

MARKAGE MB

Rectangular Multi MA smoke control damper suitable for installation in a wall or a refractory duct.



CE
1812

UK
CA



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Explanation of the abbreviations and pictograms

Wn = nominal width	hod = horizontal duct	KIT = kit (delivered separately for repair or upgrade)
Hn = nominal height	vew = vertical wall penetration	PG = connection flange to the duct
Sn = free air passage	V = volt	GKB (type A) / GKF (type F): "GKB"
E = integrity	W = watt	stands for standard plasterboards (type A according to EN 520) while "GKF"
I = thermal insulation	V AC = Volt alternating current	plasterboards offer a higher fire resistance for a similar plate thickness (type F according to EN 520)
S = smoke leakage: max. 200 m ³ /(h m ²)	V DC = Volt direct current	Cal-Sil = calcium silicate
according to EN 1366-10	E.TELE = power supply magnet	ζ [-] = pressure loss coefficient
60/120 = fire resistance time	E.ALIM = power supply motor	Q = airflow
Pa = pascal	Auto = automatic	ΔP = static pressure drop
o -> i = meets the criteria from the outside	Tele = remote controlled	v = air speed in the duct
(o) to the inside (i)	Pnom = nominal capacity	Lwa = A-weighted sound power level
i <-> o = fire side not important	Pmax = maximum capacity	ME = motorised
AA = automatic activation	DAS MOD = modular product	H = habitat
MA = manual activation	OP = option (delivered with the product)	
multi = multi compartment		
ved = vertical duct		

	large dimensions		fast and easy installation
	superior air tightness (tested at 1500 Pa)		

CE DoP Rf-t V32 EN ■ G-01/07/2026

MARKAGE MB				MARKAGE MB			
1. Unique identification code of the product-type: Rectangular single and multi MA smoke control damper for installation in a wall or refractory duct.				Rectangular single and multi MA smoke control damper for installation in a wall or refractory duct.			
2. Intended uses: RF Technologies NV, Lange Anbaachstraat 40, B-9860 Oosterzele				RF Technologies NV, Lange Anbaachstraat 40, B-9860 Oosterzele			
3. Manufacturer: System 1				System 1			
4. Systems of ANCP: 6. Declared performance according to EN 12101-8:2011				6. Declared performance according to EN 12101-8:2011			
Essential characteristics				Essential characteristics			
Range	Type	Material	Sealing	Installation	Classification	Performance	
1000x1600 mm ≤ MARKAGE MB 200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Rigid wall	Aerated concrete ≥ 100 mm	Mortar	1	El 90 / (V _{seal} + El) ↔ o) S1500 C10000 HOT 400/30 MA MULTI		
	Rigid floor	Aerated concrete ≥ 100 mm	Mortar	1	El 90 / 20 / (h _{seal} + El) ↔ o) S1500 C10000 HOT 400/30 MA MULTI		
	Horizontal refractory duct	Promatlect LS ≥ 35 mm	Promat glue K84	1	El 90 / 20 / (h _{seal} + El) ↔ o) S1500 C10000 HOT 400/30 MA MULTI		
		Promatlect L500 ≥ 40 mm	Promat glue K84	2	El 90 / 20* (h _{seal} + El) ↔ o) S1500 C10000 HOT 400/30 MA MULTI		
		Promatlect AD ≥ 40 mm	Promat glue K84	2	El 90 / 20* (h _{seal} + El) ↔ o) S1500 C10000 HOT 400/30 MA MULTI		
		Geotec 545	Geocol	2	El 90 / 20* (h _{seal} + El) ↔ o) S1500 C10000 HOT 400/30 MA MULTI		
		Promatlect LS ≥ 35 mm	Promat glue K84	2	El 90 / 20* (h _{seal} + El) ↔ o) S1500 C10000 HOT 400/30 MA MULTI		
		Promatlect L500 ≥ 40 mm	Promat glue K84	2	El 90 / 20* (h _{seal} + El) ↔ o) S1500 C10000 HOT 400/30 MA MULTI		
		Promatlect AD ≥ 40 mm	Promat glue K84	2	El 90 / 20* (h _{seal} + El) ↔ o) S1500 C10000 HOT 400/30 MA MULTI		
		Geotec 545	Geocol	2	El 90 / 20* (h _{seal} + El) ↔ o) S1500 C10000 HOT 400/30 MA MULTI		
	Vertical refractory duct	Masonry, concrete blocks, concrete El 90/120	Promat glue K84 / mortar	2	El 90 / 20* (h _{seal} + El) ↔ o) S1500 C10000 HOT 400/30 MA MULTI		
	Shaft	Masonry, concrete blocks, concrete El 90/120	Promat glue K84 / mortar	2	El 90 / 20* (h _{seal} + El) ↔ o) S1500 C10000 HOT 400/30 MA MULTI		
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatlect LS ≥ 35 mm	Promat glue K84	2	El 60 / 20* (h _{seal} + El) ↔ o) S1000 C10000 MA MULTI		
		Promatlect L500 ≥ 40 mm	Promat glue K84	2	El 60 / 20* (h _{seal} + El) ↔ o) S1000 C10000 MA MULTI		
		Promatlect AD ≥ 40 mm	Promat glue K84	2	El 60 / 20* (h _{seal} + El) ↔ o) S1000 C10000 MA MULTI		
		Geotec 545	Geocol	2	El 60 / 20* (h _{seal} + El) ↔ o) S1000 C10000 MA MULTI		
		Promatlect LS ≥ 35 mm	Promat glue K84	2	El 60 / 20* (h _{seal} + El) ↔ o) S1000 C10000 MA MULTI		
		Promatlect L500 ≥ 40 mm	Promat glue K84	2	El 60 / 20* (h _{seal} + El) ↔ o) S1000 C10000 MA MULTI		
	Vertical refractory duct	Promatlect AD ≥ 40 mm	Promat glue K84	2	El 60 / 20* (h _{seal} + El) ↔ o) S1000 C10000 MA MULTI		
		Geotec 545	Geocol	2	El 60 / 20* (h _{seal} + El) ↔ o) S1000 C10000 MA MULTI		
		Promatlect LS ≥ 35 mm	Promat glue K84	2	El 60 / 20* (h _{seal} + El) ↔ o) S1000 C10000 MA MULTI		
		Promatlect L500 ≥ 40 mm	Promat glue K84	2	El 60 / 20* (h _{seal} + El) ↔ o) S1000 C10000 MA MULTI		
Type of installation: built-in 0/90°/180°/270° In compartment boundary (wall, 'w').	Horizontal refractory duct	Promatlect LS ≥ 35 mm	Promat glue K84	2	El 60 / 20* (h _{seal} + El) ↔ o) S1000 C10000 MA MULTI		
		Promatlect L500 ≥ 40 mm	Promat glue K84	2	El 60 / 20* (h _{seal} + El) ↔ o) S1000 C10000 MA MULTI		
		Promatlect AD ≥ 40 mm	Promat glue K84	2	El 60 / 20* (h _{seal} + El) ↔ o) S1000 C10000 MA MULTI		
		Geotec 545	Geocol	2	El 60 / 20* (h _{seal} + El) ↔ o) S1000 C10000 MA MULTI		

Signed for and on behalf of the manufacturer by:
Duchan Laplace, R&D Manager

Duchan Laplace, R&D Manager

Maer

For shaft type classifications, approval must be coordinated locally with the competent authority or approval body.

Postzerle. 01/07/2026

Product presentation MARKAGE MB

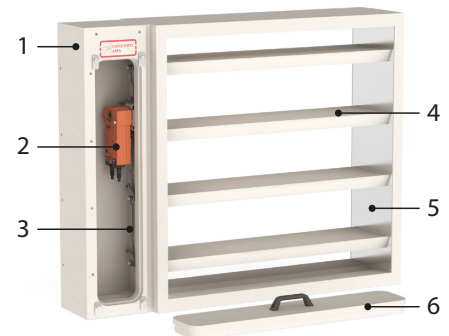
The MARKAGE MB rectangular Multi MA smoke control damper is suitable for installation in a wall or a refractory duct and has a fire resistance of 90 or 120 minutes, depending on the application and installation. The damper is available in a wide range of dimensions. The MARKAGE MB smoke control damper has an MA and HOT400/30 classification which ensures that in the event of a fire, the damper blades can still change position during the first 30 minutes. In this way, smoke control can be adjusted during or after a fire.

Smoke control shutters and dampers are suitable for use in ventilating protected lobbies, venting to shafts either naturally or mechanically. They open to evacuate smoke in emergency situations whilst maintaining fire resistant integrity in both directions in standby position.

- ✓ large number of installation options
 - ✓ can be activated with a bus communication module
 - ✓ large dimensions
 - ✓ superior air tightness (tested at 1500 Pa)
-
- compliant with EN 12101-8
 - tested according to EN 1366-10 and EN 1366-2
 - suitable for installation in rigid wall and refractory ducts
 - maintenance-free
 - for indoor use



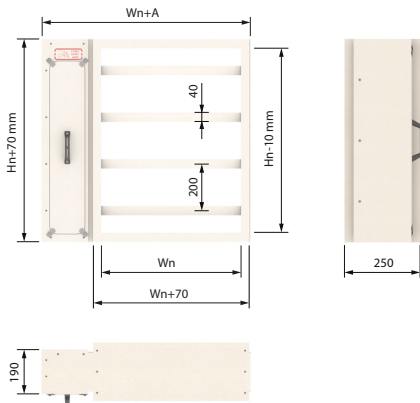
1. actuator compartment (+ communication module)
2. actuator
3. damper blade mechanism
4. damper blade
5. damper housing
6. access hatch



Range and dimensions MARKAGE MB

Range and dimensions MARKAGE MB

	$\geq$	$\leq$
(W x H) mm	200x200	1200x2400



Rectangular Multi MA smoke control damper suitable for installation in a wall or a refractory duct

Hn in steps of 200 mm, Wn in steps of 50 mm.

For dimensions (Wn x Hn) from 200 x 200 mm to 1200 x 2400 mm, A = 295 mm.

Evolution - kits



KIT BEN24

Servomotor BEN 24V



KIT BEN230

Servomotor BEN 230V



KIT BEN24-ST

Servomotor BEN 24V with plug (ST)



KIT BEE24

Servomotor BEE 24V



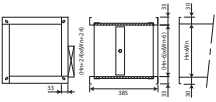
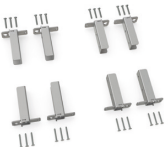
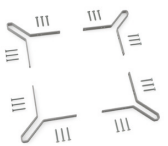
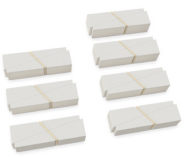
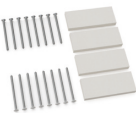
KIT BEE230

Servomotor BEE 230V

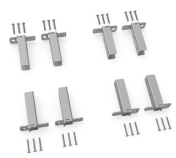
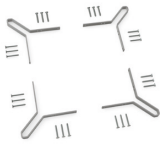
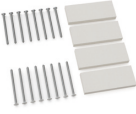


KIT BEE24-ST

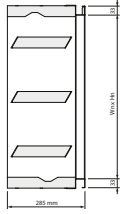
Servomotor BEE 24V with plug (ST)

	KIT BE24	Servomotor BE 24V
	KIT BE24-ST	Servomotor BE 24V with plug (ST)
	KIT BE230	Servomotor BE 230V
	MECT	Testbox for mechanisms 24/48 V (magnet, motor, beginning and end of range switches)
	PG30	Alternative connection to standard PS at the shaft side: PG30 connection to ducts with 30 mm flanges, with elliptical holes Ø 8,5 x 16 mm.
	KITS BP FM	Base plate for a bus communication module (Markage MB)
	VS	Mounting brackets for vertical suspension
	HS	Mounting brackets for horizontal suspension
	KITS SUPP	Installation material for seals with a joint
	JK BAT	Mounting hardware for combining multiple dampers into a battery

Options - at the time of order

	BP FM	Base plate for a bus communication module (Markage MB)
	VS	Mounting brackets for vertical suspension
	HS	Mounting brackets for horizontal suspension
	KITS SUPP	Installation material for seals with a joint
	JK BAT	Mounting hardware for combining multiple dampers into a battery
	ZENiX 1SD	The ZENiX 1SD field device is used to monitor and control 1 motorized smoke control damper with 230 V actuator. No configuration is required as it has a predefined device address.

Flange types - at the time of order

	PG30	Flange for connection to metal ducts.
	PPT-MA	Galvanised steel grille.

Storage and handling

As this product is a safety element, it should be stored and handled with care.

Avoid:

- any kind of impact or damage
- contact with water
- deformation of the casing

It is recommended:

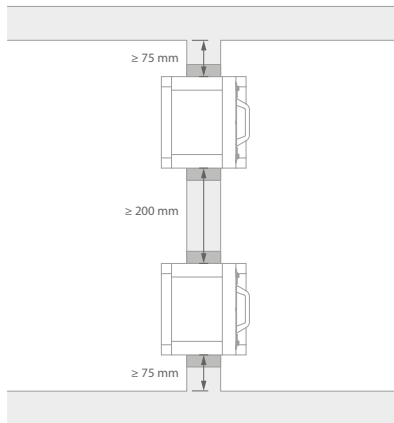
- to unload in a dry area
- not to flip or roll the product to move it
- not to use the damper as a scaffold, working table, etc.
- not to store smaller dampers inside larger ones

Installation

General points

- The installation must comply with the installation manual and the classification report.
- The installation of the smoke control duct must comply with the classification report delivered by the manufacturer.
- Axis orientation: see the declaration of performance.
- Avoid the obstruction of adjoining smoke control ducts.
- Verify if the blade can move freely.
- Rf-t smoke dampers may be applied to smoke control ducts that have been tested according to EN 1366-8 and EN 1366-9 as appropriate.
 - ⚠ Caution: when fitting, the product should be handled with care and remain protected from any sealing products.
 - ⚠ Caution: before putting the installation into operation, clean off all the dust and dirt.
 - ⚠ Caution: bear in mind the blade's clearance inside the smoke control duct.

Installation at a minimal distance from another smoke control damper or from an adjacent wall/floor

1

1. European test standard EN 1366-10 specifies the minimum required distance between 2 smoke control dampers and between a smoke control damper and a supporting construction when applied at a compartment boundary (wall mounted classification):

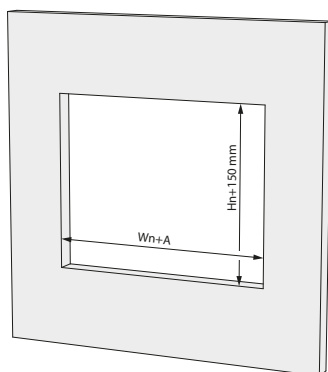
- 200 mm between 2 smoke control dampers (measured from damper tunnel to damper tunnel, without taking the connecting flanges into account)
- 75 mm between a smoke control damper and a supporting construction (measured from the damper tunnel, without taking the connection flanges into account)

Installation in rigid wall

The product was tested and approved in:

Range	Wall type	Sealing	Classification
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Rigid wall	Aerated concrete ≥ 100 mm Mortar	El 90 (v ₂ w i ↔ o) S1500 C10000 HOT 400/30 MA MULTI

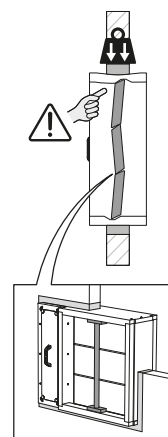
1



1. Make an opening with dimensions $(Wn+A) \times (Hn+150)$ mm.
A = 375 mm for a standard damper.

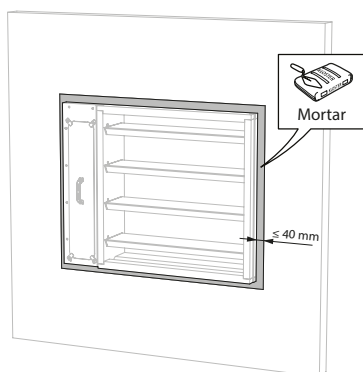
⚠ Caution: for a damper with height ≤ 400 mm and option BP FM or ZENiX 1SD, A = 545 mm.

2



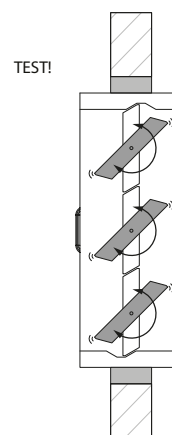
2. Mount the damper in the opening.
Support the tunnel and block the damper blades in the closed position to prevent deformation of the tunnel while the sealing is curing.

3



3. Seal the rest of the opening with standard mortar.

4



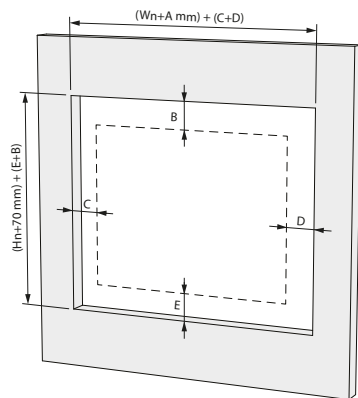
4. Check the functioning of the damper blades after the curing time of the sealing and after removing the struts.
Test the mechanism of the damper.

Installation in rigid wall, sealing with rigid stone wool boards with coating

The product was tested and approved in:

Range	Wall type	Sealing	Classification
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Rigid wall	Aerated concrete ≥ 100 mm Stone wool + coating ≥ 140 kg/m ³	El 90 (v ₂ w i ↔ o) S1500 C10000 HOT 400/30 MA MULTI

1

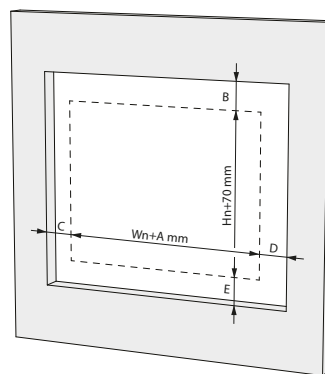


50mm ≤ E / B / C / D ≤ 400mm

1. Make an opening with dimensions $(Wn+A+C+D) \times (Hn+70+B+E)$ mm. $A = 295$ mm for a standard damper.

⚠ Caution: for a damper with height ≤ 400 mm and option BP FM or ZENix 1SD, $A = 465$ mm.

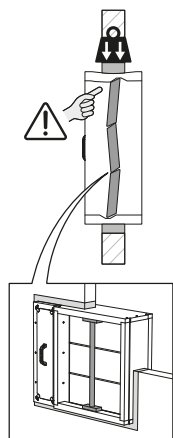
2



50mm ≤ E / B / C / D ≤ 400mm

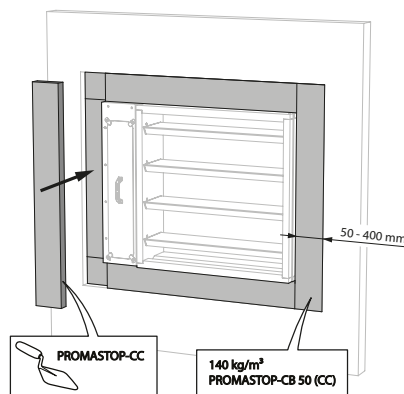
2. Mount the damper in the opening. Sealing B, C, D & E between 50 and 400 mm each. The damper does not need to be centered in the opening. The maximum distance between the damper and the edge of the opening is 400 mm.

3



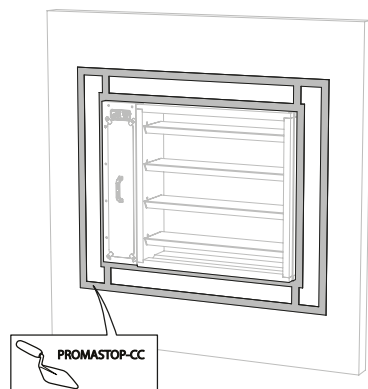
3. Support the tunnel and block the damper blades in the closed position to prevent deformation of the tunnel while the sealing is curing.

4



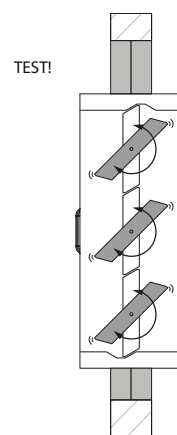
4. Seal the rest of the opening with 2 layers of 50 mm thick coated rigid mineral wool panels (type PROMASTOP CB-CC). The panels must be installed staggered. When installing, always apply coating (type PROMASTOP-CC) to the end of each panel.

5



5. The panels must be installed staggered and the joints must be covered all around with coating (type PROMASTOP-CC) to create a uniform layer thickness for the entire sealing.

6



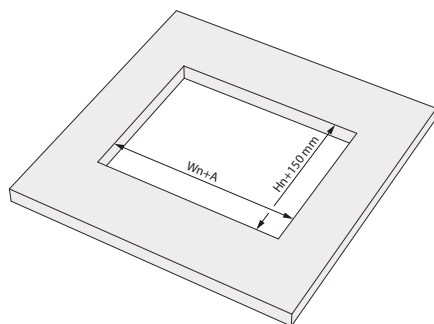
6. Check the functioning of the damper blades after the curing time of the sealing and after removing the struts. Test the mechanism of the damper.

Installation in rigid floor

The product was tested and approved in:

Range	Wall type	Sealing	Classification
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Rigid floor	Aerated concrete ≥ 100 mm Mortar	El 90/120 ($h_o, w_i \leftrightarrow o$) S1500 C10000 HOT 400/30 MA MULTI

1



2

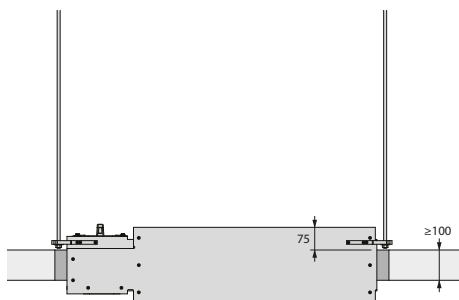


1. Make an opening with dimensions $(W_n+A) \times (H_n+150)$ mm.
 $A = 375$ mm for a standard damper.

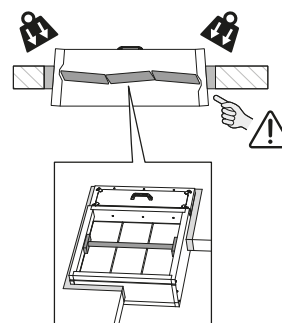
2. Mount the damper in the opening.

⚠ Caution: for a damper with height ≤ 400 mm and option BP FM or ZENiX 1SD, $A = 545$ mm.

3



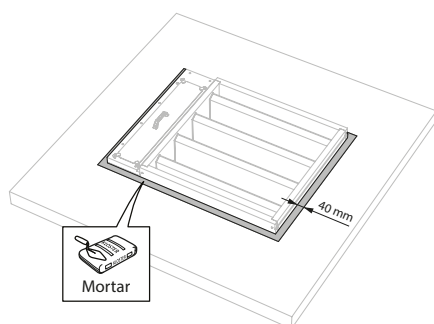
4



3. Optionally, the damper can be suspended separately with the horizontal suspension (HS MAS).

4. Support the tunnel and block the damper blades in the closed position to prevent deformation of the tunnel while the sealing is curing.

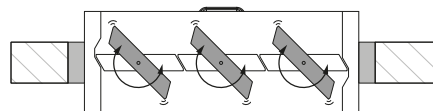
5



5. Seal the rest of the opening with standard mortar.

6

TEST!



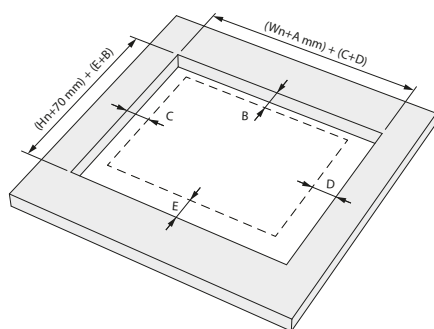
6. Check the functioning of the damper blades after the curing time of the sealing and after removing the struts. Test the mechanism of the damper.

Installation in rigid floor, sealing with rigid stone wool boards with coating

The product was tested and approved in:

Range	Wall type	Sealing	Classification
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Rigid floor	Aerated concrete ≥ 100 mm Stone wool + coating ≥ 140 kg/m ³	El 90/120 (h ₀ w i ↔ o) S1500 C10000 HOT 400/30 MA MULTI

1

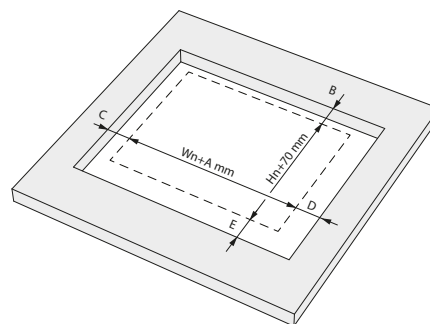


50mm ≤ E / B / C / D ≤ 400mm

1. Make an opening with dimensions $(Wn+A+C+D) \times (Hn+70+B+E)$ mm. A = 295 mm for a standard damper.

⚠ Caution: for a damper with height ≤ 400 mm and option BP FM or ZENiX 1SD, A = 465 mm.

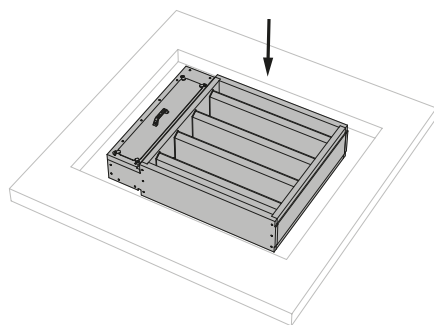
2



50mm ≤ E / B / C / D ≤ 400mm

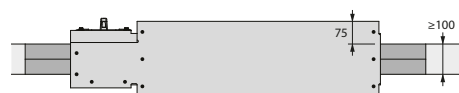
2. Sealing B, C, D & E between 50 and 400 mm each. The damper does not need to be centered in the opening. The maximum distance between the damper and the edge of the opening is 400 mm.

3



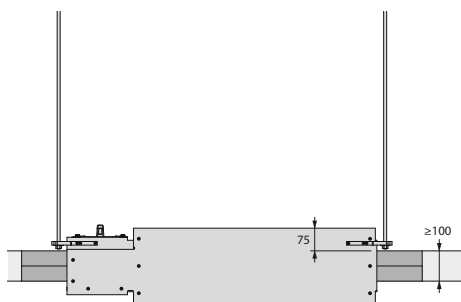
3. Mount the damper in the opening.

4



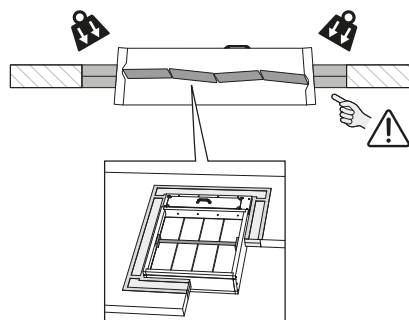
4. Bring the damper to the correct height so the seal fits centrally on the damper.

5



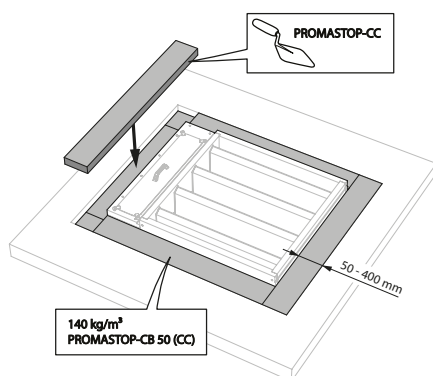
5. Optionally, the damper can be suspended separately with the horizontal suspension (HS MAS).

6



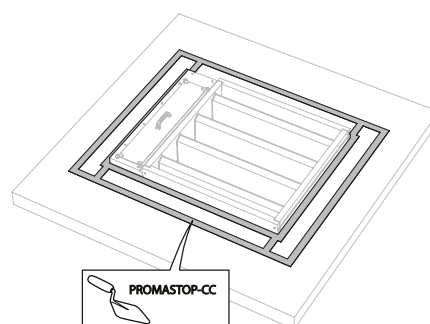
6. Support the tunnel and block the damper blades in the closed position to prevent deformation of the tunnel while the sealing is curing.

7



7. Seal the rest of the opening with 2 layers of 50 mm thick coated rigid mineral wool panels (type PROMASTOP CB-CC). The panels must be installed staggered. When installing, always apply coating (type PROMASTOP-CC) to the end of each panel.

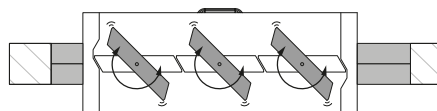
8



8. The joints must be covered all around with coating (type PROMASTOP-CC) to create a uniform layer thickness for the entire sealing.

9

TEST!



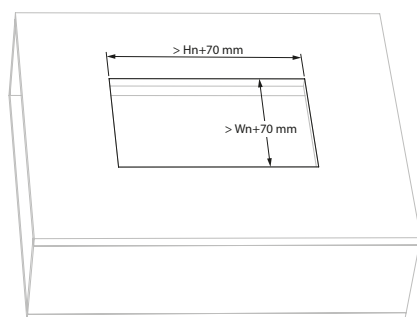
9. Check the functioning of the damper blades after the curing time of the sealing and after removing the struts. Test the mechanism of the damper.

Installation in a horizontal refractory duct, in the plane of the duct

The product was tested and approved in:

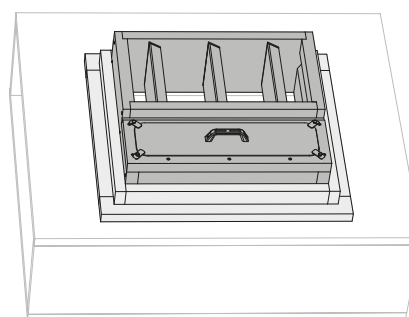
Range	Wall type		Sealing	Classification
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	El 90/120* (h _{od} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	El 90/120* (h _{od} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	El 90/120* (h _{od} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	El 60/120* (h _{od} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	El 60/120* (h _{od} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	El 60/120* (h _{od} i ↔ o) S1000 C10000 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Geotec S45	Geocol	El 90/120* (h _{od} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Geotec S45	Geocol	El 60/120* (h _{od} i ↔ o) S1000 C10000 MA MULTI

1



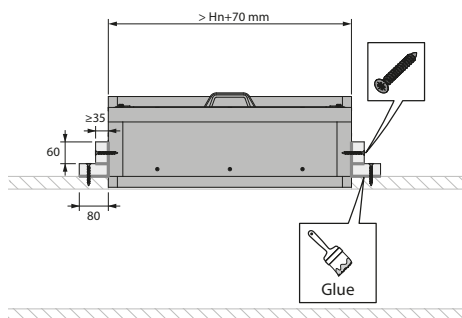
1. Make an opening with minimum dimensions (Wn+70) x (Hn+70) mm.

2



2. The damper can be mounted directly in this opening. Fit the damper in the opening with the access hatch accessible. Place the back wall of the damper against the duct. Installation of the damper does not require a minimum duct depth. The product will not obstruct the airflow in the duct.

3



3. Seal the joint between the damper and the opening with Promat Glue K84 (Promatect) or Geocol (Geotec).

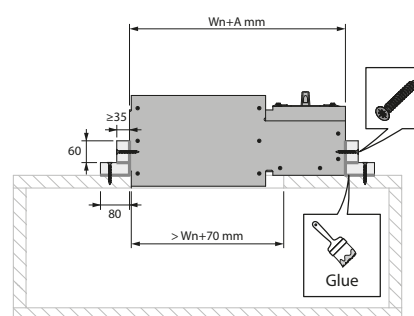
Install the positioning and sealing strips with:

- for Promatect LS: screws $\varnothing 5 \times 50$ mm with a maximum spacing of 200 mm and Promat Glue K84
- for Promatect L500 / AD: screws $\varnothing 5 \times 70$ mm in the duct and screws $\varnothing 5 \times 55$ mm in the damper, with a maximum spacing of 200 mm and Promat Glue K84
- for Geotec: screws $\varnothing 5 \times 90$ mm in the duct and screws $\varnothing 5 \times 60$ mm in the damper, with a maximum spacing of 120 mm and Geocol.

Make sure no screws penetrate the damper casing.

Fabricate the positioning and sealing strips from duct material. For a corner seal, use two strips of 80 mm and 60 mm respectively.

4

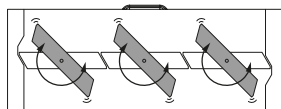


4. $A = 295$ mm for a standard damper.

⚠ Caution: for a damper with height ≤ 400 mm and option BP FM or ZENiX 1SD, $A = 465$ mm.

5

TEST!



5. Check the functioning of the damper blades after the curing time of the sealing and after removing the struts.

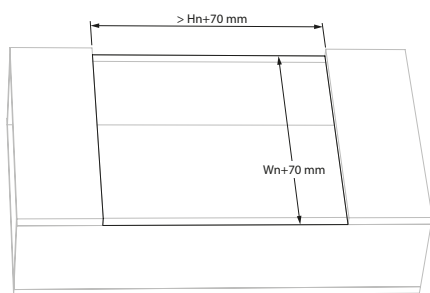
Test the mechanism of the damper.

Installation in a horizontal refractory duct, overlapping with one side of the duct

The product was tested and approved in:

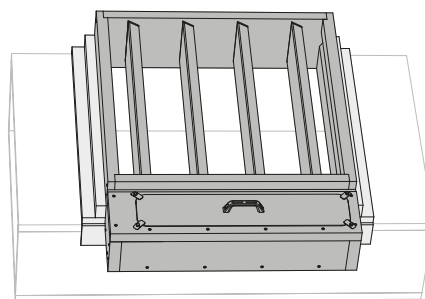
Range	Wall type		Sealing	Classification
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	El 90/120* (h _{od} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	El 90/120* (h _{od} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	El 90/120* (h _{od} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	El 60/120* (h _{od} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	El 60/120* (h _{od} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	El 60/120* (h _{od} i ↔ o) S1000 C10000 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Geotec S45	Geocol	El 90/120* (h _{od} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Geotec S45	Geocol	El 60/120* (h _{od} i ↔ o) S1000 C10000 MA MULTI

1



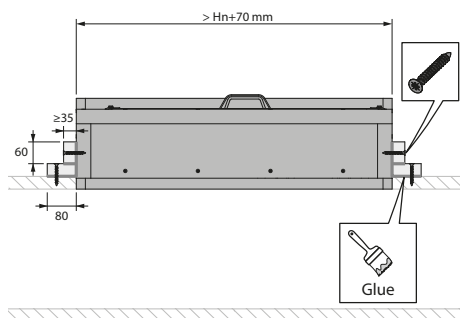
1. Make an opening with minimum dimensions (Wn+70) x (Hn+70) mm.
If the opening overlaps with an edge of the duct, follow the installation method below.

2



2. The damper can be mounted directly in this opening.
If the flanges of the damper coincide with an edge of the duct, make sure they are flush with the duct.
Installation of the damper does not require a minimum duct depth. The product will not obstruct the airflow in the duct.

3



3. Seal the joint between the damper and the opening with Promat Glue K84 (Promatect) or Geocol (Geotec).

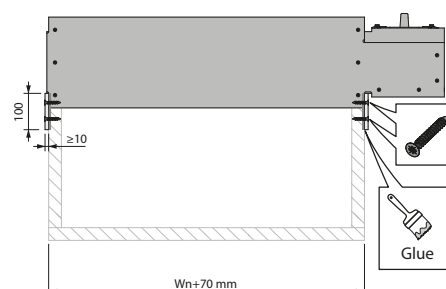
Install the positioning and sealing strips with:

- for Promatect LS: screws $\varnothing 5 \times 50$ mm with a maximum spacing of 200 mm and Promat Glue K84
- for Promatect L500 / AD: screws $\varnothing 5 \times 70$ mm in the duct and screws $\varnothing 5 \times 55$ mm in the damper, with a maximum spacing of 200 mm and Promat Glue K84
- for Geotec: screws $\varnothing 5 \times 90$ mm in the duct and screws $\varnothing 5 \times 60$ mm in the damper, with a maximum spacing of 120 mm and Geocol.

Make sure no screws penetrate the damper casing.

Fabricate the positioning and sealing strips from duct material. For a corner seal, use two strips of 80 mm and 60 mm respectively.

4

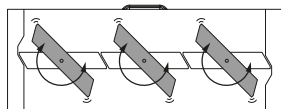


4. For flat sealing on the flange of the damper, use :

- for Promatect: a strip 10×100 mm made from calcium silicate with a density of 870 kg/m^3 (type PROMATECT H). Fasten these bars strips two rows of screws $\varnothing 3.9 \times 35$ mm at intervals of 150 mm.
- for Geotec : a strip 45×100 mm made from Geotec with a density of 750 kg/m^3 . Fasten these bars strips two rows of screws $\varnothing 5 \times 90$ mm in the duct and $\varnothing 5 \times 60$ mm in the damper, at intervals of 120 mm.

5

TEST!



5. Check the functioning of the damper blades after the curing time of the sealing and after removing the struts.

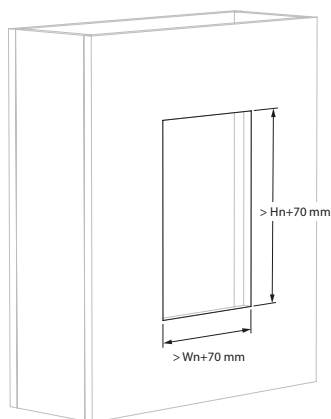
Test the mechanism of the damper.

Installation in a vertical refractory duct or in the vertical plane of a horizontal duct, within the plane of the duct

The product was tested and approved in:

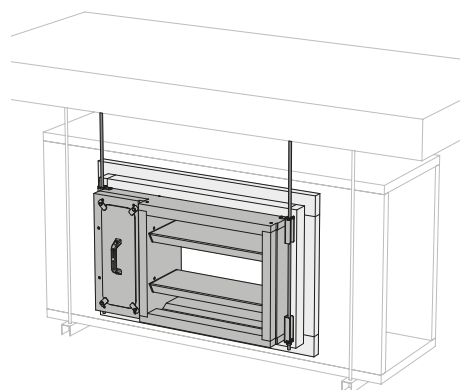
Range	Wall type		Sealing	Classification
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Vertical refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Vertical refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Vertical refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Vertical refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Vertical refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Vertical refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Geotec S45	Geocol	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Vertical refractory duct	Geotec S45	Geocol	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Geotec S45	Geocol	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Vertical refractory duct	Geotec S45	Geocol	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI

1



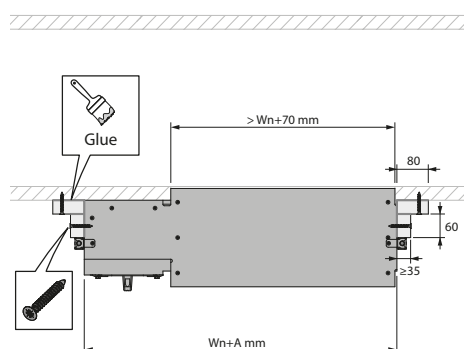
1. Make an opening with minimum dimensions (Wn+70) x (Hn+70) mm.

2



2. Optionally, the damper can be suspended separately with the vertical suspension (VS MAS).

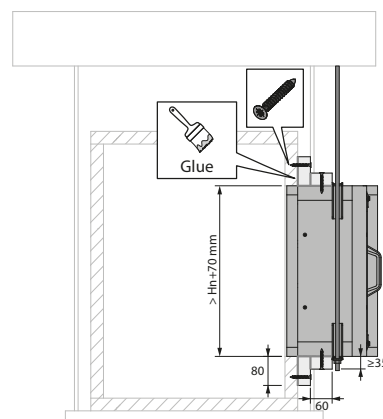
3



3. The damper can be mounted directly in this opening. Fit the damper in the opening with the access hatch accessible. Place the back wall of this compartment against the duct. Installation of the damper does not require a minimum duct depth. The product will not obstruct the airflow in the duct. A = 295 mm for a standard damper.

⚠ Caution: for a damper with height ≤ 400 mm and option BP FM or ZENiX 1SD, A = 465 mm.

4



4. Seal the joint between the damper and the opening with Promat Glue K84 (Promatect) or Geocol (Geotec).

Install the positioning and sealing strips with:

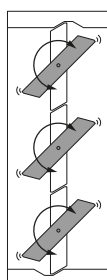
- for Promatect LS: screws $\varnothing 5 \times 50$ mm with a maximum spacing of 200 mm and Promat Glue K84
- for Promatect L500 / AD: screws $\varnothing 5 \times 70$ mm in the duct and screws $\varnothing 5 \times 55$ mm in the damper, with a maximum spacing of 200 mm and Promat Glue K84
- for Geotec: screws $\varnothing 5 \times 90$ mm in the duct and screws $\varnothing 5 \times 60$ mm in the damper, with a maximum spacing of 120 mm and Geocol.

Make sure no screws penetrate the damper casing.

Fabricate the positioning and sealing strips from duct material. For a corner seal, use two strips of 80 mm and 60 mm respectively.

5

TEST!



5. Check the functioning of the damper blades after the curing time of the sealing and after removing the struts.

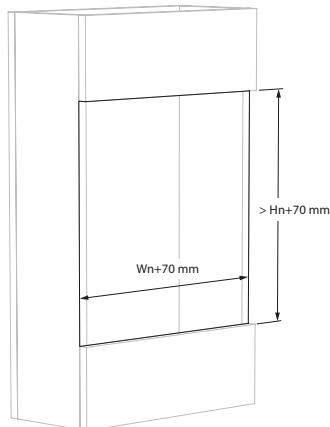
Test the mechanism of the damper.

Installation in a vertical refractory duct, overlapping with one side of the duct

The product was tested and approved in:

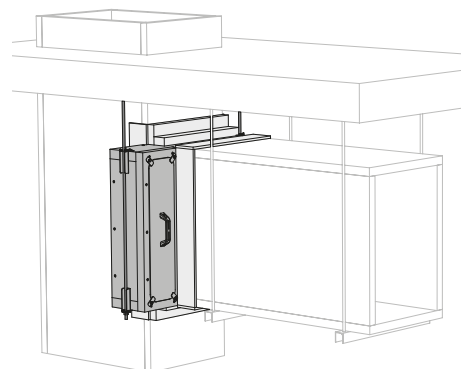
Range	Wall type		Sealing	Classification
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Vertical refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Vertical refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Vertical refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Vertical refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Vertical refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Vertical refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Geotec S45	Geocol	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Vertical refractory duct	Geotec S45	Geocol	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Geotec S45	Geocol	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Vertical refractory duct	Geotec S45	Geocol	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI

1



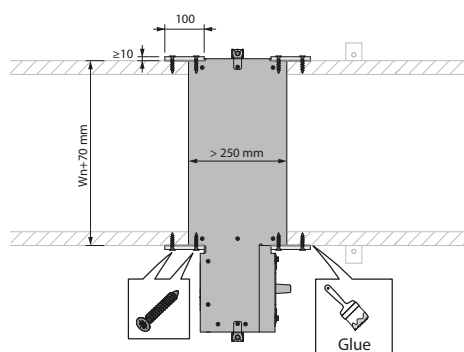
1. Make an opening with minimum dimensions (Wn+70) x (Hn+70) mm.
If the opening overlaps with an edge of the duct, follow the installation method below.

2



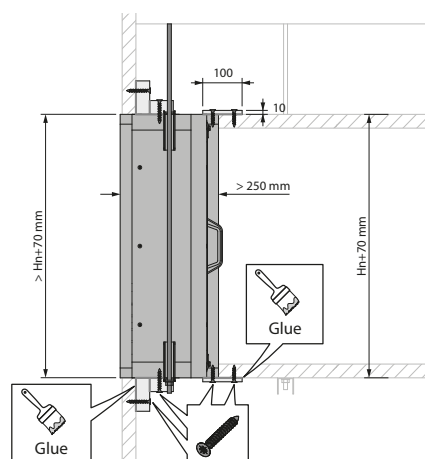
2. Optionally, the damper can be suspended separately with the vertical suspension (VS MAS).
The damper can be mounted directly in this opening.
Fit the damper in the opening with the access hatch accessible.
The back wall of the damper is placed against the duct if it does not extend outside the duct.
If the flanges of the damper coincide with an edge of the duct, make sure they are flush with the duct.
Installation of the damper does not require a minimum duct depth. The product will not obstruct the airflow in the duct.

3



3. Seal the joint between the damper and the opening with Promat Glue K84 (Promatect) or Geocol (Geotec).
For flat sealing on the flange of the damper, use :
- for Promatect: a strip 10 x 100 mm made from calcium silicate with a density of 870 kg/m³ (type PROMATECT H). Fasten these bars strips two rows of screws Ø 3.9 x 35 mm at intervals of 150 mm.
- for Geotec : a strip 45 x 100 mm made from Geotec with a density of 750 kg/m³. Fasten these bars strips two rows of screws Ø 5 x 90 mm in the duct and Ø 5 x 60 mm in the damper, at intervals of 120 mm.

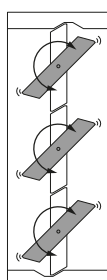
4



4. Install the positioning and sealing strips with:
- for Promatect LS: screws Ø 5 x 50 mm with a maximum spacing of 200 mm and Promat Glue K84
- for Promatect L500 / AD: screws Ø 5 x 70 mm in the duct and screws Ø 5 x 55 mm in the damper, with a maximum spacing of 200 mm and Promat Glue K84
- for Geotec: screws Ø 5 x 90 mm in the duct and screws Ø 5 x 60 mm in the damper, with a maximum spacing of 120 mm and Geocol.
Make sure no screws penetrate the damper casing.
Fabricate the positioning and sealing strips from duct material. For a corner seal, use two strips of 80 mm and 60 mm respectively.

5

TEST!



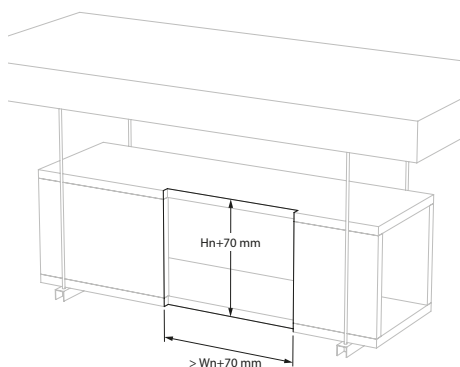
5. Check the functioning of the damper blades after the curing time of the sealing and after removing the struts.
Test the mechanism of the damper.

Installation in the vertical plane of a horizontal refractory duct, overlapping with one side of the duct

The product was tested and approved in:

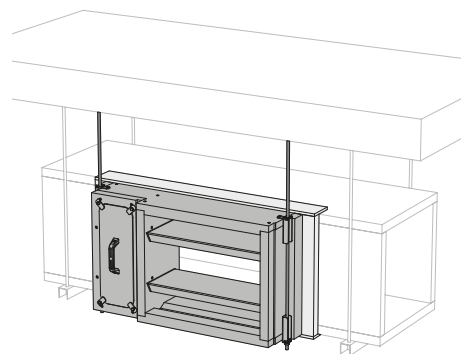
Range	Wall type		Sealing	Classification
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Vertical refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Vertical refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Vertical refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Vertical refractory duct	Promatect LS ≥ 35 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Vertical refractory duct	Promatect L500 ≥ 40 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Vertical refractory duct	Promatect AD ≥ 40 mm	Promat glue K84	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Horizontal refractory duct	Geotec S45	Geocol	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
200x200 mm ≤ MARKAGE MB ≤ 1000x1600 mm	Vertical refractory duct	Geotec S45	Geocol	EI 90/120* (v _{ed} i ↔ o) S1500 C10000 HOT 400/30 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Horizontal refractory duct	Geotec S45	Geocol	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI
1000x1600 mm ≤ MARKAGE MB ≤ 1200x2400 mm	Vertical refractory duct	Geotec S45	Geocol	EI 60/120* (v _{ed} i ↔ o) S1000 C10000 MA MULTI

1



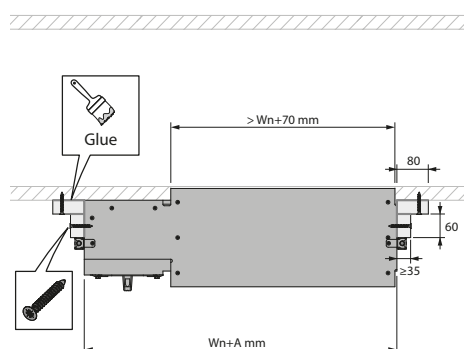
1. Make an opening with minimum dimensions (Wn+70) x (Hn+70) mm.
If the opening overlaps with an edge of the duct, follow the installation method below.

2



2. Optionally, the damper can be suspended separately with the vertical suspension (VS MAS).
The damper can be mounted directly in this opening.
Fit the damper in the opening with the access hatch accessible.
The back wall of the damper is placed against the duct if it does not extend outside the duct.
If the flanges of the damper coincide with an edge of the duct, make sure they are flush with the duct.
Installation of the damper does not require a minimum duct depth. The product will not obstruct the airflow in the duct.

3



3. Seal the joint between the damper and the opening with Promat Glue K84 (Promatect) or Geocol (Geotec).

Install the positioning and sealing strips with:

- for Promatect LS: screws $\varnothing 5 \times 50$ mm with a maximum spacing of 200 mm and Promat Glue K84
- for Promatect L500 / AD: screws $\varnothing 5 \times 70$ mm in the duct and screws $\varnothing 5 \times 55$ mm in the damper, with a maximum spacing of 200 mm and Promat Glue K84
- for Geotec: screws $\varnothing 5 \times 90$ mm in the duct and screws $\varnothing 5 \times 60$ mm in the damper, with a maximum spacing of 120 mm and Geocol.

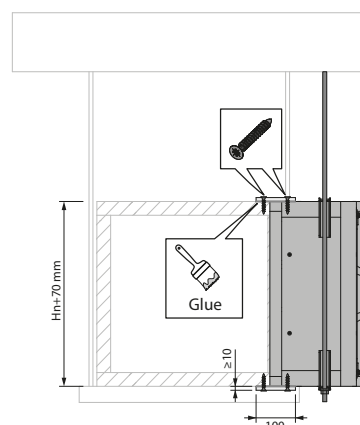
Make sure no screws penetrate the damper casing.

Fabricate the positioning and sealing strips from duct material. For a corner seal, use two strips of 80 mm and 60 mm respectively.

A = 295 mm for a standard damper.

⚠ Caution: for a damper with height ≤ 400 mm and option BP FM or ZENiX 1SD, A = 465 mm.

4

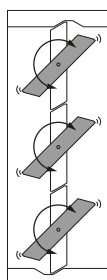


4. For flat sealing on the flange of the damper, use :

- for Promatect: a strip 10 x 100 mm made from calcium silicate with a density of 870 kg/m³ (type PROMATECT H). Fasten these bars strips two rows of screws $\varnothing 3.9 \times 35$ mm at intervals of 150 mm.
- for Geotec : a strip 45 x 100 mm made from Geotec with a density of 750 kg/m³. Fasten these bars strips two rows of screws $\varnothing 5 \times 90$ mm in the duct and $\varnothing 5 \times 60$ mm in the damper, at intervals of 120 mm.

5

TEST!

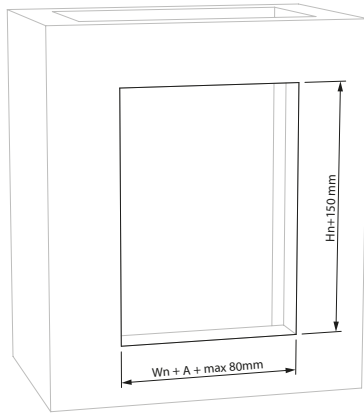


5. Check the functioning of the damper blades after the curing time of the sealing and after removing the struts.

Test the mechanism of the damper.

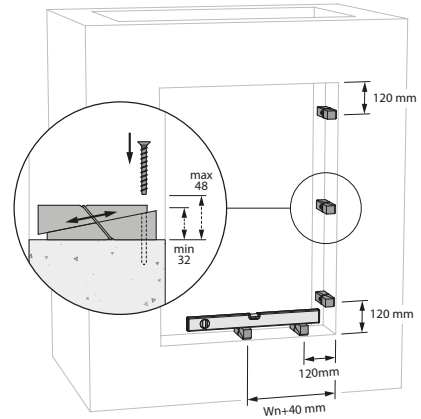
Installation in shaftwall, sealing with mortar

1



1. Make an opening with dimensions $(W_n + A + \max 80\text{ mm}) \times (H_n + 150\text{ mm})$. $A = 295\text{ mm}$ for a standard damper. Attention: for a damper $\leq 400\text{ mm}$ high and with option BP FM or ZENiX 1SD, $A = 465\text{ mm}$.

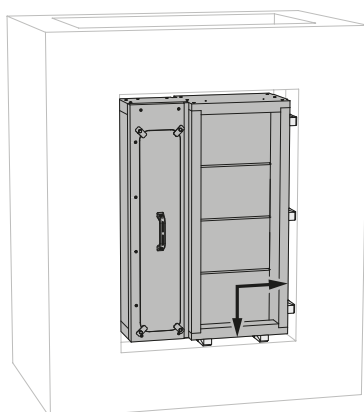
2



2. Optionally, the damper can be placed in the centre of the opening using the KITS SUPP. Place elements of the KITS SUPP in the opening at the indicated distances. Attach each element by gluing or screwing it in the reveal.

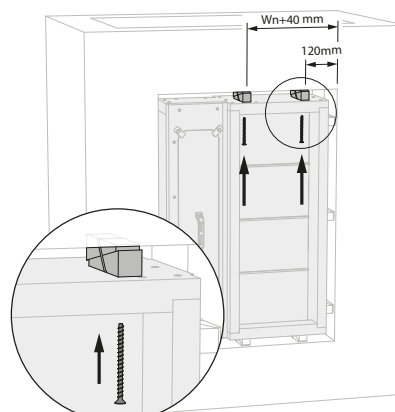
- ⚠ Attention: ensure that both wedges of each KITS SUPP element remain moveable relative to each other. Use a water level for placement of the damper. The height can be adjusted by moving each element of the KITS SUPP. Set up a straight angle by aligning the elements of the KITS SUPP with the vertical reveal.
- ⚠ Attention: the elements of the KITS SUPP are not found in the actuator compartment of the damper.

3



3. Place the damper in the opening. Align the damper with the elements of the KITS SUPP if present.

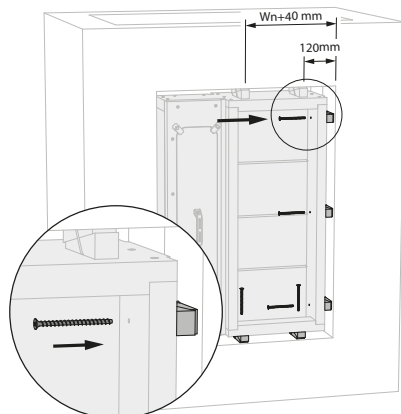
4



4. Add elements of the KITS SUPP to the remaining side at the indicated distances. Eliminate the slack between the wall and the damper by moving both wedges of each KITS SUPP element relative to each other. Optionally, anchor the damper inside the wall using a suitable screw type for that wall type. Drill through both the tunnel wall and the elements of the KITS SUPP.

⚠ Attention: Make sure no screws protrude that may hinder the rotation of the damper blades. When placing the screws, mind the rotational direction of the damper blades if possible.

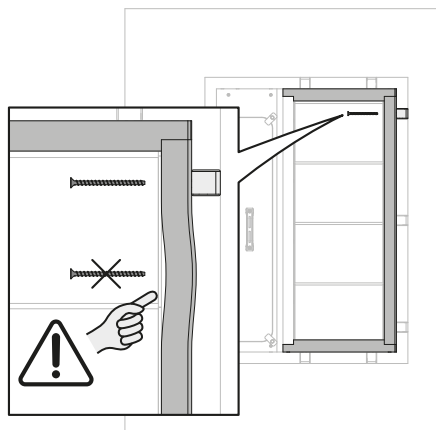
5



5. Drill through both the tunnel wall and the elements of the KITS SUPP to place any additional anchoring. Ensure that any slack between the tunnel wall and the reveal is completely filled by the elements of the KITS SUPP.

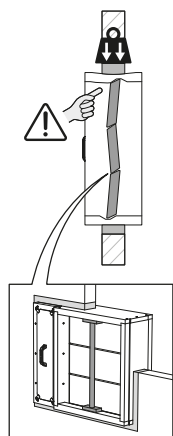
⚠ Attention: Make sure no screws protrude that may hinder the rotation of the damper blades. When placing the screws, mind the rotational direction of the damper blades if possible.

6



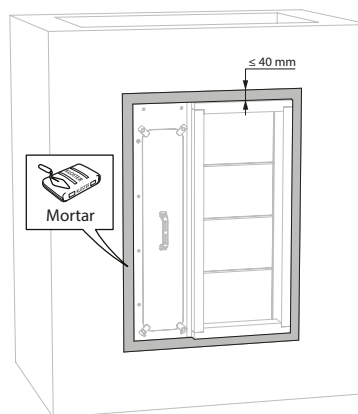
6. Attention: Anchoring of the damper without KITS SUPP may seriously damage the product. If anchor screws are tightened without support at the joint level, the tunnel wall may deform and break.

7



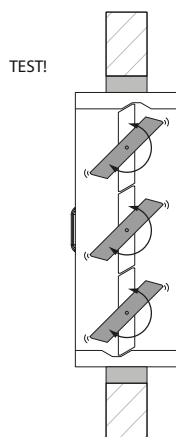
7. Support the tunnel and block the damper blades in the closed position to prevent deformation of the tunnel while the sealing is curing.

8



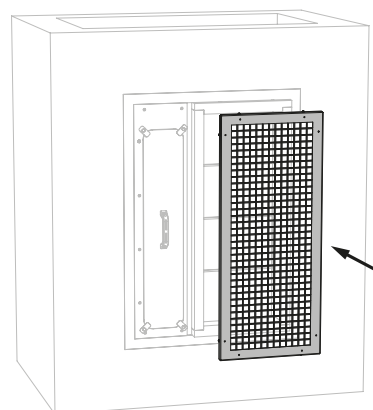
8. Seal the rest of the opening with standard mortar.

9



9. Check the functioning of the damper blades after the curing time of the sealing and after removing the struts. Test the mechanism of the damper.

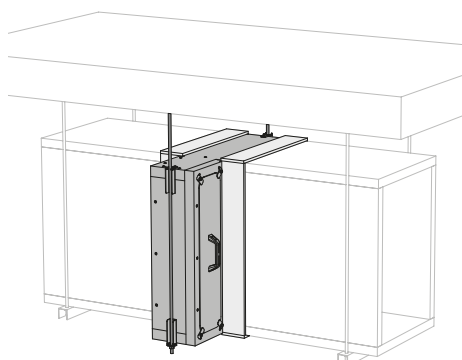
10



10. Finish the installation. Place a grille to prevent direct contact with the damper blades.

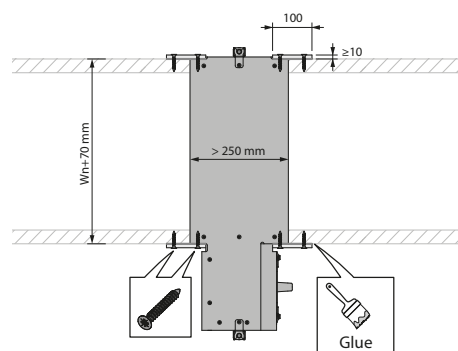
Installation in a refractory duct, in the cross-section of the duct

1



1. Place the damper in the middle of the duct with external dimensions $(W_n + 70) \times (H_n + 70)$ mm. The damper can be suspended separately with the vertical suspension (VS MAS). Analogously, the horizontal suspension (HS MAS) can be used with a vertical duct.

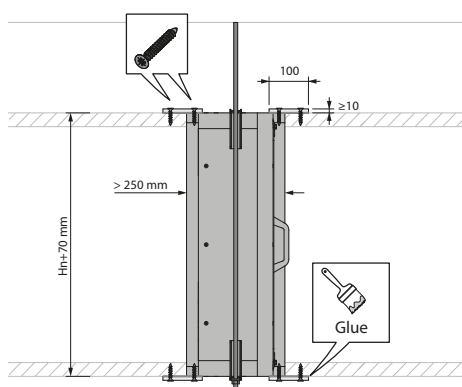
2



2. Seal the joint between the damper and the opening with Promat Glue K84 (Promatect) or Geocol (Geotec).

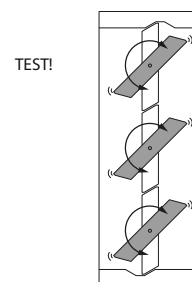
For flat sealing on the flange of the damper, use :
 - for Promatect: a strip 10 x 100 mm made from calcium silicate with a density of 870 kg/m³ (type PROMATECT H). Fasten these bars strips two rows of screws Ø 3.9 x 35 mm at intervals of 150 mm.
 - for Geotec : a strip 45 x 100 mm made from Geotec with a density of 750 kg/m³. Fasten these bars strips two rows of screws Ø 5 x 90 mm in the duct and Ø 5 x 60 mm in the damper, at intervals of 120 mm.

3



3. Finish the sealing completely.

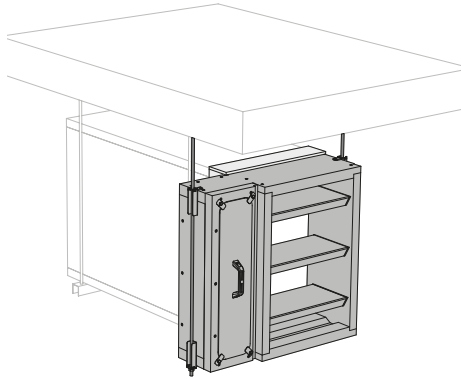
4



4. Check the functioning of the damper blades after the curing time of the sealing and after removing the struts. Test the mechanism of the damper.

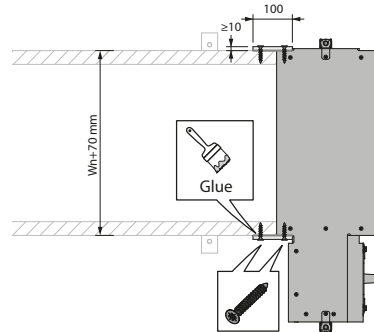
Installation in a refractory duct, at the end of the duct

1



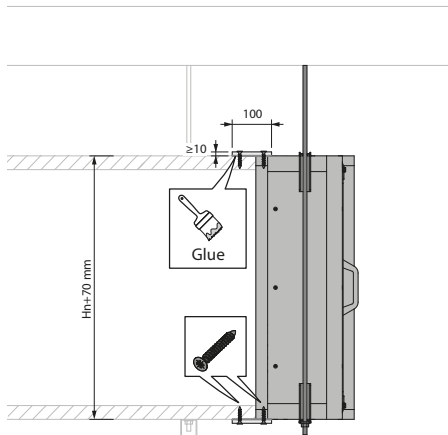
1. Place the damper in the middle of the duct with external dimensions $(W_n + 70) \times (H_n + 70)$ mm. The damper can be suspended separately with the vertical suspension (VS MAS). Analogously, the horizontal suspension (HS MAS) can be used with a vertical duct.

2



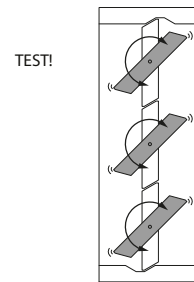
2. Seal the joint between the damper and the opening with Promat Glue K84 (Promatect) or Geocol (Geotec). For flat sealing on the flange of the damper, use :
 - for Promatect: a strip 10×100 mm made from calcium silicate with a density of 870 kg/m^3 (type PROMATECT H). Fasten these bars strips two rows of screws $\varnothing 3.9 \times 35$ mm at intervals of 150 mm.
 - for Geotec : a strip 45×100 mm made from Geotec with a density of 750 kg/m^3 . Fasten these bars strips two rows of screws $\varnothing 5 \times 90$ mm in the duct and $\varnothing 5 \times 60$ mm in the damper, at intervals of 120 mm.

3



3. Finish the sealing completely.

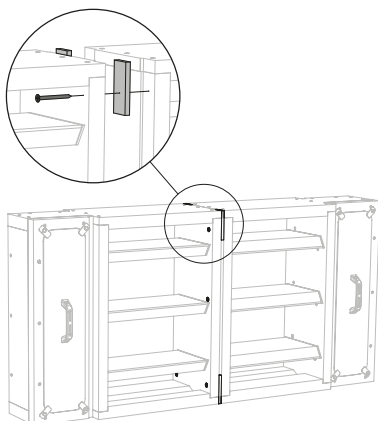
4



4. Check the functioning of the damper blades after the curing time of the sealing and after removing the struts. Test the mechanism of the damper. Place a grille (PPT) on the damper to protect the damper blades.

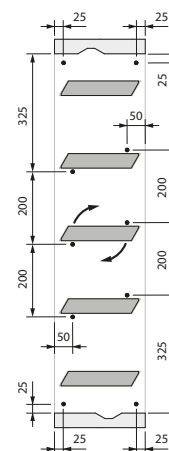
Battery mounting with option JK BAT

1



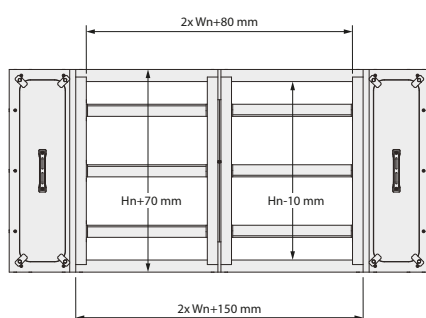
1. For battery mounting with the damper blades in line with each other:
Install both dampers against one another with the connection compartments on opposite sides.
Install the calcium silicate plates at the end of each groove between both dampers. Make sure the plates are flush with the damper connection flanges.

2



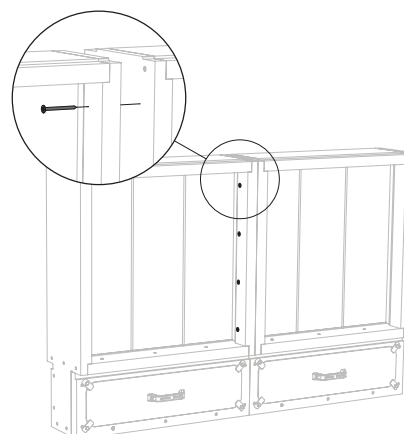
2. Attach one damper to the other with the supplied screws $\varnothing 5 \times 70$ mm. Pay attention to the rotation direction of the damper blades and ensure that the screws do not interfere with the damper blades.

3



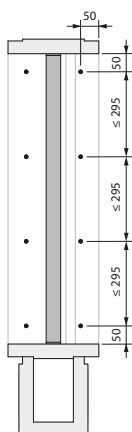
3. The collar with external dimensions $((2 \times Wn) + 150)$ mm x $(Hn + 70)$ mm is suitable for connecting a common duct.

4



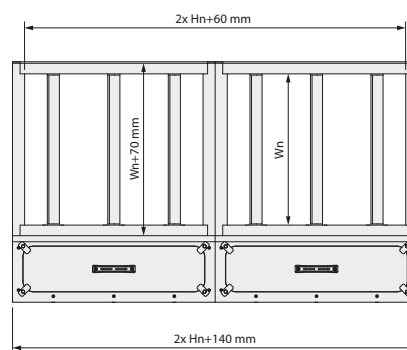
4. No JK BAT-kit required for battery mounting with the connection compartments in line with each other:
Install both dampers against one another with the connection compartments aligned.

5



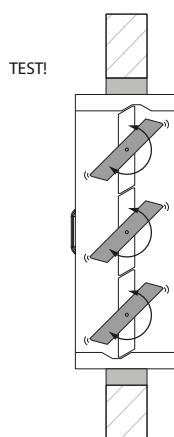
5. Attach one damper to the other with screws $\varnothing 5 \times 70$ mm on both the front and back of the dampers.

6



6. The collar with external dimensions $((2 \times W_n) + 140)$ mm x $(H_n + 70)$ mm is suitable for connecting a common duct.

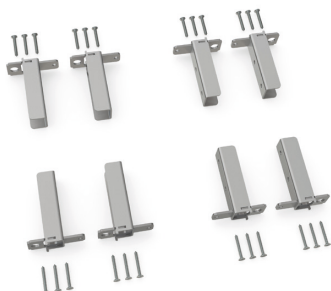
7



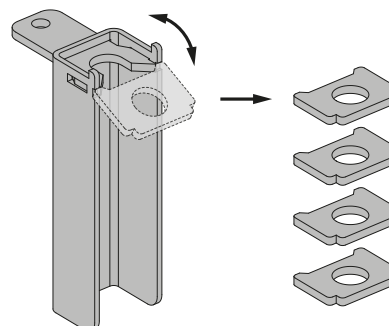
7. Check the functioning of the damper blades after the curing time of the sealing and after removing the struts. Test the mechanism of the damper.

Installation with vertical suspension (VS MAS)

1

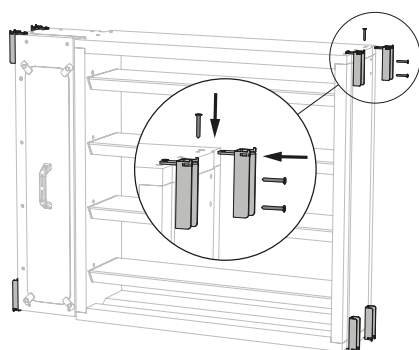


2



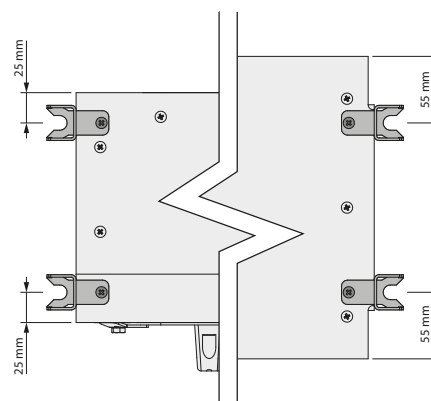
2. Break off the tabs of the angle brackets and save them for further installation.

3



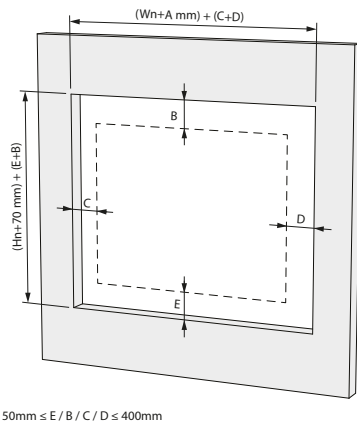
3. Fit the angle brackets on the corners of the damper. The orientation depends on the desired orientation of the damper (vertical or horizontal damper blades). Align the U-profiles of the angle brackets with one another and note the vertical direction. The short side of each angle bracket, with one screw, should be on the top or bottom of the damper.

4



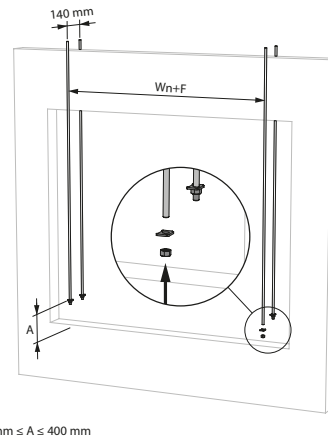
4. Attach the angle brackets with the supplied screws $\varnothing 5 \times 35$ mm. The screws near the connection compartment are 25 mm from the edge, while screws in the tunnel wall are 55 mm from the edge.

5



5. Position the damper in the opening of the wall according to the guidelines for each wall type.

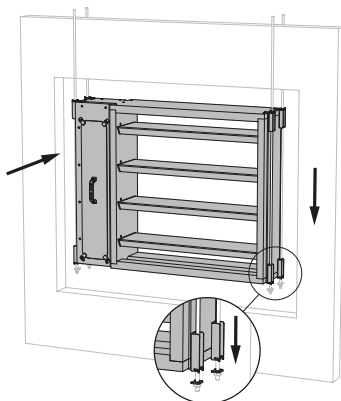
6



6. Fit the threaded rods ($\geq M10$) for damper suspension on the front and back of the wall, with $F = 320$ mm for a standard damper.

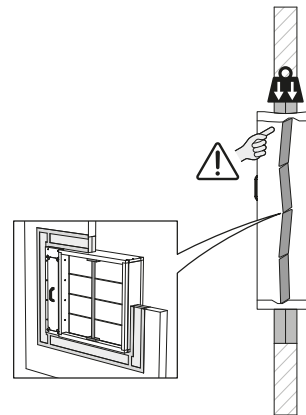
⚠ Caution: for a damper with height ≤ 400 mm and option BP FM or ZENiX 1SD, $F = 490$ mm. Put a tab and a nut on each threaded rod. Align all tabs at the same height.

7



7. Place the damper on the tabs. The threaded rods must be inside the U profiles of the angle brackets. Make sure to secure the tabs to the bottom angle brackets. When passing through the compartment wall, the suspension must not be insulated. When installed in ducts, the suspension must be insulated in the same way as the suspension of the duct.

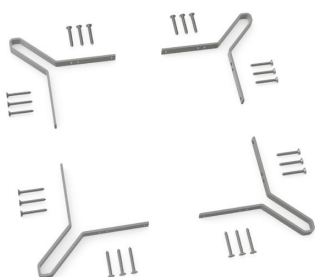
8



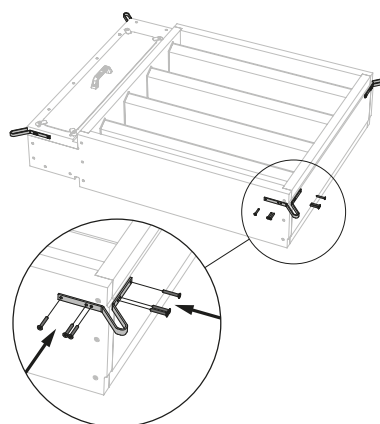
8. Support the tunnel and block the damper blades in the closed position to prevent deformation of the tunnel while the sealing is curing. Complete the sealing of the damper according to the guidelines per wall type.

Installation with horizontal suspension (HS MAS)

1

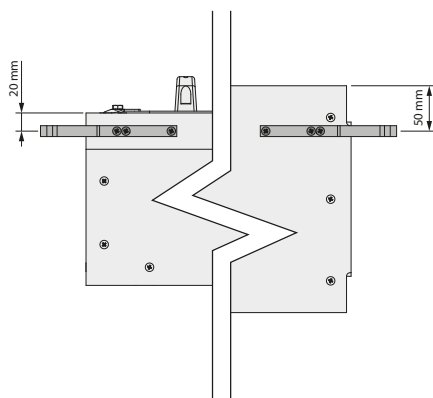


2



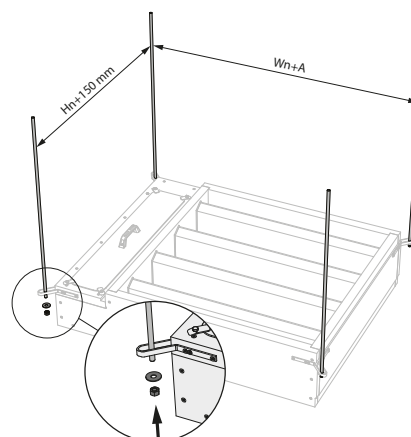
2. Fit the angle brackets on the corners of the damper.

3



3. Attach the angle brackets with the supplied screws $\varnothing 5 \times 35$ mm. The screws near the connection compartment are 20 mm from the edge, while screws in the tunnel wall are 50 mm from the edge.

4



4. Fit the threaded rods ($\geq M10$) for damper suspension, with $A = 375$ mm for a standard damper.

⚠ Caution: for a damper with height ≤ 400 mm and option BP FM or ZENiX 1SD, $A = 545$ mm. Position the damper and place a tab and a nut on each threaded rod for fastening. Complete the sealing of the damper according to the guidelines per wall type.

Maintenance

- No specific maintenance required.
- Schedule at least 2 visual checks each year.
- Remove dust and all other particles before use.
- Follow local maintenance regulations (i.e. BS9999 Annex V; NF S 61-933) and EN13306.

Operation and mechanisms



BEN/BEE Remotely controlled actuator

The actuator BEN/BEE is specifically designed for remote control of smoke control dampers.

1. access for manual operation



Options - at the time of order

BP FM

Base plate for a bus communication module (Markage MB)

Unlocking

- **manual unlocking:** turn the enclosed handle anticlockwise (VRE; VU120) or clockwise (MARKAGE MB; VUW120).
- **remote unlocking:** power cables 1 and 2.

Caution:

⚠ Do not use a drill or powered screwdriver.

Resetting

- **manual resetting:** turn the enclosed handle clockwise (VRE; VU120) or anticlockwise (MARKAGE MB; VUW120).
- **motorised resetting:** power cables 1 and 3.

Caution:

⚠ Do not use a drill or powered screwdriver.



BE (MAS) Remotely controlled servomotor

The BE actuator is specifically designed for remote control of MARKAGE MB smoke control dampers with large dimensions ($H_n \geq 1200$ mm).

1. access for manual resetting
2. plug (ST)



Options - at the time of order

BP FM

Base plate for a bus communication module (Markage MB)

Unlocking

- **manual unlocking:** turn the enclosed handle anti-clockwise.
- **automatic unlocking:** n/a
- **remote unlocking:** power cables 1 and 2.

Caution:

⚠ Do not use a drill or powered screwdriver.

Resetting

- **manual resetting:** turn the enclosed handle clockwise.
- **motorised resetting:** power cables 1 and 3.

Caution:

⚠ Do not use a drill or powered screwdriver.



BE + BEE Remotely controlled servomotor

The BE actuator is specifically designed for remote control of MARKAGE MB smoke control dampers with large dimensions ($H_n \geq 1200$ mm).

1. access for manual resetting
2. plug (ST)



Options - at the time of order

BP FM

Base plate for a bus communication module (Markage MB)

Unlocking

- **manual unlocking:** turn the enclosed handle anti-clockwise.
- **automatic unlocking:** n/a
- **remote unlocking:** power cables 1 and 2.

Caution:

⚠ Do not use a drill or powered screwdriver.

Resetting

- **manual resetting:** turn the enclosed handle clockwise.
- **motorised resetting:** power cables 1 and 3.

Caution:

⚠ Do not use a drill or powered screwdriver.



BEE + BEE Remotely controlled servomotor

The BE actuator is specifically designed for remote control of MARKAGE MB smoke control dampers with large dimensions ($H_n \geq 1200$ mm).

1. access for manual resetting
2. plug (ST)



Options - at the time of order

BP FM

Base plate for a bus communication module (Markage MB)

Unlocking

- **manual unlocking:** turn the enclosed handle anti-clockwise.
- **automatic unlocking:** n/a
- **remote unlocking:** power cables 1 and 2.

Caution:

⚠ Do not use a drill or powered screwdriver.

Resetting

- **manual resetting:** turn the enclosed handle clockwise.
- **motorised resetting:** power cables 1 and 3.

Caution:

⚠ Do not use a drill or powered screwdriver.



BE + BEN Remotely controlled servomotor

The BE actuator is specifically designed for remote control of MARKAGE MB smoke control dampers with large dimensions ($H_n \geq 1200$ mm).

1. access for manual resetting
2. plug (ST)



Options - at the time of order

BP FM

Base plate for a bus communication module (Markage MB)

Unlocking

- **manual unlocking:** turn the enclosed handle anti-clockwise.
- **automatic unlocking:** n/a
- **remote unlocking:** power cables 1 and 2.

Caution:

⚠ Do not use a drill or powered screwdriver.

Resetting

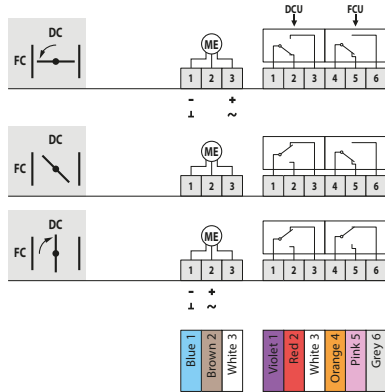
- **manual resetting:** turn the enclosed handle clockwise.
- **motorised resetting:** power cables 1 and 3.

Caution:

⚠ Do not use a drill or powered screwdriver.

Electrical connection

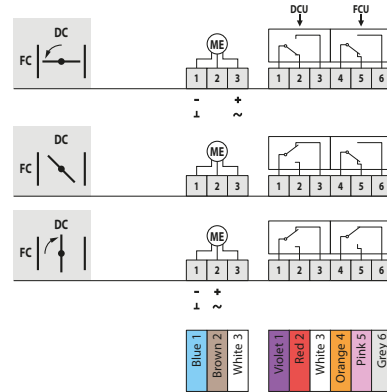
BEN



DC: Switch closed position smoke evacuation shutter

FC: Switch open position smoke evacuation shutter

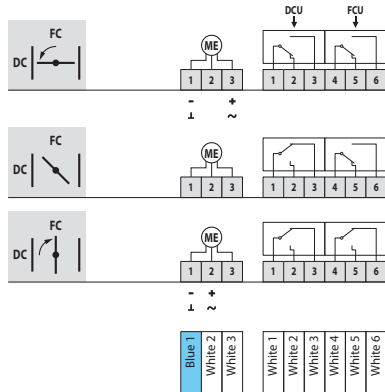
BEE



DC: Switch closed position smoke evacuation shutter

FC: Switch open position smoke evacuation shutter

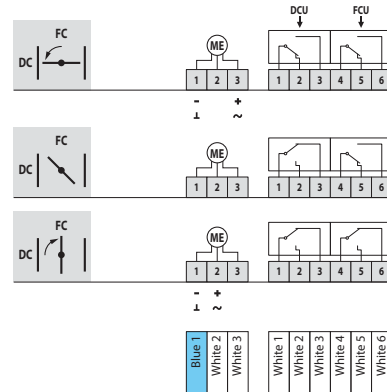
BE (MAS)



DC: Switch closed position smoke evacuation shutter

FC: Switch open position smoke evacuation shutter

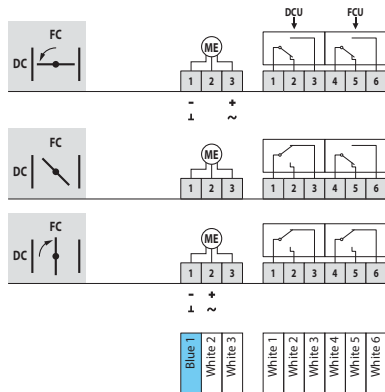
BE + BEE



DC: Switch closed position smoke evacuation shutter

FC: Switch open position smoke evacuation shutter

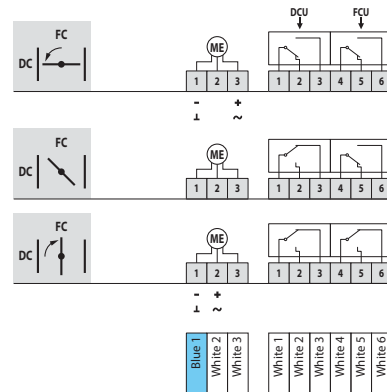
BEE + BEE



DC: Switch closed position smoke evacuation shutter

FC: Switch open position smoke evacuation shutter

BE + BEN



DC: Switch closed position smoke evacuation shutter

FC: Switch open position smoke evacuation shutter

MEC	Nominal voltage motor	Nominal voltage magnet	Power consumption (stand-by)	Power consumption (operating)	Standard switches	Resetting time motor
BEN24	24 V AC/DC		0,1 W	3 W	1mA...3A (0.5A), DC 5V...AC 250V	< 30 s (90°)
BEN230	230 V AC		0,4 W	4 W	1mA...3A (0.5A), DC 5V...AC 250V	< 30 s (90°)
BEN24-ST	24 V AC/DC		0,1 W	3 W	1mA...3A (0.5A), DC 5V...AC 250V	< 30 s (90°)
BEE24	24 V AC/DC		0,1 W	2,5 W	1mA...3A, AC 250V	< 60 s (90°)
BEE230	230 V AC		0,4 W	3,5 W	1mA...3A, AC 250V	< 60 s (90°)
BEE24-ST	24 V AC/DC		0,1 W	2,5 W	1mA...3A, AC 250V	< 60 s (90°)
BE24	24 V AC/DC	N/A	0,5 W	12 W	1mA...6A, DC 5V...AC 250V	< 60 s (90°)
BE230	230 V AC	N/A	0,5 W	8 W	1mA...6A, DC 5V...AC 250V	< 60 s (90°)
BE24-ST	24 V AC/DC	N/A	0,5 W	12 W	1mA...6A, DC 5V...AC 250V	< 60 s (90°)
BE24 + BEE24	24 V AC/DC	N/A	0,5 W	12 W	1mA...6A, DC 5V...AC 250V	< 60 s (90°)
BE230 + BEE230	230 V AC	N/A	0,5 W	8 W	1mA...6A, DC 5V...AC 250V	< 60 s (90°)
BEE24 + BEE24	24 V AC/DC	N/A	0,5 W	12 W	1mA...6A, DC 5V...AC 250V	< 60 s (90°)
BEE230 + BEE230	230 V AC	N/A	0,5 W	8 W	1mA...6A, DC 5V...AC 250V	< 60 s (90°)
BE24 + BEN24	24 V AC/DC	N/A	0,5 W	12 W	1mA...6A, DC 5V...AC 250V	< 60 s (90°)
BE230 + BEN230	230 V AC	N/A	0,5 W	8 W	1mA...6A, DC 5V...AC 250V	< 60 s (90°)

MEC	Running time spring	Noise level motor	Cable supply / control	Cable auxiliary switch	Protection class
BEN24		58 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
BEN230		58 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
BEN24-ST		58 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free), with plug connectors	1 m, 6 x 0.75 mm ² (halogen-free), with plug connectors	IP 54
BEE24		58 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
BEE230		58 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
BEE24-ST		58 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
BE24	N/A	ca. 62 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
BE230	N/A	ca. 62 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
BE24-ST	N/A	ca. 62 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free), with plug connectors	1 m, 6 x 0.75 mm ² (halogen-free), with plug connectors	IP 54
BE24 + BEE24	N/A	ca. 62 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
BE230 + BEE230	N/A	ca. 62 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
BEE24 + BEE24	N/A	ca. 62 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
BEE230 + BEE230	N/A	ca. 62 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
BE24 + BEN24	N/A	ca. 62 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
BE230 + BEN230	N/A	ca. 62 dB (A)	1 m, 3 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54

Selection data

$$\Delta p = 0,6 * v^2 * \zeta$$

Hn\Wn [mm]		200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
200	ζ [-]	0,48	0,47	0,46	0,45	0,44	0,43	0,42	0,41	0,40	0,40	0,40	0,40	0,40	0,40	0,39	0,39	0,39	0,39	0,39	0,39	0,39
400	ζ [-]	0,37	0,36	0,34	0,33	0,32	0,31	0,30	0,29	0,28	0,28	0,28	0,28	0,27	0,27	0,27	0,27	0,27	0,27	0,27	0,27	0,27
600	ζ [-]	0,33	0,32	0,31	0,30	0,29	0,28	0,27	0,26	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,24	0,24	0,24	0,24
800	ζ [-]	0,32	0,31	0,30	0,29	0,28	0,27	0,26	0,25	0,23	0,23	0,23	0,23	0,23	0,23	0,22	0,22	0,22	0,22	0,22	0,22	0,22
1000	ζ [-]	0,31	0,30	0,29	0,29	0,27	0,26	0,25	0,24	0,23	0,22	0,22	0,22	0,22	0,22	0,21	0,21	0,21	0,21	0,21	0,21	0,21
1200	ζ [-]	0,30	0,29	0,29	0,28	0,27	0,26	0,25	0,23	0,22	0,22	0,21	0,21	0,21	0,21	0,21	0,21	0,21	0,20	0,20	0,20	0,20
1400	ζ [-]	0,30	0,29	0,29	0,28	0,27	0,26	0,24	0,23	0,22	0,22	0,21	0,21	0,21	0,21	0,21	0,21	0,20	0,20	0,20	0,20	0,20
1600	ζ [-]	0,29	0,30	0,30	0,28	0,30	0,30	0,20	0,20	0,21	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,19	0,19	0,19	0,19
1800	ζ [-]	-	-	-	-	0,26	0,25	0,24	0,22	0,21	0,21	0,21	0,20	0,20	0,20	0,20	0,20	0,19	0,19	0,19	0,19	0,19
2000	ζ [-]	-	-	-	-	0,26	0,25	0,24	0,22	0,21	0,21	0,21	0,20	0,20	0,20	0,20	0,19	0,19	0,19	0,19	0,19	0,19
2200	ζ [-]	-	-	-	-	0,26	0,25	0,24	0,22	0,21	0,21	0,20	0,20	0,20	0,20	0,20	0,19	0,19	0,19	0,19	0,19	0,19
2400	ζ [-]	-	-	-	-	0,26	0,25	0,23	0,22	0,21	0,21	0,20	0,20	0,20	0,20	0,19	0,19	0,19	0,19	0,19	0,19	0,19

MARKAGE MB - A-weighted sound power level Lwa in the room

Hn\Wn [mm]		200	250	300	350	400	450	500	550	600	650	700
200	Sn [m²]	0,0300	0,0375	0,0450	0,0525	0,0600	0,0675	0,0750	0,0825	0,0900	0,0975	0,1050
400	Sn [m²]	0,0620	0,0775	0,0930	0,1085	0,1240	0,1395	0,1550	0,1705	0,1860	0,2015	0,2170
600	Sn [m²]	0,0940	0,1175	0,1410	0,1645	0,1880	0,2115	0,2350	0,2585	0,2820	0,3055	0,3290
800	Sn [m²]	0,1260	0,1575	0,1890	0,2205	0,2520	0,2835	0,3150	0,3465	0,3780	0,4095	0,4410
1000	Sn [m²]	0,1580	0,1975	0,2370	0,2765	0,3160	0,3555	0,3950	0,4345	0,4740	0,5135	0,5530
1200	Sn [m²]	0,1900	0,2375	0,2850	0,3325	0,3800	0,4275	0,4750	0,5225	0,5700	0,6175	0,6650
1400	Sn [m²]	0,2220	0,2775	0,3330	0,3885	0,4440	0,4995	0,5550	0,6105	0,6660	0,7215	0,7770
1600	Sn [m²]	0,2540	0,3175	0,3810	0,4445	0,5080	0,5715	0,6350	0,6985	0,7620	0,8255	0,8890
1800	Sn [m²]					0,5720	0,6435	0,7150	0,7865	0,8580	0,9295	1,0010
2000	Sn [m²]					0,6360	0,7155	0,7950	0,8745	0,9540	1,0335	1,1130
2200	Sn [m²]					0,7000	0,7875	0,8750	0,9625	1,0500	1,1375	1,2250
2400	Sn [m²]					0,7640	0,8595	0,9550	1,0505	1,1460	1,2415	1,3370

Hn\Wn [mm]		750	800	850	900	950	1000	1050	1100	1150	1200	
200	Sn [m²]	0,1125	0,1200	0,1275	0,1350	0,1425	0,1500	0,1575	0,1650	0,1725	0,1800	
400	Sn [m²]	0,2325	0,2480	0,2635	0,2790	0,2945	0,3100	0,3255	0,3410	0,3565	0,3720	
600	Sn [m²]	0,3525	0,3760	0,3995	0,4230	0,4465	0,4700	0,4935	0,5170	0,5405	0,5640	
800	Sn [m²]	0,4725	0,5040	0,5355	0,5670	0,5985	0,6300	0,6615	0,6930	0,7245	0,7560	
1000	Sn [m²]	0,5925	0,6320	0,6715	0,7110	0,7505	0,7900	0,8295	0,8690	0,9085	0,9480	
1200	Sn [m²]	0,7125	0,7600	0,8075	0,8550	0,9025	0,9500	0,9975	1,0450	1,0925	1,1400	
1400	Sn [m²]	0,8325	0,8880	0,9435	0,9990	1,0545	1,1100	1,1655	1,2210	1,2765	1,3320	
1600	Sn [m²]	0,9525	1,0160	1,0795	1,1430	1,2065	1,2700	1,3335	1,3970	1,4605	1,5240	
1800	Sn [m²]	1,0725	1,1440	1,2155	1,2870	1,3585	1,4300	1,5015	1,5730	1,6445	1,7160	
2000	Sn [m²]	1,1925	1,2720	1,3515	1,4310	1,5105	1,5900	1,6695	1,7490	1,8285	1,9080	
2200	Sn [m²]	1,3125	1,4000	1,4875	1,5750	1,6625	1,7500	1,8375	1,9250	2,0125	2,1000	
2400	Sn [m²]	1,4325	1,5280	1,6235	1,7190	1,8145	1,9100	2,0055	2,1010	2,1965	2,2920	

Sample order

Every air flow lower than the above mentioned maximum value, will meet the listed A-weighted sound power level for the respective dimension. The measurements were carried out in accordance with standard EN ISO 5135: Acoustics – Determination of sound power levels of noise from air-terminal devices, air-terminal units, dampers and valves by measurement in a reverberation test room. More information on sound power can be found in the product information on our website (documents).

Sample order

MARKAGE MB	350	200	BEN24	PG30	PG30	BP	FM
1	2	3	4	5	6		7

1. product
2. width
3. height
4. servomotor type
5. connection flange on the side of the access hatch
6. connection flange on the opposite side of the access hatch
7. option

Approvals and certificates

All our products are submitted to a number of tests by official test institutes. Reports of these tests form the basis for the approvals of the products.



31586 / 31587 / 33507 / 33508

Efectis-1812-CPR-1905

Efectis-2822-UKCA-CPR-0016