

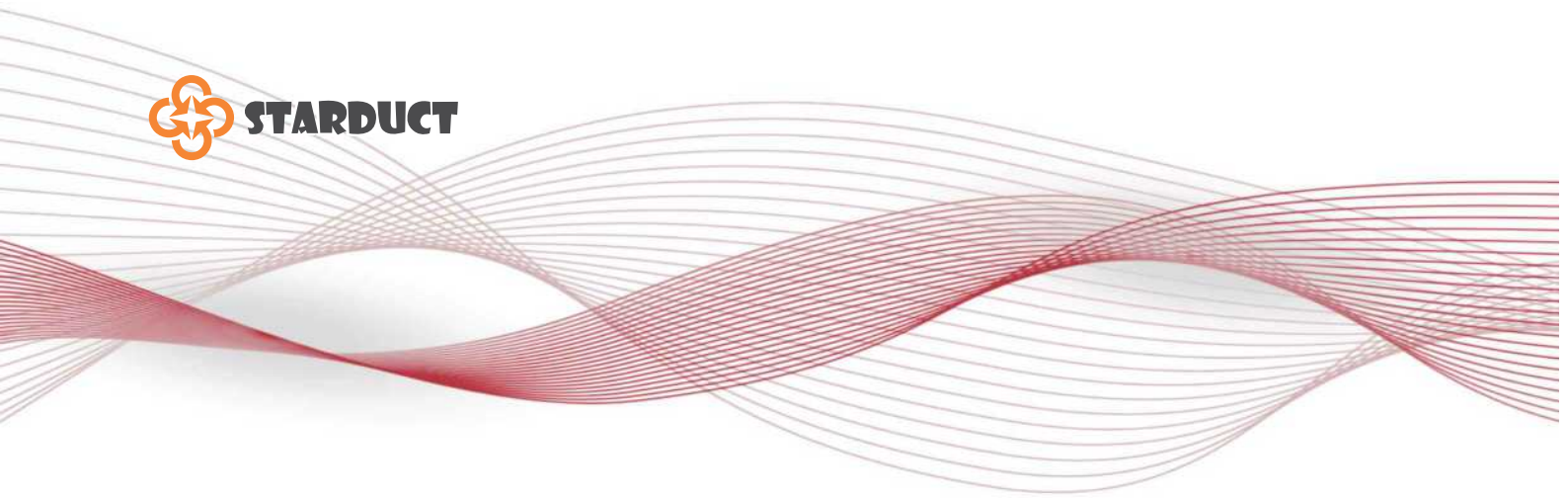
INSULATED FIRE DAMPER AND DUCT

QCVN 03:2021/BCA



**Fire Damper [E]
Insulated Fire Damper [EI]
Insulated Fire Duct [EI]**





WE

SELL

SUPERIORITY



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STARDUCT

the certified manufacturer

With 20 years of experience in manufacturing supporting products and systems for MEP and HVAC, Star Asia Jsc. (NSCA) has been supplying many heavy industrial, commercial with its products and service.

Products for life-safe of Star Asia Jsc., including fire dampers, insulated fire dampers under Starduct brand, are result from the combination of research, experience and expertises of our staff.

THE CERTIFIED MANUFACTURER

Life safety dampers are classified as "fire fighting and prevention equipment" and must be certified as per the National Technical Regulation fo Fire Fighting and Prevention Equipments (QCVN 03:2021/BCA) to meet requirements of QCVN 06:2021/BXD. In addition to the high requirements in quality and technical, fire and smoke dampers also should be registered to inspect and granted certificates for fire fighting and prevention equipments by Vietnam Fire and Rescue Police Department - Ministry of Public Security as regulated by the Decree 136/2020/NĐ-CP on the acceptance works of fire fighting and prevention in constructions. Star Asia Jsc. has a pride of the first company in Vietnam who is meet requirements of manufacturing and service for fire dampers and insulated fire dampers. All fire damper products from us have been certified of representative sample inspection as regulated by law.

STANDARDS TO BE APPLIED

Following and meeting technical requirements of standard systems is the thoroughly direction of Star Asia Jsc. In designing, production, testing, we always base on and refer to highest standards of the industry such as AMCA, ASTM, ASHRAE, ISO, AHRI, TCVN...

MEMBERSHIP OF ASSOCIATIONS

Star Asia Jsc., is the official member of **AMCA (Air Movement and Control Association)** and **Vietnam Fire & Rescue Association**



**BỘ CÔNG AN
CỤC CẢNH SÁT PCCC VÀ CNCH**

**CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc**

Số: 36 /GXN-PCCC

**GIẤY XÁC NHẬN
ĐỦ ĐIỀU KIỆN KINH DOANH DỊCH VỤ PHÒNG CHÁY VÀ CHỮA CHÁY**

Căn cứ Nghị định số 136/2020/NĐ-CP ngày 24 tháng 11 năm 2020 của Chính phủ quy định chi tiết một số điều và biện pháp thi hành Luật Phòng cháy và chữa cháy và Luật sửa đổi, bổ sung một số điều của Luật Phòng cháy và chữa cháy;

Căn cứ kết quả kiểm tra hồ sơ đề nghị xác nhận đủ điều kiện kinh doanh dịch vụ phòng cháy và chữa cháy đối với cơ sở;

Xét đề nghị của: Công ty cổ phần đầu tư công nghệ Ngôi Sao Châu Á,

**CỤC CẢNH SÁT PHÒNG CHÁY, CHỮA CHÁY VÀ CỨU NẠN, CỨU HỘ
XÁC NHẬN:**

CÔNG TY CỔ PHẦN ĐẦU TƯ CÔNG NGHỆ NGÔI SAO CHÂU Á

Giấy chứng nhận đăng ký doanh nghiệp công ty cổ phần, mã số doanh nghiệp: **0101491386** cấp ngày **29 tháng 6 năm 2022** (đăng ký thay đổi lần thứ 14), cơ quan cấp: **Phòng Đăng ký kinh doanh - Sở Kế hoạch và Đầu tư thành phố Hà Nội.**

Trụ sở tại: **Nhà số 16, tổ dân phố 12 phố Nhân Mỹ, phường Mỹ Đình 1, quận Nam Từ Liêm, thành phố Hà Nội, Việt Nam.**

Người đại diện theo pháp luật: **NGUYỄN THỊ THÚY HỒNG**

Chức vụ: **Giám đốc**

CCCD/CMND/Hộ chiếu số: **038171000006**, cơ quan cấp: **Cục Cảnh sát QLHC về TTXH.**

Nơi đăng ký hộ khẩu thường trú: **P1/E2 tập thể khí tượng Láng, phường Láng Thượng, quận Đống Đa, thành phố Hà Nội, Việt Nam.**

Đủ điều kiện kinh doanh dịch vụ phòng cháy và chữa cháy (có danh mục kèm theo) *!*

Nơi nhận:

- Công ty cổ phần đầu tư công nghệ Ngôi Sao Châu Á;
- PC07- CATP. Hà Nội (để theo dõi);
- Lưu: VT, P3.

Hà Nội, ngày 25 tháng 07 năm 2022

**KT. CỤC TRƯỞNG
CỤC CẢNH SÁT PHÒNG CHÁY VÀ CỨU NẠN, CỨU HỘ**



Hoàng Ngọc Huỳnh

Đại tá Hoàng Ngọc Huỳnh



Chứng nhận

Hệ thống quản lý chất lượng

This is to certify that the Quality Management System of:

NHÀ MÁY CƠ KHÍ STARDUCT

(thuộc CÔNG TY CỔ PHẦN ĐẦU TƯ CÔNG NGHỆ NGÔI SAO CHÂU Á)

Cụm công nghiệp Thị trấn Phùng, huyện Đan Phượng, thành phố Hà Nội, Việt Nam

Đã được đánh giá và phù hợp với các yêu cầu của tiêu chuẩn:

ISO 9001:2015

Chứng nhận này có hiệu lực theo lĩnh vực hoạt động sau:

Sản xuất và cung cấp cửa gió, van gió, ống gió, thang, máng, khay cáp và các sản phẩm cơ khí ngành cơ điện và điều hòa không khí thông gió, khung giá đỡ pin năng lượng mặt trời.

Ngày ban hành chứng nhận lần đầu:	01/02/2018
Ngày chứng nhận hiện tại:	01/02/2021
Chứng nhận có hiệu lực đến:	31/01/2024
Số chứng nhận:	NVQV17299-Q
Nace/ EA:	25.99

Phê duyệt:

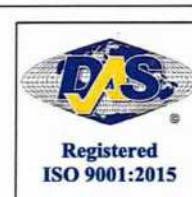


GIÁM ĐỐC
Nguyễn Hương Giang

Ngày: 01/02/2021

DAS CERTIFICATION Ltd.

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Fax: +84-24-37763777
Website: www.dasvietnam.com
Email: dasinfo@dasvietnam.com



VICAS 009 - QMS

UNINSULATED FIRE DAMPER E120



Model:
S-FD-(M/FS)

Certification of inspection for fire fighting equipment

Mẫu số PC29

**BỘ CÔNG AN
CỤC CẢNH SÁT PCCC VÀ CNCH****CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc**

Số:.....1021.../KĐ-PCCC-P7

**GIẤY CHỨNG NHẬN
KIỂM ĐỊNH PHƯƠNG TIỆN PHÒNG CHÁY VÀ CHỮA CHÁY**

Căn cứ Nghị định số 136/2020/NĐ-CP ngày 24/11/2020 của Chính phủ quy định chi tiết một số điều và biện pháp thi hành của Luật Phòng cháy và chữa cháy và Luật sửa đổi, bổ sung một số điều của Luật Phòng cháy và chữa cháy;

Xét đề nghị của: Công ty Cổ phần ĐTCN Ngôi Sao Châu Á
về việc cấp giấy chứng nhận kiểm định phương tiện phòng cháy và chữa cháy tại văn bản số: 1308/2022 ngày 13 tháng 08 năm 2022;

Căn cứ kết quả kiểm định về phòng cháy và chữa cháy đối với phương tiện/lô phương tiện tại biên bản kiểm định ngày 30 tháng 09 năm 2022 của Trung tâm tư vấn và chuyển giao công nghệ PCCC và CNCH – Cục cảnh sát PCCC và CNCH

**CỤC CẢNH SÁT PHÒNG CHÁY, CHỮA CHÁY VÀ CỨU NẠN, CỨU HỘ
CHỨNG NHẬN:**

Mẫu phương tiện: Phòng cháy, chữa cháy ghi tại trang 2 - 11
của: Công ty Cổ phần ĐTCN Ngôi Sao Châu Á, địa chỉ: Nhà số 16, tổ dân phố 12 phố Nhân Mỹ, phường Mỹ Đình 1, quận Nam Từ Liêm, Thành phố Hà Nội

Tại thời điểm kiểm định, số phương tiện này có các thông số kỹ thuật phù hợp với các quy định về phòng cháy và chữa cháy và được phép sử dụng trong lĩnh vực phòng cháy và chữa cháy./

Nơi nhận:

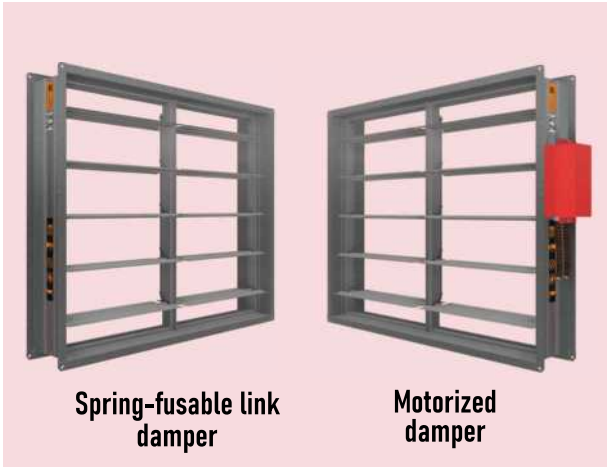
- Công ty Cổ phần ĐTCN Ngôi Sao Châu Á;
- Phòng CS PCCC và CNCH - CA các địa phương;
- Lưu: VT, P7(N.T.H);

Hà Nội, ngày 13 tháng 03 năm 2023**KT. CỤC TRƯỞNG
PHÓ CỤC TRƯỞNG**

(ghi rõ họ tên và đóng dấu)

**Đại tá Bùi Quang Việt**

UNISULATED FIRE DAMPER[E] S-FD-(M/FS) : 1200 (W) x1200 (H) x210 (L)


DESCRIPTION

Starduct fire damper S-FD (M/FS) is a fire fighting equipment for static or dynamic HVAC systems that can remain in operation during fires.

S-FD dampers of Star Asia Jsc. are the products, that meet testing requirements of the National Technical Regulation to Fire Fighting and Prevention Equipments (QCVN 032021/BCA) and have fire resistance rating of 120 minutes (E120) with the certificate of representative sample inspection as per the Decree 136/2020/NĐ-CP,

In addition to fire fighting and protection regulations, S-FD dampers are also produced according to requirements of HVAC industry standards such as Smacna, AMCA...

Type: S-FD models are used for protection of openings in walls, partitions or floors and have fire resistance rating of 120/90/60/45 minutes (E).

ORDERING CODE	S-FD - M/FS - WxH - TDC - 2 - E 120
Fire Damper code M = motorized damper: BELIMO; 230V(AC) FS = mechanical damper: spring fusible link	Uninsulated, Fire-resist. rate 120 min. Flange type: 2-side TDC Dimension: Width (W) x Height (H)

Single section damper

Motorized damper


Spring-fusible link damper

Construction

1. Frame: CNC folding, 2-side TDC. Galvanized steel sheet, thickness 1.15mm
2. Blade: single or multiple. 3V type. Galvanized steel sheet, thickness 1.15mm
3. Axle: square steel bar 10x10mm. Galvanized
4. Bush: cooper, 2-piece, CNC lathe


Activation mechanism

■ Activated by fire-alarm signal and control by electric motor 230V AC



Actuated by fire signals
BELIMO actuator
FSLF230(-S)
Common open
Close time 15s

■ Activated by working temperature with fusible links and springs



Fusible link activated @ 70°Cx2, closing by 2 springs (D10) in each section

INSTALLATION OF UNINSULATED FIRE DAMPER [E] S-FD-(M/FS) : 1200 (W) x1200 (H) x210 (L)

MOTORIZED DAMPER

BELIMO actuator
UL 555
FSLF(-S) 3.5Nm
Return spring
Auxiliary switch
Voltage: 230V AC

Damper dimensions

Opening dimensions

Section

Installation guide - 2-side TDC

- Minimum distances between sides of the opening and wall should be 200mm and ceiling/beam should be 75mm. Note: set the motor in the accessible side.
- Insert asbestos gasket, mount the damper on the wall by M8/L100 anchor bolts @ spacing of 300mm
- Caulk Hilti Cp606 glue in the inside and outside of damper perimeter
- Check inside the damper and remove all foreign objects (if any)
- Check by running open/close to ensure smooth operation for the damper

FUSABLE LINKAGE DAMPER

Damper dimensions

Opening dimensions

Section

Installation guide - 2-side TDC

- Minimum distances between sides of the opening and wall should be 200mm and ceiling/beam should be 75mm.
- Insert asbestos gasket, mount the damper on the wall by M8/L100 anchor bolts @ spacing of 300mm
- Caulk Hilti Cp606 glue in the inside and outside of damper perimeter
- Check inside the damper and remove all foreign objects (if any)
- Check by running open/close to ensure smooth operation for the damper

SEPARATED MULTI-SECTION

With $W > W$ - tested
With $H \leq H$ - tested

With $W < W$ - tested
With $H > H$ - tested

With $W \geq W$ - tested
With $H \geq H$ - tested

Control motor: BELIMO, UL555, spring return actuator

Model code : FSLF 24V(AC/DC)/230V(AC)(-S)

- AC 24V 50/60Hz, DC 24V* : FSLF24(-S) US or NSA
 - AC 230V 50/60Hz : FSLF230(-S) US or NSA
- Meet requirement of UL555(S) when tested as an assembly with suitable dampers
 - Torque: 3.5Nm @ 177°C(350°F) for 30 minutes
 - Running time: 15s
 - Control: Open/Close



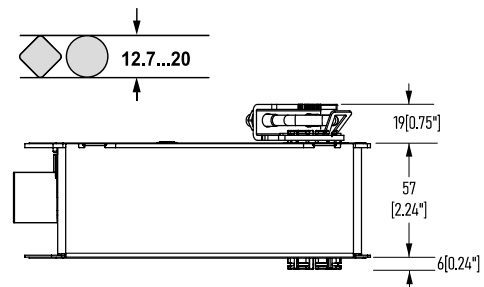
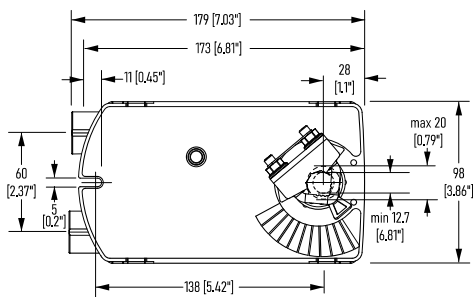
Technical data

Electrical data	Nominal voltage	AC 24V 50/60Hz, DC 24V*	
	Nominal voltage range	AC 19.2...26.4V, DC 24...36V*	
	Power consumption	15VA @ running / 3.5VA @holding	
	For transformer sizing	25VA	
	Fusing	1A slow blow	
Connection	- Motor	1m, 18ga, 2 color coded leads	
	- Auxiliary switch	1m, 18ga, 4 appliance leads 1/2" conduit connector	
Function data	Torque	3.5Nm (0-177°C) @ nominal voltage	
	Direction of rotation	Selectable by CW/CCW installation	
	Angle of rotation	Max. 95°	
	Auxiliary switch	- FSLF24-S 2 SPST, 1mA@DC5V, 3(0.5)A, 120/250V □ fixed @ 10° ⇐ 85° ⇐	
	Running time	- Motor < 15s at rate voltage and torque - Spring return < 15s	
Safety	Position indicator	Mechanical	
	Protection class	Class 2 supply	
	Degree of protection	IP30 / NEMA type	
	Mode of operation	Type 1.AA.B	
	Ambient temperature	- Chế độ thường 0...+50°C - Chế độ an toàn 3 open/Close cycle after 1/2hr @ 177°C	
	Storage temperature	-40...+80°C	
	Humidity test	95% RH, non-condensing	
	Maintenance	Maintenance-free	
	Dimensions/Weight	Dimensions (L x W x H)	179 x 98 x 82mm
		Shaft diameter	12.7 ... 20mm**
Weight		- FSLF24 Approx. 1.6kg - FSLF24-S Approx. 1.7kg	
Safety note	AC 24V: connect via safety isolating transformer, class 2 supply		

* Filtered and regulated DC 24V power supplies is needed

** For damper spindle Ø16 ... 20mm, use K6-1

Dimensions [mm/inches]



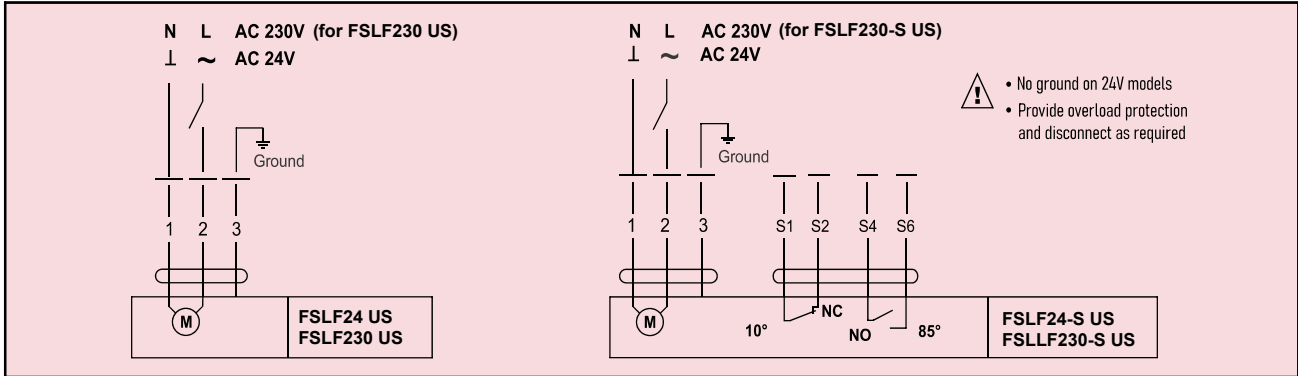
NOTE! Starduct fire dampers are designed compatible with BELIMO actuator - this is the only recommended actuator by NSCA. NSCA will not take any concerning responsibility if other actuators are installed by the users. Contact us for more information

Wiring diagram

Model: FSLF

Note :

- Parallel connection of several actuator is possible
- Power consumption must be observed


Wiring diagram - Model FSLF24/230 (-S) US/NSA
Accessories

BAE165 US	165°F (74°C) electric thermal sensor, SPST, normally closed
S2A-F US	Auxiliary switch, 2xSPDT, 3A (0.5A inductive) @ 250V AC max.

Typical Specification

All smoke and combination fire and smoke dampers shall be provided with Belimo FSTF, FSLF, FSNF, or FSAF actuators. All substitutions must be approved before submission of bid. Damper and actuator shall have UL 555S Listing for 250°F (350°F). Actuator shall have been tested to UL 2043 per requirements of IMC 602.2 and NEC 300.22 (c). Where position indication is required -S models with auxiliary switches or damper blade switches will be provided per code requirements.

Wiring diagrams

Application Notes

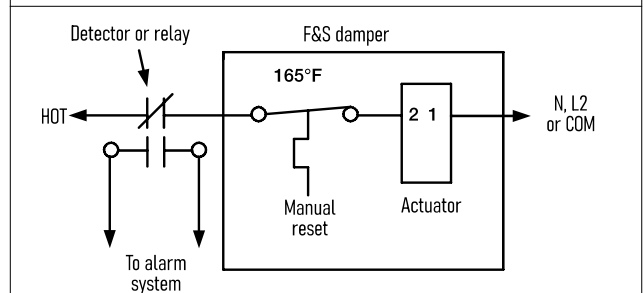
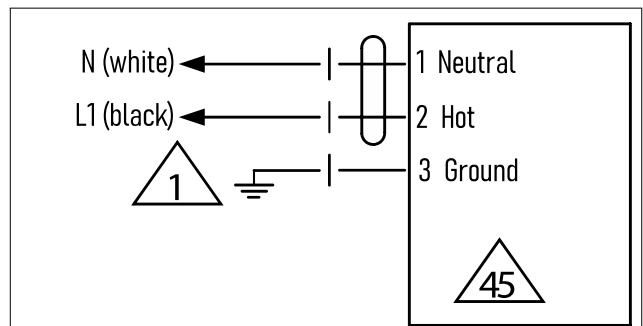
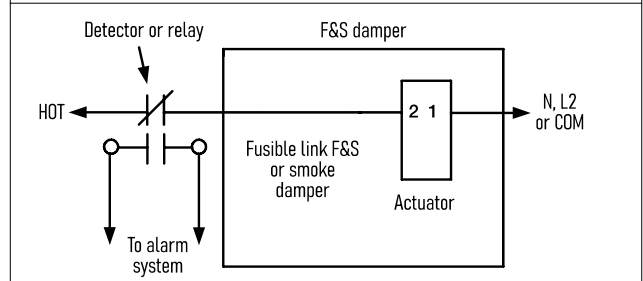
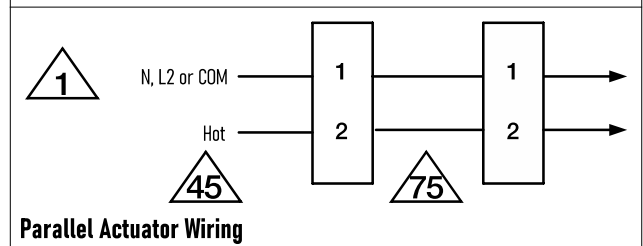
- Provide overload protection and disconnect as required.
- Actuators may be powered in parallel. Power consumption must be observed.
- Ground present on some models.

Typical specification

All Starduct EI dampers shall be provided with Belimo FSTF, FSLF, FSNF, FSAF actuators. All substitutions must be approved by NSCA (Star Asia Jsc.) before ordering.

All alternative motors must be UL certificated ones and tested to UL 2043 as requirements of IMC 602.2 và NEC 300.22®

Model -S should be supplied if position indication of blade is required


Typical smoke or fusible link damper wiring

Typical smoke or fusible link damper wiring

Parallel Actuator Wiring

PROGRAM TO CALCULATE PRESSURE LOSS FOR STARDUCT DAMPERS

Insert input data in the orange cells in the below table, in which :

- V_{duct} is the airstream velocity in duct. Unit: m/s. Design engineer to insert this data.
- Dimensions of damper as per width and height. Unit: mm. Design engineer to insert this data.
- C_o is average pressure drop coefficient of velocity limit 5 to 10m/s, fixed value = 2.75. No need to insert.
- V_{damper} - no need to insert as the program will automatically calculate

CALCULATION PRESSURE LOSS FOR VCD, FD AND OTHERS			
Damper dimensions:	Width (W) mm	Height (H) mm	Cross section (m ²)
	300	300	0.09
V_{duct} (m/s)	5	Q (m ³ /h) :	1,620
Cross section area (m ²)	0.053	Velocity difference factor V^2 (m/s)	12.51
V_{damper} (m/s)	8.54	C_o (5-10 m/s)	2.75
Pressure loss ΔP :		34.39 Pa	

(*) Contact us to get the link of the program

PRESSURE DROP CALCULATION METHOD

EFFECTIVE AREA OF STARDUCT DAMPER (cm²)

H Cao-mm Rõng-mm W	200	300	400	500	600	700	800	900	1000	1100	1200
200	185	315	435	564	685	805	934	1055	1184	1304	1434
300	315	527	731	944	1147	1360	1573	1776	1989	2192	2405
400	463	768	1082	1388	1702	2007	2313	2627	2932	3238	3552
500	592	981	1378	1767	2165	2553	2951	3339	3737	4126	4338
600	722	1193	1674	2155	2627	3108	3589	4061	4542	5023	5495
700	870	1443	2026	2599	3173	3756	4329	4912	5485	6068	6642
800	990	1656	2322	2979	3645	4301	4967	5624	6290	6956	7613
900	1147	1906	2664	3432	4190	4949	5717	6475	7234	8001	8760
1000	1267	2118	2960	3811	4653	5504	6346	7197	8038	8889	9731
1100	1138	2081	3025	3968	4921	5865	6808	7761	8704	9648	10591
1200	1240	2266	3302	4329	5356	6392	7419	8455	9481	10508	11544

$$\Delta P = C_o \times V^2$$

In which:

- C_o is the average pressure drop coefficient of 5-7 and 10m/s velocity, and $C_o = 2.75$
- V^2 (m/s) is the face area velocity going through the damper with

$$V_{\text{damper}} = \frac{Q \text{ (m}^3\text{/s)}}{\text{Effective area (cm}^2\text{)}} \quad V^2 = (V_{\text{damper}} - V_{\text{duct}})^2$$

Note: data of full open damper

Example:

$V_{\text{duct}} = 5$ m/s, Damper size: 300x300mm → effective area 900 cm²



• $Q =$ effective area x duct velocity = 900 x 5 = 4500 (m³/h)

• $V_{\text{damper}} = 4500/527 = 8.53$ (m/s) [527 taken from the size 300x300 in the table]

• $V^2 = (8.53 - 5)^2 = 12.52$ (Pa)

Result: Pressure loss $\Delta P = 2.75 (C_o) \times 12.52 (V^2) = 34.4$ Pa

MARKS AND LABELS - Applied on each damper

<p>Nhà sản xuất : CÔNG TY CPĐTCN NGÔI SAO CHÂU Á Nơi sản xuất : Nhà máy cơ khí Starduct Cụm CN Phùng, Đan Phượng, Hà Nội, Việt Nam Hotline : 0240 3514 7999</p>	<p>→ Manufacturer, made place, address, phone number.</p>
<p>Tên sản phẩm : VAN NGĂN CHÁY KHÔNG CÁCH NHIỆT Mã hiệu : SFD-M Cấp ngăn cháy : E120 Kích thước : W600 x H300 X L210</p>	<p>→ Product name, model, dimensions, fire rate, insulation rate</p>
<p>Số GCN : 1021. Ngày cấp : 13.03.2023 Đơn vị cấp : Cục CS PCCC và CHCN, BCA</p>	<p>→ Number of the applicable certificate, issued date, issued by</p>
<p>Tên dự án : BỆNH VIỆN VIỆT NHẬT Địa chỉ : Số 10 đường ABC, Phường, Quận, Huyện, Tỉnh, Thành phố</p>	<p>→ Name of project, delivery address</p>
<p>Số quản lý : NS-S20-3-1 Ngày sản xuất : 20.03.2023</p>	<p>→ Admin. ref # (Series), Prod. date</p>
	<p>→ QR Code for checking origin, serial number</p>
 <p>Web site : www.starduct.vn</p>	<p>→ Manufacturer Logo, Web address</p>

LIST OF LEGAL DOCUMENTS ACCOMPANYING WITH GOODS FOR A PROJECT

- 1- A copy (notarized) of the certificate of verified sample
- 2- A copy (notarized) of the certificate of verified requirements for production and service
- 3- List of certified models (i.e quantity, sizes and ref. numbers of each damper in the list)
- 4- Installation drawings as per tests.
- 5- Delivery minutes from manufacturer

Warning sign system of Star Asia

	<p>Do Not Drop Không kéo lê, tránh rơi đổ</p>		<p>Do Not Walk or Stand On Không dẫm hoặc đứng lên trên</p>		<p>This Side Up Xếp hướng lên trên</p>
	<p>Dry Storing Bảo quản nơi khô ráo</p>		<p>Store In Warehouse Bảo quản trong kho</p>		<p>Sharp Edge Use Glove Vật có cạnh sắc Đeo găng an toàn khi làm việc</p>
	<p>Handle With Care Nhẹ tay khi dịch chuyển</p>		<p>Use Forklift To Move Chuyển bằng xe nâng</p>		<p>Use Scissor Forklift To Lift Up Nâng lên cao bằng xe nâng chuyên dụng</p>

Storage and handling

As fire damper is a safety element, it should be stored and handled with care

Avoid:

- Any kind of impact or damage
- Contact with water
- Deformation of the casing

Recommendations for Star Asia :

- To unload in a dry area
- Not to flip or roll the product to move it
- Not use the damper as a scaffold, working table etc.
- Do not store smaller damper inside large one
- Do not stand or seat on the product



Nhận và bảo quản nơi khô ráo nước



Sử dụng găng bảo hộ khi làm việc



Không dẫm, đạp, trèo, đi trên van

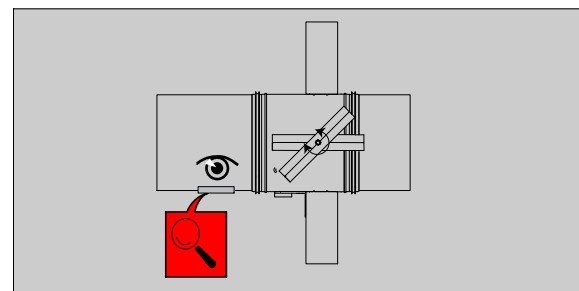
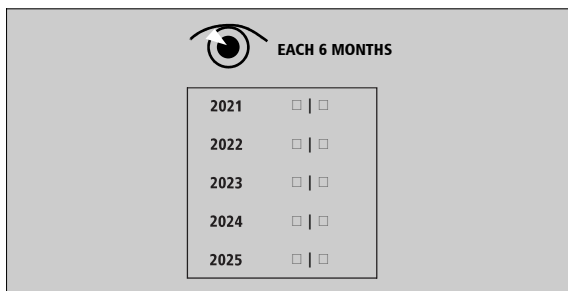


Không thả, lãn, lật lỏi, kéo, đẩy, ...

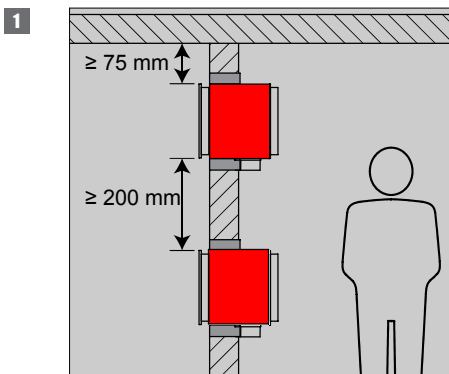
Important notes when installation

General :

- The installation must comply with the installation manual delivered with the product and the classification report.
- Axis orientation: see the declaration of performance
- Avoid obstruction of adjoining ducts.
- Product installation: always doing with closed damper blade
- Verify if the blade can move freely
- Please observe safety distances with respect to other construction elements. The operating mechanism must also remain accessible: allow for a clearance of 200 mm around the housing.
- The air tightness class will be maintained if the damper is installed according to the installation manual.
- The fire dampers are always tested in standardised constructions according to QCVN 60:2021/BXD. The achieved results are valid for similar supporting constructions with a fire resistance, thickness and density equal or superior to the supporting construction used during the test.
- The damper must remain accessible for inspection and maintenance.
- Schedule at least two running checks each year.



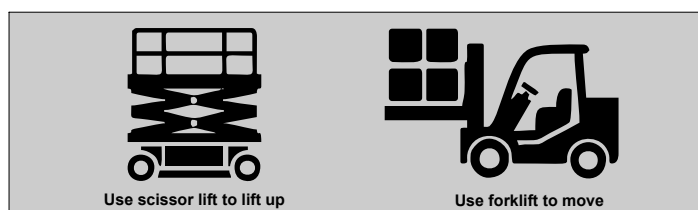
Installation at a minimal distance from another damper or from an adjacent supporting construction



1. Principle according to the test standard:

Minimum distance of ≥ 75 mm from the ceiling

Minimum distance > 200 mm to an adjacent damper



INSULATED MOTORIZED FIRE DAMPER

Ei120 fire damper



Model:
S-MFSD

INSULATED MOTORIZED FIRE DAMPER [EI 120]

S-MFSD : W1200 x H800 x L600



Motorized damper

DESCRIPTION

Starduct fire damper S-MFSD is a fire fighting equipment for preventing fire, smoke and temperature spreading in HVAC systems that can remain in operation during fires.

S-MFSD dampers has been matched requirements of test as regulated in the National Technical Regulation to Fire Fighting and Prevention Equipments (QCVN 032021/BCA) and have fire resistance rating of 120 minutes (Ei120) with the certificate of representative sample inspection as per the Decree 136/2020/NĐ-CP,

In addition to fire fighting and protection regulations, S-MFSD dampers are also produced according to requirements of HVAC industry standards such as Smacna, AMCA...

Type: S-MFSD models are symmetric dampers for installation in walls of the two fire zones and have fire resistance rating of 120 minutes (EI 120).

CONSTRUCTION

Materials

- Frame: galvanized steel sheet, thickness: 1.15 mm
- Insulation for frame and blade: 2 layers of MgSO₄ board (950 kg/m³), thickness 10mm and 1 layer of MgO (380kg/m³), thickness 38mm
- Blade stopper: steel sheet, thickness 1.15mm
- Axle : steel CT45, hexagon bar, CNC lathe, D20
- Bearing: 204
- Crank arm: steel plate, thickness 5mm
- Sealing : Hilti CP606 glue
- Blade seal: Hilti FS one Max intumescent firestop sealant

Dimensions

- **Single sectionle: Max.=1200 (W) x 800 (H) x 600 (L) [mm]**

Construction

- 1 side TDC 32 flange and 1 side V40 flange. Frame bars are jointed with M8 bolts.
- Balde: one flat blade of 1 layer of MgO 38mm board and 2 layers of MgSO₄ 10mm board.

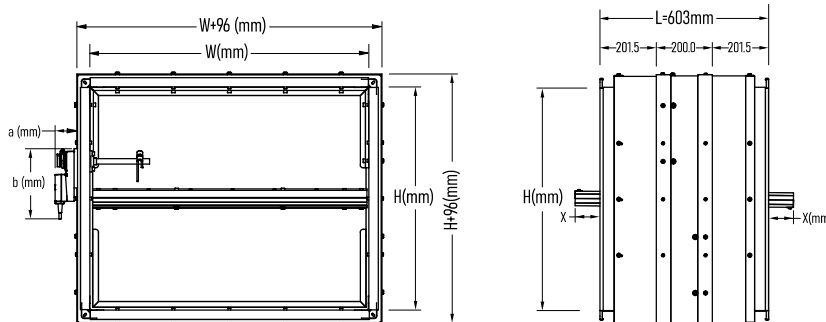
Class

- EI 120 (2 hrs).

Actuating mechanism

- BELIMO FSLF(-S) UI555 actuator, close time 15s (see p.32)
- Motor laying on one side of wall

Single section damper



Actuated by signals
BELIMO actuator
FSLF24(-S)
FSLF230(-S)
Common open
Close time 15s

- Standard step for calculation: **50mm**
- Max. and Min. dimensions of single section damper (mm):
250 x 250 ≤ W x H ≤ 1200 x 800
- Overall dimensions (mm): **[W+96] x [H+96]**
- Dimensions by Depth x Height of the actuator (mm) **a x b**
- Prostrusion over damper face of the blade [X] in relation with the height [H]:
 - **H=600 → x=0** ▪ **H=650 → x=25** ▪ **H=700 → x=50**
 - **H=750 → x=75** ▪ **H=800 → x=100**

Certification of inspection for insulated fire damper [Ei] W1200xH800xL600

Mẫu số PC29

**BỘ CÔNG AN
CỤC CẢNH SÁT PCCC VÀ CNCH****CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc**

Số:.....4420...../KB-PCCC-P7

**GIẤY CHỨNG NHẬN
KIỂM ĐỊNH PHƯƠNG TIỆN PHÒNG CHÁY VÀ CHỮA CHÁY**

Căn cứ Nghị định số 136/2020/NĐ-CP ngày 24/11/2020 của Chính phủ quy định chi tiết một số điều và biện pháp thi hành của Luật Phòng cháy và chữa cháy và Luật sửa đổi, bổ sung một số điều của Luật Phòng cháy và chữa cháy;

Xét đề nghị của: Công ty Cổ phần đầu tư công nghệ Ngôi Sao Châu Á về việc cấp giấy chứng nhận kiểm định phương tiện phòng cháy và chữa cháy tại văn bản số: 2408/2022 ngày 24 tháng 08 năm 2022;

Căn cứ kết quả kiểm định về phòng cháy và chữa cháy đối với phương tiện/lô phương tiện tại biên bản kiểm định ngày 24 tháng 08 năm 2022 của Trung tâm tư vấn và chuyển giao công nghệ PCCC và CNCH – Cục cảnh sát PCCC và CNCH

**CỤC CẢNH SÁT PHÒNG CHÁY, CHỮA CHÁY VÀ CỨU NẠN, CỨU HỘ
CHỨNG NHẬN:**

Mẫu phương tiện: Phòng cháy, chữa cháy ghi tại trang 2 - 9 của: Công ty Cổ phần đầu tư công nghệ Ngôi Sao Châu Á, địa chỉ: Tầng 3 Trung tâm thương mại Interserco, 17 Phạm Hùng, phường Mỹ Đình 1, quận Nam Từ Liêm, Thành phố Hà Nội

Tại thời điểm kiểm định, số phương tiện này có các thông số kỹ thuật phù hợp với các quy định về phòng cháy và chữa cháy và được phép sử dụng trong lĩnh vực phòng cháy và chữa cháy./

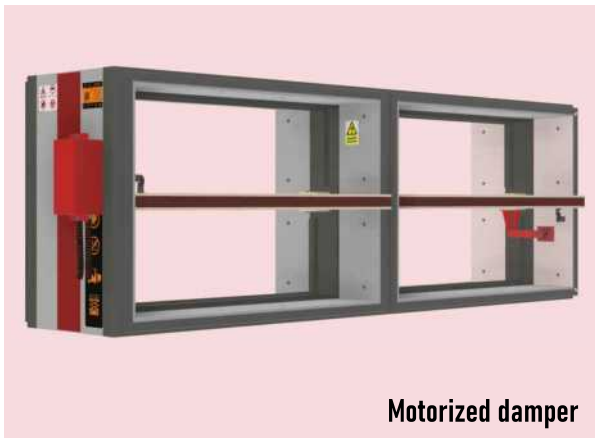
Nơi nhận:

- Công ty Cổ phần DTCN Ngôi Sao Châu Á;
- Trung tâm TV và CGCN PCCC và CNCH;
- Phòng CS PCCC và CNCH - CA các địa phương;
- Lưu: VT, P7(N.T.H);

Hà Nội, ngày 27 tháng 10 năm 2022**KT. CỤC TRƯỞNG
PHÓ CỤC TRƯỞNG**
(Ký, ghi rõ họ tên và đóng dấu)**Đại tá Bùi Quang Việt**

INSULATED MOTORIZED FIRE DAMPER [EI 120]

S-MFSD : W2000 x H1000 x L600



DESCRIPTION

Starduct fire damper S-MFSD is a fire fighting equipment for preventing fire, smoke and temperature spreading in HVAC systems that can remain in operation during fires.

S-MFSD dampers has been matched requirements of test as regulated in the National Technical Regulation to Fire Fighting and Prevention Equipments (QCVN 032021/BCA) and have fire resistance rating of 120 minutes (Ei120) with the certificate of representative sample inspection as per the Decree 136/2020/NĐ-CP,

In addition to fire fighting and protection regulations, S-MFSD dampers are also produced according to requirements of HVAC industry standards such as Smacna, AMCA...

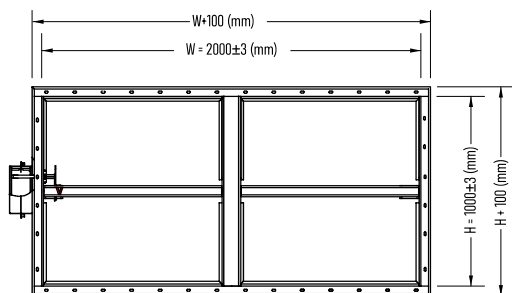
Type: S-MFSD models are symmetric dampers for installation in walls of the two fire zones and have fire resistance rating of 120 minutes (EI 120).

CONSTRUCTION

Materials

- Frame: galvanized steel sheet, thickness: 1.15 mm
- Insulation for frame and blade: 2 layers of MgSO₄ board (950 kg/m³), thickness 10mm and 1 layer of MgO (380kg/m³), thickness 38mm
- Blade stopper: steel sheet, thickness 1.15mm
- Axle : steel CT45, hexagon bar, CNC lathe, D20
- Bearing: 204
- Crank arm: steel plate, thickness 5mm
- Sealing : Hilti CP606 glue
- Blade seal: Hilti FS one Max intumescent firestop sealant

Single section damper



- Standard step for calculation:

50mm

- Max. and Min. dimensions of single section damper (mm):
1200 x 800 ≤ W x H ≤ 2000 x 1000
- Overall dimensions (mm): **[W+100 x [H+100]**
- Dimensions by Depth x Height of the actuator (mm) **a x b**
- Prostrusion over damper face of the blade [X] in relation with the height [H]:
 - **H=600 → x=0** ▪ **H=650 → x=25** ▪ **H=700 → x=50**
 - **H=750 → x=75** ▪ **H=1000 → x= 200**

Dimensions

- **Single section: Max.=2000 (W) x 1000 (H) x 600 (L) [mm]**

Construction

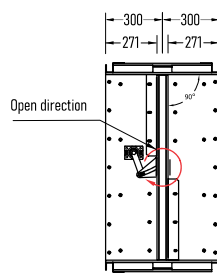
- Frame bars are jointed with M8 bolts, 2-side V40 flange
- Balde: one flat blade of 1 layer of MgO 38mm board and 2 layers of MgSO₄ 10mm board.

Class

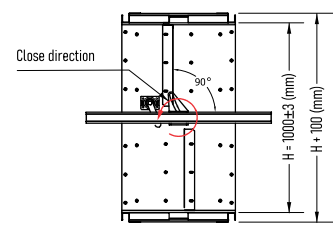
- EI 120 (2 hrs).

Actuating mechanism

- BELIMO FSNF(-S) UL555 actuator, close time 15s (see p. 32)
- Motor laying on one side of wall



SECTION N-N CLOSED BLADE
SCALE 1/12



SECTION M-M OPEN BLADE
SCALE 1/12

BELIMO



Actuated by signals
BELIMO actuator
FSNF24V (AC/DC)-(S)
Common open
Close time 15s

Certification of inspection for insulated fire damper [Ei] W2000xH1000xL600

Mẫu số PC29

**BỘ CÔNG AN
CỤC CẢNH SÁT PCCC VÀ CNCH****CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc**

Số:.....897...../KD-PCCC-P7

**GIẤY CHỨNG NHẬN
KIỂM ĐỊNH PHƯƠNG TIỆN PHÒNG CHÁY VÀ CHỮA CHÁY**

Căn cứ Nghị định số 136/2020/NĐ-CP ngày 24/11/2020 của Chính phủ quy định chi tiết một số điều và biện pháp thi hành của Luật Phòng cháy và chữa cháy và Luật sửa đổi, bổ sung một số điều của Luật Phòng cháy và chữa cháy;

Xét đề nghị của: Công ty Cổ phần ĐTCN Ngôi Sao Châu Á
về việc cấp giấy chứng nhận kiểm định phương tiện phòng cháy và chữa cháy tại
văn bản số: 02/2022 ngày 25 tháng 11 năm 2022;

Căn cứ kết quả kiểm định về phòng cháy và chữa cháy đối với phương tiện/
lô phương tiện tại biên bản kiểm định ngày 25 tháng 11 năm 2022 của
Trung tâm tư vấn và chuyển giao công nghệ PCCC và CNCH – Cục cảnh sát
PCCC và CNCH

**CỤC CẢNH SÁT PHÒNG CHÁY, CHỮA CHÁY VÀ CỨU NẠN, CỨU HỘ
CHỨNG NHẬN:**

Mẫu phương tiện: Phòng cháy, chữa cháy ghi tại trang 2 - 11
của: Công ty Cổ phần ĐTCN Ngôi Sao Châu Á, địa chỉ: Nhà số 16, tổ dân phố 12
phố Nhân Mỹ, phường Mỹ Đình 1, quận Nam Từ Liêm, Thành phố Hà Nội

Tại thời điểm kiểm định, số phương tiện này có các thông số kỹ thuật phù hợp với các quy định về phòng cháy và chữa cháy và được phép sử dụng trong lĩnh vực phòng cháy và chữa cháy./.

Nơi nhận:

- Công ty Cổ phần ĐTCN Ngôi Sao Châu Á;
- Phòng CS PCCC và CNCH - CA các địa phương;
- Lưu: VT, P7(N.T.H);

Hà Nội, ngày 06... tháng 03... năm 2023**KT. CỤC TRƯỞNG
PHÓ CỤC TRƯỞNG**

ghi rõ họ tên và đóng dấu)

**Đại tá Bùi Quang Việt**

MULTI-SECTION INSULATED MOTORIZED FIRE DAMPER [EI 90]

S-MFSD : W2480 x H1680 x L600



Motorized damper

DESCRIPTION

Starduct fire damper S-MFSD is a fire fighting equipment for preventing fire, smoke and temperature spreading in HVAC systems that can remain in operation during fires.

S-MFSD dampers has been matched requirements of test as regulated in the National Technical Regulation to Fire Fighting and Prevention Equipments (QCVN 03 2021/BCA) and have fire resistance rating of 90 minutes (Ei120) with the certificate of representative sample inspection as per the Decree 136/2020/NĐ-CP.

In addition to fire fighting and protection regulations, S-MFSD dampers are also produced according to requirements of HVAC industry standards such as Smacna, AMCA...

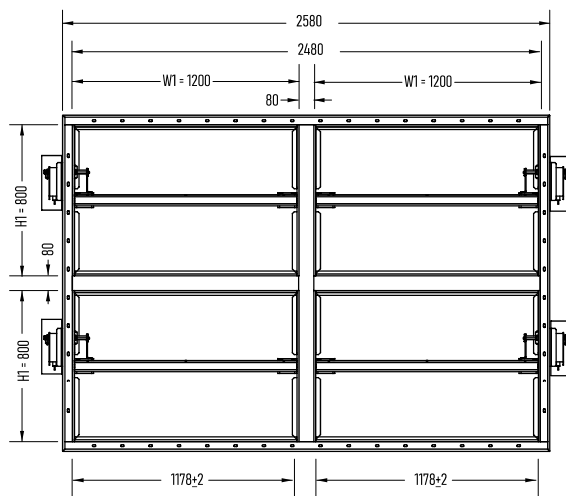
Type: S-MFSD models are symmetric dampers for installation in walls of the two fire zones and have fire resistance rating of 90 minutes (EI 90).

CONSTRUCTION

Materials

- Frame: galvanized steel sheet, thickness: 1.15 mm
- Insulation for frame and blade: 2 layers of MgSO₄ board (950 kg/m³), thickness 10mm and 1 layer of MgO (380kg/m³), thickness 38mm
- Blade stopper: steel sheet, thickness 1.15mm
- Axle : steel CT45, hexagon bar, CNC lathe, D20
- Bearing: 204
- Crank arm: steel plate, thickness 5mm
- Sealing : Hilti Cp606 glue
- Blade seal: Hilti FS one Max intumescent firestop sealant

Multi-section damper



- Standard step for calculation: **50mm**
- Applicable dimensions (mm):
2000 x 1000 ≤ W x H ≤ 2480 x 1680
- Overall dimensions (mm): **[W+180 x [H+180]**
- Dimensions by Depth x Height of the actuator (mm) **a x b**

Dimensions

- **Multi-section = 2480 (W) x 1680 (H) x 600 (L) [mm]**

Construction

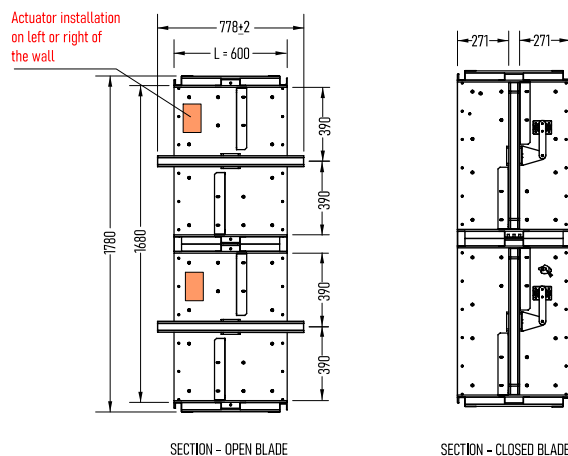
- 2-side V40 flange. Frame bars are jointed with M8 bolts.
- Balde: one flat blade of 1 layer of MgO 38mm board and 2 layers of MgSO₄ 10mm board.

Class

- EI 90 (1.5 hrs).

Actuating mechanism

- BELIMO FSNF(-S) UL555 actuator, close time 15s (see p. 32)
- Motor laying on one side of wall



Note: contact us for download link the copy of material certificate

Certification of inspection for multi-section insulated fire damper [Ei]

Mẫu số PC29

**BỘ CÔNG AN
CỤC CẢNH SÁT PCCC VÀ CNCH****CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc**

Số:.....945...../KD-PCCC-P7

**GIẤY CHỨNG NHẬN
KIỂM ĐỊNH PHƯƠNG TIỆN PHÒNG CHÁY VÀ CHỮA CHÁY**

Căn cứ Nghị định số 136/2020/NĐ-CP ngày 24/11/2020 của Chính phủ quy định chi tiết một số điều và biện pháp thi hành của Luật Phòng cháy và chữa cháy và Luật sửa đổi, bổ sung một số điều của Luật Phòng cháy và chữa cháy;

Xét đề nghị của: Công ty Cổ phần ĐTCN Ngôi Sao Châu Á
về việc cấp giấy chứng nhận kiểm định phương tiện phòng cháy và chữa cháy tại văn bản số: 090123/NSCA ngày 09 tháng 01 năm 2022;

Căn cứ kết quả kiểm định về phòng cháy và chữa cháy đối với phương tiện/lô phương tiện tại biên bản kiểm định ngày 09 tháng 01 năm 2022 của Trung tâm tư vấn và chuyển giao công nghệ PCCC và CNCH – Cục cảnh sát PCCC và CNCH

**CỤC CẢNH SÁT PHÒNG CHÁY, CHỮA CHÁY VÀ CỨU NẠN, CỨU HỘ
CHỨNG NHẬN:**

Mẫu phương tiện: Phòng cháy, chữa cháy ghi tại trang 2 - 11
của: Công ty Cổ phần ĐTCN Ngôi Sao Châu Á, địa chỉ: Nhà số 16, tổ dân phố 12 phố Nhân Mỹ, phường Mỹ Đình 1, quận Nam Từ Liêm, Thành phố Hà Nội

Tại thời điểm kiểm định, số phương tiện này có các thông số kỹ thuật phù hợp với các quy định về phòng cháy và chữa cháy và được phép sử dụng trong lĩnh vực phòng cháy và chữa cháy.

Nơi nhận:

- Công ty Cổ phần ĐTCN Ngôi Sao Châu Á;
- Phòng CS PCCC và CNCH - CA các địa phương;
- Lưu: VT, P7(N.T.H);

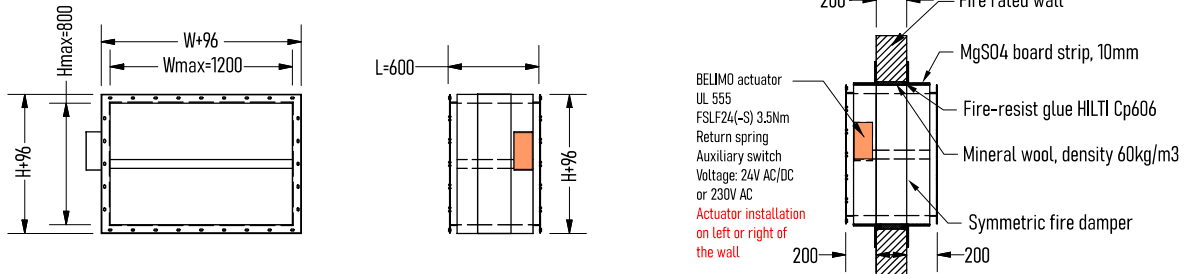
Hà Nội, ngày 08 tháng 03 năm 2023**KT. CỤC TRƯỞNG
PHÓ CỤC TRƯỞNG**

(Ký, ghi rõ họ tên và đóng dấu)

**Đại tá Bùi Quang Việt**

INSTALLATION OF INSULATED FIRE DAMPER [EI] S-MFSD-L600

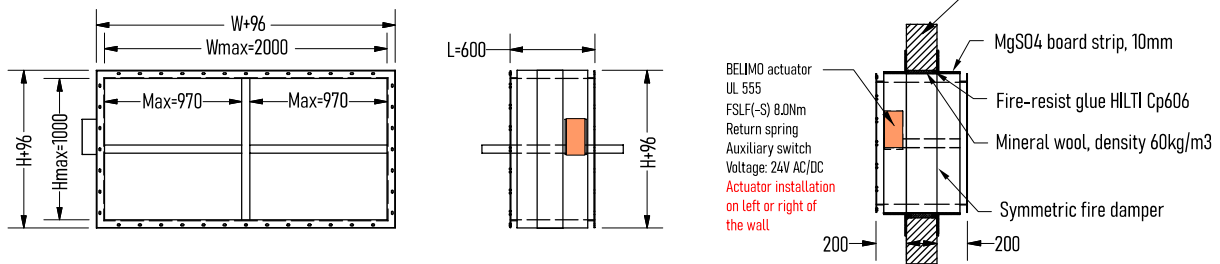
Dimensions range $W < 1200 \times H < 800$



Installation guide EI damper - 1 side TDC flange and 1 side V40 flange

- Minimum distances between damper sides and ceiling/beam should be 75mm. Opening size: $(W+150) \times (H+150)$
- Insert mineral wool (60kg/m³) into the gap along the perimeter of the damper
- Caulk Hilti Cp606 glue in the inside and outside of damper perimeter for both sides of wall
- Install the MgSO₄ board strip over the above gap (along damper perimeter) for both sides of wall
- Check inside the damper and remove all foreign objects (if any)
- Check by running open/close to ensure smooth operation of the damper

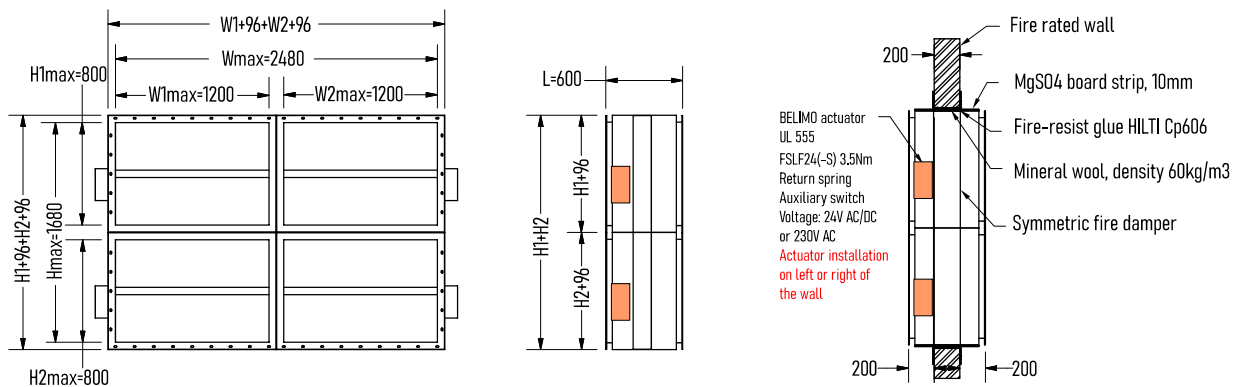
Dimensions range $(1200 < W \leq 2000) \times (800 < H \leq 1000)$



Installation guide EI motorized damper - 2-side V40 flange

- Minimum distances between damper sides and ceiling/beam should be 75mm. Opening size: $(W+150) \times (H+150)$
- Insert mineral wool into (60kg/m³) the gap along the perimeter of the damper
- Caulk Hilti Cp606 glue in the inside and outside of damper perimeter for both sides of wall
- Install the MgSO₄ board strip over the above gap (along damper perimeter) for both sides of wall
- Check inside the damper and remove all foreign objects (if any)
- Check by running open/close to ensure smooth operation of the damper

Dimensions range $(W > 2000) \times (1000 < H \leq 1600)$

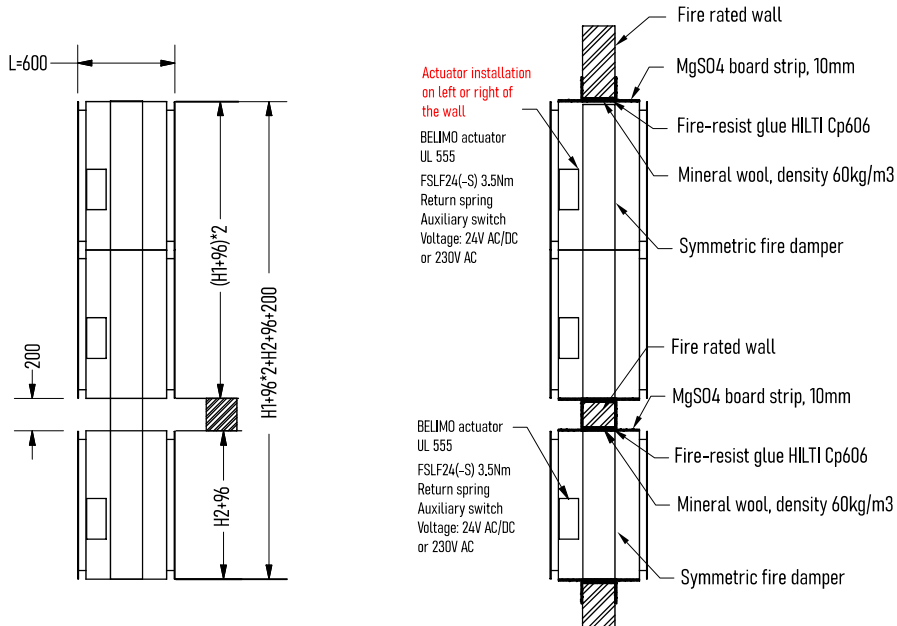
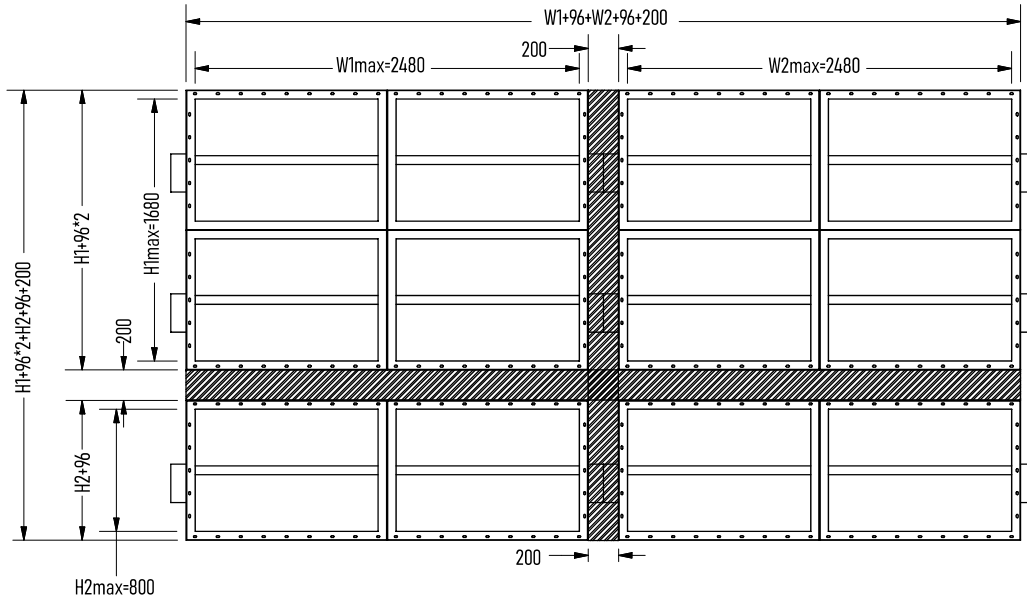


Installation guide EI motorized damper - 2-side V40 flange

- Minimum distances between damper sides and ceiling/beam should be 75mm. Opening size: $(W+150) \times (H+150)$
- Insert mineral wool into (60kg/m³) the gap along the perimeter of the damper
- Caulk Hilti Cp606 glue in the inside and outside of damper perimeter for both sides of wall
- Install the MgSO₄ board strip over the above gap (along damper perimeter) for both sides of wall
- Check inside the damper and remove all foreign objects (if any)
- Check by running open/close to ensure smooth operation of the damper

EXTENDED INSTALLATION OF INSULATED FIRE DAMPER [EI] S-MFSD-L600

Dimensions range ($W > 2400$) x ($H > 1600$) divided by assemblies of $W_{max} 2480$ x $H_{max} 1680$ (mm)



Installation guide EI damper - 2-side V40 flange

- Minimum distances between damper sides and ceiling/beam should be 75mm. Opening size: $(W+150) \times (H+150)$
- Each multi-section damper installed in a separate opening, spacing 200mm
- Insert mineral wool into (60kg/m³) the gap along the perimeter of the damper
- Caulk Hilti Cp606 glue in the inside and outside of damper perimeter for both sides of wall
- Install the MgSO₄ board strip over the above gap (along damper perimeter) for both sides of wall
- Check inside the damper and remove all foreign objects (if any)
- Check by running open/close to ensure smooth operation of the damper

INSULATED MOTORIZED FIRE DAMPER (L210mm)[EI 60]

S-MFSD-L210 : W1200 x H800 X L210



DESCRIPTION

Starduct fire damper S-MFSD is a fire fighting equipment for preventing fire, smoke and temperature spreading in HVAC systems that can remain in operation during fires.

S-MFSD dampers has been matched requirements of test as regulated in the National Technical Regulation to Fire Fighting and Prevention Equipments (QCVN 032021/BCA) and have fire resistance rating of 60 minutes (Ei60) with the certificate of representative sample inspection as per the Decree 136/2020/NĐ-CP,

In addition to fire fighting and protection regulations, S-MFSD dampers are also produced according to requirements of HVAC industry standards such as Smacna, AMCA...

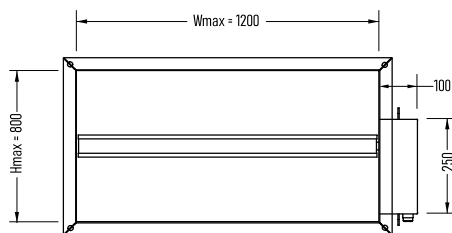
Type: S-MFSD models are symmetric dampers for installation in walls in fire zones and have fire resistance rating of 60 minutes (EI 60).

CONSTRUCTION

Materials

- Frame: galvanized steel sheet, thickness: 1.15 mm
- Insulation for frame and blade: 2 layers of MgSO₄ board (950 kg/m³), thickness 10mm and 1 layer of MgO (380kg/m³), thickness 38mm
- Blade stopper: steel sheet, thickness 1.15mm
- Axle : steel Ct45, hexagon bar, CNC lathe, D20
- Bearing: 204
- Sealing : Hilti Cp606 glue
- Blade seal: Hilti FS one Max intumescent firestop sealant

Details of a single module



- Standard step for calculation: **50mm**
- Max. and Min. dimensions of single section damper (mm):
250 x 250 ≤ W x H ≤ 1200 x 800
- Overall dimensions (mm): **[W+96] x [H+96]**
- Dimensions by Depth x Height of the actuator (mm) **a x b**
- Prostrusion over damper face of the blade [X] in relation with the height [H]:
 - **H=600 → x=200** ▪ **H=650 → x=225** ▪ **H=700 → x=250**
 - **H=750 → x=275** ▪ **H=800 → x= 300**

Dimensions

- **Max. Dim. module = 1200 (W) x 800 (H) x 210 (L) [mm]**

Construction

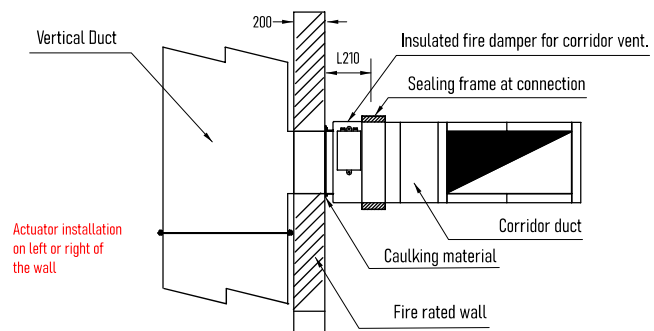
- Frame bars are jointed with M8 bolts. 2-side TDC flange
- Balde: one flat blade of 1 layer of MgO 38mm board and 2 layers of MgSO₄ 10mm board.

Class

- EI 60 (1 hrs).

Actuating mechanism

- BELIMO FSLF(-S) UL555 actuator, close time 15s (see p. 32)
- Motor laying on the damper frame


BELIMO


Standard

Actuated by signals
BELIMO actuator
FSLF24V(AC/DC)-(S)
FSLF230V(AC)-(S)
Common open
Close time 15s

ORDERING CODE

S-MFSD-L210 - WxH - TDC - EI

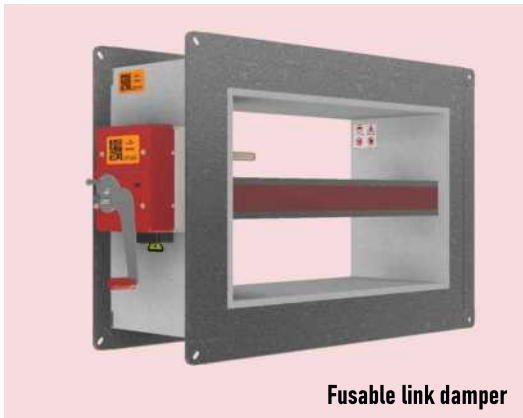
Fire damper (L210mm)

Dim.: Width (W) x Height (H)

EI class: 30/45/60

Flange type: TDC

INSULATED FUSABLE LINK FIRE DAMPER (L210mm)[EI 120] S-FSD-L210 : W1200 x H800 X L210



DESCRIPTION

Starduct fire damper S-FSD is a fire fighting equipment for preventing fire, smoke and temperature spreading in HVAC systems that can remain in operation during fires.

S-MFSD dampers has been matched requirements of test as regulated in the National Technical Regulation to Fire Fighting and Prevention Equipments (QCVN Q32021/BCA) and have fire resistance rating of 60 minutes (Ei60) with the certificate of representative sample inspection as per the Decree 136/2020/NĐ-CP,

Starduct S-FSD is a new generation fusible link insulated fire damper. Fusible link with torque spring is a protected invention of Star Asia Jsc. The product has some features those help better controlling inspection and "blind" points in comparison with existing products.

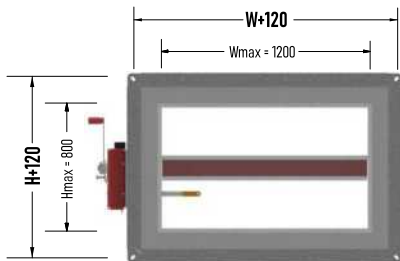
Type: S-FSD models are symmetric dampers for installation on walls in fire zones and have fire resistance rating of 120 minutes (EI120/90/60/45/30).

CONSTRUCTION

Materials

- Frame: galvanized steel sheet, thickness: 1.15 mm + 2 layers of MgSO₄ board (950 kg/m³), thickness 10mm + 1 layer of mineral wool, thickness 40mm, density 220kg/m³
- Blade stopper: 2 layers of steel sheet, thickness 0.75mm + 2 layers of MgSO₄ board (950 kg/m³), thickness 10mm + 1 layer of mineral wool, thickness 40mm, density 220kg/m³
- Blade stopper: steel plate, thickness 1.15mm
- Axle : steel CT45, hexagon bar, CNC lathe, D20
- Bearing: inox 304
- Sealing : Hilti CP606 glue
- Blade seal: Hilti FS one Max intumescent firestop sealant

Details



Dimensions

- **Max. Dim. module = 1200 (W) x 800 (H) x 210 (L) [mm]**

Construction

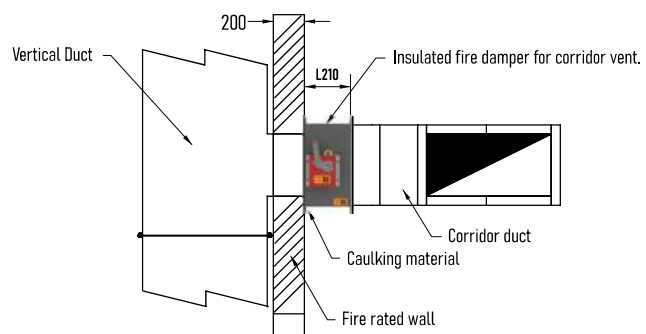
- Frame bars are jointed with M8 bolts. 2-side TDC 32 flange
- Balde: one flat blade

Class

- EI 120 (2 hrs).

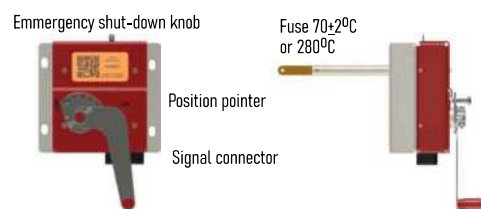
Actuating mechanism

- Fusible link with torque spring
- Insalling on damper frame



- Standard step for calculation: **50mm**
- Max. and Min. dimensions of single section damper (mm):
150 x 150 ≤ W x H ≤ 1200 x 800
- Overall dimensions (mm): **[W+120] x [H+120]**
- Dimensions by Depth x Height of the actuator (mm) **a x b**
- Prostrusion over damper face of the blade [X] in relation with the height [H]:
 - **H=600 → x=200** ▪ **H=650 → x=225** ▪ **H=700 → x=250**
 - **H=750 → x=275** ▪ **H=800 → x= 300**

"5-in-1" actuator with torque spring



ORDERING CODE

S-FSD-L210 - WxH - TDC - EI

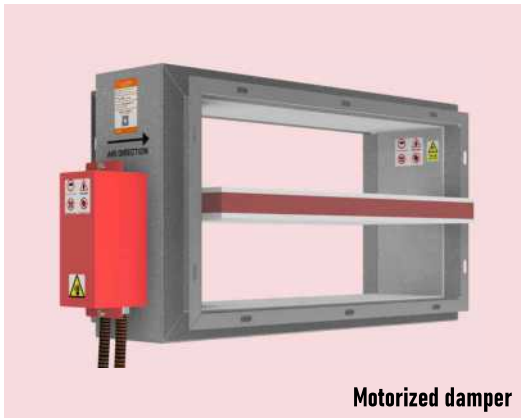
Insulated fire damper (L210mm)

EI class: 30/45/60/90/120

Dim. : Width (W) x Height (H)

Flange type: **TDC**

“3-in-1” INSULATED FIRE DAMPER [EI 60] S-MFSD-L300 : 1200(W) x 800(H)x300(L)



DESCRIPTION

Starduct fire damper S-MFSD-L300 is a fire fighting equipment for preventing fire, smoke and temperature spreading in HVAC systems that can remain in operation during fires. The product has been matched requirements of test as regulated in the National Technical Regulation to Fire Fighting and Prevention Equipments (QCVN 032021/BCA) and have fire resistance rating of 60 minutes (Ei60) with the certificate of representative sample inspection as per the Decree 136/2020/NB-CP,

In addition to fire fighting and protection regulations, S-MFSD dampers are also produced according to requirements of HVAC industry standards such as Smacna, AMCA... Especially, a positioner can be installed to enable the damper working as a combination fire-smoke damper (3-in-1).

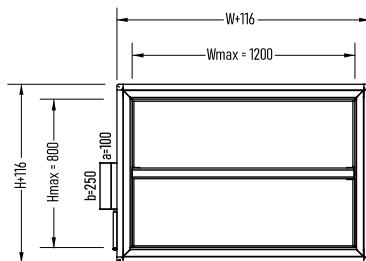
Type: S-MFSD models are symmetric dampers for installation in walls in fire zones and have fire resistance rating of 60 minutes (EI 60).

CONSTRUCTION

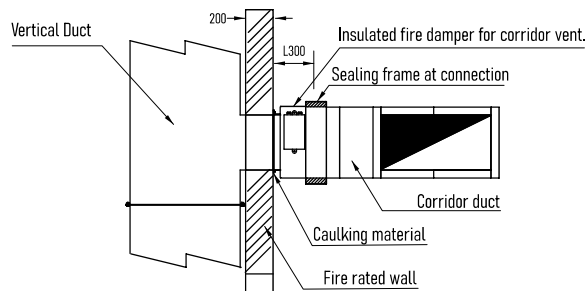
Materials

- Frame: galvanized steel sheet, thickness: 1.15 mm
- Insulation for frame and blade: MgSO₄ board (950 kg/m³), and MgO (380kg/m³)
- Blade stopper: steel sheet, thickness 1.15mm
- Axle : steel CT45, hexagon bar, CNC lathe, D20
- Bearing: 204
- Crank arm: steel plate 5mm
- Sealing : Hilti Cp606 glue
- Blade seal: Hilti FS one Max intumescent firestop sealant

Details



Actuator installation
on left or right of
the wall



Dimensions

- **Max. dim. = 1200 (W) x 800 (H) x 300 (L) [mm]**

Construction

- Frame bars are jointed with M8 bolts, 2-side V40 flange
- Case & Balde: one flat blade of 1 layer of MgO 38mm board and 2 layers of MgSO₄ 10mm board.

Class

- EI 60 (1 hrs).

Actuating mechanism

- BELIMO FSLF-(S) UL-555 actuator, close time 15s (see p. 32)
- Modulating BELIMO actuator

- Standard step for calculation: **50mm**
- Max. and Min. dimensions of single section damper (mm):
250 x 250 ≤ W x H ≤ 1200 x 800
- Overall dimensions (mm): **[W+116] x [H+116]**
- Dimensions by Depth x Height of the actuator (mm) **a x b**
- Prostrusion over damper face of the blade [X] in relation with the height [H]:
 - **H=600 → x=150** ▪ **H=650 → x=175** ▪ **H=700 → x=200**
 - **H=750 → x=225** ▪ **H=800 → x= 250**



Standard

Actuated by signals
BELIMO actuator
FSAF24-SR-(S)
Common open
Close time 15s



Addition opt.

Belimo angle set device
Model : SGA 24
Regulating angle
of blade at 1-9
positions to balance
airstream as a VCD

ORDERING CODE

S-MFSD-L300 - WxH - V40 - EI

Insulated fire damper - L300mm

EI class: 30/45/60

Dim. : Width (W) x Height (H)

Flange type: V40

PROGRAM TO CALCULATE PRESSURE LOSS FOR STARDUCT DAMPERS

Insert input data in the orange cells in the below table, in which :

- V_{duct} is the airstream velocity in duct. Unit: m/s. Design engineer to insert this data.
- Dimensions of damper as per width and height. Unit: mm. Design engineer to insert this data.
- C_o is average pressure drop coefficient of velocity limit 5 to 10m/s, fixed value = 2.75. No need to insert.
- V_{damper} - no need to insert as the program will automatically calculate

CALCULATION PRESSURE LOSS FOR VCD, FD AND OTHERS			
Damper dimensions:	Width (W) mm	Height (H) mm	Cross section (m ²)
	300	300	0.09
V_{duct} (m/s)	5	Q (m ³ /h) :	1,620
Cross section area (m ²)	0.053	Velocity difference factor V_2 (m/s)	12.51
V_{damper} (m/s)	8.54	C_o (5-10 m/s)	2.75
Pressure loss ΔP :		34.39 Pa	

(*) Contact us to get the link of the program

PRESSURE DROP CALCULATION METHOD

EFFECTIVE AREA OF STARDUCT DAMPER (cm²)

H Cao-mm Rõng-mm W	200	300	400	500	600	700	800	900	1000	1100	1200
200	185	315	435	564	685	805	934	1055	1184	1304	1434
300	315	527	731	944	1147	1360	1573	1776	1989	2192	2405
400	463	768	1082	1388	1702	2007	2313	2627	2932	3238	3552
500	592	981	1378	1767	2165	2553	2951	3339	3737	4126	4338
600	722	1193	1674	2155	2627	3108	3589	4061	4542	5023	5495
700	870	1443	2026	2599	3173	3756	4329	4912	5485	6068	6642
800	990	1656	2322	2979	3645	4301	4967	5624	6290	6956	7613
900	1147	1906	2664	3432	4190	4949	5717	6475	7234	8001	8760
1000	1267	2118	2960	3811	4653	5504	6346	7197	8038	8889	9731
1100	1138	2081	3025	3968	4921	5865	6808	7761	8704	9648	10591
1200	1240	2266	3302	4329	5356	6392	7419	8455	9481	10508	11544

$$\Delta P = C_o \times V^2$$

In which:

- C_o is the average pressure drop coefficient of 5-7 and 10m/s velocity, and $C_o = 2.75$
- V^2 (m/s) is the face area velocity going through the damper with

$$V_{\text{damper}} = \frac{Q \text{ (m}^3\text{/s)}}{\text{Effective area (cm}^2\text{)}} \quad V^2 = (V_{\text{damper}} - V_{\text{duct}})^2$$

Note: data of full open damper

Example:

$V_{\text{duct}} = 5$ m/s, Damper size: 300x300mm → effective area 900 cm²


• $Q =$ effective area x duct velocity = 900 x 5 = 4500 (m³/h)

• $V_{\text{damper}} = 4500/527 = 8.53$ (m/s) [527 taken from the size 300x300 in the table]

• $V^2 = (8.53 - 5)^2 = 12.52$ (Pa)

Result: Pressure loss $\Delta P = 2.75 (C_o) \times 12.52 (V^2) = 34.4$ Pa


MARKS AND LABELS - Applied on each damper

<p>Nhà sản xuất : CÔNG TY CPĐTCN NGÔI SAO CHÂU Á Nơi sản xuất : Nhà máy cơ khí Starduct Cụm CN Phùng, Đan Phượng, Hà Nội, Việt Nam Hotline : 0240 3514 7999</p>	→ Manufacturer, made place, address, phone number.
<p>Tên sản phẩm : VAN NGÂN CHÁY KHÔNG CÁCH NHIỆT Mã hiệu : SFD-M Cấp ngăn cháy : E120 Kích thước : W600 x H300 X L210</p>	→ Product name, model, dimensions, fire rate, insulation rate
<p>Số GCN : 1021. Ngày cấp : 13.03.2023 Đơn vị cấp : Cục CS PCCC và CHCN, BCA</p>	→ Number of the applicable certificate, issued date, issued by
<p>Tên dự án : BỆNH VIỆN VIỆT NHẬT Địa chỉ : Số 10 đường ABC, Phường, Quận, Huyện, Tỉnh, Thành phố</p>	→ Name of project, delivery address
<p>Số quản lý : NS-S20-3-1 Ngày sản xuất : 20.03.2023</p>	→ Admin. ref # (Series), Prod. date
	→ QR Code for checking origin, serial number
 Web site : www.starduct.vn	→ Manufacturer Logo, Web address

LIST OF LEGAL DOCUMENTS ACCOMPANYING WITH GOODS FOR A PROJECT

- 1- A copy (notarized) of the certificate of verified sample
- 2- A copy (notarized) of the certificate of verified requirements for production and service
- 3- List of certified models (i.e quantity, sizes and ref. numbers of each damper in the list)
- 4- Installation drawings as per tests.
- 5- Delivery minutes from manufacturer

Warning sign system of Star Asia

	<p>Do Not Drop Không kéo lê, tránh rơi đổ</p>		<p>Do Not Walk or Stand On Không dẫm hoặc đứng lên trên</p>		<p>This Side Up Xếp hướng lên trên</p>
	<p>Dry Storing Bảo quản nơi khô ráo</p>		<p>Store In Warehouse Bảo quản trong kho</p>		<p>Sharp Edge Use Glove Vật có cạnh sắc Đeo găng an toàn khi làm việc</p>
	<p>Handle With Care Nhẹ tay khi dịch chuyển</p>		<p>Use Forklift To Move Chuyển bằng xe nâng</p>		<p>Use Scissor Forklift To Lift Up Nâng lên cao bằng xe nâng chuyên dụng</p>

Control motor: BELIMO spring return actuator

Model code : FSLF24/230(-S)

- AC 24V 50/60Hz, DC 24V* : FSLF24(-S) US or NSA
- AC 230V 50/60Hz : FSLF230(-S) US or NSA

- Meet requirement of UL555(S) when tested as an assembly with suitable dampers
- Torque: 3.5Nm @ 177°C(350°F) for 30 minutes
- Running time: 15s
- Control: Open/Close



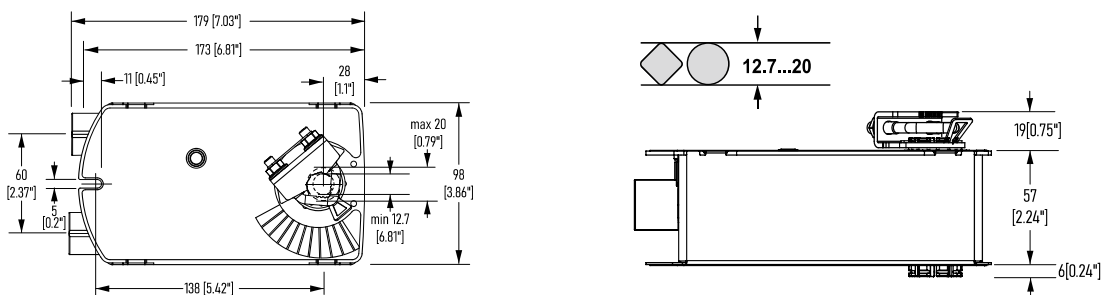
Technical data

Electrical data	Nominal voltage	AC 24V 50/60Hz, DC 24V*
	Nominal voltage range	AC 19.2...26.4V, DC 24...36V*
	Power consumption	15VA @ running / 3.5VA @holding
	For transformer sizing	25VA
Function data	Fusing	1A slow blow
	Connection	- Motor: 1m, 18ga, 2 color coded leads - Auxiliary switch: 1m, 18ga, 4 appliance leads 1/2" conduit connector
	Torque	3.5Nm (0-177°C) @ nominal voltage
	Direction of rotation	Selectable by CW/CCW installation
	Angle of rotation	Max. 95°
	Auxiliary switch	- FSLF24-S: 2 SPST, 1mA@DC5V, 3(0.5)A, 120/250V □ fixed @ 10° ⇐ 85° ⇐
Safety	Running time	- Motor: < 15s at rate voltage and torque - Spring return: < 15s
	Position indicator	Mechanical
	Protection class	Class 2 supply
	Degree of protection	IP30 / NEMA type
	Mode of operation	Type 1.AA.B
	Ambient temperature	- Chế độ thường: 0...+50°C - Chế độ an toàn: 3 open/Close cycle after 1/2hr @ 177°C
	Storage temperature	-40...+80°C
	Humidity test	95% RH, non-condensing
	Maintenance	Maintenance-free
	Dimensions/Weight	Dimensions (L x W x H)
Shaft diameter		12.7 ... 20mm**
Weight		- FSLF24: Approx. 1.6kg - FSF24-S: Approx. 1.7kg
Safety note		AC 24V: connect via safety isolating transformer, class 2 supply

* Filtered and regulated DC 24V power supplies is needed

** For damper spindle Ø16 ... 20mm, use K6-1

Dimensions [mm/inches]



NOTE! Starduct fire dampers are designed compatible with BELIMO actuator - this is the only recommended actuator by NSCA. NSCA will not take any concerning responsibility if other actuators are installed by the users. Contact us for more information

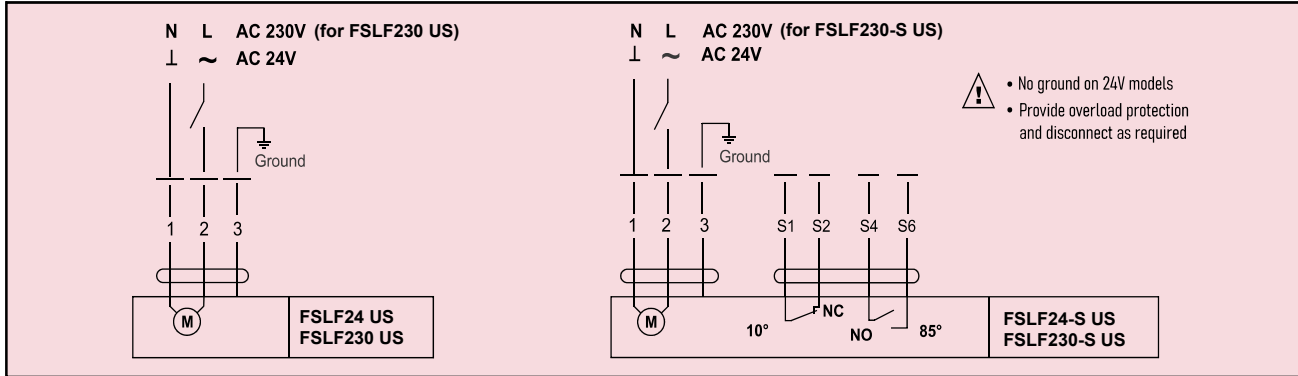
Wiring diagram

Model: FSLF



Note :

- Parallel connection of several actuator is possible
- Power consumption must be observed



Wiring diagram - Model FSLF24/230 (-S) US/NSA

Accessories

BAE165 US	165°F (74°C) electric thermal sensor, SPST, normally closed
S2A-F US	Auxiliary switch, 2xSPDT, 3A (0.5A inductive) @ 250V AC max.

Typical Specification

All smoke and combination fire and smoke dampers shall be provided with Belimo FSTF, FSLF, FSNF, or FSAF actuators. All substitutions must be approved before submission of bid. Damper and actuator shall have UL 555S Listing for 250°F (350°F). Actuator shall have been tested to UL 2043 per requirements of IMC 602.2 and NEC 300.22 (c). Where position indication is required -S models with auxiliary switches or damper blade switches will be provided per code requirements.

Wiring diagrams



Application Notes

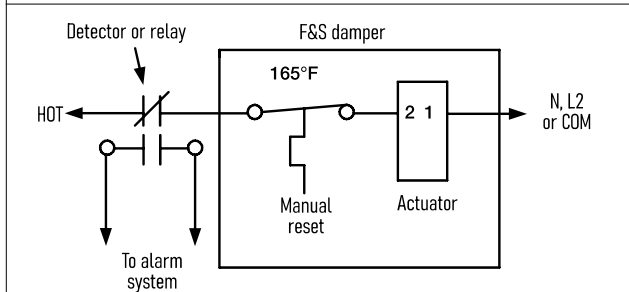
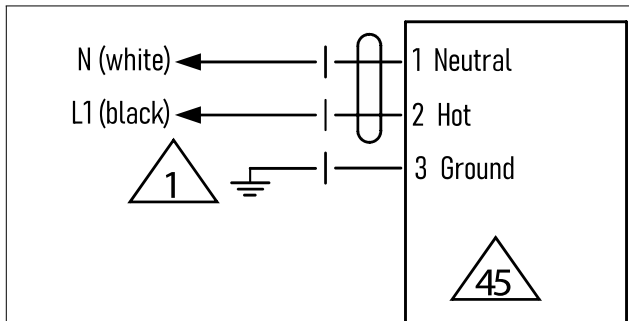
- Provide overload protection and disconnect as required.
- Actuators may be powered in parallel. Power consumption must be observed.
- Ground present on some models.

Typical specification

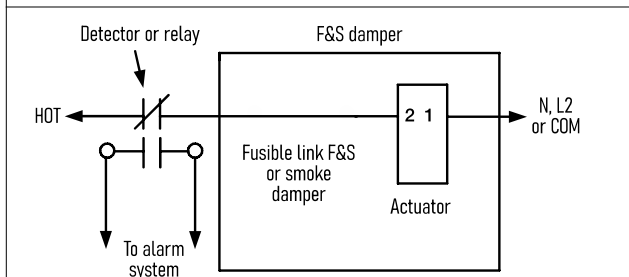
All Staduct EI dampers shall be provided with Belimo FSTF, FSLF, FSNF, FSAF actuators. All substitutions must be approved by NSCA (Star Asia Jsc.) before ordering.

All alternative motors must be UL certificated ones and tested to UL 2043 as requirements of IMC 602.2 và NEC 300.22®

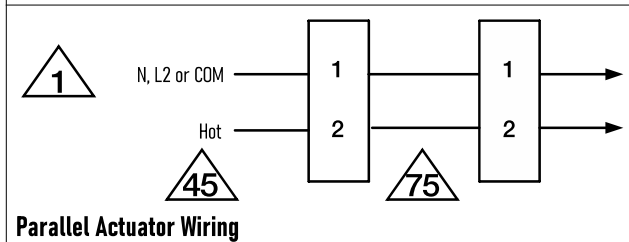
Model -S should be supplied if position indication of blade is required



Typical smoke or fusible link damper wiring



Typical smoke or fusible link damper wiring



Parallel Actuator Wiring

Control motor: BELIMO spring return actuator

Model code : FSNF24/230(-S)

● AC 24V 50/60Hz, DC 24V* : FSNF24(-S) US or NSA

● AC 230V 50/60Hz : FSNF230(-S) US or NSA

- Meet requirement of UL555(S) when tested as an assembly with suitable dampers
- Torque: 8.0Nm @ 177°C(350°F) for 30 minutes
- Running time: 15s
- Control: Open/Close



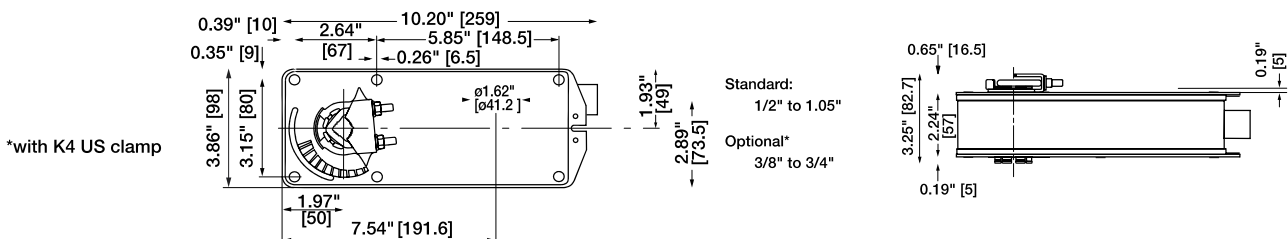
Technical data

Electrical data	Nominal voltage	AC 24V 50/60Hz, DC 24V*		
	Nominal voltage range	AC 19.2...26.4V, DC 24...36V*		
	Power consumption	15VA @ running / 3.5VA @holding		
	For transformer sizing	25VA		
	Fusing	1A slow blow		
	Connection	- Motor	1m, 18ga, 2 color coded leads	
		- Auxiliary switch	1m, 18ga, 4 appliance leads 1/2" conduit connector	
	Function data	Torque	8.0Nm (0-177°C) @ nominal voltage	
Direction of rotation		Selectable by CW/CCW installation		
Angle of rotation		Max. 95°		
Auxiliary switch		- FSNF24-S	2 SPST, 1mA@DC5V, 3(0.5)A, 120/250V □ fixed @ 10° ↖ 85° ↗	
Running time		- Motor	< 15s at rate voltage and torque	
		- Spring return	< 15s	
Position indicator		Mechanical		
Safety	Protection class	Class 2 supply		
	Degree of protection	IP30 / NEMA type		
	Mode of operation	Type 1.A.A.B		
	Ambient temperature	- Chế độ thường	0...+50°C	
- Chế độ an toàn		3 open/Close cycle after 1/2hr @ 177°C		
Storage temperature		-40...+80°C		
Humidity test		95% RH, non-condensing		
Maintenance		Maintenance-free		
Dimensions/Weight	Dimensions (L x W x H)		179 x 98 x 82mm	
	Shaft diameter		12.7 ... 20mm**	
	Weight	- FSNF24		Approx. 1.6kg
		- FSNF24-S		Approx. 1.7kg
Safety note			AC 24V: connect via safety isolating transformer, class 2 supply	

* Filtered and regulated DC 24V power supplies is needed

** For damper spindle Ø16 ... 20mm, use K6-1

Dimensions [mm/inches]

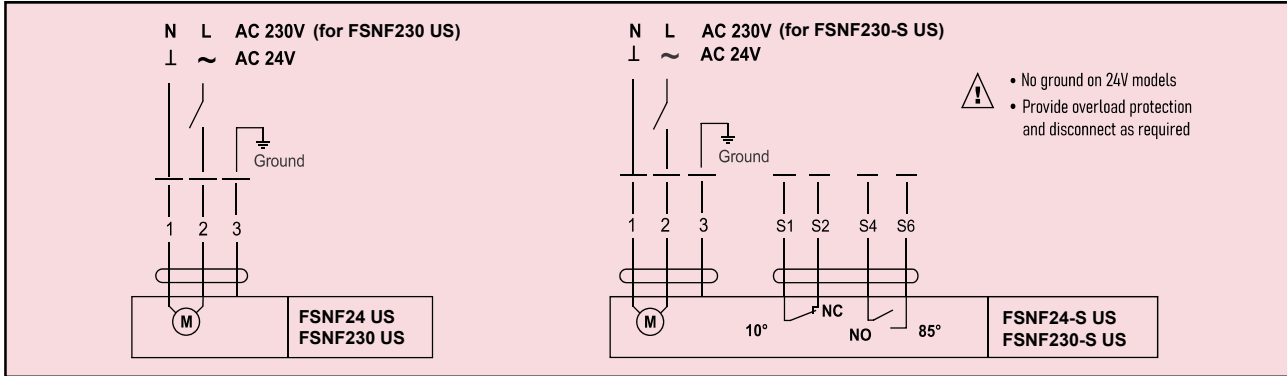


NOTE! Starduct fire dampers are designed compatible with BELIMO actuator - this is the only recommended actuator by NSCA. NSCA will not take any concerning responsibility if other actuators are installed by the users. Contact us for more information

Wiring diagram Model FSNF

Note :

- Parallel connection of several actuator is possible
- Power consumption must be observed



Wiring diagram - Model FSNF24/230 (-S) US/NSA

Accessories

BAE165 US	165°F (74°C) electric thermal sensor, SPST, normally closed
S2A-F US	Auxiliary switch, 2xSPDT, 3A (0.5A inductive) @ 250V AC max.

Typical Specification

All smoke and combination fire and smoke dampers shall be provided with Belimo FSTF, FSLF, FSNF, or FSAF actuators. All substitutions must be approved before submission of bid. Damper and actuator shall have UL 555S Listing for 250°F (350°F). Actuator shall have been tested to UL 2043 per requirements of IMC 602.2 and NEC 300.22 (c). Where position indication is required -S models with auxiliary switches or damper blade switches will be provided per code requirements.

Wiring diagrams



Application Notes

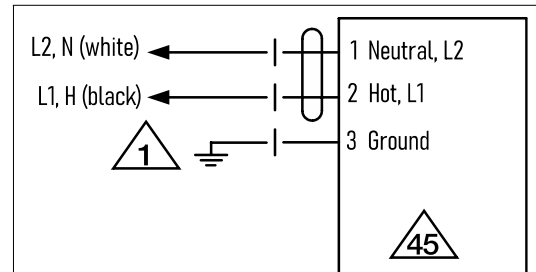
- Provide overload protection and disconnect as required.
- Actuators may be powered in parallel. Power consumption must be observed.
- Ground present on some models.

Typical specification

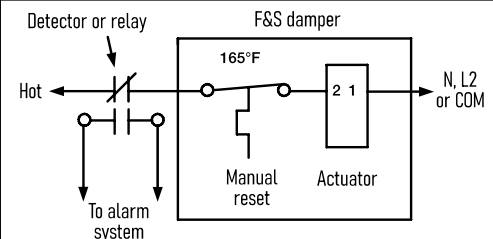
All Staduct EI dampers shall be provided with Belimo FSTF, FSLF, FSNF, FSAF actuators. All substitutions must be approved by NSCA (Star Asia Jsc.) before ordering.

All alternative motors must be UL certificated ones and tested to UL 2043 as requirements of IMC 602.2 và NEC 300.22©

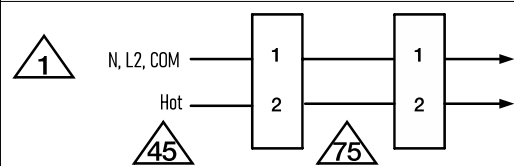
Model -S should be supplied if position indication of blade is required



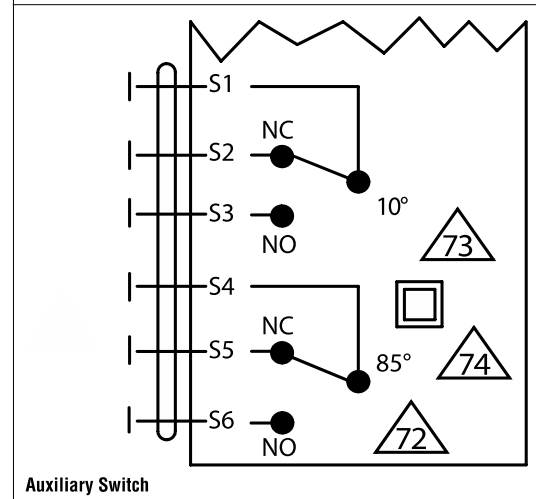
230 VAC



Typical containment damper control wiring



Parallel Actuator Wiring



Auxiliary Switch

Control motor: BELIMO spring return, modulating actuator

Model code : FSAF24-SR-S

● **AC 24V 50/60Hz, DC 24V* : FSAF24-SR-S**

- Meet requirement of UL555(S) when tested as an assembly with suitable dampers
- Torque: 20Nm @ 121°C(250°F) for 30 minutes
- Running time: 20s
- Control: Modulating Open/Close



BELIMO



Made in USA

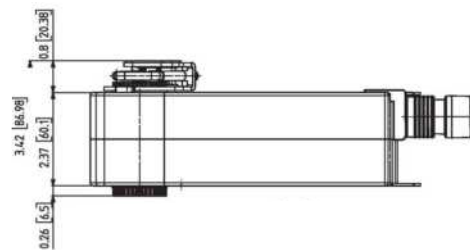
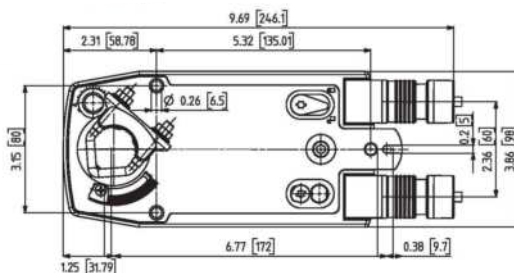
Technical data

Electrical data	Nominal voltage	AC 24V 50/60Hz, DC 24V*
	Nominal voltage range	AC 19.2...28.8V, DC 21.6...28.8V*
	Power consumption	6.5W, 9.5VA/ 3W, 5VA @holding
	For transformer sizing	10VA
Fusing		
Connection	- Motor	1m, 18ga, 2 color coded leads
	- Auxiliary switch	1m, 18ga, 4 appliance leads 1/2" conduit connector
Function data	Torque	20Nm (0-121°C) @ nominal voltage
	Direction of rotation	Selectable by CW/CCW installation
	Angle of rotation	Max. 95°
	Auxiliary switch	2 SPST, 1mA@DC5V, 3(0.5)A, 120/250V □ fixed @ 10° ⇐ 85° ⇐
	Running time	- Motor < 75s at rate voltage and torque - Spring return < 20s
	Position indicator	Mechanical
Safety	Protection class	Class 2 supply
	Degree of protection	IP30 / NEMA type
	Mode of operation	Type 1.AA.B
	Ambient temperature	- Chế độ thường 0...+50°C - Chế độ an toàn 3 open/Close cycle after 1/2hr @ 177°C
	Storage temperature	-40...+80°C
	Humidity test	95% RH, non-condensing
Maintenance	Maintenance-free	
Dimensions/Weight	Dimensions (L x W x H)	246 x 98 x 86.98mm
	Shaft diameter	12.7 ... 20mm**
	Weight	Approx. 2.6kg
Safety note	AC 24V: connect via safety isolating transformer, class 2 supply	

* Filtered and regulated DC 24V power supplies is needed

** For damper spindle Ø16 ... 20mm, use K6-1

Dimensions [mm/inches]

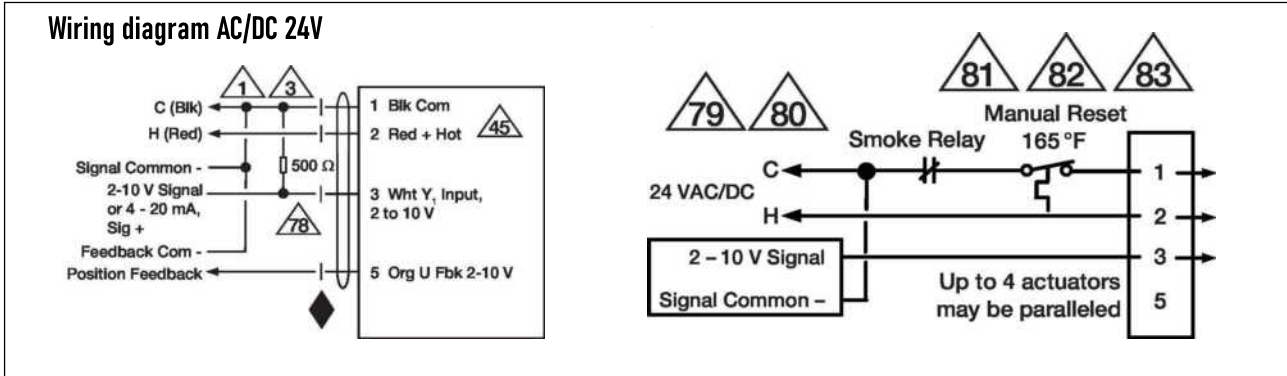


NOTE! Starduct fire dampers are designed compatible with BELIMO actuator – this is the only recommended actuator by NSCA. NSCA will not take any concerning responsibility if other actuators are installed by the users. Contact us for more information

Wiring diagram Model FSAF24-SR-S

Note :

- Parallel connection of several actuator is possible
- Power consumption must be observed



Sơ đồ nối dây series FSAF24-SR-S

Accessories	
BAE165 US	165°F (74°C) electric thermal sensor, SPST, normally closed
S2A-F US	Auxiliary switch, 2xSPDT, 3A (0.5A inductive) @ 250V AC max.

Typical Specification

All smoke and combination fire and smoke dampers shall be provided with Belimo FSTF, FSLF, FSNF, or FSAF actuators. All substitutions must be approved before submission of bid. Damper and actuator shall have UL 555S Listing for 250°F (350°F). Actuator shall have been tested to UL 2043 per requirements of IMC 602.2 and NEC 300.22 (c). Where position indication is required -S models with auxiliary switches or damper blade switches will be provided per code requirements.

Wiring diagrams

Application Notes

- 1 Provide overload protection and disconnect as required.
- 45 Actuators may be powered in parallel. Power consumption must be observed.
- 75 Ground present on some models.

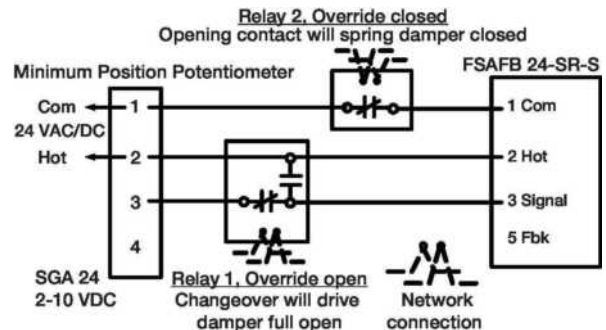
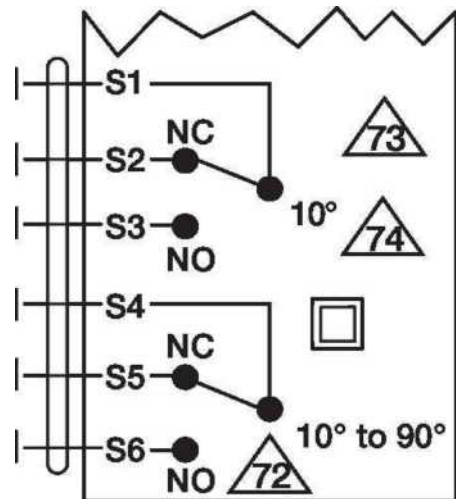
Typical spectification

All Staduct EI dampers shall be provided with Belimo FSTF, FSLF, FSNF, FSAF actuators. All substitutions must be approved by NSCA (Star Asia Jsc.) before ordering.

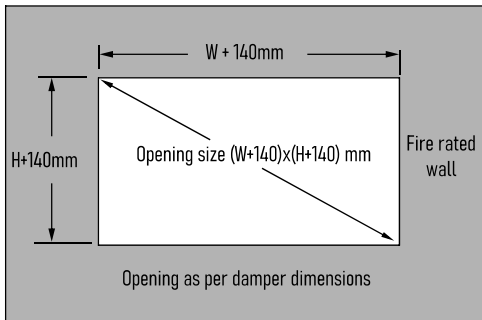
All alternative motors must be UL certificated ones and tested to UL 2043 as requirements of IMC 602.2 và NEC 300.22@

Model -S should be supplied if position indication of blade is required

Auxiliary Switch

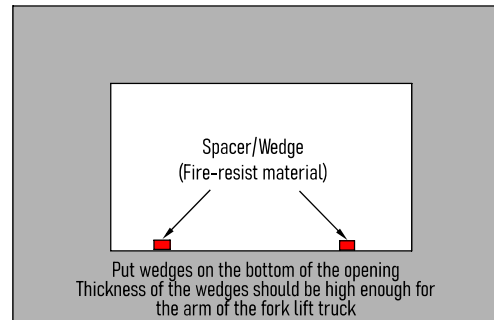


INSTALLATION STEPS - EI DAMPER



OPENING

Method as the descriptions in the test report
Contractors should obey the rules of the QCVN06:2021/BXD



Insert the damper in the opening (by folk lift), balance, level the damper by supporting wedges so that all the gaps between damper sides and hole sides are equal.
Note: the blade **must be closed** during installation



Adjust so that blade shaft laying at center of wall thickness. Space between wall face and flange face should be ~200mm. Fill the gap between damper frame and opening side by mineral wool of 60kg/m³. Check and ensure the evenness and firmness of the damper in the opening. If finding that the blade rotation is unsmooth, re-adjust and re-check. Continue to stuff and press mineral wool into the gap until stable, keep a groove of 20mm deep (from wall face) along the perimeter of the damper



Caulk fire-resist sealant Hilti Cp606 into the perimetric groove on both sides of wall



Smoothen the sealant surface and correct fault (if any). Should be done on both sides of wall



Install the fire-resist board plate on wall face along the perimeter of the damper. This plate is made of MgSO₄, thickness 10mm, density 950kg/m³. Should be done in both sides of wall



After finishing installation and caulking in both sides of wall, check again for open/close function and paste marks and labels. Take safety guards if the damper is not connected to duct yet.

Storage and handling

As fire damper is a safety element, it should be stored and handled with care

Avoid:

- Any kind of impact or damage
- Contact with water
- Deformation of the casing

Recommendations for Star Asia :

- To unload in a dry area
- Not to flip or roll the product to move it
- Not use the damper as a scaffold, working table etc.
- Do not store smaller damper inside large one
- Do not stand or seat on the product



Nhận và bảo quản nơi khô ráo nước



Sử dụng găng bảo hộ khi làm việc



Không dẫm, đạp, trèo, đi trên van



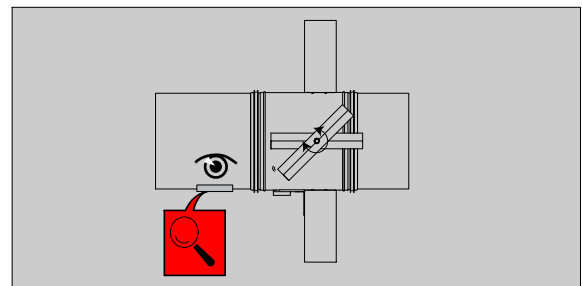
Không thả, lăn, lật lồi, kéo, đẩy, ...

Important notes when installation

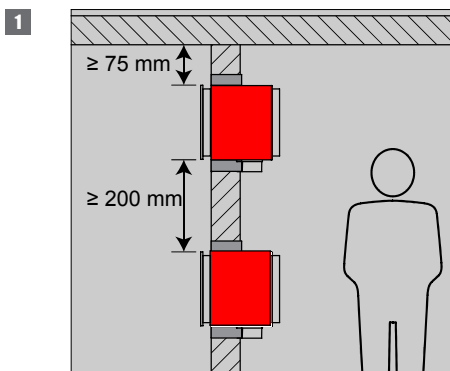
General :

- The installation must comply with the installation manual delivered with the product and the classification report.
- Axis orientation: see the declaration of performance
- Avoid obstruction of adjoining ducts.
- Product installation: always doing with closed damper blade
- Verify if the blade can move freely
- Please observe safety distances with respect to other construction elements. The operating mechanism must also remain accessible: allow for a clearance of 200 mm around the housing.
- The air tightness class will be maintained if the damper is installed according to the installation manual.
- The fire dampers are always tested in standardised constructions according to QCVN 60:2021/BXD. The achieved results are valid for similar supporting constructions with a fire resistance, thickness and density equal or superior to the supporting construction used during the test.
- The damper must remain accessible for inspection and maintenance.
- Schedule at least two running checks each year.

EACH 6 MONTHS	
2021	<input type="checkbox"/> <input type="checkbox"/>
2022	<input type="checkbox"/> <input type="checkbox"/>
2023	<input type="checkbox"/> <input type="checkbox"/>
2024	<input type="checkbox"/> <input type="checkbox"/>
2025	<input type="checkbox"/> <input type="checkbox"/>



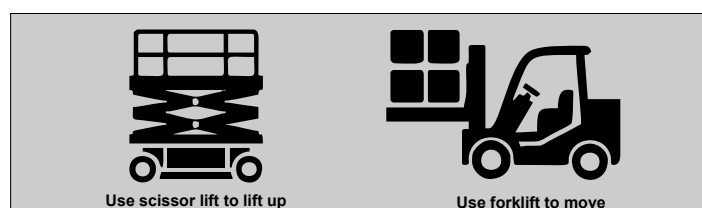
Installation at a minimal distance from another damper or from an adjacent supporting construction



1. Principle according to the test standard:

Minimum distance of ≥ 75 mm from the ceiling

Minimum distance ≥ 200 mm to an adjacent damper



INSULATED FUSEABLE LINKS FIRE DAMPER



Model:
S-FSD

Certification of inspection for fusable-link insulated fire damper [Ei] 1200x800

Mẫu số PC29

**BỘ CÔNG AN
CỤC CẢNH SÁT PCCC VÀ CNCH**
**CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - Tự do - Hạnh phúc**

Số:.....892...../KD-PCCC-P7

**GIẤY CHỨNG NHẬN
KIỂM ĐỊNH PHƯƠNG TIỆN PHÒNG CHÁY VÀ CHỮA CHÁY**

Căn cứ Nghị định số 136/2020/NĐ-CP ngày 24/11/2020 của Chính phủ quy định chi tiết một số điều và biện pháp thi hành của Luật Phòng cháy và chữa cháy và Luật sửa đổi, bổ sung một số điều của Luật Phòng cháy và chữa cháy;

Xét đề nghị của: Công ty Cổ phần ĐTCN Ngôi Sao Châu Á
về việc cấp giấy chứng nhận kiểm định phương tiện phòng cháy và chữa cháy tại văn bản số: 01/2022 ngày 12 tháng 12 năm 2022;

Căn cứ kết quả kiểm định về phòng cháy và chữa cháy đối với phương tiện/lô phương tiện tại biên bản kiểm định ngày 12 tháng 12 năm 2022 của Trung tâm tư vấn và chuyển giao công nghệ PCCC và CNCH – Cục cảnh sát PCCC và CNCH

**CỤC CẢNH SÁT PHÒNG CHÁY, CHỮA CHÁY VÀ CỨU NẠN, CỨU HỘ
CHỨNG NHẬN:**

Mẫu phương tiện: Phòng cháy, chữa cháy ghi tại trang 2 - 10
của: Công ty Cổ phần ĐTCN Ngôi Sao Châu Á, địa chỉ: Nhà số 16, tổ dân phố 12 phố Nhân Mỹ, phường Mỹ Đình 1, quận Nam Từ Liêm, Thành phố Hà Nội

Tại thời điểm kiểm định, số phương tiện này có các thông số kỹ thuật phù hợp với các quy định về phòng cháy và chữa cháy và được phép sử dụng trong lĩnh vực phòng cháy và chữa cháy./p

Nơi nhận:

- Công ty Cổ phần ĐTCN Ngôi Sao Châu Á;
- Phòng CS PCCC và CNCH - CA các địa phương;
- Lưu: VT, P7(N.T.H);

 Hà Nội, ngày 03 tháng 03 năm 2023

**KT. CỤC TRƯỞNG
PHÓ CỤC TRƯỞNG**

(ghi rõ họ tên và đóng dấu)


Đại tá Bùi Quang Việt

INSULATED FIRE DAMPER - Fusable link [EI 90] S-FSD: 1200(W) x 800 (H) x (600L) mm



DESCRIPTION

Starduct fire damper S-FSD is a fire fighting equipment for preventing fire, smoke and temperature spreading in HVAC systems that can remain in operation during fires.

S-FSD dampers has been matched requirements of test as regulated in the National Technical Regulation to Fire Fighting and Prevention Equipments (QCVN 032021/BCA) and have fire resistance rating of 90 minutes (Ei90) with the certificate of representative sample inspection as per the Decree 136/2020/NĐ-CP,

In addition to fire fighting and protection regulations, S-FSD dampers are also produced according to requirements of HVAC industry standards such as Smacna, AMCA...

Type: S-FSD models are symmetric dampers for installation in walls in fire zones and have fire resistance rating of 90 minutes (EI 90).

CONSTRUCTION

Material

- Frame: galvanized steel sheet, thickness ≥ 1.15 mm
- Insulation: MgSO₄ (950 kg/m³) and MgO (380kg/m³) boards
- Balde stopper: 1.15mm steel sheet
- Axle: CT45 steel , D20
- Bearing: SKF 204
- Crank arm: 5mm steel plate
- Sealing: HILTI Cp606
- Blade seal: HILTI intumescent FS-ONE MAX sealant

Size

- Single module: **Max. = 1200 (W) x 800 (H) x 600 (L) [mm]**

Structure

- Frame: bolt joints. 2-side flange V40
- Blale: single, 1 layer of 38mm MgO and 2 layers of 10mm MgSO₄

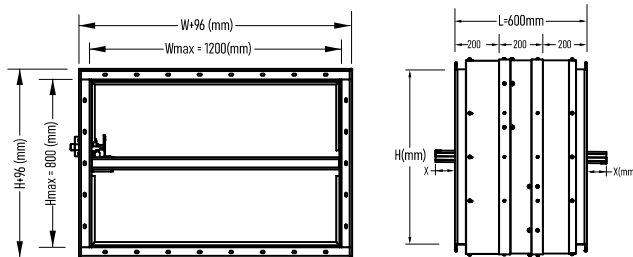
Class

- EI 90 (1.5 hrs).

Actuator

- Fusable link-torsion spring mechanism

Details of a single section damper



- Step (+/-) of dimensions: **50mm**
- Min. & Max of a single section damper (mm):
 $200 \times 200 \leq W \times H \leq 1200 \times 800$
- Overall dimensions (mm)
 $[W+96] \times [H+96]$
- Dimension of actuator (Deepth x height) (mm)
50mm
- Exceeding part of the blade (x)
 - **H=600** → x=0 ▪ **H=650** → x=25 ▪ **H=700** → x=50
 - **H=750** → x=75 ▪ **H=800** → x=100

AN PROTECTED INVENTION OF STARDUCT

Patent Pending
Patent No. 01-2022-03689SC



Blade lifting mechanism



Blade position indicating knob



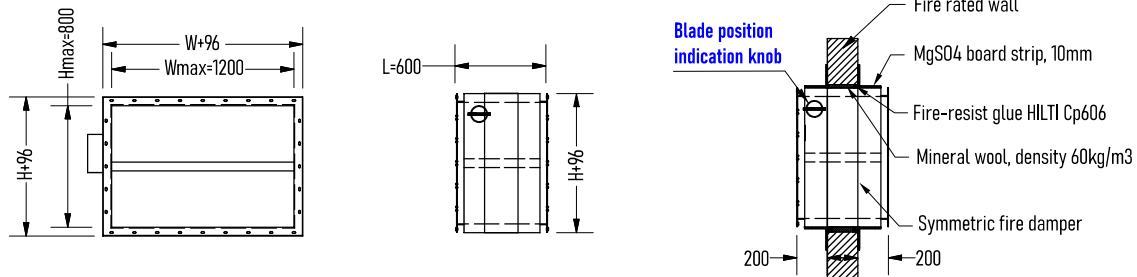
Torsion spring

The fustable link-torsion spring activator for insulated fire damper is a registered INVENTION of Star Asia and protected by Vietnamese Laws (No. 01-2022-03689SC). The mechanism includes a torsion spring being set outside damper section connecting to the crank arm and the position indicator (as a closing knob). The mechnism is for lengthen the spring life span and solve "deadpoints" problem of the existing mechanisms.

Note: contact NSCA for download link of test report of the fuse

INSTALLATION OF FUSABLE LINK INSULATED FIRE DAMPER [EI] S-FSD

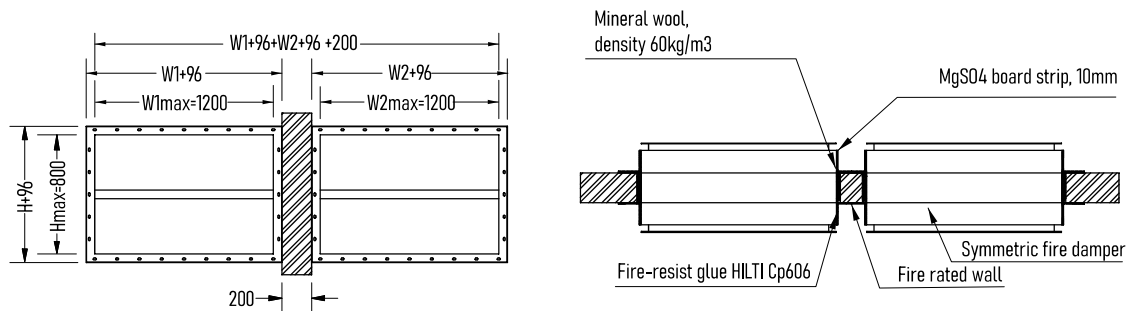
$W \leq 1200 \times H \leq 800$



Installation guide EI damper - 2-side V40 flange

- Minimum distances between damper sides and ceiling/beam should be 75mm. Opening size: $(W+150) \times (H+150)$
- Insert mineral wool (60kg/m³) into the gap along the perimeter of the damper
- Caulk Hilti Cp606 glue in the inside and outside of damper perimeter for both sides of wall
- Install the MgSO₄ board strip over the above gap (along damper perimeter) for both sides of wall
- Check inside the damper and remove all foreign objects (if any)
- Check by running open/close to ensure smooth operation of the damper

Splitting alternative if W is over the dimensions: $W \geq 1200 \times H \leq 800$



Installation guide EI damper - 2-side V40 flange

- Minimum distances between damper sides and ceiling/beam should be 75mm. Opening size: $(W+150) \times (H+150)$
- Distance between the two openings is 200mm
- Insert mineral wool (60kg/m³) into the gap along the perimeter of the damper
- Caulk Hilti Cp606 glue in the inside and outside of damper perimeter for both sides of wall
- Install the MgSO₄ board strip over the above gap (along damper perimeter) for both sides of wall
- Check inside the damper and remove all foreign objects (if any)
- Check by running open/close to ensure smooth operation of the damper

ORDERING CODE

S-FSD - WxH - V40 - EI

Insulated fire damper - fusable link

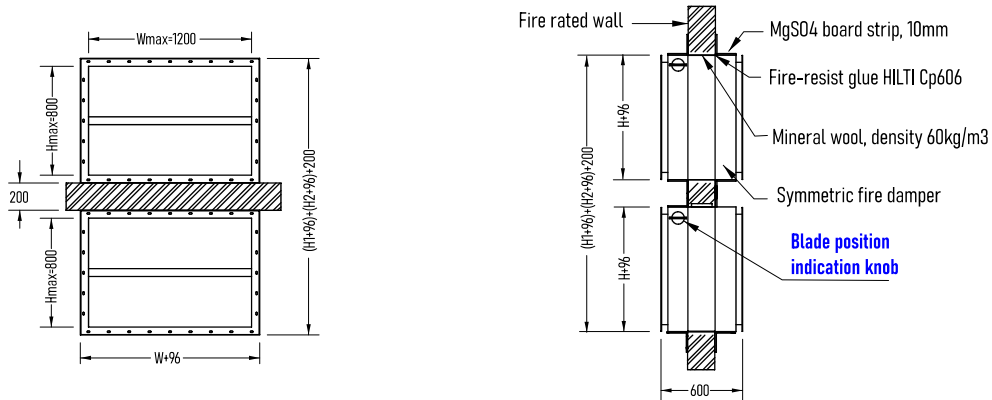
EI class: 30/45/60/90

Dim. : Width (W) x Height (H)

Flange: V40

INSTALLATION OF FUSABLE LINK INSULATED FIRE DAMPER [EI] S-FSD

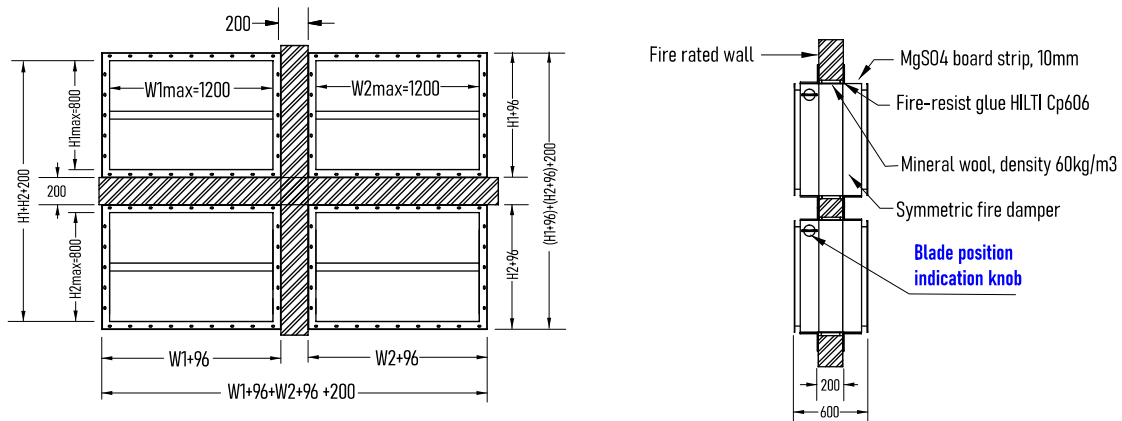
Splitting alternative if W is over the dimensions : $W \leq 1200 \times H > 800$



Installation guide EI damper - 2-side V40 flange

- Minimum distances between damper sides and ceiling/beam should be 75mm. Opening size: $(W+150) \times (H+150)$
- Distance between the two openings is 200mm
- Insert mineral wool (60kg/m³) into the gap along the perimeter of the damper
- Caulk Hilti Cp606 glue in the inside and outside of damper perimeter for both sides of wall
- Install the MgSO₄ board strip over the above gap (along damper perimeter) for both sides of wall
- Check inside the damper and remove all foreign objects (if any)
- Check by running open/close to ensure smooth operation of the damper

Splitting alternative if W & H are over the dimensions : $W > 1200 \times H > 800$



Installation guide EI damper - 2-side V40 flange

- Minimum distances between damper sides and ceiling/beam should be 75mm. Opening size: $(W+150) \times (H+150)$
- Distance between the two openings is 200mm
- Insert mineral wool (60kg/m³) into the gap along the perimeter of the damper
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- Check by running open/close to ensure smooth operation of the damper

ORDERING CODE

S-FSD - WxH - V40 - EI

Insulated fire damper

Dim. : Width (W) x Height (H)

EI class: 30/45/60/90

Flange: V40

PROGRAM TO CALCULATE PRESSURE LOSS FOR STARDUCT DAMPERS

Insert input data in the orange cells in the below table, in which :

- V_{duct} is the airstream velocity in duct. Unit: m/s. Design engineer to insert this data.
- Dimensions of damper as per width and height. Unit: mm. Design engineer to insert this data.
- C_o is average pressure drop coefficient of velocity limit 5 to 10m/s, fixed value = 2.75. No need to insert.
- V_{damper} - no need to insert as the program will automatically calculate

CALCULATION PRESSURE LOSS FOR VCD, FD AND OTHERS

Damper dimensions:	Width (W) mm	Height (H) mm	Cross section (m ²)
	300	300	0.09
V_{duct} (m/s)	5	Q (m ³ /h) :	1,620
Cross section area (m ²)	0.053	Velocity difference factor V_2 (m/s)	12.51
V_{damper} (m/s)	8.54	C_o (5-10 m/s)	2.75

Pressure loss ΔP :

34.39 Pa

(*) Contact us to get the link of the program

PRESSURE DROP CALCULATION METHOD

EFFECTIVE AREA OF STARDUCT DAMPER (cm²)

H Cao-mm Rõng-mm W	200	300	400	500	600	700	800	900	1000	1100	1200
200	185	315	435	564	685	805	934	1055	1184	1304	1434
300	315	527	731	944	1147	1360	1573	1776	1989	2192	2405
400	463	768	1082	1388	1702	2007	2313	2627	2932	3238	3552
500	592	981	1378	1767	2165	2553	2951	3339	3737	4126	4338
600	722	1193	1674	2155	2627	3108	3589	4061	4542	5023	5495
700	870	1443	2026	2599	3173	3756	4329	4912	5485	6068	6642
800	990	1656	2322	2979	3645	4301	4967	5624	6290	6956	7613
900	1147	1906	2664	3432	4190	4949	5717	6475	7234	8001	8760
1000	1267	2118	2960	3811	4653	5504	6346	7197	8038	8889	9731
1100	1138	2081	3025	3968	4921	5865	6808	7761	8704	9648	10591
1200	1240	2266	3302	4329	5356	6392	7419	8455	9481	10508	11544

$$\Delta P = C_o \times V^2$$

In which:

- C_o is the average pressure drop coefficient of 5-7 and 10m/s velocity, and $C_o = 2.75$
- V^2 (m/s) is the face area velocity going through the damper with

$$V_{\text{damper}} = \frac{Q \text{ (m}^3\text{/s)}}{\text{Effective area (cm}^2\text{)}} \quad V^2 = (V_{\text{damper}} - V_{\text{duct}})^2$$

Note: data of full open damper

Example:

$V_{\text{duct}} = 5$ m/s, Damper size: 300x300mm → effective area 900 cm²



• $Q =$ effective area x duct velocity = 900 x 5 = 4500 (m³/h)

• $V_{\text{damper}} = 4500/527 = 8.53$ (m/s) [527 taken from the size 300x300 in the table]

• $V^2 = (8.53 - 5)^2 = 12.52$ (Pa)

Result: Pressure loss $\Delta P = 2.75 (C_o) \times 12.52 (V^2) = 34.4$ Pa

MARKS AND LABELS - Applied on each damper

<p>Nhà sản xuất : CÔNG TY CPĐTCN NGÔI SAO CHÂU Á Nơi sản xuất : Nhà máy cơ khí Starduct Cụm CN Phùng, Đan Phượng, Hà Nội, Việt Nam Hotline : 0240 3514 7999</p>	→ Manufacturer, made place, address, phone number.
<p>Tên sản phẩm : VAN NGĂN CHÁY KHÔNG CÁCH NHIỆT Mã hiệu : SFD-M Cấp ngăn cháy : E120 Kích thước : W600 x H300 X L210</p>	→ Product name, model, dimensions, fire rate, insulation rate
<p>Số GCN : 1021. Ngày cấp : 13.03.2023 Đơn vị cấp : Cục CS PCCC và CHCN, BCA</p>	→ Number of the applicable certificate, issued date, issued by
<p>Tên dự án : BỆNH VIỆN VIỆT NHẬT Địa chỉ : Số 10 đường ABC, Phường, Quận, Huyện, Tỉnh, Thành phố</p>	→ Name of project, delivery address
<p>Số quản lý : NS-S20-3-1 Ngày sản xuất : 20.03.2023</p>	→ Admin. ref # (Series), Prod. date
	→ QR Code for checking origin, serial number
 Web site : www.starduct.vn	→ Manufacturer Logo, Web address

LIST OF LEGAL DOCUMENTS ACCOMPANYING WITH GOODS FOR A PROJECT

- 1- A copy (notarized) of the certificate of verified sample
- 2- A copy (notarized) of the certificate of verified requirements for production and service
- 3- List of certified models (i.e quantity, sizes and ref. numbers of each damper in the list)
- 4- Installation drawings as per tests.
- 5- Delivery minutes from manufacturer

Warning sign system of Star Asia

	<p>Do Not Drop Không kéo lê, tránh rơi đổ</p>		<p>Do Not Walk or Stand On Không dẫm hoặc đứng lên trên</p>		<p>This Side Up Xếp hướng lên trên</p>
	<p>Dry Storing Bảo quản nơi khô ráo</p>		<p>Store In Warehouse Bảo quản trong kho</p>		<p>Sharp Edge Use Glove Vật có cạnh sắc Đeo găng an toàn khi làm việc</p>
	<p>Handle With Care Nhẹ tay khi dịch chuyển</p>		<p>Use Forklift To Move Chuyển bằng xe nâng</p>		<p>Use Scissor Forklift To Lift Up Nâng lên cao bằng xe nâng chuyên dụng</p>

Storage and handling

As fire damper is a safety element, it should be stored and handled with care

Avoid:

- Any kind of impact or damage
- Contact with water
- Deformation of the casing

Recommendations for Star Asia :

- To unload in a dry area
- Not to flip or roll the product to move it
- Not use the damper as a scaffold, working table etc.
- Do not store smaller damper inside large one
- Do not stand or seat on the product



Nhận và bảo quản nơi khô ráo nước



Sử dụng găng bảo hộ khi làm việc



Không dẫm, đạp, trèo, đi trên van



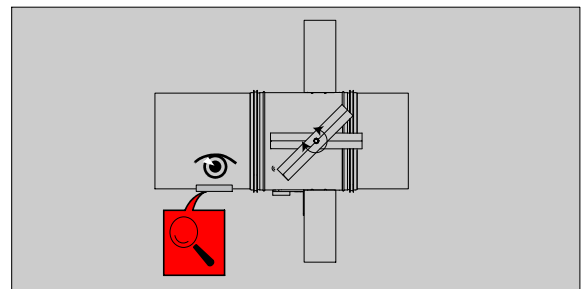
Không thả, lăn, lật lúi, kéo, đẩy, ...

Important notes when installation

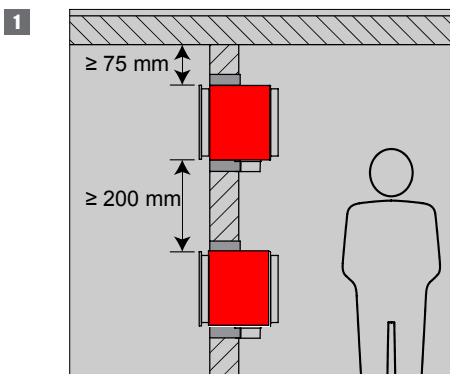
General :

- The installation must comply with the installation manual delivered with the product and the classification report.
- Axis orientation: see the declaration of performance
- Avoid obstruction of adjoining ducts.
- Product installation: always doing with closed damper blade
- Verify if the blade can move freely
- Please observe safety distances with respect to other construction elements. The operating mechanism must also remain accessible: allow for a clearance of 200 mm around the housing.
- The air tightness class will be maintained if the damper is installed according to the installation manual.
- The fire dampers are always tested in standardised constructions according to QCVN 60:2021/BXD. The achieved results are valid for similar supporting constructions with a fire resistance, thickness and density equal or superior to the supporting construction used during the test.
- The damper must remain accessible for inspection and maintenance.
- Schedule at least two running checks each year.

EACH 6 MONTHS	
2021	<input type="checkbox"/> <input type="checkbox"/>
2022	<input type="checkbox"/> <input type="checkbox"/>
2023	<input type="checkbox"/> <input type="checkbox"/>
2024	<input type="checkbox"/> <input type="checkbox"/>
2025	<input type="checkbox"/> <input type="checkbox"/>



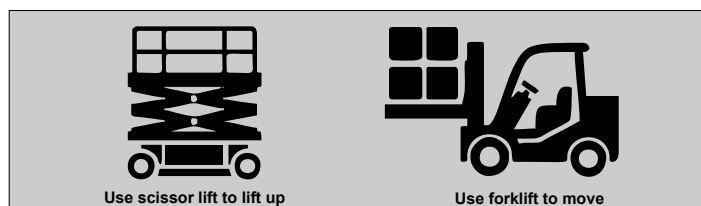
Installation at a minimal distance from another damper or from an adjacent supporting construction



1. Principle according to the test standard:

Minimum distance of ≥ 75 mm from the ceiling

Minimum distance ≥ 200 mm to an adjacent damper



Use scissor lift to lift up

Use forklift to move

FIRE-RESIST, INSULATED DUCT, TYPE B

Standard/test method : ISO 6944-1:2008



Model:
S-EID

TEST REPORT No. 224.22.KC.NCPCC
Conducted by Institute of Building Structures**VIỆN KHOA HỌC CÔNG NGHỆ XÂY DỰNG**
Vietnam Institute for Building Science and Technology**VIỆN CHUYÊN NGÀNH KẾT CẤU CÔNG TRÌNH XÂY DỰNG**
Institute of Building Structures

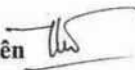
Địa chỉ: 81 Trần Cung - Nghĩa Tân - Cầu Giấy - Hà Nội

Website: vienketcau.vn - TEL: 024- 37543439 - Fax: 024.62692708

BÁO CÁO KẾT QUẢ THỬ NGHIỆM ĐÓT
XÁC ĐỊNH KHẢ NĂNG CHỊU LỬA CỦA MẪU SẢN PHẨM ỐNG GIÓ
MẪU ỐNG HỖ (ỐNG LOẠI B)

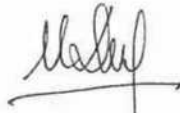
(No: 224.22.KC.NCPCC)

Khách hàng: Công ty Cổ phần Đầu tư Công nghệ Ngôi Sao Châu Á
Địa chỉ: Tầng 03, TTTM Interserco, 17 Phạm Hùng, Phường Mỹ Đình 1, Quận Nam Từ Liêm, Thành phố Hà Nội
Loại mẫu: Mẫu ống hờ (mẫu ống B)
Hợp đồng: 159/2021 VKC

Nhóm thực hiện**Chủ trì:** Nguyễn Trung Kiên **Cộng tác viên chính:**

1. Nguyễn Thị Ngọc Diệp 
2. Hà Văn Hạnh 
3. Thành Hữu Hồng Giang 
4. Đào Duy Anh 
5. Lê Đắc Châu 
6. Nguyễn Việt Sơn 
7. Phạm Tuấn Hoàng 

Hà Nội, ngày 30 tháng 5 năm 2022

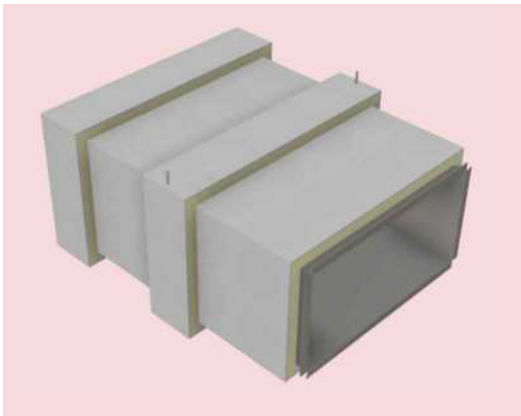
Phòng Nghiên cứu
Phòng chống cháy**Phạm Minh Điền****Phòng Tổng hợp****Nguyễn Phương Tùng****Viện chuyên ngành Kết cấu****KT. GIÁM ĐỐC**
PHÓ GIÁM ĐỐC
Hoàng Anh Giang

Báo cáo số: 224.22.KC.NCPCC

BM ISO FR 01 - 03

2/39

Ei90 Duct



Description

Fire and insulated ducts (EI) are not considered as a fire fighting equipment need to be verified. However, EI ducts must be produced by certified manufacturers, who has a certificate of matching requirements for producing and service fire protective equipments as the Decree 136/2020/NB-CP of the Government. And the producer must have test reports as per standard and test method ISO 6944-1:2008 those conducted by accredited labs.

Legal documents relating to Ei90 Starduct ducts:

1. Certificate No. 36/GXN-PCCC granted by Fire and Rescue Police Dept. - Ministry of Public Security on 04.08.2022
2. Test Report No: 244.22.KC.NCPCC - Testing standard ISO 6944-1:2008
3. Fire-protect and insulation rate: Ei90/45/30/15 - Type: B

CONSTRUCTION

Material

- Duct body: steel sheet, galvanized, thickness 0.75 mm
- Covered with a layer of MgO, thickness 38mm and a layer of MgSO4 fire-resist board, thickness 10mm

Max. dimensions :

- Width (W) 1250mm x Height (H) 1000mm

Seam type

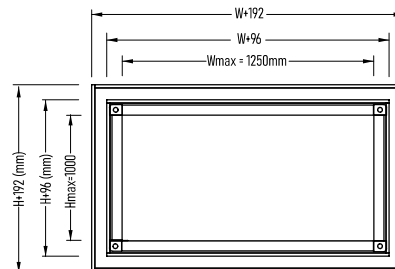
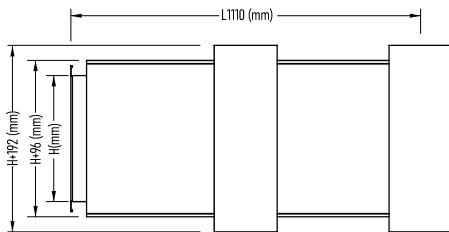
- Pittsburg

Flange:

- 2-side TDC

Characteristics

- Class: Ei 30 ~ Ei 90



Thickness of insulating layer

EI Class	Thickness (mm)	Weight (kg/m ²)
EI - 30	MgO 38mm + MgSO4 10mm	
EI - 45	MgO 38mm + MgSO4 10mm	
EI - 60	MgO 38mm + MgSO4 10mm	
EI - 90	MgO 38mm + MgSO4 10mm	
EI - 120		Test as request
EI - 180		Test as request

ORDERING CODE

S-EID - WxH - L - EI 30/45/60/90

EI DUCT

Dim.: Width x Height

EI class

Length

Max. dimensions :

- Width (W) = 1250 mm.

- Height (H) = 1000 mm

Thickness and reinforcement

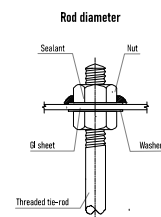
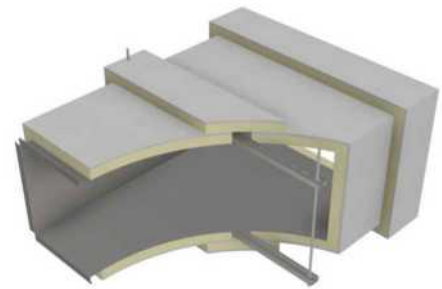
Width (mm)	Thickness (mm)	Trapeze hanger	Reinforcement <small>Not included in price</small>
$W \leq 800$	0.75	U4121 - 1.5mm	
$800 < W \leq 1000$	0.75	U4121 - 1.5mm	
$1000 < W \leq 1250$	0.75	U4121 - 1.5mm	

Max. DIMENSIONS : - Width (W) = 1250 mm.

- Height (H) = 1000 mm

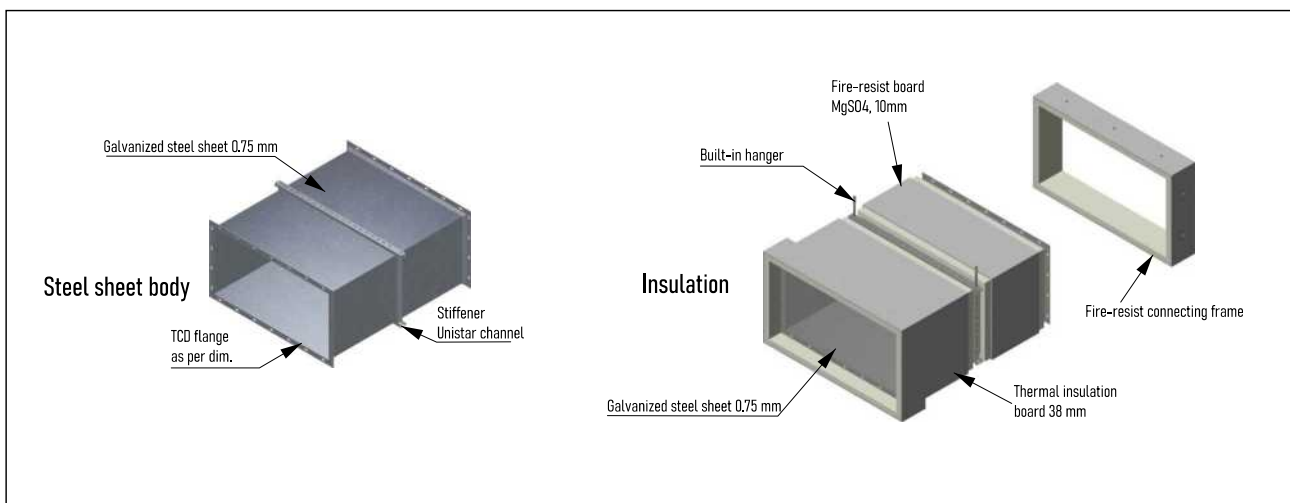
Reinforcement by threaded rod

REF.	Dimensions - By biggest side of duct (mm)	Number of threaded rod standard length 1200 mm
A	 < 750	-
B	 751 - 1000	1
C	 1001 - 1500	1
D	 1501 - 2250	2
E	 > 2251	3

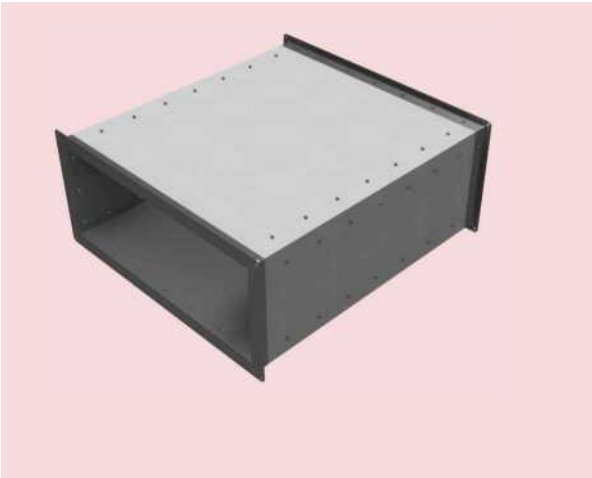


Length of tie-rod (mm)	Diameter
500 and below	M10
500 and above	M12

Detail of steel cladding duct



Ei60 Duct



Description

Fire and insulated ducts (EI) are not considered as a fire fighting equipment need to be verified. However, EI ducts must be produced by certified manufacturers, who has a certificate of matching requirements for producing and service fire protective equipments as the Decree 136/2020/NĐ-CP of the Government. And the producer must have test reports as per standard and test method ISO 6944-1:2008 those conducted by accredited labs.

Legal documents relating to Ei60 Starduct ducts:

1. **Certificate No. 36/GXN-PCCC granted by Fire and Rescue Police Dept. - Ministry of Public Security on 04.08.2022**
2. **Test Report No : - Testing standard ISO 6944-1:2008**
3. **Fire-protect and insulation rate: Ei60/45/30/15 - Type : B**

CONSTRUCTION

Material

- Duct body: steel sheet, galvanized, thickness 0.75 mm
- Covered with glass wool 25mm, 32kg/m³ and a layer of MgSO₄ fire-resist board, thickness 10mm

Max. dimensions :

- Width (W) 2200mm x Height (H) 800mm

Seam type

- Pittsburg

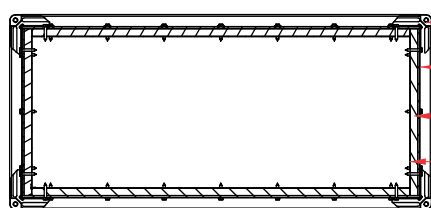
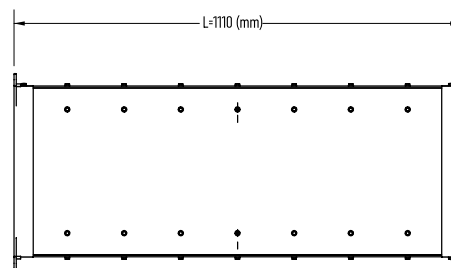
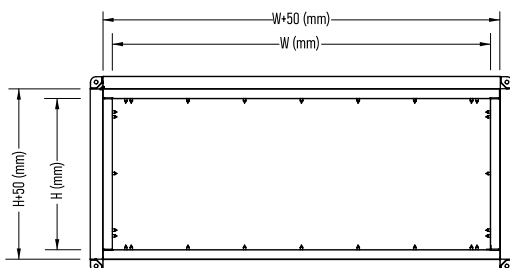
Flange:

- 2-side TDC

Characteristics

- Class: Ei60

Detail metal duct and insulation layers

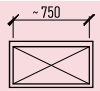
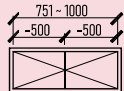
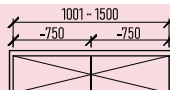
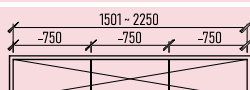
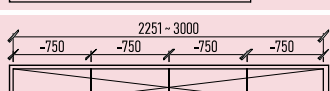


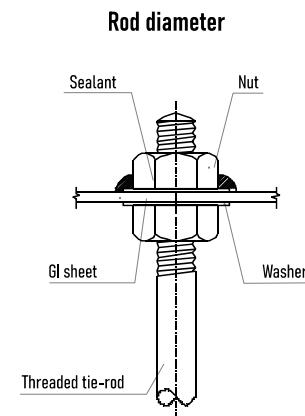
- TDC flange
- MgSO₄ 950kg/m³, thickness 10mm
- Mineral wool 32kg/m³, thickness 25mm
- Steel sheet, galvanized, thickness 0.75mm

Thickness and reinforcement

Width (mm)	Thickness (mm)	Trapeze hanger	Reinforcement <small>Not included in price</small>
$W \leq 800$	0.75	U4121 - 1.5mm	
$800 < W \leq 1000$	0.75	U4121 - 1.5mm	
$1000 < W \leq 1500$	0.75	U4121 - 1.5mm	
$1500 < W \leq 2200$	0.75	U4121 - 2.0mm	

Reinforcement by threaded rod

REF.	Dimensions - By biggest side of duct (mm)	Number of theraded rod standard length 1200 mm
A		-
B		1
C		1
D		2
E		3



Length of tie-rod (mm)	Diameter
500 and below	M10
500 and above	M12

MÃ ĐẶT HÀNG

S-EID - WxH - L - EI 30/45/60

EI DUCT EI class
Dim.: Width x Height Length

Max. dimensions :

- Width (W) = 2200 mm.
- Height (H) = 800 mm

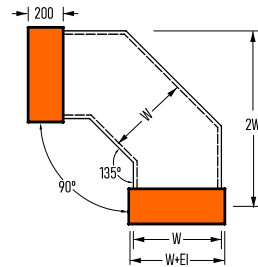
FITTINGS

Vertical equal elbow 90°

Includes :

- 1 elbow as requested size
- 2 equal flanges - EI

The dimesions are defaulted as Starduct standard

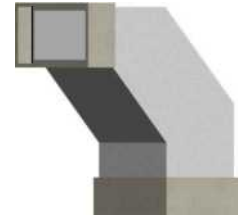
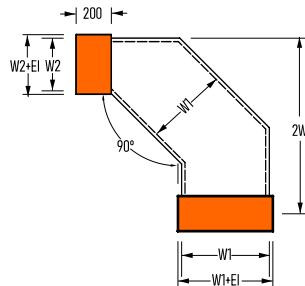


Vertical reducer elbow 90°

Includes :

- 1 elbow as requested size
- 2 equal flanges - EI

The dimesions are defaulted as Starduct standard

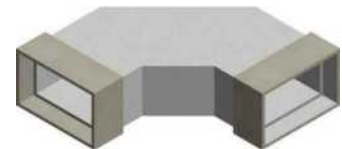
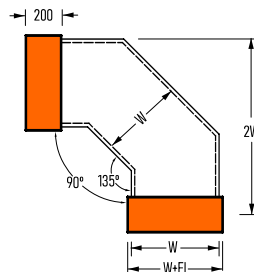


Horizontal equal elbow 90°

Includes :

- 1 elbow as requested size
- 2 equal flanges - EI

The dimesions are defaulted as Starduct standard

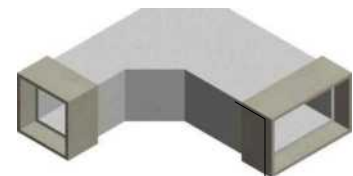
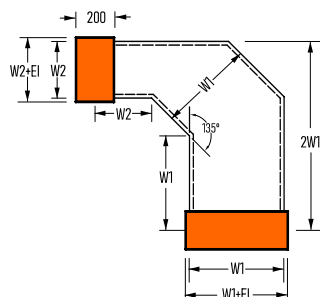


Horizontal reducer 90°

Includes :

- 1 reduce elbow as requested size
- 2 unequal flanges - EI

The dimesions are defaulted as Starduct standard

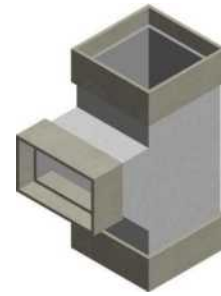
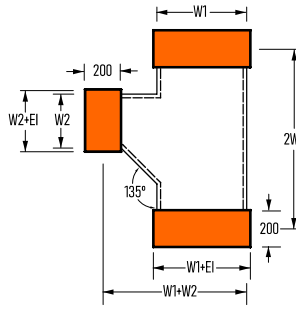


Vertical Tee

Includes :

- 1 Tee as requested size
- 3 flanges - EI

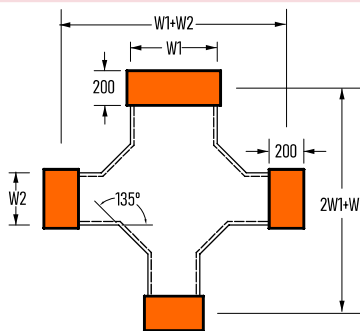
The dimensions are defaulted as Starduct standard


Cross piece

Includes :

- 1 Cross fitting as requested sizes
- 4 flanges - EI

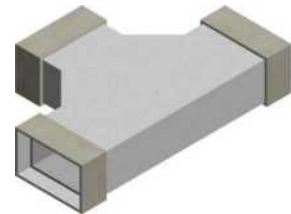
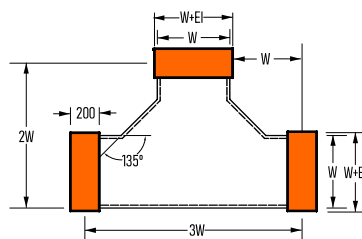
The dimensions are defaulted as Starduct standard


Horizontal equal Tee

Includes :

- 1 Tee as requested sizes
- 3 flanges - EI

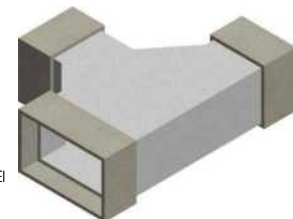
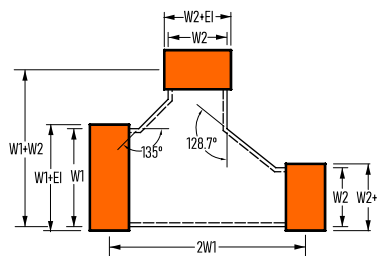
The dimensions are defaulted as Starduct standard


Horizontal unequal Tee

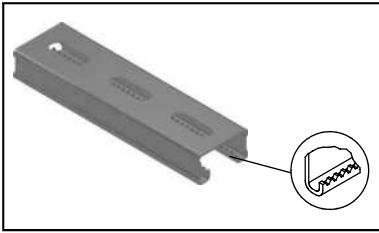
Includes :

- 1 Tee as requested sizes
- 3 flanges - EI

The dimensions are defaulted as Starduct standard



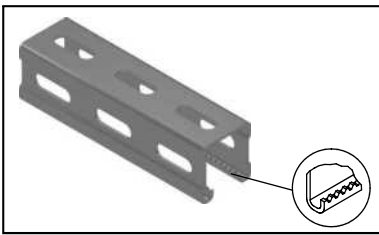
SUPPORTING SYSTEM



U-channel: U4121
 Thickness: 1.5mm
 Length as requested
 End cap and buffer incl.



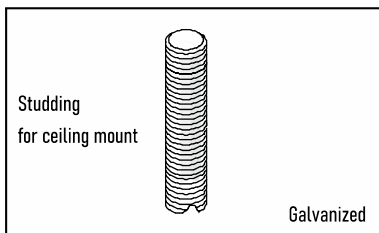
Cantilever U4121
 Wall mounted
 Anchor bolts incl.



U-channel" U4141
 Thickness: 2.0-2.5mm
 Length as requested
 End cap and buffer incl.



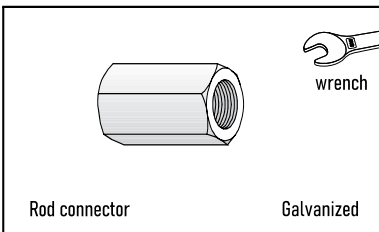
Trapeze hanger U4121
 Ceiling mounted
 Threaded rod incl.



Studding
for ceiling mount

Galvanized

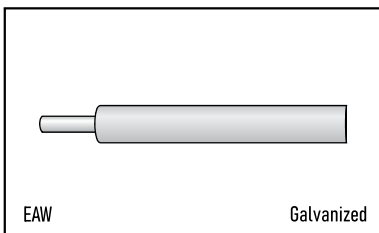
Prod. code M6	Prod. code M8	Prod. code M10	Prod. code M12	Prod. code M16
M6 x 1M	M8 x 1M	M10 x 1M	M12 x 1M	M16 x 1M
M6 x 2M	M8 x 2M	M10 x 2M	M12 x 2M	M16 x 2M
M6 x 3M	M8 x 3M	M10 x 3M	M12 x 3M	M16 x 3M



Rod connector

Galvanized

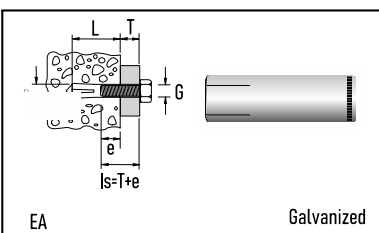
Prod. code	G	Wrench (mm)	L (mm)	Package
6334M6	M6	10	18	50
6334M8	M8	13	24	50
6334M10	M10	17	30	50
6334M12	M12	19	36	50
6334M16	M16	24	48	50



EAW

Galvanized

Prod. code	Prod. code
EAW H6	EAM6
EAW H8	EAM8
EAW H8 x 40	EAM8 x 40
EAW H10	EAM10
EAW H12	EAM12
EAW H16	EAM16
EAW H20	EAM20



EA

Galvanized

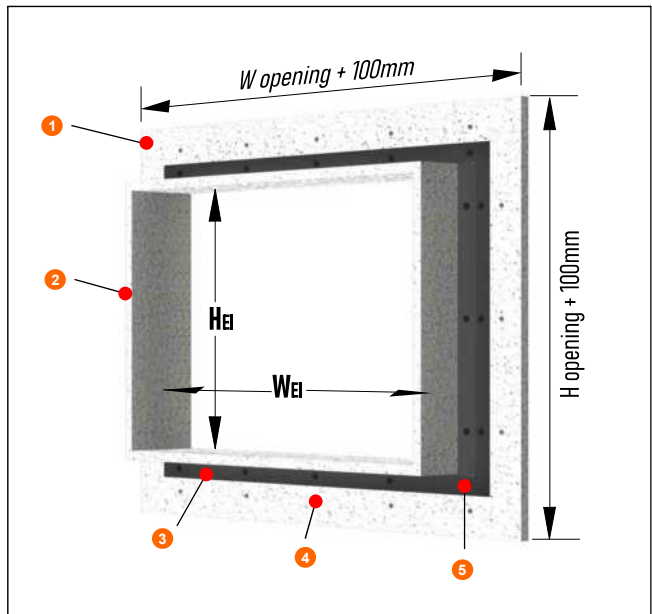
Prod. code	CLASS	D (mm)	L (mm)	Ø (mm)	G	e min. (mm)	e max. (mm)
EAM6	-	8	25	8	M6	6	11
EAM8	1.8kN	10	30	10	M8	8	13
EAM8 x 40	3.0kN	10	40	10	M10	8	13
EAM10	3.6kN	12	40	12	M12	10	17
EAM12	5.7kN	15	50	15	M16	12	18
EAM16	7.4kN	20	65	20	M18	16	21
EAM20	11.3kN	25	80	25	M20	20	30

Wall opening collars

Openings thru walls and slab for running ducts are critical details. They need special and professional solutions and materials to ensure a fast, properly and effectively installation.

- 1 El class board 1
- 2 El class collar (board)
- 3 V30 bar support frame
- 4 Holes for M8 expansion bolts
- 5 Self-tapping screw M5/L10

Accessories for thru-wall installation



P s fittings

$W \leq 6000\text{mm}$, $H \leq 2500\text{mm}$

Original dimension : $W_{mm} \times H_{mm} \times L1200$

Overlap dimension : Original dimension + El Board $\times 2$ + Mineral wool thickness $\times 2$ (by El class-see table 1)

Price is quoted by unit/piece (VND/pc)

5b Note: Where the width over $>1500\text{mm}$, a crosswise U-frame (5b) need to be added and continued every 500mm

* The above structure applies to both of duct types exposed to external fire and to internal fire

Floor opening collars

- 1 Fire-resistant supporting frame
- 2 Floor penetration sleeve

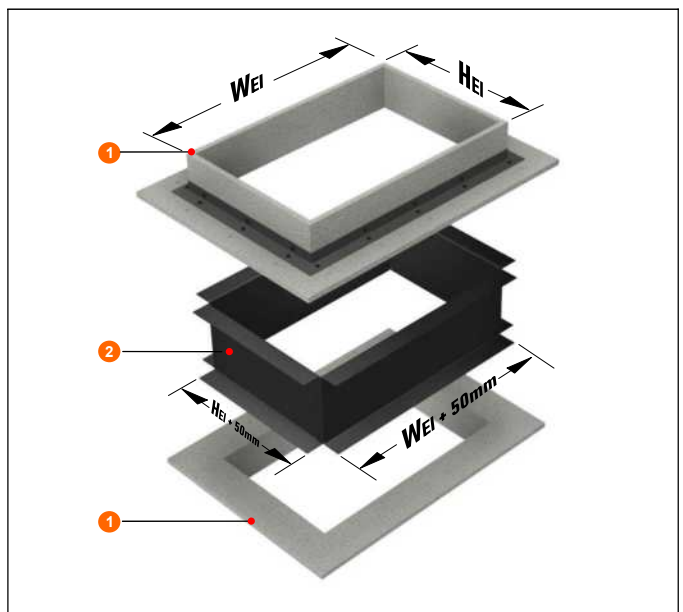
Dimension

Fire-resistant supporting frame:

W_{ei} = outer width of the EI duct
 H_{ei} = outer height of the EI duct

Floor penetration sleeve

Width = $W_{ei} + 50$ (mm)
 Height = $H_{ei} + 50$ (mm)



FIRE-PROTECTION PAD FOR ANCHOR EXPANSION BOLTS

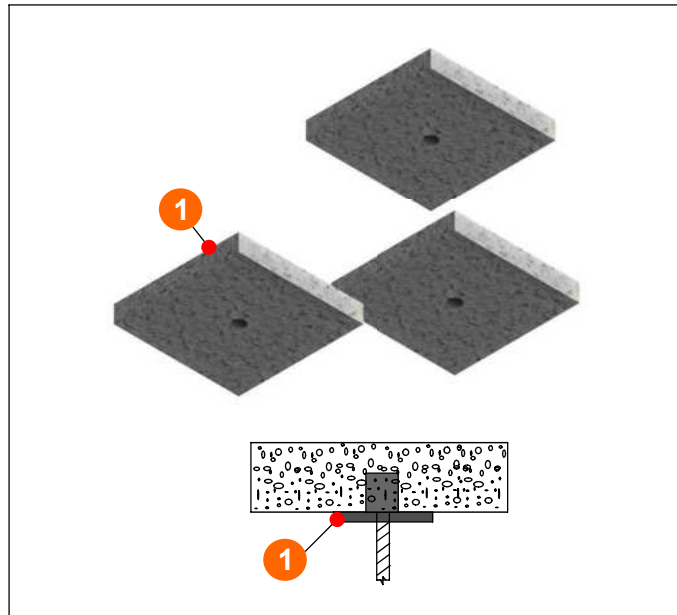
1 Fire-protection pad for anchor expansion bolt

The anchor expansion bolt in concrete slabs is a critical point. This bolt has to bears full load of the duct system.

In fire, the linkage between concrete and bolt can be quickly loosen then cause the collapse to duct system sooner than planned.

So, heat-protection for these critical points by fire-protection pads is a must and recommended by Starduct.

Protecting anchor bolts



P s fittings

$W \leq 6000\text{mm}$, $H \leq 2500\text{mm}$

Original dimension : $W\text{mm} \times H\text{mm} \times L1200$

Overlap dimension : Original dimension + El Board $\times 2$ + Mineral wool thickness $\times 2$ (by El class-see table 1)

Price is quoted by unit/piece (VND/pc)

5b Note: Where the width over $>1500\text{mm}$, a crosswise U-frame (5b) need to be added and continued every 500mm

* The above structure applies to both of duct types exposed to external fire and to internal fire

Fire-protection frame for duct joints & hangers

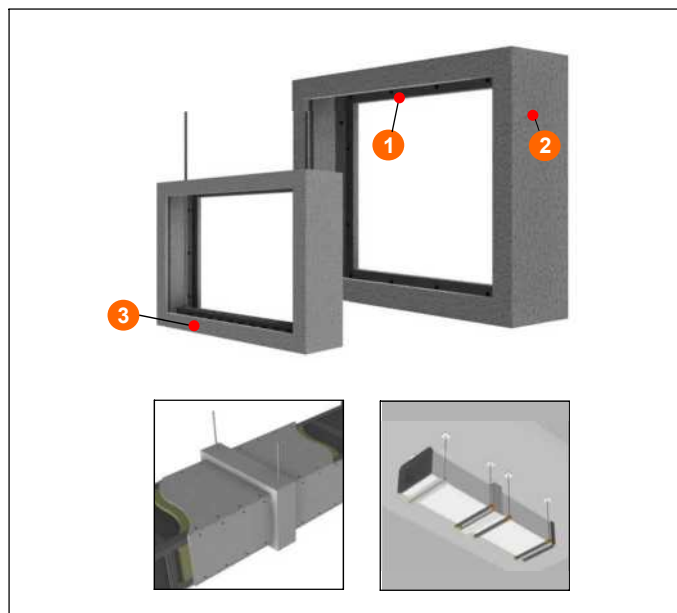
1 V30/2 mm steel bar frame

2 Fire-protect & Thermal insulation board

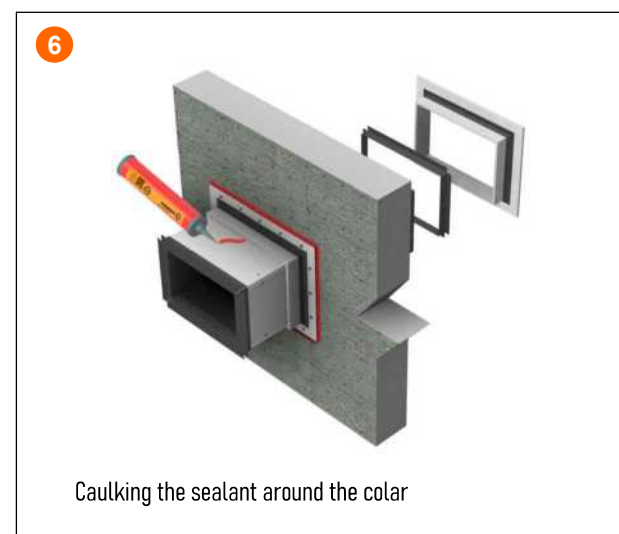
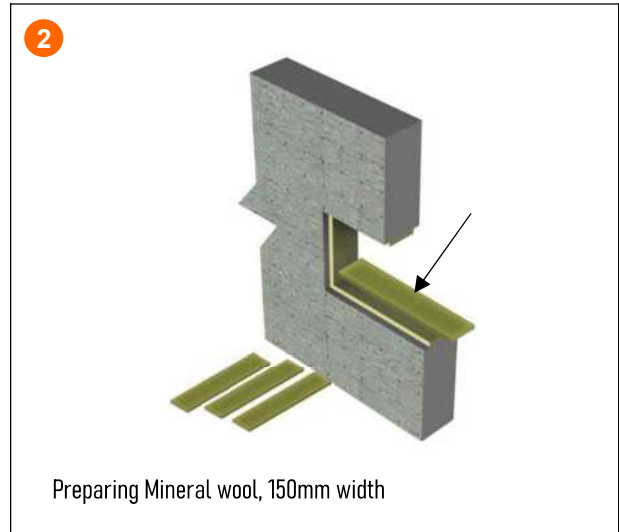
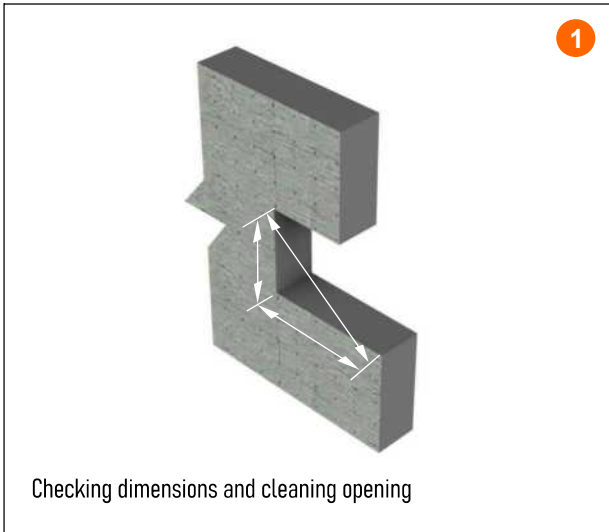
3 Trapeze hanger

The joints made from galvanized steel are designed to be open for easier installation, but they will be directly exposed to flame in case of fire from the outside. The same will happen to trapeze hangers.

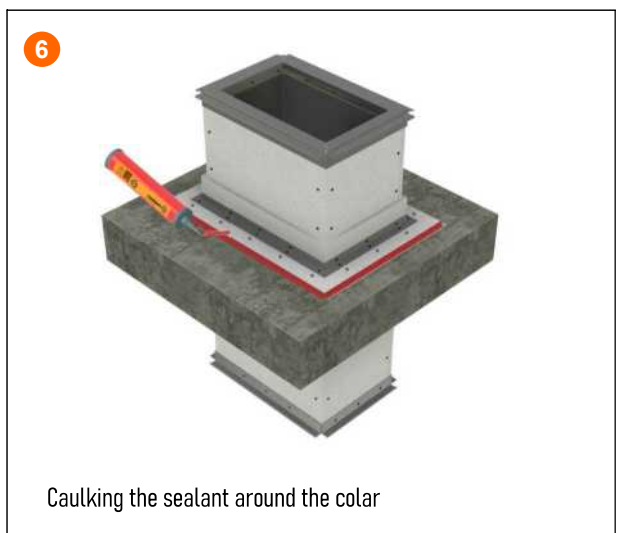
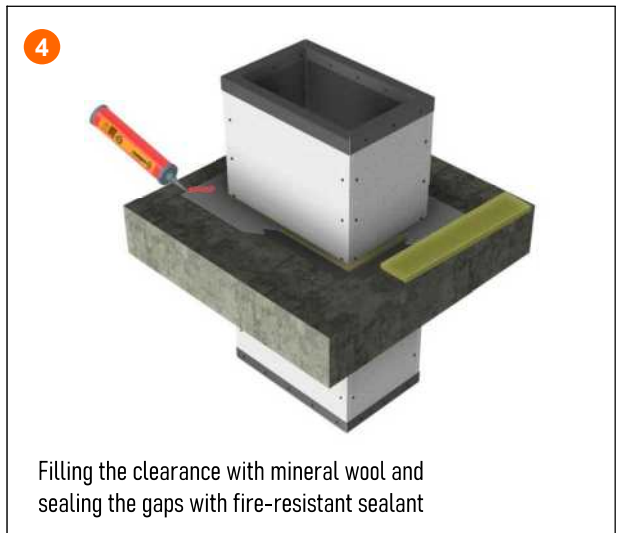
Therefore, Starduct recommends that customers to use a fire-protection frame for duct joints and hangers if the duct system located in or running through fire zones.



SUGGESTION FOR PENETRATED WALLS INSTALLATION

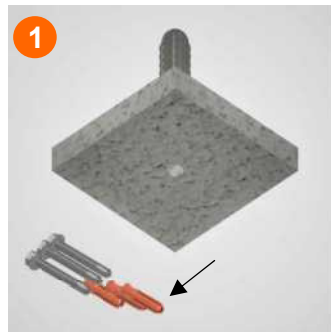


SUGGESTION FOR PENETRATED FLOORS INSTALLATION

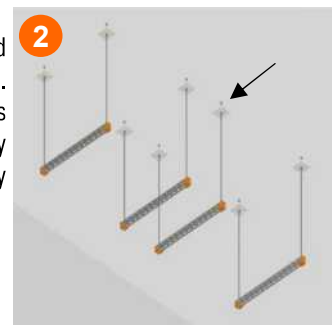


HANGING AND CONNECTING THE DUCT

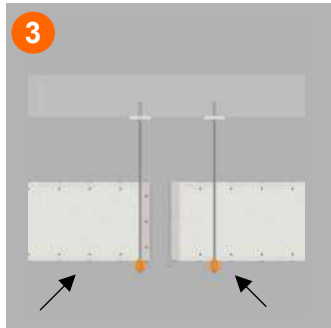
Determine the plan of duct system and install anchor bolts. Sizes of anchor bolts as in the instructions for load. Use heat-resistant pads to protect the anchor expansion bolts.



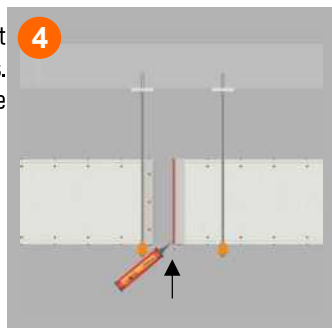
Install trapeze hanger and adjust them straight ahead. Fix the heat-resistant pads on the ceiling surface by nuts on the rod and apply sealant.



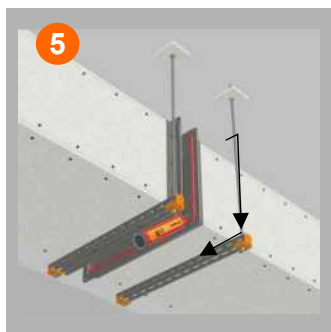
Pass ducts through the hangers in place. Adjust the ducts straight ahead. Take with care to avoid damaging insulation layers.



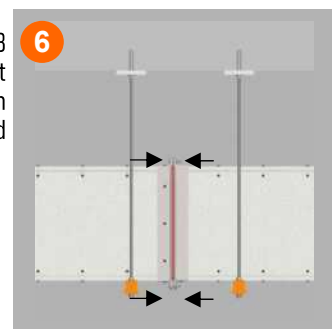
Apply heat resistant sealant over one surface of flanges. Sealant should be the same El class as ducts.



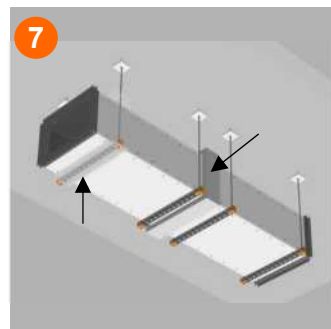
Sealant should be applied enough to seal tightly the 2 surfaces of flange.



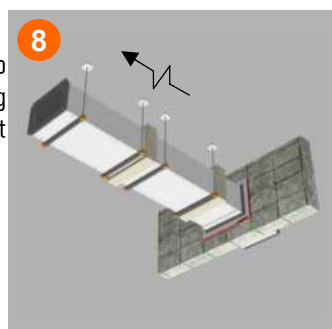
Fixing the 2 ducts in 2-3 min. after applying sealant by bolts or cleats. Take with care to get uniform and airtight layer of sealant.



Install the fire-protection frames for joints with M5/L10 self-tapping screws. Apply heat-resistant sealant over gaps (if any).



Repeat the procedure to next joints while adjusting the entire system to meet requirements.



Recommended materials for sealing ducts

HEAT-RESISTANT SEALANT

Sealing is an important work in installing HVAC system and fire-protection system.

First requirement is airtightness for the HVAC system, so that, no pressure loss available during working time. In the other hand, the fire-protection requires that the above safe situation must be retmained in at least 2 hours.

In case of fire, the sealants must stand for extreme conditions, so they need appropriate quality and to be thoroughly tested as requirements of national and international standards. In Vietnam, the QCVB 06: 2012/BXD standard is mandatory.

Beside properly installation, sealing materials are the ultra important factor for the effectiveness of the works.

The materials include heat-resistant sealants (glue), intumescent sealant, fire stop motar.



FIRE STOP MOTAR

Hướng dẫn tính khối lượng sản phẩm ngăn cháy lan”

Chất làm kín ngăn cháy CP 606

Thể tích ống = 310 ml (CP 606)

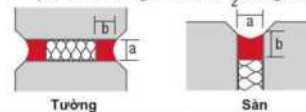
a = độ rộng khe liên kết (cm)

b = độ sâu sản phẩm bơm vào (cm)

Độ dài thi công tính bằng mét cho mỗi ống = $\frac{\text{thể tích ống (ml)}}{a \times b}$

VD: sản có khe rộng 20mm, bơm sản phẩm sâu 10mm, thể tích mỗi ống là 310ml.
Vậy độ dài thi công mỗi ống = $310 / (1 \times 2) = 1,55$ mét mỗi ống cho một phía sản.

(Đối với khe dùng CP 606, $b = \frac{1}{2} a$ tổng thể)



Rộng khe (mm)	0-15	16-20	21-30
Sâu của khe (mm)	6	10	15

Chất làm kín ngăn cháy lan tương nỡ FS-ONE MAX

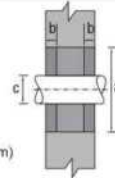
Loại ống = 580 ml (FS-ONE MAX)

Số ống cần là, $n = \frac{V_s}{\text{thể tích ống (ml)}}$

Thể tích bịt kín cho ứng dụng tường (thi công cho cả hai phía) $V_s = \frac{\pi}{4} \times (a^2 - c^2) \times 2b$

Thể tích bịt kín cho sàn (chỉ thi công một phía) $V_s = \frac{\pi}{4} \times (a^2 - c^2) \times b$

a = đường kính lỗ (cm)
b = chiều sâu thi công (cm) (thao khảo chứng chỉ)
c = đường kính ngoài của ống hoặc đường kính bó cáp (cm)



Vữa ngăn cháy lan CP 636

bao 20 kg tạo ra 22.2 lít

a = chiều sâu lỗ mở (cm)

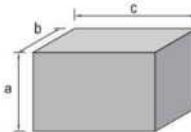
b = chiều dài lỗ mở (cm)

c = độ rộng lỗ mở (cm)

Lỗ mở trống,

Số bao cần = $\frac{a \times b \times c}{22,000}$

VD: sản dày 65 mm có lỗ mở 1 mét x 1 mét:
Theo đó, số lượng bao cần = $\frac{6.5 \times 100 \times 100}{22,000} = 3$ bao



FIRE STOP COATING

Hướng dẫn tính khối lượng cho sơn ngăn cháy lan CFS-SP WB (Dựa trên chiều dày thi công 3mm khi còn ướt)

Bề rộng khe (mm)	Giáp mí 12.5mm hai bên (mm)	Chiều dài thi công cho mỗi thùng 19 lít (m)
25	50	110
50	75	75
100	125	45
150	175	35
200	225	30



Heavy industrial and infrastructure projects

(about 100 project all over the country)



Vinh Tan thermal power plant
Contractor: Posco E&C - Korea



Nghien Son, Long Son oil refinery plants
Contractor: Temsco - Korea
Contractor: Deasun - Viet Nam



Thai Binh thermal power plant
Contractor : Sigma - Vietnam



Hydroelectric projects
Contractors : Probuild, H2T, ...- Vietnam



Nhiệt điện Nghi Sơn 2 thermal power plants
Contractor : Doosan Heavy Industries - Korea



Vinfast autofactory
Contractor : Cotecons., Unicons, Ricons - Vietnam



Metro station Nhổn - Hà Nội
Contractor : Colas Rails - France
Contractor : Tân Thành An - Vietnam



Metro station Bến thành - Suối Tiên
Contractor : Hitachi - Japan
Contractor : Đại Cơ - Vietnam

Industrial projects

(about 1000 project all over the country)



Cargo station ASCV - Nội Bài airport
Contractor : Hawee - Vietnam



Panasonic Thăng Long plant
Contractor : Takisha - Japan



ABB Việt Nam plant
Contractor : Unicons - Vietnam



Vinsmart plant
Contract : Đoàn Nhất - Vietnam



Coca-Cola Hà Nội plant
Contractor : Probuild



Kyocera plant
Contractor : Kinden - Japan



NISSIN Việt Nam plant
Contractor : Yurtec - Japan



Phenikaa Hòa Lạc plant
Contractor : Sigma - Vietnam

Building, hotel, trade center projects

(about 2000 project all over the country)



Vinfast Tower



TTTM Doji



Vinhomes NCT



VP Bank Tower



Sun Thủy Khuê



Sun Quảng An Tây Hồ



Vinhomes Smart City



Vinhomes Symphony



Vinhomes Ocean Park



Vinhomes Skylake



Vinhomes West Point



Vinhomes Grand Park



Đại học FPT Hòa Lạc



Đại Học FPT Cầu Giấy



Vinhomes Green Bay



Vinhomes Gardenia



Newteccons Tower



Altara Qui Nhơn



Marriott Đà Nẵng



Hilton Hải Phòng



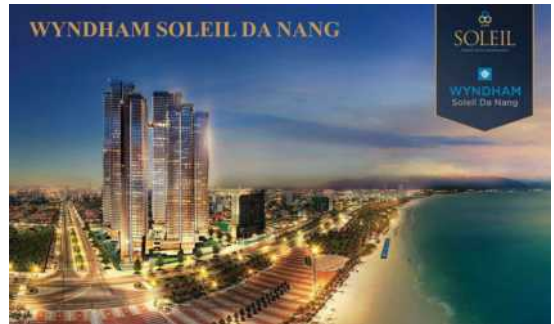
Megamalls of Vingroup



Trade centers over the country of Vingroup



Hồng Ngọc hospital



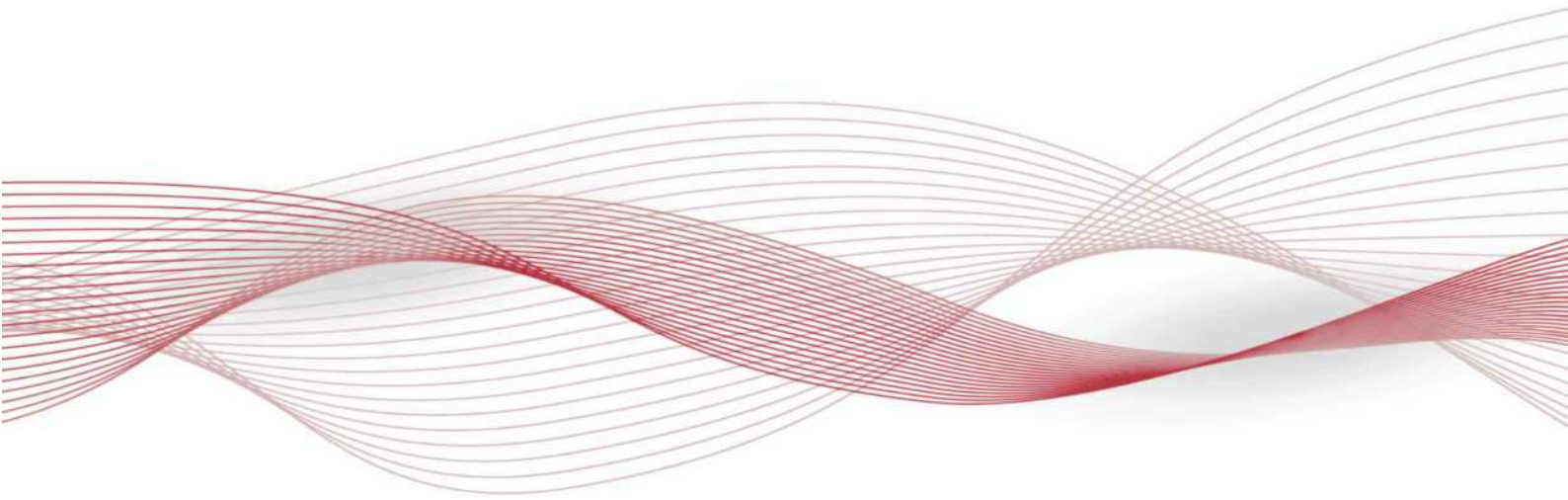
Codotel Ánh Dương



Viettel Office tower



Other hotels and resorts over the country



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