

KOOLAIR

SDK

Smoke evacuation
damper

Fire protection

ISO 9001

BUREAU VERITAS
Certification

Sistema de Gestión



www.koolair.com



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General characteristics





Description

The SDK range consists of single-blade smoke exhaust dampers, designed for both primary air intake and smoke exhaust. Designed according to EN 12101-8, they can be installed in multi-sector or single-sector vertical/horizontal exhaust ducts. Tested and classified according to EN 1366-10 and EN 13501-4, respectively.

Product range

- **SDK**
Single-blade smoke exhaust damper without a decorative panel..
- **SDK-PANEL**
Single-blade smoke exhaust damper with a decorative panel.

Actuation types

- **M** 
Manual reset mechanism with remote-controlled opening actuation via electromagnet. Includes single (FDCU) or double (FDCB) start and end limit switch signalling. Features a damper locking system and manual opening.
- **MEH** 
Motorised reset mechanism (24/48V DC) with remote-controlled opening actuation via electromagnet (24/48V DC). Includes single (FDCU) or double (FDCB) start and end limit switch signalling. Features a damper locking system and manual opening.

Design and materials

Designed according to EN 12101-8 specifications, they are composed of:

- A main body made of galvanised steel coated with a refractory material.
- A blade consisting of a central galvanised steel structure, covered on the external side by a decorative panel in SDK-PANEL models, and on the internal side by another refractory material. SDK models that do not include a decorative panel require an external grille.

Accessories

The dampers in the SDK range can be equipped with various accessories:

-Decorative frame, with or without a grille, made of aluminium, with anodised or painted finish according to the RAL colour chart.

- Decorative frame for SDK-PANEL - Aluminium frame, without a grille, fixed with visible screws.
- RPK: Fixed protection grille with visible screws.
- RPK-1A: Removable protection grille with visible screws.
- RPK-2A: removable protection grille with concealed screws.
- RPK-P: P protection grille.
- RPK-X: hinged protection grille.

- Metal mounting frame fixed to the duct to facilitate damper installation.

- Horizontal anti-fall safety grille inside the duct, which can be attached to the mounting frame.

Technical parameters

Durability test

- 300 cycles for remote-controlled actuation by electromagnet and manual or motorised (MEH) reset.

Fire Test Pressure

500Pa negative pressure (sub-pressure).

Ambient Test Pressure

1500Pa negative pressure (sub-pressure).

Rest Position

Closed position. During normal operation, the damper is closed.

Safety Position

Open position for the damper in the room where the fire/smoke occurs.
Closed position for dampers located in safe areas to be isolated.

Airflow Direction

Two-way

Fire Protection Direction

Both sides (i↔o)

Position Indication

- Manual reset mechanism: standby position (single-pole or double-pole) and safety position (single-pole or double-pole) switches.
- MEH motorised reset mechanism: standby position (single-pole or double-pole) and safety position (single-pole or double-pole) switches.

Opening and Closing Time

MEH motorised reset mechanism < 30s.

Compliance with European Directives

2014/35/EU Low Voltage

2014/30/EU Electromagnetic Compatibility

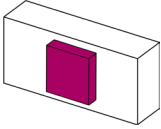
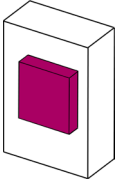
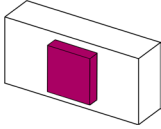
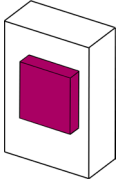
Transportation and Storage

Store indoors, in a dry place, from -20 °C to 50 °C.

Declared Performance

Safeair, S.L. (Spain)
Avda. San Isidro, nave C-3, 45223 Seseña – TOLEDO
EN 12101-8:2011

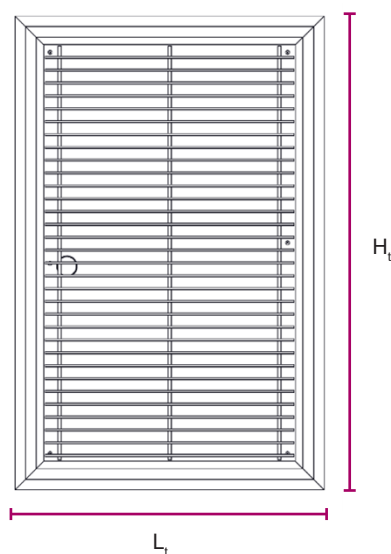
Smoke control damper
0370-CPR-7366 **SDK SERIES**

MODEL	CLASSIFICATION	LOCATION OF THE INSTALLATION	INSTALLATION	ACCESSORIES
CE SDK-PANEL-M 300 x 385 700 x 1100	EI 120 (v_{ed} i↔o) S1500 C300 AAmulti	Smoke exhaust duct	 	Optional: <ul style="list-style-type: none"> • Decorative grille • Mounting frame • Safety grille for mounting frame • Detached anti-fall grille
CE SDK-PANEL-MEH 300 x 385 700 x 1100				
CE SDK-M 300 x 385 700 x 1100	EI 120 (v_{ed} i↔o) S1500 C300 AAmulti	Smoke exhaust duct	 	Mandatory: <ul style="list-style-type: none"> • Decorative grille Optional: <ul style="list-style-type: none"> • Mounting frame • Safety grille for mounting frame • Detached anti-fall grille
CE SDK-MEH 300 x 385 700 x 1100				

- (E) Integrity
 (I) Insulation
 (ved) Vertical damper axis installation on vertical wall
 (i ↔ o) Mechanism position (regardless of the fire side)
 (S) Airtightness
 (AA) Automatic activation
 Multi Suitable for multi-compartment systems

Dimensions

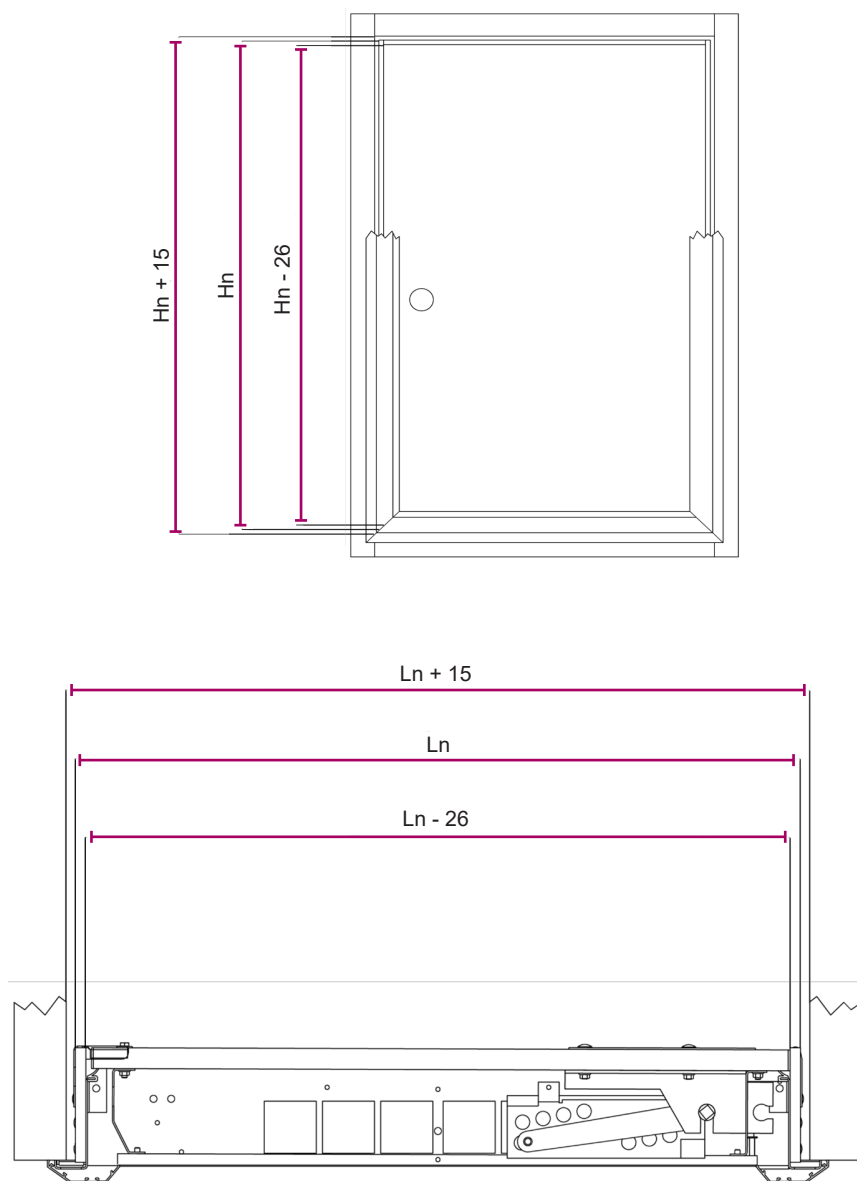
External dimensions



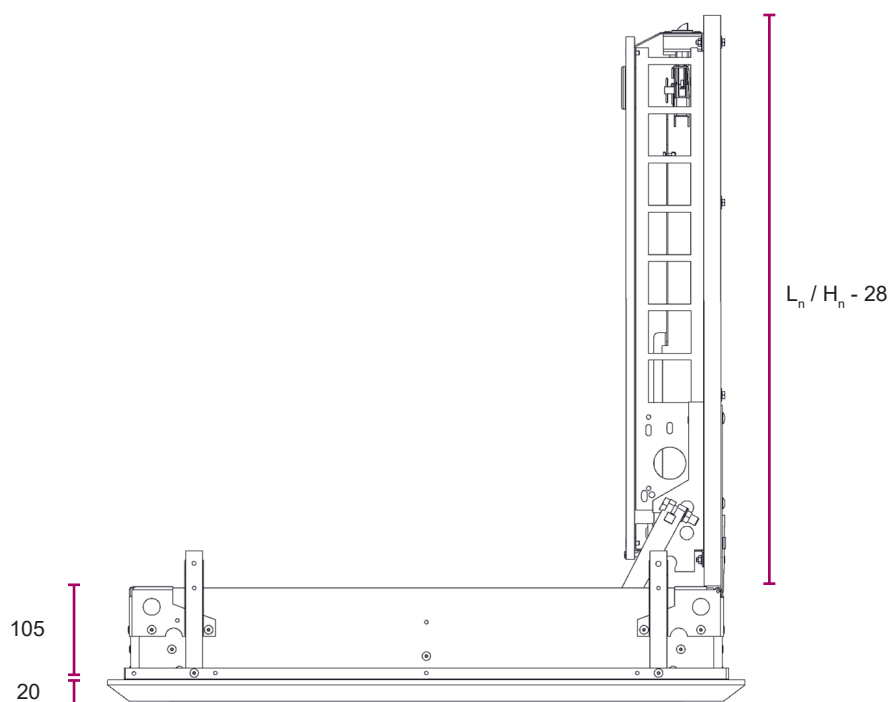
L_n [mm]	L_t [mm]					
	SDK frame	RPK	RPK-1A	RPK-2A	RPK-P	RPK-X
300	351	394	394	434	434	394
350	401	444	444	484	484	444
400	451	494	494	534	534	494
450	501	544	544	584	584	544
500	551	594	594	634	634	594
550	601	644	644	684	684	644
600	651	694	694	734	734	694
650	701	744	744	784	784	744
700	751	794	794	834	834	794

H_n [mm]	H_t [mm]					
	SDK frame	RPK	RPK-1A	RPK-2A	RPK-P	RPK-X
385	436	455				
400	451	470				
450	501	520				
500	551	570				
550	601	620				
600	651	670				
650	701	720				
700	751	770				
750	801	820				
800	851	870				
850	901	920				
900	951	970				
950	1001	1020				
1000	1051	1070				
1050	1101	1120				
1100	1151	1170				

Internal dimensions



Internal dimensions



Technical data

Air passage area for SDK and SDK-PANEL without grille

S.L. [m²]		L _n [mm]								
		300	350	400	450	500	550	600	650	700
H _n [mm]	385	0,091	0,109	0,127	0,145	0,163	0,181	0,199	0,216	0,234
	400	0,095	0,113	0,132	0,151	0,169	0,188	0,207	0,226	0,244
	450	0,107	0,128	0,150	0,171	0,192	0,213	0,234	0,256	0,277
	500	0,120	0,144	0,167	0,191	0,215	0,238	0,262	0,286	0,310
	550	0,133	0,159	0,185	0,211	0,237	0,264	0,290	0,316	0,342
	600	0,145	0,174	0,203	0,231	0,260	0,289	0,317	0,346	0,375
	650	0,158	0,189	0,220	0,251	0,283	0,314	0,345	0,376	0,407
	700	0,171	0,204	0,238	0,272	0,305	0,339	0,373	0,406	0,440
	750	0,183	0,219	0,256	0,292	0,328	0,364	0,400	0,437	0,473
	800	0,196	0,235	0,273	0,312	0,351	0,389	0,428	0,467	0,505
	850	0,208	0,250	0,291	0,332	0,373	0,414	0,456	0,497	0,538
	900	0,221	0,265	0,309	0,352	0,396	0,440	0,483	0,527	0,571
	950	0,234	0,280	0,326	0,372	0,419	0,465	0,511	0,557	0,603
	1000	0,246	0,295	0,344	0,393	0,441	0,490	0,539	0,587	0,636
	1050	0,259	0,310	0,361	0,413	0,464	0,515	0,566	0,617	0,669
	1100	0,272	0,325	0,379	0,433	0,487	0,540	0,594	0,648	0,701

A_v = Air passage area (dm²)

A_b = Blade area

H_n = Nominal height

L_n = Nominal length

$$S.L. = ((L_n - 26) \times (H_n - 26) - A_b) \times 10^{-4}$$

$$A_b = ((H_n - 26) \times 70) \times 0.3$$

Air passage area for SDK and SDK-PANEL without grille

Kp [-]		Ln [mm]								
		300	350	400	450	500	550	600	650	700
Hn [mm]	385	2,177	2,004	1,760	1,595	1,476	1,387	1,318	1,263	1,219
	400	2,080	1,916	1,683	1,526	1,411	1,327	1,261	1,208	1,166
	450	1,808	1,666	1,465	1,329	1,231	1,158	1,101	1,055	1,019
	500	1,594	1,471	1,295	1,175	1,089	1,025	0,974	0,934	0,902
	550	1,423	1,314	1,158	1,052	0,975	0,917	0,873	0,837	0,809
	600	1,282	1,185	1,045	0,950	0,881	0,829	0,789	0,757	0,732
	650	1,166	1,078	0,951	0,865	0,803	0,756	0,720	0,691	0,667
	700	1,067	0,987	0,872	0,793	0,736	0,694	0,661	0,634	0,613
	750	0,983	0,910	0,804	0,732	0,680	0,640	0,610	0,586	0,566
	800	0,910	0,843	0,745	0,679	0,631	0,594	0,566	0,544	0,525
	850	0,846	0,784	0,694	0,632	0,588	0,554	0,528	0,507	0,490
	900	0,791	0,733	0,649	0,591	0,550	0,518	0,494	0,475	0,459
	950	0,741	0,687	0,609	0,555	0,516	0,487	0,464	0,446	0,431
	1000	0,697	0,647	0,573	0,523	0,487	0,459	0,438	0,420	0,407
	1050	0,658	0,611	0,541	0,494	0,460	0,434	0,414	0,397	0,384
	1100	0,622	0,578	0,513	0,468	0,435	0,411	0,392	0,377	0,364

k_p = Pressure loss constant

H_n = Nominal Height

L_n = Nominal Length

To calculate the static pressure loss of an SDK damper based on a given airflow rate Q [m^3/h], the passage velocity V_k [m/s] is calculated according to the damper's air passage area [m^2].

Calculation example

For a damper with dimensions 600x600 mm, we refer to the air passage table and obtain the corresponding value, which in this example is 0.317 m^2 . Considering an airflow rate of 4000 m^3/h , the passage velocity is calculated using the formula:

$$V_k = \frac{Q}{A} = \frac{\left(\frac{4000 \frac{m^3}{h}}{3600 \frac{s}{h}} \right)}{0.317 m^2}$$

$$V_k = 3.50 m/s$$

For this velocity, we use the previously indicated pressure loss formula and obtain:

$$\Delta P = k_p \times V_k^2$$

$$= 0.789 \times (3.501 m/s)^2$$

$$\Delta P = 9.69 Pa$$

Ordering code

SDK - M - T24E CC - FDCU - MM - w/o anti-fall safety grille - RPK - RAL 9003 matt - 700 x 1100

1

2

3

4

5

6

7

8

9

10

1. Model:

SDK
SDK-PANEL

2. Mechanism:

M - manual reset mechanism
MEH - motorised reset mechanism

3. Electromagnet:

T24E DC – remote controlled 24V DC electromagnet
T48E DC – remote controlled 48V DC electromagnet

4. Signalling:

FDCU - single start and end limit switches
FDCB – double start and end limit switches

5. Assembly frame:

- w/o mounting frame
MM - with mounting frame

6. Anti-fall safety grille:

- W/o anti-fall safety grille
With anti-fall safety grille for MM
With detached anti-fall safety grille

7. Deco frame:

- Grille w/o decorative frame
RPK
RPK-1A
RPK-2A
RPK-X
RPK-P

8. Finish:

Natural aluminium
Matt natural anodised
RAL 9003/9005/9006/9010/9016 shine or matt

9. Length:

300 to 700

10. Height:

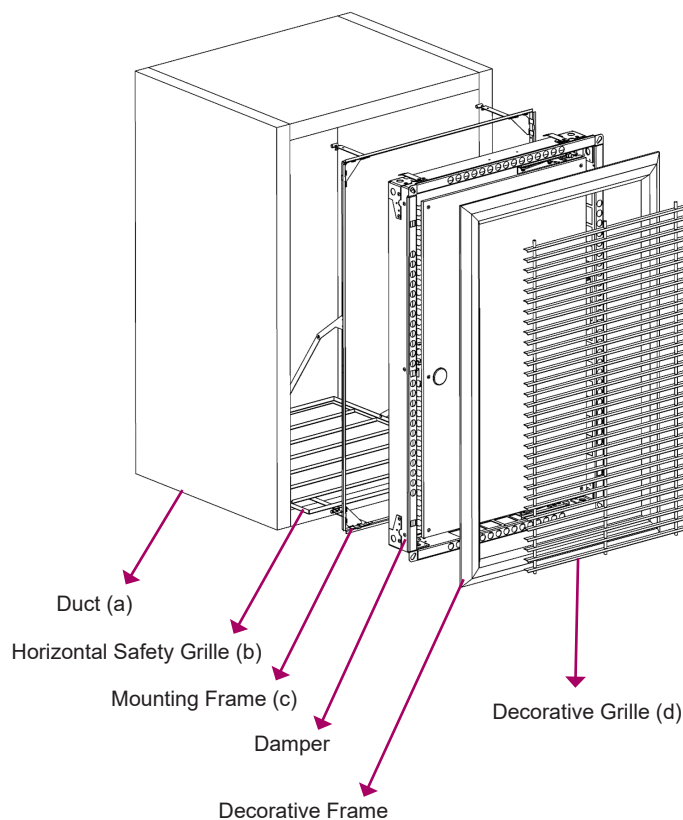
385 to 1100

Accessories

	SDK	SDK-PANEL
Mounting frame		
With Mounting Frame	●	●
Without Mounting Frame	●	●
Fall-prevention safety grille		
Without anti-fall safety grille	●	●
Anti-fall safety grille for MM	●	●
Detached anti-fall safety grill	●	●
Decorative frame		
Decorative frame without grille	×	●
RPK	●	●
RPK-1A	●	●
RPK-2A	●	●
RPK-X	●	●
RPK-P	●	●

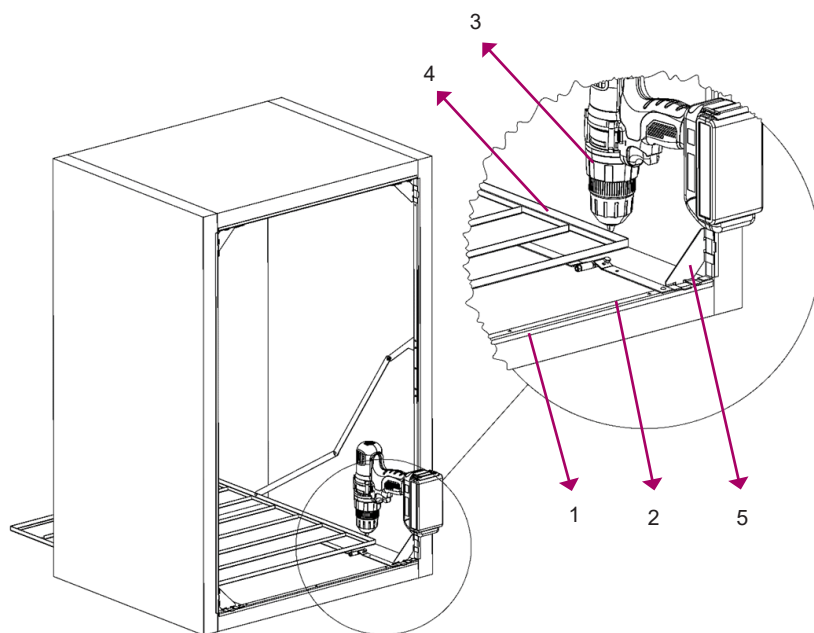
Installation and commissioning

General components



- a. PROMATECT AD 50 mm duct for multi-compartment systems, using tested ductwork according to EN 1366-8, or ductwork manufactured with materials of equal or greater density than those used in certification tests. The duct installation must be carried out according to the manufacturer's drawings.
- b. Optional element (sold separately), the anti-fall safety grille can be integrated with the mounting frame or detached, to fix it directly to the duct.
- c. Optional element (sold separately), may or may not include the safety grille.
- d. The decorative grille is optional in the SDK-Panel series; in the SDK series, it is included as standard.

Installation of the mounting frame in the duct (optional accessory)



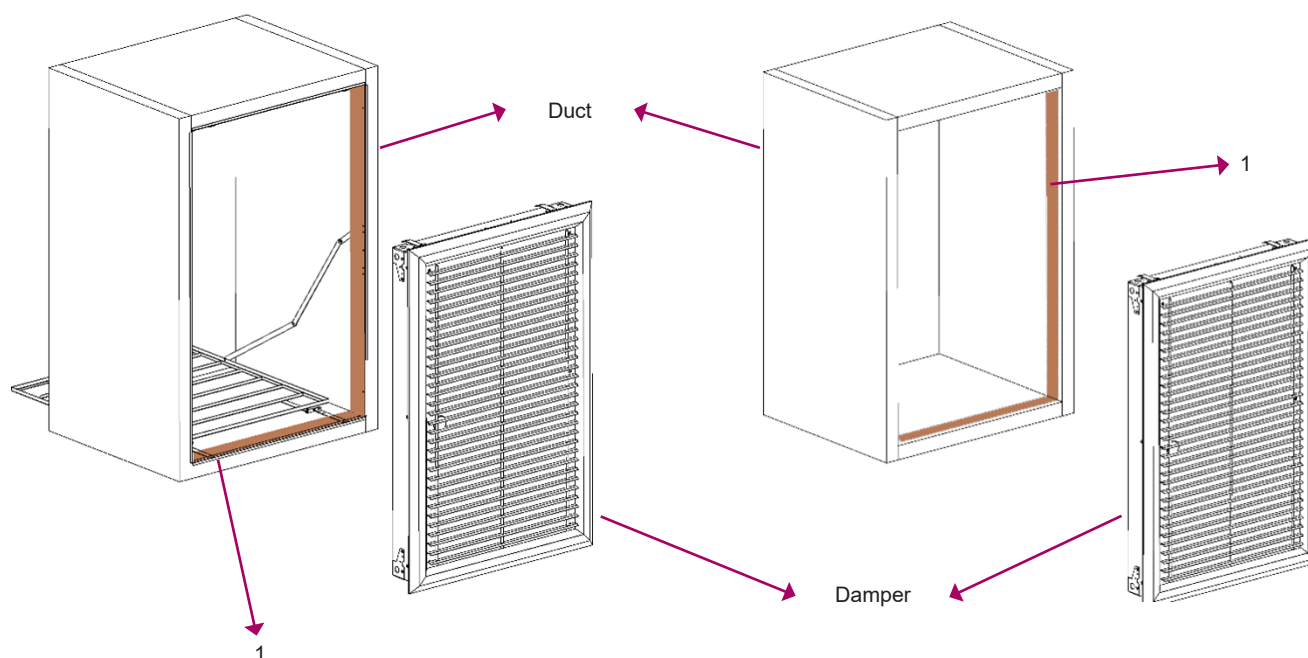
1. Apply a bead of K84 adhesive sealant before placing the mounting frame in the duct.
2. Place the mounting frame inside the duct, ensuring it abuts the front tabs.
3. Screw the mounting frame to the duct through the holes along the entire perimeter of the frame and the fixing tabs using 3.5 x 40 mm screws.
4. If the mounting frame includes an anti-fall safety grille, lower the grille onto the base of the duct and screw it in place.
5. Remove and discard the alignment brackets. Ensuring that the tensioners are fully extended and the grille is in a horizontal position.

IMPORTANT: Verify that the frame is not misaligned to prevent improper damper operation.

Damper installation

Installation WITH mounting frame

Installation WITHOUT mounting frame



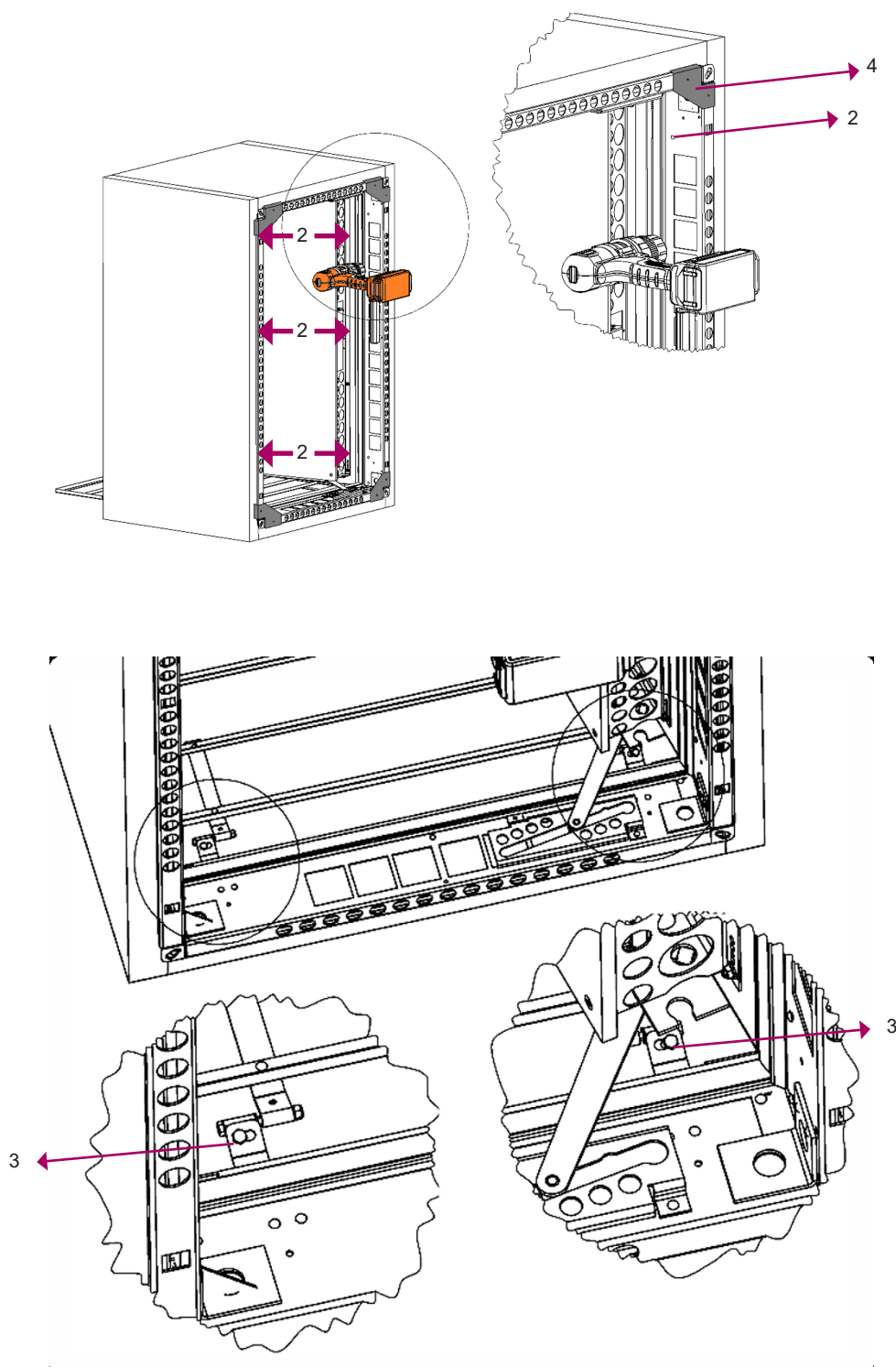
1. Whether or not a mounting frame is used, apply a sealing layer of K84 sealant around the entire inner perimeter before installing the damper, thick enough to seal the space between the damper and the duct. After installing the damper, let it dry for 24 hours.

IMPORTANT: Verify that the frame is not misaligned to prevent improper damper.

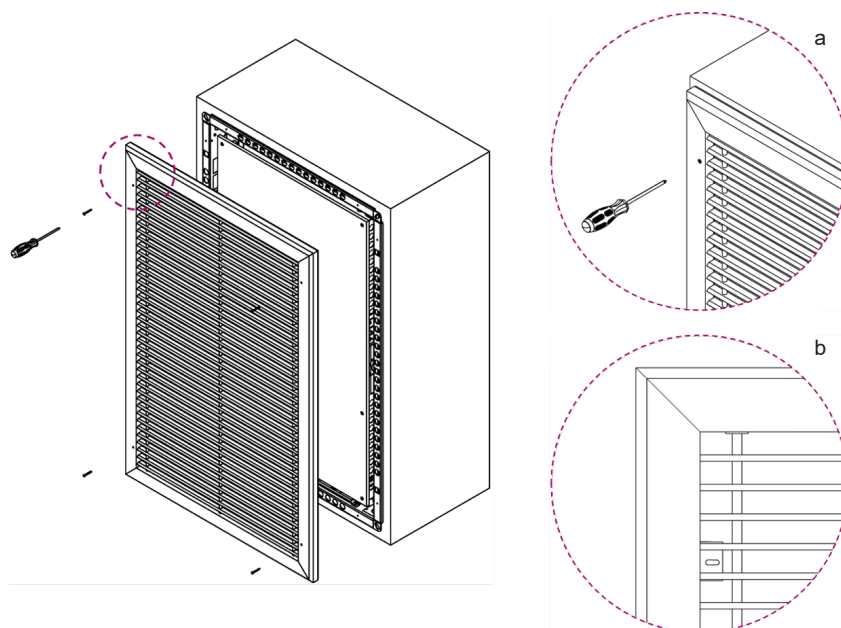
2. Screw the damper to the duct with 3.5 x 50 mm screws through the holes on the sides of the body.
3. If the installation includes a mounting frame, secure the damper fixing tabs to the mounting frame fixing tabs with M5 x 16 mm hexagonal screws.
4. Once the damper is fixed to the duct, remove the front brackets (used for packaging).

IMPORTANT – Once the K84 sealant has dried, it is necessary to perform the opening and closing operation at least 5 times to remove any remaining sealant from the hinges and ensure the damper opens correctly.

Damper installation



Installation of decorative frame and grille (where applicable)



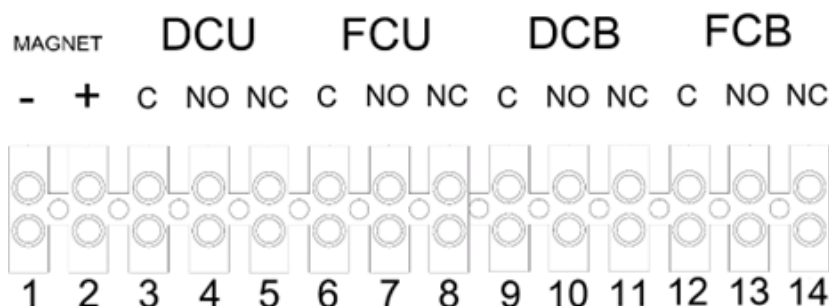
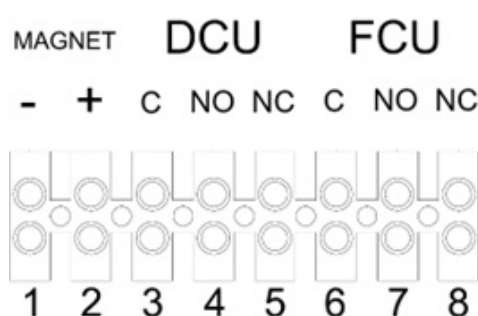
With the damper installed, fix the decorative frame to the damper frame using the screws on the front of the frame (a). For the frame with concealed screws (b), access the fixing point through the gap between the grille blades.

Electrical connections

The dampers in the SDK range have a connection box fixed inside the extruded aluminium profile, next to the damper's shaft, where the connections for the following components are located:

- Solenoid.
 - Start and end limit switches (SDK-PANEL-M/SDK-M)
 - Actuator connections (SDK-PANEL-MEH/SDK-MEH)
- Depending on the supplied damper model, there will be 2 types of signalling:
- FDCU - start and end limit switches
 - FDCB - double start and double end of stroke limit switches

Manual actuation M



Connections:

1. Black
2. Red
3. Red-white
4. Purple
5. Light blue
6. Brown
7. Orange
8. Black
9. Pink
10. Grey
11. Yellow
12. Grey-black
13. Green
14. Blue

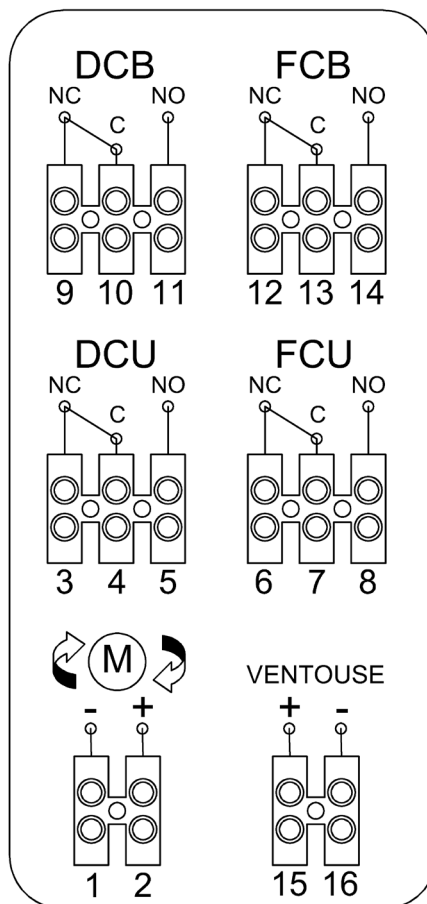
Nomenclature:

- MAGNET: solenoid.
- DCU: single pole start limit switch.
- FCU: single pole end limit switch.
- DCB: double pole start limit switch.
- FCB: double pole end limit switch.
- FDCU: single pole safety position limit switches.
- FDCB: double pole safety position limit switches.

MEH Actuation

- 1 ---- White
 2 ---- Red
 3 ---- Violet
 4 ---- Red-White
 5 ---- Light Blue
 6 ---- Orange
 7 ---- Brown
 8 ---- Black
 9 ---- Grey
 10 --- Pink
 11 --- Yellow
 12 --- Green
 13 --- Grey-Black
 14 --- Blue

 15 --- RED
 16 --- BLACK



Connections:

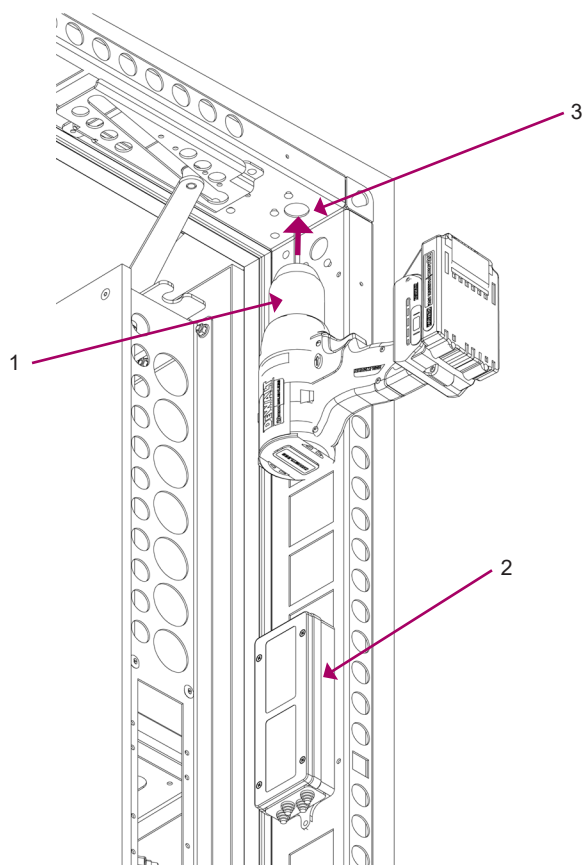
1. White
2. Red
3. Purple
4. Red-white
5. Light blue
6. Orange
7. Brown
8. Preto
9. Grey
10. Pink
11. Yellow
12. Green
13. Green-black
14. Blue
15. Red
16. Black

Nomenclature:

- MAGNET: solenoid.
- DCU: single pole start limit switch.
- FCU: single pole end limit switch.
- DCB: double pole start limit switch.
- FCB: double pole end limit switch.
- FDCU: single pole safety position limit switches.
- FDCB: double pole safety position limit switches.

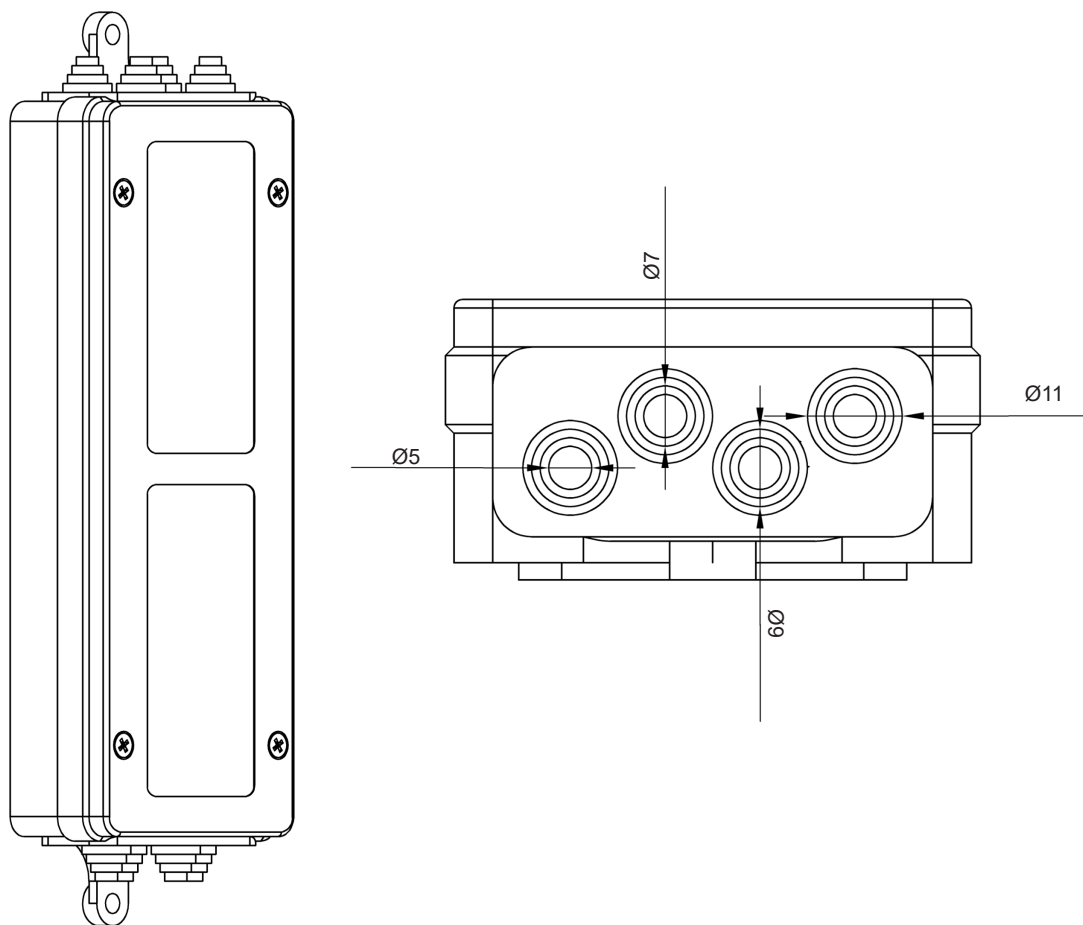
General power supply

- Connect to a voltage source according to the damper specifications.
- Incorrect wiring or incorrect voltage can cause damper malfunction or damage to the actuators.

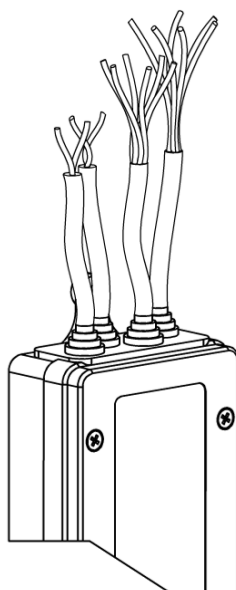


1. Drill an 18 mm cable entry hole through the damper and the duct.
2. Pass the power supply/signalling cables through the hole and make the connections in the connection box.
3. Make the connections in the junction box.
 - a. Open the required cable glands through the hole closest to the diameter of the hose to maintain the box's watertightness.

General power supply

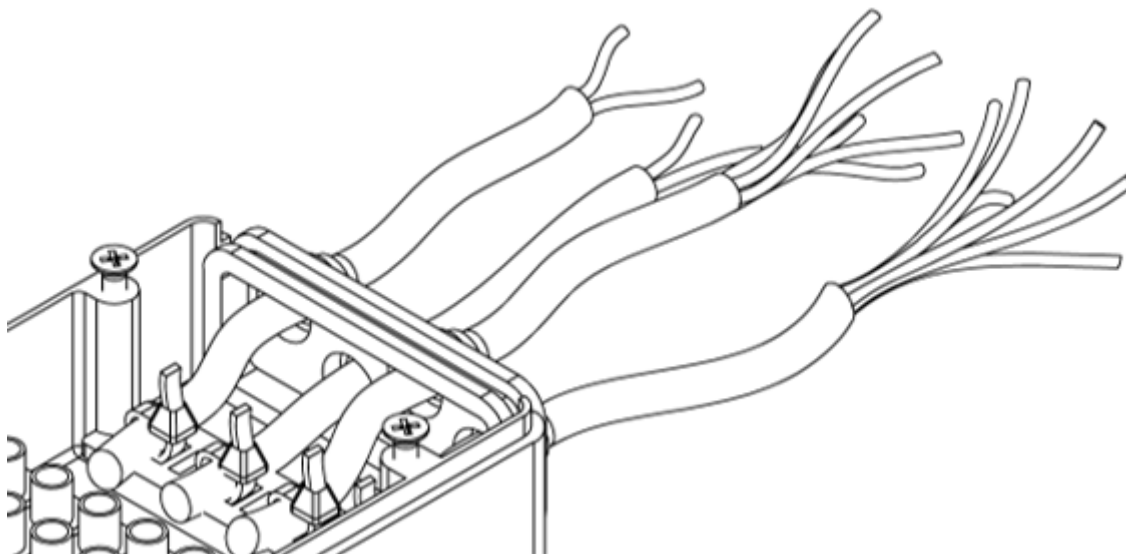


Always make the connections using cables in hoses; never insert loose wires.



b. Secure the cable hoses using the cable ties provided in the junction box.

General power supply

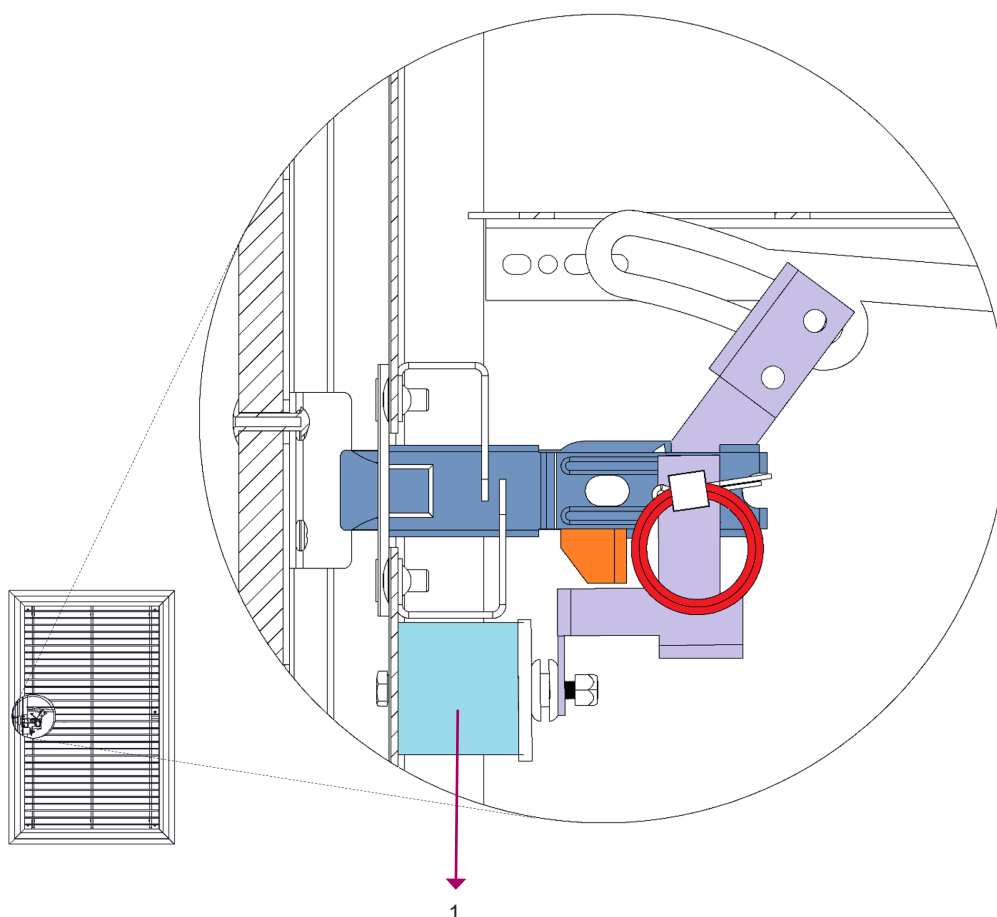


4. Seal the cable gland hole with the same fire-resistant insulating material used in the duct installation (not included).

Instructions for use

Damper opening

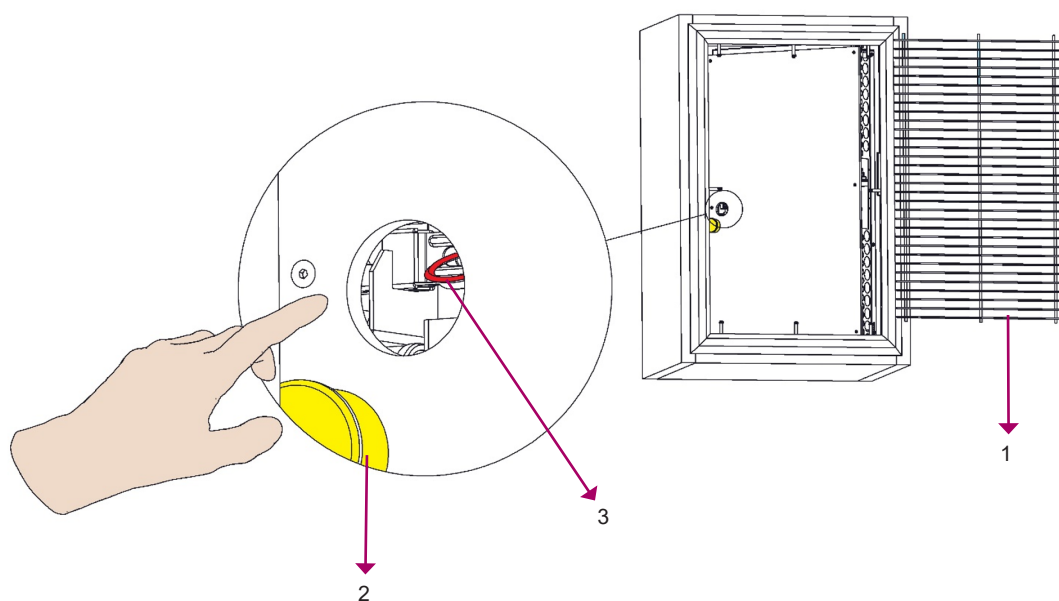
The dampers in the SDK range feature automatic opening via remote control, a closing system unlocked via electromagnet (1). During installation, it is important to supply the damper with the correct voltage to ensure its operation and avoid damaging its components.



Damper closing

Manual Actuation M

1. Remove the decorative grille (1); in SDK-PANEL, this is an optional component
2. Remove the plastic plug (2) from the decorative panel (SDK-PANEL only)
3. Pull the closing system ring (3) until the door engages in the body



MEH Actuation

The closing of the SDK...MEH models is automatic; the signal is sent via remote control, and the motor closes the damper.

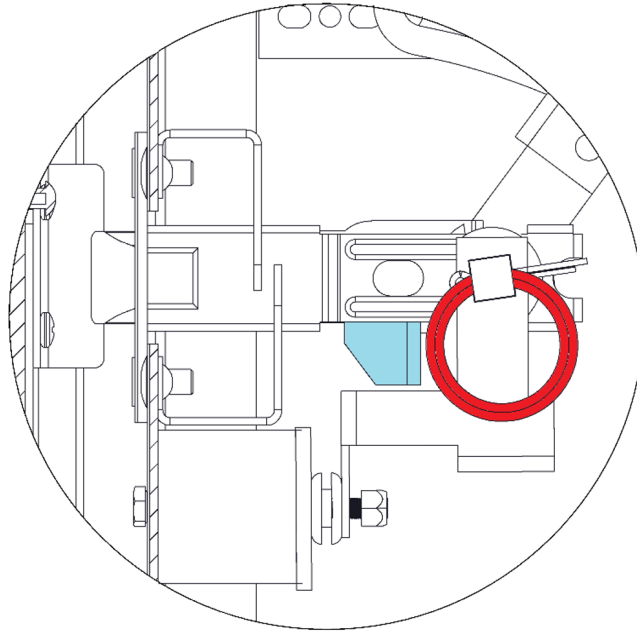
In units equipped with MEH actuation, the damper can be closed manually, similar to manual actuation M.

Manual opening

Manual Actuation M and MEH

The dampers in the M and MEH models have an opening mechanism for situations where remote-controlled opening is not possible.

1. Removal of the plastic plug from the decorative panel provides access to the closing mechanism.
2. Pulling the slider lever (1) releases the damper, and it opens automatically.



Maintenance and warranty

Incorrect damper assembly (misalignment, incorrect electrical connections, etc.) will void the warranty. Koolair shall not be held liable if the assembly, installation, and electrical connections are not carried out in accordance with this technical manual. In this case, the warranty is not guaranteed.

Tests and certifications

All our dampers are tested by official institutions. Our smoke evacuation damper certifications are based on the reports from these tests. Tested according to EN 1366-10 and EN-12101-8 standards.



0370

0370-CPR-7366 Certificate

Koolair Group tests are conducted by nationally and internationally accredited bodies or those registered with ILAC (International Laboratory Accreditation Cooperation).

Certifying body:

LGAI. Technological Center, S.A
Campus UAB – Ronda de la Font del Carmen s/n
E-08193 Bellaterra (Barcelona)
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CEN-SDK-0525-03



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