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FDS-3G

## Rectangular fire damper

## Fire dampers



www.koolair.com

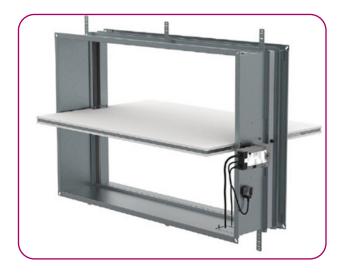


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## **General Characteristics**



#### Description

Fire dampers provide passive fire protection, designed to facilitate compartmentation and prevent the spread of toxic gases, smoke, and fire. Standard fire dampers are designed and certified in accordance with standard EN 15650 and tested according to EIS criteria in compliance with standard EN 1366-2. The fire damper and its installation are integral to the fire resistance rating. FDS-3G fire dampers are intended to be used in the installations listed and described in their Manual. By default, all fire dampers are supplied with a manual mechanism or a servomotor mechanism and, optionally, a power supply and a communication unit.

#### **Main Features**

- Lightweight construction
- Standard air tightness class C3
- Low pressure loss
- Removable mechanism
- Integrated inspection hatch (dimensions greater than 200 x 200)
- Wide range of installations up to EI120S

#### **Types of Products**

#### • FDS-3G

Rectangular fire damper with a maximum fire resistance of 120 minutes and a unique body design. Dimensions range from 100 x 100 to 1,200 x 800 mm.

#### • FDS-3G+KS

Rectangular fire damper with square kit up to 800 x 600 mm.



### **Activation Types**

#### Manually operated fire dampers

By default, all manually operated fire dampers are supplied with manual control and, optionally, with microswitches and an electromagnet. In the event of a fire, the fire damper closes automatically. Depending on the version, the damper closes either after the thermal fuse melts, or by remote activation using an electromagnet via pulse connection. Once the damper blade is closed, it is mechanically locked in this position and can only be opened manually. The activation mechanism is triggered when the air temperature in the duct reaches 74 °C (for additional options, select Temperature Activation in the technical parameters menu) and the damper closes within one second of the fuse melting.

## AM-FD CE

• H0

Fire damper with an activation mechanism with cover, crank and spring return release mechanism activated by a thermal fuse set at 74 °C (or 100 °C on request).

#### • H2

Fire damper with H0 activation mechanism + open and closed position indication with 230 V AC or 24 V AC/DC contact switches.

#### • H5-2

Fire damper with H0 activation mechanism + 24 V AC/DC electromagnetic release mechanism in the pulse connection (release occurs when the electromagnet is activated) + open and closed position indication with 230 V AC or 24 V AC/DC contact switches.

#### • H6-2

Fire damper with H0 activation mechanism + 230 V AC electromagnetic release mechanism in the pulse connection (release occurs when the electromagnet is activated) + open and closed position indication with 230 V AC or 24 V AC/DC contact switches.



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• KH-0

Fire damper with an activation mechanism with cover, crank and spring return release mechanism activated by a thermal fuse set at 74 °C.

#### • KH2U

Fire damper with KH0 activation mechanism + open and closed position indication with 12/24/48 V AC/DC – 125 V AC contact switches. Manual reset.

#### • KH2B

Fire damper with KH0 activation mechanism + open and closed position indication with double 12/24/48 V AC/DC – 125 V AC contact switches. Manual reset.

#### • KH5-2U

Fire damper with KH0 activation mechanism + 24/48 V DC electromagnetic release mechanism in the pulse connection (release occurs when the electromagnet is activated) + open and closed position indication with 12/24/48 V AC/DC – 125 V AC contact switches. Manual reset.

#### • KH5-2B

KH0 activation mechanism + 24/48 V DC electromagnetic release mechanism in the pulse connection (release occurs when the electromagnet is activated) + open and closed position indication with double 12/24/48 V AC/DC - 125 V AC contact switches. Manual reset.

#### • KHM5-2U

Fire damper with KH0 activation mechanism + 24/48 V DC electromagnetic release mechanism in the pulse connection (release occurs when the electromagnet is activated) + open and closed position indication with 12/24/48 V AC/DC – 125 V AC contact switches + RMK4.0 motorised reset mechanism (24/48 V AC/DC).

#### • KHM5-2B

KH0 activation mechanism + 24/48 V DC electromagnetic release mechanism in the pulse connection (release occurs when the electromagnet is activated) + open and closed position indication with double 12/24/48 V AC/DC – 125 V AC contact switches + RMK4.0 motorised reset mechanism (24/48 V AC/DC).



## AM-FD-K (on request)

Fire damper with KH0 activation mechanism + open and closed position indication with 230 V AC contact switches. Manual reset.

#### • KH3B

Fire damper with KH0 activation mechanism + open and closed position indication with double 230 V AC contact switches. Manual reset.

#### • KH6-2U

Fire damper with KH0 activation mechanism + 230 V AC electromagnetic release mechanism in the pulse connection (release occurs when the electromagnet is activated) + open and closed position indication with 230 V AC contact switches. Manual reset.

#### • KH6-2B

Fire damper with KH0 activation mechanism + 230 V AC electromagnetic release mechanism in the pulse connection (release occurs when the electromagnet is activated) + open and closed position indication with double 230 V AC contact switches. Manual reset.

Fire damper with KH0 activation mechanism + 230 V AC electromagnetic release mechanism in the pulse connection (release occurs when the electromagnet is activated) + open and closed position indication with 230 V AC contact switches + RMK4.0 motorised reset mechanism (24/48 V AC/DC).

#### • KHM6-2B

Fire damper with KH0 activation mechanism + 230 V AC electromagnetic release mechanism in the pulse connection (release occurs when the electromagnet is activated) + open and closed position indication with double 230 V AC contact switches + RMK4.0 motorised reset mechanism (24/48 V AC/DC).

#### Servomotor-operated activation mechanism

By default, all servomotor-operated fire dampers are supplied with a servomotor equipped with microswitches and, optionally, with a power and communication unit. The fire damper is equipped with a servomotor including a return spring that can close the damper from the building management system or after the electrothermal fuse blows. Servomotor-operated fire dampers in their standard configuration are equipped with an electrothermal fuse, which activates the closing of the damper when ambient temperature reaches or exceeds 72 °C. The power circuit to the servomotor is disconnected and its spring closes the damper within 20 seconds.

Notes:



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The Belimo servomotor is also available with 95 °C or 120 °C fuses.

The Belimo servomotor must be equipped with a control unit for triggering BSIA pulses.

#### BELIMO SERVOMOTOR $\mathbf{C}\mathbf{\epsilon}$

#### • B230T

Fire damper with activation mechanism + Belimo return spring servomotor (230 V AC) + electrothermal fuse and auxiliary switches.

#### • B24T

Fire damper with activation mechanism + Belimo return spring servomotor (24 V AC/DC) + 72 °C electrothermal fuse and auxiliary switches.

#### • B24T-W

Fire damper with an activation mechanism + Belimo return spring servomotor (24 V AC/DC) + 72 °C electrothermal fuse and auxiliary switches, supplied with cable connectors for the power and communication unit (communication unit not part of the mechanism) or control unit for triggering BSIA pulses.

#### BELIMO SERVOMOTOR + BSIA

#### • B24T-W+BSIA

Fire damper with B24T-W activation mechanism + Belimo control unit for triggering BSIA pulses.

### Design

The fire dampers have galvanised sheet steel housings. The blades made from asbestos-free insulation have a rubber seal for cold smoke and an intumescent seal, which expands in the event of fire.

### **Product Composition**

The product is made of galvanised sheet steel, a calcium silicate panel, fire-resistant carbon glass fibres, polyurethane foam and ethylene-propylene rubber. These materials are processed in accordance with local regulations. The product does not contain any hazardous substances, except for the fusible link solder, which contains one milligram of lead.

#### **List of Accessories**

Detailed information on the accessories available for the FDS-3G is available in the fire damper catalogue and technical selection guide.



## **Technical Parameters**

### **Durability Test**

• 50 cycles of the AM-FD manual activation mechanism – no changes to required properties

• 300 cycles of the AM-FD-K manual activation mechanism – no changes to required properties (manual and motorised reset)

• 10,000 + 100 + 100 cycles of the BELIMO servomotor-operated activation mechanism – no changes to required properties with BSIA only **(F) () ()** 

#### **Fire Test Pressure**

Negative pressure between 300 and 500 Pa.

#### **Safety Position**

Closed (in the event of fire, the damper is closed either by the servomotor spring or by the manual mechanism spring).

#### **Airflow Direction**

In both directions.

#### **Permissible Air Velocity**

The damper can continue to function at a maximum velocity of 12 m/s. Air free of any mechanical or chemical contamination.

#### **Fire Protection Side**

Depending on the installation classification: both sides (i $\leftrightarrow$ o)

#### **Repeated Opening**

Suitable for daily inspection procedures. It is not possible to operate the device once the activation temperature has been reached.

#### **Activation Temperature**

- · Manual operation:
- CE

74 °C in the standard configuration (100 °C on request), by means of a spring once the fusible link has melted



74 °C, by means of a spring once the fusible link has melted

· Servomotor operation:

**CE** 72 °C in the standard configuration (95 °C or 120 °C on request with the Belimo servomotor) by means of a spring once the current in the electrothermal fuse has been disconnected





### **Operating Temperature**

- Minimum: 0 °C
- Maximum: 60 °C for the fusible link set at 74 °C and 72 °C.
- Maximum: 85 °C for the fusible link set at 95 °C.
- Maximum: 105 °C for the fusible link set at 120 °C.

#### Adaptation to Environmental Conditions

Weather protection, with temperatures above 0 °C, up to 95% RH (3K5 according to EN 60721-3-3).

#### **Open/Closed Indicators**

- Microswitches with manual control Activation types H2 to H6-2 and KH2 to KH6-2
- Microswitches incorporated in the servomotor Activation types B24T-W
- Closing/Opening time
- Manual activation < 1 s, servomotor activation < 20 s

#### Maintenance

Not required. If required by the laws of the country where the dampers are installed, clean with a dry cloth.



#### Inspections

According to the laws of the country in which the fire dampers are installed: at least every 12 months

Permissible Pressure 1200Pa

Blade Leakage (EN 1751) Class 3 in the standard configuration

Housing Leakage (EN 1751) Class C in the standard configuration

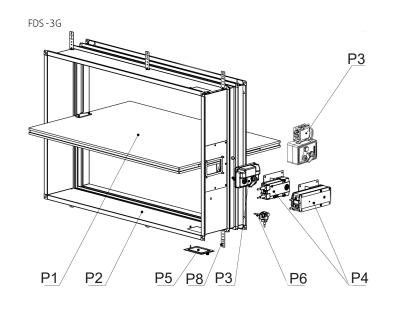
**Compliance with CE Directives** Low voltage Directive 2014/35/EU Electromagnetic compatibility Directive 2014/30/EU

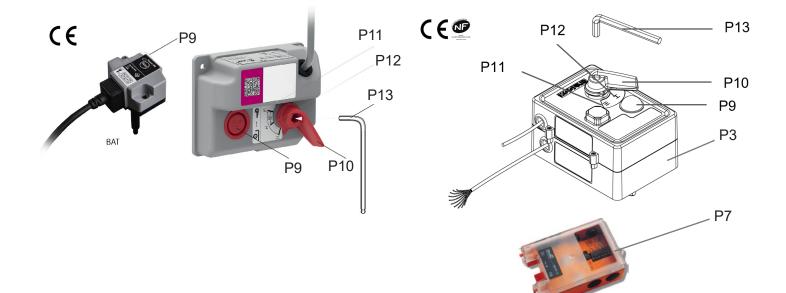
**Transportation and Storage** Store in a dry place indoors, between -20 °C and +50 °C

**Types of Servomotors** Belimo: BFL230-T, BFN230-T, BF230-T, BFL24-T, BFN24-T, BF-24-T BFL24-T-ST, BFN24-T-ST, BF24-T-ST, + BSIA (24/48 V)

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### **Product Parts**





#### Key:

- P1. Blade P2. Housing
- P3. Manual activation mechanism (KH0, KH...)
- P4. Servomotor activation mechanism (B... + BSIA) 💇
- P5. Inspection hatch cover
- P6. Electrothermal fuse (BAT72, TA-72)
- P7. BSIA (mandatory with the B274T-W servomotor)
- P8. Foldable suspension
- P9. Release and test button
- P10. Crank
- P11. Open position
- P12. Closed position
- P13. 10 mm Allen wrench (not included)



### Performance Evaluation – FDS-3G

#### 23 CE 1396

Safeair, S.L. (Spain) Avda. San Isidro, nave C-3, 45223 Seseña – TOLEDO

1396-CPR-0231, FDS-3G (valid for subgroups: KS...)

#### EN15650: 2010

#### **Rectangular fire dampers**

Standard activation conditions/sensitivity - Satisfactory

- Sensor load capacity
- Sensor response temperature

#### Response time – Satisfactory

- Closing time
- Operational reliability Satisfactory
- Motorised cycle 10,200 cycles
- Manual cycle (manual/motorised) = 300 cycles (AM-FD-K)

#### Fire resistance:

- · Resistivity depends on the installation method and location
- Integrity E
- · Maintenance of cross-sectional area (according to E)
- Mechanical stability (according to E)
- Cross-sectional area (according to E)
- Insulation I
- Smoke leakage S

Durability of response time – Satisfactory

· Temperature and sensor response capability

Durability of operational reliability - Satisfactory

Opening and closing cycle

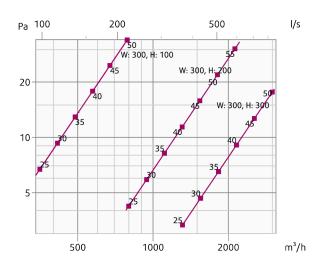
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## Diagrams

The pressure drop and total A-weighted sound power level discharged depend on the nominal width and height of the damper and the volume of air flow at different duct pressures. The type of activation does not affect the airflow parameter, which is why only one activation type is shown in the diagrams.

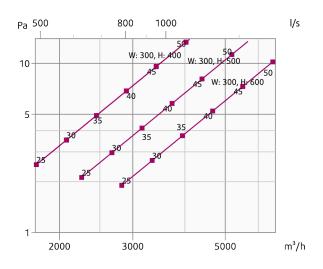
#### FDS-3G-...

Pressure drop and A-weighted sound power level in dB(A)



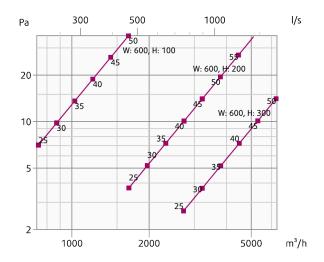
FDS-3G-...

Pressure drop and A-weighted sound power level in dB(A)



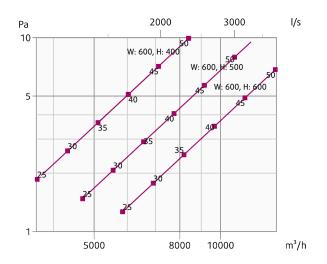
FDS-3G-...

Pressure drop and A-weighted sound power level in dB(A)



FDS-3G-...

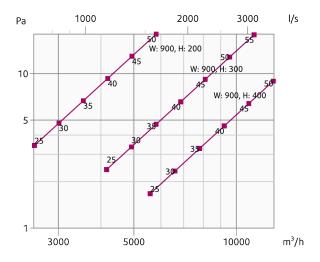
Pressure drop and A-weighted sound power level in dB(A)





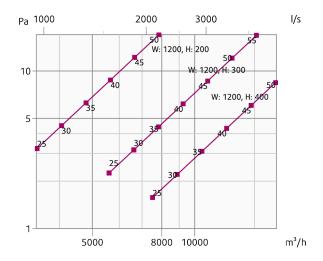
#### FDS-3G-...

Pressure drop and A-weighted sound power level in  $\ensuremath{\mathsf{dB}}(A)$ 

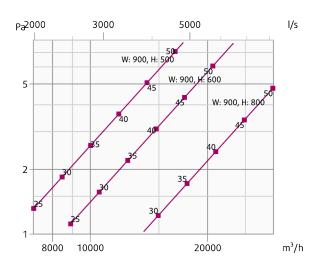


FDS-3G-...

Pressure drop and A-weighted sound power level in dB(A)

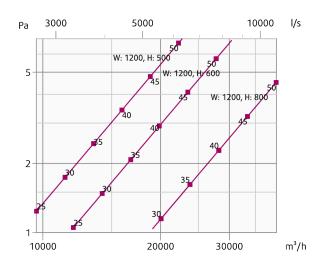


FDS-3G-...



FDS-3G-...

Pressure drop and A-weighted sound power level in dB(A)



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## **Dimensions**

Free area

	(2)										W (n	nm)									
S.L.	(m-)	100	150	200	250	300	315	350	355	400	450	500	550	560	600	630	650	700	710	750	800
	100	0,005	0,008	0,011	0,014	0,017	0,018	0,020	0,021	0,024	0,024	0,027	0,030	0,030	0,032	0,034	0,035	0,038	0,039	0,041	0,044
	150	0,008	0,012	0,017	0,022	0,028	0,029	0,033	0,033	0,038	0,040	0,045	0,049	0,050	0,054	0,057	0,059	0,064	0,065	0,068	0,073
	175	0,010	0,015	0,022	0,028	0,034	0,036	0,041	0,041	0,047	0,050	0,056	0,062	0,064	0,068	0,072	0,074	0,080	0,082	0,086	0,092
	180	0,011	0,016	0,022	0,029	0,036	0,038	0,042	0,043	0,049	0,053	0,059	0,065	0,066	0,071	0,075	0,078	0,084	0,085	0,090	0,096
	200	0,012	0,018	0,026	0,034	0,041	0,043	0,049	0,049	0,056	0,061	0,068	0,075	0,077	0,083	0,087	0,090	0,097	0,099	0,104	0,112
	250	-	0,024	0,035	0,045	0,055	0,058	0,065	0,066	0,075	0,082	0,092	0,102	0,103	0,111	0,117	0,121	0,131	0,133	0,141	0,150
	300	-	0,031	0,043	0,056	0,068	0,072	0,081	0,082	0,094	0,103	0,115	0,128	0,130	0,140	0,147	0,152	0,164	0,167	0,177	0,189
	315	-	-	0,046	0,059	0,072	0,076	0,086	0,087	0,099	0,109	0,122	0,135	0,138	0,148	0,156	0,161	0,174	0,177	0,187	0,200
	350	-	-	0,052	0,067	0,082	0,086	0,097	0,099	0,112	0,124	0,139	0,154	0,157	0,168	0,177	0,183	0,198	0,201	0,213	0,227
	355	-	-	0,053	0,068	0,083	0,088	0,099	0,100	0,114	0,126	0,141	0,156	0,159	0,171	0,180	0,186	0,201	0,204	0,216	0,231
н	400	-	-	-	0,078	0,096	0,101	0,113	0,115	0,131	0,145	0,163	0,180	0,183	0,197	0,207	0,214	0,232	0,235	0,249	0,266
(mm)	450	-	-	-	0,087	0,107	0,113	0,127	0,129	0,147	0,166	0,186	0,206	0,210	0,226	0,238	0,245	0,265	0,269	0,285	0,305
	500	-	-	-	0,099	0,121	0,127	0,143	0,145	0,165	0,188	0,210	0,232	0,236	0,254	0,268	0,277	0,299	0,303	0,321	0,343
	550	-	-	-	-	0,134	0,142	0,159	0,162	0,184	0,209	0,233	0,258	0,263	0,283	0,298	0,308	0,332	0,337	0,357	0,382
	560	-	-	-	-	0,137	0,145	0,162	0,165	0,188	0,213	0,238	0,263	0,268	0,289	0,304	0,314	0,339	0,344	0,364	0,390
	600	-	-	-	-	0,148	0,156	0,175	0,178	0,202	0,230	0,257	0,284	0,290	0,311	0,328	0,339	0,366	0,371	0,393	0,420
	630	-	-	-	-	-	0,154	0,173	0,176	0,201	0,229	0,257	0,284	0,290	0,312	0,329	0,340	0,368	0,374	0,396	0,424
	650	-	-	-	-	-	-	0,179	0,182	0,208	0,237	0,266	0,295	0,300	0,324	0,341	0,352	0,381	0,387	0,410	0,439
	700	-	-	-	-	-	-	0,195	0,198	0,226	0,258	0,289	0,320	0,327	0,352	0,370	0,383	0,414	0,421	0,446	0,477
	710	-	-	-	-	-	-	-	-	0,230	0,262	0,294	0,325	0,332	0,357	0,376	0,389	0,421	0,427	0,453	0,485
	750	-	-	-	-	-	-	-	-	0,244	0,278	0,312	0,346	0,353	0,380	0,400	0,414	0,447	0,454	0,481	0,515
	800	-	-	-	-	-	-	-	-	-	0,299	0,335	0,372	0,379	0,408	0,430	0,444	0,481	0,488	0,517	0,553

$$S.L. (dm^{2}) = A_{c} - A_{b} - A_{s}$$

$$A_{c}(dm^{2}) = (W - 12) (H - 12)$$

#### Legend:

S.L. = free area W = width H = height  $A_c = \text{contact area}$   $A_b = \text{blade area}$   $A_s = \text{sealing area}$   $W_b = \text{blade width} = W-12$   $t_b = \text{blade thickness}$  $W_g = \text{gasket width}$ 

## **Dimensions**

Free area

eı	(m2)					W (mm)	)			
S.L.	(m-)	850	900	950	1000	1050	1100	1120	1150	1200
	100	-	-	-	-	-	-	-	-	-
	150	-	-	-	-	-	-	-	-	-
	175	-	-	-	-	-	-	-	-	-
	180	-	-	-	-	-	-	-	-	-
	200	0,102	0,109	0,115	0,121	0,128	0,134	0,137	0,141	0,147
	250	0,143	0,152	0,161	0,170	0,178	0,187	0,191	0,196	0,205
	300	0,184	0,195	0,206	0,218	0,229	0,240	0,245	0,252	0,263
	315	0,196	0,208	0,220	0,232	0,244	0,256	0,261	0,268	0,280
	350	0,224	0,238	0,252	0,266	0,280	0,293	0,299	0,307	0,321
	355	0,228	0,242	0,256	0,271	0,285	0,299	0,304	0,313	0,327
н	400	0,265	0,281	0,298	0,314	0,330	0,347	0,353	0,363	0,379
(mm)	450	0,305	0,324	0,343	0,362	0,381	0,400	0,407	0,419	0,437
	500	0,346	0,367	0,389	0,410	0,431	0,453	0,461	0,474	0,495
	550	0,387	0,410	0,434	0,458	0,482	0,506	0,515	0,530	0,554
	560	0,395	0,419	0,443	0,468	0,492	0,516	0,526	0,541	0,565
	600	0,427	0,454	0,480	0,506	0,533	0,559	0,569	0,585	0,612
	630	0,452	0,479	0,507	0,535	0,563	0,591	0,602	0,619	0,647
	650	0,468	0,497	0,526	0,554	0,583	0,612	0,624	0,641	0,670
	700	0,508	0,540	0,571	0,602	0,634	0,665	0,678	0,697	0,728
	710	0,517	0,548	0,580	0,612	0,644	0,676	0,689	0,708	0,739
	750	0,549	0,583	0,617	0,651	0,684	0,718	0,732	0,752	0,786
	800	0,590	0,626	0,662	0,699	0,735	0,771	0,786	0,808	0,844

$$S.L. (dm^{2}) = A_{c} - A_{b} - A_{s}$$

$$A_{c}(dm^{2}) = (W - 12)^{*}x(H - 12)^{*} * 10^{-4}$$

$$A_{b}(dm^{2}) = W_{b}xt_{b}x10^{-4}$$

$$A_{s}(dm^{2}) = ((W - 12)^{*}x(H - 12)) - ((W - 12^{*} - (2 * W_{g}))) * (H - 12^{*} - (2 * W_{g}))) * 10^{-4}$$

#### Legend:

S.L. = free area W = width H = height  $A_c = contact area$   $A_b^c = blade area$   $A_s^c = sealing area$   $W_b^c = blade width = W-12$   $t_b^c = blade thickness$  $W_g^c = gasket width$ 

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## **Dimensions**

Free area

+ (m	(m)										<b>W</b> (I	mm)									
t <sub>ь</sub> (m	iiii)	100	150	200	250	300	315	350	355	400	450	500	550	560	600	630	650	700	710	750	800
	100	20	20	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	150	20	20	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	175	20	20	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	180	20	20	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	200	20	20	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	250	-	20	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	300	-	20	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	315	-	-	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	350	-	-	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	355	-	-	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
н	400	-	-	-	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
(mm)	450	-	-	-	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
	500	-	-	-	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
	550	-	-	-	-	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
	560	-	-	-	-	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
	600	-	-	-	-	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
	630	-	-	-	-	-	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
	650	-	-	-	-	-	-	35	35	35	35	35	35	35	35	35	35	35	35	35	35
	700	-	-	-	-	-	-	35	35	35	35	35	35	35	35	35	35	35	35	35	35
	710	-	-	-	-	-	-	-	-	35	35	35	35	35	35	35	35	35	35	35	35
	750	-	-	-	-	-	-	-	-	35	35	35	35	35	35	35	35	35	35	35	35
	800	-	-	-	-	-	-	-	-	-	35	35	35	35	35	35	35	35	35	35	35

$$S.L.(dm^{2}) = A_{c} - A_{b} - A_{s}$$

$$A_{c}(dm^{2}) = (W - 12)^{*}x(H - 12)^{*} * 10^{-4}$$

$$A_{b}(dm^{2}) = W_{b}xt_{b}x10^{-4}$$

$$A_{s}(dm^{2}) = ((W - 12)^{*}x(H - 12)) - ((W - 12^{*} - (2 * W_{g})) * (H - 12^{*} - (2 * W_{g}))) * 10^{-4}$$

#### Legend:

S.L. = free area W = width H = height  $A_c = \text{contact area}$   $A_b = \text{blade area}$   $A_s = \text{sealing area}$   $W_b = \text{blade width} = W-12$   $t_b = \text{blade thickness}$  $W_g = \text{gasket width}$ 

## **Dimensions**

Free area

6 /m	o.mo)					W (mm)	)			
t <sub>ь</sub> (n	nm)	850	900	950	1000	1050	1100	1120	1150	1200
	100	-	-	-	-	-	-	-	-	-
	150	-	-	-	-	-	-	-	-	-
	175	-	-	-	-	-	-	-	-	-
	180	-	-	-	-	-	-	-	-	-
	200	35	35	35	35	35	35	35	35	35
	250	35	35	35	35	35	35	35	35	35
	300	35	35	35	35	35	35	35	35	35
	315	35	35	35	35	35	35	35	35	35
	350	35	35	35	35	35	35	35	35	35
	355	35	35	35	35	35	35	35	35	35
н	400	35	35	35	35	35	35	35	35	35
(mm)	450	35	35	35	35	35	35	35	35	35
	500	35	35	35	35	35	35	35	35	35
	550	35	35	35	35	35	35	35	35	35
	560	35	35	35	35	35	35	35	35	35
	600	35	35	35	35	35	35	35	35	35
	630	35	35	35	35	35	35	35	35	35
	650	35	35	35	35	35	35	35	35	35
	700	35	35	35	35	35	35	35	35	35
	710	35	35	35	35	35	35	35	35	35
	750	35	35	35	35	35	35	35	35	35
	800	35	35	35	35	35	35	35	35	35

$$S.L. (dm^{2}) = A_{c} - A_{b} - A_{s}$$

$$A_{c}(dm^{2}) = (W - 12) (H - 12)$$

#### Legend:

S.L. = free area W = width H = height  $A_c = \text{contact area}$   $A_b = \text{blade area}$   $A_s = \text{sealing area}$   $W_b = \text{blade width} = W-12$   $t_b = \text{blade thickness}$  $W_g = \text{gasket width}$ 

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## **Dimensions**

Free area

											W (I	nm)									
W <sub>g</sub> (I	nm)	100	150	200	250	300	315	350	355	400	450	500	550	560	600	630	650	700	710	750	800
	100	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	150	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	175	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	180	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	200	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	250	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	300	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	315	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	350	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	355	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Н	400	-	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
(mm)	450	-	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	500	-	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	550	-	-	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	560	-	-	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	600	-	-	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	630	-	-	-	-	-	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
	650	-	-	-	-	-	-	13	13	13	13	13	13	13	13	13	13	13	13	13	13
	700	-	-	-	-	-	-	13	13	13	13	13	13	13	13	13	13	13	13	13	13
	710	-	-	-	-	-	-	-	-	13	13	13	13	13	13	13	13	13	13	13	13
	750	-	-	-	-	-	-	-	-	13	13	13	13	13	13	13	13	13	13	13	13
	800	-	-	-	-	-	-	-	-	-	13	13	13	13	13	13	13	13	13	13	13

$$S.L. (dm^{2}) = A_{c} - A_{b} - A_{s}$$

$$A_{c}(dm^{2}) = (W - 12) (H - 12) * 10^{-4}$$

$$A_{b}(dm^{2}) = W_{b} x t_{b} x 10^{-4}$$

$$A_{s}(dm^{2}) = ((W - 12) ((W - 12) - (2 * W_{g})) * (H - 12) (2 * W_{g})) * (10^{-4})$$

#### Legend:

S.L. = free area W = width H = height  $A_c = \text{contact area}$   $A_b = \text{blade area}$   $A_s = \text{sealing area}$   $W_b = \text{blade width} = W-12$   $t_b = \text{blade thickness}$  $W_g = \text{gasket width}$ 

## **Dimensions**

Free area

Mar (r						W (mm)				
Wg (r	nm)	850	900	950	1000	1050	1100	1120	1150	1200
	100	-	-	-	-	-	-	-	-	-
	150	-	-	-	-	-	-	-	-	-
	175	-	-	-	-	-	-	-	-	-
	180	-	-	-	-	-	-	-	-	-
	200	13	13	13	13	13	13	13	13	13
	250	13	13	13	13	13	13	13	13	13
	300	13	13	13	13	13	13	13	13	13
	315	13	13	13	13	13	13	13	13	13
	350	13	13	13	13	13	13	13	13	13
	355	13	13	13	13	13	13	13	13	13
н	400	13	13	13	13	13	13	13	13	13
(mm)	450	13	13	13	13	13	13	13	13	13
	500	13	13	13	13	13	13	13	13	13
	550	13	13	13	13	13	13	13	13	13
	560	13	13	13	13	13	13	13	13	13
	600	13	13	13	13	13	13	13	13	13
	630	13	13	13	13	13	13	13	13	13
	650	13	13	13	13	13	13	13	13	13
	700	13	13	13	13	13	13	13	13	13
	710	13	13	13	13	13	13	13	13	13
	750	13	13	13	13	13	13	13	13	13
	800	13	13	13	13	13	13	13	13	13

$$S.L. (dm^{2}) = A_{c} - A_{b} - A_{s}$$

$$A_{c}(dm^{2}) = (W - 12)^{*}x(H - 12)^{*} + 10^{-4}$$

$$A_{b}(dm^{2}) = W_{b}xt_{b}x10^{-4}$$

$$A_{s}(dm^{2}) = ((W - 12)^{*}x(H - 12)) - ((W - 12^{*} - (2 * W_{g})) * (H - 12^{*} - (2 * W_{g}))) * 10^{-4}$$

#### Legend:

S.L. = free area W = width H = height  $A_c = contact area$   $A_b^c = blade area$   $A_s^c = sealing area$   $W_b^c = blade width = W-12$   $t_b^c = blade thickness$  $W_g^c = gasket width$ 



## **Dimensions and Weight**

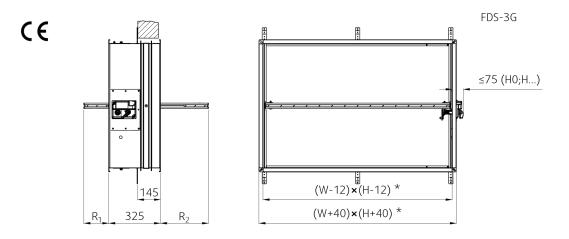
#### Dimensions

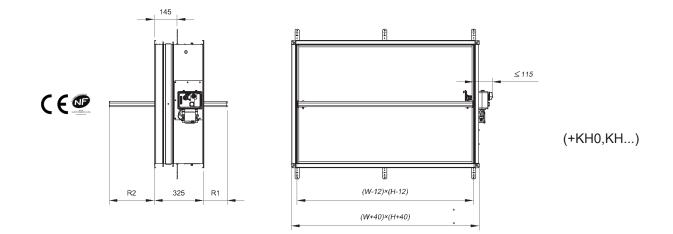
To prevent obstruction of the damper blade movement, connect a straight duct section with minimum lengths R1 or R2, respectively. R1 and R2 represent the overhang of the fully open damper blade, including the seals and blade gaskets.

#### NOTES

'\* For nominal dimension W = 100 mm, the internal width is 100 mm and the outer flange width is 152 mm; and/or for nominal dimension H = 100 mm, the internal height is 100 mm and the outer flange height is 152 mm.

#### FDS-3G, 100 x 100 to 1200 x 800







## **Dimensions and Weight**

## Blade protrusion

											H (r	nm)										
	100	150	175	180	200	250	300	315	350	355	400	450	500	550	560	600	630	650	700	710	750	800
R <sup>1</sup>	-188	-163	-150	-148	-143	-118	-93	-85	-68	-65	-43	-18	7	32	37	57	72	82	107	112	132	157
R <sup>2</sup>	-43	-18	-5	-3	2	27	52	60	77	80	102	127	152	177	182	202	217	227	252	257	277	302

## Weight

116 - 1	400()										W (I	mm)									
(Kg ±	10%)	100	150	200	250	300	315	350	355	400	450	500	550	560	600	630	650	700	710	750	800
	100	4,2	4,6	5,1	5,5	6	6,1	6,4	6,5	6,9	7,4	7,8	8,3	8,4	8,8	9	9,2	9,7	9,8	10,1	10,6
	150	4,6	5,1	5,6	6,2	6,7	6,8	7,2	7,3	7,7	8,3	8,8	9,3	9,4	9,9	10,2	10,4	10,9	11	11,4	11,9
	200	5,1	5,7	6,2	6,8	7,4	7,6	8	8,1	8,6	9,2	9,8	10,4	10,5	11	11,3	11,6	12,2	12,3	12,7	13,3
	250	-	6,2	6,8	7,5	8,1	8,3	8,8	8,9	9,4	10,2	10,8	11,5	11,6	12,1	12,5	12,8	13,4	13,5	14,1	14,7
	300	-	6,7	7,4	8,1	8,8	9,1	9,6	9,7	10,3	11,1	11,8	12,5	12,6	13,2	13,6	13,9	14,6	14,8	15,4	16,1
	315	-	-	7,6	8,3	9,1	9,3	9,8	9,9	10,5	11,3	12,1	12,8	13	13,5	14	14,3	15	15,2	15,8	16,5
	350	-	-	8	8,8	9,6	9,8	10,3	10,4	11,1	12	12,8	13,5	13,7	14,3	14,8	15,1	15,9	16	16,7	17,5
	355	-	-	8,1	8,9	9,7	9,9	10,4	10,5	11,2	12,1	12,9	13,6	13,8	14,4	14,9	15,2	16	16,2	16,8	17,6
	400	-	-	8,6	9,4	10,3	10,5	11,1	11,2	12	12,9	13,7	14,6	14,8	15,4	15,9	16,3	17,1	17,3	18	18,8
н	450	-	-	-	10,1	11	11,3	11,9	12	12,8	13,8	14,7	15,6	15,8	16,5	17,1	17,5	18,4	18,6	19,3	20,2
(mm)	500	-	-	-	10,7	11,7	12	12,7	12,8	13,7	14,7	15,7	16,7	16,9	17,7	18,2	18,6	19,6	19,8	20,6	21,6
	550	-	-	-	-	12,4	12,7	13,5	13,6	14,5	15,6	16,7	17,7	17,9	18,8	19,4	19,8	20,9	21,1	21,9	22,9
	560	-	-	-	-	12,6	12,9	13,6	13,7	14,7	15,8	16,7	17,9	18,1	19	19,6	20	21,1	21,3	22,2	23,2
	600	-	-	-	-	13,1	13,5	14,2	14,4	15,4	16,5	17,7	18,8	19	19,9	20,5	21	22,1	22,3	23,2	24,3
	630	-	-	-	-	-	-	18,4	18,5	19,9	21,5	23	24,6	24,9	26,1	27,1	27,7	29,2	29,6	30,8	32,4
	650	-	-	-	-	-	-	18,8	19	20,4	22	23,6	25,2	25,5	26,8	27,7	28,3	29,9	30,3	31,5	33,1
	700	-	-	-	-	-	-	19,9	20	21,6	23,2	24,9	26,6	26,9	28,3	29,3	30	31,7	32	33,3	35
	710	-	-	-	-	-	-	-	20,3	21,8	23,5	25,2	26,9	27,2	28,6	29,6	30,3	32	32,3	33,7	35,4
	750	-	-	-	-	-	-	-	-	22,7	24,5	26,3	28,1	28,4	29,8	30,9	31,6	33,4	33,7	35,2	36,9
	800	-	-	-	-	-	-	-	-	23,9	25,8	27,6	29,5	29,9	31,4	32,5	33,2	35,1	35,5	37	38,9

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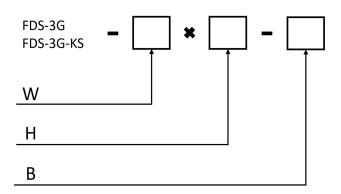
## **Dimensions and Weight**

## Weight

(Kat	40%)					W (mm)	)			
(Kg ±	10%)	850	900	950	1000	1050	1100	1120	1150	1200
	100	-	-	-	-	-	-	-	-	-
	150	-	-	-	-	-	-	-	-	-
	200	-	-	-	-	-	-	-	-	-
	250	-	-	-	-	-	-	-	-	-
	300	26,5	27,7	29	30,2	31,5	32,7	34	35,2	36,1
	315	21,2	22,2	23,1	24,1	25,6	26,6	27	27,6	28,5
	350	22,6	23,6	24,7	25,7	27,3	28,3	28,7	29,3	30,4
	355	22,8	23,9	24,9	25,9	27,5	28,6	29	29,6	30,6
	400	24,6	25,7	26,9	28	29,7	30,8	31,2	31,9	33
н	450	26,6	27,8	29,1	30,3	32,1	33,3	33,8	34,5	35,7
(mm)	500	28,6	29,9	32,2	32,6	64,4	62,7	36,3	37,1	38,4
	550	30,6	32	33,4	34,8	36,8	38,2	38,8	39	41
	560	31	35,5	33,9	35,3	37,3	38,7	39,3	40,1	41,6
	600	32,6	34,1	35,6	37,1	39,2	40,7	41,3	42,2	43,7
	630	33,9	35,5	37	38,6	40,7	42,2	42,8	43,8	45,3
	650	34,7	36,3	37,9	39,5	41,6	43,2	43,9	44,8	46,4
	700	36,7	38,4	40,1	41,8	44	45,7	46,4	47,4	49,1
	710	37,1	38,8	40,5	42,2	44,5	46,2	46,9	47,9	49,6
	750	38,7	40,5	42,3	44	46,4	48,2	48,9	49,9	51,7
	800	40,7	42,6	44,5	46,3	48,8	50,6	51,4	52,5	54,4



## **Order Code**



W – Width

100 mm to 1,200 mm (FDS-3G)

H – Height

100 mm to 800 mm (FDS-3G)

**B – Activation Type (KH0 to B24T-W)** 

## AM-FD CE

H0 (manual lever, no switches)

H2 (manual lever, 2 start of stroke and end of stroke limit switches)

H5-2 (manual lever, 24V AC/DC electromagnet, 2 start of stroke and end of stroke limit switches)

H6-2 (manual lever, 230V AC electromagnet, 2 start of stroke and end of stroke limit switches)

B230T (Belimo 230V AC servomotor)

B24T (Belimo 24V AC/DC servomotor)

B24T-W (Belimo 24V AC/DC servomotor and cable connector for communication unit)

## ам-fd-к 🤇 🧲 💇

KH0 (manual lever, no switches)

KH2U (manual lever, 1 start of stroke limit switch and 1 end of stroke limit switch 12/24/48V AC/DC, 125V AC) KH2B (manual lever, 2 start of stroke limit switches and 2 end of stroke limit switches 12/24/48V AC/DC, 125V AC) KH5-2U (manual lever, 24/48V DC electromagnet, 1 start of stroke limit switch and 1 end of stroke limit switch 12/24/48V AC/DC, 125V AC

KH5-2B (manual lever, 24/48V DC electromagnet, 2 start of stroke limit switches and 2 end of stroke limit switches 12/24/48V AC/DC, 125V AC)

KHM5-2U (manual lever, 24/48V DC electromagnet, 1 start of stroke limit switch and 1 end of stroke limit switch 12/24/48V AC/DC, 125V AC), RMK4.0 (motorised reset at 24/48 AC/DC)

KHM5-2B (manual lever, 24/48V DC electromagnet, 2 start of stroke limit switches and 2 end of stroke limit switches 12/24/48V AC/DC, 125V AC), RMK4.0 (motorised reset at 24/48 AC/DC)

#### AM-FD-K (on request)

KH0 (manual lever, no switches)

KH3U (manual lever, 1 start of stroke limit switch and 1 end of stroke limit switch 230V AC)

KH3B (manual lever, 2 start of stroke limit switches and 2 end of stroke limit switches 230V AC)

KH6-2U (manual lever, 24/48V DC electromagnet, 1 start of stroke limit switch and 1 end of stroke limit switch 230V AC) KH6-2B (manual lever, 24/48V DC electromagnet, 2 start of stroke limit switches and 2 end of stroke limit switches 230V AC) AC)

KHM6-2U (manual lever, 24/48V DC electromagnet, 1 start of stroke limit switch and 1 end of stroke limit switch 230V AC), RMK4.0 (motorised reset at 24/48 AC/DC)

KHM6-2B (manual lever, 24/48V DC electromagnet, 2 start of stroke limit switches and 2 end of stroke limit switches 230V AC), RMK4.0 (motorised reset at 24/48 AC/DC)

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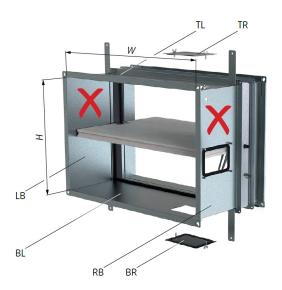
## **Order Code**

#### Examples of order codes for rectangular fire dampers

#### FDS-3G-1200x800-H5-2 (AM-FD)

Rectangular fire damper, nominal dimensions: width × height = 1,200 × 800 mm, with open and closed position indication by 230V microswitches.

Note: Fire resistance depends on the installation method.



#### B – Activation Type (KH0 to B24T-W)

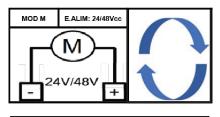
#### W and H < 200

No inspection hatch. Inspection is performed via a removable mechanism or an additional inspection hatch must be added to the connection duct. W and  $H \ge 200$ 

Standard in position: BR



#### **Identification label**



FDR3G (100 <= 0	DN =	400 mm) n	ésistance	au feu selo	on mode d	'installatio	n
Résistance au feu		wet	dry	soft	Hilti	On & Out 2	On & Out 1 layers
El60 (ve hoi↔ o) S	ve	• 0	•	•	•	•	•
	ho	•	٠	•			
El90 (ve hoi↔ o) S	ve	• 0	•	•	•	•	
	ho	•	•	•			
El120 (ve ho i ↔ o) S	ve	• •					
	ho	•					
Notes:		•Tes	té à 300 P	a ∝Testé à	500 Pa; V	oir Notice	

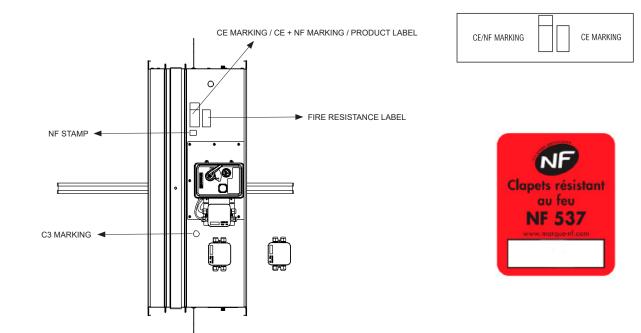
Mécanisme de déclencheme Code: AM-FD-KHM5			Ζ	+	No. of Concession, No. of Conces
Signalisation: FDCB: 12/24/ 125 V AC	48 V AC/DC ou	Ľ	=	ĥ	₩ <b>€₽</b> ,°
E.TELE 24/48 DC 3	5W	$1^{2^{4}}$	W.48V		
E.ALIM 24/48 DC		Γ <sub>D</sub> c	U F	C	J DCB FCB
Fabriqué: 07/11/2024	Code de	ĸ	Ť t		ININI
Type de commande: télé	compatibilité:	LI Ì		ľ	
IP42 K12345600010001	KS94	NC C	NON(	20 7	NONC C NONC C NO 8 9 101 1121 31 4

Clapet résistant au feu 23 C C 1396 - CPR - 0231 DOP FDS-3G B Norme produit EN 15650 Dim.nom: 200 x 200	DS-3G 200 x 200 3C	N° Titulaire NF: <b>21</b>	
Référence: REM-SYSTEMAIR-Nº	VAR: KS94,KS12 Laresstance au reu depend de la methode dinstalation Voir éloquelle de résistance su feu INSTALLER SELON NOTICE TECHNIQUE	S.L. (dm2) 2,6	
No de Série: SAFEAIR S.L K12345600010001 +34.918.098 ;	Produit non modulaire		

#### Legend:

- auto = automatic
- RC = remote-controlled
- Pa = pressure in Pascals
- ND = nominal dimensions (mm)
- FA = free area
- PI = power input
- RCI = remote control input
- E = emission
- VAC = Volts alternating current
- VDC = Volts direct current

#### **Location of Labels**



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## Installation

anal						
			a)	b)*	c)*	
FDS-3G <b>C €</b> 100 × 100 1200 × 800 Subpressure 300Pa	FDS-3G	El 60 ( $v_e h_o i \leftrightarrow o$ ) S	≥ 100 mm	≥ 150 mm	≥ 150 mm	
		El 90 ( $v_e h_o i \leftrightarrow o$ ) S	≥ 125 mm			
	El 120 ( $v_e h_o i \leftrightarrow o$ ) S	≥ 150 mm			360°	
1 Wet	FDS-3G 100 × 100 1200 × 800 Subpressure 500Pa	El 120 (v <sub>e</sub> h <sub>o</sub> i ↔ o) S	≥ 150 mm	≥ 150 mm	≥ 150 mm	360°
	FDS-3G	El 60 ( $v_e h_o i \leftrightarrow o$ ) S	≥ 100 mm		≥ 110 mm	
	100 × 100 1200 × 800 Subpressure 300Pa	El 90 ( $v_e h_o i \leftrightarrow o$ ) S	≥ 125 mm	≥ 110 mm		360°
3 Soft		EI 60 ( $v_e^{}i \leftrightarrow o$ ) S	≥ 100 mm	- ≥ 110 mm		
	FDS-3G	El 90 (v <sub>e</sub> i $\leftrightarrow$ o) S	≥ 125 mm			360°
	100 × 100	El 60 ( $h_{o} i \leftrightarrow o$ ) S			≥ 110 mm	
	1200 × 800	El 90 ( $h_o i \leftrightarrow o$ ) S			≥ 110 mm	
	Subpressure 300Pa	El 120 (h <sub>o</sub> i $\leftrightarrow$ o) S			≥ 150 mm	
3H Hilti	FDS-3G 100 × 100 1200 × 800 Subpressure 300Pa	El 60 (v <sub>e</sub> - i $\leftrightarrow$ o) S	≥ 100 mm	≥ 110 mm		360°
	FDS-3G <b>CE</b> 100 × 100	EI 60 ( $v_e - i \leftrightarrow o$ ) S	≥ 100 mm	· ≥ 110 mm		
1 ON & OUT		El 90 (v <sub>e</sub> - i $\leftrightarrow$ o) S	≥ 125 mm			
5.2 ON & OUT	FDS-3G <b>( €</b> 100 × 100 1200 × 800 Subpressure 300Pa	El 60 (v <sub>e</sub> - i ↔ o) S	≥ 100 mm	≥ 125 mm		
	FDS-3G	El 60 (v <sub>e</sub> - i $\leftrightarrow$ o) S	≥ 100 mm	· ≥ 110 mm		
5.3 ON & OUT	100 × 100 1200 × 800 Subpressure 300Pa	El 90 (v <sub>e</sub> - i $\leftrightarrow$ o) S	≥ 125 mm			
5.4 ON & OUT	FDS-3G 100 × 100 1200 × 800 Subpressure 300Pa	El 60 (v <sub>e</sub> - i ↔ o) S	≥ 100 mm	≥ 110 mm		

## Installation

#### Legend

- 1. Wet Installation in wet material, filled with plaster/mortar/concrete
- 2. Dry Dry installation, made good with board and mineral wool filler
- 3. Soft Soft installation using
- 4. Hilti Made good with Hilti foam only.
- 5.1. In & Out IN & OUT the wall installation with 2 layers of Mineral Wool rated
- 5.2. In & Out IN & OUT the wall installation with 1 layer of mineral wool rated
- 5.3. On & Out ON & OUT of the wall installation rated for EI90S, Using Promatect boards
- 5.4. On & Out ON & OUT of the wall installation rated for El60S, Using Promatect boards

#### Types of wall

- a) Flexible wall (plasterboard)
- b) Wall made of concrete/masonry/aerated concrete (rigid)
- c) Floor/ceiling made of concrete/aerated concrete (rigid)

#### Classification

- (E) Integrity.
- (I) Isolation.
- $(h_{o})$  Installed in horizontal slab. Mounted in horizontal enclosure.
- (v) Installed in wall or stud wall. Mounted in vertical enclosure.
- $(i \leftrightarrow o)$  Mechanism position. Symmetric (independent of airflow direction).
- (S) Air tightness

#### Installation, Maintenance & Operation

Some damper parts may have sharp edges – therefore to protect yourself from harm, please use gloves during damper installation and manipulation. In order to prevent electric shock, fire or any other damage which could result from incorrect damper usage and operation, it is important to:

- 1. Ensure that the installation is performed by a trained person.
- 2. Follow the written and depicted instructions provided within the Handbook closely.
- 3. Perform damper inspection in accordance with Handbook.
- 4. Check the damper's functionality as per the chapter "Fire Damper Functionality Check" before you install the fire damper. This procedure prevents the installation of a damper that has been damaged during transportation or handling.

Information about installation, maintenance and operation can be found at www.koolair.com.

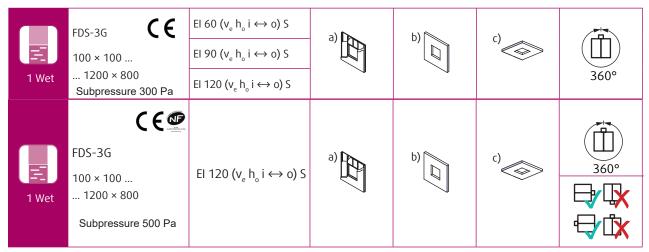
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### **Rules for installation**

- The duct connected to the fire damper must be supported or hung in such a way that the damper does not carry its weight. The damper must not support any part of the surrounding construction or wall which could cause damage and consequent damper failure. It is recommended to connect the damper to a dilatation compensator on either end of the damper.
- The damper driving mechanism can be placed on either side of the wall, however, it needs to be placed to ensure easy access during inspection.
- According to the standard EN 1366-2, the distance between the fire damper bodies must be at least 200 mm. This
  condition does not apply to tested distances. Therefore, Wet and Soft installations are approved for smaller distances
  under condition that the resulted resistivity is reduced to EI90S.
- The distance between the wall/ceiling and the fire damper must be at least 75 mm. This condition does not apply to tested distances. Therefore, Wet and Soft installations are approved for smaller distances under condition that the resulted resistivity is reduced to EI90S.
- The fire damper must be installed into a fire partition structure in such a way that the damper blade in its closed position is located inside this structure. A bendable hinge is provided on the damper body which represents a plane where supporting construction begins. This condition does not apply for installations On & Out.
- For each resistivity the minimum thickness of its supporting construction cannot be decreased as per EN 1366-2 at least 200 mm from the installation opening.
- The gap in the installation opening between the fire damper and the wall/ceiling can be increased by up to 50% of the gap area or decreased to the smallest amount possible that still provides sufficient space for the installation of the filling.

IN ACCORDANCE WITH EN 15650, ALL FIRE DAMPERS MUST BE INSTALLED IN ACCORDANCE WITH THE INSTALLATION INSTRUCTIONS PROVIDED BY THE MANUFACTURER.

### Wet installation



#### Using Plaster/Mortar/Concrete Filling

Importante Usar el soporte del interior de la compuerta al añadir el relleno. El peso del relleno puede dañar o doblar la envolvente de la compuerta.

Important: Use support inside the damper when adding filling. The weight of the filling can damage or bend the damper casing.

- 1. The opening in the supporting construction must be prepared as shown below. The surfaces of the opening must be clean and even.
- 2. Openings in flexible walls must be reinforced in line with the standards for plasterboard walls. The dimensions of the opening should be the nominal dimensions of the damper plus an additional clearance. For circular dampers, an opening with diameter D1 should be made.
- 3. Insert the closed damper in the centre of the opening so that the damper blade is in the wall. Use the foldable bracket (2; units) to secure the damper against the wall with a suitable screw (F1; recommended screw diameter 5.5 mm, e.g. DIN7981).
- 4. For damper width above 800 mm, it is recommended to use a duct support inside the damper to ensure the weight of the filling material does not damage or deform the damper casing.
- 5. Fill the area between the wall and the damper with plaster, mortar or concrete filler (2). Take care to avoid soiling the working parts of the damper, which could prevent it from functioning properly. It is recommended that the working parts are covered during installation. Boards can be used to avoid seepage of the filling material although they are not necessary for wet installation.
- 6. First allow the plaster, mortar or concrete filler to harden and then carry out the following steps.
- 7. Once the filling material has hardened, remove the duct support from inside the damper.
- 8. If necessary, uncover or clean the damper after installation.
- 9. Check damper operation

#### **Standard Distances**

According to EN 1366-2, there must be a minimum distance of 75 mm between the wall or ceiling and the damper body. Where multiple ducts cross through a fire wall, there must be a minimum distance of 200 mm between two damper bodies. This also applies to the distance between a damper and any foreign object passing through the fire wall nearby.

#### Smaller Distances - Maximum resistivity reduced to El90S

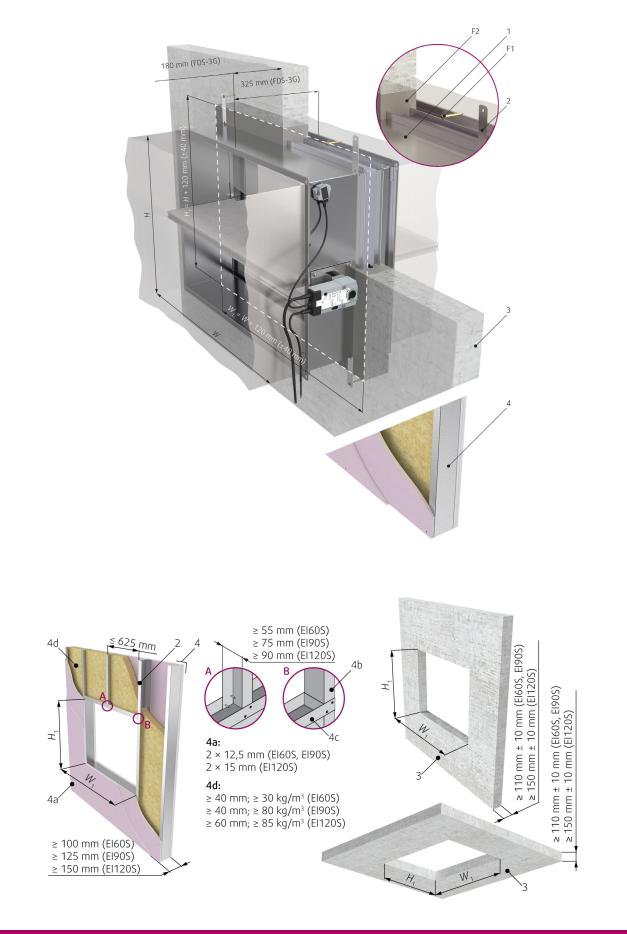
The distance between 2 individual fire dampers can be reduced to 60 mm, measured from surface to surface of the housing and the distance between the surface of the damper installed in the duct and the adjacent supporting construction (wall/floor) can be reduced to 40 mm, provided that the fire resistance classification will be reduced as follows: El90 ( $v_a i \leftrightarrow o$ ) S

#### Installation in a thinner wall than tested

It is possible to install the damper in a thinner wall provided that an additional layer(s) of fire board is fixed to the wall surface so that the damper penetration is sealed to the same length as that tested. The minimum width of the boards added around the damper should be 200 mm. What is more, any thinner walls must be classified according to EN 13501-2:2007 + A1: 2009 for the fire resistance required for the intended use of the product. In the case of an overhanging wall, the additional layers of fire board must be fixed to the steel supporting structure.

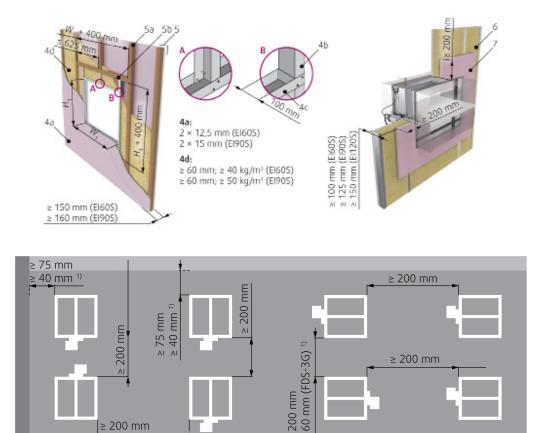


### Wet installation





### Wet installation



#### Legend:

F1. Screw  $\geq$  5,5 DIN7981 or suitable wall plug and screw size 6.

≥ 60 mm (FDS-3G)

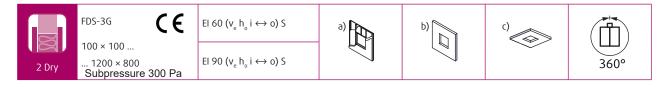
- F2. Plaster/mortar/concrete filling
- 1. Fire damper (actuator side)
- 2. Bendable hanger
- 3. Concrete/masonry/cellular concrete wall or ceiling
- 4. Flexible (plasterboard) wall
- 4a. 2 layers of plasterboard fireproof plate type F, EN 520
- 4b. Vertical CW profiles
- 4c. Horizontal CW profiles
- 4d. Mineral wool; thickness/cubic density see picture.
- 5. Flexible (wood beam) wall
- 5a. Vertical spruce wooden beam  $\ge 60 \times 100$  mm
- 5b. Horizontal spruce wooden beam ≥ 80 × 100 mm
- 6. Alternative thinner wall (classified in accordance with EN 13501-2:2007 + A1: 2009 for fire resistance required for product application)
- 7. Area of 200 mm from opening around the damper must have the same composition and be created the same way as Flexible (plasterboard) wall.

#### Notes:

- a) Flexible (plasterboard) wall
- b) Concrete/masonry/cellular concrete (rigid) wall
- c) Concrete/cellular concrete (rigid) floor/ceiling
- v Vertical wall
- hoise Horizontal floor/ceiling
- 1) Smaller distances resistivity must be reduced to El90 (  $v_{e} i \leftrightarrow o$  ) S

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### **Dry installation**



#### Using Mineral Wool and Cover Boards

- 1. The supporting construction opening must be prepared as depicted. Opening surfaces must be even and cleaned off. The flexible wall opening must be reinforced as per the standards for plasterboard walls. The opening dimensions are driven by the nominal dimensions of the damper with added clearance. For rectangular dampers, the opening will have dimensions of W1 and H1.
- 2. With FDS-3G dampers it is necessary to install the bendable hangers (2) onto the cover boards using suitable screws or screws with wall plug (F1). Insert the damper from the mechanism side and secure the bendable hangers of the damper into the cover board (FDS-3G). Subsequently mount the remaining cover boards from the mechanism side.
- 3. Fill in the area between the wall and the damper with mineral wool (F3) with a density of at least 50 kg/m3 thoroughly but in such a way that will not deform the damper housing, while paying attention to prevent the fouling of the damper's functional parts, which could limit its correct functionality.
- 4. Close the gap between the damper and the mounting opening, for a circular damper use CBR-FD cover boards, for a rectangular damper use CBS-FD cover boards with screws (F1) through pre-drilled holes.
- 5. All the gaps between the cover boards, between cover boards and the wall and between cover boards and the fire damper need to be filled with fire-resistive coating (F4).
- 6. If needed, uncover and clean the damper after installation.
- 7. Check the damper's functionality

#### **Standard Distances**

According to EN 1366-2, there must be a minimum distance of 75 mm between the wall or ceiling and the damper body. Where multiple ducts cross through a fire wall, there must be a minimum distance of 200 mm between two damper bodies.

This also applies to the distance between a damper and any foreign object passing through the fire wall nearby

#### Smaller distances

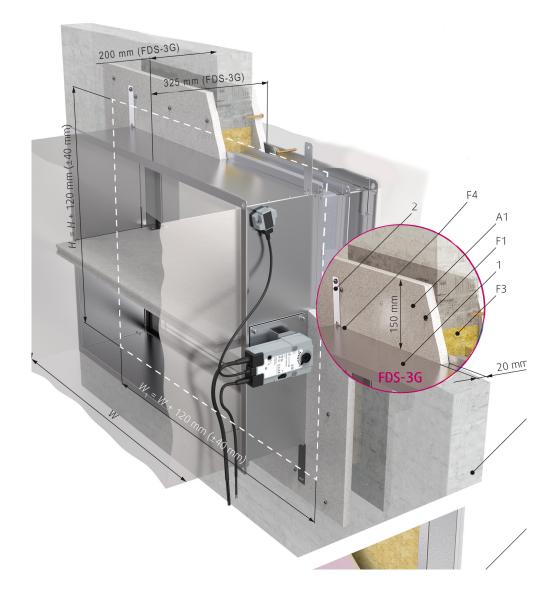
For Dry installation, the minimum distance from the wall or ceiling to the damper body is 150 mm. For multiple crossings through a fire-resistive wall the minimum distance between two damper bodies is 300 mm. Distances between the damper and a nearby foreign object crossing the fire-resistive wall is 200 mm.

#### Installation in a thinner wall than tested

It is possible to install the damper in a thinner wall provided that an additional layer(s) of fire board is fixed to the wall surface so that the damper penetration is sealed to the same length as that tested. The minimum width of the boards added around the damper should be 200 mm. What is more, any thinner walls must be classified according to EN 13501-2:2007 + A1: 2009 for the fire resistance required for the intended use of the product. In the case of an overhanging wall, the additional layers of fire board must be fixed to the steel supporting structure.

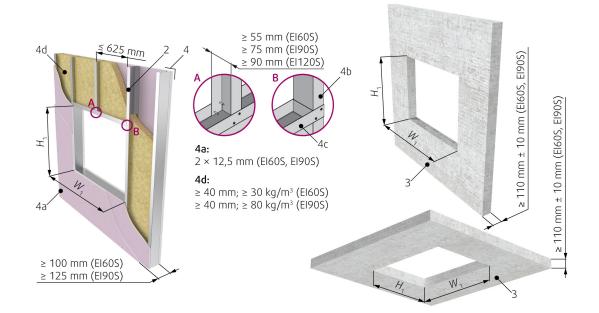


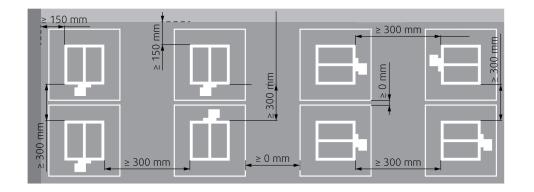
## Dry installation

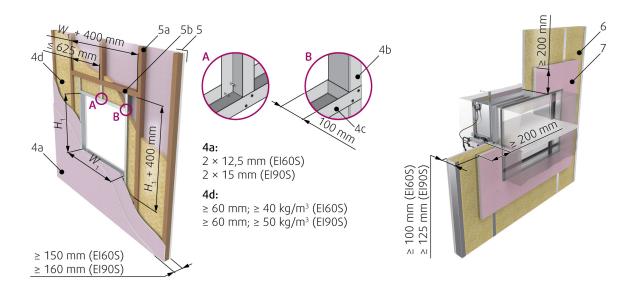


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## **Dry installation**









### **Dry installation**

#### Legend:

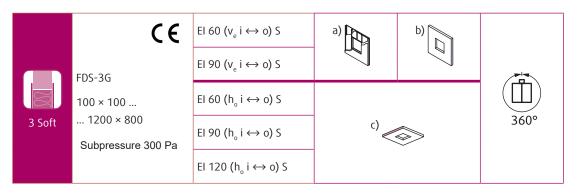
- F1. Screw ≥ 5,5 DIN7981 or suitable wall plug and screw size 6.
- F3. Mineral wool filling (min. 50 kg/m3)
- F4. Fire resistive coating, e.g. Promastop-CC/Promat
- A1. Cover board CBS-FD (accessory) obligatory
- 1. Fire damper (actuator side)
- 2. Bendable hanger
- 3. Concrete/masonry/cellular concrete wall or ceiling
- 4. Flexible (plasterboard) wall
- 4a. 2 layers of plasterboard fireproof plate type F, EN 520
- 4b. Vertical CW profiles
- 4c. Horizontal CW profiles
- 4d. Mineral wool; thickness/cubic density see picture.
- 5. Flexible (wood beam) wall
- 5a. Vertical spruce wooden beam  $\ge 60 \times 100$  mm
- 5b. Horizontal spruce wooden beam ≥ 80 × 100 mm
- 6. Alternative thinner wall (classified in accordance with EN 13501-2:2007 + A1: 2009 for fire resistance required for product application)
- 7. Area of 200 mm from opening around the damper must have the same composition and be created the same way as Flexible (plasterboard) wall.

#### Notes:

- a) Flexible (plasterboard) wall
- b) Concrete/masonry/cellular concrete (rigid) wall
- c) Concrete/cellular concrete (rigid) floor/ceiling
- v<sub>e</sub> Vertical wall
- h<sub>o</sub> Horizontal floor/ceiling

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## Soft installation



### Installation into a Soft Crossing with fire-resistive coating

For this type of installation, the use of flexible connections is recommended (see accessory FCR) due to thermal expansion of the connected ducts in the event of a fire. Install flexible connections so that there is a minimum distance of 50 mm from the flexible part to the edge of the damper blade in the open position.

- 1. The opening in the supporting construction must be prepared as shown below. The surfaces of the opening must be clean and even. Openings in flexible walls must be reinforced in line with the standards for plasterboard walls. The dimensions of the opening should be the nominal dimensions of the damper plus an additional clearance. For circular dampers, an opening with diameter D1 should be made.
- 2. Prepare mineral wool segments with a thickness equal to the height of the opening (F5).
- 3. First apply a suitable fireproof coating (F6) on the damper at the place of its future installation: use the same fireproof coating to assemble and fix the filling material of the future installation. Once the fireproof coating has dried, the damper and the filling are ready for installation.
- 4. Apply the same fireproof coating (F6) on the internal surface of the wall cavity. Likewise, apply the fireproof coating on the external surface of the filler that is fixed to the surface of the damper. Immediately after applying the fireproof coating, insert the damper in the wall cavity. The damper blade must be located within the supporting structure.
- 5. After inserting the damper into the opening and securing it with the foldable brackets and the corresponding screws (F1), apply the same fireproof coating (F6). The coating should be at least 2 mm thick and 100 mm wide on the exposed filling material and applied evenly on the edges of the wall from both sides. Do not apply the coating where the mechanism, inspection access doors and manufacturer's labels are located.
- 6. If necessary, uncover or clean the damper after installation.
- 7. Check damper operation

### **Standard Distances**

According to the standard EN 1366-2, the minimum distance from the wall or ceiling to the damper body is 75 mm. For multiple crossings through a fire-resistive wall the minimum distance between two damper bodies is 200 mm. This applies to distances between the damper and a nearby foreign object crossing the fire-resistive wall.

#### Smaller distances

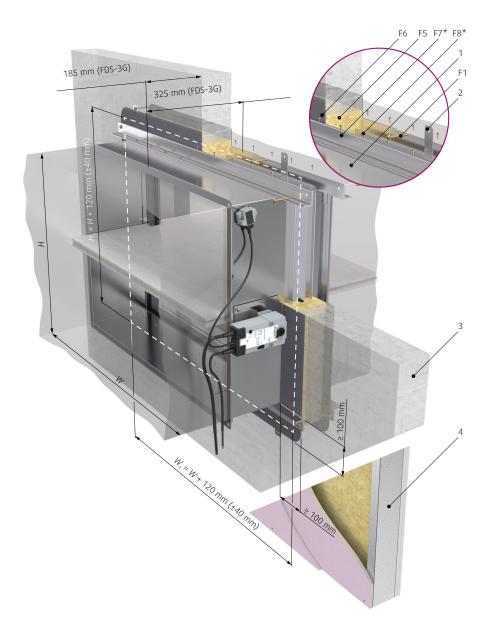
The distance between 2 individual fire dampers can be reduced to 60 mm, measured from surface to surface of the housing and the distance between the surface of the damper installed in the duct and the adjacent supporting construction (wall/floor) can be reduced to 40 mm.

#### Installation in a thinner wall than tested

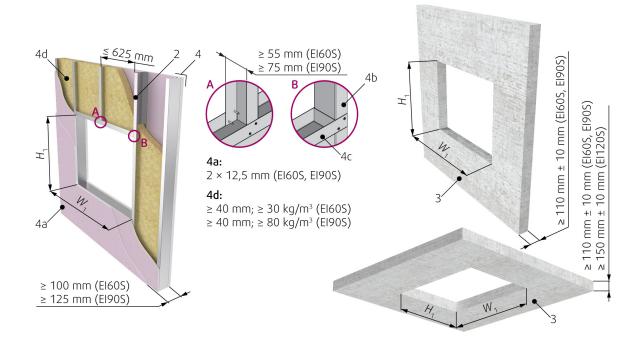
It is possible to install the damper in a thinner wall provided that an additional layer(s) of fire board is fixed to the wall surface so that the damper penetration is sealed to the same length as that tested. The minimum width of the boards added around the damper should be 200 mm. What is more, any thinner walls must be classified according to EN 13501-2:2007 + A1: 2009 for the fire resistance required for the intended use of the product. In the case of an overhanging wall, the additional layers of fire board must be fixed to the steel supporting structure.

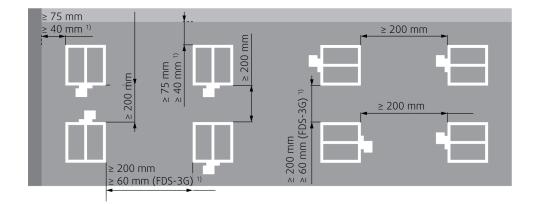


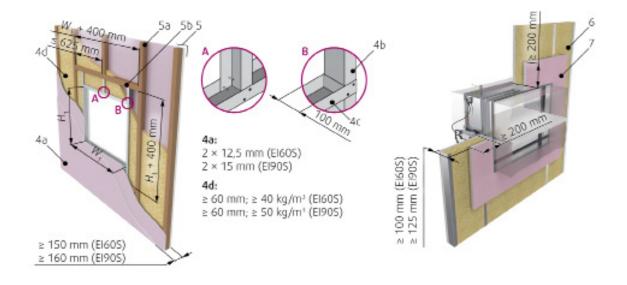
## Soft installation



## Soft installation









## Soft installation

### Legend:

- F1. Screw ≥ 5,5 DIN7981 or suitable wall plug and screw size 6.
- F5. Mineral wool segment (minimum 150 kg/m3).
- F6. Layer of fire resistive coating (Promastop-CC/Promat) at least 2 mm thick for exposed surfaces.
- 1. Fire damper (actuator side)
- 2. Bendable hanger
- 3. Concrete/masonry/cellular concrete wall or ceiling
- 4. Flexible (plasterboard) wall
- 4a. 2 layers of plasterboard fireproof plate type F, EN 520
- 4b. Vertical CW profiles
- 4c. Horizontal CW profiles
- 4d. Mineral wool; thickness/cubic density see picture.
- 5. Flexible (wood beam) wall
- 5a. Vertical spruce wooden beam  $\ge 60 \times 100$  mm
- 5b. Horizontal spruce wooden beam  $\ge 80 \times 100 \text{ mm}$
- 6. Alternative thinner wall (classified in accordance with EN 13501-2:2007 + A1: 2009 for fire resistance required for product application)
- 7. Area of 200 mm from opening around the damper must have the same composition and be created the same way as Flexible (plasterboard) wall.

#### Notes:

- a) Flexible (plasterboard) wall
- b) Concrete/masonry/cellular concrete (rigid) wall
- c) Concrete/cellular concrete (rigid) floor/ceiling
- v<sub>e</sub> Vertical wall
- h<sub>o</sub> Horizontal floor/ceiling
- 1) Smaller distances resistivity maximum EI90 (  $v_e i \leftrightarrow o$  ) S



## Hilti installation

	FDS-3G		a)	b)	
N N N	100 × 100	El 60 (v <sub>e</sub> - i $\leftrightarrow$ o) S			
3H Hilti	1200 × 800 Subpressure 300 Pa				360°

### Filling made only from Hilti foam

For this type of installation, the use of flexible connections is recommended (see accessory FCR) due to thermal expansion of the connected ducts in the event of a fire. Install flexible connections so that there is a minimum distance of 50 mm from the flexible part to the edge of the damper blade in the open position. Recommendation: surplus material can be reused as filler for this type of installation. It can be inserted into the cavity before adding foam using the pistol.

- 1. The opening of the supporting construction must be prepared as described. The surfaces of the opening must be clean and even. 2. Openings in flexible walls must be reinforced in line with the standards for plasterboard walls. The dimensions of the opening should be the nominal dimensions of the damper plus an additional clearance. For circular dampers, an opening with diameter D1 should be made.
- 2. Insert the damper concentrically into the opening and fix it using the foldable brackets and suitable screws (F1).
- 3. Wear protective gloves when handling the foam. Insert the barrel of the foam pistol into the centre of the cavity between the damper and the opening and fill completely with foam (F17): any excess foam can be quickly inserted back into the cavity by hand.
- 4. Once the filler (F17) has solidified it will always remain partially flexible and any excess foam protruding from the wall can be cut off.
- 5. If necessary, uncover or clean the damper after installation.
- 6. Check damper operation

#### **Standard Distances**

According to EN 1366-2, there must be a minimum distance of 75 mm between the wall or ceiling and the damper body. Where multiple ducts cross through a fire wall, there must be a minimum distance of 200 mm between two damper bodies.

This also applies to the distance between a damper and any foreign object passing through the fire wall nearby.

#### Smaller distances

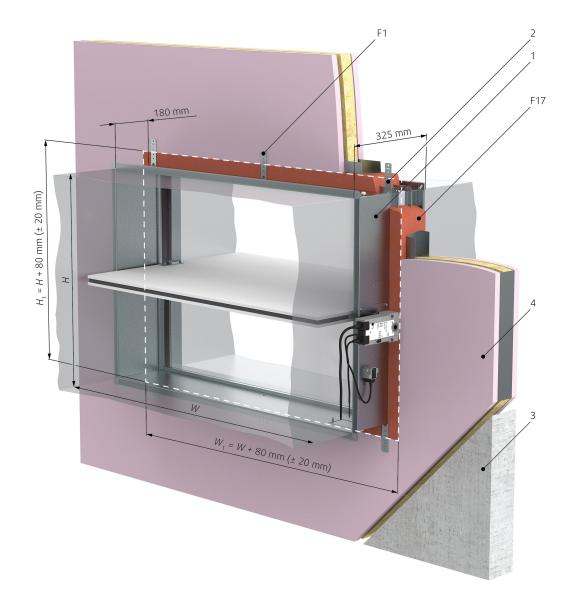
The distance between 2 individual fire dampers may be reduced to 60 mm, measured from casing surface to casing surface, and the distance between the surface of the damper installed in the duct and the adjacent supporting construction (wall/floor) may be reduced to 40 mm.

#### Installation in a Wall thinner than tested

It is possible to install the damper in a thinner wall provided that an additional layer(s) of fire board is fixed to the wall surface so that the damper penetration is sealed to the same length as that tested. The minimum width of the boards added around the damper should be 200 mm. What is more, any thinner walls must be classified according to EN 13501-2:2007 + A1: 2009 for the fire resistance required for the intended use of the product. In the case of an overhanging wall, the additional layers of fire board must be fixed to the steel supporting structure.

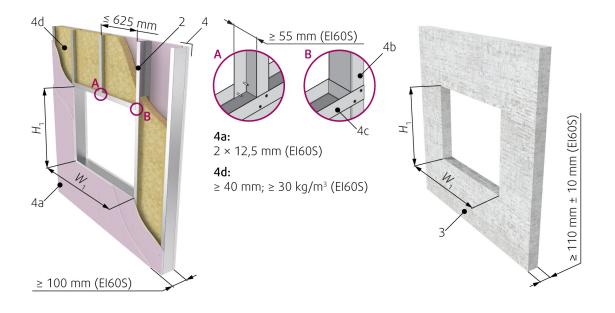


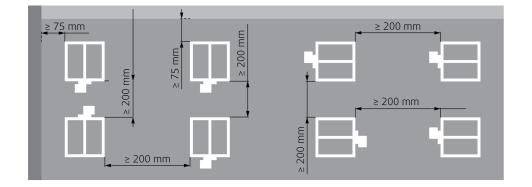
## Hilti installation

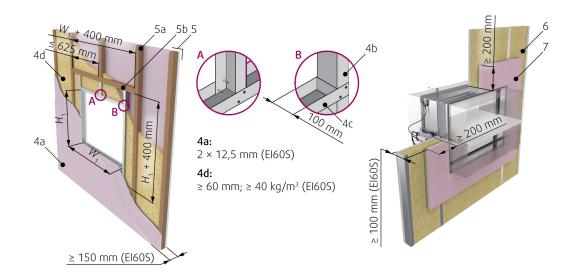


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## Hilti installation







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## Hilti installation

### Legend:

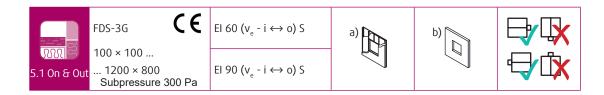
- F1. Screw  $\geq$  5,5 e.g. DIN7981 or suitable wall plug and screw size 6.
- F17. Foam CFS-F FX/HILTI.
- 1. Fire damper (actuator side)
- 2. Bendable hanger
- 3. Concrete/masonry/cellular concrete wall or ceiling
- 4. Flexible (plasterboard) wall
- 4a. 2 layers of plasterboard fireproof plate type F, EN 520
- 4b. Vertical CW profiles
- 4c. Horizontal CW profiles
- 4d. Mineral wool; thickness/cubic density see picture.
- 5. Flexible (wood beam) wall
- 5a. Vertical spruce wooden beam  $\ge 60 \times 100$  mm
- 5b. Horizontal spruce wooden beam  $\ge 80 \times 100$  mm
- 6. Alternative thinner wall (classified in accordance with EN 13501-2:2007 + A1: 2009 for fire resistance required for product application)
- 7. Area of 200 mm from opening around the damper must have the same composition and be created the same way as Flexible (plasterboard) wall.

#### Notes:

- a) Flexible (plasterboard) wall
- b) Concrete/masonry/cellular concrete (rigid) wall
- v<sub>e</sub> Vertical wall
- 1) Smaller distances maximum resistivity EI90 ( ve i↔o ) S

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## ON & OUT wall installation, El90S – 2 layers of mineral wool



### Using 2 layers of mineral wool

SUGGESTION: Plaster/mortar/concrete (F2) can be used as an alternative filling material instead of the filler (F9) in the cavity in the wall with the duct, in which case the coating (F10) is not necessary. There are two possible ways to fix the damper: using the MP-MX ring or using the UVH30 ring, see point 3 of the instructions. Prepare the damper for installation by holding it in the opening using ceramic adhesive tape (12) and fix it with a suitable metal ring (13 or 14).

- 1. The opening in the supporting construction must be prepared as shown in the figure. The surfaces of the opening must be clean and even. Openings in flexible walls must be reinforced in line with the standards for plasterboard walls. The dimensions of the opening should be the nominal dimensions of the damper plus an additional clearance. For circular dampers, an opening with diameter D1 should be made.
- 2. Insert the duct into the load-bearing structure together with the damper so that the duct protrudes from the wall by the required distance. Push the insulation around the duct (F9) and trim the edges so that it is flush with the wall. Paint the surface of the insulation in line with the wall with a suitable coat of paint (F10) up to 100 mm from the duct so that it covers the insulation and part of the wall. Alternatively, plaster/mortar/concrete can be used as filling material (F2).
- 3. Fix the circular damper with L-shaped sheet metal brackets (F11) evenly all around the perimeter at 4 points.
- 4. Depending on the type of ring that is embedded in the blade location, the damper should be suspended with:
  - M12 threaded rod (11) when using the MP-MX ring (13).
  - 2 × M10 threaded rod (15) when using the UVH30 ring (14).
- 5. Insulate the parts of the damper and duct between the damper and the wall. Fix the insulation to the wall using a suitable fireproof coating (BSF, ISOVER). The circular part of the damper should be joined to the duct insulation with an access wire (9) for both insulation layers, as is normally applied when insulating circular ducts.
- 6. Cover the face of the insulation and the perimeter with galvanised sheet metal cladding (accessory A2) up to 15 mm from the edge of the insulation, fix the sheet metal against the damper casing via the holes in the accessories 10). Any protruding screws could obstruct the blade during opening and must be cut back so that they do not impede the movement of the blade.
- 7. If necessary, uncover or clean the damper after installation.
- 8. Ensure that the fixing screws do not interfere with the movement of the blade and check that the damper operates correctly

#### **Duct rules**

The rules for hanger placement and duct suspension depend on the damper's distance from the supporting construction. The desired distance from the wall to the end of the duct connection with the damper divides the rules into two groups:

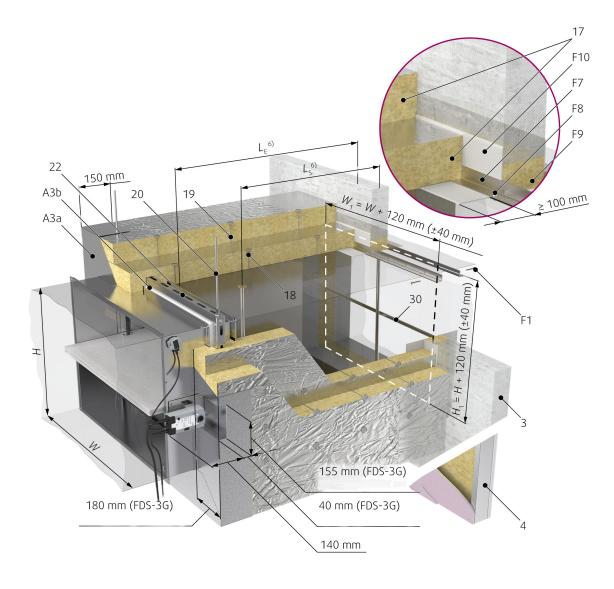
- Distance from 35 mm to max. 1500 mm.
- Distance greater than 1500 mm.

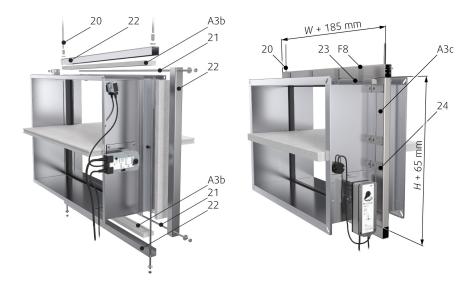
#### Installation Distances

For installation 5.1 ON & OUT, the minimum distance from the wall or ceiling to the damper body is 200 mm. Where multiple ducts cross through a fire wall, there must be a minimum distance of 400 mm between two damper bodies. The damper and any foreign object passing nearby through the fire wall must be separated by a minimum distance of 200 mm



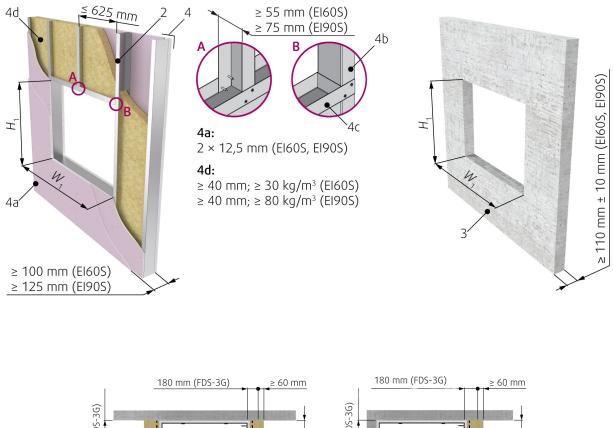
## ON & OUT wall installation, El90S – 2 layers of mineral wool

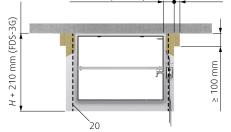


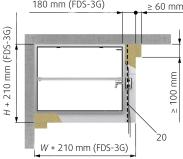


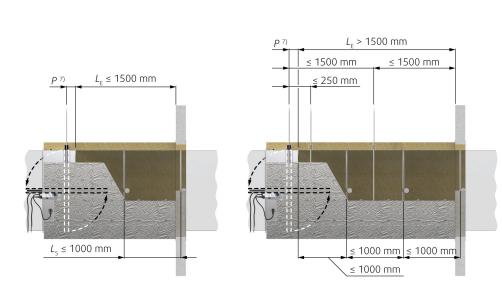
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## ON & OUT wall installation, El90S – 2 layers of mineral wool









## ON & OUT wall installation, El90S – 2 layers of mineral wool

### Legend:

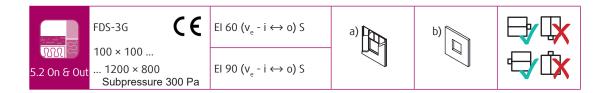
- F1. Screw ≥ 5,5 DIN7981 or suitable wall plug and screw size 6.
- F7. L-profile 60 × 40 × 3 mm, length W + 300 mm or WL + 300 mm F8 Screw 3,9 × max. 13 DIN7504
- F9. Mineral wool segment (min. 66 kg/m3) in a wall
- F10. Layer of fire resistive coating (BSF/ISOVER) at least 2 mm thick for exposed surfaces
- F11. Sheet metal belt 40 × 2 mm bent into an L shape of 35 and 160 mm
- A3a. Insulation front cover; min. thickness 0,9 mm A3b. Calcium silicate board 60 × 20 mm
- A3c. Steel frame made from HILTI profile; e.g. MQ31 (for FDS-3G)
- 1. Fire damper (actuator side)
- 3. Concrete/masonry/brick/cellular concrete wall or ceiling
- 4. Flexible (plasterboard) wall
- 4a. 2 layers of plasterboard fireproof plate type F, EN 520 4b. Vertical CW profiles
- 4c. Horizontal CW profiles
- 4d. Mineral wool; thickness/cubic density see picture.
- 17. Mineral wool segment ULTIMATE Protect Slab 4.0 Alu1/ISOVER (min. 66 kg/m3) inner layer & outer layer
- 18. Welding pin, length 180 or 200 mm Top without welding pins, side 20 pins/m2, bottom 20 pins/m2; distance between pins max. 250 mm, distance of the pin from the edge 80 mm
- Welding pin length 90 or 100 mm Top without welding pins, side 20 pins/m2, bottom 20 pins/m2; distance between pins max. 250 mm, distance of the pin from the edge 80 mm
- 20. Steel threaded rod M10
- 21. Steel threaded rod M8
- 22. U-profile (MQ31/HILTI)
- 23. Damper insulation frame's screw
- 24. Sheet metal plate 85 × 40 × 2,5 mm

#### Notes:

- a) Flexible (plasterboard) wall
- b) Concrete/masonry/cellular concrete (rigid) wall
- v<sub>e</sub> Vertical wall
- 5 Rules for hanger placements and duct suspensions depend on the dampers distance from the supporting construction LE
- 7 The distance P is the distance from the blade axis to the damper flange. The distance depends on the type of damper used.
- 6 Rules for hanger placements LP and duct suspensions LS depend on the damper's distance from the supporting construction LE
- F2 Plaster/mortar/concrete filling can serve as replacement of filling F9. Using Plaster/mortar/concrete filling the coating F10 is not needed.

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## ON & OUT wall installation, El60S – 1 layer of mineral wool



### Using 1 layer of Mineral Wool

TIP: The duct-wall cavity filling can be also replaced by plaster/mortar/concrete (F2) as a replacement of filling (F9), then the coating (F10) is not needed for the cavity filling. Damper Preparation before Installation:Fasten the rectangular damper in the blade/perforation location only on the top and bottom sides with U-profiles (28), and then fasten the U-profiles together by using the threaded rod M10 (20).

- 1. The supporting construction opening must be prepared as depicted. Opening surfaces must be even and cleaned off. The flexible wall opening must be reinforced as per the standards for plasterboard walls. The opening dimensions are driven by the nominal dimensions of the damper with added clearance. For rectangular dampers, the opening will have the dimensions of W1 and H1.
- 2. Insert the duct into the load-bearing structure along with the damper in such a way that the duct will stick out of the wall to the needed distance. Press the insulation around the duct (F9) and cut its edges to even it with the wall surface. Paint the insulation surface in alignment with the wall with a suitable coat of paint (F10) up to 100 mm from the duct to cover the insulation and part of the wall. Or use filling (F2) as per WET installation.
- 3. Reinforce the rectangular duct with stiffening rods (30) along the insulated duct. The first cross is placed on the wall, the others at distances of LS.
- 4. Insulate the damper and duct parts between the damper and the wall. Glue the insulation (29) in one 80 mm layer onto the wall around the duct by using a suitable fire-resistive coating (F10). Secure the insulation (29) using 80 mm long welding pins (27). The actuator, thermosensor, and inspection lid must remain uninsulated with a gap of a maximum of 20 mm.
- 5. Around the front side and on all surfaces that are not covered with aluminum foil, apply aluminum tape (25).
- 6. If needed, uncover and clean the damper after installation.
- 7. Make sure the fixing screws are not interfering with the blade movement and check the damper's functionality

#### **Duct rules**

The rules for hanger placement and duct suspension depend on the damper's distance from the supporting construction. The desired distance from the wall to the end of the duct connection with the damper divides the rules into two groups:

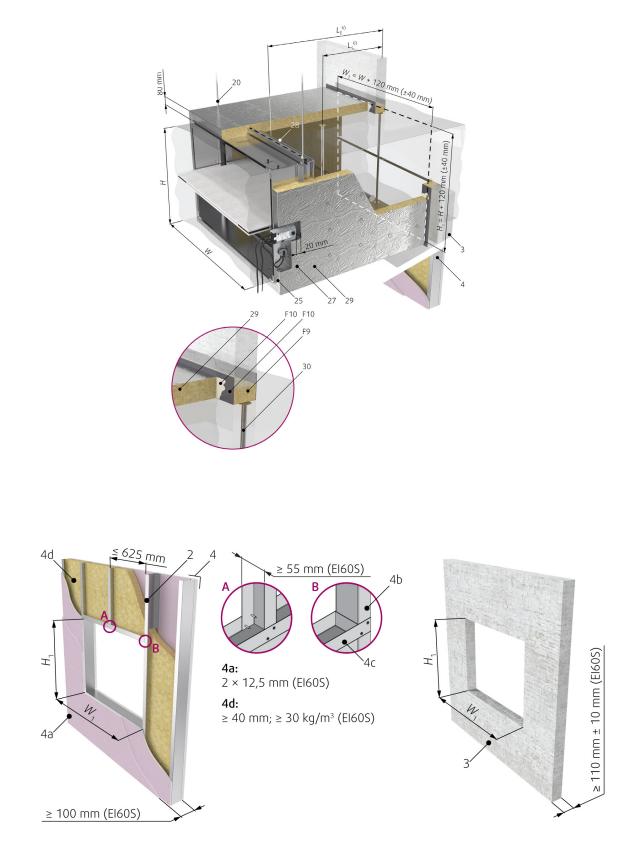
- Distance from 35 mm to max. 1500 mm
- Distance greater than 1500 mm

#### **Installation Distances**

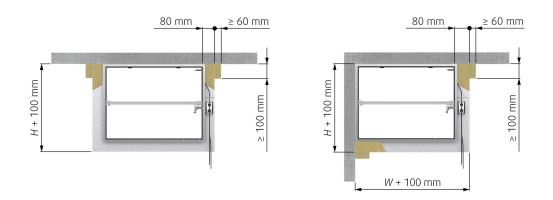
For installation 5.2 ON & OUT, the minimum distance from the wall or ceiling to the damper body is 40 mm. For multiple crossings through a fire-resistive wall the minimum distance between two damper bodies is 200 mm. The distance of 200 mm also applies for distances between the damper and a nearby foreign object crossing the fireresistive wall.

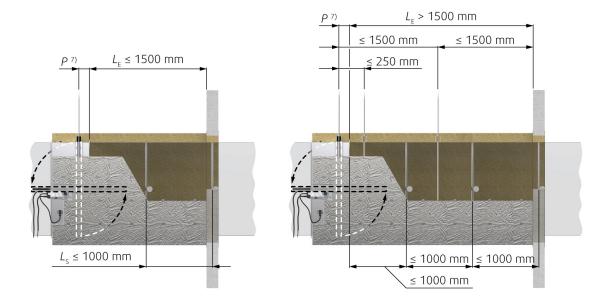


## ON & OUT of the wall installation, El60S – 1 layer of mineral wool



## ON & OUT of the wall installation, El60S – 1 layer of mineral wool





## ON & OUT of the wall installation, El60S – 1 layer of mineral wool

### Legend:

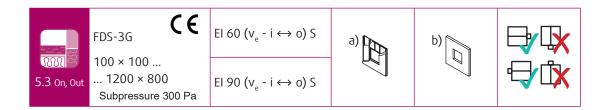
- F9. Mineral wool segment (min. 66 kg/m3) in a wall
- F10. Layer of fire resistive coating (BSF/ISOVER) at least 2 mm thick for exposed surfaces
- 1. Fire damper (actuator side)
- 3. Concrete/masonry/brick/cellular concrete wall or ceiling
- 4. Flexible (plasterboard) wall
- 4a. 2 layers of plasterboard fireproof plate type F, EN 520
- 4b. Vertical CW profiles
- 4c. Horizontal CW profiles
- 4d. Mineral wool; thickness/cubic density see picture.
- 20. Steel threaded rod M10
- 25. Aluminium tape around the front side and on places uncovered with alufoil
- 27. Welding pin length 80 mm Top without welding pins, side 20 pins/m2, bottom 20 pins/m2; distance between pins max. 250 mm, distance of the pin from the edge 80 mm
- 28. U-profile (MQ31/HILTI) top and bottom
- 29. Mineral wool segment thickness 80 mm (min. 66 kg/m3; ISOVER Ultimate U-Protect Slab 4.0 Alu1)
- 30. Stiffening rods: horizontal for W > 600 mm; vertical for H > 400 mm

#### Notes:

- a) Flexible (plasterboard) wall
- b) Concrete/masonry/cellular concrete (rigid) wall
- v<sub>e</sub> Vertical wall
- 5. Rules for hanger placements and duct suspensions depend on the dampers distance from the supporting construction LE
- 7. The distance P is the distance from the blade axis to the damper flange. The distance depends on the type of damper used.
- Rules for hanger placements LP and duct suspensions LS depend on the damper's distance from the supporting construction LE
- \*\* F2. Plaster/mortar/concrete filling can serve as replacement of filling F9. Using Plaster/mortar/concrete filling the coating F10 is not needed.

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## ON & OUT of the wall installation, maximum El90S – Promatec boards



### Using Promatect Boards

TIP: The duct-wall cavity filling (F12) and its coating (F13) can be also replaced by plaster/mortar/concrete (F2). Damper Preparation before Installation:Attach all 4 parts of the IKOWS-FD accessory around the casing where the damper blade is situated, as shown in picture and apply a suitable fire-resistive coating (F13) to the contact surfaces of the boards and the damper. Fasten them together using the screws included in the IKOWS-FD package

- 1. The supporting construction opening must be prepared as depicted. Opening surfaces must be even and cleaned off. The flexible wall opening must be reinforced as per the standards for plasterboard walls. The opening dimensions are driven by the nominal dimensions of the damper with added clearance. For rectangular dampers, the opening will have the dimensions of W1 and H1.
- 2. Insert the duct into the load-bearing structure along with the damper in such a way that the duct will stick out of the wall to the needed distance. Press the insulation around the duct (F12) and cut its edges to even it with the wall surface.
- 3. Paint the insulation surface in alignment with the wall with a suitable coat of paint (F13) up to 100 mm from the duct to cover the insulation and part of the wall. Or use filling (F2) as per WET installation.
- 4. Fit 4 boards (F15) of 100 mm in width around the duct and secure them using suitable screws (F1) to the wall; fasten an L-profile (F14) to the wall and the duct on the damper side; fasten 4 boards (32) by joining them together in corners by screws.
- 5. Cover the IKOWS-FD accessory (A4) and the boards (32) along the entire length with 40 mm thick boards (31); apply fire-resistive coating (F13) to all joints and fix with screws (33).
- 6. Bind the damper in the blade location using a profile (34) at the top and bottom damper side, using threaded rods(20) and nuts. The threaded rods are to be at a distance of max. 50 mm from the side insulation surface.
- 7. If needed, uncover and clean the damper after installation.
- 8. Make sure the fixing screws are not interfering with the blade movement and check the damper's functionality.

#### **Duct rules**

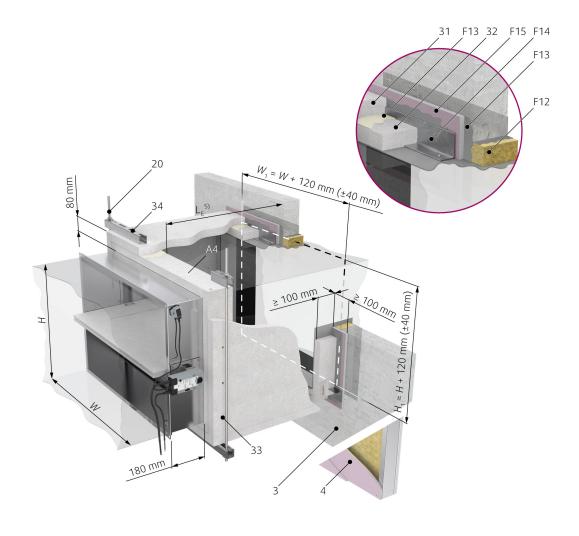
The rules for hanger placement and duct suspension depend on the damper's distance from the supporting construction. The desired distance from the wall to the end of the duct connection with the damper divides the rules into two groups:

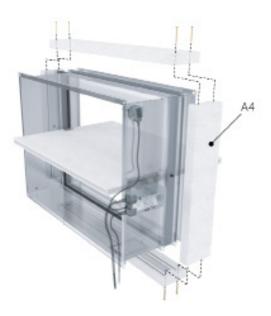
- Distance from 35 mm to max. 1500 mm
- Distance greater than 1500 mm

#### Installation Distances

For installation 5.2 ON & OUT, the minimum distance from the wall or ceiling to the damper body is 40 mm. For multiple crossings through a fire-resistive wall the minimum distance between two damper bodies is 200 mm. The distance of 200 mm also applies for distances between the damper and a nearby foreign object crossing the fire-resistive wall

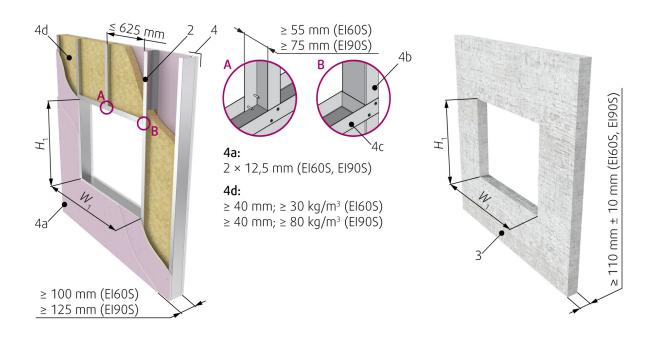


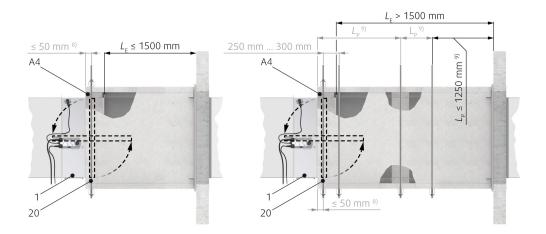


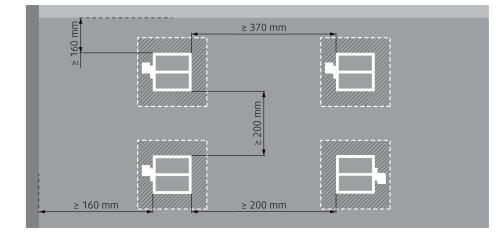


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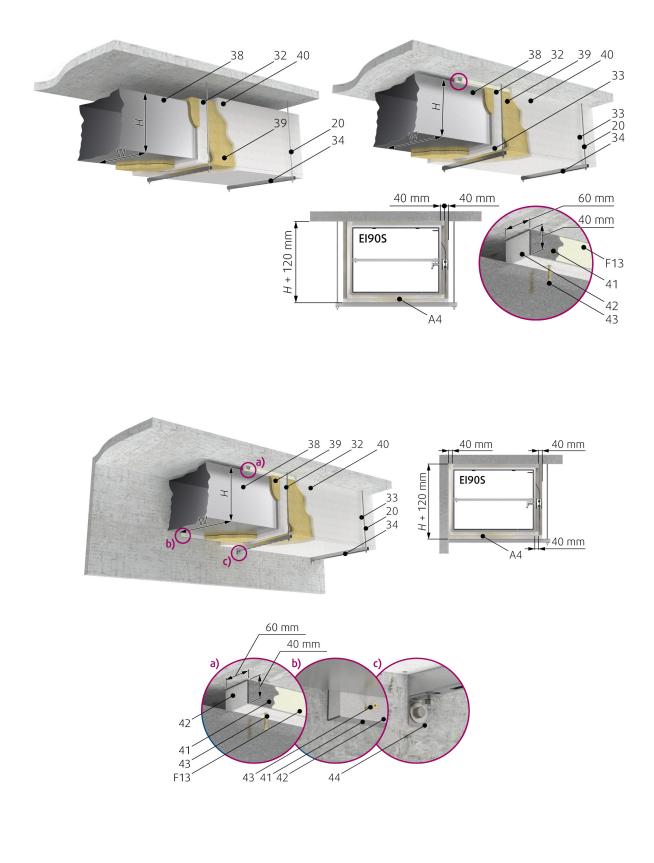
## ON & OUT of the wall installation, maximum EI90S – Promatec boards











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## ON & OUT of the wall installation, maximum El90S – Promatec boards

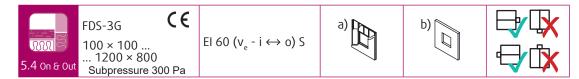
### Legend:

- F1. Screw ≥ 5,5 DIN7981 or suitable wall plug and screw size 6.
- F12. Mineral wool segment thickness of 50 mm; min. 150 kg/m3 in a wall
- F13. Fire resistive coating; Promat kleber K84/Promat
- F14. Steel L-profile 25 × 25 × 2 mm
- F15. Gypsum board thickness of 15 mm; width min. 100 mm
- A4. Installation kit IKOWS-FD-W×H (accessory)
- 1. Fire damper (actuator side)
- 3. Concrete/masonry/brick/cellular concrete wall or ceiling
- 4. Flexible (plasterboard) wall
- 4a. 2 layers of plasterboard fireproof plate type F, EN 520
- 4b. Vertical CW profiles
- 4c. Horizontal CW profiles
- 4d. Mineral wool; thickness/cubic density see picture.
- 20. Steel threaded rod M10
- 31. Calcium silicate board thickness of 40 mm; Promatect L500/Promat
- 32. Calcium silicate board; thickness 40 (20 + 20) × 100 mm; Promatect L500/Promat
- 33. Screw 5 × 80; DIN7997
- 34. U-profile (MQ41/HILTI)
- 38. Duct W × H that is eventually connected to the damper (damper is not depicted)
- 39. Mineral wool segment; thickness 40 mm/min. 40 kg/m3 (only El60)
- 40. Calcium silicate board; thickness 20 mm (El60) or 40 mm (El90); Promatect L500/Promat
- 41. Steel L-profile 60 × 40 × 1 mm
- 42. Calcium silicate board; thickness 40 × 60 mm; Promatect L500/Promat
- 43. Screw with coak; span max. 250 mm
- 44. Corner connector; MQP-1/HILTI

#### Notes:

- a) Flexible (plasterboard) wall
- b) Concrete/masonry/cellular concrete (rigid) wall
- v<sub>e</sub> Vertical wall
- 5. Rules for hanger placements and duct suspensions depend on the dampers distance from the supporting construction LE
- 6. Rules for hanger placements LP and duct suspensions LS depend on the damper's distance from the supporting construction LE
- 7. The distance P is the distance from the blade axis to the damper flange. The distance depends on the type of damper used.
- 8. The hanger must be placed a max. of 50 mm from the edge of the IKOWS-FD.
- 9. LP The recommended length of the Promatect boards from the producer is 1250 mm; the legally allowed hanger span is 1500 mm.
- \*\* F2. Plaster/mortar/concrete filling can serve as replacement of filling (F12). Using Plaster/mortar/concrete filling the coating (F13) for in the wall mineral wool is not needed.





#### Using Promatect Boards

TIP: The duct-wall cavity filling (F12) and its coating (F13) can be also replaced by plaster/mortar/concrete (F2). Damper Preparation before Installation:Attach all 4 parts of the IKOWS-FD accessory around the casing where the damper blade is situated, as shown in picture and apply a suitable fire-resistive coating (F13) to the contact surfaces of the boards and the damper. Fasten them together using the screws included in the IKOWS-FD package.

- 1. The supporting construction opening must be prepared as depicted. Opening surfaces must be even and cleaned off. The flexible wall opening must be reinforced as per the standards for plasterboard walls. The opening dimensions are driven by the nominal dimensions of the damper with added clearance. For rectangular dampers, the opening will have the dimensions of W1 and H1.
- Insert the duct into the load-bearing structure along with the damper in such a way that the duct will stick out of the wall to the needed distance. Press the insulation around the duct (F12) and cut its edges to even it with the wall surface.
- 3. Paint the insulation surface in alignment with the wall with a suitable coat of paint (F13) up to 100 mm from the duct to cover the insulation and part of the wall. Or use filling (F2) as per WET installation.
- 4. Fit 4 boards (F15) of 100 mm in width around the duct and secure them using suitable screws (F1) to the wall; fasten an L-profile (F14) to the wall and the duct on the damper side; fasten 4 boards (F15) by joining them together in corners with screws.
- 5. Insert mineral wool segments (37) around the duct perimeter between the boards (35) and the IKOWS-FD accessory (A4). Cover the IKOWS-FD accessory (A4) and the boards (35) along the entire length with 20 mm thick boards (36); apply fire-resistive coating (F13) to all joints and fix the boards with screws (33).
- 6. Bind the damper in the blade location using a profile (34) at the top and bottom damper side, using threaded rods (20) and nuts. The threaded rods are to be at a distance of a max. of 50 mm from the side insulation surface.
- 7. If needed, uncover and clean the damper after installation.
- 8. Make sure the fixing screws are not interfering with the blade movement and check the damper's functionality.

#### **Duct rules**

The rules for hanger placement and duct suspension depend on the damper's distance from the supporting construction. The desired distance from the wall to the end of the duct connection with the damper divides the rules into two groups:

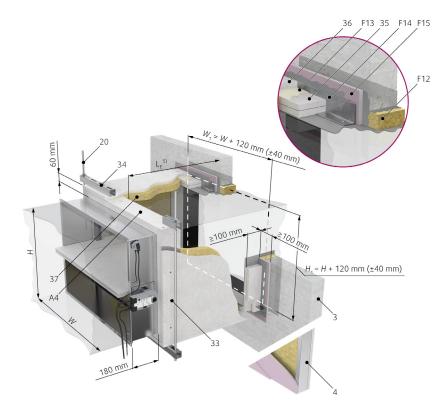
- Distance from 35 mm to max. 1500 mm.
- Distance greater than 1500 mm.

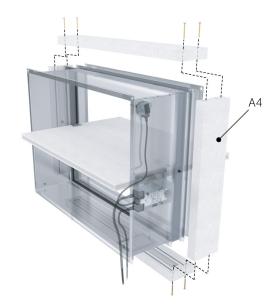
#### Installation Distances

For installation 5.4 ON & OUT, the minimum distance from the wall or ceiling to the damper body is 40 mm. For multiple crossings through a fire-resistive wall the minimum distance between two damper bodies is 200 mm. The distance 200 mm applies for distances between the damper and a nearby foreign object crossing the fire-resistive wall.

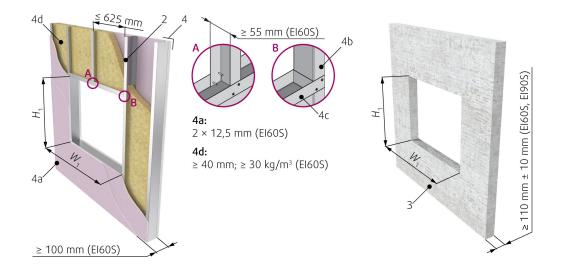
#### Installation in a Wall thinner than tested

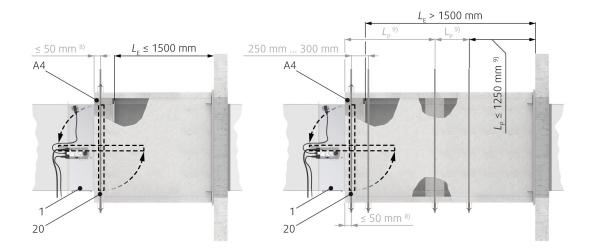
Installation in a thinner wall is allowed under the condition that an additional layer/layers of fire protective board are fixed to the surface of the wall in order to achieve the same length of damper penetration seal as was tested. The minimum width of added boards around the damper is 200 mm. In addition, the alternative thinner wall should be classified in accordance with EN 13501-2:2007 + A1: 2009 for fire-resistance required for product application. For a protruding wall, the additional layers must be fixed on the steel supporting construction of the wall.

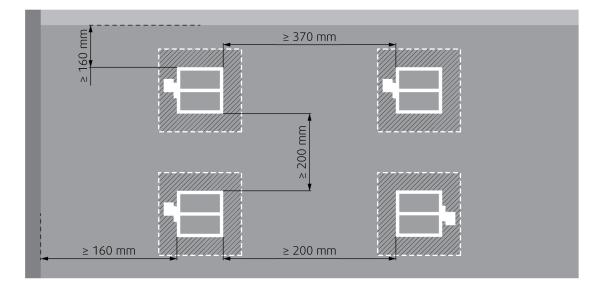


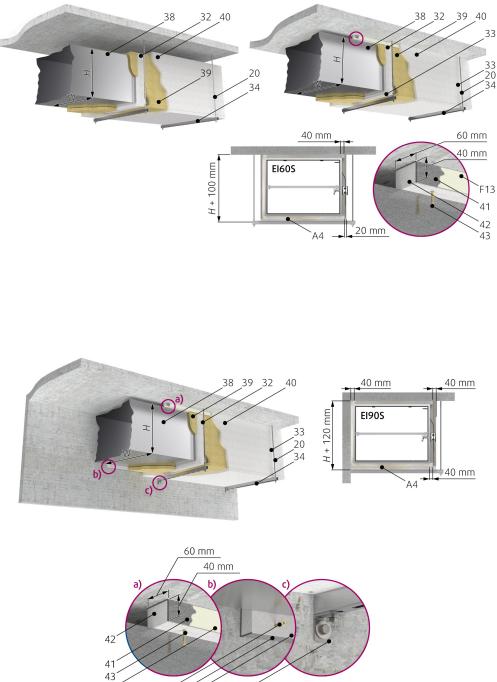












43 41 42 44

F13



#### Legend:

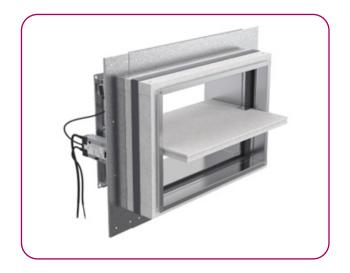
- F1. F1. Screw ≥ 5,5 DIN7981 or suitable wall plug and screw size 6.
- F12. Mineral wool segment thickness of 50 mm; min. 150 kg/m3 in a wall F13. Fire resistive coating; Promat kleber K84/Promat
- F14. Steel L-profile 25 × 25 × 2 mm
- F15. Gypsum board thickness of 15 mm; width min. 100 mm A4. Installation kit IKOWS-FD-W×H (accessory)
- 1. Fire damper (actuator side)
- 3. Concrete/masonry/brick/cellular concrete wall or ceiling
- 4. Flexible (plasterboard) wall
- 4a. 2 layers of plasterboard fireproof plate type F, EN 520 4b. Vertical CW profiles
- 4c. Horizontal CW profiles
- 4d. Mineral wool; thickness/cubic density see picture.
- 20. Steel threaded rod M10
- 31. Calcium silicate board thickness of 40 mm; Promatect L500/Promat
- 32. Calcium silicate board; thickness 40 (20 + 20) × 100 mm; Promatect L500/Promat
- 33. Screw 5 × 80; DIN7997
- 34. U-profile (MQ41/HILTI)
- 38. Duct W × H that is eventually connected to the damper (damper is not depicted)
- 39. Mineral wool segment; thickness 40 mm/min. 40 kg/m3 (only El60)
- 40. Calcium silicate board; thickness 20 mm (El60) or 40 mm (El90); Promatect L500/Promat
- 41. Steel L-profile 60 × 40 × 1 mm
- 42. Calcium silicate board; thickness 40 × 60 mm; Promatect L500/Promat
- 43. Screw with coak; span max. 250 mm
- 44. Corner connector; MQP-1/HILTI

#### Notes:

- a) Flexible (plasterboard) wall
- b) Concrete/masonry/cellular concrete (rigid) wall Ve Vertical wall
- 5. Rules for hanger placements and duct suspensions depend on the dampers distance from the supporting construction LE
- 6. Rules for hanger placements LP and duct suspensions LS depend on the damper's distance from the supporting construction LE
- 7. The distance P is the distance from the blade axis to the damper flange. The distance depends on the type of damper used.
- 8. The hanger must be placed a max. of 50 mm from the edge of the IKOWS-FD.
- 9. LP The recommended length of the Promatect boards from the producer is 1250 mm; the legally allowed hanger span is 1500 mm.
- \*\* F2. Plaster/mortar/concrete filling can serve as replacement of filling (F12). Using Plaster/mortar/concrete filling the coating (F13) for in the wall mineral wool is not needed.

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## FDS-3G-KS

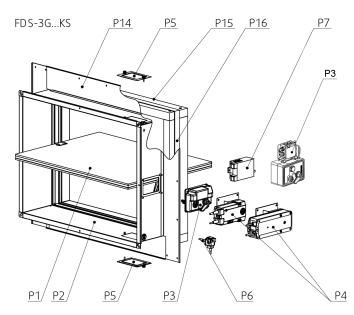


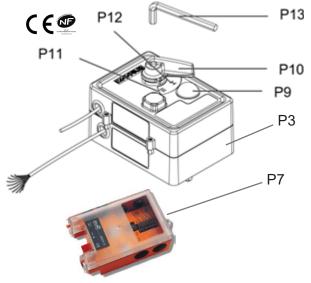
## **Description**

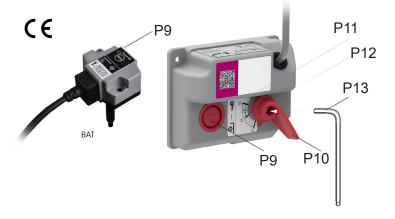
Fire dampers with square mounting kits up to 800 x 600 mm provide passive fire protection, designed to facilitate compartmentation and prevent the spread of toxic gases, smoke, and fire. FDS-3G... fire dampers are designed for easy installation. Standard fire dampers are designed and certified in accordance with standard EN 15650 and tested according to EIS criteria in compliance with standard EN 1366-2. By default, all fire dampers are supplied with a manual mechanism or a servomotor mechanism and, optionally, a power supply and a communication unit.

IMPORTANT: The installation kit cannot be supplied separately! The installation kit is delivered pre-assembled on a damper.

## **Product Parts**







#### Legend:

P1.	Blade

- Housing P2.
- P3. Manual activation mechanism (H0, H...)
- P4. Servomotor activation mechanism (B...+ BSIA)
- P5. Inspection hatch cover
- P6. Electrothermal fuse (BAT72, TA-72)
- BSIA (mandatory with the B274T-W servomotor) P7.
- P8. Foldable suspension
- P9. Release and test button
- Crank P10.
- P11. Open position
- P12. Closed position
- 10 mm Allen key (not included) P13
- P14 Base plate kit
- Cover plate (PROMAT) P15
- P16 Intumex

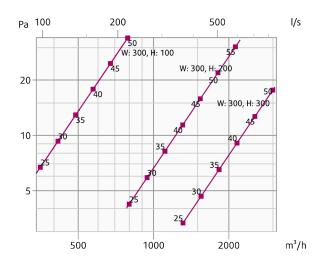


## **Diagrams**

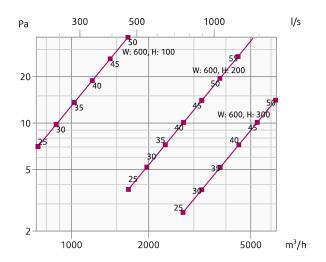
The pressure drop and total A-weighted sound power level discharged depend on the nominal width and height of the damper and the volume of air flow at different duct pressures. The type of activation does not affect the airflow parameter, which is why only one activation type is shown in the diagrams.

#### FDS-3G-KS

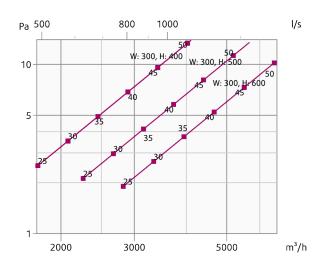
Pressure drop and A-weighted sound power level in dB(A)



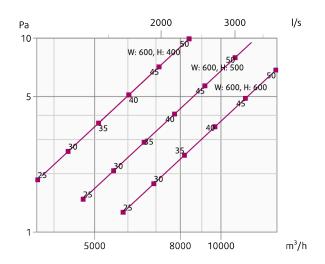
FDS-3G-KS Pressure drop and A-weighted sound power level in dB(A)



FDS-3G-KS Pressure drop and A-weighted sound power level in dB(A)



FDS-3G-KS Pressure drop and A-weighted sound power level in dB(A)

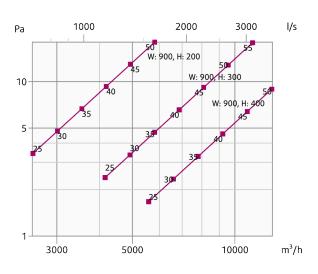


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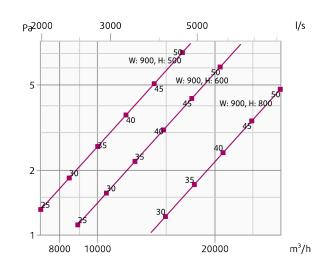
## Diagrams

#### FDS-3G-KS

Pressure drop and A-weighted sound power level in dB(A)



FDS-3G-KS Pérdida de carga y nivel de potencia acústica ponderada A en db(A)



## **FDS-3G-KS** Rectangular fire damper

## 

## **Dimensions**

Free area

	( 2)										W (I	nm)						•			
S.L.	(m~)	100	150	200	250	300	315	350	355	400	450	500	550	560	600	630	650	700	710	750	800
	100	0,005	0,008	0,011	0,014	0,017	0,018	0,020	0,021	0,024	0,024	0,027	0,030	0,030	0,032	0,034	0,035	0,038	0,039	0,041	0,044
	150	0,008	0,012	0,017	0,022	0,028	0,029	0,033	0,033	0,038	0,040	0,045	0,049	0,050	0,054	0,057	0,059	0,064	0,065	0,068	0,073
	175	0,010	0,015	0,022	0,028	0,034	0,036	0,041	0,041	0,047	0,050	0,056	0,062	0,064	0,068	0,072	0,074	0,080	0,082	0,086	0,092
	180	0,011	0,016	0,022	0,029	0,036	0,038	0,042	0,043	0,049	0,053	0,059	0,065	0,066	0,071	0,075	0,078	0,084	0,085	0,090	0,096
	200	0,012	0,018	0,026	0,034	0,041	0,043	0,049	0,049	0,056	0,061	0,068	0,075	0,077	0,083	0,087	0,090	0,097	0,099	0,104	0,112
	250	-	0,024	0,035	0,045	0,055	0,058	0,065	0,066	0,075	0,082	0,092	0,102	0,103	0,111	0,117	0,121	0,131	0,133	0,141	0,150
	300	-	0,031	0,043	0,056	0,068	0,072	0,081	0,082	0,094	0,103	0,115	0,128	0,130	0,140	0,147	0,152	0,164	0,167	0,177	0,189
	315	-	-	0,046	0,059	0,072	0,076	0,086	0,087	0,099	0,109	0,122	0,135	0,138	0,148	0,156	0,161	0,174	0,177	0,187	0,200
	350	-	-	0,052	0,067	0,082	0,086	0,097	0,099	0,112	0,124	0,139	0,154	0,157	0,168	0,177	0,183	0,198	0,201	0,213	0,227
	355	-	-	0,053	0,068	0,083	0,088	0,099	0,100	0,114	0,126	0,141	0,156	0,159	0,171	0,180	0,186	0,201	0,204	0,216	0,231
н	400	-	-	-	0,078	0,096	0,101	0,113	0,115	0,131	0,145	0,163	0,180	0,183	0,197	0,207	0,214	0,232	0,235	0,249	0,266
(mm)	450	-	-	-	0,087	0,107	0,113	0,127	0,129	0,147	0,166	0,186	0,206	0,210	0,226	0,238	0,245	0,265	0,269	0,285	0,305
	500	-	-	-	0,099	0,121	0,127	0,143	0,145	0,165	0,188	0,210	0,232	0,236	0,254	0,268	0,277	0,299	0,303	0,321	0,343
	550	-	-	-	-	0,134	0,142	0,159	0,162	0,184	0,209	0,233	0,258	0,263	0,283	0,298	0,308	0,332	0,337	0,357	0,382
	560	-	-	-	-	0,137	0,145	0,162	0,165	0,188	0,213	0,238	0,263	0,268	0,289	0,304	0,314	0,339	0,344	0,364	0,390
	600	-	-	-	-	0,148	0,156	0,175	0,178	0,202	0,230	0,257	0,284	0,290	0,311	0,328	0,339	0,366	0,371	0,393	0,420
	630	-	-	-	-	-	0,154	0,173	0,176	0,201	0,229	0,257	0,284	0,290	0,312	0,329	0,340	0,368	0,374	0,396	0,424
	650	-	-	-	-	-	-	0,179	0,182	0,208	0,237	0,266	0,295	0,300	0,324	0,341	0,352	0,381	0,387	0,410	0,439
	700	-	-	-	-	-	-	0,195	0,198	0,226	0,258	0,289	0,320	0,327	0,352	0,370	0,383	0,414	0,421	0,446	0,477
	710	-	-	-	-	-	-	-	-	0,230	0,262	0,294	0,325	0,332	0,357	0,376	0,389	0,421	0,427	0,453	0,485
	750	-	-	-	-	-	-	-	-	0,244	0,278	0,312	0,346	0,353	0,380	0,400	0,414	0,447	0,454	0,481	0,515
	800	-	-	-	-	-	-	-	-	-	0,299	0,335	0,372	0,379	0,408	0,430	0,444	0,481	0,488	0,517	0,553

$$S.L.(dm^{2}) = A_{c} - A_{b} - A_{s}$$

$$A_{c}(dm^{2}) = (W - 12)^{*}x(H - 12)^{*} * 10^{-4}$$

$$A_{b}(dm^{2}) = W_{b}xt_{b}x10^{-4}$$

$$A_{s}(dm^{2}) = ((W - 12)^{*}x(H - 12)) - ((W - 12^{*} - (2 * W_{g})) * (H - 12^{*} - (2 * W_{g}))) * 10^{-4}$$

### Legend:

S.L. = free area W = width H = height  $A_c$  = contact area  $A_b$  = blade area  $A_s$  = sealing area W<sub>b</sub> = blade width = W-12 t<sub>b</sub> = blade thickness W<sub>g</sub> = gasket width

**Fire protection** 

For nominal dimensions L = 100 mm and/or H = 100 mm, use "W" instead of "(W-12)" and "H" instead of "(H-12)" (see page 20).

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## **Dimensions**

### Free area

+ (m	)	W (mm)																			
t <sub>ь</sub> (m	····)	100	150	200	250	300	315	350	355	400	450	500	550	560	600	630	650	700	710	750	800
	100	20	20	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	150	20	20	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	175	20	20	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	180	20	20	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	200	20	20	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	250	-	20	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	300	-	20	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	315	-	-	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	350	-	-	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
	355	-	-	20	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
н	400	-	-	-	20	20	20	20	20	20	27	27	27	27	27	27	27	27	27	27	27
(mm)	450	-	-	-	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
	500	-	-	-	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
	550	-	-	-	-	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
	560	-	-	-	-	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
	600	-	-	-	-	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
	630	-	-	-	-	-	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
	650	-	-	-	-	-	-	35	35	35	35	35	35	35	35	35	35	35	35	35	35
	700	-	-	-	-	-	-	35	35	35	35	35	35	35	35	35	35	35	35	35	35
	710	-	-	-	-	-	-	-	-	35	35	35	35	35	35	35	35	35	35	35	35
	750	-	-	-	-	-	-	-	-	35	35	35	35	35	35	35	35	35	35	35	35
	800	-	-	-	-	-	-	-	-	-	35	35	35	35	35	35	35	35	35	35	35

$$S.L.(dm^{2}) = A_{c} - A_{b} - A_{s}$$

$$A_{c}(dm^{2}) = (W - 12) (H - 12)$$

For nominal dimensions L = 100 mm and/or H = 100 mm, use "W" instead of "(W-12)" and "H" instead of "(H-12)" (see page 20).

### Legend:

S.L. = free area W = width H = height  $A_c$  = contact area  $A_b$  = blade area  $A_s$  = sealing area  $W_b$  = blade width = W-12  $t_b$  = blade thickness  $W_g$  = gasket width

### **FDS-3G-KS** Rectangular fire damper

## K•I•]**A**IR

## **Dimensions**

Free area

											W (I	nm)									
W <sub>g</sub> (I	nm)	100	150	200	250	300	315	350	355	400	450	500	550	560	600	630	650	700	710	750	800
	100	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	150	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	175	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	180	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	200	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	250	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	300	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	315	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	350	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	355	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Н	400	-	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
(mm)	450	-	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	500	-	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	550	-	-	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	560	-	-	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	600	-	-	-	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	630	-	-	-	-	-	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
	650	-	-	-	-	-	-	13	13	13	13	13	13	13	13	13	13	13	13	13	13
	700	-	-	-	-	-	-	13	13	13	13	13	13	13	13	13	13	13	13	13	13
	710	-	-	-	-	-	-	-	-	13	13	13	13	13	13	13	13	13	13	13	13
	750	-	-	-	-	-	-	-	-	13	13	13	13	13	13	13	13	13	13	13	13
	800	-	-	-	-	-	-	-	-	-	13	13	13	13	13	13	13	13	13	13	13

$$S.L. (dm^{2}) = A_{c} - A_{b} - A_{s}$$

$$A_{c}(dm^{2}) = (W - 12)^{*}x(H - 12)^{*} + 10^{-4}$$

$$A_{b}(dm^{2}) = W_{b}xt_{b}x10^{-4}$$

$$A_{s}(dm^{2}) = ((W - 12)^{*}x(H - 12)) - ((W - 12^{*} - (2 * W_{g})) * (H - 12^{*} - (2 * W_{g}))) * 10^{-4}$$

### Legend:

S.L. = free area W = width H = height  $A_c$  = contact area  $A_b$  = blade area  $A_s$  = sealing area  $W_b$  = blade width = W-12  $t_b$  = blade thickness  $W_g$  = gasket width For nominal dimensions L = 100 mm and/or H = 100 mm, use "W" instead of "(W-12)" and "H" instead of "(H-12)" (see page 20).

# [{●]●]**\**IR

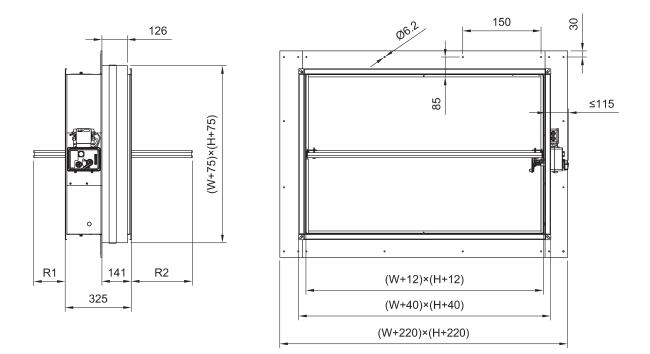
## **Dimensions and weight**

## **Dimensions**

To avoid obstructing damper blade movement, connect a straight duct with minimum lengths R1 or R2, respectively. R1 and R2 represent the overhang of the fully open damper blade, including the seals and blade gaskets.

### NOTES

'\* For nominal dimension W = 100 mm, the internal width is 100 mm and the outer flange width is 152 mm; and/or for nominal dimension H = 100 mm, the internal height is 100 mm and the outer flange height is 152 mm.





## **Dimensions and weight**

Blade protrusion

	H (mm)																					
	100	150	175	180	200	250	300	315	350	355	400	450	500	550	560	600	630	650	700	710	750	800
R <sup>1</sup>	-188	-163	-150	-148	-143	-118	-93	-85	-68	-65	-43	-18	7	32	37	57	72	82	107	112	132	157
R <sup>2</sup>	-43	-18	-5	-3	2	27	52	60	77	80	102	127	152	177	182	202	217	227	252	257	277	302

## Weight

116	400()	0%)									W (I	nm)									
(Kg ±	10%)	100	150	200	250	300	315	350	355	400	450	500	550	560	600	630	650	700	710	750	800
	100	7,1	7,9	8,8	9,6	10,5	10,5	11,4	11,5	12,3	13,2	14	14,9	15,1	15,8	16,3	16,5	17,6	17,8	18,4	19,3
	150	7,9	8,8	9,7	10,7	11,7	11,9	12,6	12,7	13,5	14,5	15,4	16,3	16,5	17,4	17,9	18,1	19,2	19,4	20,1	21
	200	8,8	9,8	10,7	11,8	12,8	13,1	13,8	13,9	14,8	15,8	16,8	17,9	18	18,9	19,4	19,6	20,9	21,1	21,8	22,8
	250	-	11,7	11,7	12,9	13,9	14,2	15	15,2	16	17,2	18,3	19,4	19,6	20,4	21	21,2	22,5	22,7	23,6	24,7
	300	-		12,8	13,9	15	15,4	16,2	16,4	17,3	18,6	19,7	20,8	21	21,9	22,6	22,7	24,1	24,4	25,4	26,5
	315	-		13,1	14,2	15,4	15,8	16,6	16,7	17,7	18,9	20,1	21,2	21,5	22,3	23,1	23,3	24,7	24,9	25,9	27
н	350	-		13,8	15	16,2	16,6	17,3	17,5	18,6	19,9	21,1	22,2	22,5	23,4	24,2	24,3	25,9	26	27,1	28,3
(mm)	355	-		13,9	15,2	16,4	16,7	17,5	17,6	18,7	20	21,2	22,4	22,6	23,6	24,3	25,4	26	26,3	27,2	28,4
	400	-		14,8	16	17,3	17,7	18,6	18,7	19,9	21,2	22,4	23,7	24	24,9	25,7	25,9	27,5	27,8	28,8	30
	450	-			17,1	18,5	18,9	19,8	19,9	21,1	22,5	23,8	25,1	25,4	26,5	27,3	27,5	29,2	29,5	30,5	31,8
	500	-			18,2	19,6	20	21	21,1	22,4	23,8	25,2	26,7	26,9	28,1	28,8	29	30,8	31,1	32,2	33,6
	550	-				20,7	21,1	22,2	22,4	23,6	25,1	26,7	28,1	28,4	29,6	30,4	30,6	32,5	32,8	33,9	35,4
	560	-				21	21,45	22,4	22,5	23,9	25,4	26,7	28,4	28,6	29,9	30,7	30,9	32,8	33,1	34,3	35,7
	600	-				21,8	22,3	23,3	23,6	24,9	26,5	28,1	29,6	29,9	31,1	32	32,1	34,1	34,4	35,7	37,2

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## Instalaltion

4 Kit	FDS-3GKS 100 × 100 800 × 600	El 120 (v <sub>e</sub> h <sub>o</sub> i $\leftrightarrow$ o) S	e (e	b)	360°
	Subpressure 500 Pa				

### Legend

- 4.- Kit Installation, using an Installation Kit
- a) Flexible (plasterboard) wall
- b) Concrete/masonry/cellular concrete (rigid) wall
- v<sub>e</sub> Vertical wall

### Installation, Maintenance & Operation

Some damper parts may have sharp edges – therefore to protect yourself from harm, please use gloves during damper installation and manipulation. In order to prevent electric shock, fire or any other damage which could result from incorrect damper usage and operation, it is important to:

- 1. Ensure that installation is performed by a trained person.
- 2. Follow the written and depicted instructions provided within Handbook closely.
- 3. Perform damper inspection in accordance with Handbook.
- 4. Check the damper's functionality as per the chapter "Fire Damper Functionality Check" before you install the fire damper. This procedure prevents the installation of a damper that has been damaged during transportation or handling. Information about installation, maintenance and operation can be found at www.koolair.com.

#### Installation rules

- The duct connected to the fire damper must be supported or hung in such a way that the damper does not carry its weight. The damper must not support any part of the surrounding construction or wall which could cause damage and consequent damper failure. It is recommended to connect the damper to a dilatation compensator on either end of the damper.
- The damper driving mechanism can be placed on either side of the wall, however it needs to be placed so as to ensure easy access during inspection.
- The distance between the fire damper bodies is defined by the Kit base plate. Smallest distance between two dampers with kit is when the Kit base plates are touching.
- The distance between the wall/ceiling is defined by the Kit base plate. Smallest distance between wall/ceiling and a damper with kit is when the Kit base plates is touching wall/ceiling.
- The fire damper must be installed into a fire partition structure in such a way that the damper blade in its closed position is located inside this structure. Kit base plate on the damper body represents a plane where supporting constructure begins.
- For each resistivity the minimum thickness of a its supporting construction cannot be decreased as per EN 1366-2 at least 200 mm from the installation opening

IN ACCORDANCE WITH EN 15650, ALL FIRE DAMPERS MUST BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.



### Installation Using an Installation Kit

IMPORTANT: The installation kit can not be delivered separately! The installation kit is delivered pre-mounted on a damper.

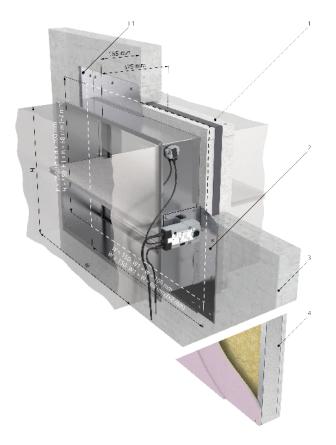
- 1. The supporting construction opening must be prepared as depicted. Opening surfaces must be even and cleaned off.
- 2. The opening dimensions are driven by the nominal dimensions of the damper with added clearance. For rectangular dampers, the opening will have dimensions of W1 × H1.
- 3. The flexible wall opening must be reinforced as per the standards for plasterboard walls. Additionally opening in the flexible wall must be reinforced as per the standards for plasterboard walls and the perimeter of its interior must be lined with a double layer of 12,5 mm thick plasterboard (see detail).
- 4. This is the simplest installation method. Insert the damper into the opening and fix the Kit base plate using appropriate screws (recommended screw diameter 5,5 e.g. DIN7981) into pre-drilled holes.
- 5. If needed, uncover and clean the damper after installation.
- 6. Check the damper's functionality.

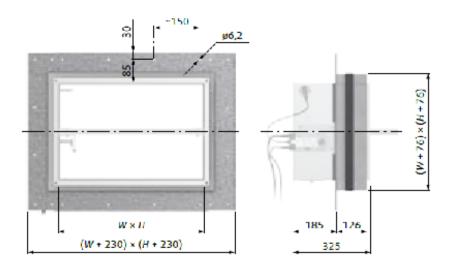
#### **Installation Standard Distances**

The distances are defined by the kit base plate. Minimum distances are when kit base plate is touching ceiling or side wall. This means from the wall or ceiling to the duct axis it is (W+230)/2 or (H+230)/2. For multiple crossings through a fire resistive wall the minimum distance between two duct axes is Wp, this means the Kit base plates are touching. This Kit base plate also serves as a distance limiter for nearby foreign objects crossing the fire resistive wall.

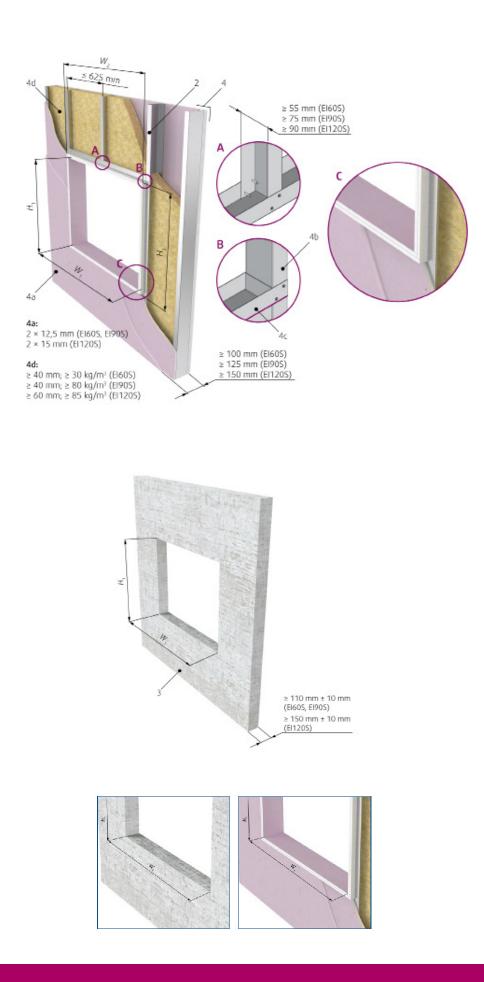
#### Installation into a Wall thinner than tested

Installation into a thinner wall is allowed under the condition that an additional layer/layers of fire protective board are fixed to the surface of the wall in order to achieve the same length of damper penetration seal as was tested. The minimum width of added boards around the damper is 200 mm. In addition, the alternative thinner wall should be classified in accordance with EN 13501-2:2007 + A1: 2009 for fire resistance required for product application. For a protruding wall, the additional layers must be fixed on the steel supporting construction of the wall.

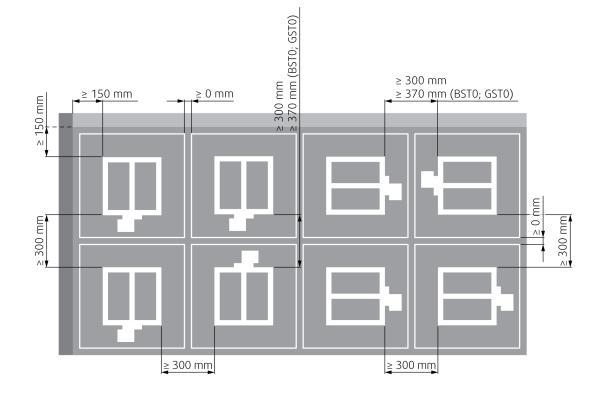








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#### Legend:

- F1 Screw  $\geq$  5,5 DIN7981 or suitable wall plug and screw size 6.
- 1. Fire damper with KIT (factory fitted)
- 2. Kit base plate fixed directly onto the wall
- 3. Concrete/masonry/cellular concrete wall or ceiling
- 4. Flexible (plasterboard) wall
- 4a. 2 layers of plasterboard fireproof plate type F, EN 520
- 4b. Vertical CW profiles
- 4c. Horizontal CW profiles
- 4d. Mineral wool; thickness/cubic density see picture.

#### Notes:

- a) Flexible (plasterboard) wall
- b) Concrete/masonry/cellular concrete (rigid) wall
- v<sub>e</sub> Vertical wall



## **Electrical connections**

## Type of activation KH0

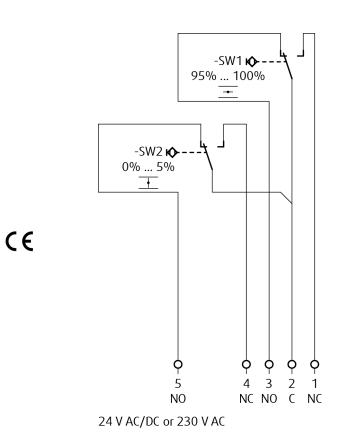
This type of actuating mechanism has no electrical components.

### Type of activation H2

IMPORTANT: Danger of electric shock! Disconnect the power supply before working on any electrical equipment. Only qualified electricians should work on the electrical installation. Microswitch: Power supply: 125/250V AC or 12/24V DC Electrical parameters:3A.

#### NOTES:

- For safety, power supplied via isolation transformer.
- Energy consumption must be monitored.



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## Type of activation H5-2

#### IMPORTANT: Danger of electric shock!

Disconnect the power supply before working on any electrical equipment. Only qualified electricians should work on the electrical installation.

#### Microswitch:

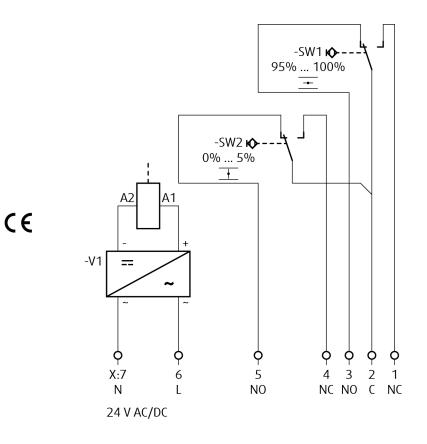
Power supply: 125/250V AC or 12/24V DC Electrical parameters: 3A

#### Impulse electromagnet:

Power supply: AC (50/60 Hz)/DC 24 V Electrical parameters: 50 VA, 10% load factor (maximum 30 seconds in operation)

#### NOTES:

- 50 VA = Nominal activation power, maximum permissible magnetic load = 300 VA
- For safety, power supplied via isolation transformer.
- · Power consumption must be observed!





## Type of activation H6-2

IMPORTANT: Danger of electric shock!

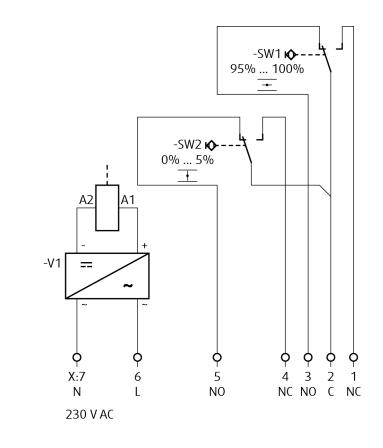
Disconnect the power supply before working on any electrical equipment. Only qualified electricians should work on the electrical installation. Microswitch:

Power supply: 125/250V AC or 12/24V DC Electrical parameters: 3A Shunt release electromagnet: Power supply: 230V AC, 50/60 Hz Electrical parameters: 50 VA, 10% load factor (maximum 30 seconds in operation)

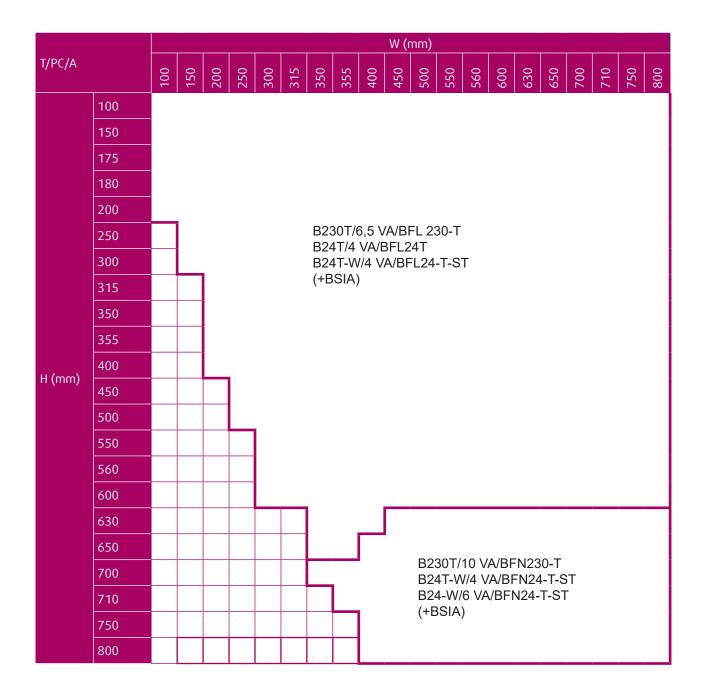
#### NOTES:

- 50 VA = nominal activation power, maximum permissible magnetic load = 300 VA
- Caution! Main supply voltage!
- A device is required to disconnect the conductors from the poles (minimum contact gap of 3 mm) to isolate them from the power supply.
- · Energy consumption must be monitored!

CE



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T/PC/A		W (mm)									
		850	006	950	1000	1050	1100	1120	1150	1200	
	100										
H (mm)	150										
	175										
	180										
	200		B23	230T/6,5 VA/BFL 230-T							
	250	B24T/4 VA/BFL24T					-				
	300		B24T-W/4 VA/BFL24-T-ST (+BSIA)					I			
	315										
	350										
	355										
	400										
	450										
	500										
	550										
	560			30T/10 VA/BFN230-T							
	600										
	630				T-W/4 VA/BFN24-T-ST -W/6 VA/BFN24-T-ST						
	650		(+BSIA)								
	700										
	710										
	750										
	800										

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## Type of activation B230T

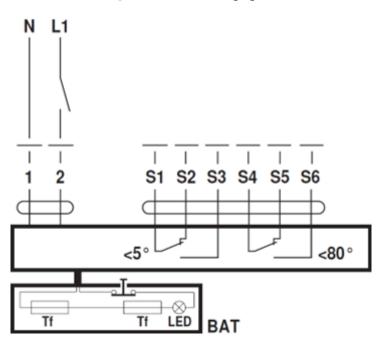
IMPORTANT: Danger of electric shock!

Disconnect the power supply before working on any electrical equipment. Only qualified electricians should work on the electrical installation.

Actuator supply: 230V AC, 50/60 Hz

#### NOTES:

- Caution! Main supply voltage!
- A device is required to disconnect the conductors from the poles (minimum contact gap of 3 mm) to isolate them from the power supply.
- It is possible to connect several actuators in parallel.
- Energy consumption must be monitored!



## AC 230 V, open-close CE

#### Legend

- 1 Blue cable
- 2 Brown cable
- S1 Purple cable
- S2 Red cable
- S3 White cable
- S4 Orange cable
- S5 Pink cable S6 Grev cable
- S6 Grey cable Tf Fusible link



## Type of activation B24T-W

IMPORTANT: Danger of electric shock!

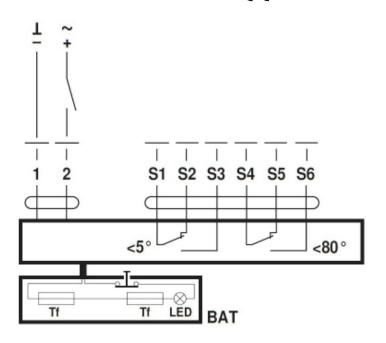
Disconnect the power supply before working on any electrical equipment. Only qualified electricians should work on the electrical installation.

Actuator supply: 24 V AC (50/60 Hz)/DC

NOTES:

- For safety, power supplied via isolation transformer.
- It is possible to connect several actuators in parallel.
- · Energy consumption must be monitored!

## AC/DC 24 V, open-close CE



#### Legend

- 1 Blue cable
- 2 Brown cable
- S1 Purple cable
- S2 Red cable
- S3 White cable
- S4 Orange cable
- S5 Pink cable
- S6 Grey cable
- Tf Fusible link

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## Type of activation KH0

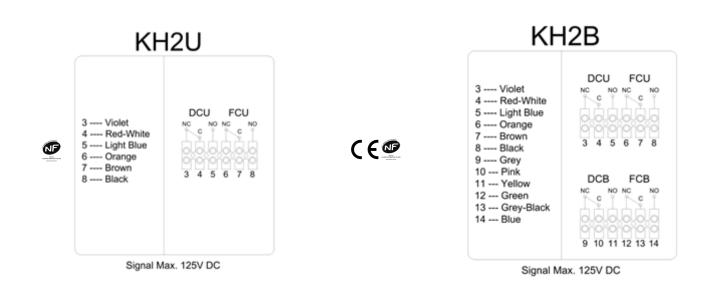
This type of actuating mechanism has no electrical components.

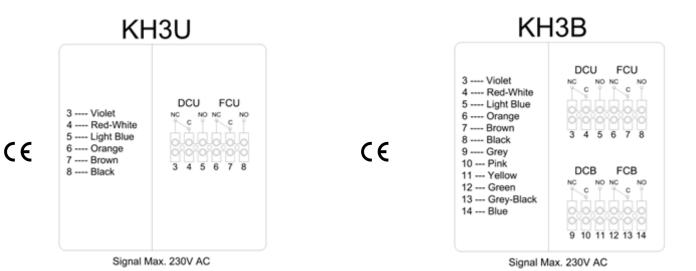
### Type of activation KH2 CE NF / KH3 CE (U-B)

IMPORTANT: Danger of electric shock! Disconnect the power supply before working on any electrical equipment. Only qualified electricians should work on the electrical installation. Microswitch: Power supply: AC/DC 12/24/48 V; AC 125 V; AC 230 V (KH3 Upon request) contact switches.

NOTES:

- · For safety, power supplied via isolation transformer.
- Energy consumption must be monitored.





Fire protection



## Type of activation KH5-2 (U-B)

#### **IMPORTANT: Danger of electric shock!**

Disconnect the power supply before working on any electrical equipment. Only qualified electricians should work on the electrical installation.

#### Microswitch:

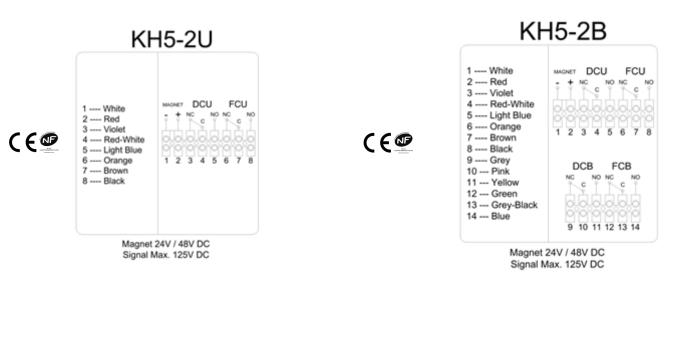
Power supply: AC/DC 12/24/48 V; AC 125 V; AC 230 V (upon request) contact switches.

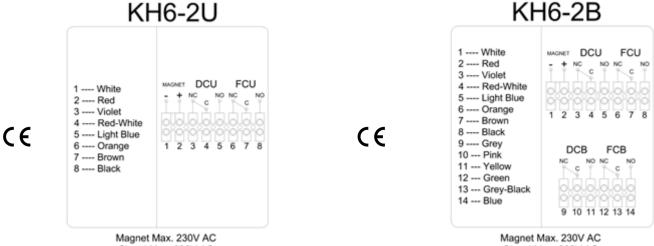
#### Impulse electromagnet

Electrical parameters: 3,5 W

#### NOTES:

3,5 W: Nominal activation power





Signal Max. 230V AC

Signal Max. 230V AC



### Type of activation KH5... + RMK-4.0 / KH6... + RMK-4.0

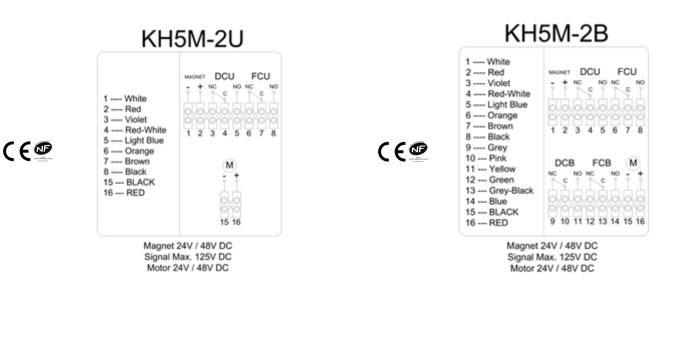
#### IMPORTANT: Danger of electric shock!

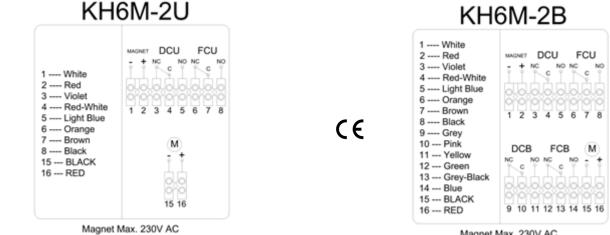
Disconnect the power supply before working on any electrical equipment. Only qualified electricians should work on the electrical installation.

Actuator supply: 24/48 AC/DC.

#### NOTES:

- Caution! Main supply voltage!
- A device is required to disconnect the conductors from the poles (minimum contact gap of 3 mm) to isolate them from the power supply.
- · It is possible to connect several actuators in parallel.





Signal Max. 230V AC Motor 24V / 48V DC Magnet Max. 230V AC Signal Max. 230V AC Motor 24V / 48V DC

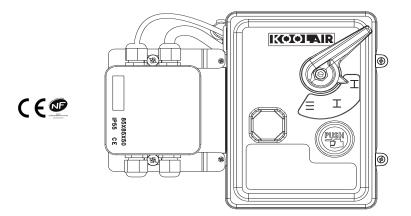
CE



### Type of activation KH... + RMK-4.0

#### Electrical connections for fire dampers type KH0, KH2U, KH2B, KH5-2U et KH5-2B (with or without RMK4.0) :

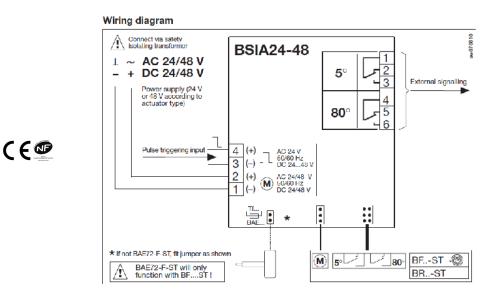
Connection must be made inside a Famatel 3051 box with watertight cable glands (at least IP42 according to EN 60529)



Any unused cable gland must be replaced by a plastic plug ensuring a protection index to at least IP42 according to EN 60529.

Each cable gland must be adapted to the diameter of the cable passing through it.

### Type of activation B24T-W + Bsia



IMPORTANT: Danger of electric shock!

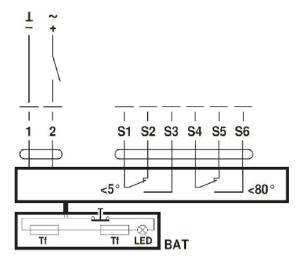
Disconnect the power supply before working on any electrical equipment. Only qualified electricians should work on the electrical installation.

Actuator supply: 24 V AC (50/60 Hz)/DC

#### NOTES:

- · For safety, power supplied via isolation transformer.
- · It is possible to connect several actuators in parallel.
- · Energy consumption must be monitored!

#### AC/DC 24 V, open-close



#### Legend

- 1. Black cable
- 2. Red cable (white for BF24-T-ST)
- S1. Violet cable (white for BF24-T-ST)
- S2. Red cable (white for BF24-T-ST)
- S3. White cable (white for BF24-T-ST)
- S4. Orange cable (white for BF24-T-ST)
- S5. Pink cable (white for BF24-T-ST)
- S6. Grey cable (white for BF24-T-ST)
- Tf. Fusible link

#### Electrical connections for fire dampers with Belimo motor + BSIA

Connection must be made inside BSIA box with watertightcable glands (at least IP42 according to EN 60529). Any unused cable gland must be replaced by a plastic plug ensuring a protection index to at least IP42 according to EN 60529.

Each cable gland must be adapted to the diameter of the cable passing through it.

## **Operation Manual**

### Warning

To avoid injury, make sure to wear gloves and keep the blades movement area clear while manipulating with the damper. NEVER OPEN THE INSPECTION LID WHEN THERE IS AIR FLOWING IN THE DUCT CONNECTED TO THE FIRE DAMPER!

## **Fire Damper Functionality Check**

#### Manually Operated Activation Mechanism

- 1. Open the damper turn the red crank (P10) using a hexagon bent wrench No. 10 (P13). Turn the red crank so that the indicator arrow is pointing to the "OPEN" position (P11), the red crank needs to remain in the "OPEN" position, and the microswitch for the open position indication must be pushed (if installed).
- 2. Close the damper release the mechanism by pressing the red release button (P9), the red crank will adjust its indicator arrow pointing to the "CLOSED" position (P12) and remain locked in this position, the microswitch for the closed position indication must be pushed (if installed).
- 3. Open the damper turn the red crank (P10) using a hexagon bent wrench No. 10. (P13) Turn the red crank so that the indicator arrow is pointing to the "OPEN" position, the red crank needs to remain in the "OPEN" position, and the microswitch for the open position indication must be pushed (if installed)

#### Spring Return Actuator Operated Activation Mechanism

- 1. The fire damper must open automatically after the actuator circuit closes the arrow on the actuator axis must show the position 90°.
- 2. Press the control switch (P9) on the Thermoelectric fuse and hold it until the fire damper is fully closed the arrow on the actuator axis must show the position 0°.
- 3. Release the control switch on the Thermoelectric fuse. The fire damper must become fully open the arrow on the actuator axis must show the position 90° which is the operating position.

### **Operation Manual**

After installation, it is necessary to adjust the damper into its operating position - open the fire damper.

#### Spring Return Actuator Operated Activation Mechanism

Connect the electric driving mechanism to the relevant electric power supply (see Electrical connection section). The electromotor is activated and adjusts the damper into its open position.

#### Manually Operated Activation Mechanism

Turn the red crank into the "OPEN" position. The damper blade must remain in open position.

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## **Damper Inspection**

The activation mechanism keeps the dampers on stand-by during their entire life cycle in accordance with this manual issued by the manufacturer. It is not permitted to alter the dampers in any way nor perform any changes to their structure without the manufacturer's consent. The operator performs regular checks of the dampers as per established regulations and standards at least once every 12 months. The check needs to be performed by an employee who has been specifically trained for this purpose.

The current fire damper condition determined during the inspection needs to be entered into the operating logbook along with the date of the inspection, the legible name, surname and signature of the employee who performed the inspection. The Operating Journal includes a copy of the employee's authorization. If any discrepancies are discovered, these need to be entered in the Operating Journal along with a proposal for their removal. The Operating Journal can be found in product documents section. Immediately after the installation and activation of the damper, it needs to be

checked under the identical conditions as apply to the above mentioned 12-month inspections. The visual check ensures that visible damages on the inspected damper parts are seen. On its external side, the damper housing and the activation mechanism are checked.

Due to the need to perform a visual check of the damper's internal parts, open the inspection lid. For small sizes there is the possibility of removing the mechanism to perform the inspection. The removable mechanism always needs to be returned back into the damper with the damper blade being closed. The damper's internal casing, thermal fuse, sealings, foaming substance, the damper blade condition and accuracy of its closure during its leaning against the

backstop in the closed position must all be checked. There must not be any strange objects or a layer of impurities from the air distribution systems inside the damper.

IN ACCORDANCE WITH NF S61-933 FOR OPERATION AND MAINTENANCE OF FIRE DAMPERS.



## **Tests and Certifications**

The FDS-3G series fire dampers meet the requirements of Regulation (EU) No. 305/2011 of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), and those of the harmonised standard EN 15650 "Ventilation for buildings – Fire dampers".

All our dampers undergo testing by accredited bodies. Our fire damper certifications are based on the reports from these tests.

Test standard: EN 1366-2 "Fire resistance tests for service installations - Part 2: Fire dampers"

Classification according to EN 13501-3 "Fire classification of construction products and building elements – Part 3: Classification using data from fire resistance tests on products and elements used in building service installations: fire-resisting ducts and fire dampers"



The CPR certificate guarantees the conformity of performance.

Grupo Koolair entrusts testing to nationally and internationally accredited bodies or those registered with the ILAC (International Laboratory Accreditation Cooperation).

Certification body:

1396 - FIRES, s.r.o. Osloboditeľov 282 059 35 Batizovce, Slovakia Tel.: +421 52 28516 11 www.fires.sk

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## **Tests and Certifications**

In addition to the above mentioned requirements, the FDS-3G and FDS-3G KS models also comply with French regulations NF-S 61-937-1 and NF-S 61-937-5, enabling their certification under the NF 537 standard:



www.marque-nf.com

This NF mark certifies:

- Compliance with NF S 61-937 standard "Fire Safety Systems Safety Devices Actuated by Control and Monitoring System". Parts 1 and 5 for dampers.
- Presumed conformity with the Order of 22 March 2004, amended on 14 March 2011, for the fire resistance classification.
- The values of the characteristics stated in this manual.

Certification body:

AFNOR Certification 11, Rue Francis de Pressensé 93571 La Plaine Saint Denis Cedex Tel.: +33(0)1.41.62.80.00 Fax: +33(0)1.49.17.90.00 Website: http://www.afnor.org y http://www.marque-nf.com email: certification@afnor.org

Holder:

Safeair, S.L. (Spain) Avda. San Isidro, nave C-3 45223 Seseña – TOLEDO



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