

KTS-0

ROUND FIRE DAMPER



Product characteristics:

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

Intended use

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

EI 120 ($v_e h_o i \leftrightarrow o$) 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, 100 mm in thickness or more and EI 120 or a higher fire resistance class (thicker, higher density, more board layers)
- rigid walls, 100 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).

EI 90 ($v_e i \leftrightarrow o$) S

- away from rigid walls of low density ($650 \pm 200 \text{ kg/m}^3$) or higher, 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 ($v_e i \leftrightarrow o$) S

- flexible walls, 75 mm in thickness or more and EI60 or a higher fire resistance class (thicker, higher density, more board layers).
- rigid walls, 75 mm in thickness or more and EI60 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).
- 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 (e.g. concrete walls, solid brick walls, cellular concrete block walls, hollow masonry unit walls or concrete slab walls).

EI 30 ($v_e i \leftrightarrow o$) S

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

Where:

E – fire integrity

I – fire insulation

S – smoke leakage

v_e – damper installed directly in a wall

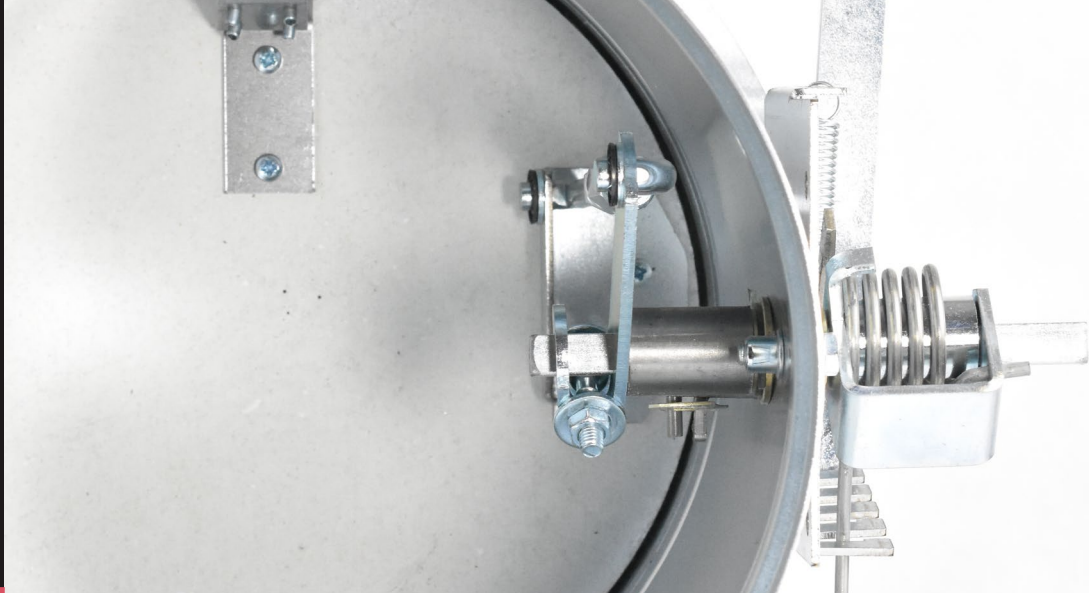
h_o – damper installed directly in a floor

$i \leftrightarrow o$ – operating effectiveness criteria are met from inside to outside (fire inside), and from outside to inside (fire outside).

120/90/60/30 – duration of fulfilment of E, I and S criteria, in minutes

FIRE VENTILATION ZONE

The damper meets the requirements of EN 15650



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

Description

The KTS-O-S dampers (with a spring mechanism) and the KTS-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 nipple connection, allowing easy connection between the duct and the damper. There is a flange on the external side of the housing that reinforces the damper structure.

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 KTS-O-S damper is provided with a spring mechanism comprising, e.a. an actuating spring, a manual release device and a fusible link with a nominal triggering temperature of $70 \pm 5^\circ\text{C}$. When the damper is being opened with a key, the actuating spring is being tensioned. The baffle is kept in the open position by the manual release device, blocked with a fusible link. The damper is automatically closed as a result of triggering the fusible link. The damage to the thermal trip automatically rotates the isolating baffle (to the closed position). The movement of the baffle is limited by two buffers.

The KTS-O-E damper is provided with an electric spring return actuator BFL, BFN or BF series manufactured by BELIMO, and the BAT or BAE thermal triggers (72°C , 95°C optionally), 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 is closed 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 KTS-O-S and KTS-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 KTS-O-E dampers with an actuator is 12 m/s and 8 m/s for the KTS-O-S dampers with a spring mechanism.

Manufacturing versions

The range of dampers covers diameters from DN160 to DN630. The primary type series includes the following sizes: **DN160, DN200, DN250, DN315, DN355, DN400, DN450, DN500, DN560, DN630.**

The KTS dampers are manufactured only for the nipple connection.

Depending on the actuation system used, the dampers are marked as follows:

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

The length of KTS dampers is $L=375$ mm.

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. The damper can also be manufactured as powder-coated.

The KTS dampers may be fitted with an inspection opening for checking the damper condition once it is installed in the ventilation system.

Dimensions

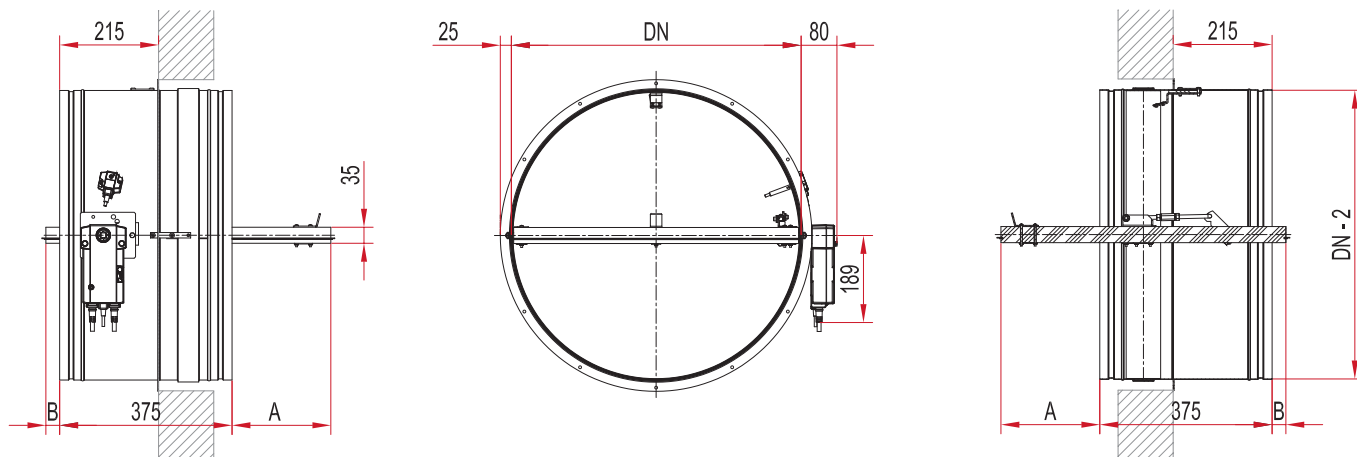


Figure 1. KTS-O-E damper (with a spring return actuator).

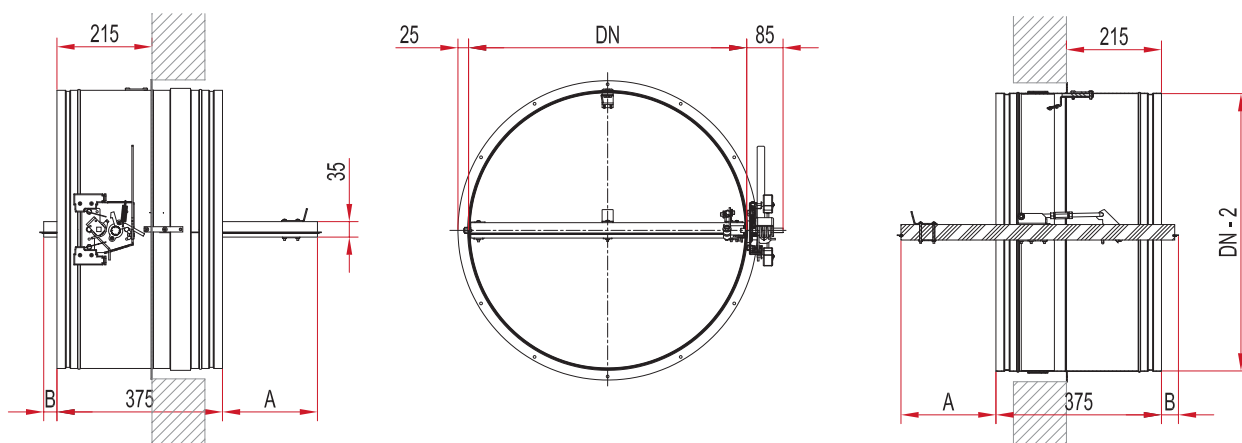


Figure 2. KTS-O-S damper (with a spring mechanism).

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

DN [mm]	KTS-O-E		KTS-O-S	
	L = 375 mm		L = 375 mm	
	A [mm]	B [mm]	A [mm]	B [mm]
160	0	0	-20	-205
200	0	0	0	-185
250	25	0	25	-160
315	58	0	58	-128
355	78	0	78	-108
400	100	0	100	-85
450	125	0	125	-60
500	150	0	150	-35
560	180	0	180	-5
630	215	30	215	30



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

Installation

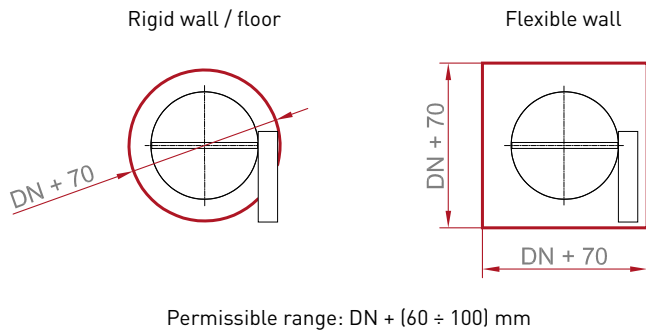


Figure 3. Openings required for the KTS-O damper.

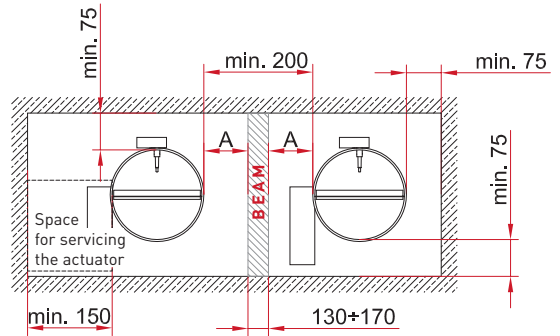


Figure 4. Spacing required between dampers.

Technical data

Table 2. The net surface area and the range of actuators used for the KTS-O dampers.

KTS-O	A [m ²]
160	0,015
200	0,024
250	0,040
315	0,067
355	0,087
400	0,112
450	0,143
500	0,179
560	0,227
630	0,290

Table 3. Sound power level emitted by the KTS-O damper to the duct, L_{WA} [dB(A)].

KTS-O	DN diameter [mm]	Air velocity in the connection duct, v [m/s]				
		2	4	6	8	10
KTS-O	160	10	19	24	28	31
	200	13	21	27	30	33
	250	15	24	29	33	36
	315	17	26	31	35	38
	355	18	27	32	36	39
	400	19	28	33	37	40
	450	22	31	36	40	42
	500	21	30	35	39	43
	560	22	31	36	40	44
	630	23	32	37	41	45

Table 4. Weight of KTS-O damper, m [kg]

KTS-O	KTS-O-E	KTS-O-S
160	4,7	3,5
200	7,3	6,1
250	8,9	7,7
315	10,8	9,6
355	12,1	10,9
400	13,5	12,3
450	15,0	13,8
500	16,5	15,3
560	18,4	17,2
630	20,5	19,3

- BFL actuator (DN≤400mm)
- BFN actuator (DN>400mm)

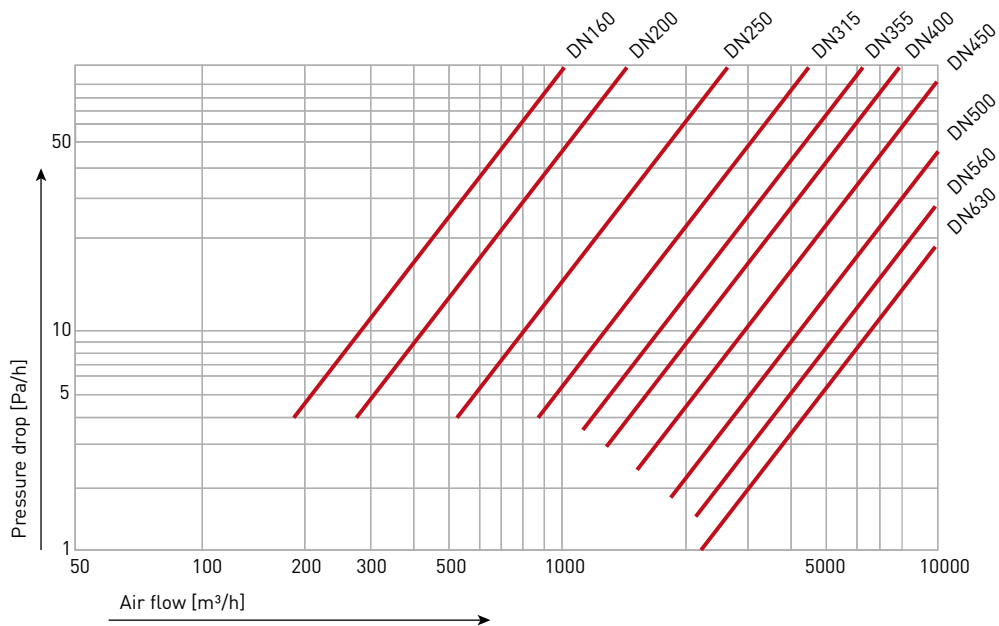


Chart 1. Flow resistance characteristics for KTS dampers.

KTS-0 - Round fire damper

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

KTS-0 - <F> - <D> - <W> - <S> - <UP> - <P> - <RAL> - <Q>

Where:

F	type of the actuation system used	
	S - spring mechanism	
	E - electric spring return actuator	
D	nominal diameter DN, [mm]: 160, 200, 250, 315, 355, 400, 450, 500, 560, 630	
W	limit switches (KTS-0-S dampers only; the dampers with actuators are always equipped with limit switches)*	
	none - no limit switches	
	W1 - limit switch indicating damper closed position	
	W2 - limit switch indicating damper open position	
	W12 - two limit switches indicating closed and open damper positions	
S	typ zastosowanego siłownika (dot. tylko klap KTS-0-E)	
	BFL - for DN ≤ 400 mm	Product marking: 24/230 – supply voltage SR – analogue control TL – communication control T – thermoelectric tripping device ST – connection socket
	BFN - for DN > 400 mm	
	BF - for communication control (TL)	
UP	seals on connections*	
	none - no seals	
	UP - seal installed	
P	finishing*	
	none - galvanized steel	
	SN - stainless steel	
	SL - coated steel	
RAL	colour as per RAL code (for SL finishing)*	
Q	inspection opening*	
	none - no inspection opening	
	R - inspection opening	

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

Sample product marking:

KTS-0-S-160-W12

KTS-0-E-630-BFN230-T-UP-SL-9010-R



In special damper versions with higher resistance (stainless or painted) the baffle is impregnated.