

Installation of Fire Damper on Masonry Floor Installation Instructions

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The Secure Way of Installing Fire Damper on Masonry Wall

1. Pre-installation Preparation

- a) Provide fire dampers opening details and location on the masonry floor to builder. Ensure that sufficient expansion gap is included in the opening size. Opening size including allowance for thermal expansion is calculated according to the latest Singapore Standard SS333, Annex G.
- b) Calculation of Floor Opening:
 - i) For Galvanized steel
Opening width = Damper width x 1.01 + 10 mm
Opening height = Damper height x 1.01 + 10 mm
 - ii) For Stainless steel damper
Opening width = Damper width x 1.015 + 10 mm
Opening height = Damper height x 1.015 + 10 mm

For convenience, we have provided a recommended opening sizes as shown in Table 1 and Table 2 in Appendix A.

- c) Check and confirm that fire damper opening position and dimensions (width, height) provided on the masonry floor is correct before proceeding to install the fire damper. In the event that the opening provided is inaccurate, request the builder to make good. Damper sleeve are made to suit the floor thickness
- d) Check that the edges of the cast opening and surfaces are flat. For hacked opening, ensure edges of the opening are made good; if there is a curb around the opening, the damper should be ordered with sleeve to include the curb thickness. Check that the sleeve length matches with the opening depth.
- e) Electrical trunking, piping or any other M & E services should not obstruct the installation of the fire damper.
- f) For safety, installer should take necessary precautions to prevent from falling through the fire damper opening during installation.
- f) Figure 1 describes the damper parts that will be mentioned throughout this installation manual.
- g) Check that the fire damper is installed according to the drawing with the blade catch facing down regardless of the air flow direction. The fire damper is bi-directional meaning it can be installed with airflow coming from either direction. For convenience of maintenance, access door/inspection opening should be installed above the damper.

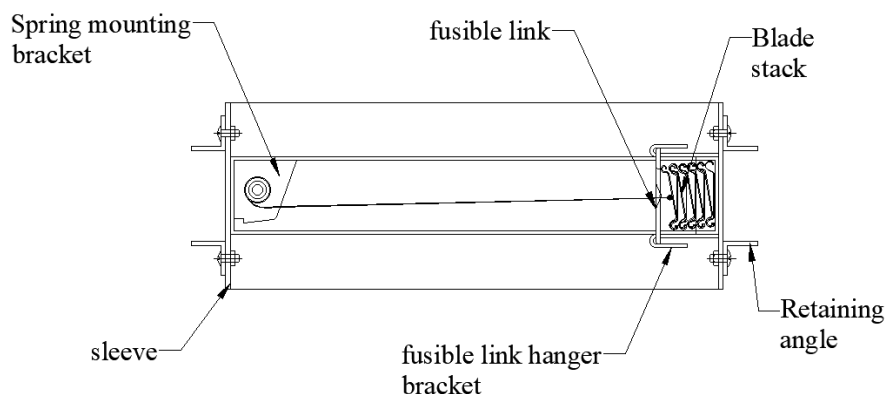


Figure 1: Damper Parts Description

2. Installation Procedures

Step 1

1a) Remove the retaining angle on the bottom side of the fire damper by unfastening the M6 bolts and nuts. Keep the fasteners for refixing.

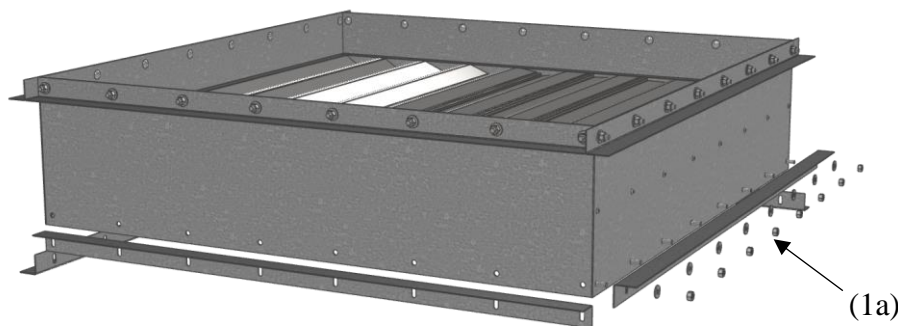


Figure 2: Remove bottom side angles

1b) Place the fire damper through the floor opening. Let the fire damper to sit securely on the floor slab/curb by its retaining angles as shown in Figure 4. For a large damper that is supplied in multiple modules, where it is difficult to lower the damper through the opening in one piece assembly from above, it is advisable to provide support from the floor below to support the damper module during installation. More manpower may be required to carry out installation of a large damper as it can be quite heavy in weight. Refer to table... for estimated weight of our fire damper.

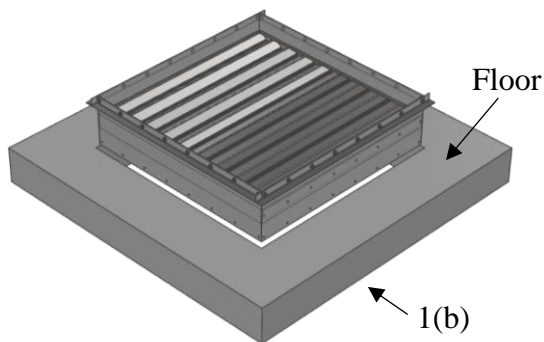


Figure 3: Place damper through floor opening

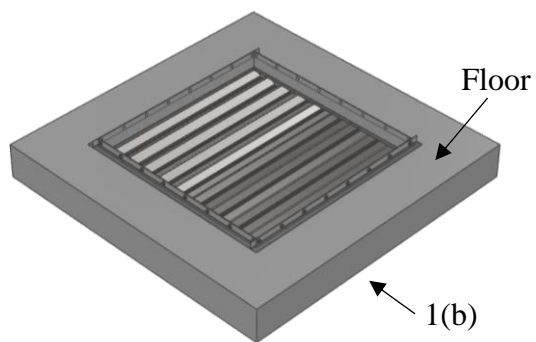
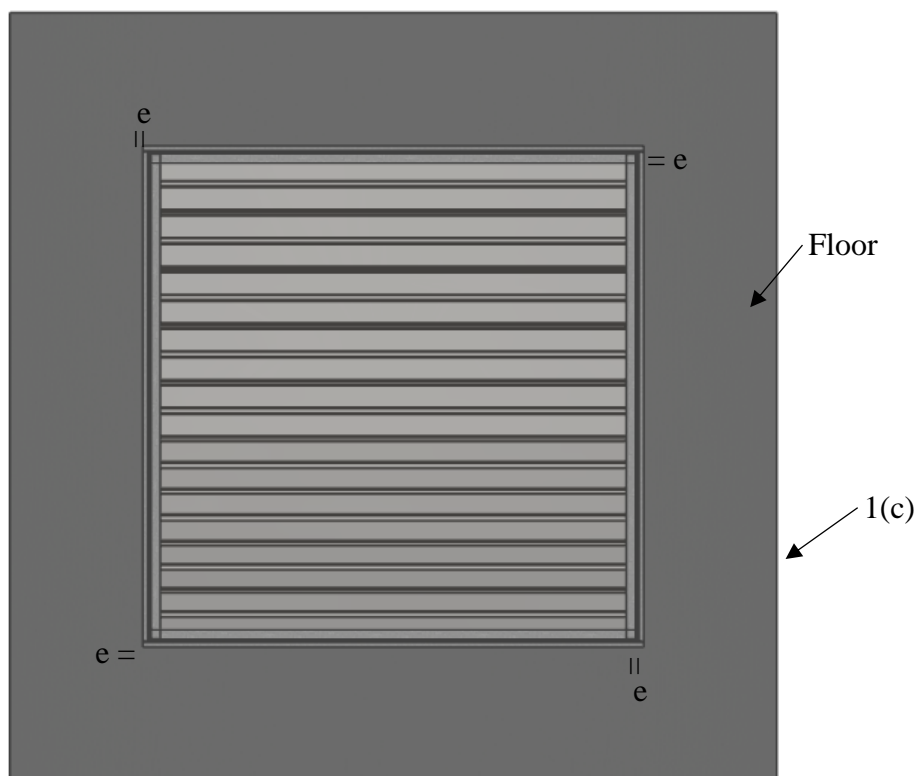


Figure 4: Damper sit on floor with retaining angles

1c) Position the fire damper centrally within the opening so that the expansion gaps all-round are equal. See drawing...



e = expansion gaps equal all round

Figure 5: Position damper in centre of opening

Step 2

Single Module Fire Damper

2a) Fill the expansion gaps all-round with compressible fire-resistance insulation.

Note: There are two alternative ways of insulating the expansion gap,

- i) by applying the insulation to the external side of sleeve before placing the damper into the floor opening, this should be done after step 1a),
- ii) by inserting the insulation into the gap after placing the damper through the floor opening, this should be done at step 2d).

If the latter method is used, the insulation has to be inserted from below the damper opening. Damper installer should decide which is the more convenient method. Our suggestion is to use the first method for single module damper and second method for two and four modules dampers.

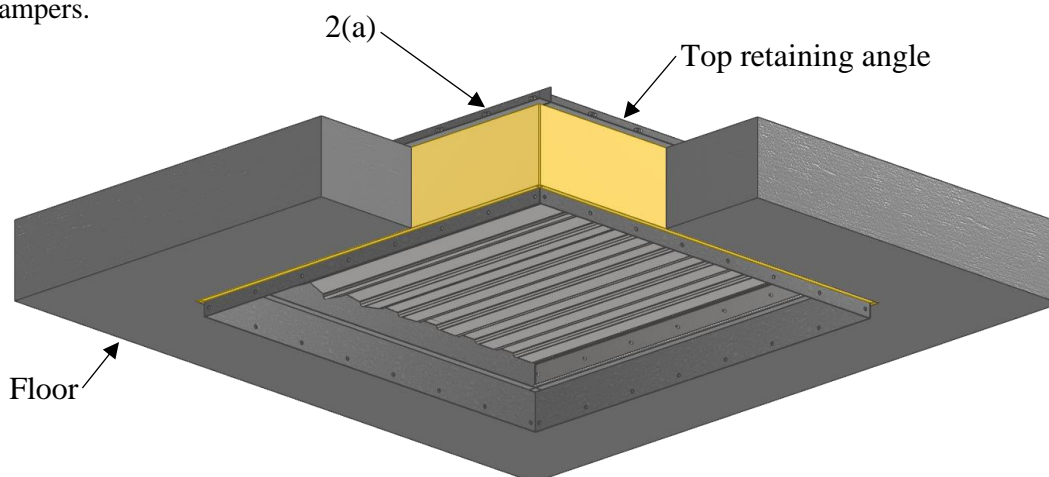


Figure 6: Fill expansion gaps with insulation

2b) Fix back the retaining angles with M6 bolts and nuts that were removed in 1a). Press the bottom-side retaining angles firmly against the underside of the masonry floor. Ensure all holes are fastened. ***Do not plaster or fasten the retaining angles to the floor slab or do anything that will hinder the expansion of the fire damper during a fire. The whole idea is for the damper to be firmly clamped within the wall and allowed to expand during a fire so as to sustain the fire damper integrity.***

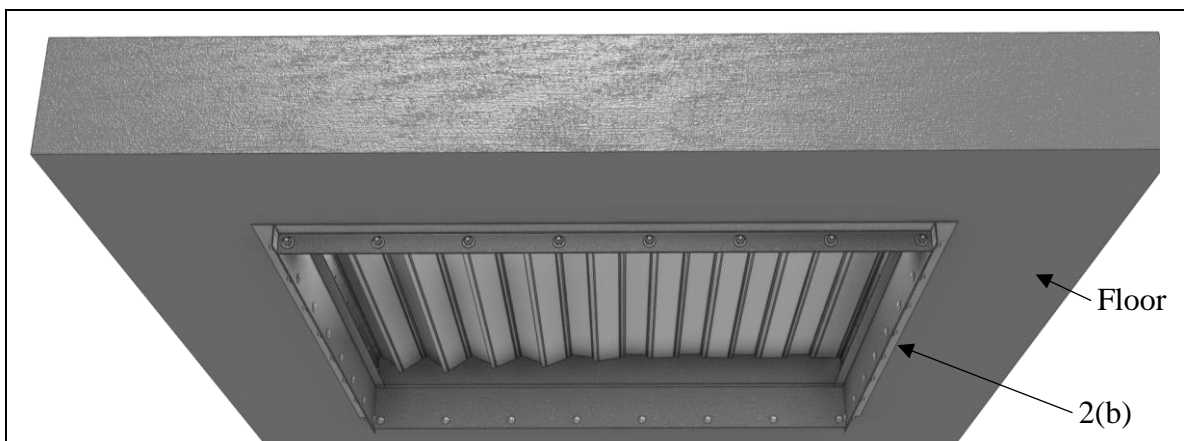


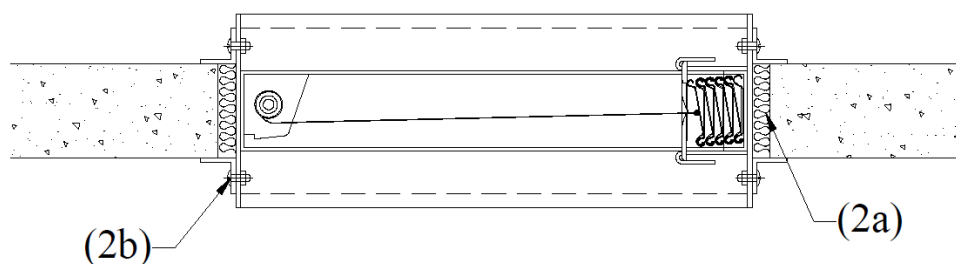
Figure 7: Press bottom angles against the floor

Multiple Module Fire Damper

2c) For multiple-module dampers, fasten adjacent modules together using the M6 bolts and nuts provided. (refer to Illustration 1-3, page 6-8). For two-by-two module assembly, fix shim plate provided between modules on the short side. Prefabricated Shim plate with pre-punched holes is provided with each two-by-two damper for the short side only.

2d) After all modules are properly secured, adjusted and levelled, check that damper is centered horizontally and expansion gaps are filled with compressible and fire-retardant insulation on all sides of the damper from below.

2e) Fix back the bottom set of retaining angles and ensure that they butt against the floor slab. ***Do not plaster or fasten the retaining angles to the floor slab or do anything that will hinder the expansion of the fire damper during a fire.***



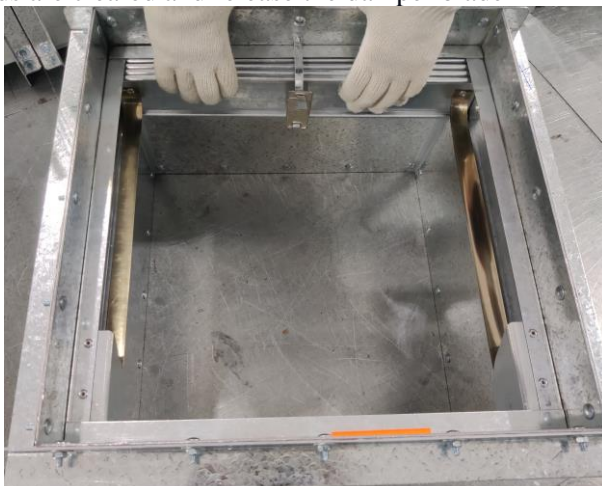
3a) Perform closing reliability test to ensure the damper can close properly before connecting the adjacent ducts. To perform this test, carry out the following steps in sequence as shown.

Step 3

- i) Remove the fusible link (see note 3)



- ii) Support the blade stack at the centre
- iii) Ensure hands are cleared and release the damper blade



- iv) Check that the blades close fully and latch (Illustration 4, pg. 8)



Note 3. For each module, remove the fusible link on one side from the hanger bracket. This can be done by straightening the fusible link hanger bracket by hand or with plier until it is straight. With one hand support the blade stack to prevent it from closing and with other hand, slide the fusible link out of the hanger bracket (Pic or dwg). Larger dampers are equipped with two stronger springs, so while removing the fusible link, an assistance may be needed to support the blade stack to prevent it from closing. Please take note of the spring set closing force designed to close the damper shown below. This is the force required to hold the blades in open position.

Each damper module is equipped with one set of springs. Each set consists of 2 similar constant-torque springs. Three spring sets cover the full range of our damper size. The smallest spring set cover damper of size up to 1200 X 500 mm, the middle spring set for size up to 1200 X 1000 mm and the largest spring set for size up to 1200 X 1683 mm. Damper larger in size are made in two or multiple modules. Each module will be incorporated with its own spring set.

The force exerted by each spring set is as follows:

	Closing force
i) Small spring set:	32.26 N (3.30 kgf)
ii) Medium spring set:	39.90 N (4.01 kgf)
iii) Large spring set:	67.28 N (6.87 kgf)

The force exerted by each spring set designed to close the damper include a minimum safety factor of 1.5 times the force required to close and latch the damper as required by Singapore Standard SS 333 - 2012

3b) Reset the blade and the fusible link (see pic).

- i) Free the blade from the latch; press the bottom blade edge away from the latch to disengage as shown.



- ii) Pull the blade by stacking each other.



- iv) Install the fusible link securely.



Note:

The access panel should be provided above the floor slab to allow blade reset at floor level. For large fire damper, more than one access panel may be required. However, building designer should plan for access to the fire damper (either from top or below) based on the site condition and duct layout.

3c) Apply duct sealant to the damper side of the S-clips, See pic. Use slow drying sealant to allow time to install the damper and connecting duct to the S-clip.

3d) Before the sealant dry, attach the "S" clip (not provided) to each end of the extended sleeve as shown in Detail A.

3e) Apply duct sealant to the duct side of the "S" clip

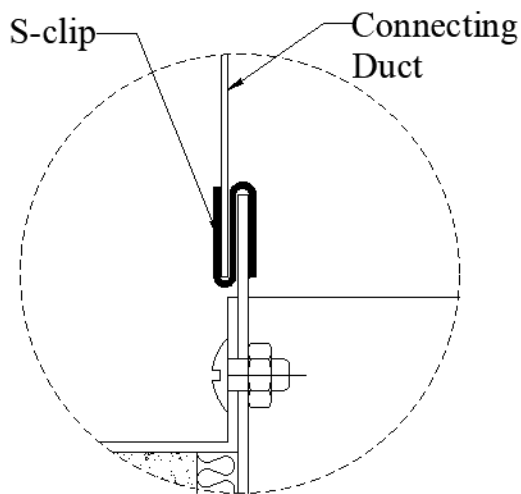
3f) Before sealant dries connect the duct to the duct-side "S" clip.

3g) Apply sufficient duct tape to seal the duct/damper joint to prevent air leaking.

Note 4. For ease of duct connection and future maintenance, connecting the duct shall be short of about 900mm. Access panel may be installed on the connecting duct.

Note 5. Duct shall be connected such that it's able to break free from the fire damper if it collapses during a fire.

Alternative clips may be used as shown in Appendix B of the latest Singapore Standard SS 333



Detail A

After installation, check the followings to ensure proper installation:

- i. All retaining angles must be firmly butted against the floor/curb and overlap it by a minimum 25 mm.
- ii. The damper is square, and all bolts and nuts are tightened to a maximum torque of 12 Nm.
- iii. All sides of the damper have an equal thermal expansion gap
- iv. Never insert a hard object in the expansion gap.
- v. Fusible link is hooked up properly. If the fusible link is lost, replace it with a new fusible link. Never substitute with wire.

Remember, lives depend on the proper functioning of fire damper.

3. Modular Arrangement

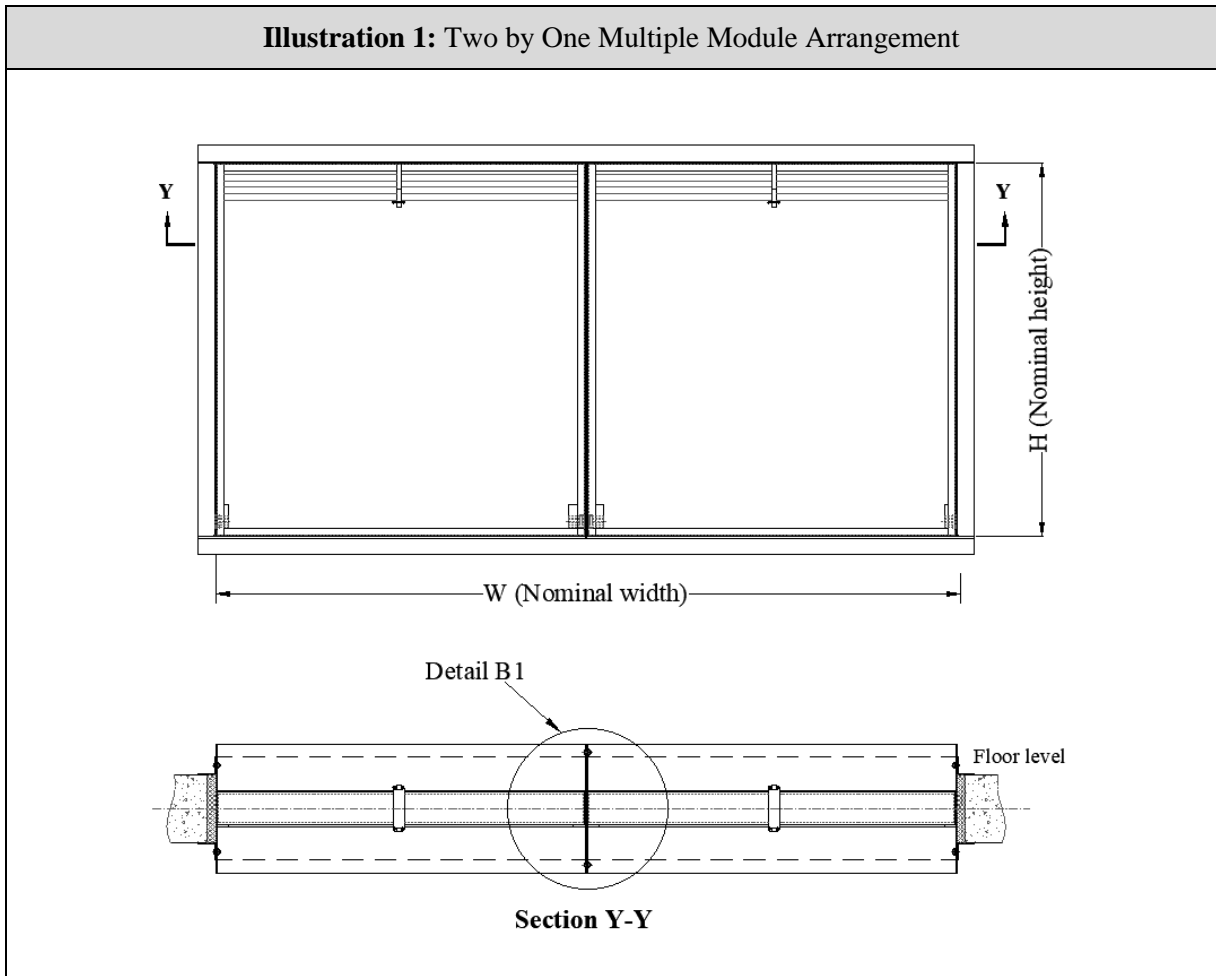
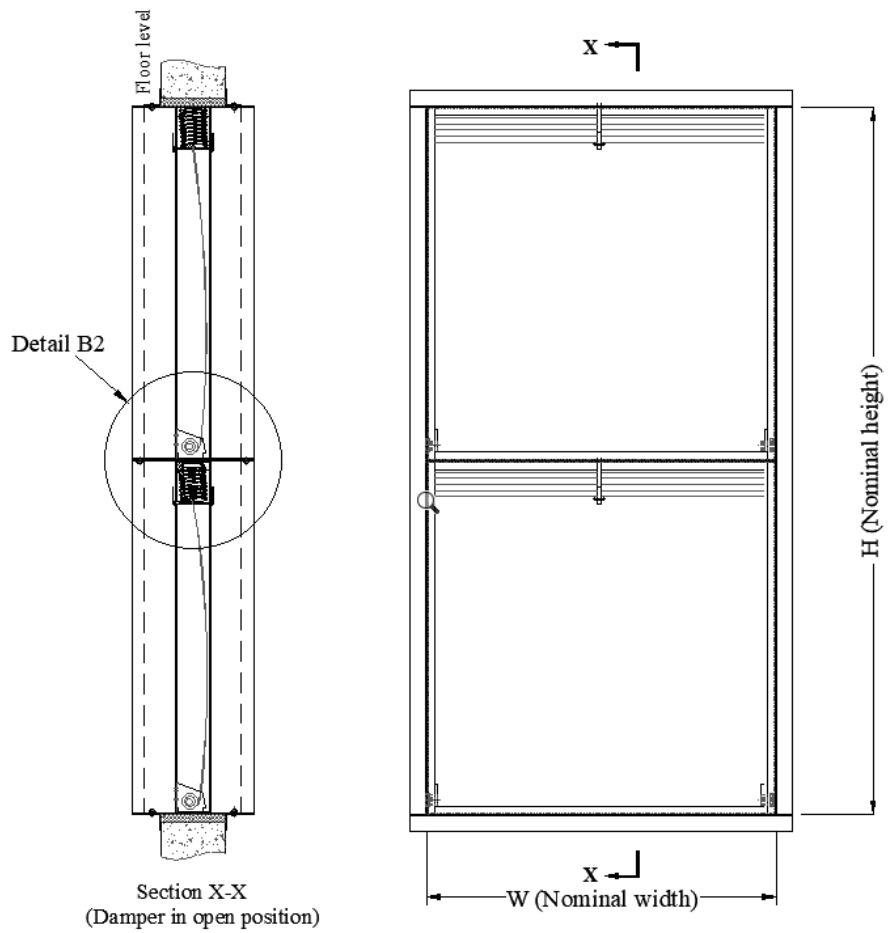


Illustration 3: One by Two Multiple Module Arrangement



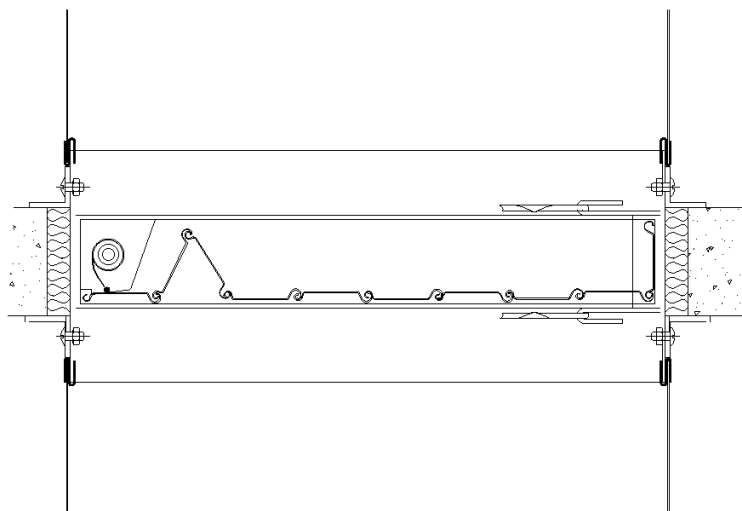
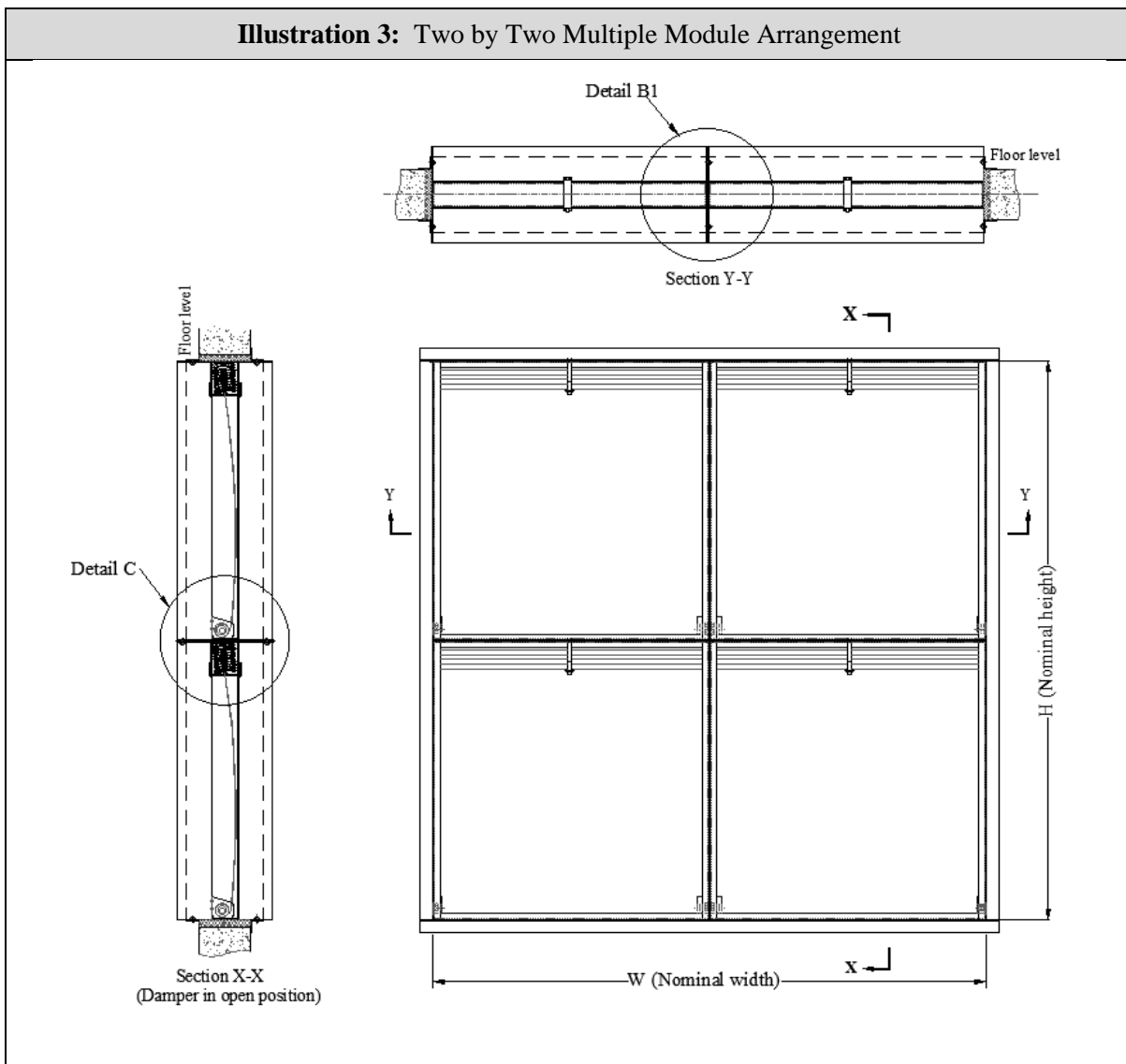
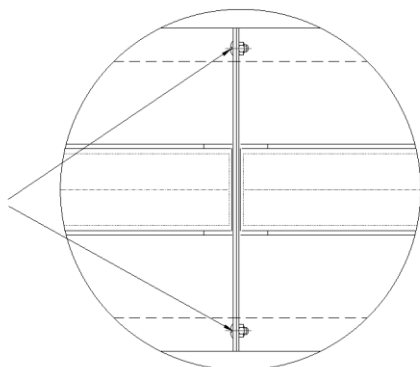


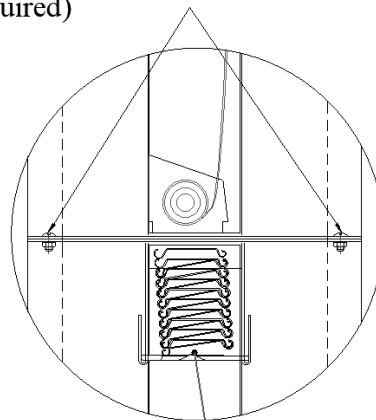
Illustration 4: Damper fully close

Sleeves fastened together with M6 steel bolts and nuts (no shim plate required)



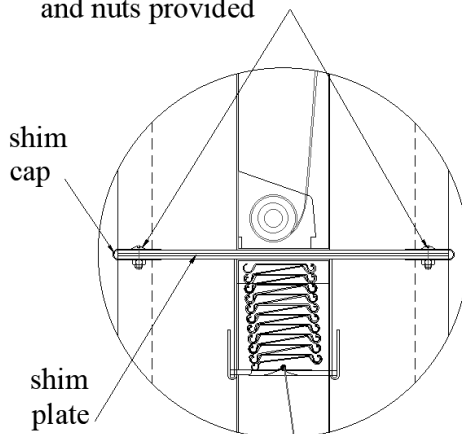
Detail B1

Sleeves fastened together with M6 steel bolts and nuts (no shim plate required)



Detail B2

shim plate, shim cap and sleeves fastened together with M6 steel bolts and nuts provided



Detail C

Note:

1] Use of shim plate and shim cap (Detail C) will apply only on the shorter side of the floor mounted two-by-two fire damper. Example, if the fire damper size is 2400 (W) x 3000 (H), shim plate and shim cap will be used on the width, W length. If the fire damper size is 2400 (W) x 2000 (H), shim plate and shim cap will be used on the height, H length.

4. Troubleshooting

Problem	Action	Remedy
Blade cannot close freely	<ul style="list-style-type: none">a) Check that blade is release squarelyb) Check that the damper is square	<ul style="list-style-type: none">i. Open fully and release squarelyii. Adjust damper and ensure its square and re-install. If necessary, remove damper to adjust.
Blade cannot close fully	<ul style="list-style-type: none">a) Check that there is no obstruction within the damper frameb) Check that springs are connected properly	<ul style="list-style-type: none">i. Remove obstruction and try closing it againii. Replace springs if they are damaged (refer to our factory for assistance)
Damper close	<ul style="list-style-type: none">a) Check if fusible link is broken	Replace fusible link

Appendix A: Thermal Expansion Gap

Table 1: Recommended Thermal expansion gap for Galvanized Steel Fire Damper all-round

Damper Dimension W or H (mm)	Recommended gap for Galvanized Steel fire dampers (mm)
	All Sides
150-850	10
851-1500	15
1501-2000	25
2001-3000	30
3001-3350?	35

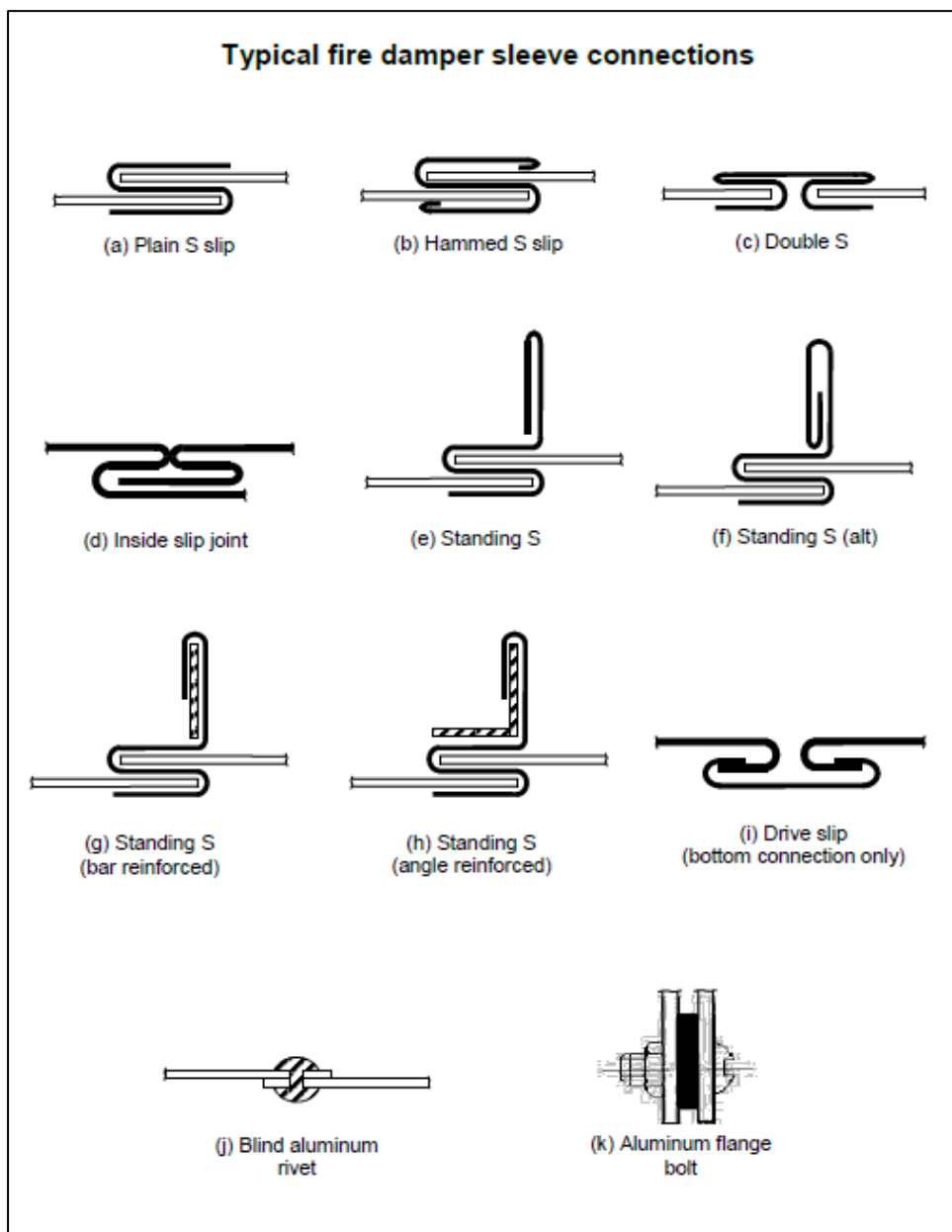
1. Table 1 is applicable to single module and multiple modules (up to 2 x 2 module arrangement) galvanized steel damper only. Damper dimension refers to width or height of a damper.

Table 2: Recommended Thermal expansion gap for Stainless Steel Fire Damper

Damper Dimension W or H (mm)	Recommended gap for Stainless Steel fire dampers (mm)
	All Sides
150-600	10
601-1250	15
1251-1500	20
1501-2000	30
2001-3000	35
3001-3350	40

1. Table 2 is applicable to single module and multiple modules (up to 2 x 2 module arrangement) stainless steel damper only. Damper dimension refers to width or height of a damper.

Appendix B: Typical Fire Damper Connection



Remark:

- 1] Extracted from SS333 Singapore Standard for Fire Dampers.
- 2] Connection (d), (i), (j), (k) are not suitable for OLS Fire Damper.
- 3] All connection clips are supplied by installer.