

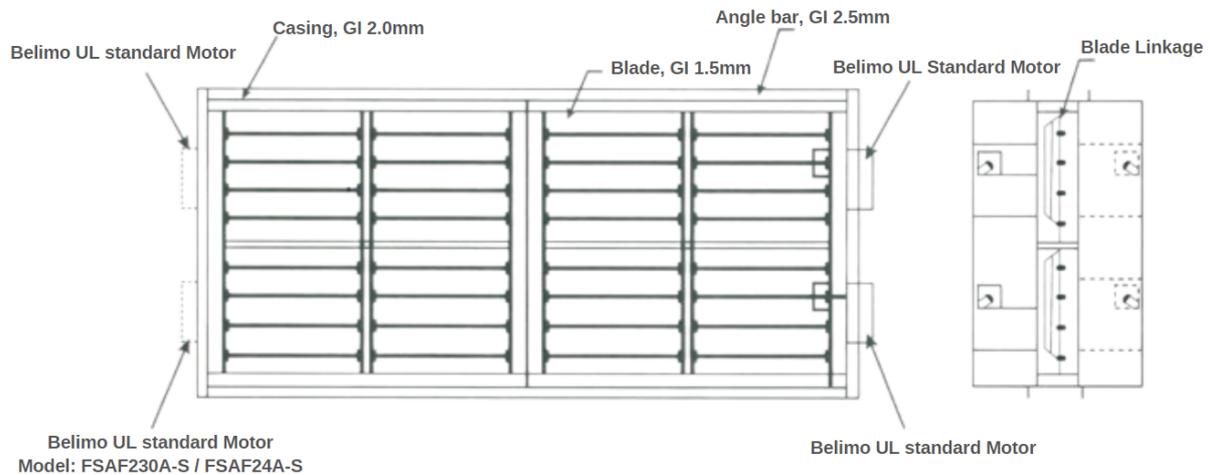


DAMPERS



MOTORIZED FIRE & SMOKE DAMPER

HART range of fire and smoke damper (FSD) is designed with the primary aim of meeting all requirements of an Engineered Smoke Control System. Hart FSD operates with velocities up to 12.2m/s at differential pressure of 1120Pa. The damper can be installed vertically and is rated for airflow and leakage in either direction.



NOTE: All pictures are for illustration purposes only

FEATURES

- Withstand pressure of up to 2000Pa when closed
- Fire rating of up to 4 hours
- Low pressure loss
- Damper operation: Electric actuator

CONSTRUCTION

- Single module: Max size 1000mm (w) x 1200mm (Ht)
 - Multiple module: Max size 3600mm (w) x 2400mm (Ht)
- Bigger sizes can be requested on a case to case basis.

STANDARDS

Hart fire and smoke damper is constructed to meet the following requirements:

1. Fire Test to BS 476 Part 22 for up to 4 hours

2. UL555S (2014)

- Clause 8: 20,000 cycles of cycling test
- Clause 9: Temperature degradation test to 250 degree Celsius for 2 hours
- Clause 10: Leakage test at elevated temperature of 175 degree Celsius
- Clause 11: Operation test of air velocity of up to 12.2m/s (blades fully open), and up to 1120Pa of differential pressure (blades fully closed), for three cycles of operation

MATERIAL



Blade thickness

1.5mm - 2.0mm galvanized steel



Frame thickness

2.0mm galvanized steel



Angle Bar thickness

2.5mm galvanized steel

MOTORIZED SMOKE DAMPER

A Motorized Smoke Damper can be defined as a device which is installed in ducts and the opening of a smoke control system or air distribution system, to block the passage of smoke and air. They can be opened as well as closed from a remote fire control and command station if and when needed. The chief functionality of this device is to prevent the smoke from entering the room through heating, ventilation or the ducts of the air conditioning system. These devices are manned by smoke detectors and fire alarms. There are specially designed smoke control system which are supposed to control the smoke migration using the floors and the walls as obstacles or barriers for creating pressure differences. These devices are used for isolating the air handlers. Though this does not mean they need to be installed on the sleeves, unlike the fire dampers.

HART Motorized Smoke Dampers are designed to integrate into the building's smoke and fire ventilation system where dampers provide an automatic means of detecting, controlling and regulating the spread of smoke and toxic gas. The two function of a smoke damper can either be:

(1) Normally closed and opened only for the channeling of smoke to outdoor during fire breakout.

(2) Normally opened and closed only during a fire breakout to prevent the progression of smoke through the system.

The unique and uncomplicated design allows for ease of installation and low cost maintenance. Hart Dampers are suitable for installation in sheet metal ductwork, partition walls, ceiling slabs, concrete or brickwork. Installation is subjected to local building rule and regulation.



HART Smoke Control Damper is constructed with a robust casing of 2.0mm thick galvanized steel and blades with 1.5mm thick galvanized steel.

The blades are fitted with diameter 12mm ms spindle in parallel operation and securely linked together on the sides with brass bushing. Stainless steel grade 304 side seals are fitted to close gap between the casing and the blades.

Smoke damper application, the use of a model with parallel blades, side seals and oilite bearings is recommended.

CURTAIN BLADE FIRE DAMPER

MODELS

The advantage of our curtain blade fire damper is the simplicity of its design. It incorporates a unique interlocking blade system giving high resistance to fire penetration and distortion. The curtain of blades rides in an integrally formed sleeve/jamb section designed to be narrow in profile, constructionally strong whilst being light in weight.

CA1 Curtain Blade Damper (Brick wall/Dry wall)

Hart Curtain Fire Damper Model CA1 is a simple and effective damper, designed to impede the spread of the fire and/or combustible product, (eg. smoke) through masonry, lightweight partition or shaft wall openings to other fire compartments of air-handling system. Resetting can be achieved from either side. This range of fire dampers find its application in commercial building construction where ventilation, heating, cooling or air-conditioning systems are employed. The design principal is based on an integral, interlocking stack of blades that closes by gravity to form a tightly sealed barrier when a fusible thermal link breaks at a set temperature. Hart Curtain Blade Fire Dampers are certified by Singapore standards and meets SS333:2012 requirements. Maximum damper sizes tested for single module is 1200 (W) x 1200 (H) and multi-module is 3600 (W) x 2400 (H).

The different types of CA1 dampers are:

- CA1-A Curtain blade, Bended or C-channel type profile, duct to duct vertical mount
- CA1-B Curtain blade, Bended or C-channel type profile, duct to grille vertical mount, air flow from grille towards duct
- CA1-C Curtain blade, Bended or C-channel type profile, duct to grille vertical, air flow from duct towards grille

The different types of CA1 (DW) (partition wall/dry wall) dampers are:

- CA1-A (DW) Curtain blade, bended or C-channel type profile, duct to duct vertical mount on drywall partition
- CA1-B (DW) Curtain blade, bended or C-channel type profile, duct to grille vertical mount on drywall partition, air flow from grille towards duct
- CA1-C (DW) Curtain blade, bended on C-channel type profile, duct to grille vertical mount on drywall partition, air flow from duct toward grille

CAF Curtain Blade Damper (Floor)

Hart Curtain Blade floor mounted fire damper, model CAF is a simple and effective damper, designed to impede the spread of the fire and/or combustible products (eg. smoke) through slab or vertical opening to the other fire compartments of the air-handling system. This fire damper finds its application in commercial building where ventilation, heating, air-conditioning systems are employed. The design principal is based on an integral, interlocking stack of blades that closes by the released of a spring coil when a fusible thermal link breaks at a set temperature. At the close position, the unfolded blades form a tightly sealed barrier. Hart Curtain Blades floor mounted fire dampers are certified by Singapore Standard and meet SS333:2012 requirements.

The CAF Damper is available with 3 mounting style:

- CAF-A Curtain blade, bended or C-channel type profile, duct to duct horizontal mount, min. slab thickness 100mm
- CAF-B Curtain blade, Bended or C-channel type profile, duct to grille horizontal mount, air flow from grille towards duct, min. slab thickness = grille + 150mm
- CAF-C Curtain blade, bended or C-channel type profile, duct to grille horizontal mount, air flow from duct toward grille, min. slab thickness = grille + 100mm

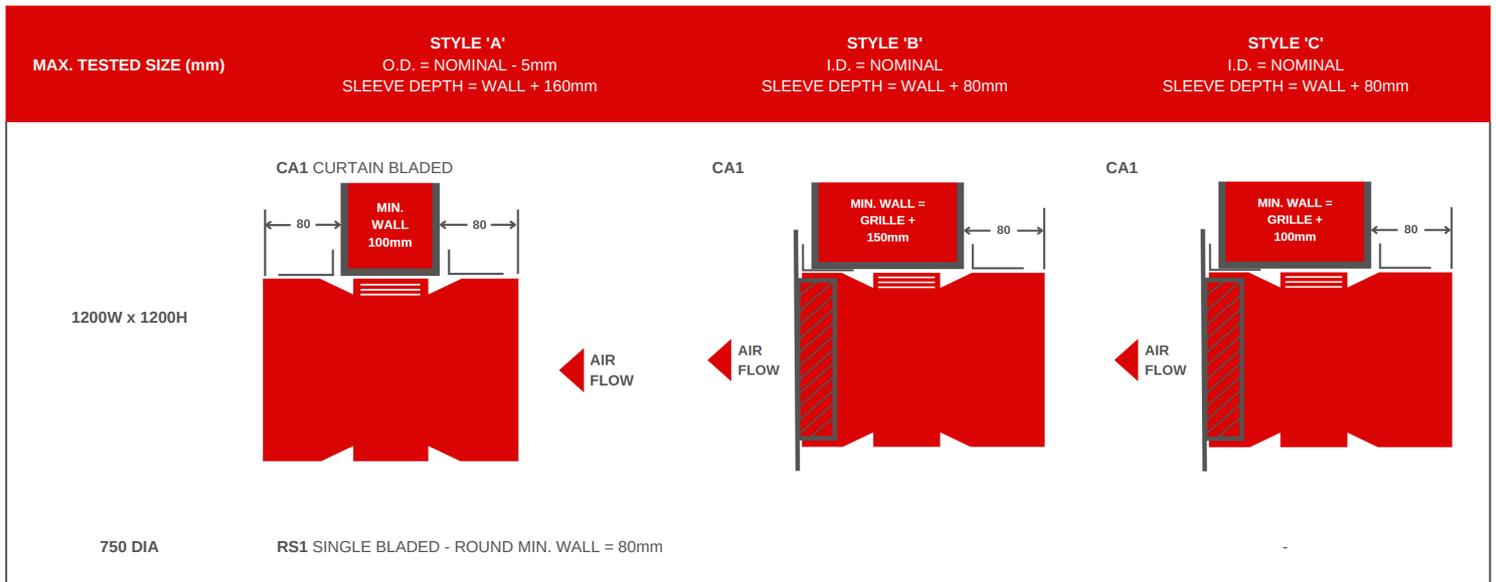
RS1 Single Blade Round Damper (Vertical)

The Hart Round Fire Damper, Model RS1 is a heavy duty damper, designed to impede the spread of fire and/or combustible products (eg. smoke) through wall or floor openings to other fire compartments of an air-handling system. This range of fire dampers finds its application in building construction and mining industry where ventilation, heating, cooling or air-conditioning systems are employed. Hart Round Fire Dampers are certified by Singapore standards and meet SS33:2012 requirements.

SUMMARY OF TESTS (SS333: 2012)

MODEL	FIRE TEST	LEAKAGE TEST	CYCLE TEST	SPRING TEST	SINGLE MODULE (mm)	MULTI-MODULE (mm)
CA1 (VERTICAL)	PASSED 4HR	PASSED	PASSED	-	1200 x 1200	3600 x 2400
CA1 (DW) (VERTICAL)	PASSED 2HR	PASSED	PASSED	-	1200 x 1200	3600 x 2400
CAF (HORIZONTAL)	PASSED 4HR	PASSED	PASSED	PASSED	1200 x 1200	2400 x 2400
RS1 (VERTICAL)	PASSED 4HR	PASSED	PASSED	PASSED	DIA 750	-

SINGLE MODULE DAMPERS



MULTI MODULAR UNITS

Dimensions allow for modular joining bolts - min. sleeve depth as above



INSTALLATION INSTRUCTIONS

- The Damper casing must completely penetrate the wall, and the blades, when in the closed position must be located in the plane of the wall and no closer than 40mm from a wall face. If the wall requires thickening to conform to above refer to Footnote References.
- The hole in the wall shall allow a clearance of 12mm (1/2") all around for dampers up to 1200mm (47 1/4") on the largest dimension and 25mm (1") all around for dampers over 1200mm (47 1/4") on the largest dimension.
- Dampers should be installed with airflow direction as indicated on damper label.
- Insert duct spigot between the loosened slotted angle and damper body up to the bolt and apply mastic seal between the damper body and duct. Tighten bolts up to the slotted angle so that adjustments permitted by the slot locates the damper blades as mentioned in step (1). The square headed coach bolts provided locate into a square hole in the damper body, hence these bolt may easily be tightened from the outside of the damper.
- Remove the slotted angles from the other side of the damper. Insert the damper complete with duct through the wall opening and pack the expansion gap with non-combustible material capable of resisting a temperature of 1000°C.
- The duct may now be connected to the other side of the damper in a similar fashion as described in step (4) ensuring that the slotted angles are butted against the wall securely, thus retaining the damper firmly in the wall. Where access is available from both sides of the wall at time of installation, do not connect fixing angles to the wall itself.
- Install adequately sized access panel in adjoining duct so that access may be gained and the damper can be test operated.
- The damper body should not protrude more than 80mm (3 1/8") past the face of the wall.

FOOTNOTE: References AS1668, PART 1, -1979, PAGE 15, "4.3 - FIRE DAMPERS".

**THIS PAGE IS
INTENTIONALLY LEFT BLANK**

MOTORIZED VOLUME CONTROL DAMPER

Motorized Volume Control Damper is manufactured of either opposed blades [Model VCD-TDF (OB)] or parallel blades [Model VCD-TDF (PB)]. Hart VCD-OB or VCD-PB provides highly efficient air flow control in conventional air handling system. Both damper types are available with parallel blade configuration for variable air volume application and opposed blade for air mixing application. The damper or stainless steel blades and frame are constructed using galvanized steel sheet with engineering plastic bushes. Multiple sections are interconnected with a solid drive shaft and provided together with individually adjustable internal blades linkages, positive connection for optimum close-off sealing.



Total damper design and tight manufacturing tolerances of Hart dampers result in long control and energy savings.

This range of motorized VCD finds its application in building construction and mining industry where ventilation, heating, cooling and air-conditioning systems are employed.

The design concept is based on an interlinked set of blades connected with a solid drive shaft using a stand pneumatic actuator or electric-electronic fail-safe spring return actuator with a fusible link incorporated into closing mechanism and spring clip holding the blades in the closed position after closure. VCD is designed with precision for a specific purpose, to control volumes of air passing through air-conditioning or ventilating systems either manually or via an actuator.

NON RETURN DAMPER

Non Return Damper (Model NRD-TDF) is specifically designed to dramatically reduce the back draft of air through air-conditioning ventilation systems. The dampers materials shall be determined according to the systems proximity to aggressive atmospheres, or its active purpose. Frame design shall be stage and rigid to reduce flex, materials being galvanized steel at a min. 12mm thick. It can be installed inside ductwork, conditioner plenums or in-line flanged ductwork configurations. Dampers are designed to control airflow not to structurally support the systems ductwork. All blades individually hinged on stainless steel stub shafts, standard with long life engineering plastic bushes and its blade tips are sealed for quiet operation.



NON RETURN DAMPER

Non Return Damper (Model NRD-TDF) and Adjustable Backdraft Damper (Model BDD-TDF) are constructed using aluminum parallel blades and galvanized steel sheet frames or stainless steel upon request.



ADJUSTABLE BACKDRAFT DAMPER

HART ENGINEERING (PRIVATE) LIMITED

11 Tuas Avenue 2 Singapore 639450

Tel: (65) 6291 2611

Fax: (65) 6296 4514

Email: info@hart.sg

Web: www.hart.com.sg