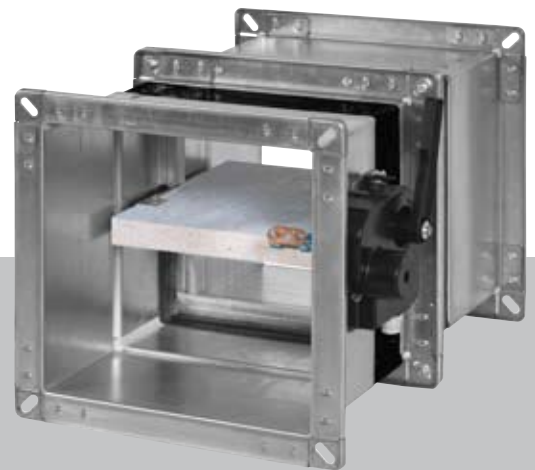




**WK30 Fire Damper**  
**Certified EI 120 S UNI EN 1366-2**







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### OVERVIEW

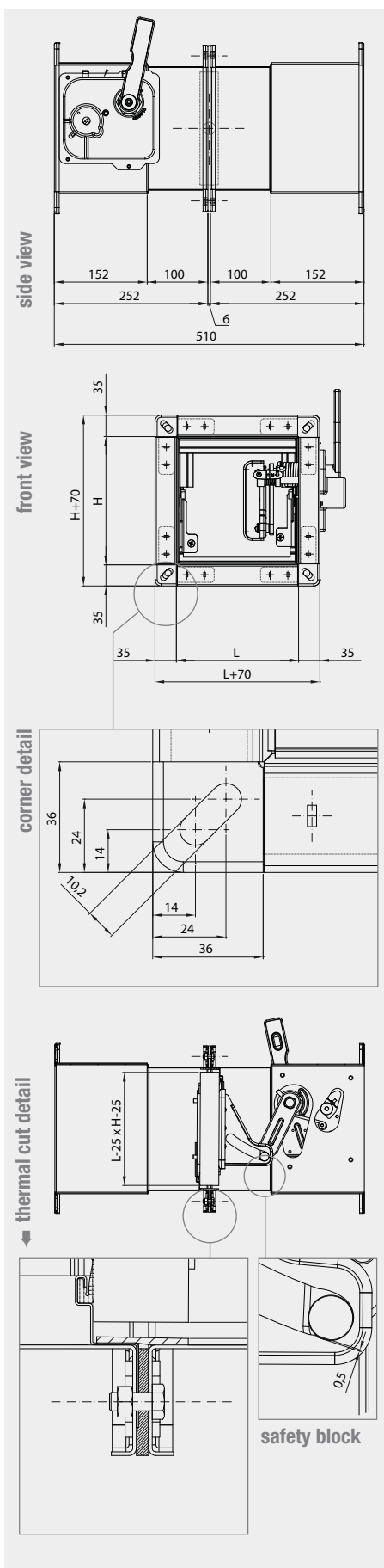
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# WK30 Fire Damper certified EI 120 S UNI EN 1366-2



## overview

The WK series fire dampers are certified to European standard EN 1366-2 (Internal Ministry decree dated 16 February 2007) at the CSI S.p.A. with classification to UNI EN 13501-3 CSI FR dated 30/07/2009 and certified at the MPA laboratories in Braunschweig - Germany.

## main characteristics

### Behaviour to fire

- automatic closure at less than 30 seconds from contact with fire;
- isolation from heat and fire for 120 minutes;
- absence of heat exchange between the two sides of the wall;
- absence of heat exchange between the two sides of the damper.

### Behaviour to smoke

- use as smoke damper both in the absence of fire (cold smoke) and in the presence of fire (hot smoke).

### Installation possibilities

damper certified for installation:

- within breeze block walls with a minimum thickness of 100mm and walls REI 90 and REI 120 equivalent;
- within light structure walls (plasterboard) with a minimum thickness of 125mm;
- within cement ceilings with a minimum thickness of 150mm.

### Installation characteristics

- strong and light structure;
- removable and replaceable closing mechanism, even once installed; symmetric structure with possibility of installation with the closing mechanism on the more accessible side.
- central part of the duct lowered to prevent friction between the blade and duct.

### Closing mechanisms

- fully mechanical;
- mechanical/magnetic for connection to fire alarm systems and smoke detection systems;
- motorised for connection to fire alarm systems and smoke detectors and with automatic re-arming for dampers not in contact with flames or if closed by mistake.

### Safety block

maintains the closure of the damper even in the event where the fire completely destroys the closing mechanism.

### Aeraulic characteristics

- absence of a preferential direction of air flow;
- air speeds up to 10m/s;
- contained air flow losses;
- low noise generation.

### Materials

- galvanized carbon steel duct;
- mono block blade in calcium silicate;
- blade composed of three layers, two external panels of calcium silicate and one internal of calcium sulphate (mod. WK40);
- thermal gasket made of mineral fibre;
- silicone gasket for cold smoke;
- thermal expanding graphite gasket.

### The obligations of the installer

The certification of the fire dampers is closely linked to the way the dampers are installed. The installer is held to scrupulously observe the installation procedures supplied by the manufacturer that reflect the installations made during the fire tests and they must highlight this in the declaration of correct product installation.



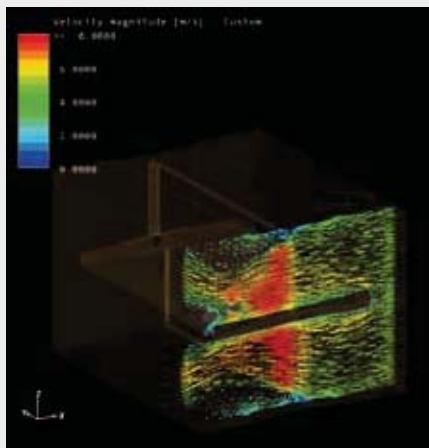
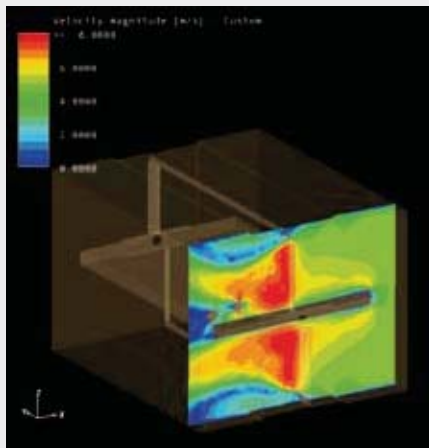
## the new safety requirements - tests performed



air flow loss calculation



acoustic measurement



fluid dynamic simulations

### The European Standards

the new European standards impose more stringent certification tests for the fire dampers compared to those requested until now.

### Fire resistance tests

The applied standards are:

**EN 1366-2 2001** "Fire resistance tests for systems of service supply - fire dampers"

**UNI EN 1363-1 2001** "Fire resistance tests - general requirements"

In particular, for the certification of a new model of fire damper, the European standards impose:

- air tight tests for cold smoke with 300Pa depression made on the largest and smallest size damper in the various installation possibilities;
- Robustness test of the closing mechanism with a verification of the holding of the air tight conditions to smoke after 50 open/close cycles;
- numerous fire tests made on the largest size reproducing all the possible installations.
- test for resistance to hot smoke maintaining the depression of 300Pa during the complete duration of the fire test made on the sides of the casing, on the extraction duct and on the supporting wall in proximity of the perimeter of the damper, certifying that the temperature is not above 180°C in any point;
- test of the thermal fuse must guarantee the closure of the damper within two minutes of the start of the fire test.

### Test on the Thermal fuse

The thermal fuses produced by MP3, calibrated at 70°C and 95°C, are certified according to standard ISO 1029-4.

### Test on closing mechanism with magnet

50 open/close cycles and fire test with the mechanism inside the test oven.

### Long duration test

The motorised version of the WK series fire dampers have been tested with 10000 open /close cycles. Such test has been carried out with both the largest and smallest size damper with the closing mechanism in horizontal and vertical position. The test has looked at all the types of motor offered. At the end of the test the functional characteristics always resulted unchanged.

### Static test when cold

Test carried out on a wall 5 meters in height suitable to guarantee the holding of the structural characteristics of the wall after the fitting of the damper. Test carried out with damper sizes 1500x800 mm and 200x200 mm according to DIN4103-1 control.

### Test of the acoustic performances

The outcomes of the acoustic performances have been carried out in the **Mook ND PEUTZ laboratories - report A 1849-2E**.

The applied standards are:

**ISO 3741 1999:** acoustic determination of sound power levels of noise sources using sound pressure - Precision methods for reverberation rooms

**ISO 5135 1997:** acoustic determination of sound power levels of noise from air-terminal devices; air terminal units; dampers and valves by measurement in a reverberation room.

### Test for the aeraulic performances

The WK series fire dampers are born not only from a careful study of the thermal insulation characteristics of the material but also as a result of an innovative fluid dynamic analysis carried out with the CFD software.

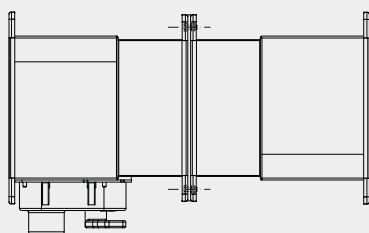
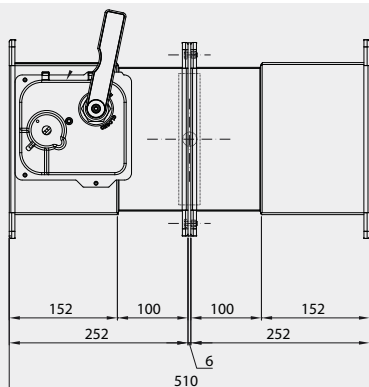
The standard used is:

**ISO 5219 1984** "Air distribution and air diffusion - Laboratory. Aerodynamic testing and rating of air terminal devices."

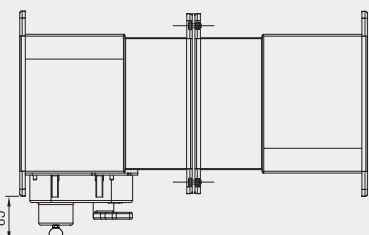
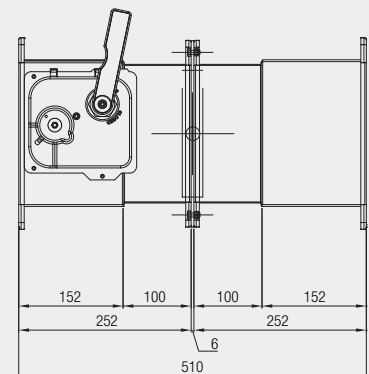


## versions and accessories

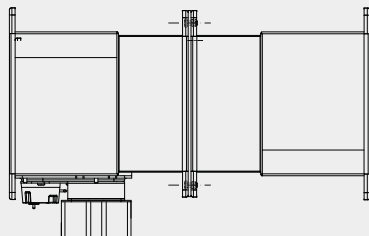
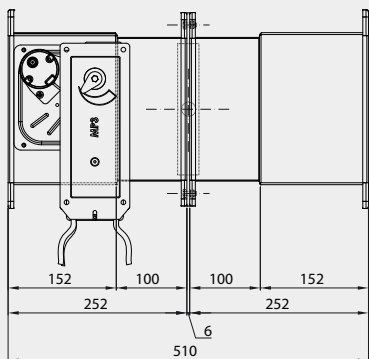
version with mechanical control



version with mechanical control complete with magnet



model with transversal motorised control



### Version with mechanical mechanism

Can be integrated by a magnetic command mechanism independently from the mechanical thermal fuse controlled by the smoke detection system, allowing to anticipate the closure of the damper to the reaction of fire to prevent indirect damages caused by the fire itself.

### Accessories for mechanical mechanism

1. End run closed damper micro switch
2. Start run open damper micro switch
3. 24V CC interruption magnet
4. 48V CC interruption magnet
5. 220V CA interruption magnet
6. 24V CC release magnet
7. 48V CC release magnet
8. 220V CA release magnet

### Version prepared for use with motor\*

The actuator comes equipped with an electrical thermal fuse, it can be connected to a smoke detection system, allowing it to anticipate the damper closure instead of reacting to fire so as to prevent indirect damages caused by the fire itself.

The rearming of the dampers not affected by the fire or the dampers closed accidentally (for example in the event of a black out) happens automatically once power is restored.

### Accessories for models prepared for use with motor:

1. 6-4 Nm24V Belimo actuator
2. 18-12 Nm24V Belimo actuator
3. 6-4 Nm230V Belimo actuator
4. 18-12 Nm230V Belimo actuator
5. 7 Nm24V Siemens actuator
6. 16 Nm24V Siemens actuator
7. 7 Nm230V Siemens actuator
8. 16 Nm230V Siemens actuator

\* There is no foreseen standard motorisation. The chosen motor is always supplied fitted to the fire damper. It is not possible to supply fire dampers ready for use with motor but without the motor itself.

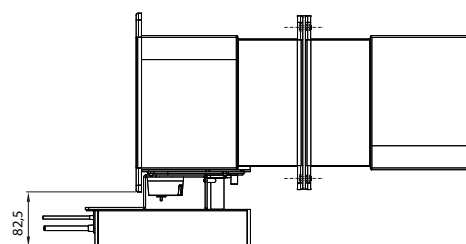
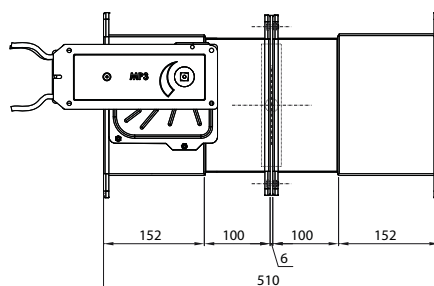
### Accessories for installations in light structures

1. Set of 4 struts for fixing to plasterboard walls with thickness 100 mm – 125 mm - 150mm.
2. Set of 4 plates for fitting in rows.

### Inspection accessories

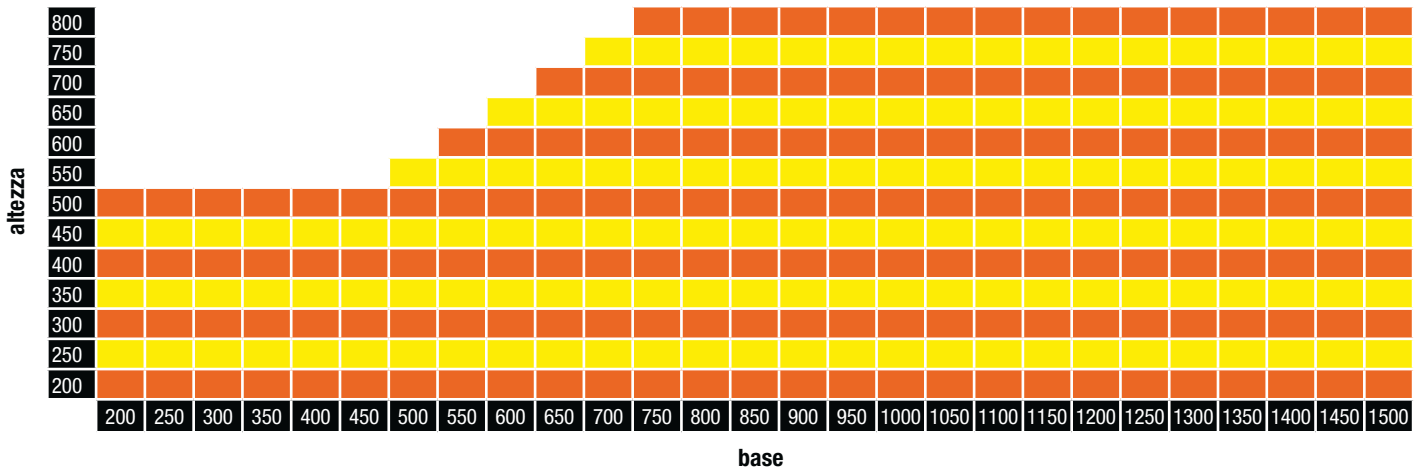
1. Inspection opening on one side of the duct, foreseen on the mechanism side.
2. Inspection openings on both sides of the duct.

### model with longitudinal motorised control



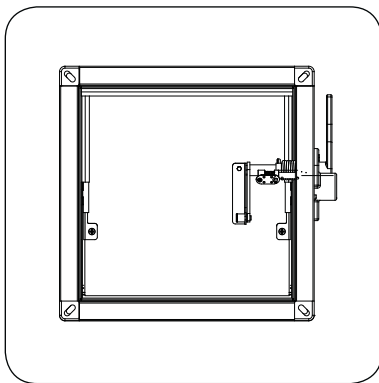


**Possible sizes - available intermediate sizes with 10mm pitch**

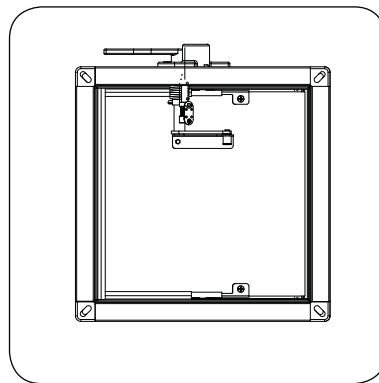


**possible fittings**

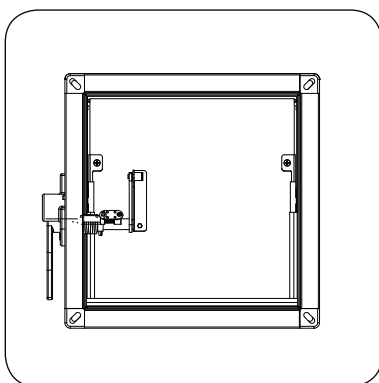
**fitting to walls**



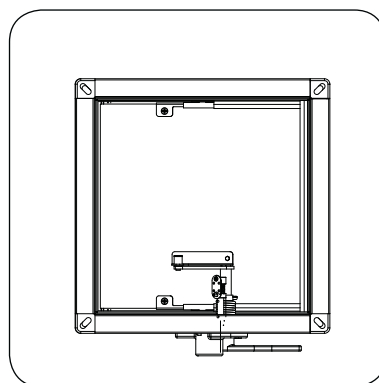
**mechanism at 0 degrees**



**mechanism at 90 degrees**

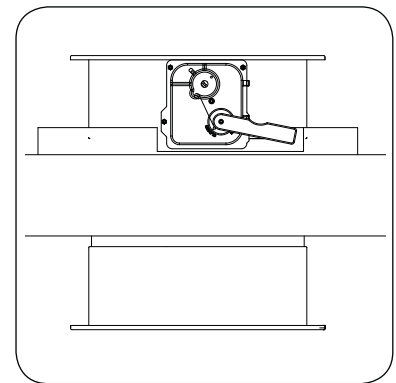


**mechanism at 180 degrees**

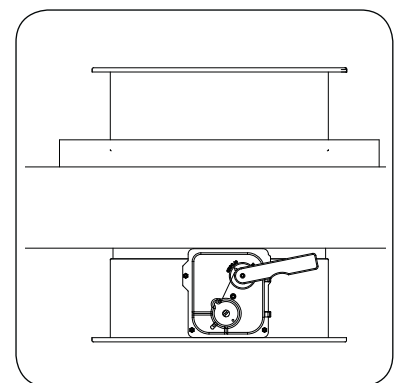


**mechanism at 270 degrees**

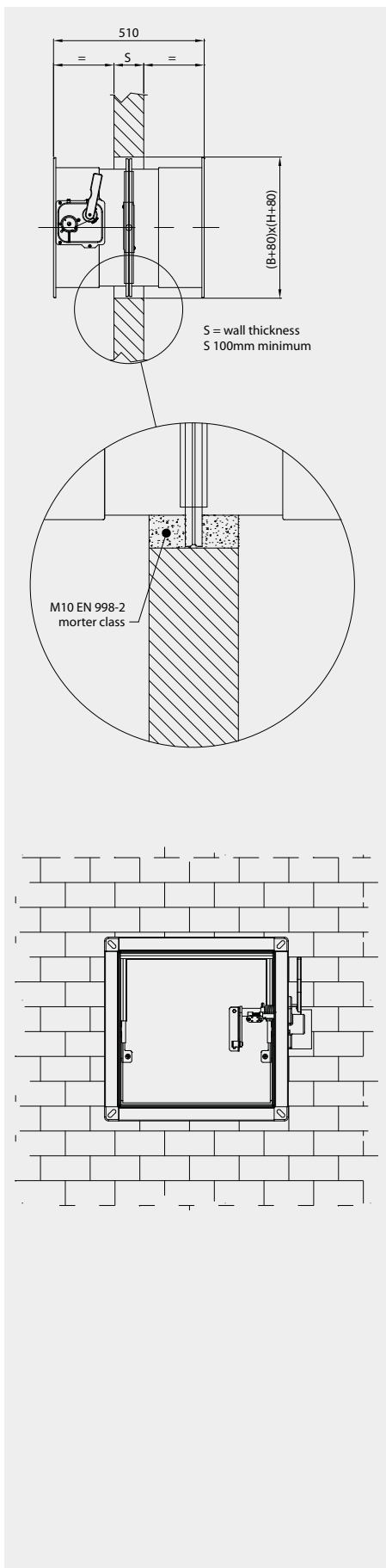
**fitting within ceilings**



**mechanism above**



**mechanism below**



## installation within brick walls

### Procedure

The EI 120 S classified fire dampers guarantee an isolation to fire and heat for 120 minutes, only if installed within walls with fire resistance at least of class REI 120 and a thickness of at least 100mm. Due to its weaker structure, the wall will have less resistance to the fire compared to the fire damper itself.

### 1. Wall openings

An opening in the wall must be made with

a base and height each 80 mm greater than the nominal size of the damper.

### 2. Damper positioning

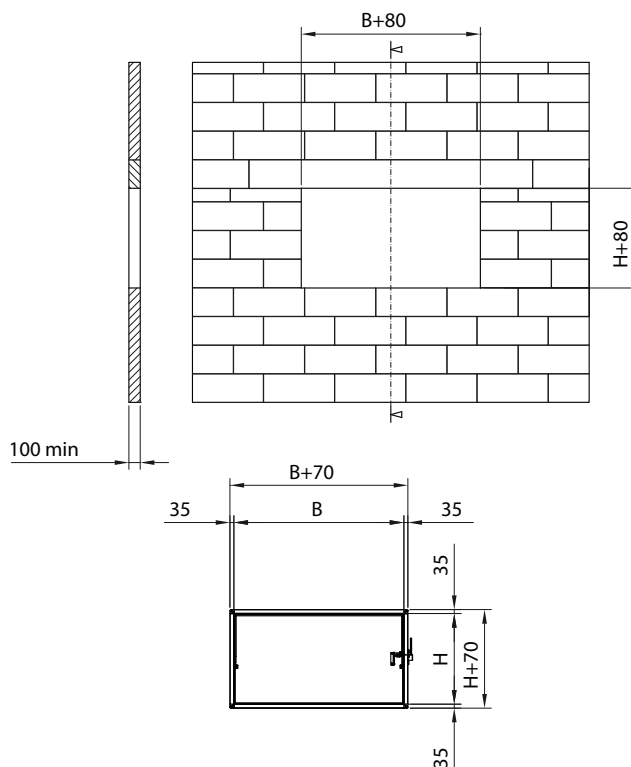
Place the damper in the centre of the opening.

### 3. Filling

Fill the gap around the damper using mortar suitable for use on fire resistant walls: M10 class or above.

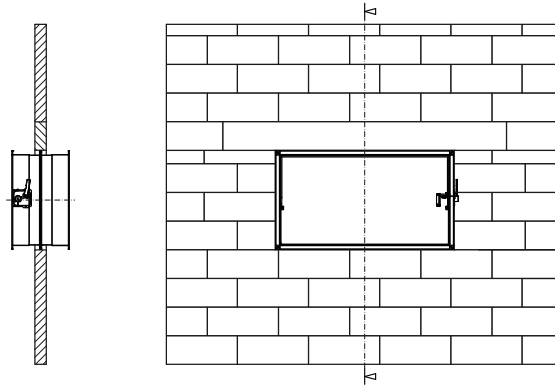
## installation within brick walls – fitting sequence

### 1 Wall opening

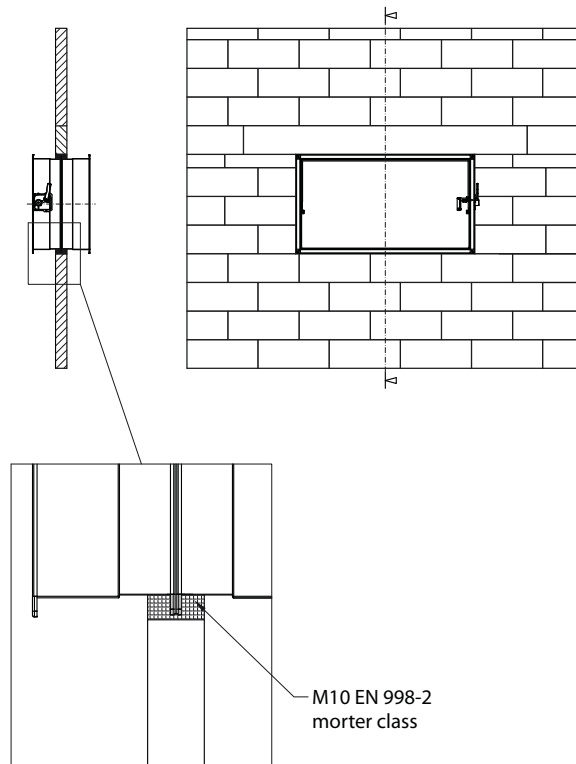


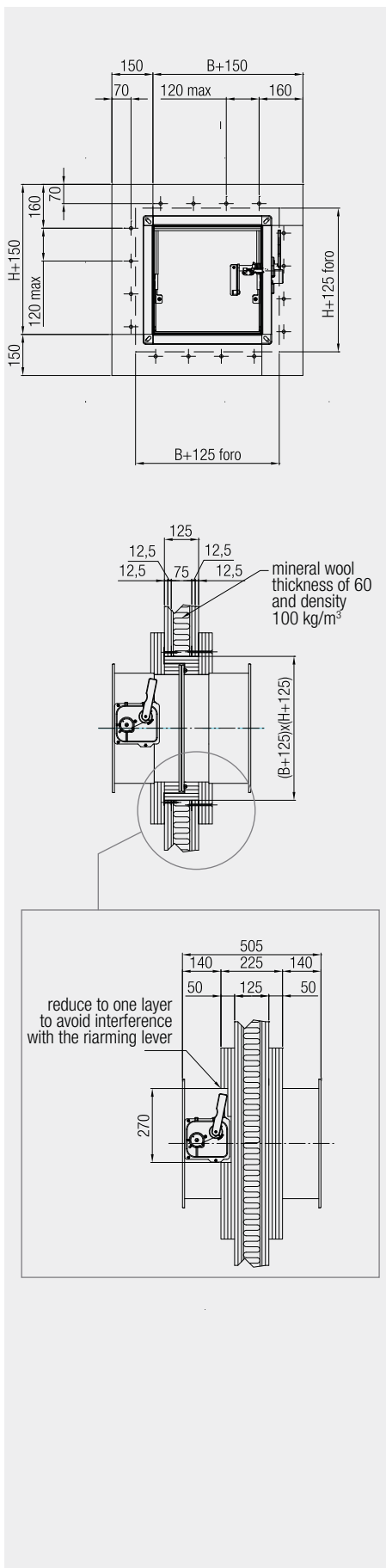


## 2 Damper positioning



## 3 Filling





## installation with plasterboard walls

### Procedure

The EI 120 S classified fire dampers guarantee isolation to fire and heat for 120 minutes only if installed within plasterboard walls with fire resistance REI 120 and with a thickness of at least 125mm. Due to its weaker structure, the wall will have less resistance to fire compared to the fire damper itself

### 1. Construction of the metal structure and wall opening for damper housing and panel fitting [a + b + c + d]

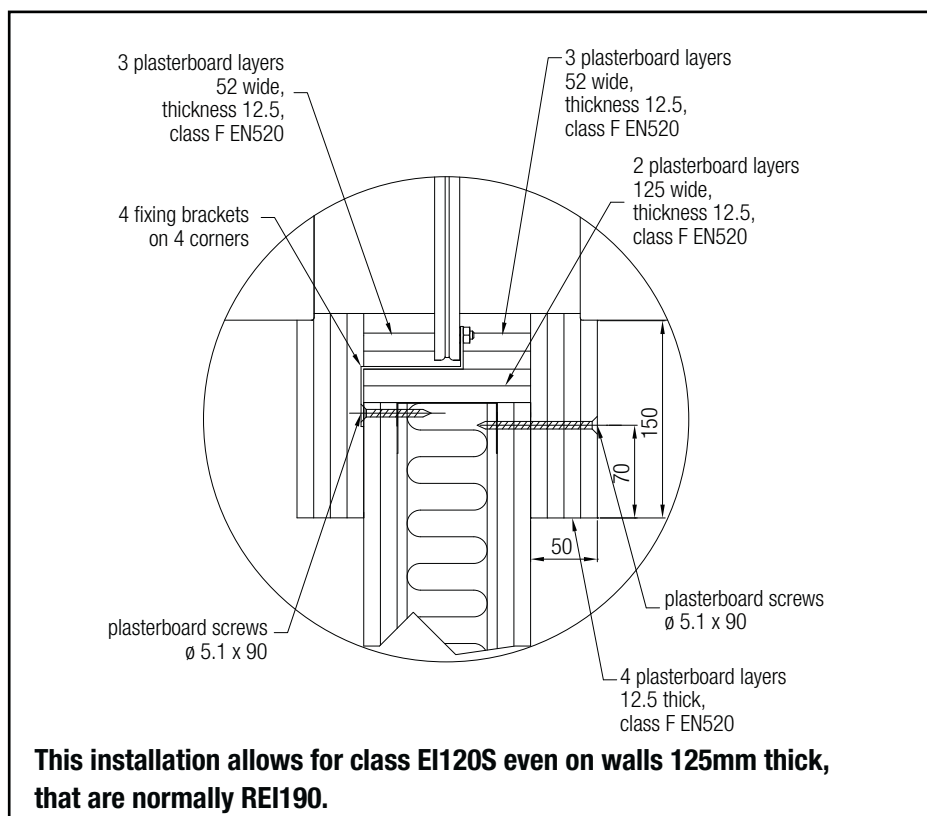
An opening in the wall must be made with a base and height each measuring 125mm more than the size of the fire damper itself.  
Cover the border of the opening with two layers of plasterboard planes as wide as the wall (125mm).

### 2. Placing, fitting and primary filling [e + f]

Four struts must be installed on the damper in relation to the corner screws of the central flange. The damper must be fixed in the middle of the opening using the four struts, as indicated above. Proceed with the filling by inserting on either side three layers of plasterboard so as to fill the thickness of the central flange.

### 3. Final filling [g]

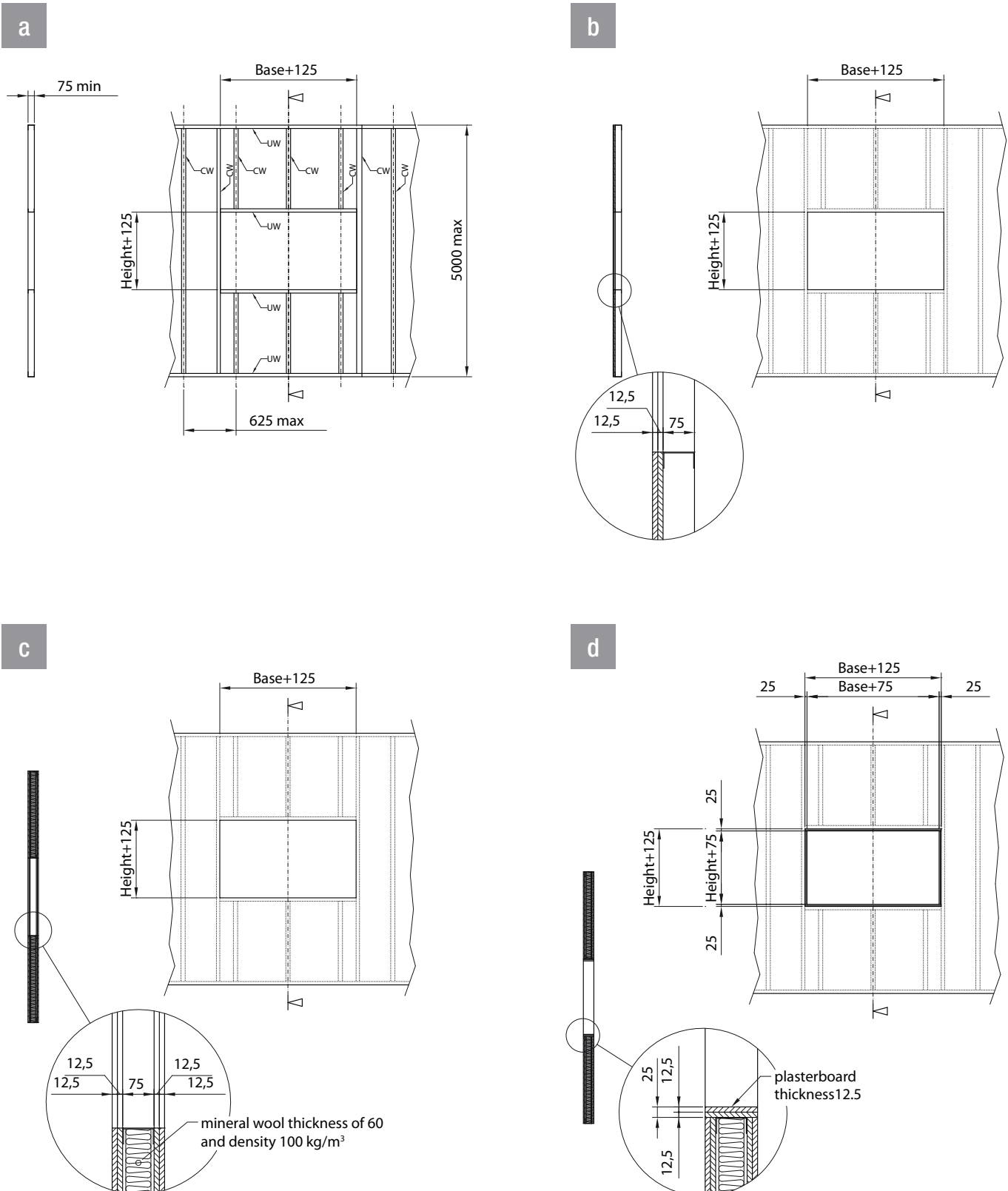
Seal from both sides with a frame made of four layers of plasterboard planes (total thickness of 50mm) 150mm wide.





## installation within plasterboard walls – fitting sequence

### 1 Construction of the metal structure and wall opening for damper housing and panel fitting

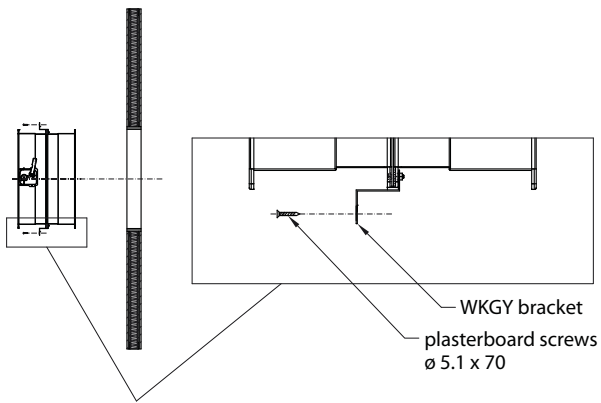




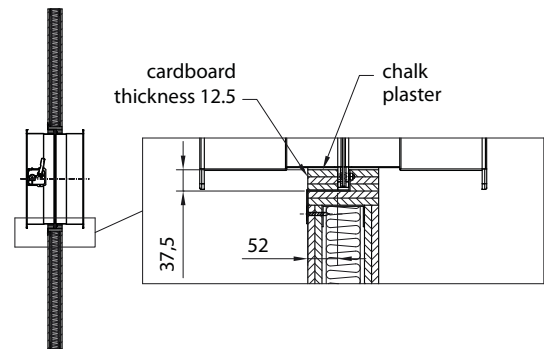
## installation within plasterboard walls – fitting sequence

### 2 Positioning, fitting and primary filling

e

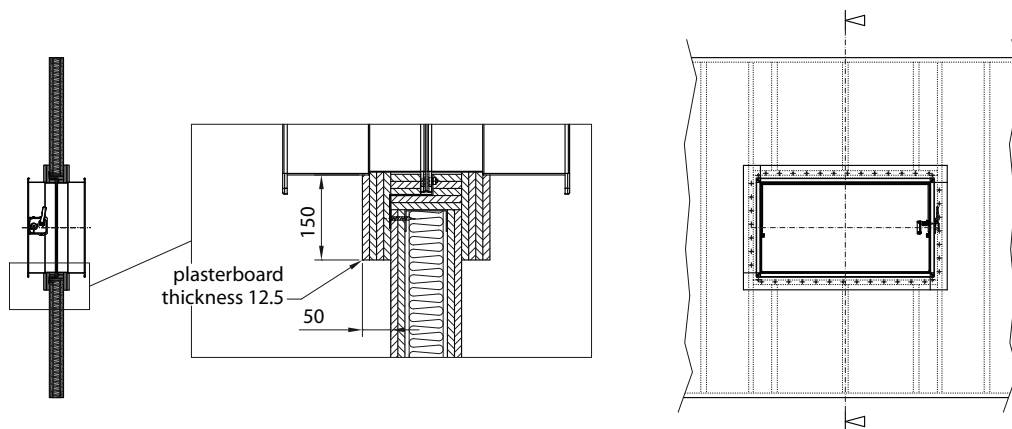


f



### 3 Final filling

g





## installation within concrete ceilings

### Procedure

The EI 120 S classified fire dampers guarantee isolation to fire and heat for 120 minutes only if installed horizontally within concrete ceilings with fire resistance REI 120 and with a thickness of at least 150mm.

Due to its weaker structure, the ceiling will have less resistance to the fire compared to the fire damper itself.

### 1. Opening in the ceiling

An opening in the ceiling must be made with a base and height each measuring 130mm greater than the nominal dimensions of the fire damper itself.

### 2. Damper positioning

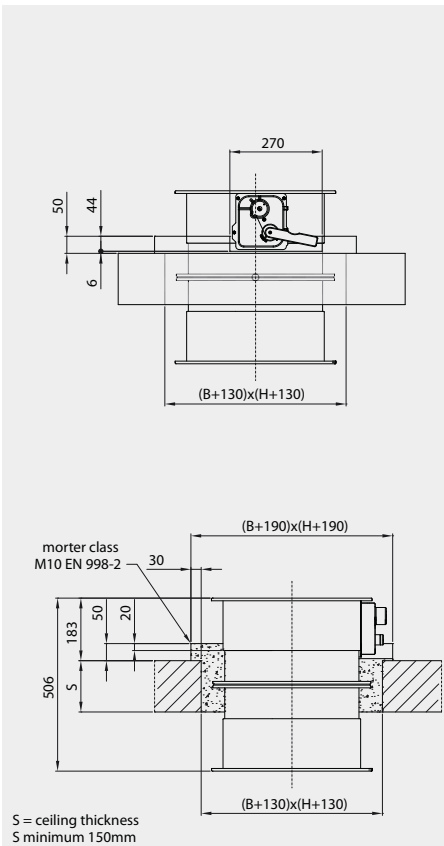
The damper must be placed in such a way that it protrudes by 183 mm above the ceiling, independently of the closing mechanism being above or below the ceiling.

### 3. Filling

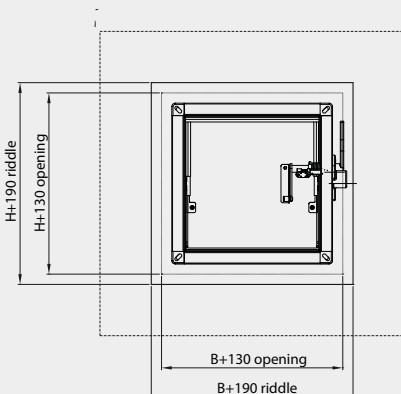
Fill the space between the damper and opening using mortar in class M10 or above.

Make a riddle above the ceiling with a base and height each measuring 190 mm more compared to the nominal dimensions of the damper (overlapping by 30mm in relation to the border of the opening) and 50 mm thick.

If the closing mechanism is above the ceiling, it will be necessary to make a cubby hole in the riddle, 270mm wide and 44mm deep.



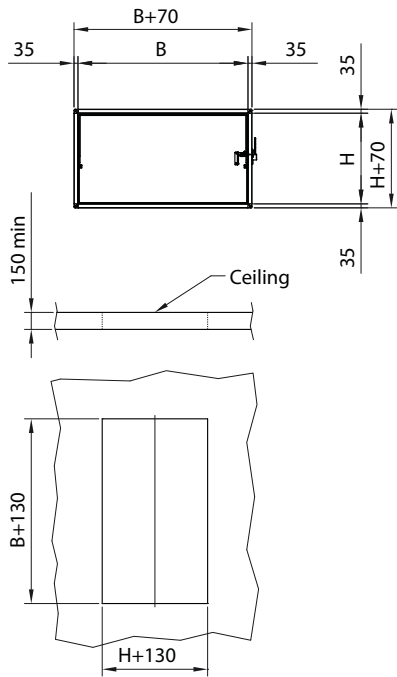
### Complete diagram



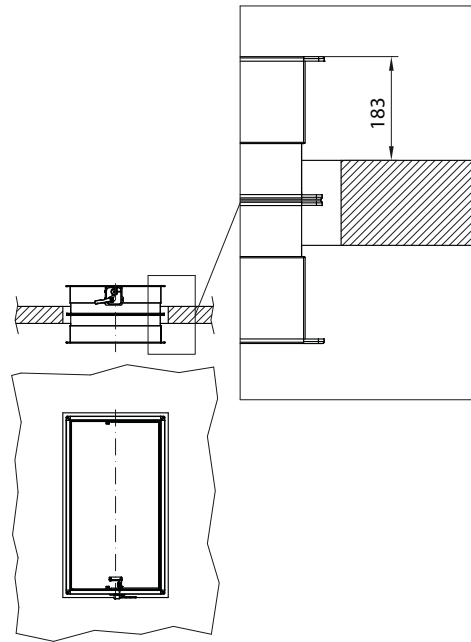


## installation within concrete ceilings – fitting sequence

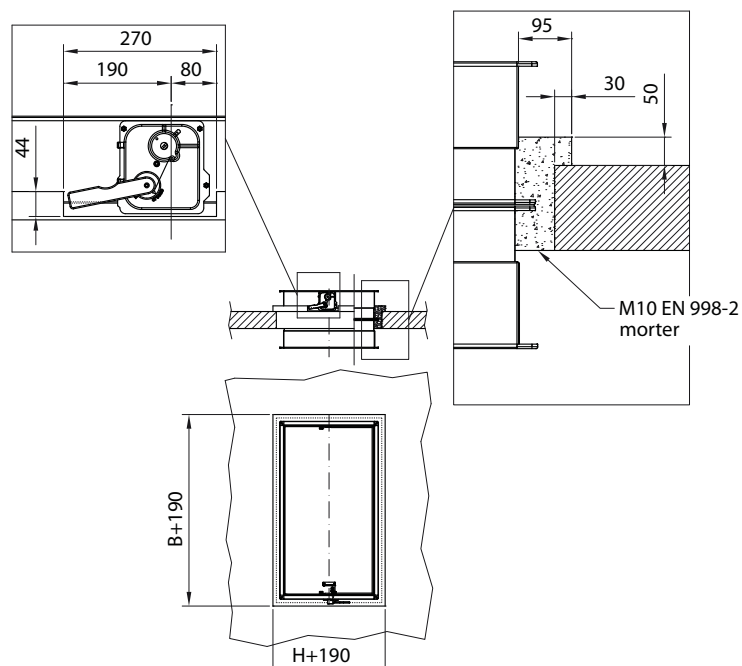
### 1 Opening in the ceiling



### 2 Damper positioning



### 3 Filling





## in-row wall installation “flange to flange”

The WK 40 model EI 120 S classified fire dampers guarantee isolation to fire and heat for 120 minutes only if installed in walls with a fire resistance REI 120 and with a thickness of at least 100 mm.

Due to its weaker structure, the ceiling will have less resistance to the fire compared to the fire damper itself.

### 1. Wall opening [a]

In the wall there must be a predisposed opening larger than the size of the damper as indicated in the sequence drawings.

### 2. Preparation of the dampers [b + c]

- Prepare blocks of porenbeton 100x65x300 mm and fix on the top face of a damper with a class M10 or above fire resistant binder. Create a further layer of binder above the blocks.
- Place the second damper above, taking care to align the flange sides of the top and bottom damper; in this way the blocks and the binder will seal the space between the two dampers.

- Drill the duct of the dampers as indicated in the drawing to join the two dampers with the appropriate set of 4 plates – ref. WKBA.

### 3. Damper fitting [d]

- Fit the previously coupled dampers in the wall.

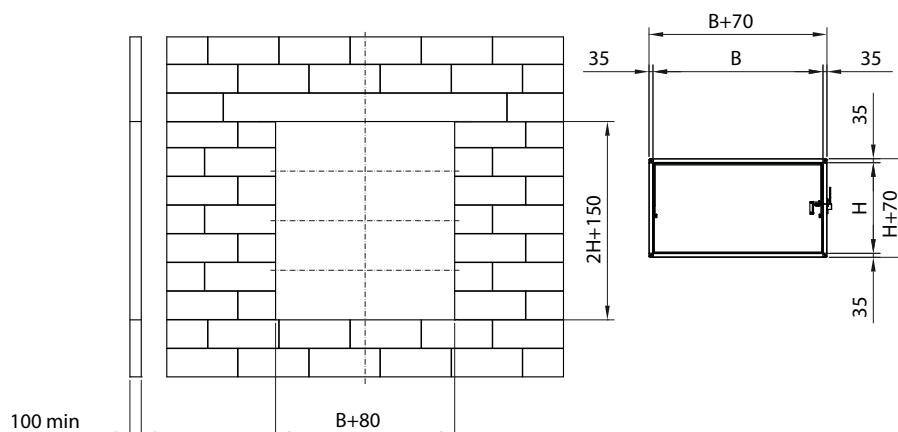
### 4. Filling preparation and filling [e]

- Prepare grooved bricks as shown in the drawing in point e).
- Fill the damper and wall opening using the prepared bricks as described above. They will form a perimeter 100 mm wide and 55 mm thick all around the dampers.
- The binder used will need to have fire resistant characteristics suitable for use in fire resistant walls: M10 class or above.

## in-row wall installation “flange to flange” – fitting sequence

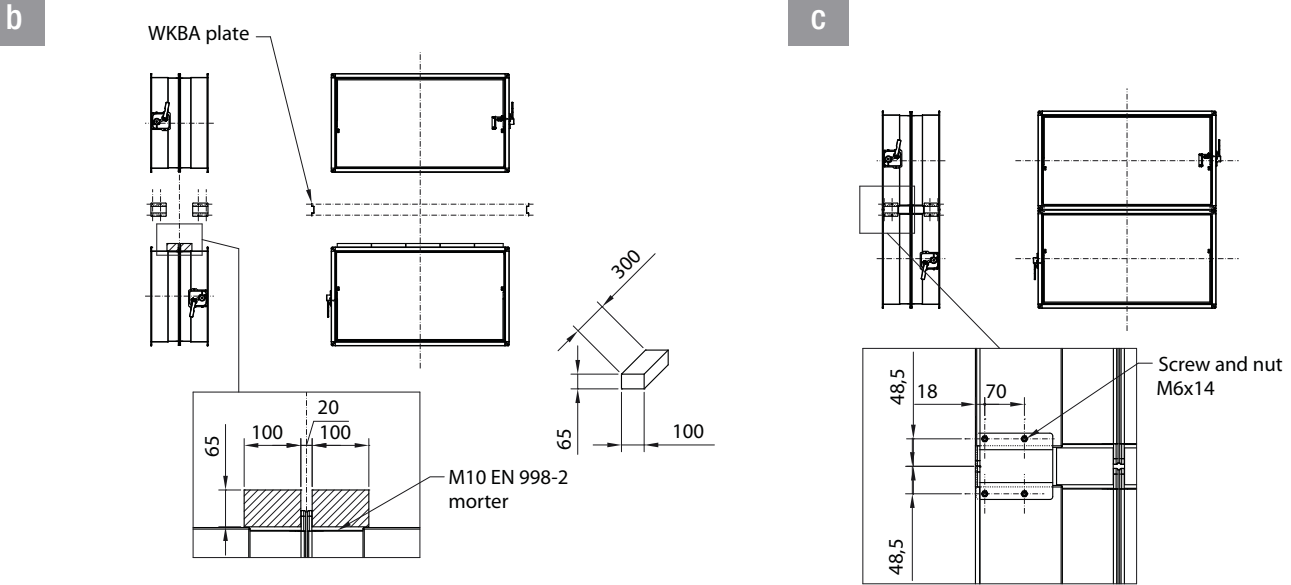
### 1 Wall opening

a

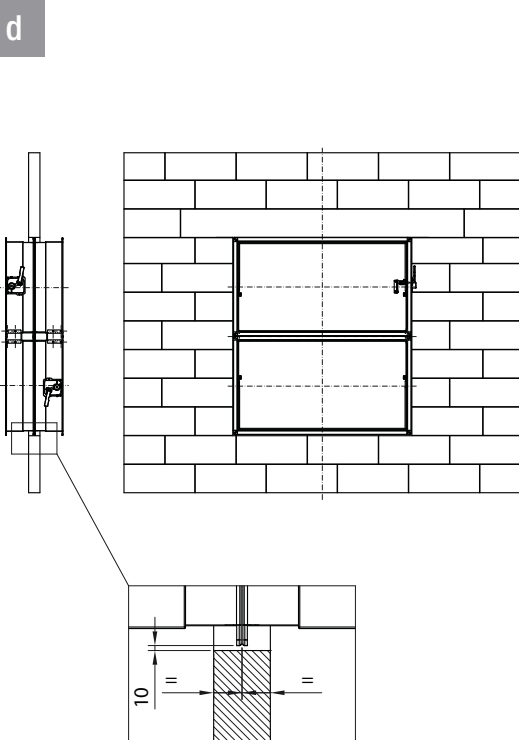




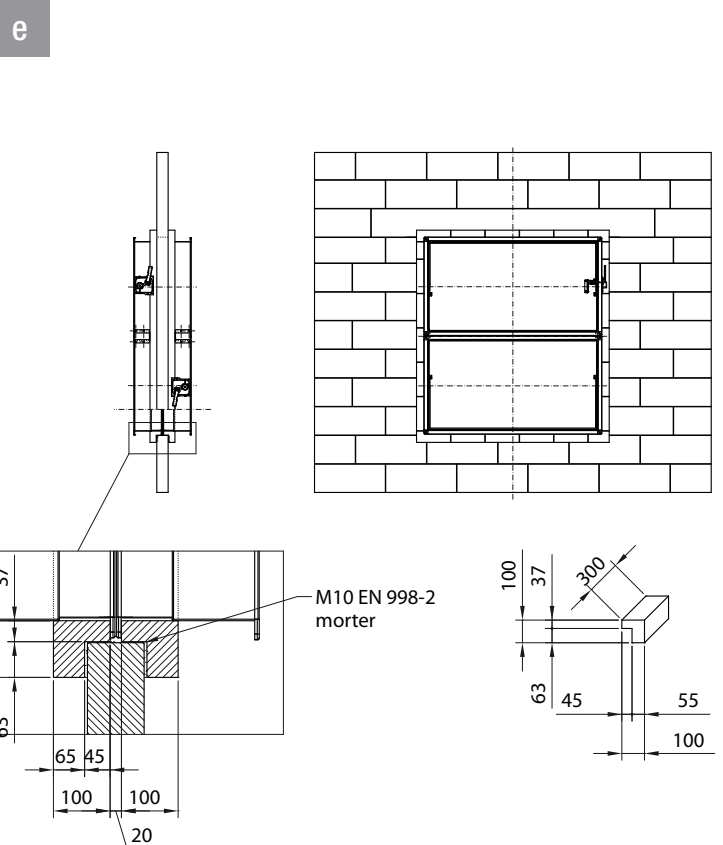
## 2 Preparation of the dampers



## 3 Damper fitting



## 4 Filling preparation and filling

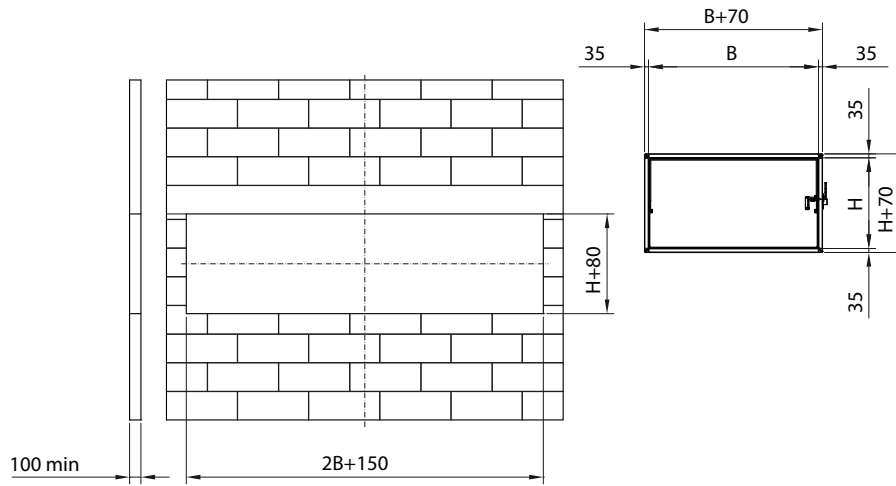




**in-line wall installation “frame to frame” – fitting sequence**

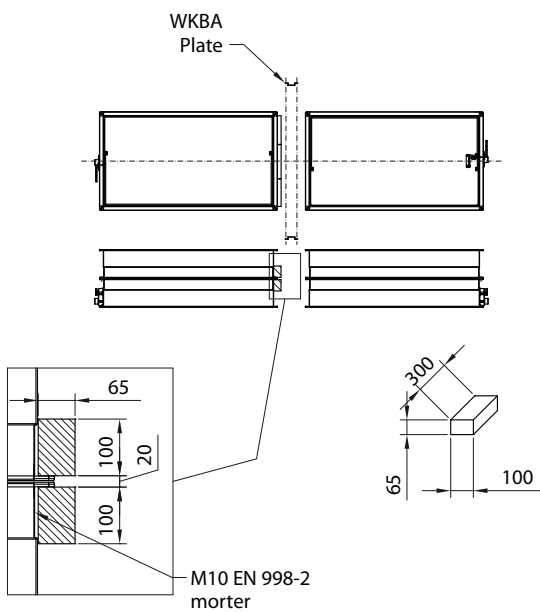
**1 Wall opening**

**a**

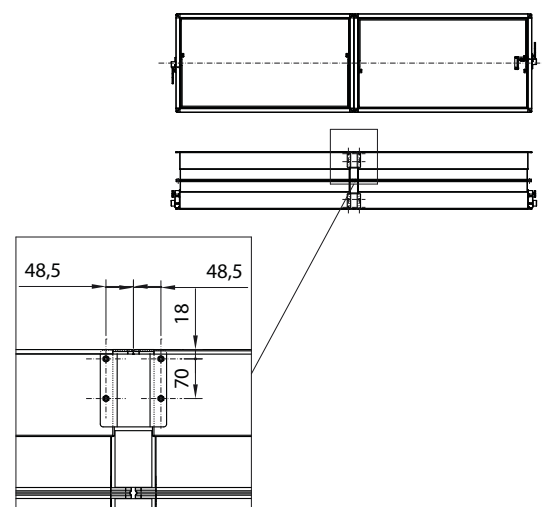


**2 Damper preparation**

**b**



**c**



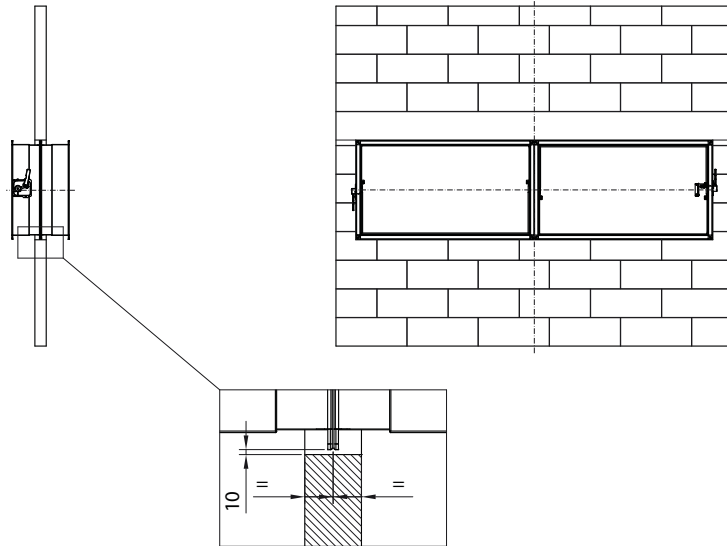


# WK30 Fire Damper certified EI 120 S UNI EN 1366-2



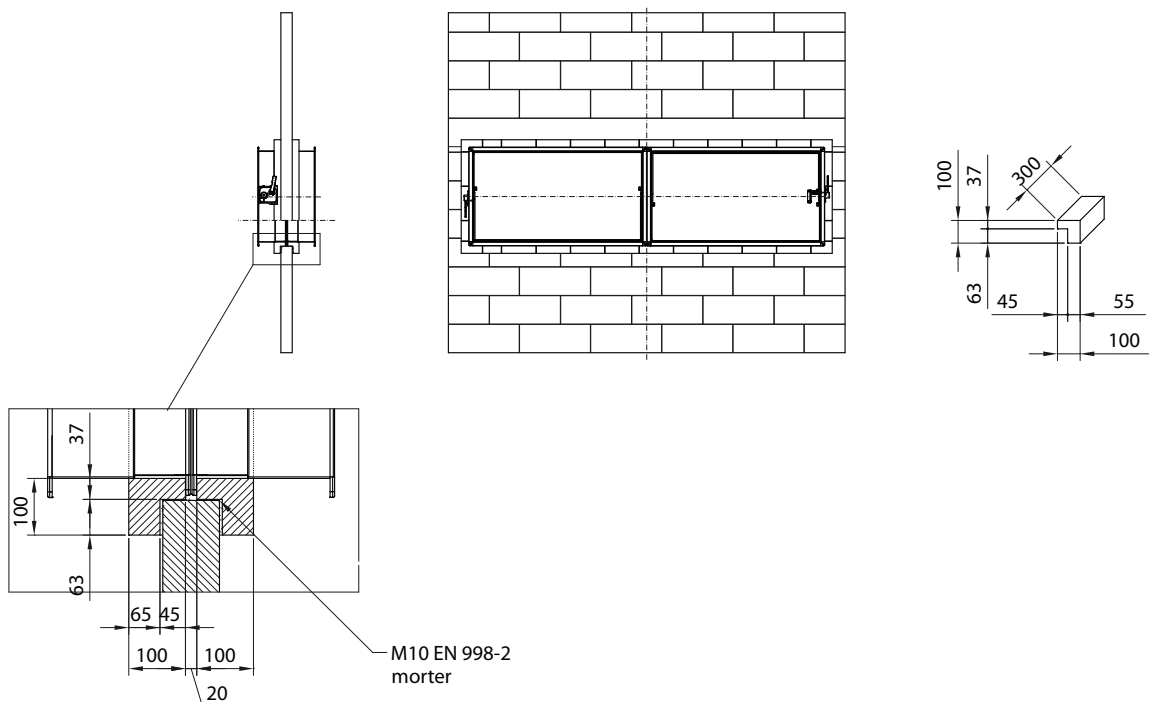
## 3 Damper fitting

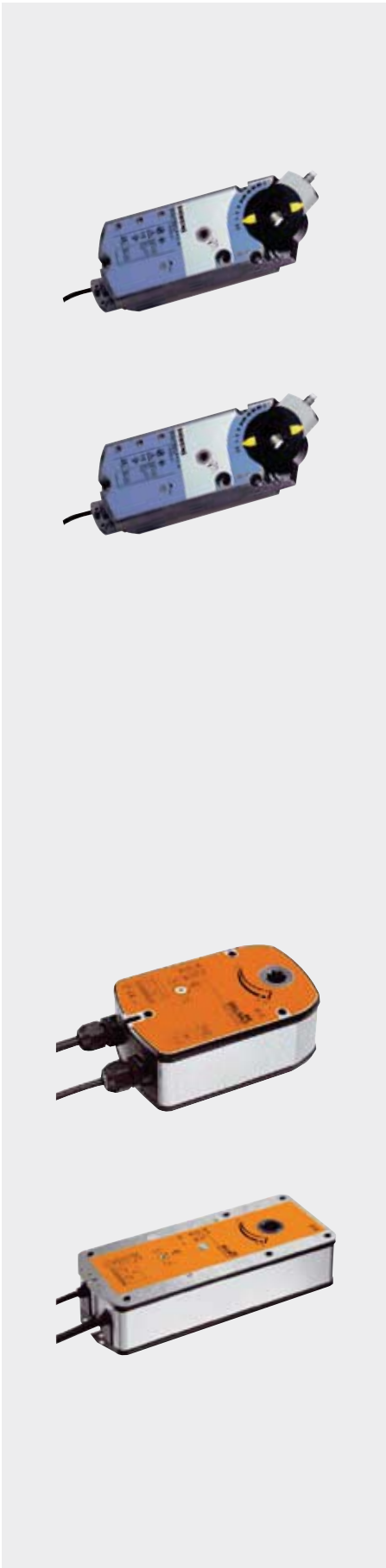
d



## 4 Filling preparation

e





## motors

### Siemens manufactured motors complete with thermal fuse

Power	End run	T. fuse	Torque	Kg	Code
AC/DC 24V	On Off - 2	1 int + 1 est	7 Nm 1,0 Mq.	1,20	GNA 126.1E/T12
AC/DC 24V	On Off - 2	1 int + 1 est	16 Nm	2,00	GGA 126.1E/T12

AC 230V	On Off - 2	1 int + 1 est	7 Nm 1,0 Mq.	1,30	GNA 326.1E/T12
AC 230V	On Off - 2	1 int + 1 est	16 Nm	2,10	GGA 326.1E/T12

### Siemens manufactured motors without thermal fuse for special applications

Power	End run	T. fuse	Torque	Kg	Code
AC/DC 24V	On Off - 2		7 Nm 1,0 Mq.	1,20	GMA 126.1E12
AC/DC 24V	On Off - 2		16 Nm	2,00	GCA 126.1E12

AC 230V	On Off - 2		7 Nm 1,0 Mq.	1,30	GMA 326.1E12
AC 230V	On Off - 2		16 Nm	2,10	GCA 326.1E12

### Belimo manufactured motors complete with thermal fuse

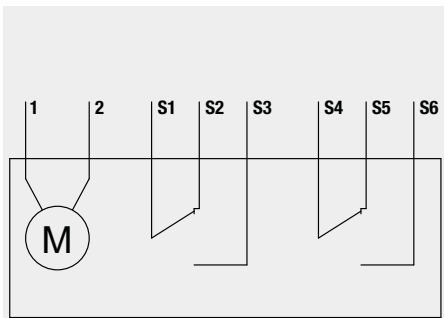
Power	End run	T. fuse	Torque	Kg	Code
AC/DC 24V	On Off - 2	1 int + 1 est	6-4 Nm 0,35 Mq.	1,63	BLF 24T
AC/DC 24V	On Off - 2	1 int + 1 est	6-4 Nm 0,35 Mq.	2,80	BLF 24TST
AC/DC 24V	On Off - 2	1 int + 1 est	18-12 Nm	2,80	BF 24T
AC/DC 24V	On Off - 2	1 int + 1 est	18-12 Nm	2,80	BF 24TST

AC 230V	On Off - 2	1 int + 1 est	6-4 Nm 0,35 Mq.	1,73	BLF 230T
AC 230V	On Off - 2	1 int + 1 est	18-12 Nm	3,10	BF 230T

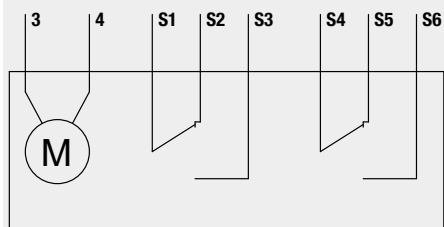
### Belimo manufactured motors without thermal fuse for special applications

Power	End run	T. fuse	Torque	Kg	Code
AC/DC 24V	On Off - 2		6-4 Nm 0,35 Mq.	1,63	BLF 24
AC/DC 24V	On Off - 2		18-12 Nm	2,80	BF 24

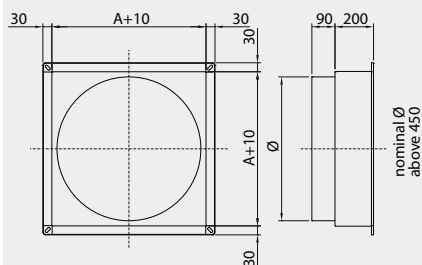
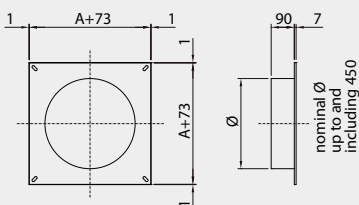
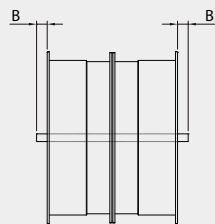
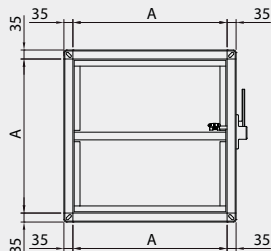
AC 230V	On Off - 2		6-4 Nm 0,35 Mq.	1,73	BLF 230
AC 230V	On Off - 2		18-12 Nm	3,10	BF 230



GNA126.1E/T12	BLF 24T	BF 24T	BLF 230T
GGA126.1E/T12	BLF 24TST	BF 24TST	BF 230T



GNA326.1E/T12 GGA326.1E/T12



## motor connection diagrams

1	negative (direct-current) or neutral (alternating current)
2	positive (direct-current) or faze (alternating current)
S1	common micro switch closed damper
S2	normally closed micro switch closed damper
S3	normally open micro switch closed damper
S4	common micro switch open damper
S5	normally closed micro switch open damper
S6	normally open micro switch open damper

3	negative (direct-current) or neutral (alternating current)
4	positive (direct-current) or faze (alternating current)
S1	common micro switch closed damper
S2	normally closed micro switch closed damper
S3	normally open micro switch closed damper
S4	common micro switch open damper
S5	normally closed micro switch open damper open damper
S6	normally open micro switch open damper

## accessories

### connection for circular ducts

Allows the use of square section dampers within circular ducts.

On the basis of the diameter of the duct, the table below helps to identify the size of the damper and the type of suitable connections.

nominal $\varnothing$	external $\varnothing$	A	B	code
160	156	200x200	-	WKQT160
200	196	200x200	-	WKQT200
250	246	250x250	-	WKQT250
300	296	300x300	-	WKQT300
315	311	350x350	-	WKQT315
355	351	400x400	-	WKQT355
400	396	400x400	-	WKQT400
450	446	450x450	-	WKQT450
500	496	500x500	-	WKQT500
560	556	600x600	50	WKQT560
630	626	650x650	75	WKQT630
710	706	750x750	125	WKQT710
800	796	800x800	150	WKQT800



## accessories

### magnet for mechanical control

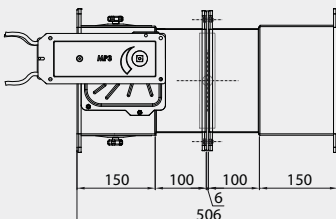
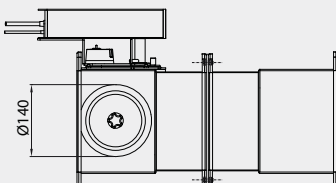
Allows control of the closing of the damper by an electrical signal, prior to the intervention of the thermal fuse, which remains nevertheless present and active. The possible reopening of the damper is done manually.

The signal can be as a result of an interruption in the current (magnet is permanently electrically connected, the absence of current results in the closure of the damper) or by current input (magnet is not permanently connected, the connection to an electrical signal results in the closure of the damper).

Thanks to the air-tight seal of the WK series damper, the magnet controlled by the smoke detection system is able to block the diffusion of toxic and harmful gases released by combustion even in the event of fires where only furniture and furnishings are involved.

### micro switches

The use of fire dampers complete with micro switches with open and/or closed damper allows to foresee a control panel that signals the status of the different dampers on site. It also allows to generate, when closing the fire damper, a command signal for the activation of the smoke evacuation dampers on site.



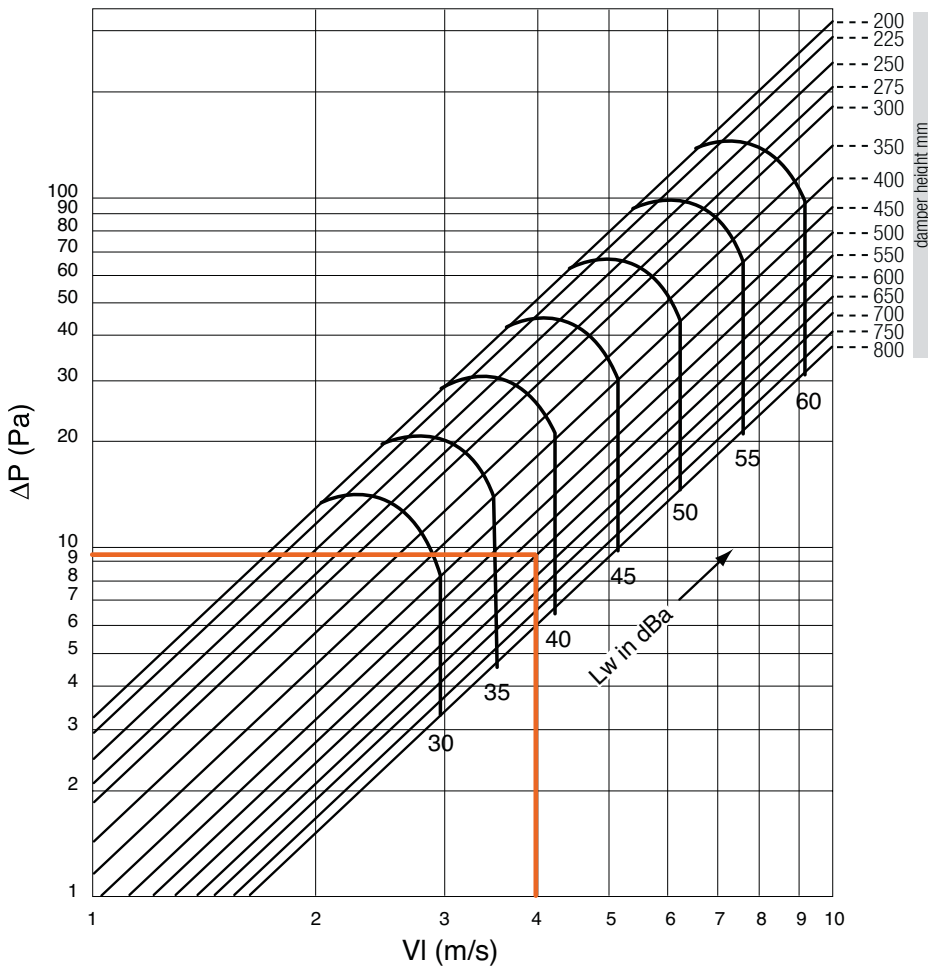
### inspection openings

Allow to verify the status of the thermal fuse or the closing mechanism with the maximum simplicity, without the need of removing the damper from the duct.



## aeraulic and acoustic performances

**Noise power and air flow loss for 400 mm base**



### Legend

- B** Base ( mm)
- H** Height ( mm)
- Q** Air flow rate (m<sup>3</sup>/h)
- VI** Air speed (m/s)
- ΔP** Total air flow loss (Pa)
- Lw** Noise power (dBA)
- F** Central frequency for octave band

### Example

- B** 600
- H** 600
- Q** 5200 m<sup>3</sup>/h
- VI** 4 m/sec
- ΔP**  $9,5 * 0,8 = 7,6$  Pa
- Lw**  $38 + 1 = 39$  dBA

### Correction for base sizes different to 400 mm

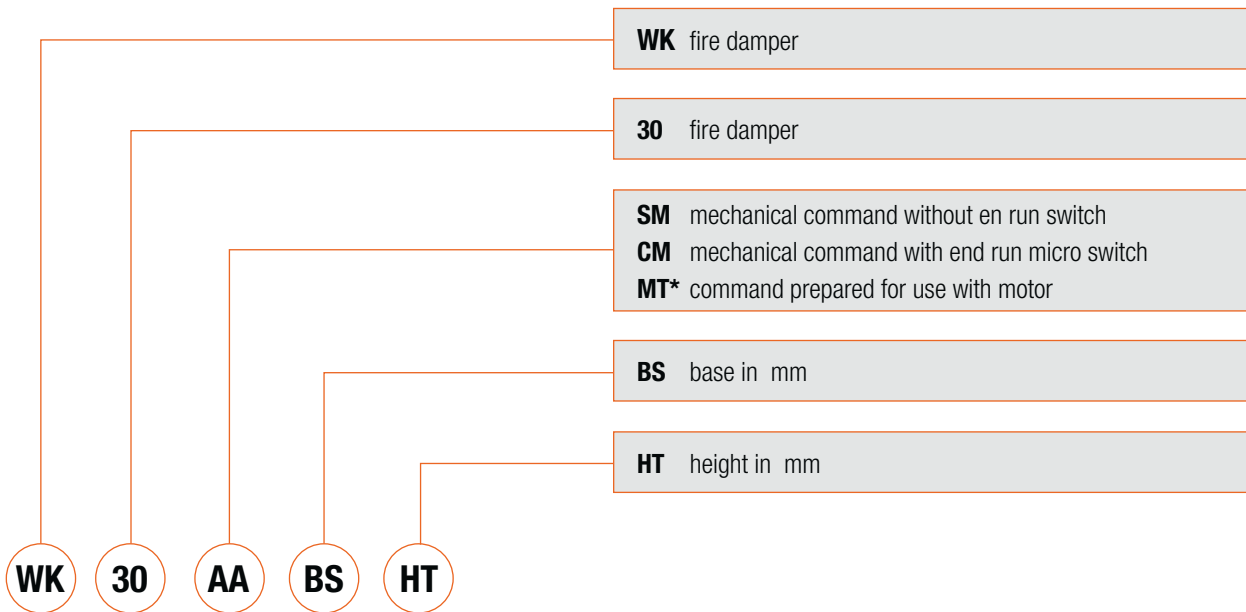
B in mm	ΔP x ...	Lw + ...
200	1,7	3,3
250	1,4	2,3
300	1,2	1,4
350	1,1	0,6
400	1,0	0,0
450	0,9	0,3
500	0,8	0,6
550	0,8	0,8
600	0,8	1,0
650	0,7	1,2
700	0,7	1,3
750	0,7	1,5
800	0,7	1,6
850	0,7	1,8
900	0,7	1,9
950	0,6	2,0
1000	0,6	2,1
1050	0,6	2,2
1100	0,6	2,3
1150	0,6	2,4
1200	0,6	2,5
1250	0,6	2,6
1300	0,6	2,7
1350	0,6	2,8
1400	0,6	2,8
1450	0,6	2,9
1500	0,6	3,0

**Correction per spectrum for each octave band**  
values to add to the pondered noise power level in dBA  
to obtain the estimation of the spectrum

VI (m/s)	F (Hz)							
	63	125	250	500	1000	2000	4000	8000
2	+25	+9	+2	-4	-9	-17	-32	-19
3	+20	+8	+1	-4	-8	-14	-27	-22
4	+15	+6	+1	-4	-7	-11	-22	-24
5	+11	+5	0	-4	-6	-8	-18	-26
6	+9	+4	-1	-4	-5	-7	-15	-25
7	+8	+4	-2	-5	-5	-7	-14	-22
8	+7	+4	-3	-5	-5	-6	-13	-21
9	+7	+4	-3	-6	-5	-6	-12	-20
10	+7	+3	-3	-6	-5	-6	-12	-19



## how to order



\* There is no foreseen standard motorised version. The chosen motor is always supplied fitted to the fire damper. There is no foreseen supply of fire dampers ready for use with motor but without the motor supplied and fitted.

Code example	
<b>WK30CM1500800</b>	Fire damper mod. 30 with end run micro switch with mechanical mechanism base 1500 height 800 mm.

<b>WKIC</b>	start run micro witch open damper
<b>WKMG024</b>	24V CC interruption magnet
<b>WKMG048</b>	48V CC interruption magnet
<b>WKMG230</b>	230V CA interruption magnet
<b>WKMA024</b>	24V CC release magnet
<b>WKMA048</b>	48V CC release magnet
<b>WKMA230</b>	230V CA release magnet
<b>WKMT</b>	motors support
<b>WKSM</b>	mechanical command without end run switch
<b>WKCM</b>	mechanical command with end run micro switch
<b>WKCM2</b>	mechanical command with start and end run micro switch
<b>WKSP1</b>	one inspection door
<b>WKSP2</b>	two inspection doors
<b>WKGY100</b>	set of 4 struts for fixing to 100 mm – 125 mm – 150 mm thick plasterboard walls.
<b>WKBA</b>	set of 4 plates for fitting in row flange to flange
<b>WKQT</b>	connection for circular ducts



**Head office**

via G. La Pira 9 a/b  
35012 Camposampiero – PD – Italia

**Milano branch**

via Pelizza da Volpedo 56 - e  
20092 Cinisello Balsamo – MI – Italia

Tel. +39 049 9303516

Fax +39 049 9317070

[www.mp3-italia.it](http://www.mp3-italia.it)

[mp3-italia@mp3-italia.it](mailto:mp3-italia@mp3-italia.it)

[vendite@mp3-italia.it](mailto:vendite@mp3-italia.it)

[sales@mp3-italia.it](mailto:sales@mp3-italia.it)