30 YEARS OF EXCELLENCE

UL

FIRE DAMPER

DESIGNED TO SAVE LIVES

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FIRE DAMPERS

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ISO 9001 CERTIFIED COMPANY

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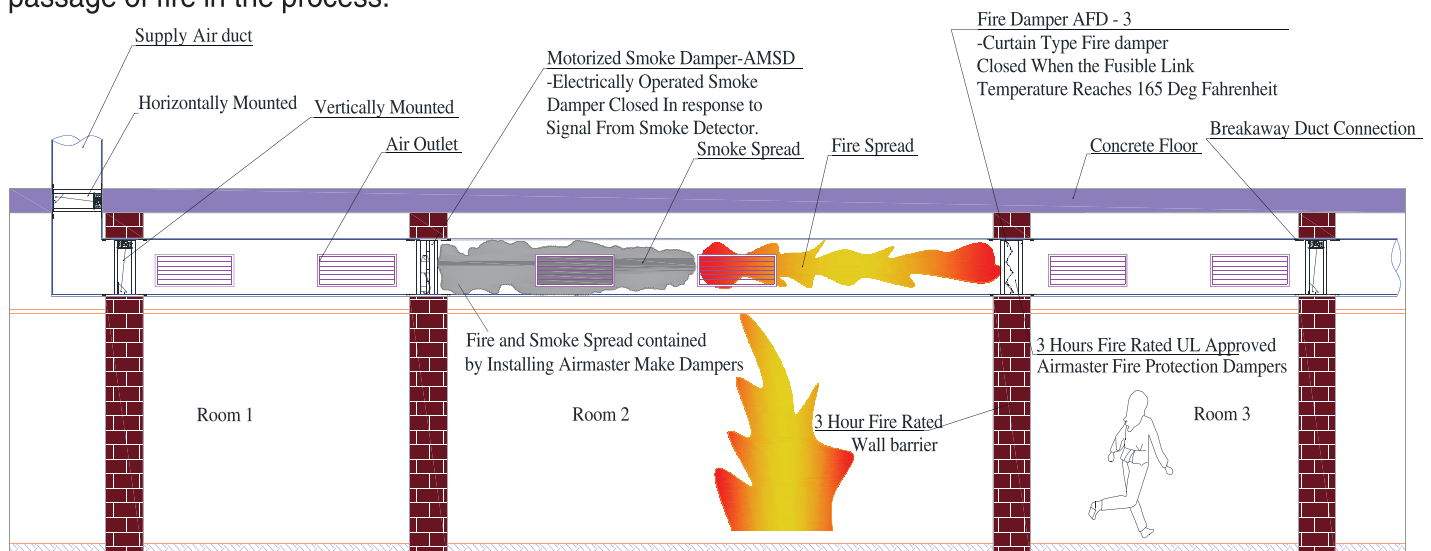ISO 9001 CERTIFIED COMPANY

INTRODUCTION

Smoke and Flames rising from residential buildings, hotels and warehouses have become a common sight nowadays. Out of 1.2 million fires reported in the U.S.A in 2013, almost 39% of the cases were structural fires causing more than 2800 deaths and $9.5 billion in property damage[1] . The 'Center for Disease Control and Prevention' notes death from fires and burns are the fifth most common cause of unintentional injury deaths and third leading cause of fatal home injury. SMOKE inhalation during fire accidents is another major reason for deaths in such cases.

In a case study conducted by NFPA, it was found that the HVAC system was not linked to smoke detector system and did not shut off during fire accident. The air from the operating HVAC system and Natural ventilation increased the growth of the fire. It is therefore important to cutoff air supply by shutting down HVAC system during fire. Various fire safety equipment are prescribed by national authorities in their building codes to overcome fire hazards in order to save life and property. One such requirement is the use of **FIRE DAMPERS** in the HVAC system.

Fire damper is a device installed in an air distribution system or an air transfer opening designed to close automatically upon detection of heat interrupting airflow and thereby restricting the passage of fire in the process.

Fire dampers are installed in fire rated walls / barriers / partitions where the HVAC ductwork penetrates ensuring that their integrity is maintained. The location and installation procedure of fire dampers should be in accordance with the widely accepted and recommended standard, *NFPA 90A – Standard for the installation of Air-Conditioning.*

Supply Air duct

Horizontally Mounted   Vertically Mounted

Air Outlet

Motorized Smoke Damper-AMSD
-Electrically Operated Smoke
Damper Closed In response to
Signal From Smoke Detector.
Smoke Spread   Fire Spread

Fire Damper AFD - 3
-Curtain Type Fire damper
Closed When the Fusible Link
Temperature Reaches 165 Deg Fahrenheit

Breakaway Duct Connection

Concrete Floor

Fire and Smoke Spread contained
by Installing Airmaster Make Dampers

3 Hours Fire Rated UL Approved
Airmaster Fire Protection Dampers

Room 1   Room 2   3 Hour Fire Rated
Wall barrier   Room 3

[1] SOURCE : NFPA research

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The most prominent testing laboratories for evaluating fire resistive materials and assemblies is the Underwriters Laboratory (UL), U.S.A. All Airmaster Fire dampers are tested and certified by UL.

Airmaster fire dampers are developed with the intention of maximizing the occupant's safety. There are two basic types of damper operations: a) Curtain type b) Multiple blade type. Though construction of both dampers are different, the purpose is the same – to interrupt airflow in order to restrict the passage of fire & smoke.

Curtain type: The blades are folded and held under spring tension using a bi-metal fusible link. Heat of 165°F (74°C) inside the duct is sufficient for fusible link to melt and break, thus allowing blades to shut like a curtain under the force of the springs attached. The fire damper acts as a barrier between fire and non-fire zones thus containing the fire in the compartment from which it originated. This gives sufficient time for occupants to escape and move into safety.

Multiple blade type: This model operates mainly using an electric actuator. Based on the application – i.e. Fire, Smoke or Combination Fire & Smoke; the actuator can be configured with the Building management system (BMS) or a smoke detector. The electric actuator is energized with power supply to keep the damper open under normal conditions. When heat/smoke is detected by the thermal responsive device (TRD) / smoke detector, power supply to actuator will be disconnected.

Should the BMS be used to close the actuator, it has to be configured to disconnect power supply to actuator. Once the circuit is open, the damper closes automatically by the force of the springs inside the actuator. Such actuators are otherwise known as spring return actuators. TRD's are supplied with a reset button to re-establish power supply thereby keeping the damper in open position.

The open/close position can be monitored by introducing a limit switch or Auxiliary switch in the damper which communicates the open/close status to the BMS or a standalone control panel. As a result, further actions could be programmed like switching on smoke extract fans or switching off all HVAC units or informing Fire department and so on.

UL Testing:

Airmaster has taken great efforts in developing fire dampers and getting it certified from UL after passing their stringent testing procedures successfully. Our dampers have withstood the demanding test requirements of UL 555 and UL 555S standards. Both these standards call of series of tests like:
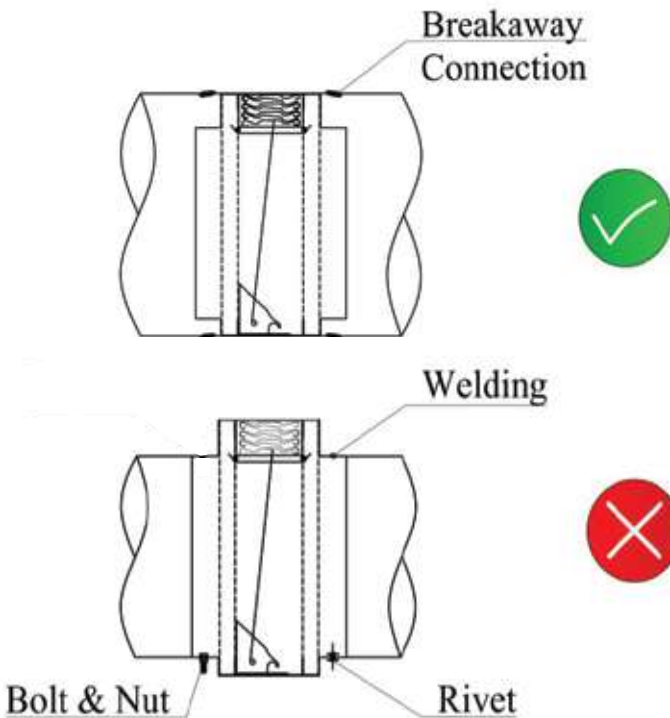

Fire Test

Hose Stream Test

cycling test for operational reliability, salt water spray test, fire endurance test followed by high pressure hose stream test, leakage test, dynamic closure test and overall integrity of the damper is also checked. Quality inspection is carried out on regular basis by UL representatives to ensure if manufacturing is done be per the mandate.

UL listed products are finally dispatched after UL labels are proudly pasted on each and every fire damper. The installation has to be carried out strictly as per the installation instructions that is sent along with every shipment.
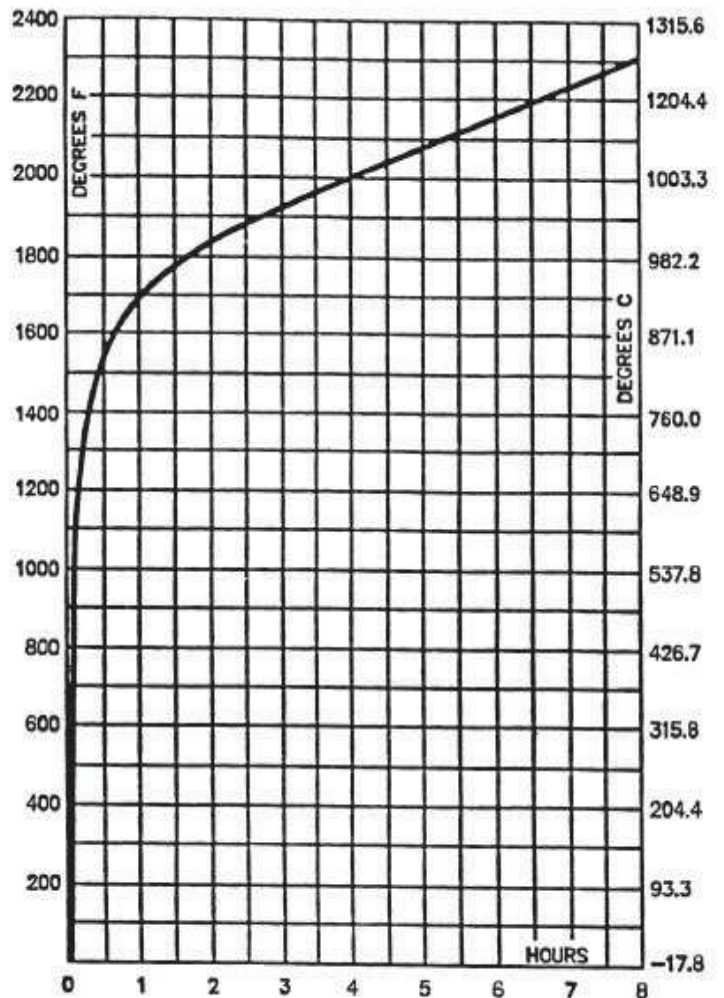
Most common installation errors to be avoided:

- Fixing of duct directly to the Fire damper frame is not allowed.
- Rigid Duct – Sleeve connection without complying sleeve thickness recommended by SMACNA (table 5-2). It is important to note that improper installation procedures could render UL listing of the damper null and void.

Handling & Storage: Fire dampers are sensitive products made for the sole purpose of saving life and property. Therefore extreme care must be taken while handling fire dampers during loading,

off-loading and storage at site against any physical damage. All fire dampers must be stored in a safe place and must be handled carefully. Dampers especially with actuators and electrical accessories must be stored in a dry enclosed area to avoid condensation. Actuators or damper blades should not be used for lifting during installation

Maintenance: Regular inspection and maintenance of fire damper is essential. *NFPA 80 – standard for fire doors and other opening protective* states that fire dampers shall require inspection and testing one year after installation. Follow up testing and inspection shall be done every 4 years except in hospitals where the frequency shall be 6 years.

Time - Temperature Curve

The Time / Temperature curve achieved during the fire test by UL laboratory is as shown above .

CURTAIN TYPE FIRE DAMPER
3 hrs Fire Rating

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CONSTRUCTION:

Frame: High quality galvanized steel sheet of thickness 16 gauge.

Blades: Interlocking type roll formed blades of thickness 20 gauge.

Blade Ramp: 16 gauge thick galvanized steel with a spring holder.

Spring: Constant force stainless steel springs on both sides.

UL listed Fusible Links: 165° F fire rating as standard.

Description:

- The interlocking type blades are designed with hat shaped reinforcement ridges ensuring strength and stability.

- The ramp is firmly secured to the frame by S.S rivets.

- The frame is designed to keep blades out of airstream to prevent dust and contamination.

- All corners of the frame are fully welded (and painted to prevent rust) to ensure sturdy construction.

- AFD-3 model fire dampers are UL 555 classified & manufactured under Airmaster's strict quality control procedures.

- AFD-3 series fire dampers are UL classified for 3 hours static application only.

- UL approved sizes are as follows:

| Section	Maximum Size W x H	Mounting Position	Fire Rating	Wall Type
Single	42" x 42"	Vertical	3	Masonry/Gypsum
Single	36" x 36"	Horizontal	1.5	Masonry/Gypsum
Multiple	84" x 84"	Vertical	3	Masonry/Gypsum
Multiple	94" x 94"	Vertical	1.5	Masonry

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Options:

- **Frame:** Round or Oval Inlet/Outlet.
- **Sleeve:** Provided only on request with sheet thickness 16 gauge.
- **UL listed Fusible link:** 212°F fire rating up to 27" x 41"(for vertical application only).
- **Micro switch:** To know the status of damper's blade open & close position.

DIMENSIONAL DETAILS

Dimensional Details:
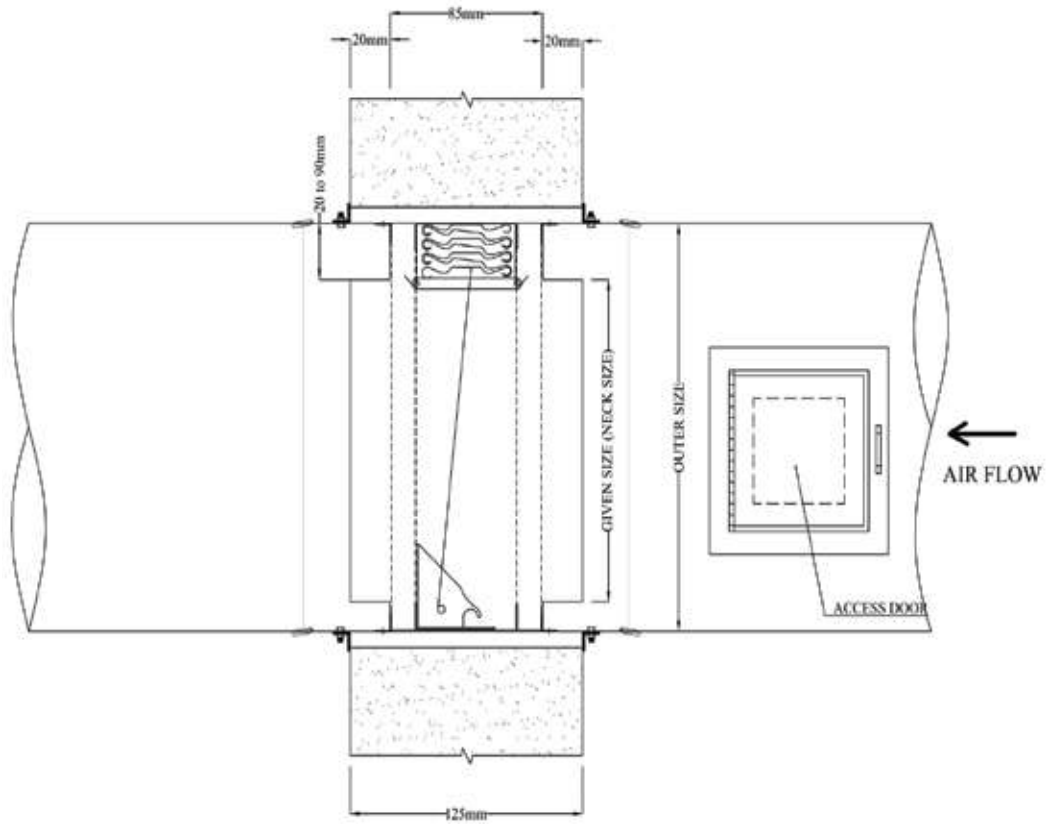
Neck Size W (mm) x H (mm)	Outer Size W (mm) x H (mm)	Neck Size W (mm) x H (mm)	Outer Size W (mm) x H (mm)
100 x 100	140 x 140	550 x 550	590 x 635
150 x 150	190 x 190	600 x 600	640 x 685
200 x 200	240 x 240	650 x 650	690 x 745
250 x 250	290 x 305	700 x 700	740 x 795
300 x 300	340 x 355	750 x 750	790 x 855
350 x 350	390 x 415	800 x 800	840 x 905
400 x 400	440 x 465	850 x 850	890 x 965
450 x 450	490 x 525	900 x 900	940 x 1015
500 x 500	540 x 575	940 x 940	980 x 1065

How to order:

Size (mm/inch)	Quantity (no.)	Limit Switch (Yes/No)	With Sleeve (Yes/No)
500 x 250	500	No	No

* All the given sizes are considered as neck size

MOTORIZED FIRE DAMPER
1.5 hrs Fire Rating

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CONSTRUCTION:

Frame: High quality galvanized steel sheet of thickness 16 gauge.

Blades: Single skin roll formed from high quality steel sheet of thickness 16 gauge.

Actuator: Honeywell, 9NM torque (UL listed).

T.R.D : Belimo (UL listed), temperature rating - 165°F.

Jamb Seal: Stainless steel.

Description:

- All corners of the frame are fully welded (and painted to prevent rust) to ensure sturdy construction for a rattle free operation.

- Designed for parallel blade operation. Blades are linked together externally (out of airstream).

- AMFD model fire dampers are UL 555 classified & manufactured under Airmaster's strict quality control procedures.

- All actuators are externally mounted with 230VAC as standard and are supplied without inbuilt auxiliary switch.

- Actuator position will be based on Clockwise (CW) closure direction as standard.

- TRD's have an inbuilt manual RESET switch to reopen the damper after closure.

- All AMFD models are factory fitted with 400mm wide & 1.2mm thick steel sleeve as standard and the entire assembly can comfortably seat through 8" thick wall.

- All dampers and TRD's are factory tested before dispatch to ensure smooth operation in the field.

- Can be used in Masonry and Gypsum walls/partitions of less than 3 hours fire resistance rating as per NFPA 90-A in accordance with ANSI/UL555 standards.

- Maximum Approved Size:
  - Multiple section : 70" x 70" (vertical installation / Static application only)
  - Single section   : 35" x 35" (vertical installation / Static & Dynamic application).
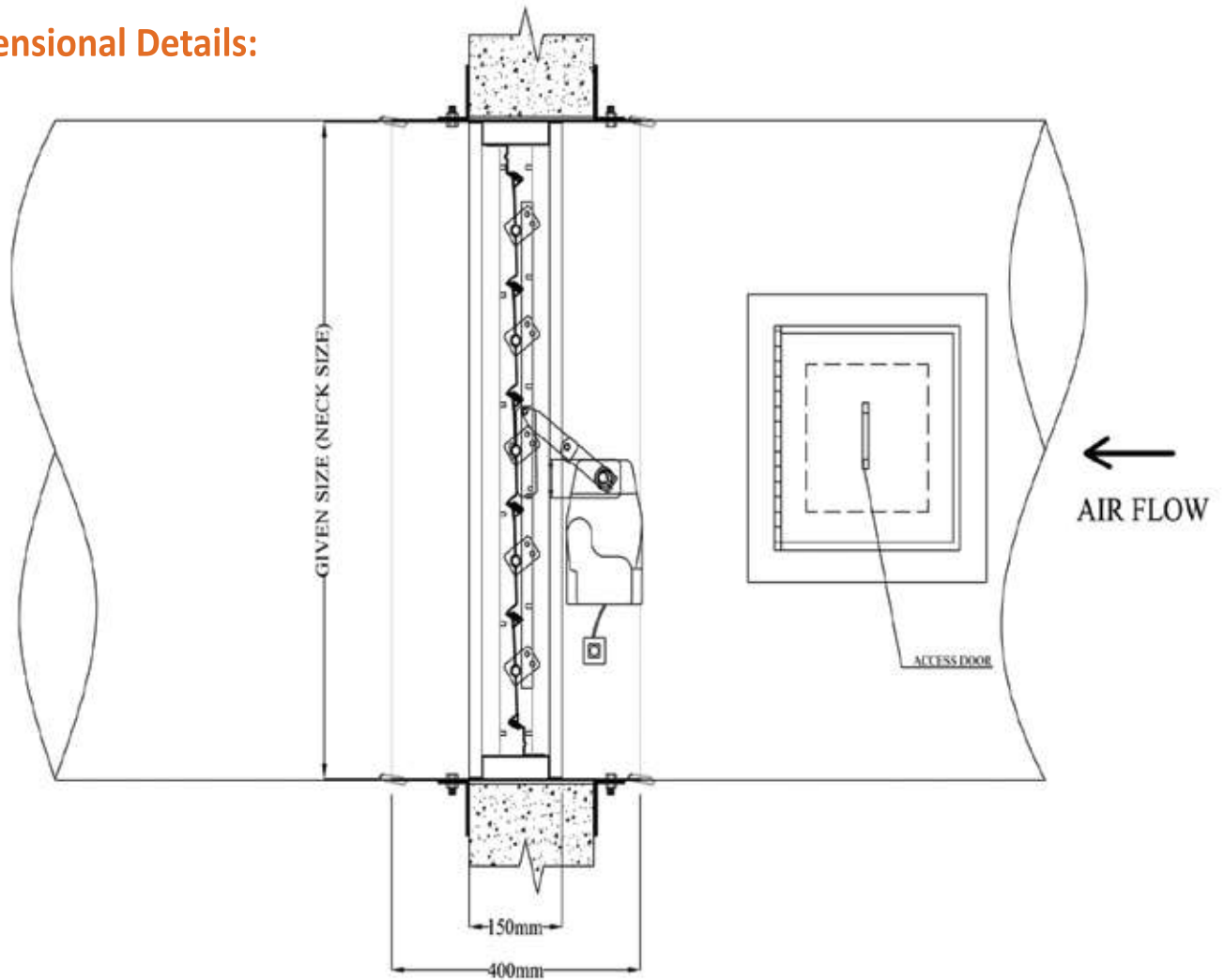
Options:

- **Gasket:** UL approved gasket
- **Actuator Position:** Counter Clockwise direction (CCW)
- **Operating Voltage:** 24VAC / 120VAC
- **Auxiliary Switch:** Actuator with inbuilt auxiliary switch

Dimensional Details:

How to order:

Size (mm/inch)	Qty (no.)	Voltage	Actuator Position (CW/CCW)	Auxiliary Switch (Yes/No)	Gasket (Yes/No)
400 x400	100	240 VAC	CW	Yes	Yes
500 x 500	250	24 VAC	CCW	No	No

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MOTORIZED FIRE & SMOKE DAMPER
1.5 hrs Fire Rating

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CONSTRUCTION:

Frame: High quality galvanized steel sheet of thickness 16 gauge.

Blades: Single skin roll formed from high quality steel sheet of thickness 16 gauge.

Actuator: Honeywell, 9NM torque (UL listed).

T.R.D : Belimo (UL listed),temperature rating -165°F.

Jamb Seal: Stainless steel.

Gasket : UL listed gasket.

Description:

- All corners of the frame are fully welded (and painted to prevent rust) to ensure sturdy construction for a rattle free operation.

- Designed for parallel blade operation.

- AMFSD series combination Fire/Smoke dampers are UL 555/555S classified

- AMFSD Dampers are available with Class II leakage rating at 2000fpm (10.2m/s) / 4"w.g (1000 pa). Suitable for most of the commercial smoke management applications in both static and dynamic systems.

- All actuators are externally mounted with 230VAC as standard and are supplied without inbuilt auxiliary switch.

- Actuator position will be based on Clockwise (CW) closure direction as standard

- TRD's have an inbuilt RESET switch to reopen the damper.

- All AMFSD models are factory fitted with 400mm wide & 1.2mm thick steel sleeve as standard and the entire assembly can comfortably seat on 8" thick wall.

- All dampers and TRD's are factory tested before dispatch to ensure smooth operation in the field.

- Actuators have to be configured with control panel or BMS system for smoke control applications before commissioning.

- Can be used in Masonry and Gypsum walls/partitions of less than 3 hours fire resistance rating as per NFPA 90-A in accordance with ANSI/UL555 standards.

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- **Maximum Approved Size:**
  - Multiple section : 70" x 70" (vertical installation / Static & Dynamic application).
  - Single section : 35" x 35" (vertical installation / Static & Dynamic application).

Options:

- **Auxiliary Switch:** Actuator with inbuilt auxiliary switch.

- **Operating Voltage:** 24VAC / 120VAC.

- **Actuator Position:** Counter Clockwise direction (CCW).

Dimensional Details:
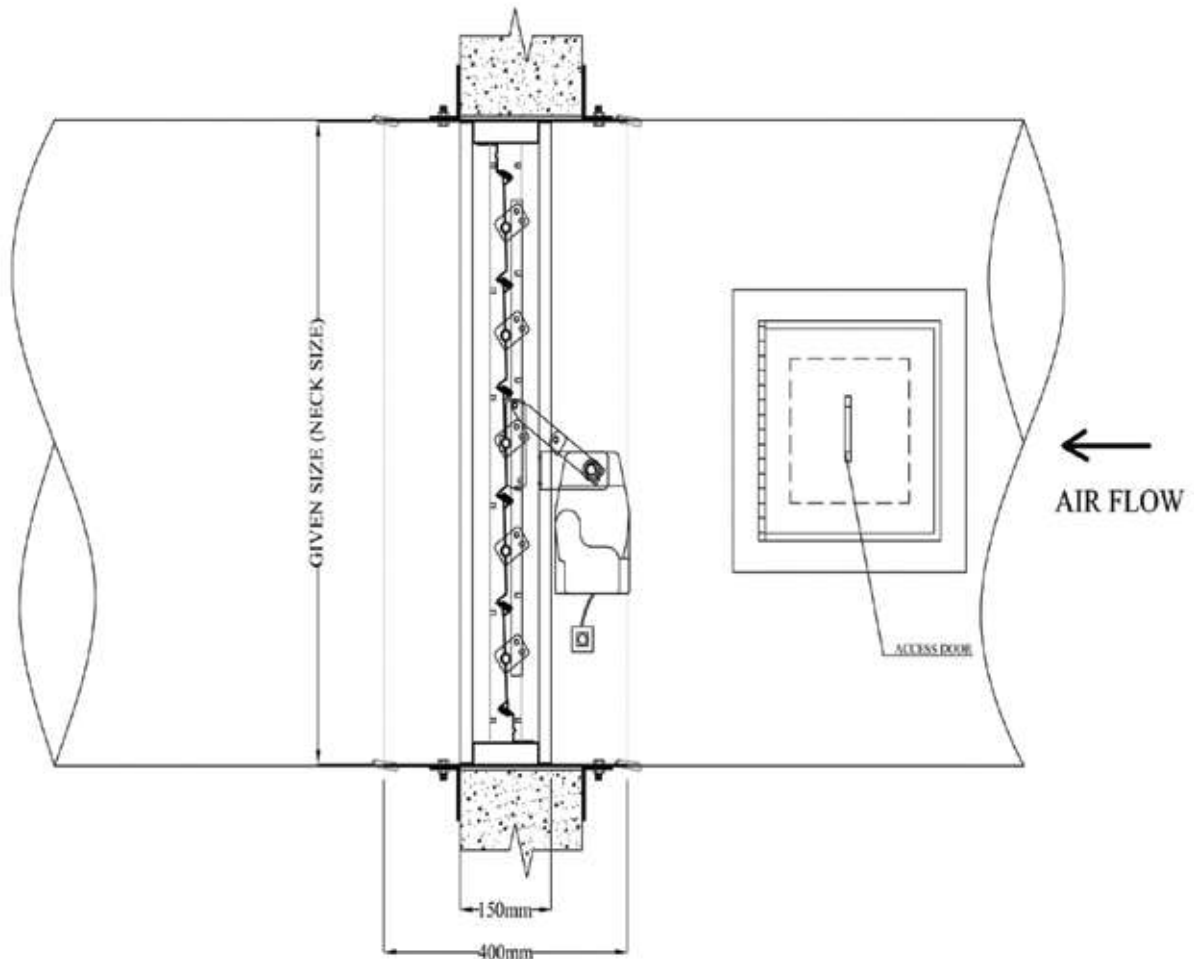
How to order:

Size (mm/inch)	Quantity (Nos)	Voltage	Actuator position (CW/CCW)	Auxiliary Switch (Yes/No)
600 x 600	50	240 VAC	CW	Yes

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MOTORIZED SMOKE DAMPER
1.5 hrs Fire Rating

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CONSTRUCTION:

Frame : High quality galvanized steel sheet of thickness 16 gauge.

Blades : Single skin roll formed from high quality steel sheet of thickness 16 gauge.

Actuator: Honeywell, 9NM torque (UL listed).

Jamb Seal: Stainless steel.

Gasket : UL listed gasket.

Description:

- Available with Class II leakage, rated at 2000fpm (10.2m/s) / 4"w.g(1000pa).Suitable for most of the commercial smoke management applications in both static and dynamic systems.

- All corners of the frame are fully welded (and painted to prevent rust) to make construction more sturdy for a rattle free operation.

- Designed for parallel blade operation. Blades are linked together externally (out of airstream).

- AMSD series is UL 555S classified and manufactured under Airmaster's strict quality control procedures..

- All actuators are externally mounted with 230VAC as standard and are supplied without inbuilt auxiliary switch. The actuator can be controlled from command station.

- Factory fitted with 400mm wide & 1.2mm thick steel sleeve and the entire assembly can comfortably seat on 8" thick wall.

- All dampers are factory tested to ensure smooth operation before dispatch.

- Actuators have to be configured with smoke detector/ control panel or BMS system for smoke control applications before commissioning.

- Can be used in Masonry and Gypsum walls/partitions of less than 3 hours fire resistance rating as per NFPA 90- A in accordance with ANSI/UL555 standards.

- Maximum Approved Size:
  - Multiple section: 280"x 35" or 140"x70" (Actuators internally mounted/vertical installaion only)
  - Single section : 35" x 35" (vertical installation only).

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Options:

- **Auxiliary Switch:** Actuator with inbuilt auxiliary switch.
- **Operating Voltage**: 24VAC / 120VAC.
- **Actuator Position:** Counter Clockwise direction (CCW).

Dimensional Details:
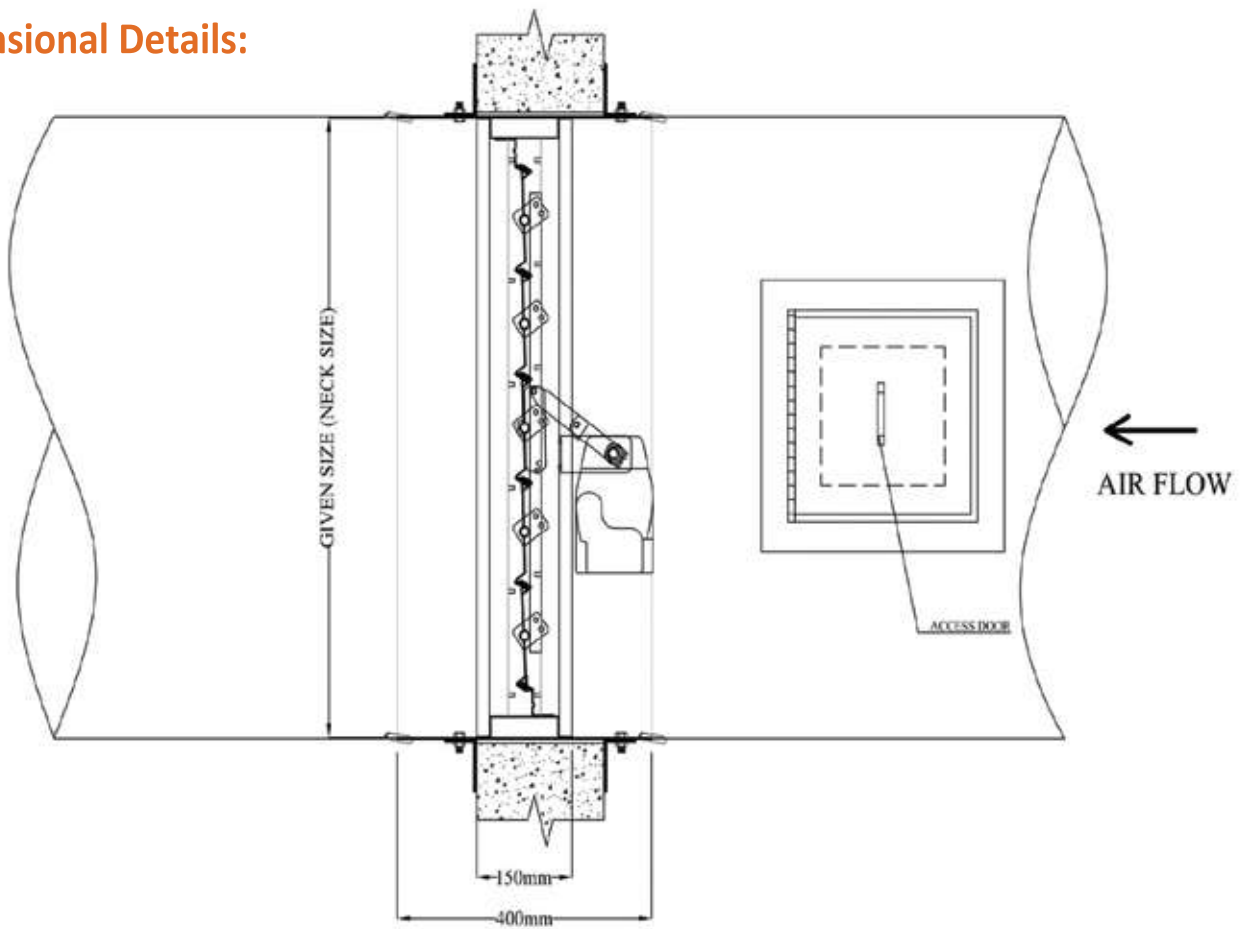
How to order:

Size (mm/inch)	Quantity (Nos)	Voltage	Actuator position (CW/CCW)	Auxiliary Switch (Yes/No)	TRD (Yes/No)
700 x 700	15	24 VAC	CCW	Yes	Yes

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CONTROLS

HONEYWELL - CONTROLS

Model - MS4609F1010 :

- Line voltage (230 Vac), 9 (N·m) torque and without open & close position-indicating switches.

Model - MS4609F1210 :

- Line voltage (230 Vac), 9 (N·m) torque and with open & close position indicating switches.

Model - MS8109F1010:

- Line voltage (24 Vac), 9 (N·m) torque and without open & close position-indicating switches.

Model - MS8109F1210 :

- Line voltage (24 Vac), 9 (N·m) torque and with open & close position indicating switches.

Temperature Ratings :

- The actuator is designed to meet UL555S standards at 350°F (176°C).

Open & Close Timings :

- Drive Open: 15 seconds typical

- Spring Close: 15 seconds typical.

Environmental Protection Ratings :

- NEMA, IP40.

Operation:

- In case of fire, damper operates on volt free signal to the actuator. i.e spring return operation.

Mounting:

- Actuator can be used for either clockwise (CW) or counter clockwise (CCW) spring return.

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