - * 1. Construction:

Frame: Minimum of 20-gauge (1mm) Galvanized Roll Formed Steel hat section w/ staked corners for integral bracing. Low profile head and sill on 17 inches (432 mm) high and shorter.

Blades: Airfoil-shaped, double skin galvanized steel mechanically fastened to form equivalent to 16-gauge steel.

Blade Seals: High Temperature Silicone rubber permanently bonded to blade.

Jamb Seals: Stainless steel, flexible metal compression type.

Axle Bearings: Bronze oilite press fit into frame.

Axle Material: Plated steel.

Drive Shaft (Jackshaft): Minimum ½ inch. (12.7 mm) diameter, plated steel

Linkage: Plated steel, concealed in frame.

Fire Closure Device: Resettable electric thermostat with External mounted switch.

Release Temperature:

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**Specifier Notes: Building codes typically require the damper releasing temperature to comply with one of the following:**

**1. The operating temperature shall be approximately 50°F (10°C) above the normal temperature within the duct system, but not less than 160°F (71°C).**

**2. The operating temperature shall be not more than 286°F (141°C) where located in a smoke control system complying with Section 909.**

**3. Where a combination fire/smoke damper is located in a smoke control system complying with Section 909, the operating temperature rating shall be approximately 50°F (10°C) above the maximum smoke control system designed operating temperature, or a maximum temperature of 350°F (177°C). The temperature shall not exceed the UL 555S degradation test temperature rating for a combination fire/smoke damper.**

**Consult your local building code for further details and select one of the following.**

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* 165 ºF (74 ºC).
* 212 ºF (100 ºC).
* 250 ºF (121 ºC).
* 350 ºF (177 ºC).

Mounting: Vertical or Horizontal

Sleeve: Standard 16-inches long x 20-gauge (406mm x 1.0mm), factory installed.

Actuator: Actuator shall be installed on elevated mounting bracket to provide sufficient installation space with built-in thermal response device and reset switch.

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Type:

Electric 24V, 50/60 Hz, modulating, fail close.

Electric 230 V, 50/60 Hz, modulating, fail close.

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Mounting:

External.

Internal.

* + - 1. **Accessories:**

1. DTO/R Two-Temperature Fire Closure Device:
2. UL classified two-temperature device permits the damper to be re-opened after initial temperature closure allowing the damper to remain operable for smoke management purposes until the high temperature limit is reached.
3. Manual damper testing is permitted by physically depressing the low temperature thermal disc from the inside of the damper sleeve and resetting the sensor from the exterior side of the damper sleeve.
4. Dual position blade indicator switch package shall either be provided connected directly to jackshaft or included internal to the actuator model and provide full open and full closed blade indication to a remote location.
5. Auxiliary Switch Package for damper open or closed indication:

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**Specifier Notes: Select one of the following.**

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* + Dual Position Indicator Switch Package: Shall connect directly to the jackshaft and provide full open and full closed blade indication to a remote location.
  + Auxiliary switches to be provided internal to the actuator (recommended)

1. Duct Smoke Detector: Factory mounted in the damper sleeve with interconnecting wiring from the damper actuator to the smoke detector enabling a single power connection point for easy field wiring. Shall be shipped loose when the damper is smaller than 12x10.
2. Momentary test switch
3. Retaining Angles

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**Specifier Notes: Select one of the following.**

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* + Model:
* Provided in field
* 1 sided - frame retaining angles 1 ½ x 1 ½ inches x 16 gauge (38 x 38 x 1.5 mm)
* 2 sided - frame retaining angles 1 ½ x 1 ½ inches x 16 gauge (38 x 38 x 1.5 mm)

1. **EXECUTION**
   * + 1. **EXAMINATION**
          1. Examine areas to receive dampers. Notify the Engineer of conditions that would adversely affect installation or subsequent utilization of dampers. Do not proceed with installation until unsatisfactory conditions are corrected
       2. **INSTALLATION**
          1. Install dampers at locations as indicated on the drawings and in accordance with manufacturer’s UL approved installation instructions.
          2. Install dampers square and free from racking with the blades running horizontally. DO NOT compress or stretch damper sleeve or frame into the duct or opening.
          3. Contractor shall furnish and install duct access door adjacent to dampers for inspection and maintenance. Where duct size permits, install minimum 12 inches x 12 inches (305 x 305 mm) duct access doors.
          4. Handle dampers using the frame or sleeve. Do not lift or move damper using blades, actuator, or jackshaft.
          5. Install bracing as required on multiple section assemblies to support assembly weight and to hold against system pressure.

**END OF SECTION**