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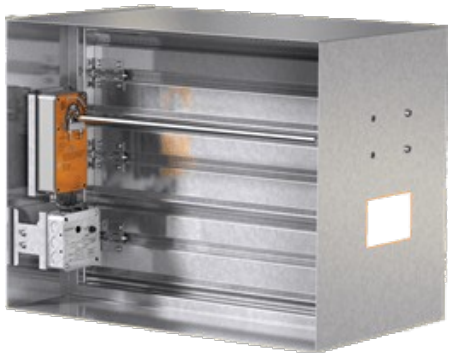
MOTORIZED
DAMPERS



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UL 555 / 555S - Classified Motorized Damper

FIREGUARD

Motorized Fire Damper UL 555: Fire Dampers are required by the International Uniform Building Code to maintain the required fire resistance rating of walls, partitions, and floors when they are penetrated by air ducts or other ventilation openings. A duct or ventilation openings in any of the fire rated partitions would permit a fire to spread from the compartment of origin to adjoining compartments or space. Motorized Fire Dampers are Installed in these ducts or ventilation openings. They close automatically upon detection of heat by a Thermal responsive device (TRD), blocking the openings and preventing the spread of fire into the adjoining compartment.

Motorized Smoke Damper UL 555S: Smoke Dampers are required by the International Uniform Building Code to maintain the required smoke leakage resistance rating of walls, partitions, and floors when they are penetrated by air ducts or other ventilation openings. Smoke Dampers can be used in two different applications, where they simply close and prevent the circulation of air and smoke through duct or a ventilation opening in a smoke barrier. Or they may be designed to control the spread of smoke using walls and floors as barriers and using the building's HVAC system and or dedicated fans to create pressure differences. Higher pressures surround the fire area and prevent the spread of smoke from the fire zone into other areas of the building. Smoke Dampers are operated with electric actuator. They may be controlled by a smoke or heat detector signal, a fire alarm signal, or in a variety of ways by the building control system to accomplish the intent of the design.

Motorized Fire Smoke Damper UL 555 / 555S: UL 555 requires each Fire damper with Its installed actuator to be rated for Fire endurance test for 1½ or 3 hr. for a specific temperature of 1800°F (1000°C). UL 555S requires each smoke damper with its installed actuator to be rated for operation at a specific velocity of airflow when open and to close against a specific pressure differential. Dampers should be selected to operate at the pressures and velocities they will see. In their application, with a minimum of 4" w.g. and 2000fpm. UL defines leakage classes by the maximum allowable leakage through a closed damper at 4" w.g. measured in cfm per square foot of damper area.

UL555 / 555S Tests:

1. Cycling Test (UL 555 / UL 555S)
2. Temperature Degradation Test (UL 555S)
3. Operational Test (UL 555S)
5. AMCA 500 D Leakage Test (UL 555 S)
6. Fire Endurance Test and Hose Stream Test (UL 555 / UL555S)
7. Salt Spray Exposure Test (UL 555 / UL 555S)

Leakage Rating Decision:

UL Standard 555S identifies three leakage classes as Classes I, II, III - based on the required applications.

1. Single Skin 3 V blades style is appropriate for use in airflow velocities slightly over 2000 fpm.
2. Aerofoil style blades are appropriate for use with velocities up to 3000 fpm.

Specifications :

Combination Fire/Smoke dampers meeting or exceeding the following specifications shall be furnished and installed at locations shown on plans or as described in schedules. Dampers shall meet the requirements of NFPA 90A and SMACNA. Dampers for use in smoke control systems and 1½ hrs / 3 hr. fire rating in accordance with the version of UL 555/UL555S

As part of the UL standards, fire/smoke dampers shall have demonstrated a capacity to open and close under HVAC system operating conditions, with pressures up to 4 inches w.g. in the closed position and 2000 fpm air velocity in the open position

In addition to the leakage ratings already specified herein, the dampers and their actuator shall be qualified under UL 555S to an elevated temperature of 250°F (121°C) or 350°F (177°C) depending upon the actuator. Appropriate pneumatic or electric actuator shall be installed by the damper manufacturer at the time of damper fabrication. Damper and actuator shall be supplied as a single entity which meets all applicable UL 555S standards for both dampers and actuator. Each damper shall be rated for leakage and airflow in either direction through the damper. Damper and actuator assembly shall be factory cycled at least 15 times to assure operation.

Motorized Fire Damper

Model: MFD - FG
Brand : Fireguard

Firmac Fire guard Series MFD-FG with 3-hour fire rating Motorized Fire damper facilitate isolating compartments of Fire in Ventilation systems in the event of fire These Fire dampers block the spread of fire through ducts, partition walls or floors. This high-performance fire isolating damper with actuator offer an effective barrier maintaining integrity in a fire situation and this is combined with low leakage characteristic for smoke management. Motorized Fire damper with actuator ensures lowest resistance to airflow in HVAC systems with airflow velocity to 2000 fpm (10.2 m/sec), 4"w.g (1000Pa) installed vertically (or) horizontally and is rated for airflow and leakage in either direction. It is suitable for installation in sheet metal ductworks or in walls or ceiling slabs made from concrete, brick or light weight partition walls.

Specifications and Testing

1. UL 555 - Classified Motorized Fire Damper 3-hour Fire Rating
2. Meets NFPA Standards.
3. Meets SMACNA Standards
4. Leakage Rating – Class III
5. Max Velocity - 2000 fpm
6. Temperature - 250 °F (121 °C)
7. Max Operating Pressure - 4 in. w.g (1000 pa)

Construction Details

Casing: Hat-shaped casing manufactured from 16 ga. (1.5mm) galvanized steel.

Blade: 3V-single skin blades Manufactured from 16 ga. (1.5mm) galvanized steel. Parallel blade operation. External linkages concealed in hat-shape frame.

TRD: Thermal Responsive Device that operates at 165° F (74° C)

Jamb seal: Stainless steel

Actuator: UL listed, Spring return, Electric 24VAC/ 230VAC, quick opening & closing

Jackshaft: 12 mm diameter Galvanized steel shaft

Brass bush: Round for spindles

Sleeve: 400mm long factory installed sleeve manufactured from 18ga (1.2mm) galvanised steel.

Optional Fittings

Retaining Angles: 1½" x 1½" x 16 gauge (40 x 40 x 1.5 mm).

Actuator Mounting Inside: Minimum Size 250x250mm (Sleeve 500mm)

Transitions (R) : Neck adapter for round duct connections.

Optional Construction (NON -UL Certification)

Frame: Stainless Steel 16 gauge (304/316L)

Blade: Stainless Steel 16 gauge (304/316L)

Actuator Location		Operating Voltage	
Standard	Optional	Standard	Optional
Left Side	Right side	230 V	120 V / 24 V

Note: Actuator location standard: Left side from rear view (Jack shaft view)

Note :

FC: Fail Close in the event of Fire

FO: Fail Open in the event of Fire

WHILE ORDERING INDICATE THE DAMPER IS FC/FO (FAIL CLOSE / FAIL OPEN)

Motorized Smoke Damper

Model: MSD - FG
Brand: Fireguard

Firmac Fire guard Series MSD-FG Class III Leakage Motorized Smoke damper facilitates isolating compartments of Smoke in the event of fire in Ventilation systems. These motorized smoke dampers are also alternatively applied as passageway for smoke extraction through shafts. Motorized Smoke Dampers may be required where ducts penetrate through smoke barriers or at other locations within an engineered smoke control system. The purpose of a motorized smoke damper is to prevent the progression of smoke through the system. To be truly effective therefore, a smoke damper must have low leakage factor. Motorized Smoke damper with actuator ensures lowest resistance to airflow in HVAC systems with velocity /Pressure rating of 2000 fpm (10.2 m/sec) @ 4"w.g (1000Pa) installed vertically (or) horizontally and is rated for airflow and leakage in both sides. It is suitable for installation in sheet metal ductworks or in walls or ceiling slabs made from concrete, brick or light weight partition walls.

Specifications and Testing

1. UL 555 S - Classified Motorized Smoke Damper Leakage
2. Meets NFPA Standards.
3. Meets SMACNA Standards
4. Leakage Rating – Class III at 250 F Elevated Temperature
5. Max Velocity - 2000 fpm
6. Temperature - 250 °F (121 °C)
7. Max Operating Pressure - 4 in. w.g (1000 pa)

Construction Details

Casing: Hat-shaped casing manufactured from 16 ga. (1.5mm) galvanized steel.

Blade: 3V-single skin blades Manufactured from 16 ga. (1.5mm) galvanized steel. Parallel blade operation. External linkages concealed in hat-shape frame.

Blade tip seal: Silicon rubber seals permanently bonded to blade edge through self-forming silicon sealant.

Jamb seal: Stainless steel

Actuator: UL listed, Spring return, Electric 24VAC/ 230VAC, quick opening & closing

Jackshaft: 12 mm diameter Galvanized steel shaft

Brass bush: Round for spindles

Sleeve: 400mm long factory installed sleeve manufactured from 18ga (1.2mm) galvanised steel.

FIREGUARD

Optional Fittings

Retaining Angles: 1½" x 1½" x 16 gauge (40 x 40 x 1.5 mm).

TRD: Thermal Responsive Device that operates at 165° F (74° C)

Actuator Mounting Inside: Minimum Size 250x250mm (Sleeve 500mm)

Transitions (R): Neck adapter for round duct connections.

Optional Construction (NON -UL Certification)

Frame: Stainless Steel 16 gauge (304/316L)

Blade: Stainless Steel 16 gauge (304/316L)

Actuator Location		Operating Voltage	
Standard	Optional	Standard	Optional
Left Side	Right side	230 V	120 V / 24 V

Note: Actuator location standard: Left side from rear view (Jack shaft view)

Note :

FC: Fail Close in the event of Fire

FO: Fail Open in the event of Fire

WHILE ORDERING INDICATE THE DAMPER IS FC/FO (FAIL CLOSE / FAIL OPEN)

Motorized Smoke & Fire Damper

Model : MSFD - FG
Brand : Fireguard

Firmac Fire guard Series MSFD-FG Series Motorized Fire/Smoke damper facilitate isolating compartments of Fire in Ventilation systems in the event of fire. These fire dampers block the spread of fire through ducts, partition walls or floors. This high-performance fire isolating damper with retailor offer an effective barrier maintaining integrity in a fire situation and this is combined with low leakage characteristic for smoke management. Motorized Smoke damper with actuator ensures lowest resistance to airflow in HVAC systems with airflow velocity to 2000 fpm (10.2 m/sec), 4“w.g (1000Pa) installed vertically (or) horizontally, and fs rated for airflow and leakage in either direction. It is suitable for installation in sheet metal ductworks or in walls or ceiling slabs made from concrete, brick or light weight partition walls.

Specifications and Testing

1. UL 555 & 555 S - Classified MSFD 3-hours Fire Rating
2. Meets NFPA Standards.
3. Meets SMACNA Standards
4. Leakage Rating – Class III at 250 F Elevated Temperature
5. Max Velocity - 2000 fpm
6. Temperature - 250 °F (121 °C)
7. Max Operating Pressure - 4 in. w.g (1000 pa)

Construction Details

Casing: Hat-shaped casing manufactured from 16 ga. (1.5mm) galvanized steel.

Blade: 3V-single skin blades Manufactured from 16 ga. (1.5mm) galvanized steel. Parallel blade operation. External linkages concealed in hat-shape frame.

TRD: Thermal Responsive Device that operates at 165° F (74° C)

Blade tip seal: Silicon rubber seals permanently bonded to blade edge through self-forming silicon sealant.

Jamb seal: Stainless steel

Actuator: UL listed, Spring return, Electric 24VAC/ 230VAC, quick opening & closing

Jackshaft: 12 mm diameter Galvanized steel shaft

Brass bush: Round for spindles and square for jackshaft

Sleeve: 400mm long factory installed sleeve (standard supply) manufactured from 18ga (1.2mm) galvanised steel

FIREGUARD

Optional Fittings

Retaining Angles: 1½" x 1½" x 16 gauge (40 x 40 x 1.5 mm).

Actuator Mounting Inside: Minimum Size 250x250mm (Sleeve 500mm)

Transitions (R): Neck adapter for round duct connections.

Optional Construction (NON -UL Certification)

Frame: Stainless Steel 16 gauge (304/316L)

Blade: Stainless Steel 16 gauge (304/316L)

Actuator Location		Operating Voltage	
Standard	Optional	Standard	Optional
Left Side	Right side	230 V	120 V / 24 V

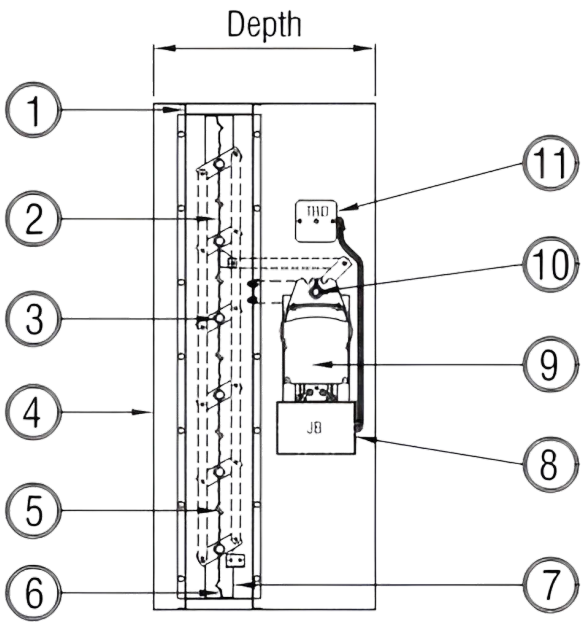
Note: Actuator location standard: Left side from rear view (Jack shaft view)

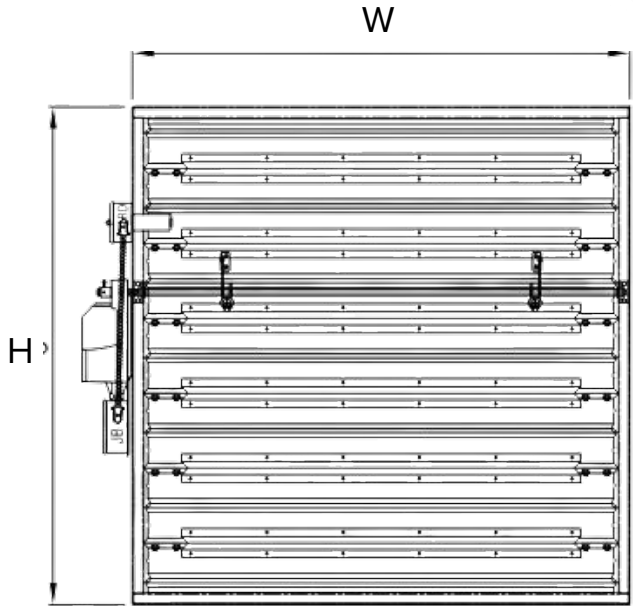
Note : FC: Fail Close in the event of Fire

FO: Fail Open in the event of Fire

WHILE ORDERING INDICATE THE DAMPER IS FC/FO (FAIL CLOSE / FAIL OPEN)

Motorized Smoke & Fire Damper





Legends

1. **Frame:** 16-gauge thickness.
2. **Blade:** 3 'V' type blade 16 gauge
3. **Blade Axle:** ½ x ½'' (12x12 mm).
4. **Jamb Seal:** Stainless steel jamb seals.
5. **Blade Stopper:** 18-gauge (12mm) thickness.
6. **Gasket:** Silicon rubber seals (For smoke application).
7. **Sleeve:** Sleeve thickness as per NFPA &UL standards.Standard 16" (400mm) length.
8. **Jack shaft:** Drive Shaft for the Actuator.
9. **TRD:** Electro Thermal responsive device.
10. **Actuator:** Honeywell / Belimo

Engineering and Performance Data

UL STANDARDS FOR MOTORIZED FIRE & SMOKE DAMPERS
Galvanized Steel Construction

Pressure Drop Data : This pressure drop testing was conducted in accordance with AMCA Standard 500-D using the three configurations shown. All data has been corrected to represent standard air at a density of .075 lb/ft3 (1.201 kg/m3). Actual pressure drop found in any HVAC system is a combination of many factors. This pressure drop information along with an analysis of Omer system influences should be used to estimate actual pressure losses for a damper installed in a given HVAC System.

AMCA Illustrates a ducted damper exhausting air into an open area. This configuration has a lower pressure drop than illustrates a fully ducted damper. This configuration has the lowest pressure drop of the three test configurations because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper because entrance losses are minimized by a straight duct run upstream of the damper. Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.

Motorized Fire & Smoke Dampers

UL-555 / SSSS Classified

Test Standard: Fire Endurance Test

Fire Endurance Test and Hose Stream Test (UL 555) Dampers are exposed to a standard test fire for a period of either t1/2 or 3 hours. This standard test fire is controlled to follow the time temperature curve illustrated. Immediately after conclusion of this fire test, the dampers are subjected to a high-pressure hose stream test during which water, at a nozzle pressure of 30 psi (207 kPa) for 11/2-hour dampers and 45 psi (310 kPa) for 3-hour
damper, is applied to the dampers from 20 feet (6 meters). The hose stream test provides an extreme shock that ensures the dampers are structurally strong enough to withstand the rigors of the severest fire conditions.

Operational Reliability Cycle Test (UL SSSS)

Fire Smoke Dampers intended for operation by gravity or spring force (not driven by an actuator) must be cycled open and closed 250 times. Fire Smoke Dampers that are driven by an electric or pneumatic actuator must be cycled open and closed (by their actuator) 20,000 times. In addition to the 20,000 full stroke cycles, if the Fire Smoke Damper is also intended for use as a volume control damper, it must be cycled open and closed (by its modulating actuator) 100,000 repositioning cycles. These operational cycling tests are accomplished prior to the temperature degradation and leakage tests.

Salt Spray Exposure Test (UL 555 & ULS SSS)

A damper sample is exposed to salt spray in a test chamber for a period of 120 hours. After this exposure, the damper must close (and latch if a latch is provided) This test demonstrates a damper's ability to function after a more severe fouling than the damper is likely to experience during its intended application.

Operational Performance Test (UL 555&ULSSSS)

A damper is subjected to airflows and pressures and must demonstrate its ability to operate in the manner expected by its configuration and intended application. Smoke and combination fire smoke damper actuators must operate the dampers open and close three times and combination fire smoke dampers must also close as they would if their heat responsive device would operate. A damper model's airflow velocity and differential pressure ratings are based on the velocity and pressure conditions against which the damper demonstrates its ability to operate.

Temperature Degradation and Cycling Test (UL 555 & UL SSSS)

A damper with an actuator that has previously been subjected to the OPERATIONAL RELIABILITY CYCLE TEST (described above) is exposed to an elevated temperature of 250°F (121°C) minimum (or higher fn multiples of 100°F {38°C for a period of 30 minutes. After this 30-minute exposure and while still at the elevated temperature, the damper actuator must operate the damper open and closed three times. Time of operation cannot excess 75 seconds for any of the open or close operations.

Leakage Test (UL SSSS)

At least three damper sizes of each model being tested (minimum width by maximum height, maximum width by minimum height, and maximum width by maximum height) that have previously been subjected to both the operational reliability cycle test and the temperature degradation and cycling test must be tested for leakage. The minimum airflow and pressure ratings of dampers shall be 2000 fpm (10.2 m/s) and 4 in.wg. (1 kPa). Ratings shall be set in 1000 fpm (5 m/s) increments from the minimum pressure. Leakage testing must be conducted at 400 fpm (2 m/s) higher than the rated airflow and .5 in. wg (.1 kPa) higher than the rated pressure. A damper's leakage rating is based on the worst-case performance of the three damper sizes tested.

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