



Fire damper

**KTM**

Certificate of constancy  
of performance  
1488-CPR-0438/W



Fulfils the requirements of the standards:

Certified according to **PN-EN 15650** (Ventilation for buildings – Fire dampers).

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

Tested in accordance with **PN-EN 1366-2** (Fire resistance tests for service installations – Part 2: Fire dampers).

## Intended use

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The KTM type fire dampers are intended to installation in general ventilation systems as cut-off baffles, separating the fire zone from the remaining part of the building (normally open). The basic function of the KTM type fire dampers is to restrain the spreading of fire, temperature and smoke.

The fire dampers, independently to the axis of rotation of the flap (with the axis angle  $0 \div 360^\circ$ ) are intended for horizontal (in walls) and vertical installation (in ceilings).

The KTM type fire dampers have fire resistance class **EI120 (vehoi ↔ o) S**, which means that the fire damper has integrity, insulation and smoke leakage not less than 120 min.

The fire dampers can be also installed in building barriers with lower fire resistance class than EI120. In such use the fire damper has the fire resistance equal to the fire resistance class of the building barrier with smoke leakage criterion maintained.

Fire damper is constructed, manufactured and tested in accordance with the standards: **PN-EN 15650** "Ventilation for buildings – Fire dampers" and **PN-EN 13501-3** "Fire classification of construction products and building elements- Part 3: Classification using data from fire resistance tests on products and elements used in building service installations: fire resisting ducts and fire dampers".

Sensitivity of the fire dampers is confirmed by tests in accordance with the standard **PN-EN 1366-2** "Fire resistance tests for service installations- Part 2: Fire dampers".

## Technical description of the device

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KTM fire damper (with return spring) consists of body with round cross-section, movable flap and driving mechanism with releasing element.

The body with nominal length of 150 [mm] for female coupling and 195 [mm] for male coupling is made from galvanized steel. On both body ends there are couplings enabling easy installation of the damper to the ductwork.

On the internal and external surface of the housing, in place of perforation around the closed flap, there is an intumescent gasket. The main characteristic of the gasket is that it expands its volume when heated, sealing all the gaps between the flap and the damper body. The KTM fire damper flap is made of silicate calcium board. On the perimeter of the flap there is a gasket to provide tightness in ambient conditions. The fire damper has actuating springs (in fire dampers where  $DN \leq 125$  [mm] there is one spring installed, and in fire dampers where  $DN > 125$  [mm] there are two springs), which during the opening of the flap are storing the energy which is then used for closing. The opened position of the flap is provided by thermal fuse with  $70^\circ\text{C}$  nominal reaction temperature, placed on special hook screws.

The closing of the flap of the KTM fire damper takes place after thermal fuse reaction, after exceeding the temperature of  $70 \pm 5^\circ\text{C}$ . In this temperature the thermal fuse breaks, causing disconnection of the flap with the hook and then the transition of the flap to closed position through the operation of the springs. After the transition of the flap to closed position, the movement of the flap is limited by the stopper. Fire dampers with diameter  $DN > 125$  [mm] have the flaps in closed position secured against possible opening.

To reopen the flap of the fire damper (if the closing was done during the test) the stopper must be unblocked.

During normal operation of the system, the flap of the KTM fire damper remains in the open position. In case of fire the fire damper flap moves to the closed position.

- On request, the fire dampers can be provided with limit switch indicating the closed position, limit switch indicating open position, as well as both limit switches mentioned above;
- The length of the fire damper can be  $150 \div 350$  [mm] for the female coupling and  $195 \div 395$  [mm] for the male coupling;

In the special chemical-resistant version, all steel components are made of acid-resistant steel and flap is impregnated with non-solvent substance which is intended to impregnate fireproof boards, recommended by the manufacturer for the chemical industry, laboratories, clinics etc. Impregnation does not change the classification of the boards as incombustible.

### Versions of the device and designation

The KWP type fire dampers are manufactured with female (KTM-DN-M) – Figure 1. and male (KTM-DN-N) – Figure 2. couplings:

Dimensional series of the KTM type fire dampers include the diameters from DN100 to DN250 (and all diameters within that range). The basic dimensional series of the diameters is: **DN100, DN125, DN160, DN200, DN250.**

Depending on the intended use and used actuating mechanism, the fire dampers are marked with the following symbols:

- KTM – fire dampers with return spring;
- KTM-E – fire dampers with electric actuator with return spring;
- KTM-ME – fire dampers with electric actuator with return spring, intended for frequent opening and closing, with possibility to use for the air flow regulation or pressure regulation during normal operation of the general ventilation system.

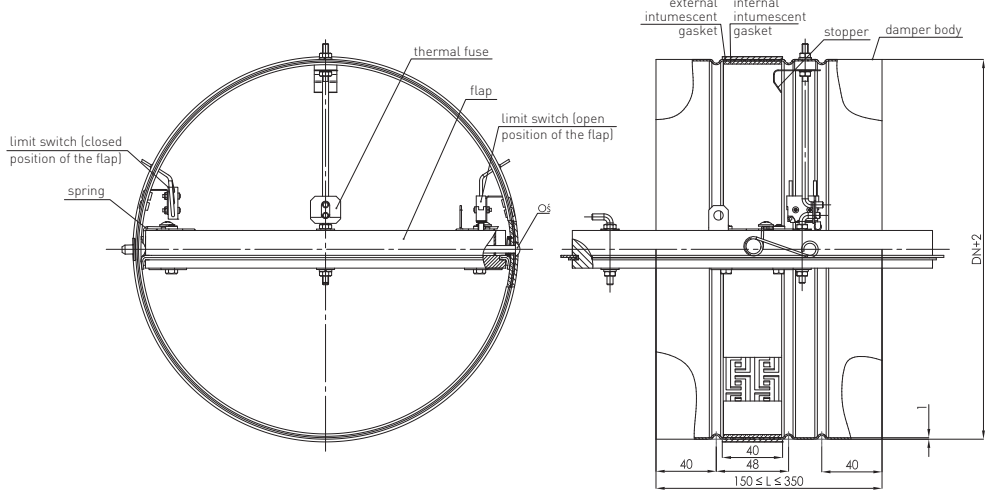


Figure 1. KTM fire damper (female coupling)

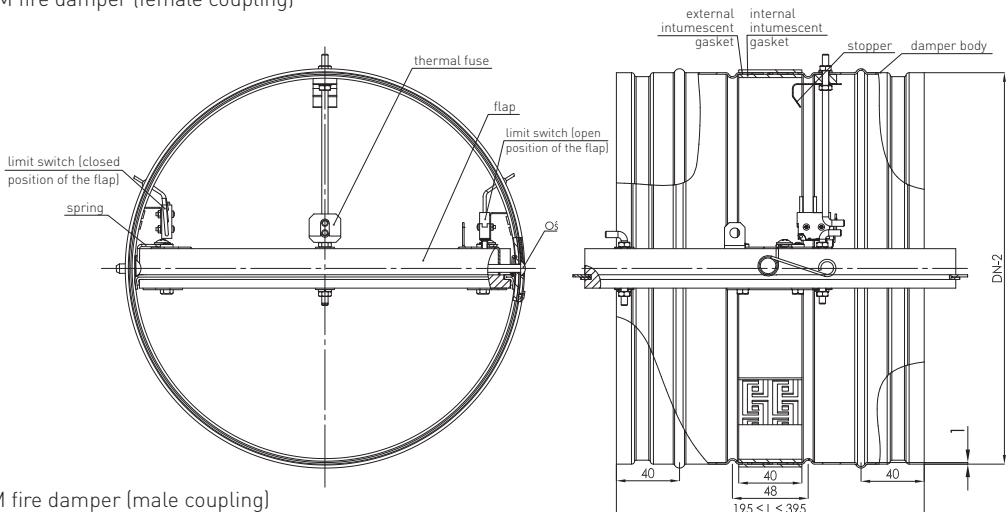


Figure 2. KTM fire damper (male coupling)

## Versions of the device and designation

Fire dampers KTM-E(ME) are made through combining basic version of the KTM type fire damper (with return spring but with no thermal fuse and limit switches) together with E type driving adapter (fig. 3. and 4.). The actuating mechanism in the KTM-E(ME) type fire dampers is an BLF series electric actuator by Belimo with power supply of 24 [V] AC/DC or 230 [V] AC. Automatic closing of the flap is realized by a thermal electric fuse with a  $72\pm 5^{\circ}\text{C}$  nominal reaction temperature (thermal electric fuse reaction causes power loss to the electric actuator). Automatic closing of the flap of the KTM-E(ME) type fire damper is realized by cutting off the power supply (with no power supplied to the electric actuator, the return spring, while returning to the free position, moves the fire damper flap to the fully closed position).

For special order the KTM-E(ME) type fire dampers are provided with thermal electric fuse with  $95^{\circ}\text{C}$  reaction temperature.

**During normal operation of the system , the flap of the KTM-E fire damper is in the open position. In case of fire, the transition of the flap to fully closed position occurs.**

**During normal operation of the system , the flap of the KTM-ME fire damper is in any position within the range  $0^{\circ}$ - $90^{\circ}$ . In case of fire, the transition of the flap to fully closed position occurs.**

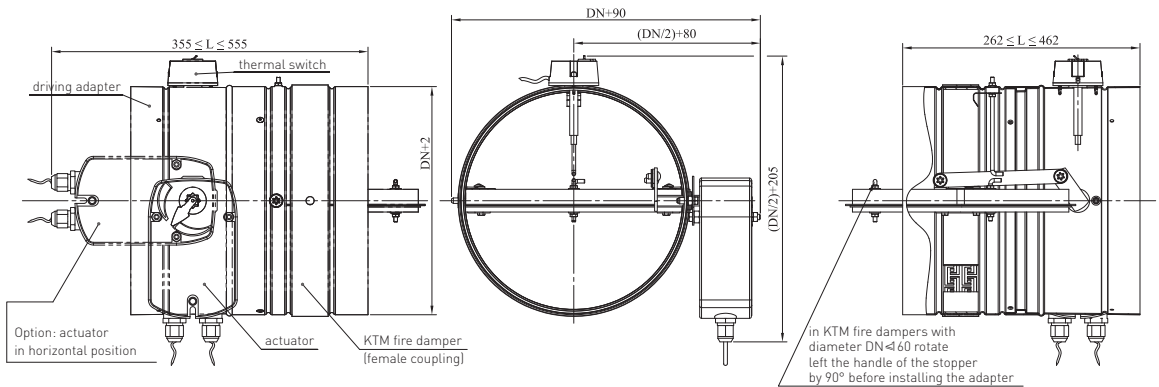


Figure 3. KTM-E (ME) fire damper (female coupling) with driving adapter and actuator.

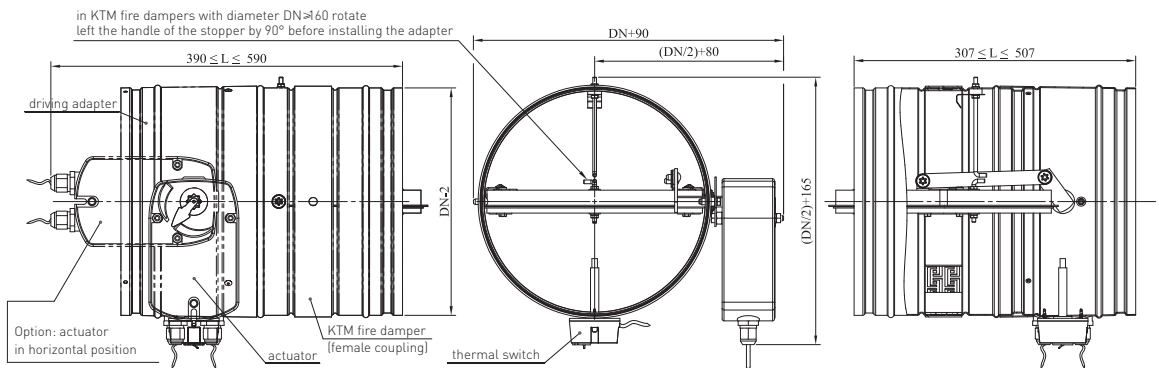


Figure 4. KTM-E (ME) fire damper (male coupling) with driving adapter and actuator.

### Rigid wall barriers

The fire dampers, to maintain declared EIS120 fire resistance class, should be installed in walls and with use of insulation systems, which are verified and classified as EI120.

It is allowed to use KTM fire dampers for lower fire resistance class walls, however it must be understood that the fire resistance class of the whole finished installation (including the KTM fire damper) is corresponding to the least classified element in the installation.

### Installation technology

#### Variant I (figure 5. i 6.)

1. Make an opening in the wall with the minimal size  $DN + 40$  [mm]
2. Put the fire damper into the installation opening, secure with hangers and keep the distance of not least than 55 mm of the flap axis from both wall surfaces (see fig. 5 and 6).
3. After setting the fire damper in accordance to the guidelines, fill the gap between the fire damper and the wall with cement mortar, cement and lime mortar or concrete.
4. After drying of the mortar (approx. 48h), remove used supports, test the fire damper operation and leave it in the fully open position (by installing the thermal fuse in the KTM type fire damper).

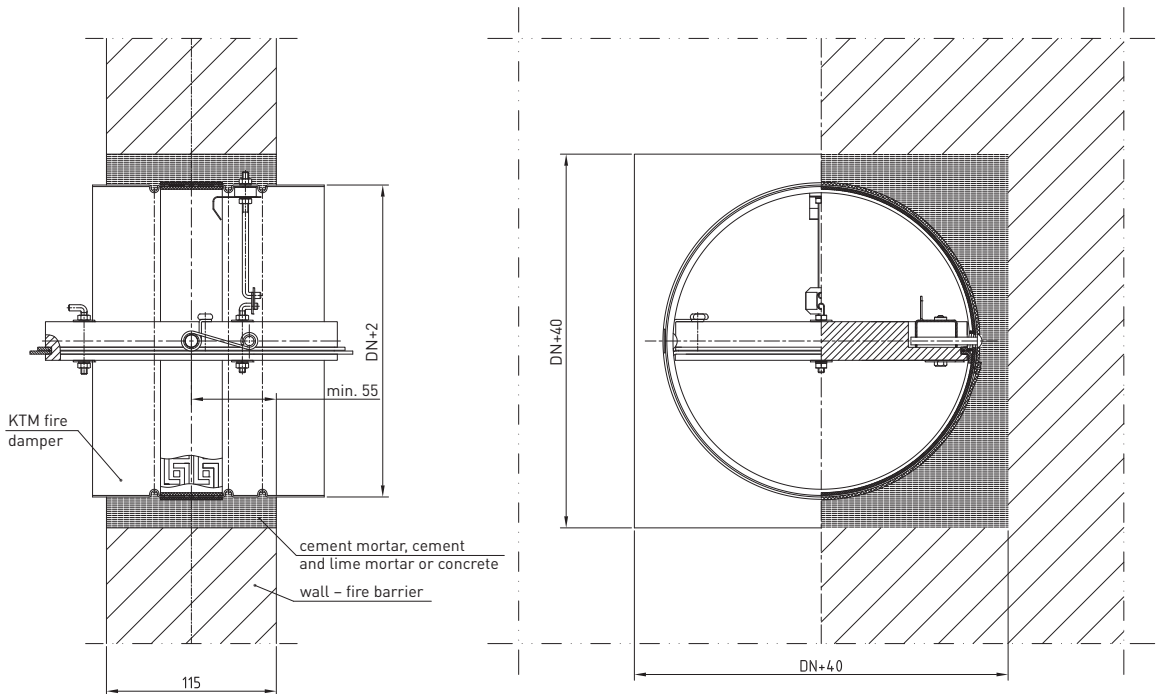


Figure 5. Installation of KTM fire damper (female coupling) in rigid wall barrier – variant I.

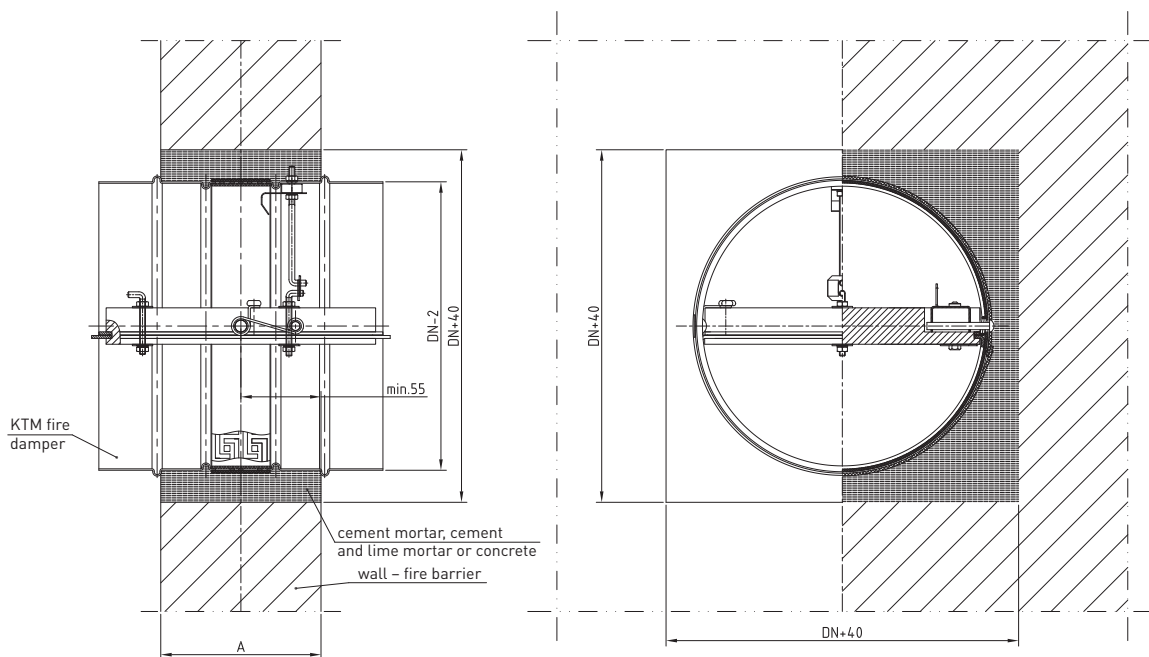


Figure 6. Installation of KTM fire damper (male coupling) in rigid wall barrier – variant I.

## Rigid ceiling barriers

### Installation technology

#### Variant I (Figure 7. i 8.)

1. Make an opening in the wall with the minimal size DN+40 [mm]
2. Put the fire damper into the installation opening, secure with hangers and keep the distance of not least than 55 mm of the flap axis from bottom or top surface of the ceiling (optimally in the ceiling axis) [see fig. 7 and 8].
3. After setting the fire damper in accordance to the guidelines, fill the gap between the fire damper and the ceiling with cement mortar, cement and lime mortar or concrete. If there is a need, before filling the gap, connect the male coupling version of fire damper with the spiro pipe (fig. 8).
4. After drying of the mortar (approx. 48h), remove used supports, test the fire damper operation and leave it in the fully open position (by installing the thermal fuse in the KTM type fire damper).

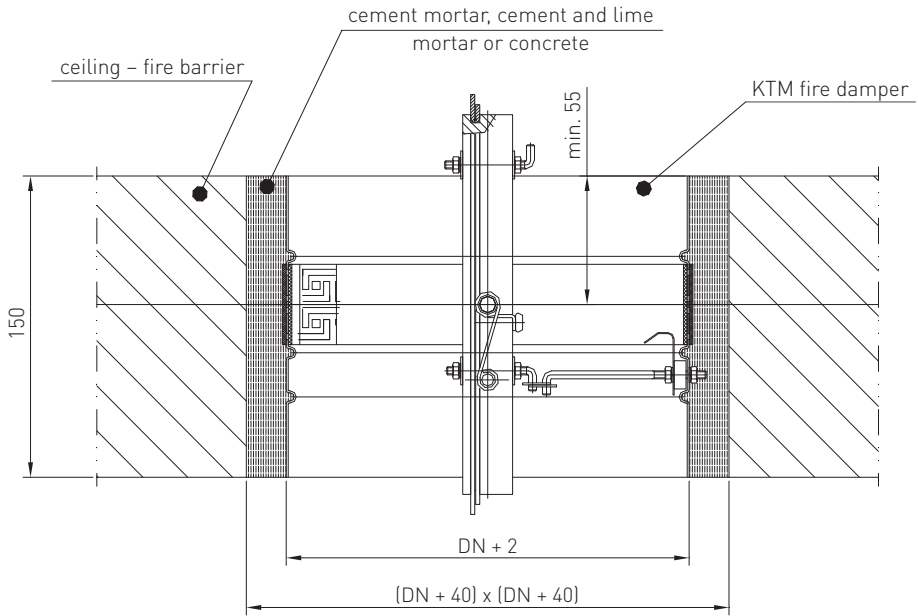


Figure 7. Installation of KTM fire damper (female coupling) in rigid ceiling partition.

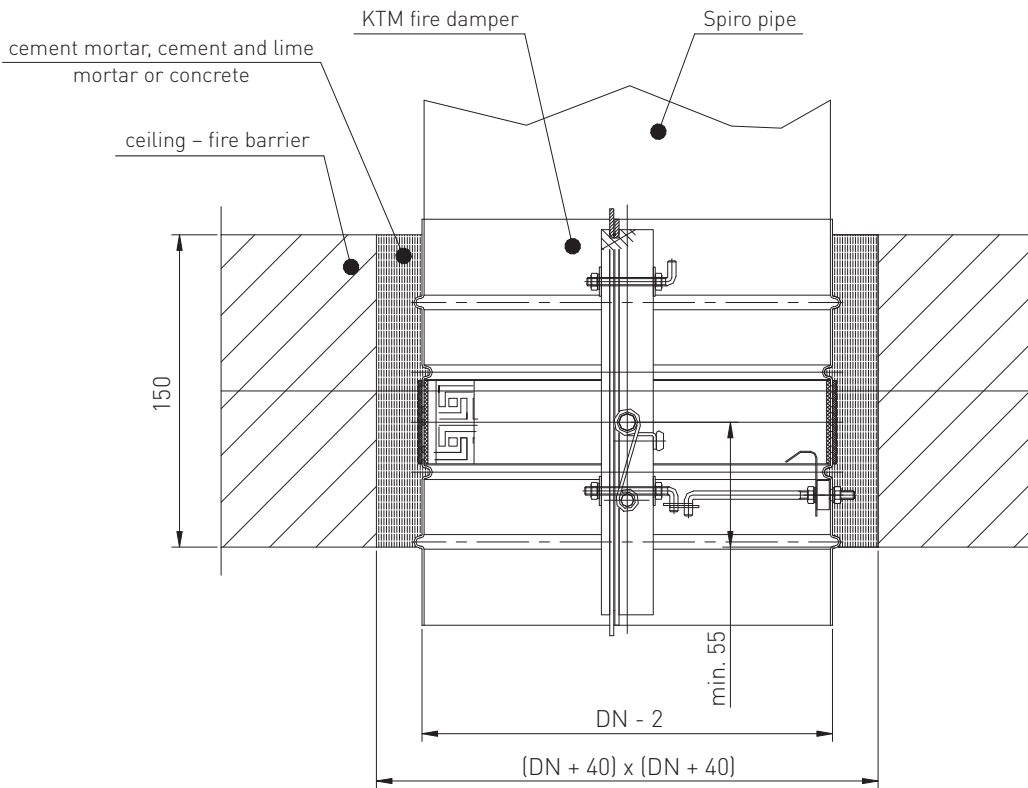


Figure 8. Installation of KTM fire damper (male coupling) in rigid ceiling partition

## Guidelines for installation of KTM fire dampers in fire barriers

### Installation technology (Figure 9.)

The installation of the KTM-E(ME) fire damper in the fire barriers should be done the same way as the installation of the KTM fire damper. It should include use of rigid support for the E(ME) type driving adapter with installed actuator, during the installation process and to the moment when the fire barrier construction will be stable.

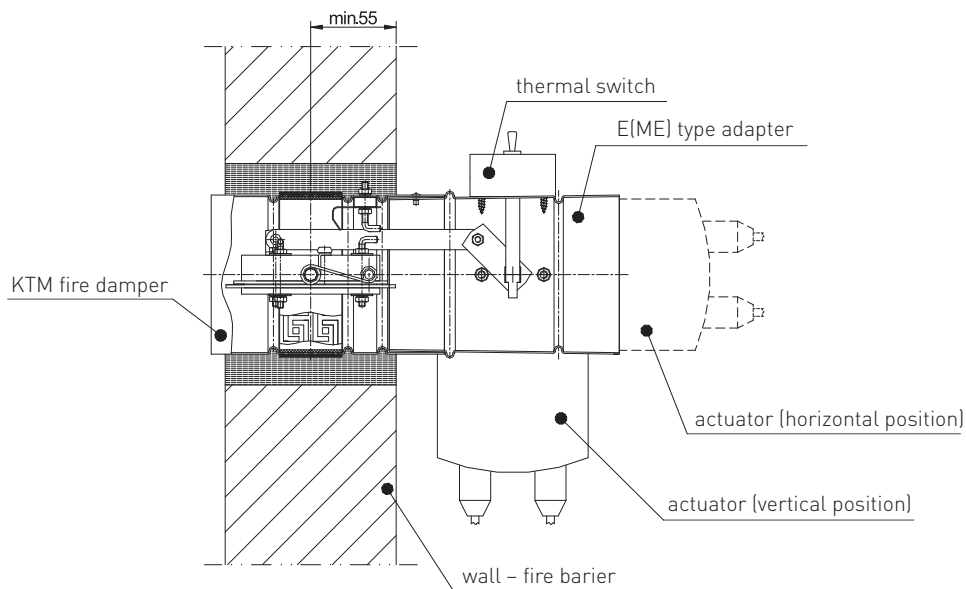


Figure 9. Installation of KTM-E(ME) fire dampers in fire barriers.

### Additional accessories

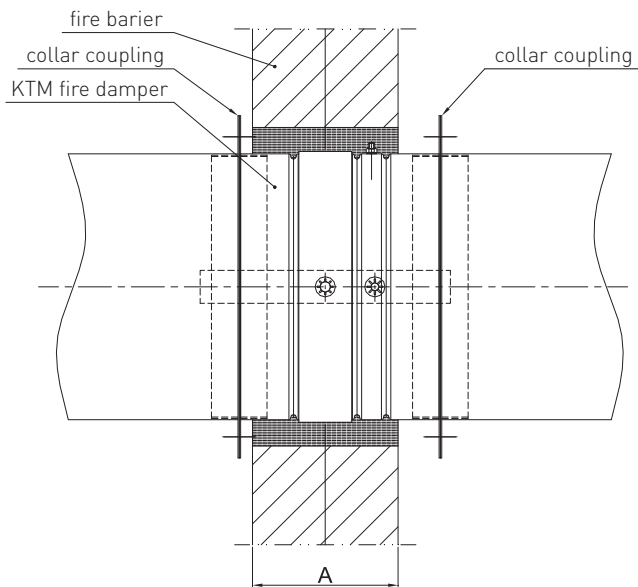


Figure 10. KTM type fire damper with collar coupling.



V [m/s]	DN	A <sub>eff</sub> [m <sup>2</sup> ]	W <sub>eff</sub> [m/s]	V [m <sup>3</sup> /h]	Δp [Pa]
	[mm]				
1	100	0,005	1	18	1
2	100	0,005	2	36	3
3	100	0,005	3	54	6
4	100	0,005	4	72	11
5	100	0,005	5	90	17
6	100	0,005	6	108	25
7	100	0,005	7	126	34
8	100	0,005	8	144	45
9	100	0,005	9	162	57
10	100	0,005	10	180	70

V [m/s]	DN	A <sub>eff</sub> [m <sup>2</sup> ]	W <sub>eff</sub> [m/s]	V [m <sup>3</sup> /h]	Δp [Pa]
	[mm]				
1	125	0,008	1	29	0
2	125	0,008	2	58	2
3	125	0,008	3	86	4
4	125	0,008	4	115	7
5	125	0,008	5	144	10
6	125	0,008	6	173	15
7	125	0,008	7	202	21
8	125	0,008	8	230	27
9	125	0,008	9	259	34
10	125	0,008	10	288	42

V [m/s]	DN	A <sub>eff</sub> [m <sup>2</sup> ]	W <sub>eff</sub> [m/s]	V [m <sup>3</sup> /h]	Δp [Pa]
	[mm]				
1	160	0,015	1	54	0
2	160	0,015	2	108	1
3	160	0,015	3	162	2
4	160	0,015	4	216	4
5	160	0,015	5	270	7
6	160	0,015	6	324	10
7	160	0,015	7	378	13
8	160	0,015	8	432	17
9	160	0,015	9	486	21
10	160	0,015	10	540	27

V [m/s]	DN	A <sub>eff</sub> [m <sup>2</sup> ]	W <sub>eff</sub> [m/s]	V [m <sup>3</sup> /h]	Δp [Pa]
	[mm]				
1	200	0,025	1	90	0
2	200	0,025	2	180	0
3	200	0,025	3	270	1
4	200	0,025	4	360	2
5	200	0,025	5	450	3
6	200	0,025	6	540	4
7	200	0,025	7	630	6
8	200	0,025	8	720	7
9	200	0,025	9	810	9
10	200	0,025	10	900	11

V [m/s]	DN	A <sub>eff</sub> [m <sup>2</sup> ]	W <sub>eff</sub> [m/s]	V [m <sup>3</sup> /h]	Δp [Pa]
	[mm]				
1	250	0,041	1	148	0
2	250	0,041	2	295	0
3	250	0,041	3	443	1
4	250	0,041	4	590	2
5	250	0,041	5	738	2
6	250	0,041	6	886	4
7	250	0,041	7	1033	5
8	250	0,041	8	1181	6
9	250	0,041	9	1328	8
10	250	0,041	10	1476	10

DN – size of the damper [mm];

A<sub>eff</sub> – actual surface of the damper [m<sup>2</sup>];

W<sub>eff</sub> – effective velocity measured in actual surface of the damper [m/s];

V – volume flow [m<sup>3</sup>/h];

Δp – pressure drop on the damper [Pa].

V [m/s]	D [mm]			
	100	125	160	200
	L <sub>WA</sub> [dB(A)]			
2	19	18	19	19
4	27	29	22	24
6	39	39	34	36
8	47	45	42	45
10	53	51	49	52

### KTM-125N-L195-W1 KTM-E-200M-L150-H-BLF24-T

KTM - X - DT - L L - W - O - S - P

**X** fire damper type  
- with return spring  
**E** with electric actuator with return spring  
**ME** with electric actuator with return spring, intended for frequent opening and closing, with possibility to use for the air flow regulation or pressure regulation during normal operation of the general ventilation system

**D** fire damper type

**T** variant of the fire damper

**M** female coupling

**N** male coupling

**L** length of the fire damper [mm]\*

150 for variant: female coupling with return spring – max L = 350

195 for variant: male coupling with return spring – max L = 395

262 for variant: female coupling with electric actuator with return spring – max L = 462

307 for variant: male coupling with electric actuator with return spring – max L = 507

**W** limit switch (refers only to KTM fire dampers)\*

- no limit switches

**W1** limit switch indicating closed position of the flap

**W2** limit switch indicating open position of the flap

**W12** both limit switches indicating open and closed position of the flap

**O** position of the actuator\*

**V** **vertical\***

**H** horizontal

**S** actuator type

BLF24-T

BLF24-T-ST

BLF230-T

BLF230-T-ST

BLF230-SR

BLF24-SR

**P** material\*

- **galvanized steel**

**SN** stainless steel

\*optional values– lack of them will cause the use of default value