

Technical documentation

FDA-BU

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2434-CPR-0198

ALNOR Systemy Wentylacji Sp. z o.o.
00-719 Warszawa, ul. Zwierzyniecka 8b
Zakład produkcyjny / place of production:
05-552 Wola Mrokwiska,
Aleja Krakowska 10, POLAND

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2434-CPR-0198

EN 15650:2010
Fire damper
Model / type: FDA-BU

Lp. No.	Zasadnicze charakterystyki wyrobu	Essential characteristics of the product	Poziomy i/lub klasy mandatowe Mandated levels and/or classes	
1	Nominalne warunki działania/ skuteczność	Nominal activation conditions/sensitivity	EI 120 (ve i↔o) S (300 Pa)	EI 90 (ve ho i↔o) S (300 Pa)
2	Nośność czujnika	Sensing element load bearing capacity	-	-
3	Temperatura zadziałania czujnika	Sensing element response temperature	≤72°	≤72°
	Opóźnienie zadziałania (czas zadziałania)	Response delay (response time)	-	-
4	Czas zamknięcia	Closure time	≤2 min	≤2 min
	Niezawodność działania	Operational reliability		
5	Cykle zadziałania	Cycling	0 cycles	0 cycles
	Odporność ogniowa	Fire resistance		
6	Szczelność ogniowa	Integrity	E120	E90
7	Izolacyjność ogniowa	Insulation	EI120	EI90
8	Dymoszczelność	Smoke leakage	EIS120	EIS90
9	Stabilność mechaniczna (w zakresie E)	Mechanical stability (under E)	E120	E90
10	Zachowanie przekroju poprzącznego (w zakresie E)	Maintenance of the cross section (under E)	E120	E90
	Trwałość w czasie odpowiedzi	Durability of response delay		
11	Reakcja czujnika na temperaturę oraz nośność	Sensing element response to temperature and load bearing capacity	≤72°	≤72°
	Trwałość niezawodności działania	Durability of operational reliability		
12	Badania cyklu otwarcia i zamknięcia	Open and closing cycle tests	0 cycles	0 cycles

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Subject of the documentation

The subject of this documentation are round butterfly shut-off fire dampers FDA-BU series, used in general ventilation systems as protection against penetration of smoke and fire between separated adjacent fire zones.

General characteristics

The shut-off fire dampers FDA-BU can be used for passage of ventilation systems through vertical and horizontal building partitions, providing fire tightness class E, fire insulation class I, smoke tightness class S of: 120 minutes – class EI 120 (ve i↔o) S class and, for horizontal partitions 90 minutes EI 90 class (ve ho i↔o) S class depending on the partition resistance class.

The fire dampers are manufactured in the following nominal sizes: DN100, DN125, DN160, DN200. The fire dampers are equipped with a thermal release mechanism. They are manufactured at ALNOR SYSTEMY WENTYLACJI Sp. z o.o. manufacturing plant in Wola Mrokowska, Aleja Krakowska 10, Poland.

The fire dampers are classified according to procedures included in PN-EN 13501-3+A1:2010P standard (fire classification of construction products and building elements). The fire resistance was tested according to PN-EN 1366-2:2015 standard (fire resistance tests for service systems — Part 2: Fire dampers). The entire manufacturing process meets the requirements of EN 15650:2010 standard.

Design of the fire dampers

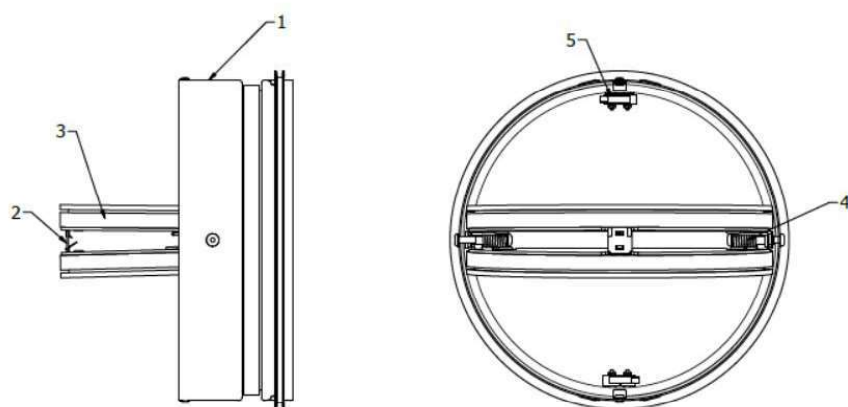
The FDA-BU dampers with round cross section.

The round body is made of DX51D + Z275 galvanised steel plate, 0,9 [mm] thick in all diameters. The body is a butt welded structure. The body length in all diameters is 70 mm (dimension tolerance ± 2 [mm]). Movable partitions are made of a fire-resistant material, covered on both sides with a 1,8 [mm] swelling gasket. In order to improve the adhesion of the blade in the closed position, a polyurethane foam gasket is bonded on one side. Profiled holders of the fusible release are riveted to the damper blades and made of sheet metal thickness 0,4 [mm]. A fusible release is snap-mounted onto the handles. Stable positioning of the damper in a ventilation duct is ensured by the EPDM rubber gasket fitted around the perimeter of the damper. The blades are mounted inside the housing on hinges made of 1,5 [mm] thick steel. The closing mechanism consists of 2 torsion springs for the DN160 and DN200 dampers or 1 for the DN100 and DN125 ones.

The damper is closed automatically as a result of temperature increase to of about 72°C by breaking the fusible release. The released partition closes immediately – special care must be taken during maintenance.



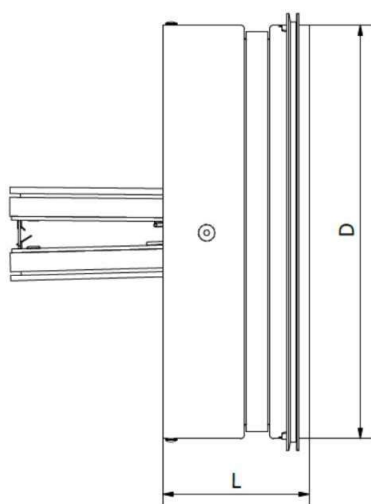
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1 - housing; 2 - fusible release; 3 - cut-off blade;
4 - torsion spring; 5 - limit switch

Fig. 1 FDA-BU, fire damper with thermal fuse mechanism.

Dimensional list of the FDA-BU fire dampers

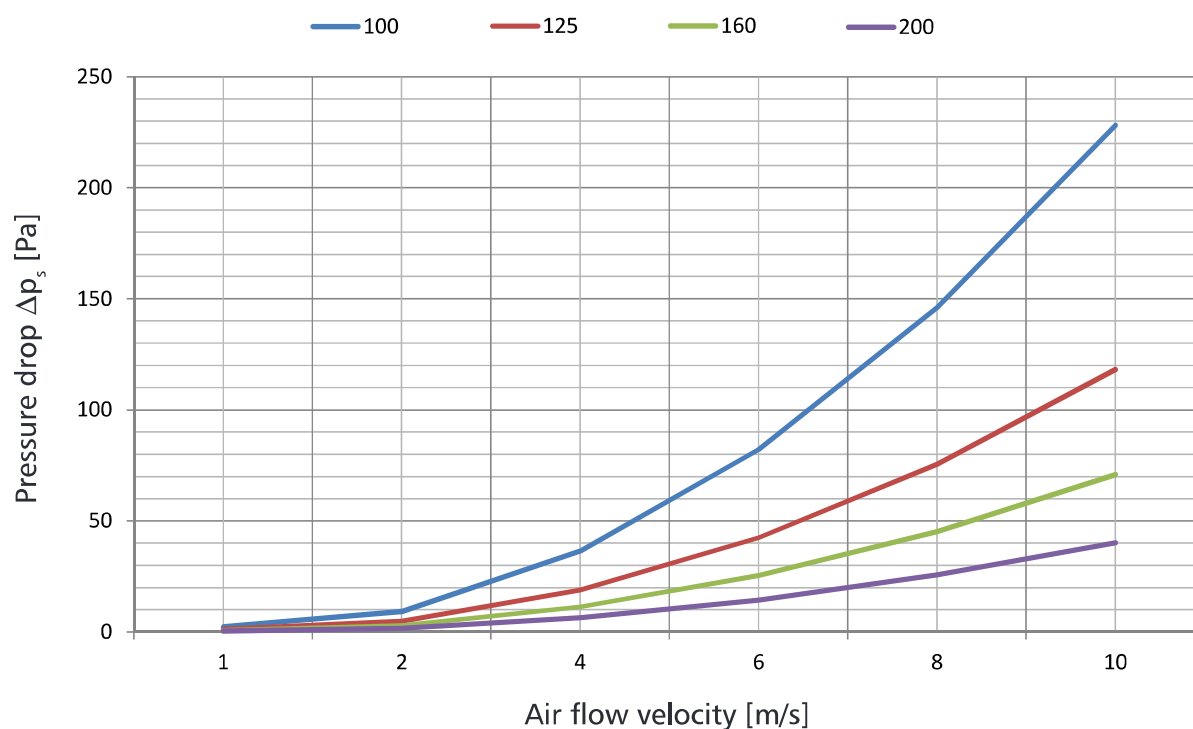


Fire damper model	DN [mm]	D [mm]	L [mm]	Weight [kg]	Effect area A_{eff} [m ²]
FDA-BU-100	100	97,5	70	0,33	0,0027
FDA-BU-125	125	122,5	70	0,44	0,0056
FDA-BU-160	160	157,5	70	0,64	0,0113
FDA-BU-200	200	197,5	70	0,90	0,0202

Table 1. FDA-BU damper dimensions

Fig. 2 FDA-BU damper dimensions

Pressure drops for air density $\rho=1.21 \text{ kg/m}^3$



Local loss factor ζ

Diameter ØD	Local loss factor ζ
Ø100	3.773
Ø125	1.954
Ø160	1.171
Ø200	0.664

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Limit switch for use with the shut-off

FDA-BU fire dampers

The FDA-BU fire dampers can be fitted with one or two limit switches to indicate the closed position of one or two damper blades.

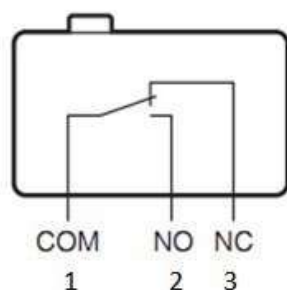
The following damper designations apply:

FDA-BU-aaa-bbb-ccc

- aaa – nominal size: 100, 125, 160, 200;
- bbb – fire resistance: EIS120, EIS90, EIS60
- ccc – optional accessories:
 - no limit switches (standard);
 - Z1 – one limit switch (closed position);
 - Z2 – two limit switches (closed position);

Limit switch	
Length and cross section of the control cable	1m/3x0.5 mm ²
Ingress protection	IP40
Contact configuration	SPDT
AC contact making capacity	5A/250 VAC

Electrical connection diagram



1, 2, 3 - designation of conductors in the signalling cable

Fig. 3 Wiring connection diagram

Intended use and scope of application

The round fire dampers are designed for installation in general ventilation systems. When integrated into fire partitions, they provide equivalent protective performance and features as the partitions. The fire damper blade remains open under normal operating conditions – it is closed automatically in the event of a fire.

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The fire dampers can be installed in the following partitions, according to table 2.

Type of partition	Minimum partition thickness (mm)
Concrete floor	150
Concrete wall	130
Solid brick wall	130
Cellular concrete block wall	130
Plasterboard wall on steel framing	130

Table 2. Permitted types of building partitions.

Installation methods of the dampers in partitions are shown in figures 9 - 16.

Possible damper installation options.

It is allowed to install the dampers in a partition in any position of the axis of rotation from 0° to 360°, and in any direction of airflow through the dampers. The damper has fire resistance on both sides (i→o) as shown in the figures below.



Fig. 4 FDA-BU, fire damper. - blade positions allowed.

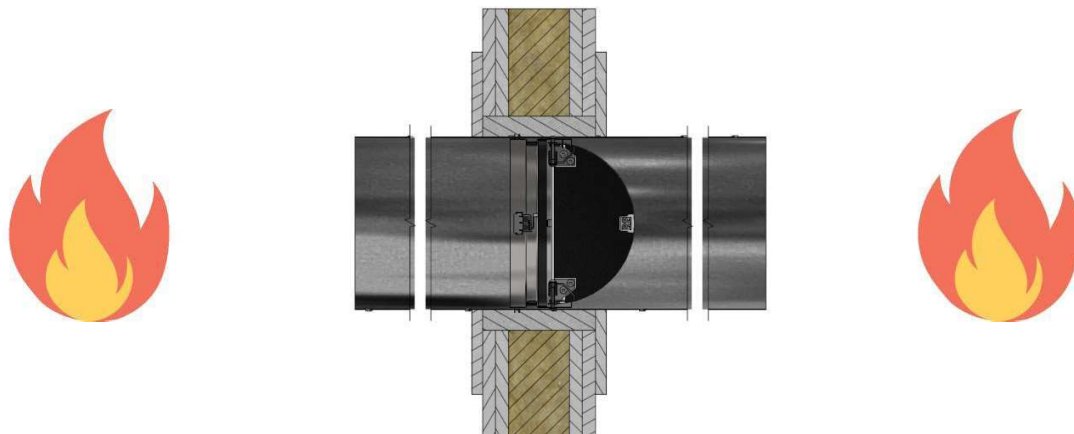


Fig. 5 FDA-BU, fire damper. - sides of the permitted fire action.

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Each time before installing the damper, inspect it visually and set the damper blades in the open position.

The dampers should be used in ventilation systems, where the maximum velocity of air flowing through the damper does not exceed 12 m/s. The air flowing should be free of particles, abrasives, chemicals and adhesive particles.

Opening and closing the blades in the FDA-BU damper:

The blades can only be opened manually. To open the damper, do the following:

- step 1 - press the blade opening stops
- step 2 - manually push the blade wings from the opposite side
- step 3 - after opening, lock the damper in the open position by hooking the fuse element with a handle on the other blade.

Step 1.



Fig. 6 FDA-BU, fire damper. - location of the damper opening stops.

Step 2.



Fig. 7 FDA-BU, fire damper. - direction of force application to open the blade.

Step 3.

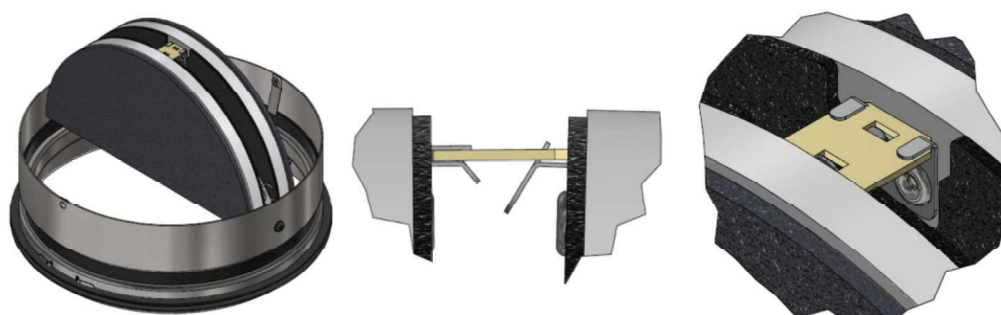


Fig. 8 FDA-BU, fire damper. - thermal release interlock mechanism.



Use extreme caution when manually opening and closing the damper. Unlocked fusible release or improperly hooked locking device results in immediate damper closure. There is a risk of trapping fingers.

The FDA-BU shut-off dampers should be installed with the following minimum distances:

- 200 mm between the dampers installed in parallel ventilation systems;
- 75 mm between the shut-off damper and the building partition (wall or ceiling).

Installation in a concrete, cellular concrete block or solid brick wall

Installation of dampers in a concrete, cellular concrete block or solid brick wall should be done according to figures 9, 10 and 11. The minimum thickness of the partition is 130 mm. The following guidelines should be noted each time:

- the dampers should be installed in a 0.5 mm thick duct set in the previously prepared openings with dimensions larger by 50 mm than the nominal dimension of the installed fire dampers;
- the sealing of the duct, the building partition (wall) must be made of fire resistant materials (e.g. concrete, mortar) and the joint must be tight, without any gaps, etc. When installing the duct, make sure that it is not deformed so that it retains its nominal size at each point;
- plan the damper installation in such a way, that the fire-protection blade of the damper, inserted into the duct after closing, be located as close to the wall symmetry axis as possible;
- the direction of installation of the fire damper is not important;
- the position of the fire damper blade axis of rotation is optional in the range of 0°-360°;
- special care should be taken not to deform the fire dampers duct and to ensure correct operation, both, before and after installation of the dampers;
- after the duct has been installed, apply 12.5 mm thick plasterboard on both sides of the partition wall; the cover should be fixed to the foundation using the appropriate fasteners/screws/anchors for concrete.

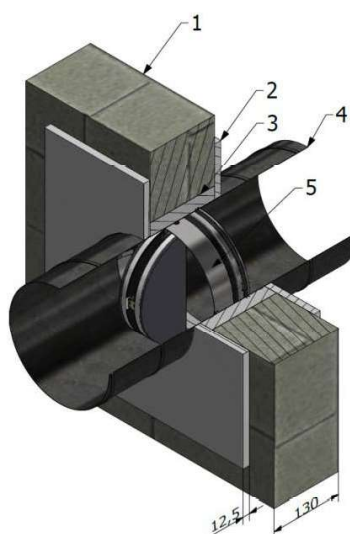


Fig. 9 FDA-BU, fire damper. - dimensions of the sealing of the duct-partition system.

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Fig. 10 FDA-BU, fire damper. - dimensions of plasterboard 12.5 mm.



- 1 - concrete, cellular concrete block or solid brick wall;
- 2 - 12,5 mm plasterboard cover; 3 - concrete, mortar or fireproof gypsum
- 4 - steel ventilation duct with a wall thickness of 0.5 mm; 5 - FDA-BU damper.

Fig. 11 FDA-BU, fire damper. - FDA-BU damper installation in a wall.

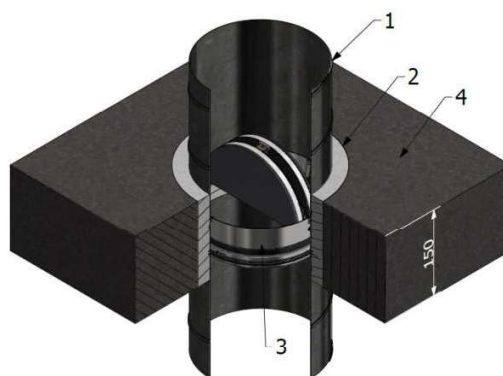
Installation in a structural floor

Installation of dampers in a structural floor should be done according to figures no. 12, 13. The minimum thickness of the horizontal floor partition is 150 mm. The following guidelines should be noted each time:

- the dampers should be installed in the embedded ventilation ducts, previously set in the ceiling opening with a dimension 50 mm greater than the nominal diameter of the duct;
- the sealing of the duct-floor joint must be made with fire resistant materials (e.g. concrete, mortar) and it must be tight, without any gaps, etc. When installing the duct, care must be taken not to deform it so that it retains its nominal size at each point;
- plan the damper installation in the duct in such a way that the fire-protection blade of the damper in its closed position be located as close to the floor symmetry axis as possible;
- the direction of installation of the fire damper is not important;
- special care should be taken not to deform the fire dampers duct and to ensure correct operation, both, before and after installation of the dampers;



Fig. 12 FDA-BU, fire damper. - dimensions of the sealing of the duct-partition system.



- 1 - Steel ventilation duct; 2 - Concrete, mortar or fireproof gypsum;
3 - FDA-BU fire damper; 4 - Concrete floor with a density of $2200 \pm 200 \text{ kg/m}^3$ or above.

Fig. 13. Installation of the FDA-BU damper in the floor.

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Installation in a plasterboard wall

Installation of dampers in the plasterboard wall should be done according to the figures no. 14, 15, 16. The minimum thickness of the partition is 130 mm. The following guidelines should be noted each time:

- the dampers should be installed in a 0.5 mm thick duct set in the previously prepared openings with dimensions larger by 50 mm than the nominal dimension of the installed fire dampers;
- the sealing of the duct, the building partition (wall) must be made of fire resistant materials (e.g. concrete, mortar) and the joint must be tight, without any gaps, etc. When installing the duct, make sure that it is not deformed so that it retains its nominal size at each point;
- plan the damper installation in such a way, that the fire-protection blade of the damper, inserted into the duct after closing, be located as close to the wall symmetry axis as possible;
- the direction of installation of the fire damper is not important;
- the position of the fire damper blade axis of rotation is optional in the range of 0°-360°;
- special care should be taken not to deform the fire dampers duct and to ensure correct operation, both, before and after installation of the dampers;
- after the duct has been installed, apply 12.5 mm thick plasterboard on both sides of the partition wall; the cover should be fixed to the foundation using the appropriate fasteners/screws/anchors for concrete.



Fig. 14 FDA-BU, fire damper. - dimensions of the sealing of the duct-partition system.

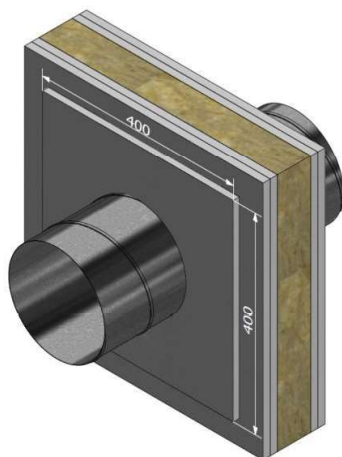
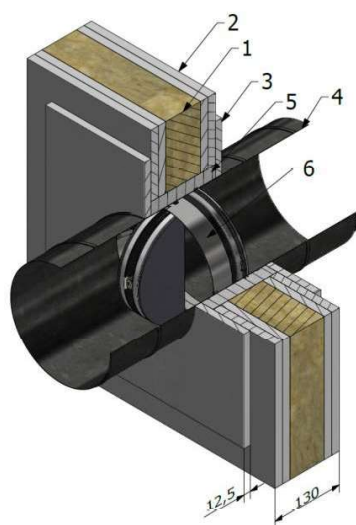


Fig. 15 FDA-BU, fire damper. - dimensions of 12,5mm plasterboard cover.



- 1 - Mineral wool, density $>100\text{kg/m}^3$; 2 - fire-resistant plasterboard, thickness 15 mm (2x2 pcs.);
3 - fire-resistant plasterboard cover, thickness 12.5 mm (2 pcs)
4 - steel ventilation duct, wall thickness 0.5 mm; 5 - concrete, mortar or fireproof gypsum

Fig. 16. Installation of the FDA-BU damper in a plasterboard wall.

Storage and transport conditions

Each FDA-BU damper, following the marking and testing, depending on the size of the production batch and the planned method of transport, is initially secured with stretch film and then, depending on the size, placed in packaging (carton, pallet, etc.).

Due to the function of the fire damper, it must be protected entirely against the effects of weather and mechanical damage (during transport and installation). The place of storage shall be an enclosed room with normal and dry climate. The dampers should be protected against bumps and dropping.

Periodic inspection and condition checks of the fire dampers

Fire dampers, as safety devices and components of the ventilation system, require periodic inspection and check after installation and commissioning of the entire system. The testing activities should be done at least every six months. The following are the inspection points that the qualified staff should verify and record the inspection results.

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actions to be done	date/result/signature	date/result/signature	date/result/signature	date/result/signature
checking the control wiring of limit switches (if provided)				
checking the interior of the damper for cleanliness and cleaning if necessary				
checking the condition of the partition and seals, possible maintenance				
confirm manual blade closing				
confirm manual blade opening				
confirm operation of limit switches for the blade in closed position				
confirm the position of the blades in the operating position				

During the installation of fire dampers, it is recommended to use revision systems upstream and downstream the dampers for periodic inspection.

Product designation

Kłapa przeciwozarowa odcinająca / Shut-off fire damper

Numer seryjny / Serial number:

Klasyfikacja / Classification:

Wyrób sklasyfikowany jako dymoszczelny / The product is classified as smoke-tight

Jednostka notyfikująca / Notified body:

2434

Norma / Norm:

EN-15650:2010

Nr DWU / DoP. No.:

027/04/2021

Data prod. / Mfg date:

Kłapę należy zainstalować zgodnie z instrukcjami producenta /

The fire damper should be installed in accordance with the manufacturer's instructions

Kłapa p.poż FDA-BU jest przeznaczona do stosowania w instalacjach wentylacji ogólnej w miejscach przejść instalacji wentylacyjnych przez przegrody budowlane o określonej odporności ogniowej /

Fire damper FDA-BU is designed for use in general ventilation in places where ventilation installation is going through construction partitions which have specific fire resistance.



Alnor Systemy Wentylacji Sp. z o.o.
ul. Zwierzyniecka 8b
00-719 Warszawa, POLSKA



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For ease of servicing, an additional label should be placed on the blade or duct near the installed damper.

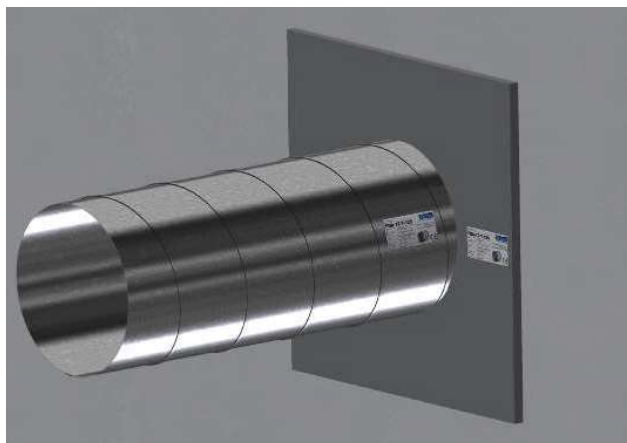


Fig. 17 FDA-BU, fire damper. - suggested labelling layout.

Terms of warranty

The product is covered by a 24 month seller's warranty from the date of sale. The Seller guarantees that defects occurring during the warranty period, which prevent the product from operating, will be removed within 21 working days from the date the defect was reported. The warranty shall be extended for the period from the reporting the defect to the date of completion of the repair.

The essential conditions for product transport and storage, required to meet the terms of warranty, are included in this documentation. The manufacturer shall be relieved from any warranty liability and any obligations as a result of: improper transport or unloading of the goods, improper installation, improper use of the purchased elements, defects resulting from improper storage of the product, changes to the design made by the user, defects resulting from improper maintenance.

In case of a complaint, the manufacturer shall deduct the equivalent amount of the components missing or damaged by the buyer or user and the cost of replacement.