

ROUND FIRE DAMPER



Characteristics:

A fire damper for general ventilation systems with an electric spring return actuator or a spring mechanism with a thermal fuse.



version: 25/03/24

Intended use

The KTM-O fire dampers are designed for application in general ventilation systems as cut-off partitions separating the fire-engulfed zone from the remaining part of the building (normally open). The purpose of these dampers is to prevent the spread of fire, heat and smoke.

The KTM-O fire dampers are certified by the Scientific and Research Centre for Fire Protection – the National Research Institute, **Certificate of Constancy of Performance No. 1438-CPR-0529**.

The dampers are designed, manufactured and tested in accordance with the following 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."

The effectiveness of the dampers is confirmed by tests according to **PN-EN 1366-2** "Fire resistance tests for service installations – Part 2: Fire dampers."

The KTM-O fire damper is classified as tightness class B (housing tightness) on the basis of tests carried out according to **PN-EN 1751** "Ventilation for buildings. Air terminal devices. Aerodynamic testing of dampers and valves."

Classification

The KTM-O fire dampers are classified in the following fire resistance classes and may be installed in the following building partitions:

EI 120 (v_e h_o i ↔ o) S

- floors with density of $2,200 \pm 200 \text{ kg/m}^3$ or higher, 150 mm in thickness or more, and a fire resistance class EI120 or higher
- rigid walls with low density ($650 \pm 200 \text{ kg/m}^3$) or higher, 115 mm in thickness or more, and EI120 or a higher fire resistance class (e.g. concrete walls, solid brick walls, cellular concrete block walls, hollow masonry unit walls or concrete slab walls)
- flexible walls, 125 mm in thickness or more and EI 120 or a higher fire resistance class (thicker, higher density, more board layers)

EI 90 (v_e i ↔ o) S

- flexible standard walls, 100 mm in thickness or more and EI90 or a higher fire resistance (thicker, greater density, more board layers)
- rigid walls, 100 mm in thickness or more, and EI90 or a higher fire resistance class (e.g. concrete walls, non-hollow brick walls, cellular concrete block walls, hollow masonry unit walls or concrete slab walls).
- away from rigid walls with low density ($650 \pm 200 \text{ kg/m}^3$) or more, 120 mm in thickness or more, and EI90 or a higher fire resistance class (e.g. concrete walls, solid brick walls, cellular concrete block walls, hollow masonry unit walls or concrete slab walls)

EI 60 (v_e i ↔ o) S

- rigid walls, 100 mm in thickness or more, and a density of 520 kg/m^3 or higher, as well as EI60 or a higher fire resistance class

EI 30 (v_e i ↔ o) S

- flexible standard walls, 75 mm in thickness or more and EI30 or a higher fire resistance (thicker, greater density, more board layers)

Where:

E - szczelność ogniowa,

I - izolacyjność ogniowa,

S - dymoszczelność,

v_e - kłapa montowana bezpośrednio na ścianie,

h_o - kłapa montowana bezpośrednio w stropie,

i ↔ o - kryteria skuteczności działania spełnione są od wewnątrz do zewnątrz (ogień wewnątrz) oraz od zewnątrz do wewnątrz (ogień zewnątrz),

120/90/60/30 - czas spełniania kryteriów E, I oraz S, wyrażony w minutach.

The KTM-O fire dampers may also be installed in buildings partitions with a lower fire resistance rating. In this case, the damper fire resistance rating is equal to the partition fire resistance rating, subject to the smoke leakage criterion.

The KTM-O fire dampers may be installed in vertical building partitions with either horizontal or vertical rotation axis, with any actuator position.

Description

The KTM-O-S dampers (with a spring mechanism) and the KTM-O-E dampers (with an electric spring return actuator) consist of a housing of a round cross-section, a moving, single-axis isolating baffle and an actuating mechanism with a release device.

The damper housing and its interacting elements are made of galvanised steel sheet. Both ends of the housing are adapted for sleeve or nipple connection, allowing easy connection between the duct and the damper.

There are intumescent seals on the outer and inner surfaces of the housing, in the place of perforation, around the closed isolating baffle. Their characteristic feature is that their volume increases at high temperatures, tightly filling all leaks between the baffle and the body.

The isolating baffle of the damper is made of calcium-silicate board, and a rubber seal is installed on its

perimeter, ensuring the damper integrity at ambient temperature.

The KTM-O-S damper is provided with actuating springs, which store energy when the baffle is being opened, which is then used to close the baffle. The open position of the baffle is ensured by a thermal fuse with nominal activation temperature 70 ± 5 °C, and which is placed in special bolted strikes. The baffle closes when the thermal fuse is activated after the actuating temperature is exceeded. Damage to the thermal fuse results in disconnection of bolted strikes, and rotation of the baffle into closed position, which is caused by the release of actuating springs. The movement of the baffle is limited by a buffer.

The KTM-O-E damper is provided with an electric spring return actuator BFL or BF series manufactured by BELIMO, and the BAT or BAE thermal triggers (72°C), constituting damper's drive system supplied by the 230 V AC or 24 V AC/DC voltage. After the voltage has been supplied, the actuator rotates the baffle to

the open position. The baffle closes due to voltage loss or when the thermal trigger is activated (the return spring in the actuator closes the baffle by returning to the non-stressed position).

During normal operation of the system, the KTM-O-S and KTM-O-E dampers are in the open position. If a fire breaks out, the damper baffle rotates to the closed position.

The permissible flow rate in a connection duct for the KTM-O-E dampers with an actuator is 12 m/s and 8 m/s for the KTM-O-S dampers with a spring mechanism.

Manufacturing versions

The range of dampers covers diameters from DN100 to DN250. The primary type series includes the following sizes: **DN100, DN125, DN160, DN200, DN250.**

The KTM-O dampers are designed for two connection types, i.e. sleeve and nipple.

Depending on the operating range and type of the actuation system used, the dampers are marked as follows:

- **KTM-O-S** – dampers with a spring mechanism
- **KTM-O-E** – dampers with an electric spring return actuator

The length of the **KTM-O-S** dampers may be 150 ÷ 350 mm for the sleeve version and 195 ÷ 395 mm for the nipple version. The length of the **KTM-O-E** dampers may be 262 ÷ 462 mm for the sleeve version and 307 ÷ 507 mm for the nipple version.

The primary length type series comprises the following sizes:

- **150 mm** – sleeve version with spring mechanism
- **195 mm** – nipple version with spring mechanism
- **262 mm** – sleeve version with electric actuator
- **307 mm** – nipple version with electric actuator

The dampers may also be fitted with limit switches indicating open or closed position of the baffle.

In a special version, resistant to aggressive environments, all components of the damper are made of stainless steel, whereas the damper baffle is impregnated with a fire-resistant board impregnation.

Dimensions

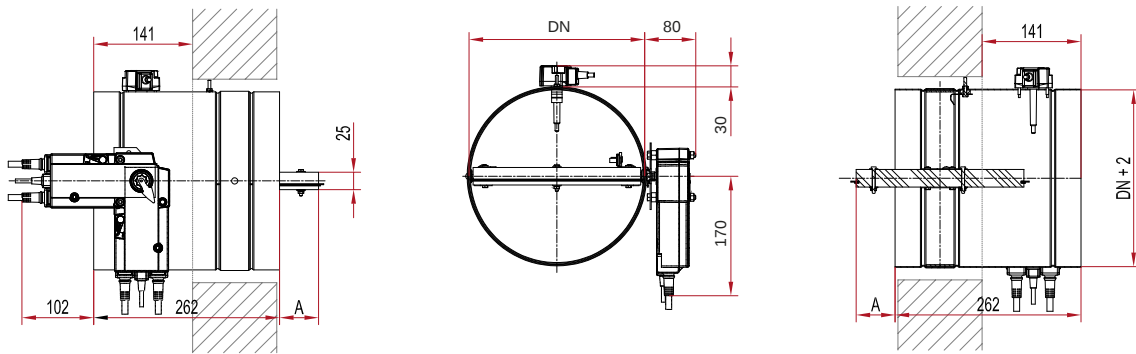


Figure 1. KTM-O-E-...-M damper (with a spring return actuator, sleeve connections).

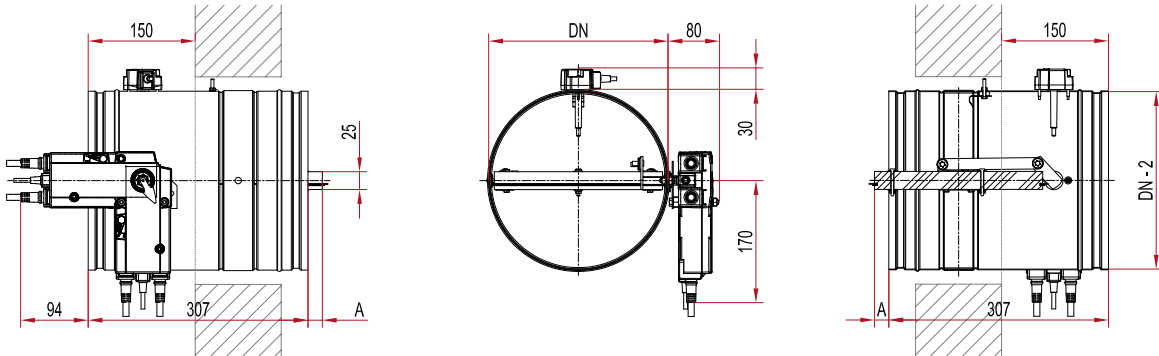


Figure 2. KTM-O-E-...-N damper (with a spring return actuator, nipple connections).

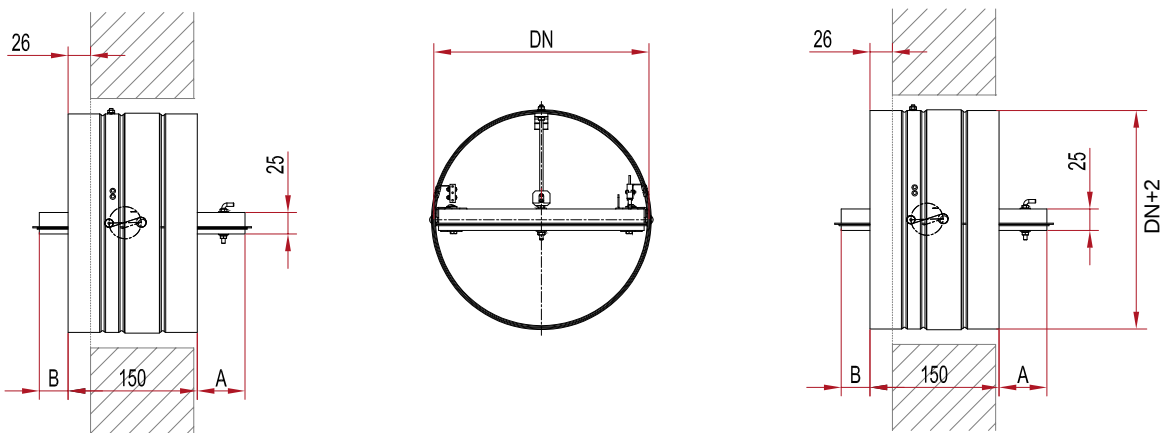


Figure 3. KTM-O-S-...-M damper (with a spring mechanism, sleeve connections)

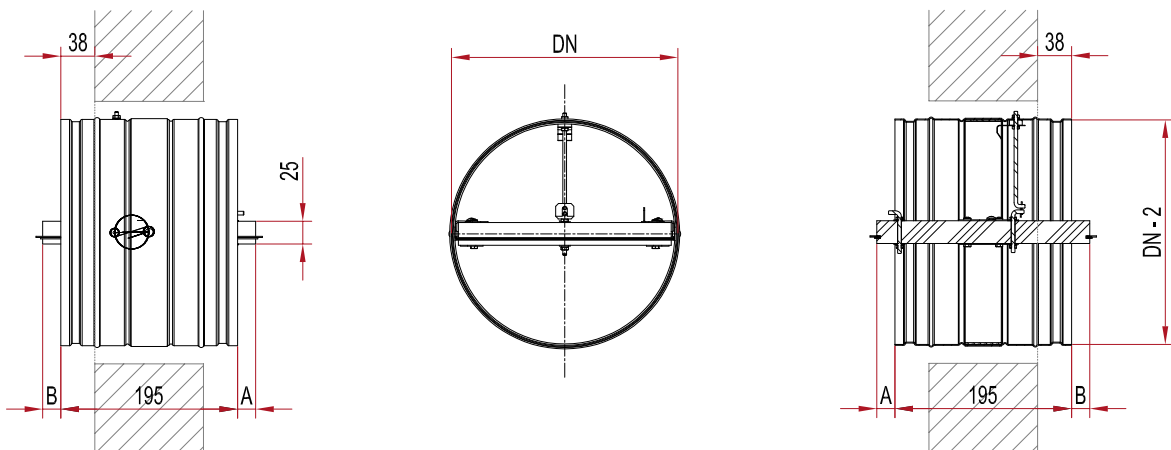
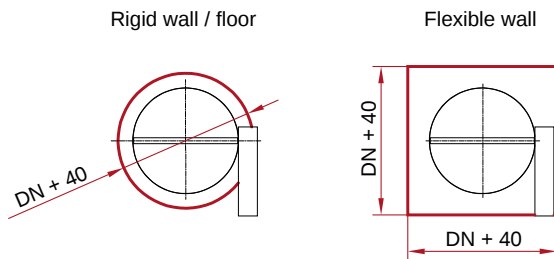


Figure 4. KTM-O-S-...-N damper (with a spring mechanism, nipple connections)

Table 1. Dimensions of the baffle protruding outside the damper body.

DN [mm]	KTM-O-E-...-M		KTM-O-E-...-N		KTM-O-S-...-M		KTM-O-S-...-N	
	L=262 mm		L=307 mm		L=150 mm		L=195 mm	
	A [mm]	B [mm]	A [mm]	B [mm]	A [mm]	B [mm]	A [mm]	B [mm]
100	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0
160	11	0	0	0	11	0	0	0
200	31	0	0	0	31	9	0	0
250	56	0	20	0	56	34	20	20

Installation



Permissible range: $DN + (40 \div 80)$ mm

Figure 5. Openings required for the KTM-O damper

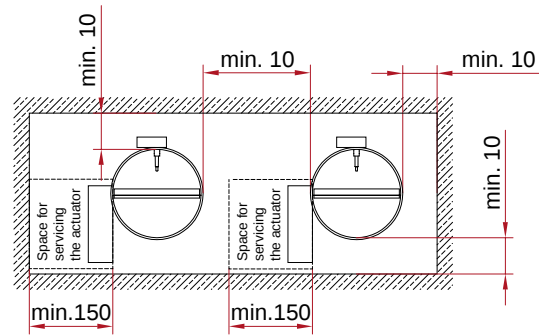


Figure 6. Spacing required between the dampers.



When mounting the damper with an actuator on the opposite side of the body, rotate the damper 180 degrees – cables will go up from the actuator.

Technical data

Table 2. The net surface area and the range of actuators used.

KTM-O		A [m ²]
DN diameter [mm]	100	0,005
	125	0,009
	160	0,016
	200	0,026
	250	0,043

0.123 - BFL actuator

Table 3. Pressure drop on KTM-O damper, Δp [Pa].

KTM-O	Air velocity in the connection duct, v [m/s]					
	2	4	6	8	10	
DN diameter [mm]	100	3	11	25	45	70
	125	2	7	15	27	42
	160	1	4	10	17	27
	200	0	2	4	7	11
	250	0	2	4	6	10

Table 4. Sound power level emitted by the KTM-O damper to the duct, L_{WA} [dB(A)].

KTM-O	Air velocity in the connection duct, v [m/s]					
	2	4	6	8	10	
DN diameter [mm]	100	19	29	39	47	53
	125	18	29	39	45	51
	160	19	28	34	42	49
	200	19	27	36	45	48
	250	18	27	36	43	47

Table 5. Weight of KTM-O damper, m [kg].

KTM-O	KTM-O-E-...-M	KTM-O-E-...-N	KTM-O-S-...-M	KTM-O-S-...-N	
DN diameter [mm]	100	3,1	3,2	0,8	0,9
	125	3,3	3,4	0,9	1,0
	160	3,7	3,9	1,1	1,3
	200	4,1	4,3	1,4	1,6
	250	4,6	4,9	1,7	2,0

KTM-O - Round fire damper

When ordering, please provide information according to the following pattern:

KTM-O- <F> - <D> - <T> - <L> - <W> - <O> - <S> - <UP> - <P> - <RAL> - <Q>

Where:

F	type of the actuation system used
	<p>S - spring mechanism</p> <p>E - electric spring return actuator</p>
D	nominal diameter, [mm]: 100, 125, 160, 200, 250
T	damper version*
	<p>M - sleeve</p> <p>N - nipple</p>
L	damper length [mm]*
	<p>150 - sleeve version with spring mechanism</p> <p>195 - nipple version with spring mechanism</p> <p>262 - sleeve version with electric spring return actuator</p> <p>307 - nipple version with electric spring return actuator</p>
W	limit switches (KTM dampers only; the dampers with actuators are always equipped with limit switches)*
	<p>none - no limit switches</p> <p>W1 - limit switch indicating damper closed position</p> <p>W2 - limit switch indicating damper open position</p> <p>W12 - two limit switches indicating closed and open damper positions</p>
O	actuator position*
	<p>V - perpendicularly to the damper body</p> <p>H - in parallel to the damper body</p>
S	type of actuator used (only for the KTM-E dampers)
	<p>BFL - for DN ≥ 100 mm</p> <p>BF - for communication control (TL)</p>
	<p>Product marking:</p> <p>24/230 – supply voltage</p> <p>TL – communication control</p> <p>T – thermoelectric tripping device</p> <p>ST – connection socket</p>
UP	seals on connections*
	<p>none - no seals</p> <p>UP - with seals (nipple version only)</p>
P	finishing*
	<p>none - galvanized steel</p> <p>SN - stainless steel</p> <p>SL - coated steel</p>
RAL	colour as per RAL code (for SL finishing)*
Q	inspection opening*
	<p>none - no inspection opening</p> <p>R - inspection opening</p>

* optional items – if not indicated, default values will be used

Sample product marking: **KTM-O-E-125M-BFL24-T**