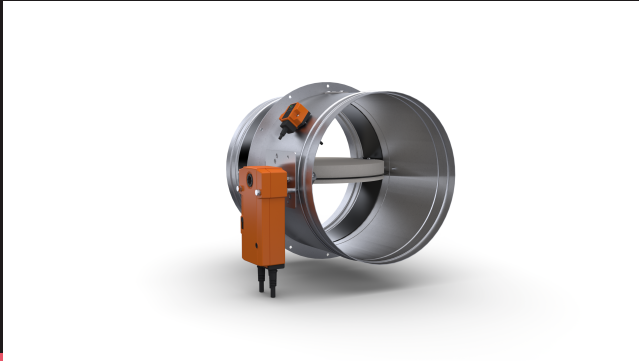


## ROUND FIRE DAMPER



### Characteristics:

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



version: 15/03/24

### 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 C** (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  $520 \text{ kg/m}^3$  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).

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.

Where:

**E** - fire integrity

**I** - fire insulation

**S** - smoke leakage

**v<sub>e</sub>** - damper installed directly in a wall

**h<sub>o</sub>** - damper installed directly in a floor

**i ↔ 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

## 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±5 °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), 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

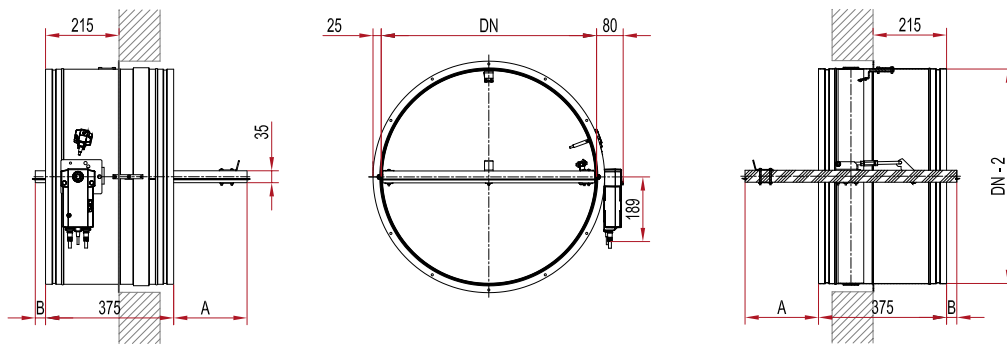


Figure 1. KTS-O-E damper (with a spring return actuator).

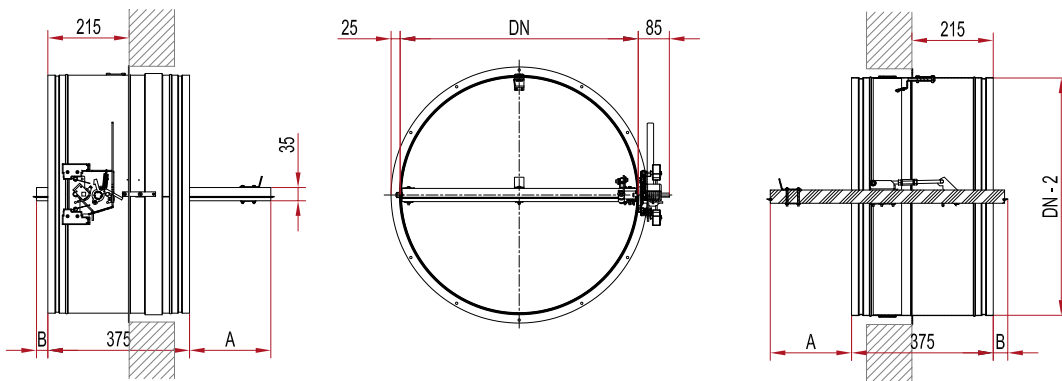


Figure 2. KTS-O-S damper (with a spring mechanism).

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

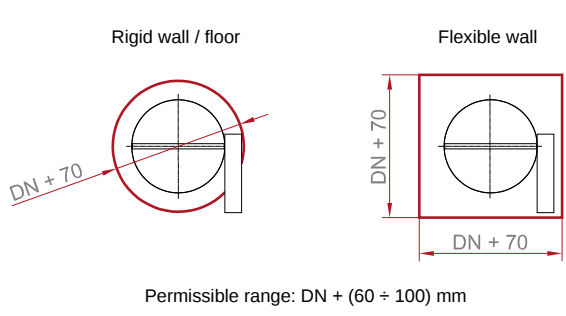


Figure 3. Spacing required between dampers.

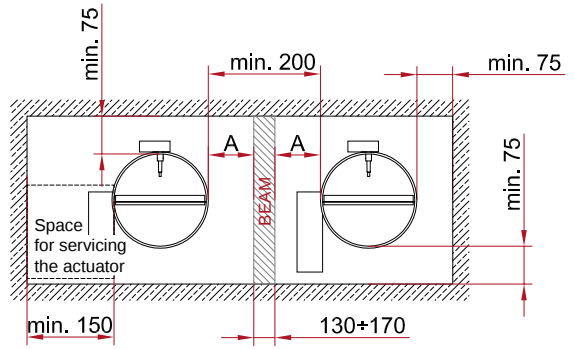


Figure 4. Openings required for the KTS-O damper.

# Technical data

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

| KTS-O | A [m <sup>2</sup> ] |
|-------|---------------------|
| 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               |

0,123 - BFL actuator (DN ≤ 400 mm)  
 0,123 - BFN actuator (DN > 400 mm)

Table 3. Sound power level emitted by the KTS-O damper to the duct, L<sub>WA</sub> [dB(A)].

| KTS-O | Air velocity in the connection duct, v [m/s] |    |    |    |    |
|-------|--|----|----|----|----|
|       | 2  | 4  | 6  | 8  | 10 |
| 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    |

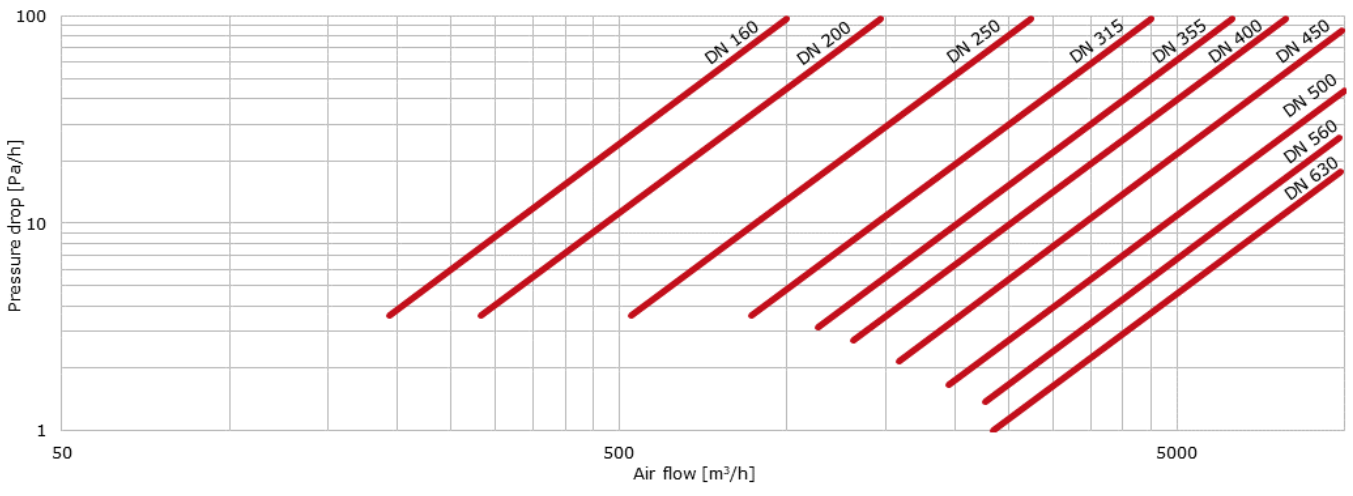


Chart 1. Chart 1. Flow resistance characteristics for KTS dampers..

# KTS-O - Round fire damper

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

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

Where:

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

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

Order example:           **KTS-O-S-160-W12**  
                                   **KTS-O-E-630-BFN230-T-UP-SL-9010-R**