



**NORD**fire

## FDMS / FDMS-VAV Fire Damper

Round dampers Ø 100-630 mm

CE certified acc. to EN 15650

Tested in accordance with EN 1366-2

Classified acc. to EN 13501-3+A1

Fire resistance EIS 45, EIS 60, EIS 90

External casing leakage class min. C, internal leakage class 2 acc. EN 1751

Corrosion resistant acc. to EN 15650

Max. air speed 12 m/s, max. pressure difference 2500 Pa

## Contents

1. Description	3
2. Damper Design FDMS	4
3. Damper Design FDMS-VAV	9
4. Dimensions and Weights of FDMS	13
5. Dimensions and Weights of FDMS-VAV	14
6. Material, Finishing	15
7. Technical Data of FDMS and FDMS-VAV	16
8. Product Marking	24
9. Placement and Assembly	26
10. Installation Opening	26
11. Statement of Installation	27
12. Descriptions of Particular Installations	28
13. Inspection, Testing	40
14. Transport and Storage	40
15. Assembly, Attendance, Maintenance and Revisions	40
16. Entry Into Service and Revisions	40

## General Information

### 1. Description

Fire dampers are shutters in ventilation duct systems that preventing spreading the fire and combustion gases from one fire compartment to the other one by shutting or closing the air duct in the positions of fire separating constructions. In the case of FDMS the fire dampers blade closes automatically air duct using a shutting spring or an return spring of its actuating mechanism in case of fire. In the case of FDMS-VAV the fire damper has an additional function of the variable air flow controller. The return spring of the actuator is started when the thermal fuse is activated or the actuator is without power supply. In the case of thermal electrical fuse the activation (closing) procedure starts, when a reset button on fuse is pushed or when a power supply of the actuating mechanism is stopped. In case FDMS of mechanical control with thermal fuse, the return spring is activated after the moment, when thermal fuse is melted. The damper's blade is sealed with a silicon gasket/packing preventing smoke penetration after closing the blade. At the same time, the damper's blade will be tighten by intumescent tape, which will be expanding in the case of fire. Dampers have no inspection door. For inspection of the damper, there is an inspection hole for camera. For others service works there must be installed inspection door externally on the duct, next to the fire damper. The damper is equipped with additional collar, around the position of the blade. On the collar, there are positioned several metallic plates (fixtures for easy installation on the wall or ceiling construction).

FDMS with mechanical control



FDMS with actuating mechanism



FDMS-VAV only with actuator



#### 1.1 Damper Characteristic

- CE certified acc. to EN 15650
- Tested in accordance with EN 1366-2
- Classified acc. to EN 13501-3+A1
- Fire resistance EIS 45, EIS 60, EIS 90
- External casing leakage class min. C, internal leakage class 2 acc. EN 1751
- In case of FDMS cycling test in class C 10 000 acc. to EN 15650
- In case of FDMS-VAV cycling test in class C 20 000 acc. to EN 15650 -  $C_{MOD}$  classification
- Corrosion resistant acc. to EN 15650
- ES Certificate of conformity No. 1391-CPR-2020/0131
- Declaration of performance No. PM/FDMS/01/20/2, PM/FDMS-VAV/01/20/2
- Hygienic assessment of fire dampers - Report No. 1.6/pos/19/19b

## 1.2 Working Conditions

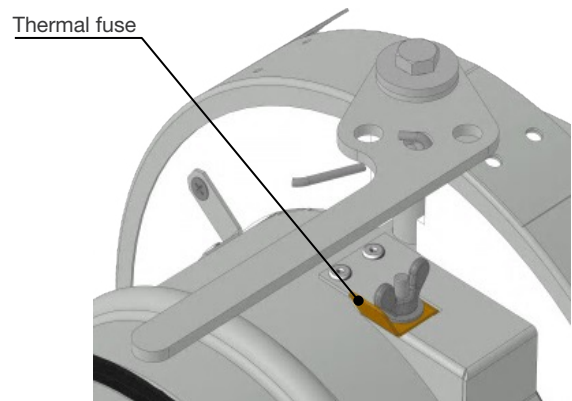
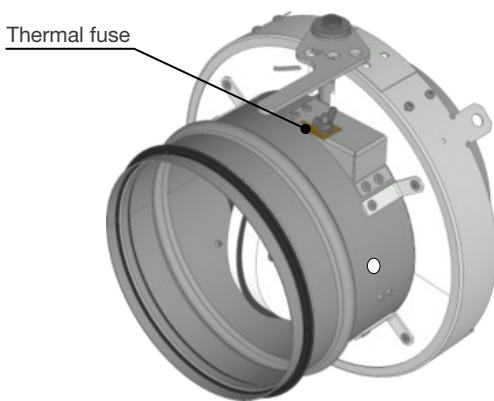
Fire damper's proper functioning is determined by the following working conditions:

- Maximum air speed: 12m/s.
- Maximum pressure difference: 2500 Pa.
- Operation of the dampers does not depend on the direction of air-flow (circulation). In case of FDM-VAV the direction of air-flow is strictly given.
- FDMS can be located in any (arbitrary) position.
- Dampers are suitable for ventilation air systems not containing any abrasive, chemical and adhesive particles.
- Dampers are designed for macroclimatic areas with mild climate according to EN 60721-3-3.
- Temperature in the place of installation is permitted to be in the range from -30°C to +50°C.

## 2. Damper Design FDMS

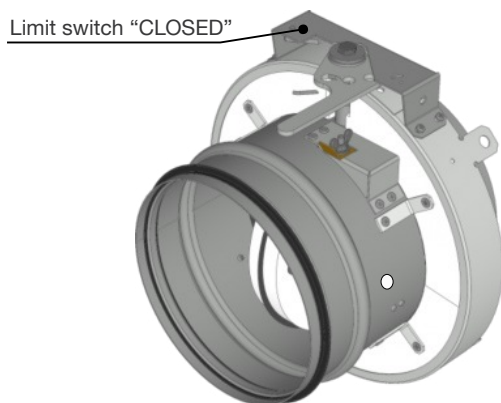
### 2.1 Design .01 - Damper with Mechanical Control

Design with mechanical control with a thermal protective fuse which actuates the shutting device within 120 seconds, when the nominal temperature reaches 72°C. Automatic initiation of the shutting device is not activated if the temperature does not exceed 70°C.



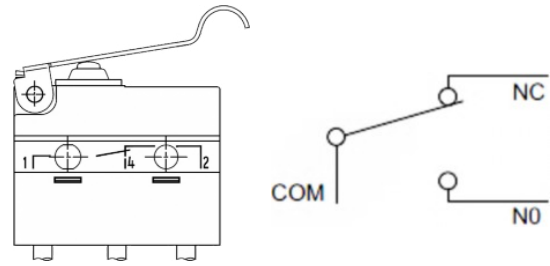
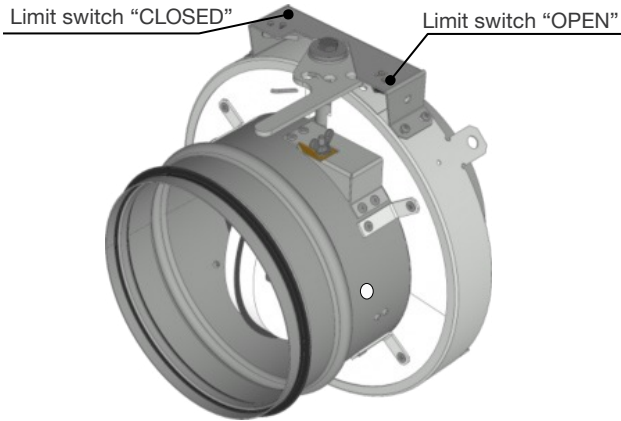
### 2.2 Design .11 - Damper with Mechanical Control and Limit Switch "CLOSED"

Design with mechanical control can be complemented with a limit switch signaling the damper's blade position "CLOSED". Limit switch is possible connect to the building management system or superordinate control system by wires, which are mounted to the switch.



2.3 Design .80 - Damper with Mechanical Control, Limit Switches “CLOSED” and “OPEN”

Design with mechanical control can be complemented with a limit switch signaling the damper’s blade position “CLOSED”. Limit switch is possible connect to the building management system or superordinate control system by wires, which are mounted to the switch.



Type	G905-300E05W1
Nominal voltage and maximal current	AC 230V /5A
Class of protection	IP 67
Working temperature	-25°C ... +120°C

- 1(COM) - black wire
- 2(NC) - gray wire
- 4(NO) - blue wire

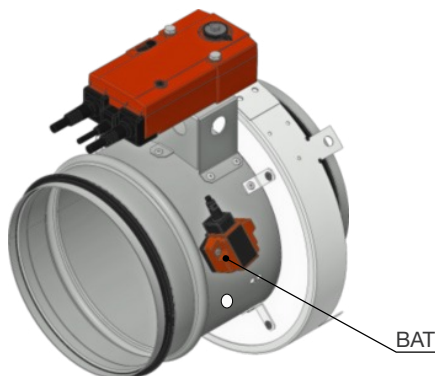
The limit switch is possible to connect in following two versions:

- a) CUT-OFF if the arm is moving ... connect wire 1+2
- b) SWITCH-ON if the arm is moving ... connect wire 1+4

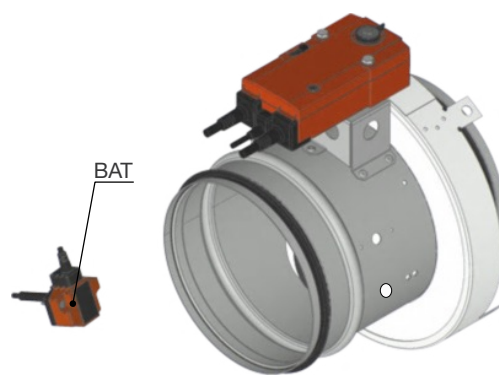
2.4 Design .40 and .50 - Damper with Electrical Actuator

The damper can be equipped with electric actuating mechanism. There are several actuators: BELIMO BFL, BFN 230-T (version .40) or BFL, BFN 24-T (version .50). After connection to the power supply AC/DC 24V or AC230V, the actuating mechanism displaces the damper blade into operation position “OPEN”. At the same time is pre-stretched back spring inside the actuator. When the actuator is under voltage (on power supply), the damper’s blade is in the position “OPEN”. The back spring is pre-stretched. Time needed for full opening of the damper blade from the position “CLOSED” to the position “OPEN” is maximum 60s. If the power supply of the actuator is cut off (due to disconnection of power supply, or pressing the reset button on the thermo-electrical starting mechanism BAT (thermal fuse), the back spring displaces the damper’s blade into the safety position “CLOSED”. The time needed for displacing of the blade from the position “OPEN” to the position “CLOSE” takes maximal 20s. In the case that the power supply is restored again (the blade can be in arbitrary position), the actuator starts re-displacing the damper’s blade position into the emergency position “OPEN”. The thermos-electrical mechanism BAT, which contains two thermal fuses Tf1 and Tf2, is a part of actuator. These fuses are activated when temperature +72°C has been exceeded. The fuse Tf1 measures the temperature in the outside of the damper and Tf2 measure the temperature inside the air duct. Both fuses, they are in serial connection. It means in fact, that when one of them is activated, the power supply of the actuator is cut-off and the actuator displaces the blade in safety position “CLOSED”. The signalization of damper position “OPEN” or “CLOSED” is provided by two limit switches, which are built-in inside the actuator. The thermal fuse BAT can be also installed separately, into the spiral air duct, outside of the fire damper (order code for this option is .4V or .5V - see the product code).

Design .40 and .50

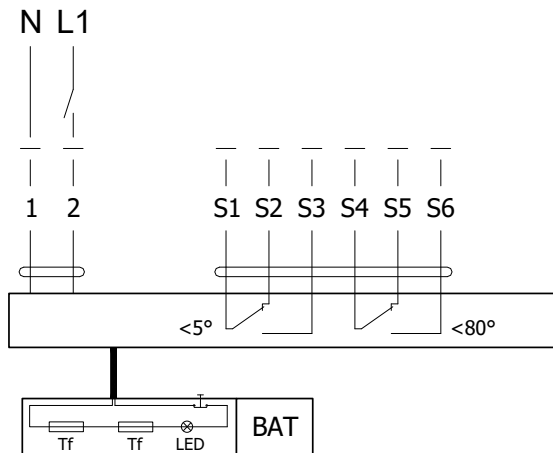


Design .4V and .5V



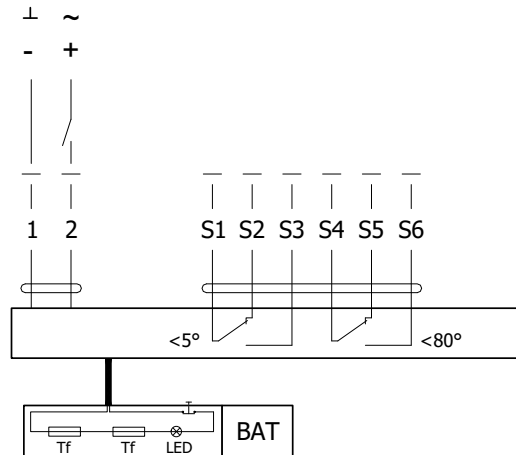
Wiring diagram of BFL 230-T, BFN 230-T

**AC230 V**



Wiring diagram of BFL 24-T, BFN 24-T

**AC/DC 24**



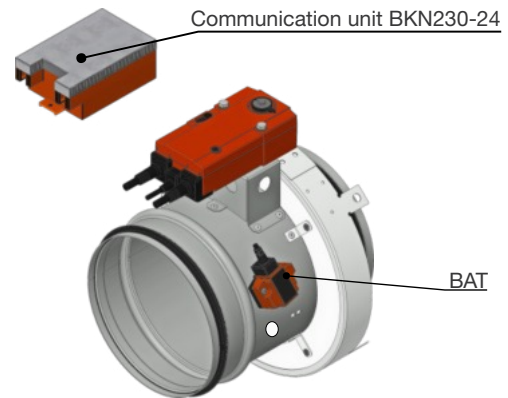
Electrical data for actuators BFL 24-T(-ST), BFN 24-T(-ST), BFL 230-T, BFN 230-T

Actuating Mechanism Belimo	BFL, BFN 230-T	BFL, BFN 24-T(-ST)
Nominal voltage	AC 230 V 50/60 Hz	AC 24 V 50/60 Hz DC 24 V
Power consumption - monitoring - holding	3,5/5 W 1,1/2,1 W	2,5/4 W 0,8/1,4 W
Dimensioning	6,5/10 VA (I <sub>max</sub> 4 A @ 5 ms)	4/6 VA (I <sub>max</sub> 8,3 A @ 5 ms)
Protection class	II	III
Degree of protection	IP 54	
Running time - motor - spring return	<math><60</math> s ~ 20 s	
Ambient temperature - normal duty - safety duty - non-operating temperature	-30 °C ... 55 °C The safe position will be attained up to max. 75°C -40 °C ... 55 °C	
Connecting - motor - auxiliary switch	cable 1 m, 2 x 0,75 mm <sup>2</sup> (BFL/BFN 24-T-ST) with 3-pin plug-in connectors cable 1 m, 6 x 0,75 mm <sup>2</sup> (BFL/BFN 24-T-ST) with 6-pin plug-in connectors	
Thermal trips	duct outside temperature 72 °C duct inside temperature 72 °C	



### 2.5 Design .60 - Damper with Electrical Actuator and Communication and Supply Device

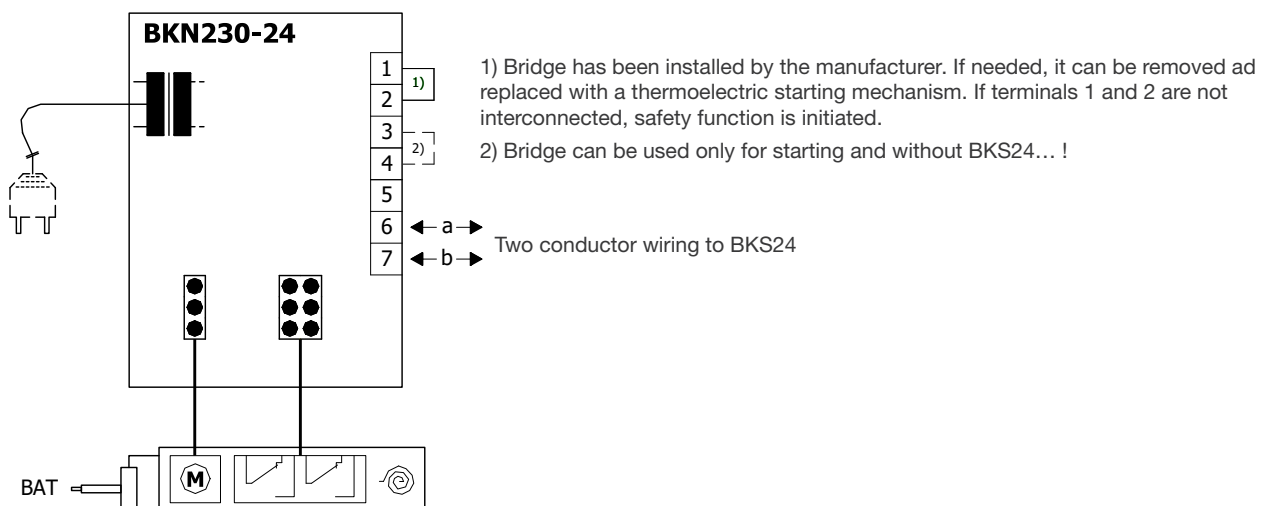
This is design with the communication and supply device BKN230-24 and the actuator BFL (BFN) 24-T-ST. It simplifies electrical wiring and interconnection of fire damper. This design facilitates checking of the damper on site and enables central control and check of fire damper during by a simple “2-wire” wiring with superordinate control unit. BKN230-24 is working as a decentralized network device for supplying of the actuator BFL (BFN) 24-T-ST on one hand and on the other hand it transmits the signal information about the fire damper position and failure. Control command SWITCH-ON and SWITCH-OFF from superordinate system controls via the same wiring to the actuating mechanism. To allow more simple connection, the actuator BFL (BFN) 24-T-ST is equipped with two connecting plugs (one with three jacks and one plug with six jacks). They are inserted directly to BKN230-24. BKN230-24 is supplied with a conductor and EURO-plug for connecting to the 230V mains. Two wire cable from superordinate system is connected to BKN230-24 by means of clamps 6 and 7 in BKN. If the drive is supposed to be controlled without any signal from the superordinate, it can be switch-on by means of a bridge between clamps 3 and 4 in BKN. A green LED diode on BKN230-24 is lighting in case the voltage 24V is present in the drive. If the TEST button on BAT is switched-on or if the power supply (e.g. by a signal from ELECTRICAL FIRE SIGNALISATION) is disconnected, the fire damper position will be “FAILURE”. It means damper blade goes in position “CLOSED”. Communication and supply device BKN230-24 has to be placed near the damper (BKN isn't mounted on damper body). It is necessary for easy connection of actuator equipped by BKN230-24 device.



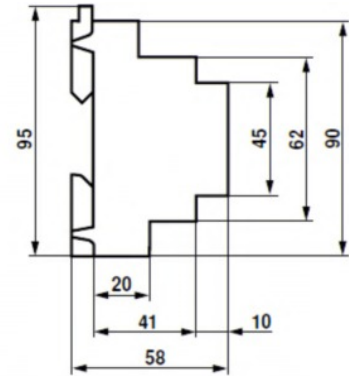
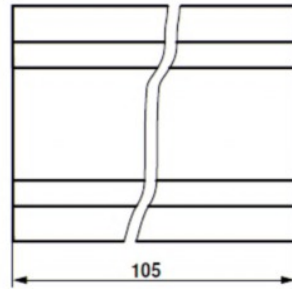
#### Technical data of the device BKN230-24

Communication and Supply Device	BKN230-24
Nominal voltage	AC 230V 50/60Hz
Power consumption	3,5 W (operating position)
Dimensioning	11 VA (including actuating mechanism)
Protection class	II
Degree of protection	IP 42
Ambient temperature	- 30 °C ... + 50 °C
Storage temperature	- 40 °C ... + 50 °C
Connection - mains	Cable 0,9 m with EURO plug of 26 type
- drive	6 pole plug, 3 pole plug
- terminal board	screw terminals for conductor 2×1,5 mm <sup>2</sup>

#### Wiring diagram of the BKN device with actuator, with act. mechanism BFL 24-T-ST, BFN 24-T-ST



2.6 Communication and Control Devices



BKS24-9A communication and control device is used for group control and checks of 1 to 9 fire dampers with the actuator BFL (BFN)24-T-ST in connection with the supply and communication device BKN230-24. Signalization of the damper blade position is individual for each damper (9 LED diodes), but the dampers can be controlled and tested only as a group. BKS24-9A is intended for use in superordinate control system, which can display operation mode and failure reports of the connected fire dampers. BKS24-9A receives signals from BKN230-24 through two wire cable. Proper damper operation is indicated by two light LED diodes:


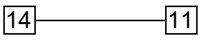



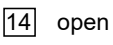
Control LED “OPEN” = damper blade in emergency position OPEN

Control LED “CLOSE” = damper blade in safety position CLOSED



If the damper does not reach the required position within the preset time, the appropriate on-board FAULT LED flashes and, at the same time, the fault contact K1 is activated (K1 is group alarm for all 9 dampers). This contact is overridden as soon the defective damper reaches the required position. The on-board FAULT LED remains on, until the fault is reset. Auxiliary contact K2 is provided for signaling the positions of dampers to a supreme communication controlling system. The function of the auxiliary contact can be programmed via terminal 14 according the next table.

**BKS24-9A contacts K1 and K2**

K1 Function Contact		Programming K2 Auxiliary Contact		
Situation	State	Function	Interconnection	State
Current Failure	15  16	K2 contact is on if all the dampers are open		17 
No Failure	15  16	K2 contact is on if the damper No. 1 is open		
		K2 contact is on if all the dampers are closed		

The BKS24-9A unit can be clipped directly onto a 35mm DIN mounting rail and external wiring is connected by two 9-pin terminal connectors.

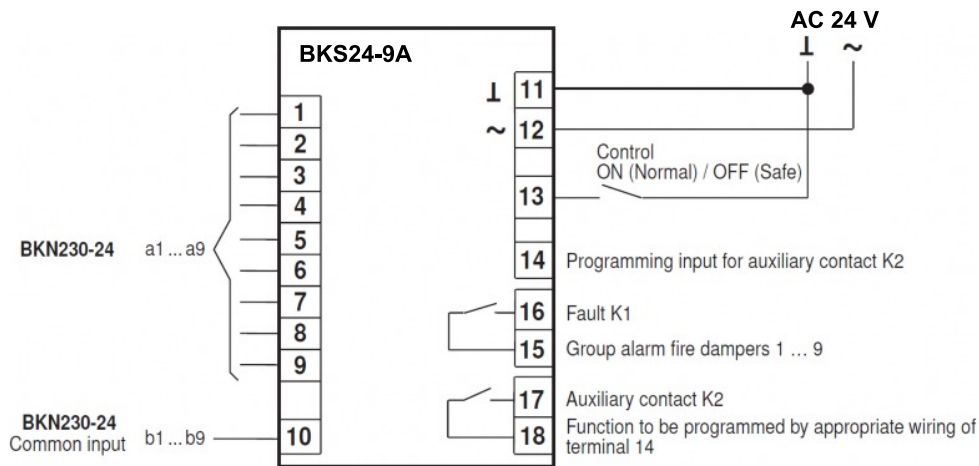
Functional testing can be performed by pressing the TEST pushbutton. While this button is held depressed, the dampers run to the safe position. Any malfunctions are indicated by the internal FAULT LED's.



Technical data of the device BKS24-9A

Communication and Control Device	BKS24-9A
Nominal voltage	AC 24 V 50/60Hz
Power consumption	3,5 W (operating position)
Dimensioning	5,5 VA
Protection class	III (safe small voltage)
Degree of protection	IP 30
Ambient temperature	0 ... +50 °C
Connection	Terminals for conductor 2 × 1,5 mm <sup>2</sup>

Wiring diagram BKS24-9A



3. Damper Design FDMS-VAV

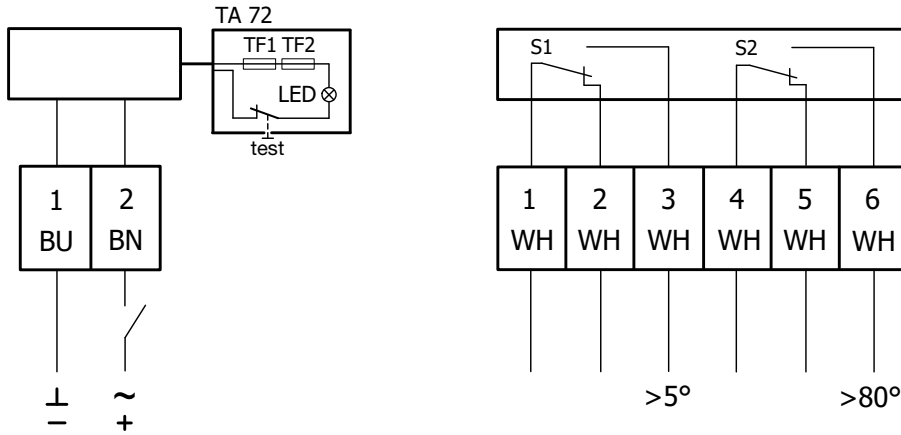
3.1 Design .50 - Damper with Electrical Actuator

The damper is equipped with electric actuating mechanism. There are several actuators depending on the damper size: GRUNER 340CTA-024D-XX-S2-V/8F12/ST06/BP8. To ensure the VAV function there is an Gruner universal actuator controller GUAC-DM3 for air flow control and GUAC-PM3 for pressure control. After connection to the power supply AC/DC 24V, the actuating mechanism displaces the damper blade into operation position given by the required air volume flow. At the same time is pre-stretched back spring inside the actuator. When the actuator is under voltage (on power supply), the damper's blade is in the position given by the required air volume flow. The back spring is pre-stretched. If the power supply of the actuator is cut off (due to disconnection of power supply, or pressing the reset button on the thermo-electrical starting mechanism BAT (thermal fuse), the back spring displaces the damper's blade into the safety position "CLOSED". The time needed for displacing of the blade from the position "OPEN" to the position "CLOSE" takes maximal 20s. In the case that the power supply is restored again (the blade can be in arbitrary position), the actuator starts re-displacing the damper's blade position given by the required air volume flow. The thermos-electrical mechanism BAT, which contains two thermal fuses Tf1 and Tf2, is a part of actuator. These fuses are activated when temperature +72°C has been exceeded. The fuse Tf1 measures the temperature in the outside of the damper and Tf2 measure the temperature inside the air duct. Both fuses, they are in serial connection. It means in fact, that when one of them is activated, the power supply of the actuator is cut-off and the actuator displaces the blade in safety position "CLOSED". The signalization of damper position "OPEN" or "CLOSED" is provided by two limit switches, which are built-in inside the actuator. The fire damper has a part with controller consists of the body of the controller with a control blade and pressure probes for determining the through-flow of air. A controller is affixed to the body for controlling the control blade, which is in this case the blade of the fire damper.

### 3.2 GRUNER Actuator and Controller

#### GRUNER actuators 340CTA-024D-XX-S2-V/8F12/ST06/BP8 wiring diagram for mains voltage 24 VAC/DC

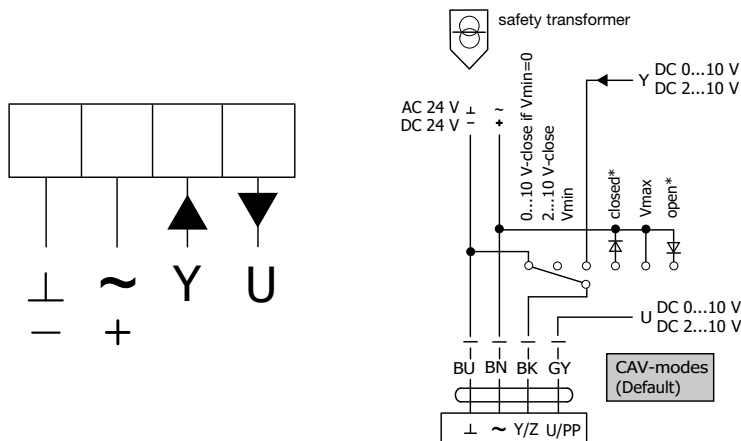
- Caution!**
- Connect through separating transformer!
  - Parallel connection of other servo drives is possible. Respect power input data.
  - Combination of mains voltage and use of signals from limit switches by very low voltage is not allowed.



- Cable colours:**
- BU1 = blue
  - BN2 = brown
  - WH1 = white
  - WH2 = white
  - WH3 = white
  - WH4 = white
  - WH5 = white
  - WH6 = white

#### GRUNER controller GUAC-DM3 / GUAC-PM3 wiring diagram for mains voltage 24 VAC/DC

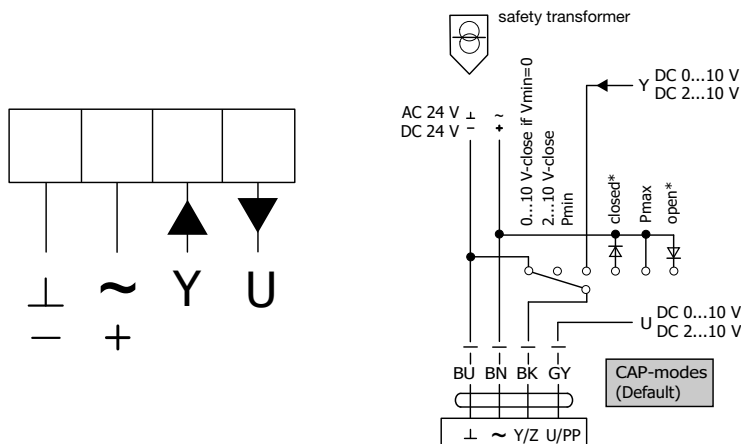
- Caution!**
- Connect via safety isolation transformer!
  - The device is not allowed to be used outside the specified field of application.
  - It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during assembly.



- Cable colours:**
- BU = blue
  - BN = brown
  - BK = black
  - GY = Gray

#### GRUNER controller GUAC-PM3 wiring diagram for mains voltage 24 VAC/DC

- Caution!**
- Connect via safety isolation transformer!
  - The device is not allowed to be used outside the specified field of application.
  - It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed during assembly.



- Cable colours:**
- BU = blue
  - BN = brown
  - BK = black
  - GY = Gray

**Electrical parameters of GRUNER actuators 340CTA-024D-XX-S2-V/8F12/ST06/BP8**

Actuating mechanism GRUNER	340CTA-024D-XX-S2-V/8F12/ST06/BP8
Nominal voltage	24V AC/DC 50/60 Hz
Power consumption - motoring	6,5 W
- holding	2,0 W
Dimensioning	7,5 VA
Protection class	III
Degree of protection	IP 54
Running time - motor	< 100 s
- spring return	< 20 s
Ambient Temperature	
- normal duty	-30 °C ... +50 °C
- safety duty	> +75°C
- non-operating temperature	-30 °C ... +50 °C
Connecting - motor	cable 1 m, 2 x 0,75 mm <sup>2</sup>
- auxiliary switch	cable 1 m, 6 x 0,75 mm <sup>2</sup>
Thermal trips	TF1 temperature inside Duct +72 °C TF2 temperature outside Duct +71 °C

**Electrical parameters of GRUNER controller GUAC-DM3**

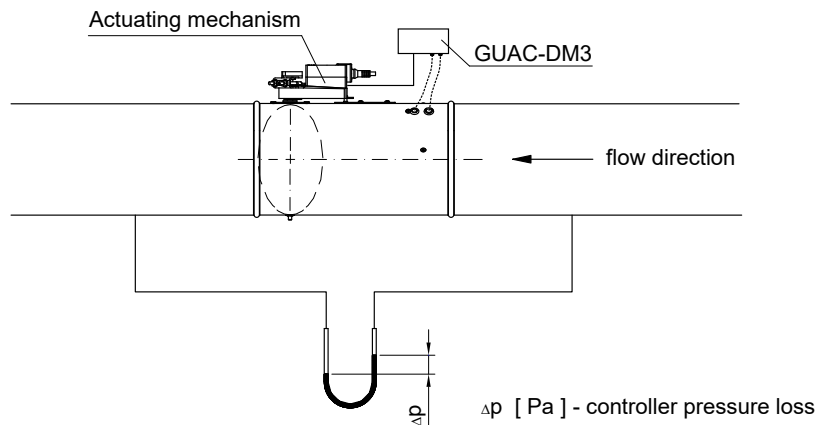
Controller GRUNER	GUAC-DM3
Nominal voltage	24V AC/DC 50/60 Hz
Power consumption	0,6 W
Dimensioning	1,3 VA
Protection class	III
Degree of protection	IP 42
Control	(0)2...10 VDC / Ri > (100 kΩ) 50 kΩ (0)4...20 mA / Rext. = 500 Ω
Feedback signal	(0)2...10 VDC, max. 0,5 mA
Priority control	closed / Vmin / Vmax / open
Ambient Temperature	
- normal duty	0 °C ... +50 °C
- storage temperature	-20 °C ... +80 °C
Connecting - controller	screw terminals, 4-pin, 0,5...2,5 mm <sup>2</sup>
- actuators	cable 1000 mm with Lumberg connector
Connection GUV	via diagnostic connector and feedback signal U/PP
Sensor	300 Pa (dynamic)
Communication	PP-Bus (1200 Bd, max. 15 VDC)

Electrical parameters of Gruner controller GUAC-PM3

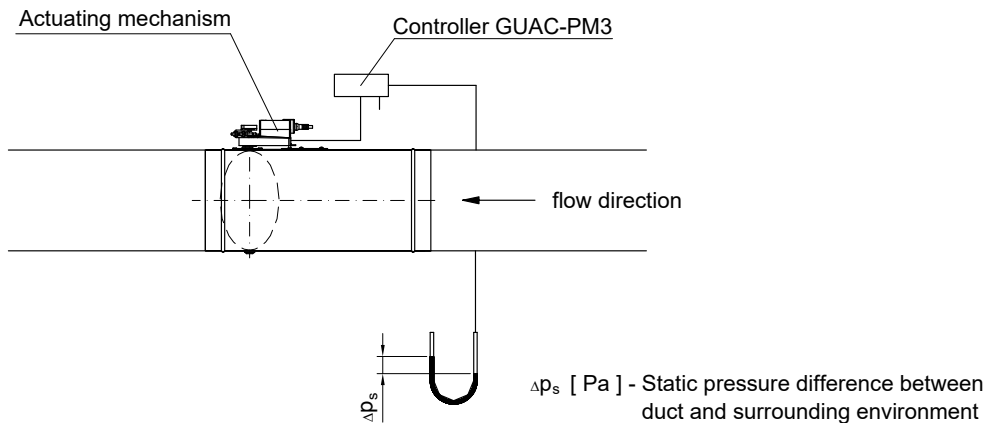
Controller GRUNER	GUAC-PM3
Nominal voltage	24V AC/DC 50/60 Hz
Power consumption	0,6 W
Dimensioning	1,3 VA
Protection class	III
Degree of protection	IP 42
Control	(0)2...10 VDC / $R_i > (100 \text{ k}\Omega) 50 \text{ k}\Omega$ (0)4...20 mA / $R_{ext.} = 500 \Omega$
Feedback signal	(0)2...10 VDC, max. 0,5 mA
Priority control	closed / Pmin / Pmax / open
Ambient Temperature	
- normal duty	0 °C ... +50 °C
- storage temperature	-20 °C ... +80 °C
Connecting - controller	screw terminals, 4-pin, 0,5...2,5 mm <sup>2</sup>
- actuators	cable 1000 mm with Lumberg connector
Connection GUV	via diagnostic connector and feedback signal U/PP
Sensor	300 Pa (static)
Communication	PP-Bus (1200 Bd, max. 15 VDC)

3.3 Types of Regulation FDMS-VAV

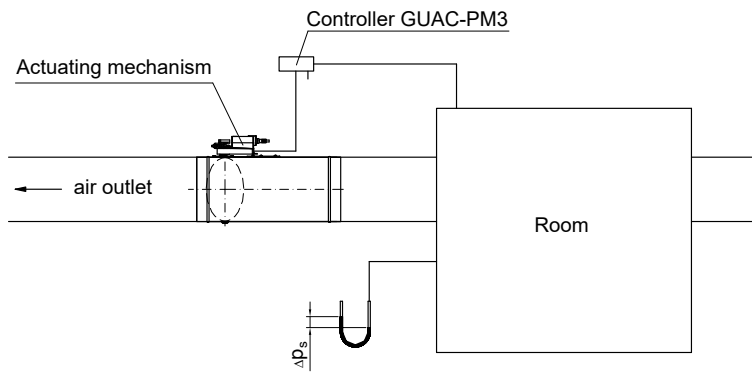
Now has the damper a given flow direction - important for the installation - AIRFLOW CONTROL



Pressure control - DUCT



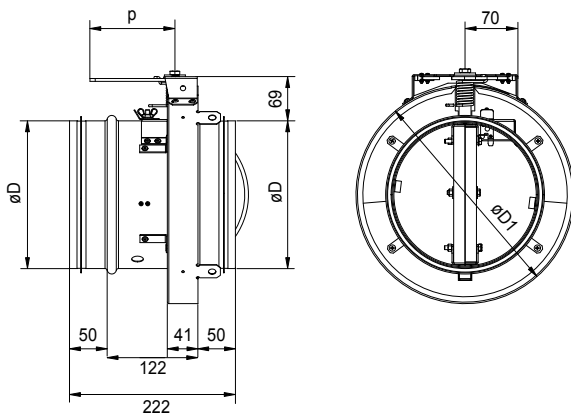
Pressure control - ROOM



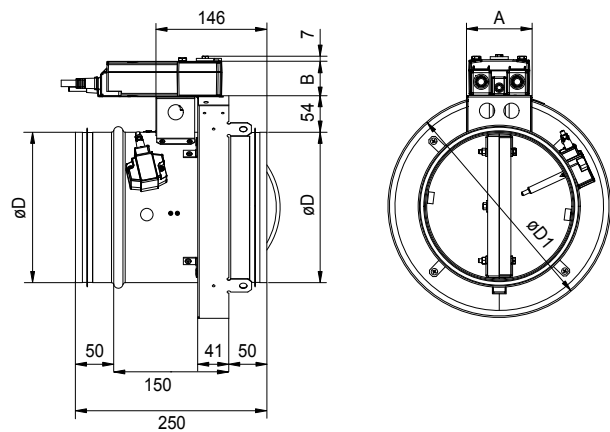
$\Delta p_s$  [ Pa ] - Static pressure difference between room and surrounding environment

4. Dimensions and Weights of FDMS

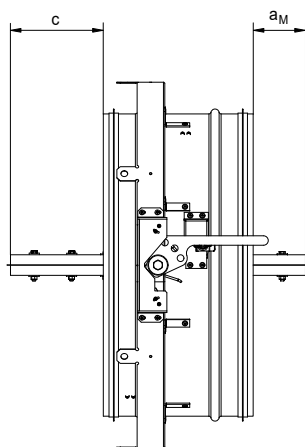
FDMS with mechanical control



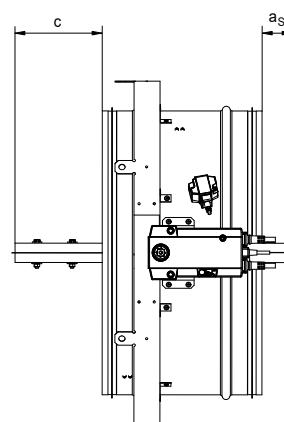
FDMS with actuating mechanism



Blade overlaps - FDMS manual and thermal



Blade overlaps - FDMS with actuating mechanism

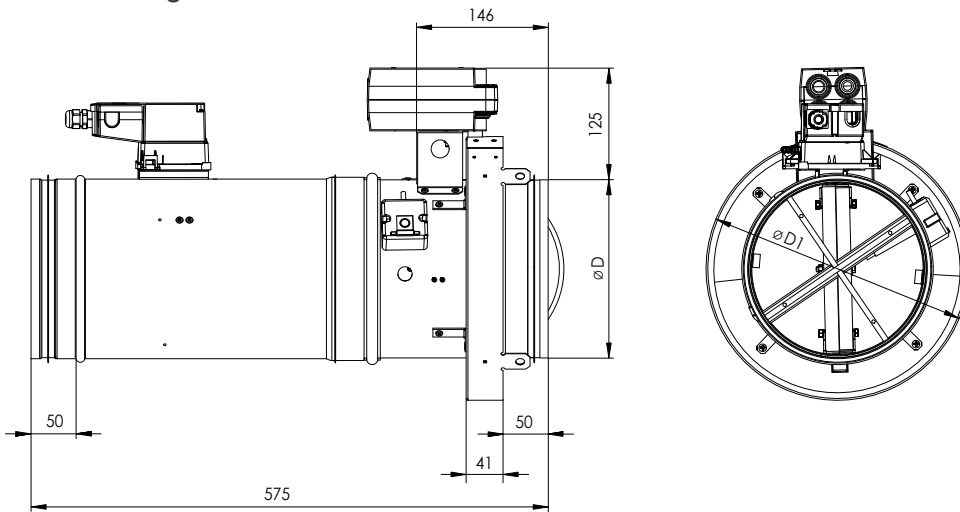


Size	D (mm)	D1 (mm)	c (mm)	p (mm)	a <sub>s</sub>	a <sub>M</sub>	A (mm)	B (mm)	Design .01, .11, .80 (kg)	Design .40, .50 (kg)	Actuator type
100	98	190	-	113	-	-	86	48	2,2	3,3	BFL24-T(-ST), BFL230-T
125	123	215	-	113	-	-	86	48	2,6	3,7	BFL24-T(-ST), BFL230-T
160	158	250	-	113	-	-	86	48	3,2	4,3	BFL24-T(-ST), BFL230-T
180	178	270	2,5	113	-	-	86	48	3,6	4,7	BFL24-T(-ST), BFL230-T
200	198	290	12,5	113	-	-	86	48	4	5,1	BFL24-T(-ST), BFL230-T
225	223	315	25	163	-	-	86	48	4,5	5,6	BFL24-T(-ST), BFL230-T
250	248	340	37,5	163	-	-	86	48	5,1	6,2	BFL24-T(-ST), BFL230-T
280	278	370	52,5	163	-	-	86	48	5,8	6,9	BFL24-T(-ST), BFL230-T
315	313	405	70	163	-	12	86	48	6,7	7,8	BFL24-T(-ST), BFL230-T
355	353	445	90	163	2	32	86	48	7,7	8,8	BFL24-T(-ST), BFL230-T
400	398	490	112,5	163	24,5	54,5	86	48	9	10,1	BFL24-T(-ST), BFL230-T
450	448	540	137,5	163	49,5	79,5	86	48	10,4	11,5	BFL24-T(-ST), BFL230-T
500	498	590	162,5	163	74,5	104,5	110	52	12	13,4	BFN24-T(-ST), BFN230-T
560	558	650	192,5	163	104,5	134,5	110	52	14,1	15,5	BFN24-T(-ST), BFN230-T
630	628	720	227,5	163	139,5	169,5	110	52	16,7	18,1	BFN24-T(-ST), BFN230-T

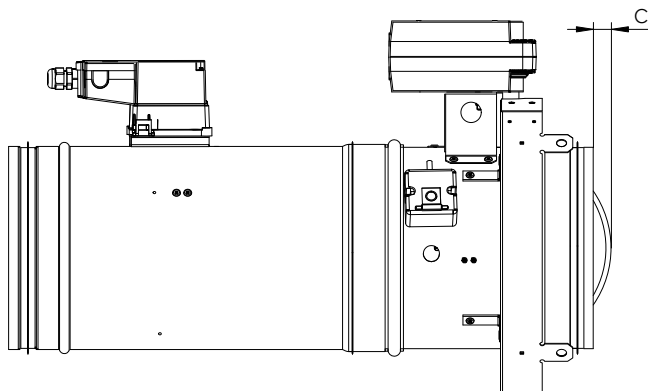
Weight of the communication unit BKN230-24 is 0,55 kg (used in design .60).

### 5. Dimensions and Weights of FDMS-VAV

FDMS-VAV with actuating mechanism

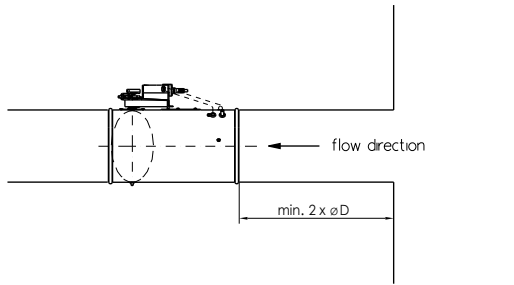


Blade overlaps - FDMS-VAV with actuating mechanism

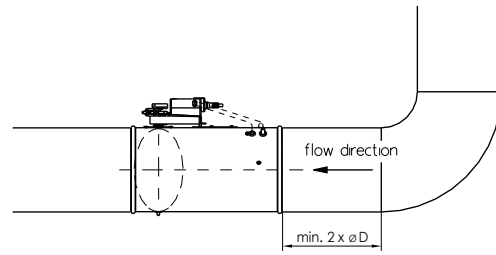




**Reccomended distance from double branch joint**



**Reccomended distance from bend**



Size	D (mm)	D1 (mm)	c (mm)	p (mm)	a <sub>s</sub>	a <sub>M</sub>	Design .50 (kg)
100	98	190	-	113	-	-	4,3
125	123	215	-	113	-	-	4,8
160	158	250	-	113	-	-	5,6
180	178	270	2,5	113	-	-	6,1
200	198	290	12,5	113	-	-	6,6
225	223	315	25	163	-	-	7,3
250	248	340	37,5	163	-	-	8,1
280	278	370	52,5	163	-	-	9,1
315	313	405	70	163	-	12	10,9
355	353	445	90	163	2	32	11,5
400	398	490	112,5	163	24,5	54,5	14,1
450	448	540	137,5	163	49,5	79,5	17,3
500	498	590	162,5	163	74,5	104,5	20,1
560	558	650	192,5	163	104,5	134,5	23,5
630	628	720	227,5	163	139,5	169,5	28,9

**6. Material, Finishing**

Damper bodies are supplied in the design made of galvanized steel plate without any other surface finishing. The round duct joint is made of galvanized steel and boards from mineral fibers. Damper blades are made of fire resistant asbestos free boards made of mineral fibers. Damper controls are made of galvanized materials with no other surface finish. Springs are galvanized. Thermal protective fuses are made of sheet brass, thickness = 0.5 mm. Fasteners are made of galvanized steel.

According to the customer’s requirements, damper can be made of stainless material.

Specifications for stainless-steel models – classification of stainless steel:

- Class A2 – Food-grade stainless steel (AISI 304 – EN 17240)
- Class A4 – Chemistry-grade stainless steel (AISI 316, 316L – EN 17346, 17349)

The respective stainless steel is the material for all components present or accessing the damper interior; components outside the damper body are typically from galvanised sheet metal (fasteners for mounting the servo drive or mechanics, mechanics components except Item 4), frame components.

The following components, including the fasteners, are made from stainless steel at all times:

- Damper body and all components permanently attached
- Leaf holders, including pins, metal parts of leaf
- Control components inside the damper (leaf angle selector, pin with lever)
- Mechanical components entering the interior of damper body (lower sheet of mechanics, lock holder “1”, lock lever “2”, lock spring, 8 dia. stopper pin, mechanics pin)
- Inspection hole cover including the clip and fasteners (if they are parts of the cover)
- Bearing for torque transfer from the lever with pin on the angle selector at the leaf (made from AISI 440C)

The leaf of the damper is made from two Promatect-H sheets, thickness 15 mm, connected with stainless-steel fasteners of corresponding class.

Plastic, rubber and silicon components, sealants, foaming bands, glass-ceramic seals, housings, brass bearings of the leaf, servo drives, and end switches are identical for all material variants of the dampers.

The thermal link is identical for all material variants of the dampers. Upon specification by customer, the thermal link may be made from A4 from stainless steel sheet metal.

The temperature-dependent initiator of the servo drive (sensor) is modified for stainless-steel variants of the dampers; the standard galvanised screws are replaced with stainless-steel M4 screws of corresponding class the counterpart has stainless-steel riveting M4 nuts.

Some fasteners and components are available in one class of stainless steel; the type will be used in all stainless-steel variants.

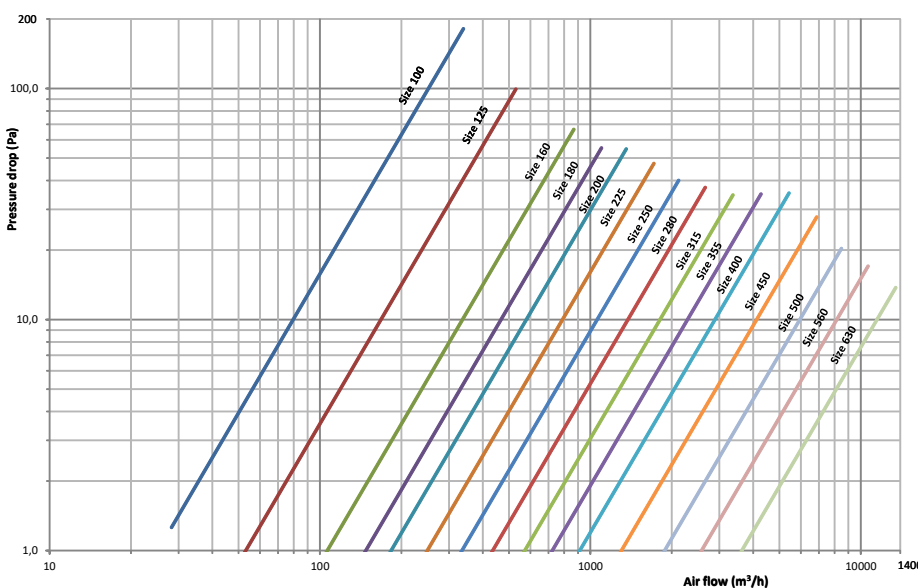
The leaf in the variants for chemical environments (Class A4) is always treated with a coating of chemically resistant Promat SR.

Any other requirements for the design shall be considered atypical and shall be addressed on an individual basis.

## 7. Technical Data of FDMS and FDMS-VAV

### 7.1 Pressure Loss

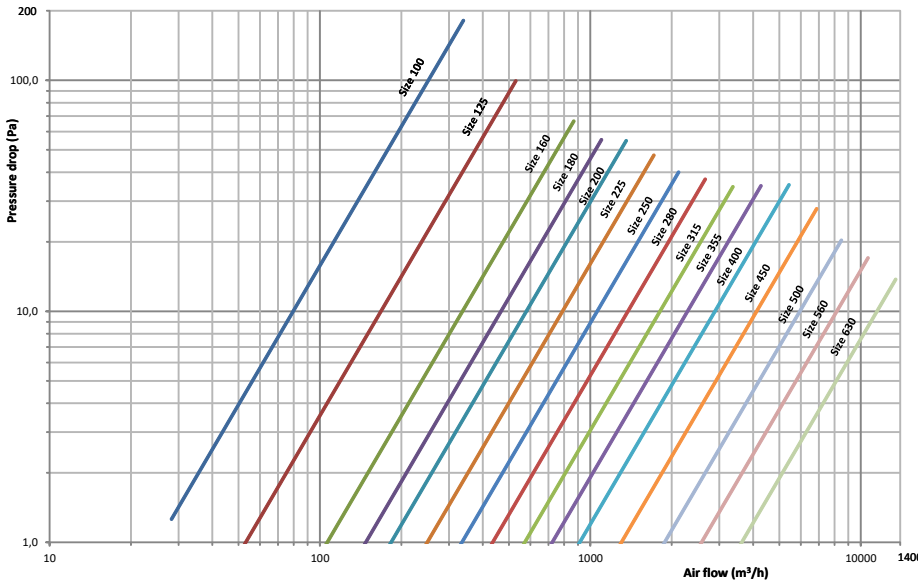
#### FDMS



Caution:

All the data is valid for dampers in the full “OPEN” position!

FDMS-VAV



Caution:  
All the data is valid for dampers in the full “OPEN” position!

7.2 Air Volume Flow

Size	Air volume (m³/h)				V <sub>nom</sub>	
	Minimum (w=1 m/s)		Maximum (w=7 m/s)		m³/h	l/s
	m³/h	l/s	m³/h	l/s		
100	30	8	200	56	200	56
125	45	13	310	86	310	86
140	55	15	400	111	400	111
160	70	19	500	139	500	139
180	90	25	650	181	650	181
200	115	32	800	222	800	222
225	145	40	1000	278	1000	278
250	180	50	1250	347	1250	347
280	220	61	1550	431	1550	431
315	280	78	2000	556	2000	556
355	355	99	2500	694	2500	694
400	455	126	3200	889	3200	889
500	710	197	5000	1389	5000	1389
630	1120	311	7900	2194	7900	2194

7.3 Operating Mode and Setup

GUAC-DM3

Operating mode

Through connecting the power supply to BU+BN (1+2) and a reference signal Y to BK (3) in the range of (0)2...10 VDC, the connected actuator regulates to the set point. The current flow in % of V<sub>nom</sub> is provided as a feedback signal U on GY (4) for other actuators and can be communicated via PP-Bus.

CAP modes / override controls: AC\*/DC signal to terminal BK (3)

The controller is overload-proof.

Edit

The selector allows the changing of values. The position of the arrow shows the value set. The changes are displayed as soon as the selector is moved ±10° from the position.

**Flow/Unit**

Setting the desired actual volume flow unit in m<sup>3</sup>/h and l/s.

**Vmin**

Adjust the desired flow Vmin (setpoint Y = 0 / 2 VDC).

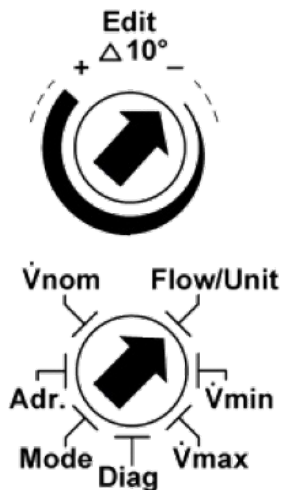
**Vmax**

Adjust the desired flow Vmax (setpoint Y = 10 VDC).

**Diag**

Diagnostic menu:

- off - diagnostic mode is off
- on - diagnostic mode is on
- oP - opens the damper
- cL - closes the damper
- Lo - activated Vmin
- Hi - activated Vmax
- 123 - software version



**Mode**

Setting the direction of rotation:

- 0-n...0-10 VDC normal
- 2-n...2-10 VDC normal
- 0-i ...0-10 VDC invers
- 2-i ...2-10 VDC invers

**Vnom**

Setting the nominal volumetric flow depending on the VAV-box.

**GUAC-PM3**

**Operating mode**

Through connecting the power supply to BU+BN (1+2) and a reference signal Y to BK (3) in the range of (0)2...10 VDC, the connected actuator regulates to the specified set point. The current pressure in % of Pnom is provided as a feedback signal U on GY (4) for other actuators and can be communicated via PP-Bus.

CAP modes / override controls: AC\*/DC signal to terminal BK (3)

The controller is overload-proof.

**Edit**

The selector allows the changing of values. The position of the arrow shows the value set. The changes are displayed as soon as the selector is moved ±10° from the position.

**Pres / Unit**

Setting the desired actual pressure unit to Pa and H<sup>2</sup>O.

**Pmin**

Adjust the desired flow Pmin (setpoint Y = 0 / 2 VDC).

**Pmax**

Adjust the desired flow Pmax (setpoint Y = 10 VDC).

**Dig**

Diagnostic menu:

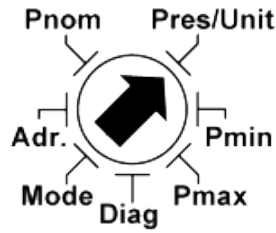
- off - diagnostic mode is off
- on - diagnostic mode is on
- oP - opens the damper
- cL - closes the damper
- Lo - activated Vmin
- Hi - activated Vmax
- 123 - software version



**Mode**

Setting the direction of rotation:

- 0-n...0-10 VDC normal
- 2-n...2-10 VDC normal
- 0-i ...0-10 VDC invers
- 2-i ...2-10 VDC invers



**Pnom**

Shows the nominal pressure setting.

**7.4 Noise Data FDMS / FDMS-VAV**

Level of acoustic power corrected with filter A

- $L_{wA}$  - acoustic power level corrected with filter A (dB(A))
- f - frequency in octave range (Hz)
- w - air flow velocity (m/s)

Caution: All the data is valid for dampers in the full “OPEN” position!

$L_{wA}$  value for size 100 (dB(A))

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	2	8	13	16	19	22	25	27	29
125	< 2	4	12	18	23	27	31	34	36	39	41
250	< 2	8	17	24	29	34	37	41	44	46	49
500	< 2	9	18	26	31	36	40	44	47	50	53
1000	< 2	5	16	24	30	35	40	43	47	50	53
2000	< 2	< 2	10	18	25	30	35	39	43	46	49
4000	< 2	< 2	< 2	9	16	22	27	32	36	39	43
8000	< 2	< 2	< 2	< 2	5	11	16	21	25	29	32
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>23</b>	<b>30</b>	<b>36</b>	<b>41</b>	<b>45</b>	<b>49</b>	<b>52</b>	<b>55</b>	<b>57</b>

$L_{wA}$  value for size 125 (dB(A))

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	< 2	5	9	13	16	19	21	23	25
125	< 2	< 2	8	15	20	24	27	30	33	35	37
250	< 2	4	13	20	26	30	34	37	40	43	45
500	< 2	5	15	22	28	33	37	41	44	47	49
1000	< 2	< 2	12	20	26	32	36	40	43	46	49
2000	< 2	< 2	6	14	21	27	32	36	39	43	46
4000	< 2	< 2	< 2	6	13	19	24	28	32	36	39
8000	< 2	< 2	< 2	< 2	< 2	7	13	18	22	25	29
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>19</b>	<b>26</b>	<b>32</b>	<b>37</b>	<b>41</b>	<b>45</b>	<b>48</b>	<b>51</b>	<b>54</b>

$L_{WA}$  value for size 160 (dB(A))

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	< 2	5	10	13	16	19	22	24	26
125	< 2	< 2	9	15	20	24	27	31	33	36	38
250	< 2	5	14	21	26	31	34	38	41	43	46
500	< 2	6	15	23	28	33	37	41	44	47	50
1000	< 2	2	13	21	27	32	37	40	44	47	50
2000	< 2	< 2	7	15	22	27	32	36	40	43	46
4000	< 2	< 2	< 2	6	13	19	24	29	33	36	40
8000	< 2	< 2	< 2	< 2	< 2	8	13	18	22	26	29
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>20</b>	<b>27</b>	<b>33</b>	<b>38</b>	<b>42</b>	<b>45</b>	<b>49</b>	<b>52</b>	<b>54</b>

$L_{WA}$  value for size 180 (dB(A))

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	< 2	4	9	13	16	18	21	23	25
125	< 2	< 2	8	14	19	23	27	30	32	35	37
250	< 2	4	13	20	25	30	34	37	40	42	45
500	< 2	5	15	22	28	33	37	40	43	46	49
1000	< 2	< 2	12	20	26	31	36	40	43	46	49
2000	< 2	< 2	6	14	21	27	31	35	39	42	45
4000	< 2	< 2	< 2	6	13	19	24	28	32	36	39
8000	< 2	< 2	< 2	< 2	< 2	7	12	17	21	25	29
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>19</b>	<b>26</b>	<b>32</b>	<b>37</b>	<b>41</b>	<b>45</b>	<b>48</b>	<b>51</b>	<b>54</b>

$L_{WA}$  value for size 200 (dB(A))

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	< 2	5	10	13	17	19	22	24	26
125	< 2	< 2	9	15	20	24	28	31	33	36	38
250	< 2	5	14	21	26	31	35	38	41	43	46
500	< 2	6	15	23	29	33	38	41	44	47	50
1000	< 2	3	13	21	27	32	37	41	44	47	50
2000	< 2	< 2	7	15	22	27	32	36	40	43	46
4000	< 2	< 2	< 2	6	14	19	25	29	33	37	40
8000	< 2	< 2	< 2	< 2	< 2	8	13	18	22	26	30
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>20</b>	<b>27</b>	<b>33</b>	<b>38</b>	<b>42</b>	<b>46</b>	<b>49</b>	<b>52</b>	<b>55</b>

$L_{WA}$  value for size 225 (dB(A))

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	< 2	4	9	12	15	18	21	23	25
125	< 2	< 2	8	14	19	23	27	30	32	35	37
250	< 2	4	13	20	25	30	33	37	40	42	45
500	< 2	5	14	22	27	32	36	40	43	46	49
1000	< 2	< 2	12	20	26	31	36	39	43	46	49
2000	< 2	< 2	6	14	21	26	31	35	39	42	45



f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
4000	< 2	< 2	< 2	5	12	18	23	28	32	35	39
8000	< 2	< 2	< 2	< 2	< 2	7	12	17	21	25	28
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>19</b>	<b>26</b>	<b>32</b>	<b>37</b>	<b>41</b>	<b>45</b>	<b>48</b>	<b>51</b>	<b>53</b>

L<sub>WA</sub> value for size 250 (dB(A))

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	< 2	4	9	12	15	18	21	23	25
125	< 2	< 2	8	14	19	23	27	30	32	35	37
250	< 2	4	13	20	25	30	33	37	40	42	45
500	< 2	5	14	22	27	32	36	40	43	46	49
1000	< 2	< 2	12	20	26	31	36	39	43	46	49
2000	< 2	< 2	6	14	21	26	31	35	39	42	45
4000	< 2	< 2	< 2	5	12	18	23	28	32	35	39
8000	< 2	< 2	< 2	< 2	< 2	7	12	17	21	25	28
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>19</b>	<b>26</b>	<b>32</b>	<b>37</b>	<b>41</b>	<b>44</b>	<b>48</b>	<b>51</b>	<b>53</b>

L<sub>WA</sub> value for size 280 (dB(A))

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	< 2	5	10	13	16	19	22	24	26
125	< 2	< 2	9	15	20	24	27	30	33	36	38
250	< 2	5	14	21	26	30	34	38	41	43	45
500	< 2	6	15	23	28	33	37	41	44	47	49
1000	< 2	2	13	21	27	32	37	40	44	47	50
2000	< 2	< 2	6	15	22	27	32	36	40	43	46
4000	< 2	< 2	< 2	6	13	19	24	29	33	36	39
8000	< 2	< 2	< 2	< 2	< 2	8	13	18	22	26	29
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>20</b>	<b>27</b>	<b>33</b>	<b>38</b>	<b>42</b>	<b>45</b>	<b>49</b>	<b>52</b>	<b>54</b>

L<sub>WA</sub> value for size 315 (dB(A))

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	< 2	6	10	14	17	20	22	24	26
125	< 2	< 2	9	16	21	25	28	31	34	36	38
250	< 2	5	14	21	27	31	35	38	41	44	46
500	< 2	6	16	23	29	34	38	41	45	48	50
1000	< 2	3	13	21	27	33	37	41	44	47	50
2000	< 2	< 2	7	15	22	28	33	37	40	44	47
4000	< 2	< 2	< 2	7	14	20	25	29	33	37	40
8000	< 2	< 2	< 2	< 2	2	8	14	18	23	26	30
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>20</b>	<b>27</b>	<b>33</b>	<b>38</b>	<b>42</b>	<b>46</b>	<b>49</b>	<b>52</b>	<b>55</b>

$L_{WA}$  value for size 355 (dB(A))

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	< 2	7	11	15	18	21	23	25	27
125	< 2	2	10	17	22	26	29	32	35	37	39
250	< 2	6	15	22	28	32	36	39	42	45	47
500	< 2	7	17	24	30	35	39	42	46	49	51
1000	< 2	4	14	22	28	34	38	42	45	48	51
2000	< 2	< 2	8	16	23	29	34	38	41	45	48
4000	< 2	< 2	< 2	8	15	21	26	30	34	38	41
8000	< 2	< 2	< 2	< 2	3	9	15	19	24	27	31
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>21</b>	<b>28</b>	<b>34</b>	<b>39</b>	<b>43</b>	<b>47</b>	<b>50</b>	<b>53</b>	<b>56</b>

 $L_{WA}$  value for size 400 (dB(A))

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	< 2	8	12	16	19	22	24	26	28
125	< 2	3	11	18	23	27	30	33	36	38	40
250	< 2	7	16	23	29	33	37	40	43	46	48
500	< 2	8	18	25	31	36	40	43	47	50	52
1000	< 2	5	15	23	29	35	39	43	46	49	52
2000	< 2	< 2	9	17	24	30	35	39	42	46	49
4000	< 2	< 2	< 2	9	16	22	27	31	35	39	42
8000	< 2	< 2	< 2	< 2	4	10	16	20	25	28	32
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>22</b>	<b>29</b>	<b>35</b>	<b>40</b>	<b>44</b>	<b>48</b>	<b>51</b>	<b>54</b>	<b>57</b>

 $L_{WA}$  value for size 450 (dB(A))

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	< 2	6	11	15	18	21	23	25	27
125	< 2	< 2	10	16	21	25	29	32	35	37	39
250	< 2	6	15	22	27	32	36	39	42	45	47
500	< 2	7	17	24	30	35	39	42	46	48	51
1000	< 2	4	14	22	28	33	38	42	45	48	51
2000	< 2	< 2	8	16	23	29	33	38	41	45	48
4000	< 2	< 2	< 2	8	15	21	26	30	34	38	41
8000	< 2	< 2	< 2	< 2	3	9	15	19	24	27	31
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>21</b>	<b>28</b>	<b>34</b>	<b>39</b>	<b>43</b>	<b>47</b>	<b>50</b>	<b>53</b>	<b>56</b>

 $L_{WA}$  value for size 500 (dB(A))

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	< 2	4	9	12	16	18	21	23	25
125	< 2	< 2	8	14	19	23	27	30	32	35	37
250	< 2	4	13	20	25	30	34	37	40	42	45
500	< 2	5	14	22	28	32	37	40	43	46	49
1000	< 2	< 2	12	20	26	31	36	40	43	46	49
2000	< 2	< 2	6	14	21	26	31	35	39	42	45

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
4000	< 2	< 2	< 2	5	13	18	24	28	32	36	39
8000	< 2	< 2	< 2	< 2	< 2	7	12	17	21	25	28
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>19</b>	<b>26</b>	<b>32</b>	<b>37</b>	<b>41</b>	<b>45</b>	<b>48</b>	<b>51</b>	<b>53</b>

$L_{WA}$  value for size 560 (dB(A))

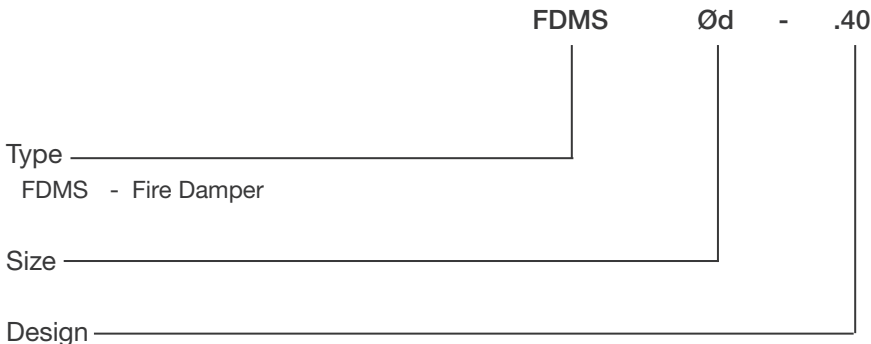
f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	< 2	5	10	13	17	19	22	24	26
125	< 2	< 2	9	15	20	24	28	31	33	36	38
250	< 2	5	14	21	26	31	35	38	41	43	46
500	< 2	6	15	23	29	33	38	41	44	47	50
1000	< 2	3	13	21	27	32	37	41	44	47	50
2000	< 2	< 2	7	15	22	27	32	36	40	43	46
4000	< 2	< 2	< 2	6	14	19	25	29	33	37	40
8000	< 2	< 2	< 2	< 2	< 2	8	13	18	22	26	29
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>20</b>	<b>27</b>	<b>33</b>	<b>38</b>	<b>42</b>	<b>46</b>	<b>49</b>	<b>52</b>	<b>54</b>

$L_{WA}$  value for size 630 (dB(A))

f (Hz)	w (m/s)										
	2	3	4	5	6	7	8	9	10	11	12
63	< 2	< 2	< 2	3	8	12	15	18	20	22	24
125	< 2	< 2	7	13	18	22	26	29	32	34	36
250	< 2	3	12	19	25	29	33	36	39	41	44
500	< 2	4	14	21	27	32	36	39	43	45	48
1000	< 2	< 2	11	19	25	31	35	39	43	45	48
2000	< 2	< 2	5	13	20	26	30	35	39	41	45
4000	< 2	< 2	< 2	5	12	18	23	27	31	35	38
8000	< 2	< 2	< 2	< 2	< 2	6	12	16	21	24	28
<b>Total</b>	<b>&lt; 15</b>	<b>&lt; 15</b>	<b>18</b>	<b>25</b>	<b>31</b>	<b>36</b>	<b>40</b>	<b>44</b>	<b>47</b>	<b>50</b>	<b>53</b>

## 8. Product Marking



### 8.1 Fire dampers FDMS



- .01 - Thermal with mechanical control
- .11 - Thermal with mechanical control and limit switch ("CLOSED")
- .80 - Thermal with mechanical control and two limit switches ("CLOSED" and "OPEN")
- .40 - With actuating mechanism BFL(BFN)230-T (AC 230 V)
- .50 - With actuating mechanism BFL(BFN)24-T (AC/DC 24 V)
- .4V - With actuating mechanism BFL(BFN)230-T, sensor BAT is not mounted on the damper's body, only connected with actuator by cable
- .5V - With actuating mechanism BFL(BFN)230-T, sensor BAT is not mounted on the damper's body, only connected with actuator by cable
- .60 - With actuating mechanism BFL(BFN)24-T-ST and communication unit BKN230-24
- .6V - With actuating mechanism BFL(BFN)230-T, sensor BAT is not mounted on the damper's body, only connected with actuator by cable

Example: FDMS 630-.40

Data label FDMS (placed on the casing of fire damper)


<b>MANDÍK</b> ®		MANDÍK, a.s. Dobříšská 550, 267 24 Hostomice, Czech Republic		 MANUAL
<b>FIRE DAMPER - FDMS</b>				
DIMENSION:		ACTUATING SYSTEM:		
YEAR/SER.NO.:		WEIGHT (kg):		
<b>FIRE PROTEC. CLASS: EI 60 (ve ho i ↔ o) S</b>				
TPM 125/17	Cert. No.: 1391-CPR-2020/0131, DoP: PM/FDMS(FDMS-VAV)/01/20/2		EN 15650:2010	 1391

8.2 Fire dampers FDMS


Type	FDMS-VAV - Fire Damper
Size	Ød - .50 / DM3
Design	.50 - With actuating mechanism GRUNER - 340CTA-024D-XX-S2-V/8F12/ST06/BP8 (AC/DC 24 V) With controller GRUNER - GUAC-DM3 / GUAC-PM3 (AC/DC 24 V)
Controller	DM3 - flow control PM3 - pressure control
Air flow	Vmin/Vmax - values of air flow in v m³/h (control of air flow)

Example: FDMS-VAV 630-.50/DM3 200/800

Data label FDMS-VAV with air flow control GUAC-DM3 (placed on the casing of fire damper)

<b>MANDÍK</b> ® MANDÍK, a.s. Dobříšská 550, 267 24 Hostomice, Czech Republic	
FIRE DAMPER FDMS-VAV	
DIMENSION:	ACT. SYSTEM:
SER. NO.:	WEIGHT (kg):
FIRE PROTECTION CLASS: EI 60 (ve ho i↔o) S	
Cert. 1391-CPR-2020/0131	EN 15650:2010
V <sub>NOM</sub> (m³/hod)	CONTROL VOLTAGE
V <sub>MIN</sub> (m³/hod)	V <sub>MAX</sub> (m³/hod) TPM 125/17
GRUNER type GUAC-DM3+340CTA-024D-03-S2/V, PP Bus 	

Data label FDMS-VAV with pressure control GUAC-PM3 (placed on the casing of fire damper)

<b>MANDÍK</b> ® MANDÍK, a.s. Dobříšská 550, 267 24 Hostomice, Czech Republic	
FIRE DAMPER FDMS-VAV	
DIMENSION:	ACT. SYSTEM:
SER. NO.:	WEIGHT (kg):
FIRE PROTECTION CLASS: EI 60 (ve ho i↔o) S	
Cert. 1391-CPR-2020/0131	EN 15650:2010
P <sub>NOM</sub> (m³/hod)	CONTROL VOLTAGE
P <sub>MIN</sub> (m³/hod)	P <sub>MAX</sub> (m³/hod) TPM 125/17
GRUNER type GUAC-PM3+340CTA-024D-03-S2/V, PP Bus 	

### 9. Placement and Assembly

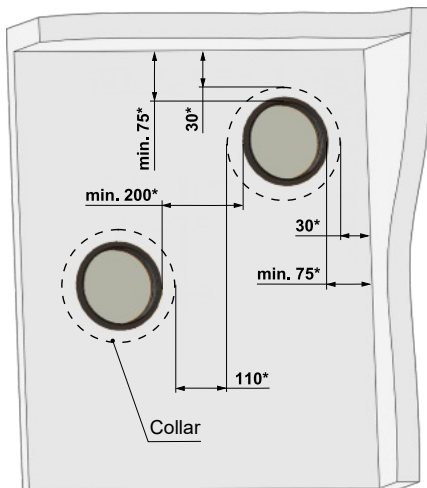
Fire dampers are suitable for installation in arbitrary position in vertical and horizontal passages of fire separating constructions. Damper assembly procedures must be done so as all load transfer from the fire separating constructions to the damper body is absolutely excluded. Back-to-back air-ducting must be hung or supported so as all load transfer from the back-to-back piping to the damper is absolutely excluded. Installation gap must be filled by approved material perfectly in all the installation space volume (installation gap). To be able to provide inspection, inside of the fire damper is the damper with camera inspection hole standardly equipped. For other service works, the external access door (inspection hole) must be installed on the air duct, next to the fire damper.

The distance between the fire damper and the construction (wall, ceiling) must be minimum 75 mm. In case that two or more dampers are supposed to be installed in one fire separating construction, the distance between the adjacent dampers must be at least 200 mm according to EN 1366-2 paragraph 13.6.

The control mechanism has to be protected (covered) against damage and pollution during installation process. All fire dampers has to be closed during installation process. The damper body should not be deformed in the course of bricking in. Once the damper is built in, its blade should not grind on the damper body during opening or closing.

Fire damper FDMS-VAV has the same possibilities of the installation like fire damper FDMS.

#### Position of the dampers in the wall (mm)

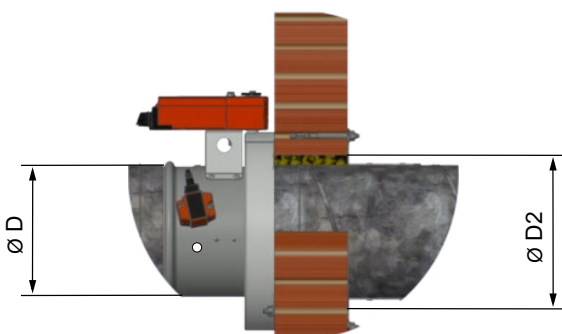


\* Other values - see the installation details for installation flange to flange and next to ceiling or/and wall.

### 10. Installation Opening

The dimensions of installation opening for the connected air duct depends on the type of sealant - see the table.

Fire stopper type	Recommended material	D2 (mm)
Glass fibers	PROMAGLAF: Mat: thick 13 mm, Paper: thick: 6 mm + from outside HILTI: Firestop Acrylic sealant CFS-S ACR or similar	D+28, D+14
Glass fiber fabric	KOBEMAT: Mat: thick 9 mm + from outside HILTI: Firestop Acrylic sealant CFS-S ACR or similar	D+20
Fire resistant sealant	HILTI: Firestop Acrylic sealant CFS-S ACR or similar	D+10
Stone wool	ISOVER: Orstech LSP H thick 20 mm + from outside mastic HILTI: Firestop coating CFS-CT or PROMASTOP-P or K or similar	D+40
Mortar or gypsum	HILTI: Fire mortar CFS-M RG or similar	D+80





## 11. Statement of Installation

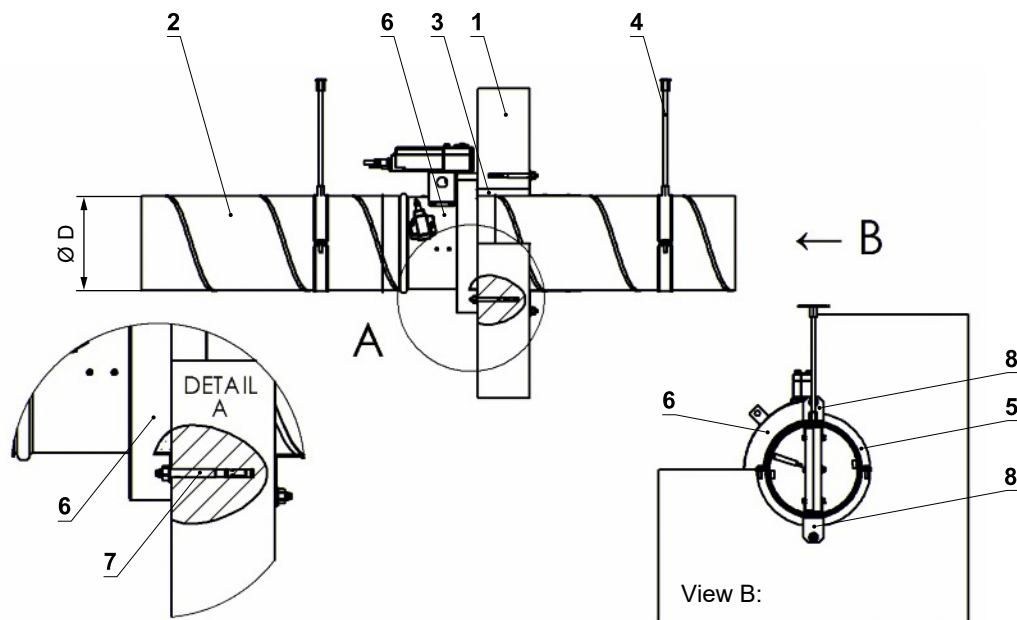
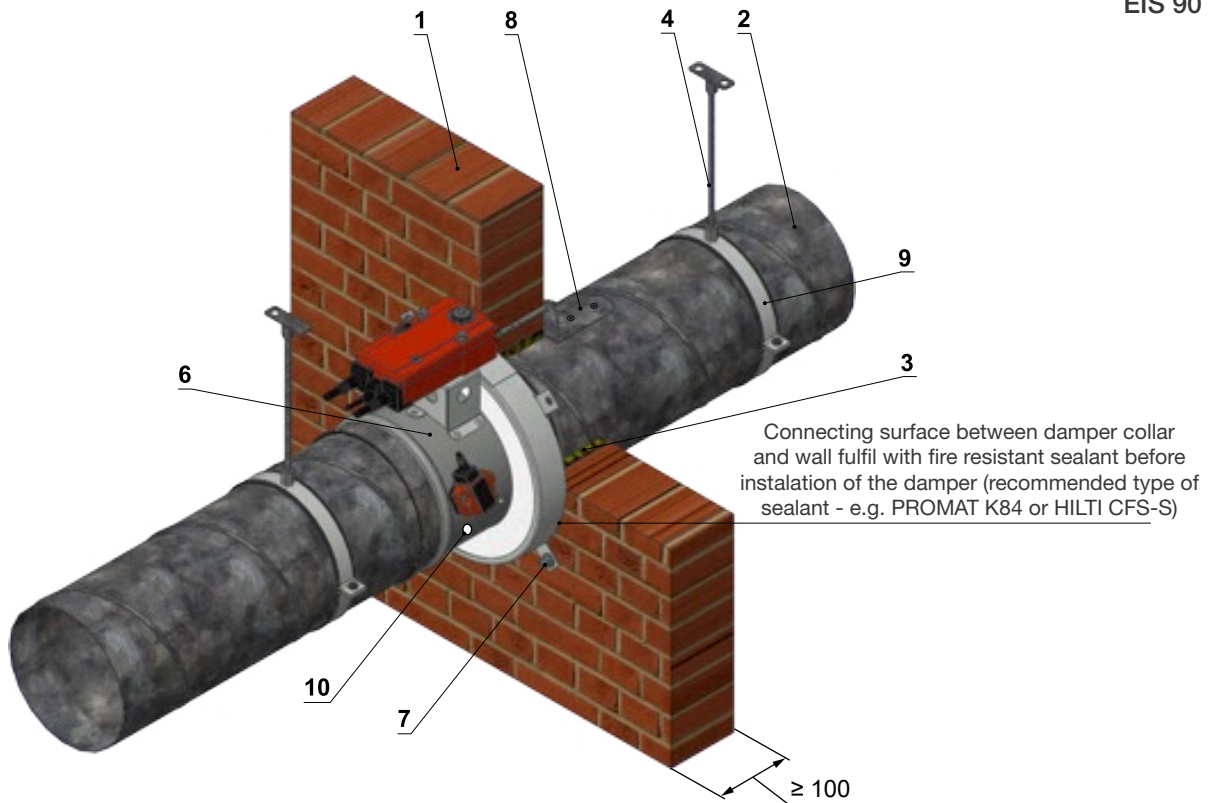
The damper is designed for installation on a wall or intermediate floor for circular air-duct connection.

Construction	Installation in the wall or ceiling	Material of stuffing box
Solid wall construction (t≥100mm)	Dry	Fire resistant sealant or stone wool or glass fiber fabric
Solid wall construction (t≥100mm)	Wet	Mortar or gypsum
Outside solid wall construction with t≥100mm (insulation of the pipe between wall and damper made from stone wool)	Dry	Fire resistant sealant or stone wool or glass fiber fabric
Outside solid wall construction with t≥100mm (insulation of the pipe between wall and damper made from stone wool)	Wet	Mortar or gypsum
Solid ceiling construction 110 - Concrete / 125 - Aerated concrete	Dry	Fire resistant sealant or stone wool or glass fiber fabric
Solid ceiling construction 110 - Concrete / 125 - Aerated concrete	Wet	Mortar or gypsum
Outside solid ceiling construction with 110 - Concrete / 125 - Aerated concrete (insulation of the pipe between wall and damper made from stone wool)	Dry	Fire resistant sealant or stone wool or glass fiber fabric
Outside solid ceiling construction with 110 - Concrete / 125 - Aerated concrete (insulation of the pipe between wall and damper made from stone wool)	Wet	Mortar or gypsum
Gypsum wall construction (t≥100mm)	Dry	Fire resistant sealant or stone wool or glass fiber fabric
Gypsum wall construction (t≥100mm)	Wet	Mortar or gypsum
Outside gypsum wall construction with t≥100mm (insulation of the pipe between wall and damper made from stone wool)	Dry	Fire resistant sealant or stone wool or glass fiber fabric
Outside gypsum wall construction with t≥100mm (insulation of the pipe between wall and damper made from stone wool)	Wet	Mortar or gypsum
Sandwich wall (insulated wall panel) construction	Dry	Fire resistant sealant or stone wool or glass fiber fabric
Outside sandwich wall (insulated wall panel) construction with insulation of the pipe	Dry	Fire resistant sealant or stone wool or glass fiber fabric

## 12. Descriptions of Particular Installations

### Damper on the solid wall

EIS 90

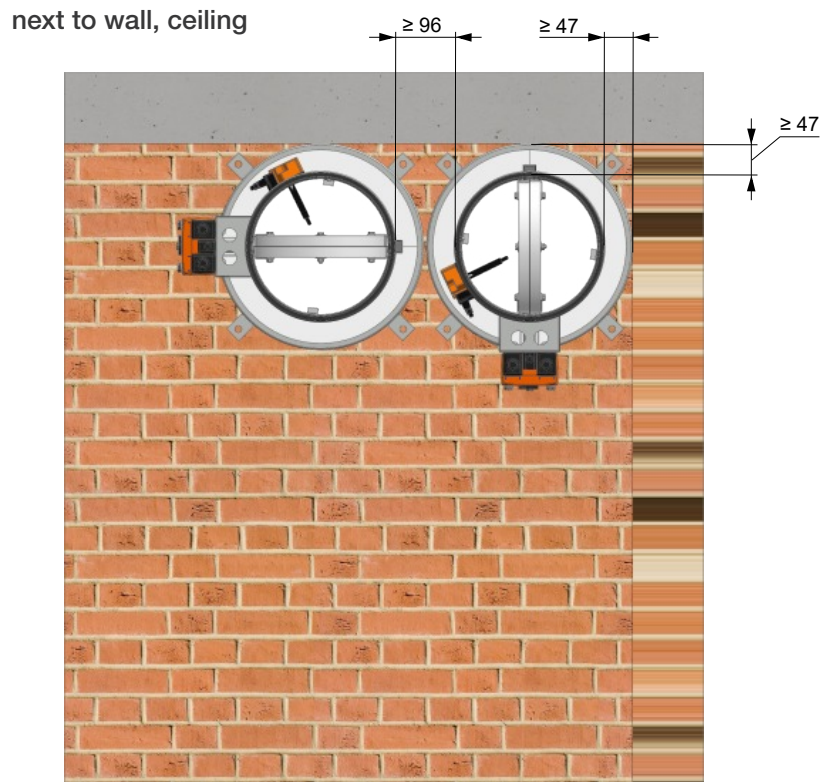


Position:

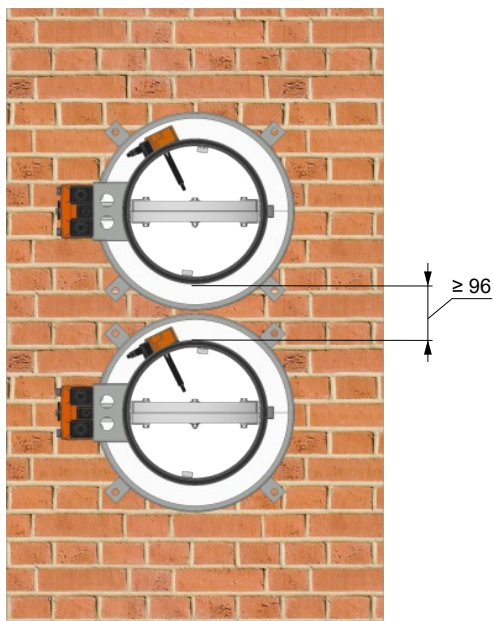
- 1 - Solid wall construction
- 2 - Spiral pipe
- 3 - Fire resistant fill (for recommended materials see separate table)
- 4 - Threaded rod and anchor to the wall (or ceiling) (e.g. threaded rod M8 and anchor type according pipe weight)
- 5 - Fire protection mastic min. thickness 1 mm (e.g. PROMASTOP-P or K)
- 6 - Fire damper FDMS
- 7 - Anchor for damper collar (e.g. FISCHER - type ZYKON FZA M8x30)
- 8 - Fixing part of the pipe between wall and pipe (only recommended)
- 9 - Hanging ring (e.g. FISCHER - type LGS)
- 10 - Inspection hole for camera covered with removable air-tight rubber cap

Damper on the solid wall - flange to flange and installation next to wall, ceiling

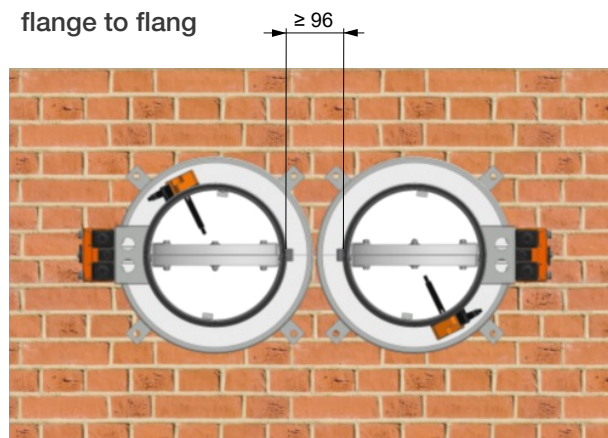
EIS 90



flange to flange



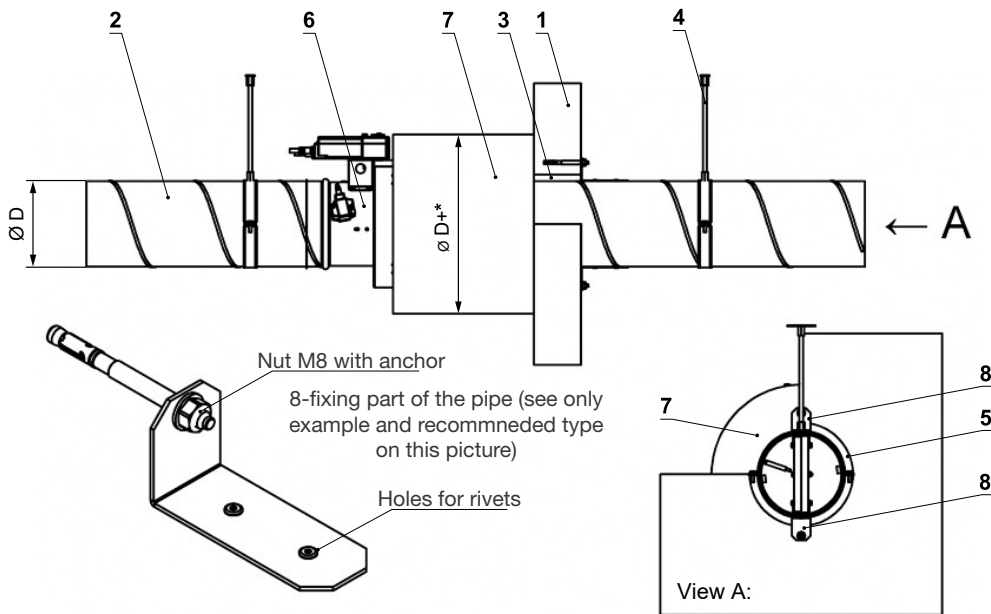
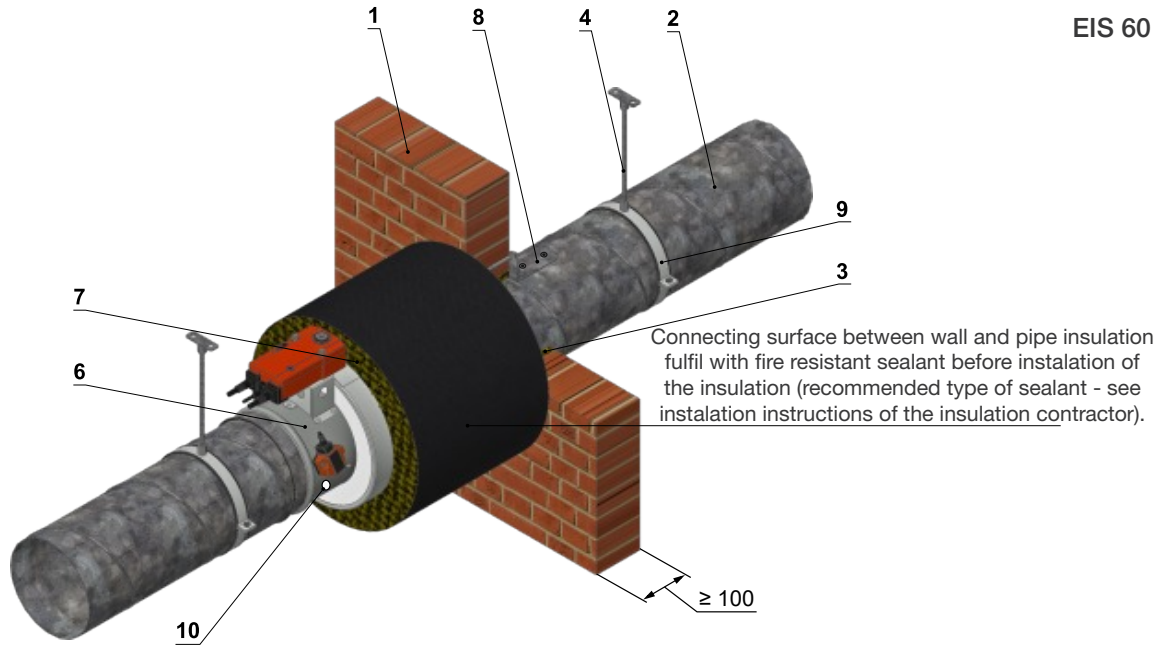
flange to flange



The same installation like on the solid wall and the same materials.

Damper outside the solid wall

EIS 60



\* Material properties:  
ISOVER with min. density 66 kg/m<sup>3</sup>, min. th. 100 mm  
PAROC with min. density 80 kg/m<sup>3</sup>, min. th. 50 mm

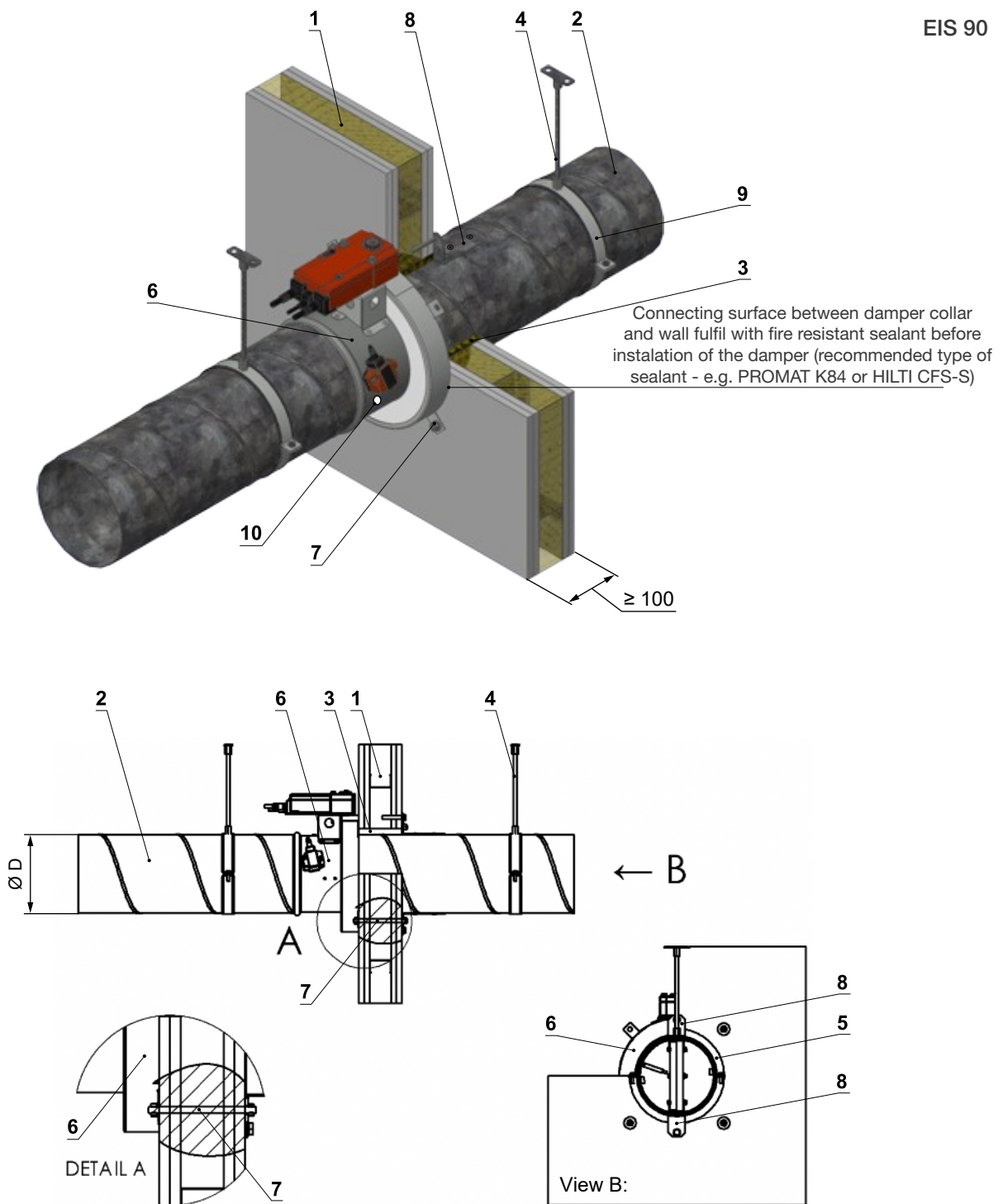
Position:

- 1 - Solid wall construction
- 2 - Spiral pipe
- 3 - Fire resistant fill (for recommended materials see separate table)
- 4 - Threaded rod and anchor to the wall (or ceiling) (e.g. threaded rod M8 and anchor type according pipe weight)
- 5 - Fire protection mastic min. thickness 1 mm (e.g. PROMASTOP-P or K)
- 6 - Fire damper FDMS
- 7 - Pipe insulation with min. fire resistance EI60 (e.g. ISOVER Ulimate protect Wired MAT 4.0 ALU1, PAROC hvac Fire Mat BlackCoat)\*
- 8 - Fixing part of the pipe between wall and pipe (only recommended)
- 9 - Hanging ring (e.g. FISCHER - type LGS)
- 10 - Inspection hole for camera covered with removable air-tight rubber cap

\* Installation of pipe insulation perform according instructions of the manufacturer.

Damper on the gypsum wall

EIS 90



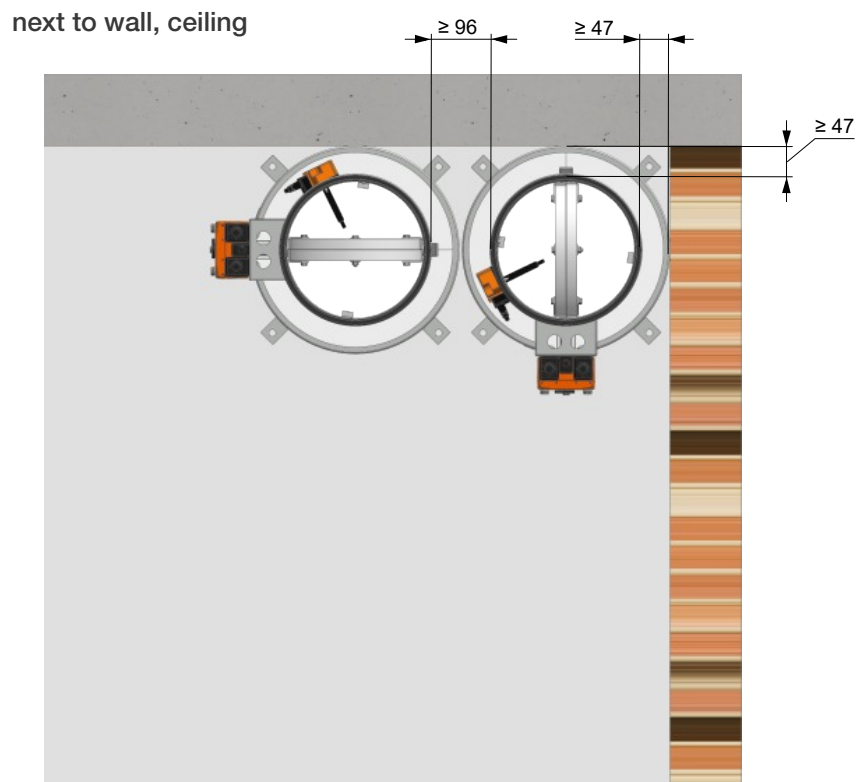
Position:

- 1 - Gypsum wall construction
- 2 - Spiral pipe
- 3 - Fire resistant fill (for recommended materials see separate table)
- 4 - Threaded rod and anchor to the wall (or ceiling) (e.g. threaded rod M8 and anchor type according pipe weight)
- 5 - Fire protection mastic min. thickness 1mm (e.g. PROMASTOP-P or K)
- 6 - Fire damper FDMS
- 7 - Anchor for damper collar (threaded rod and nuts M8 or e.g. anchor FISCHER - type KD8)
- 8 - Fixing part of the pipe between wall and pipe (only recommended)
- 9 - Hanging ring (e.g. FISCHER - type LGS)
- 10 - Inspection hole for camera covered with removable air-tight rubber cap

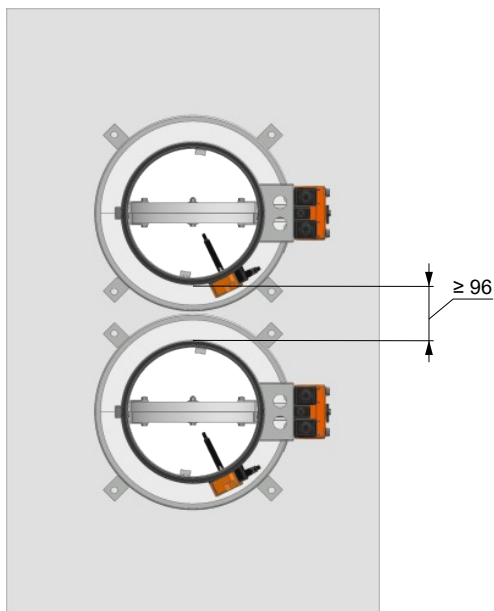


Damper on the gypsum wall - flange to flange and installation next to wall, ceiling

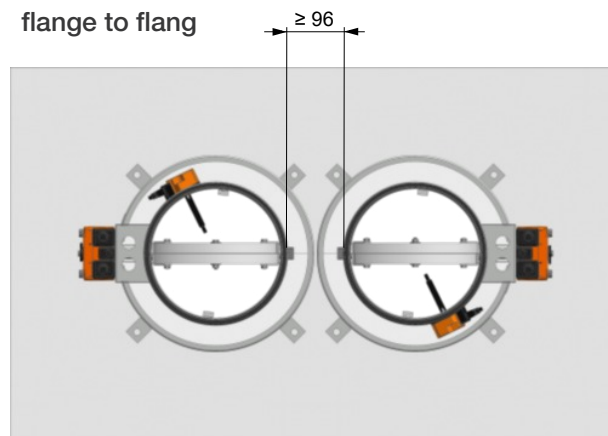
EIS 90



flange to flange



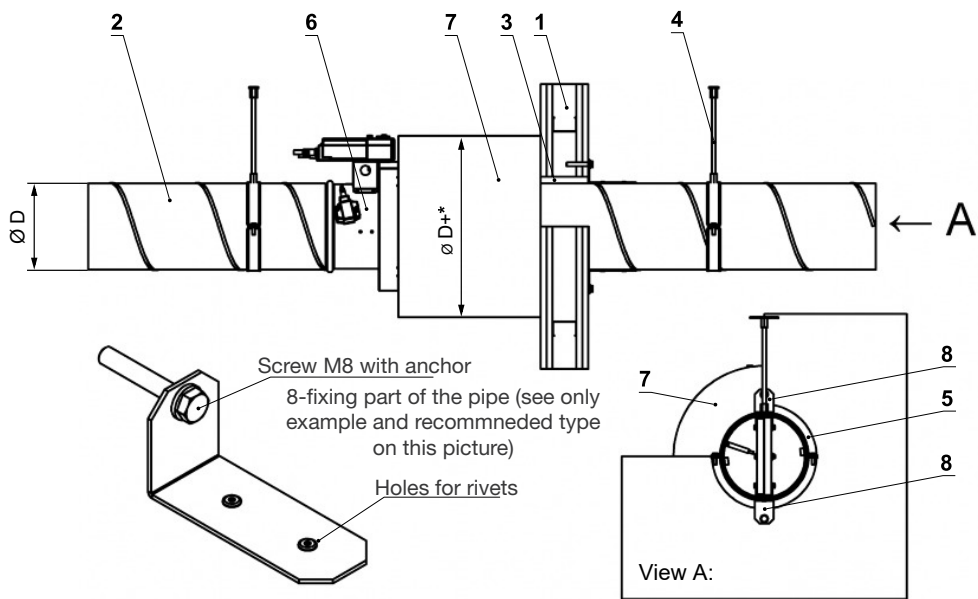
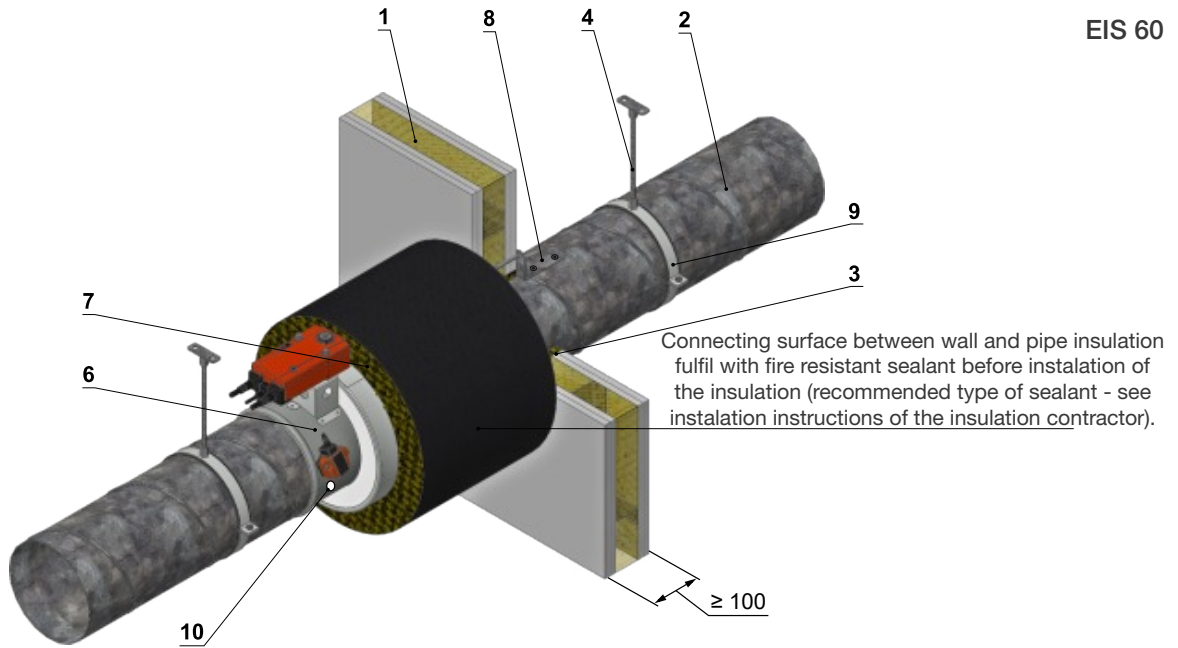
flange to flange



The same installation like on the gypsum wall and the same materials.

Damper outside the gypsum wall

EIS 60



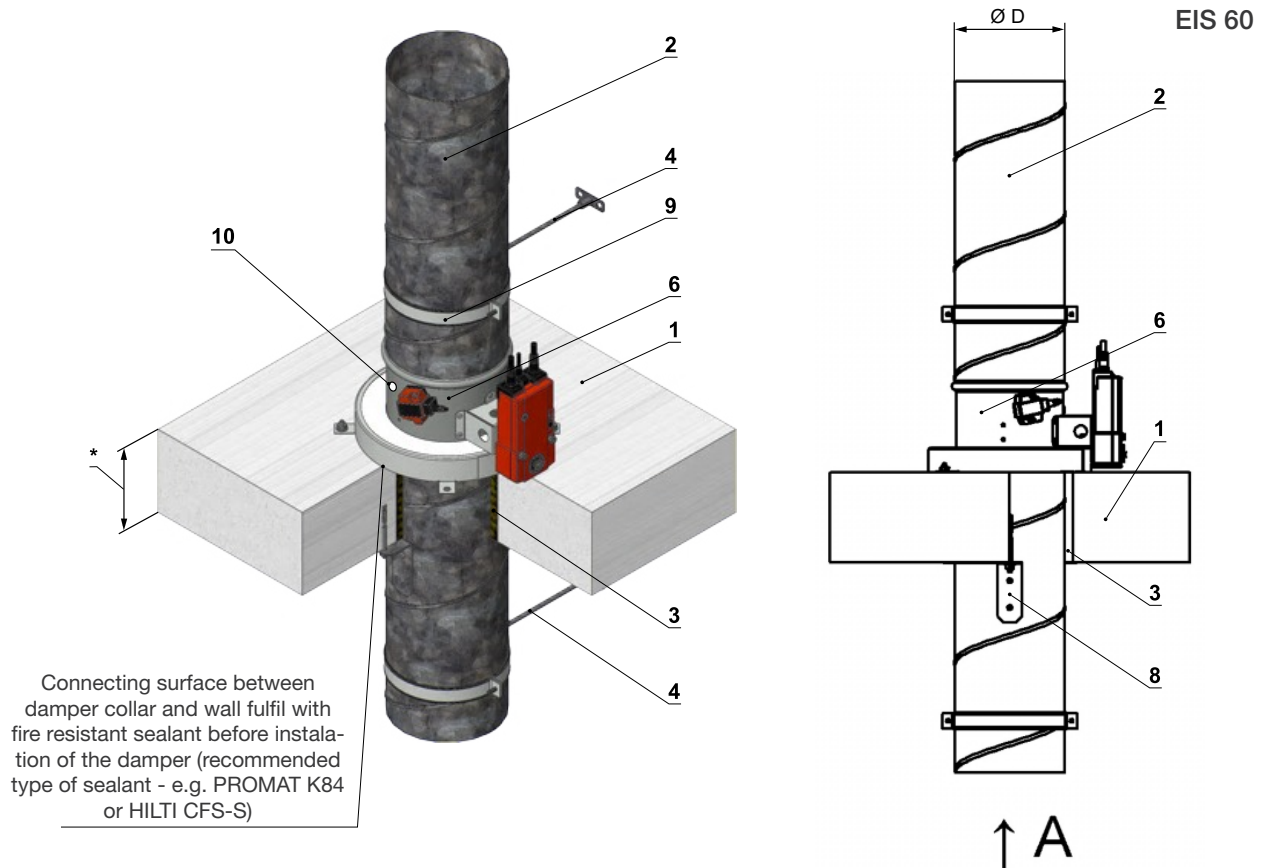
\* Material properties:  
 ISOVER with min. density 66 kg/m<sup>3</sup>, min. th. 100 mm  
 PAROC with min. density 80 kg/m<sup>3</sup>, min. th. 50 mm

Position:

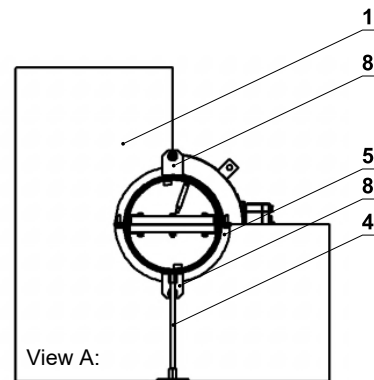
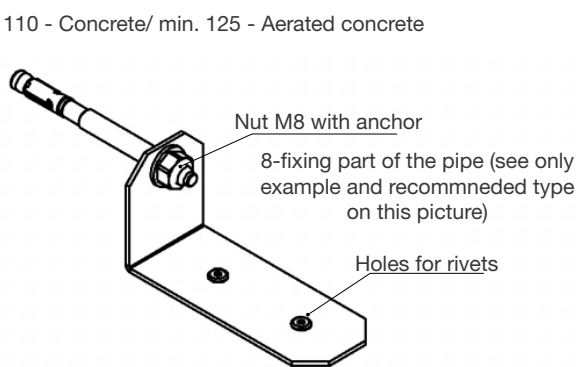
- 1 - Gypsum wall construction
- 2 - Spiral pipe
- 3 - Fire resistant fill (for recommended materials see separate table)
- 4 - Threaded rod and anchor to the wall (or ceiling) (e.g. threaded rod M8 and anchor type according pipe weight)
- 5 - Fire protection mastic min. thickness 1 mm (e.g. PROMASTOP-P or K)
- 6 - Fire damper FDMS
- 7 - Pipe insulation with min. fire resistance EI60 (e.g. ISOVER Ulimat protect Wired MAT 4.0 ALU1, PAROC hvac Fire Mat BlackCoat)\*
- 8 - Fixing part of the pipe between wall and pipe (only recommended)
- 9 - Hanging ring (e.g. FISCHER - type LGS)
- 10 - Inspection hole for camera covered with removable air-tight rubber cap

\* Installation of pipe insulation perform according instructions of the manufacturer.

Damper on the concrete ceiling construction



\* min. 110 - Concrete/ min. 125 - Aerated concrete



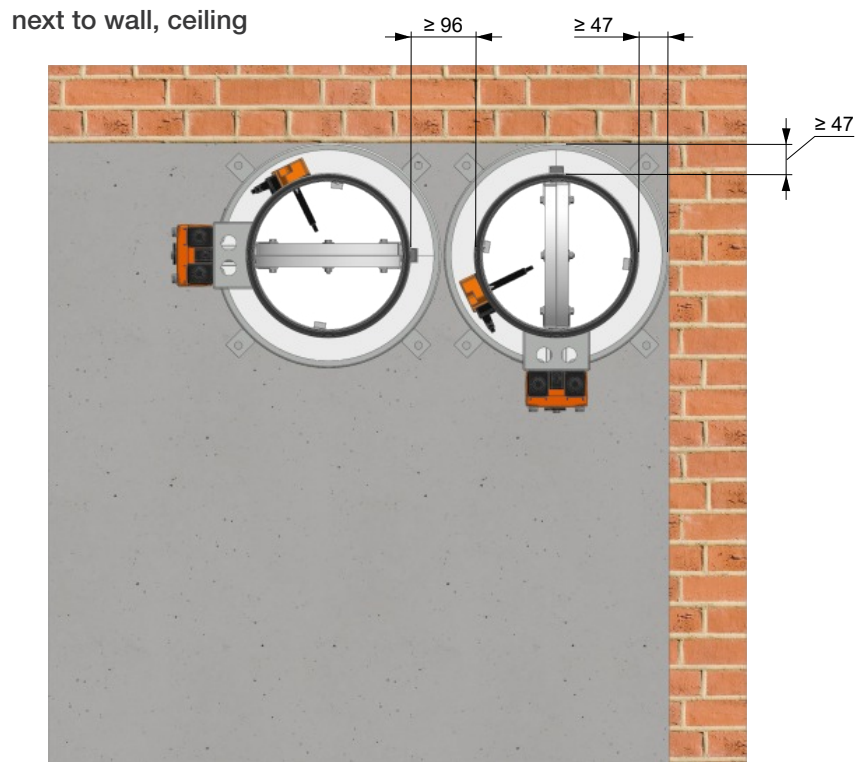
Position:

- 1 - Solid ceiling construction
- 2 - Spiral pipe
- 3 - Fire resistant fill (for recommended materials see separate table)
- 4 - Threaded rod and anchor to the wall (or ceiling) (e.g. threaded rod M8 and anchor type according pipe weight)
- 5 - Fire protection mastic min. thickness 1mm (e.g. PROMASTOP-P or K)
- 6 - Fire damper FDMS
- 7 - Anchor for damper collar (e.g. FISCHER - type ZYKON FZA M8×30)
- 8 - Fixing part of the pipe between wall and pipe (only recommended)
- 9 - Hanging ring (e.g. FISCHER - type LGS)
- 10 - Inspection hole for camera covered with removable air-tight rubber cap

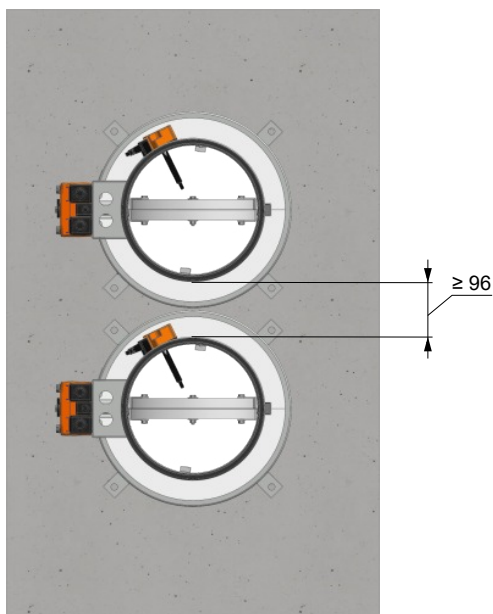


Damper on the concrete ceiling construction - flange to flange and installation next to wall, ceiling

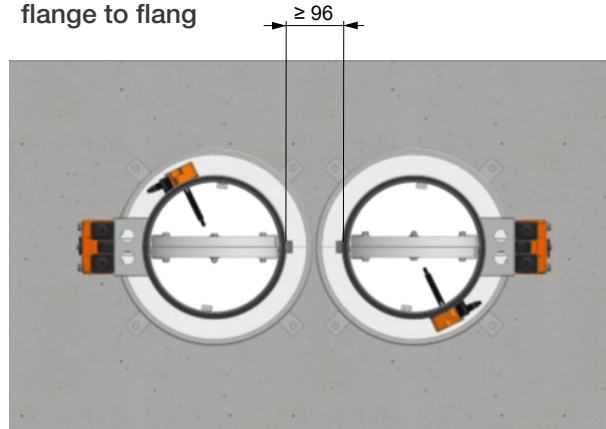
EIS 60



flange to flange

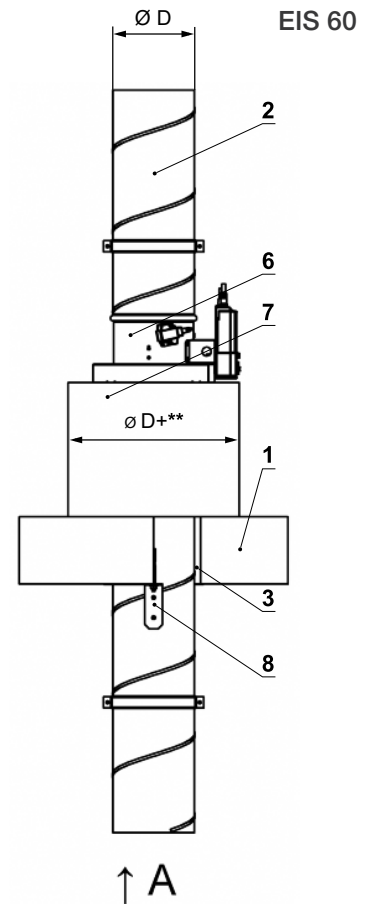
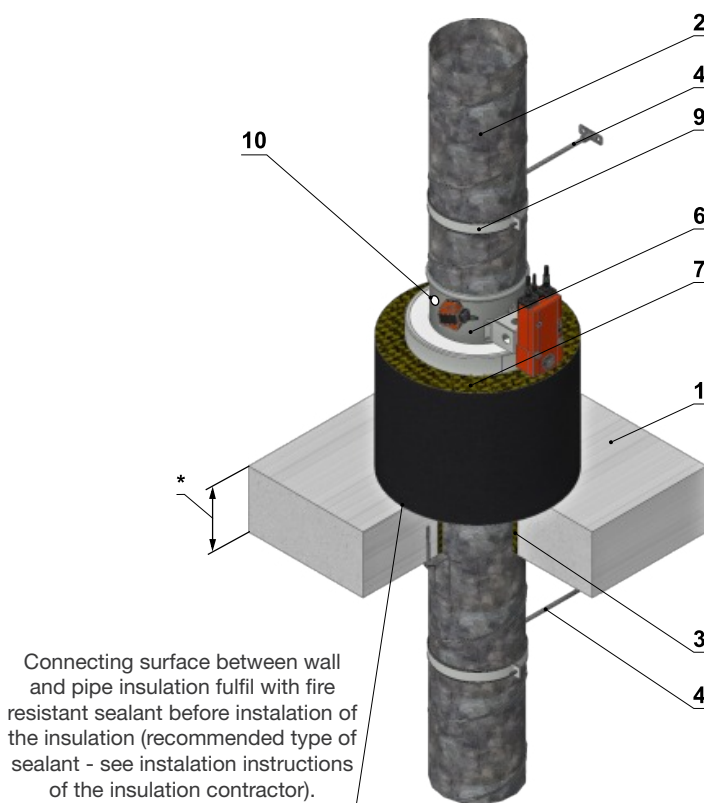


flange to flange

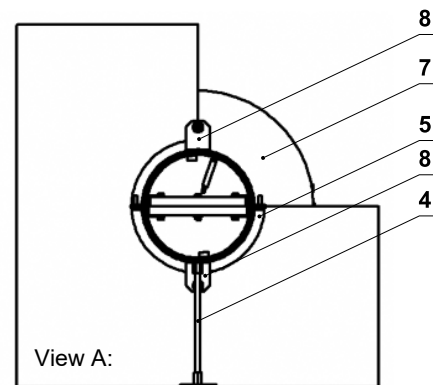
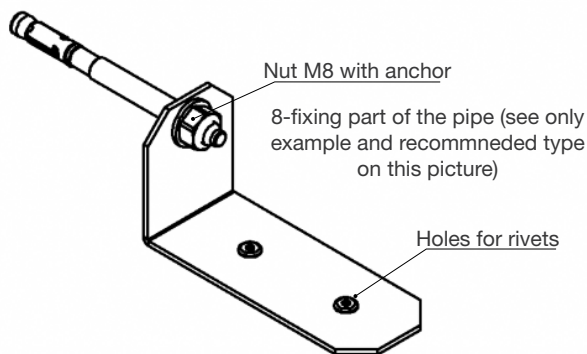


The same installation like on the ceiling wall and the same materials.

Damper outside the concrete ceiling construction



\* min. 110 - Concrete/ min. 125 - Aerated concrete



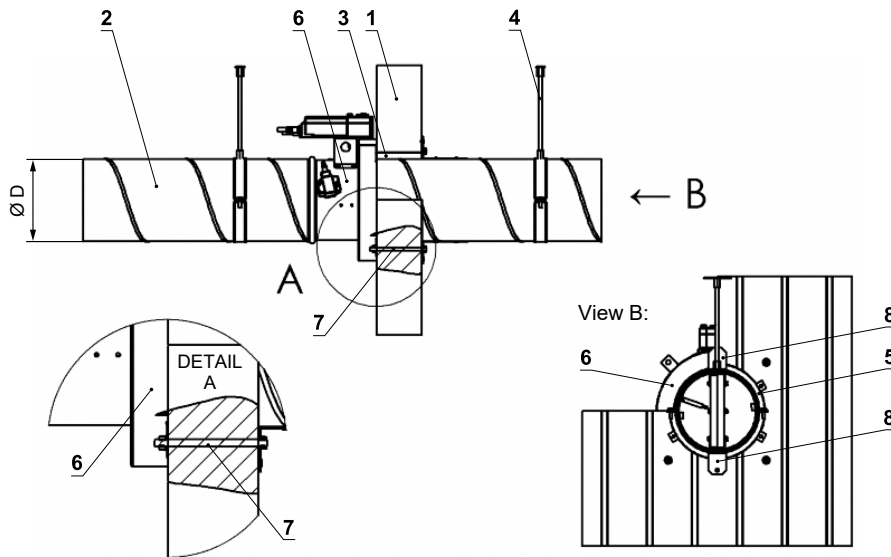
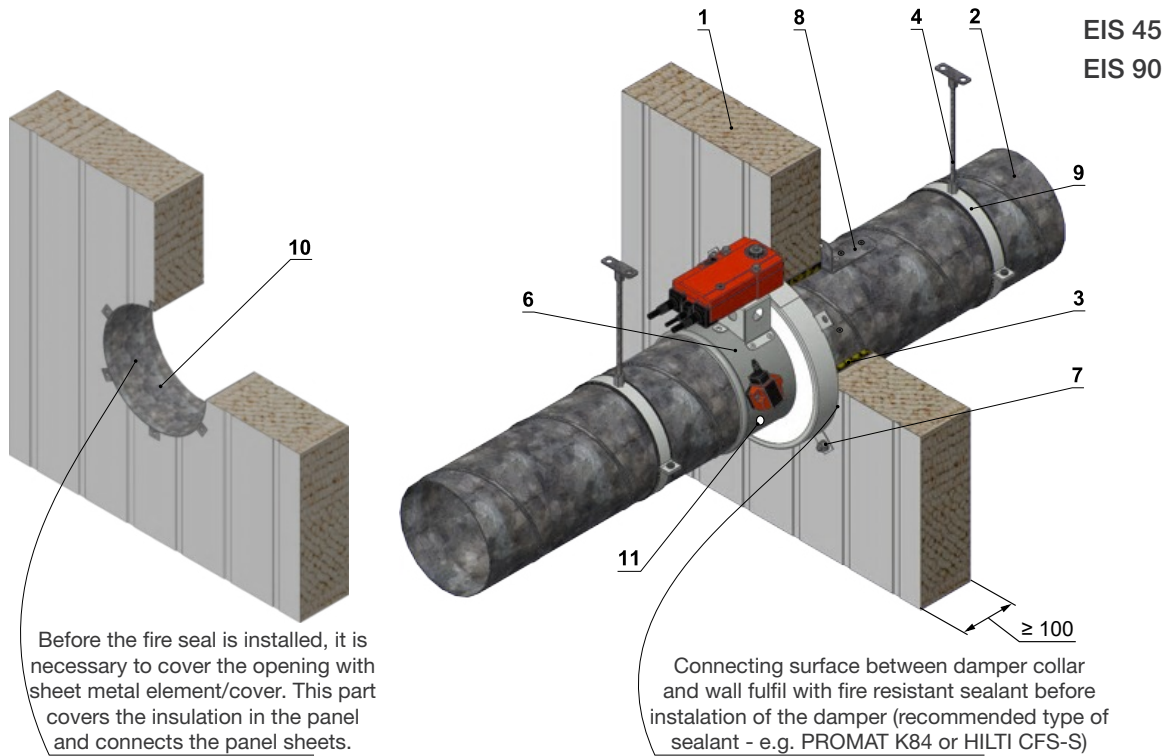
\*\* Material properties:  
ISOVER with min. density 66 kg/m<sup>3</sup>, min. th. 100 mm  
PAROC with min. density 80 kg/m<sup>3</sup>, min. th. 50 mm

Position:

- 1 - Solid ceiling construction
- 2 - Spiral pipe
- 3 - Fire resistant fill (for recommended materials see separate table)
- 4 - Threaded rod and anchor to the wall (or ceiling) (e.g. threaded rod M8 and anchor type according pipe weight)
- 5 - Fire protection mastic min. thickness 1 mm (e.g. PROMASTOP-P or K)
- 6 - Fire damper FDMS
- 7 - Pipe insulation with min. fire resistance EI60 (e.g. ISOVER Ulimat protect Wired MAT 4.0 ALU1, PAROC hvac Fire Mat BlackCoat)\*
- 8 - Fixing part of the pipe between wall and pipe (only recommended)
- 9 - Hanging ring (e.g. FISCHER - type LGS)
- 10 - Inspection hole for camera covered with removable air-tight rubber cap

\*\* Installation of pipe insulation perform according instructions of the manufacturer.

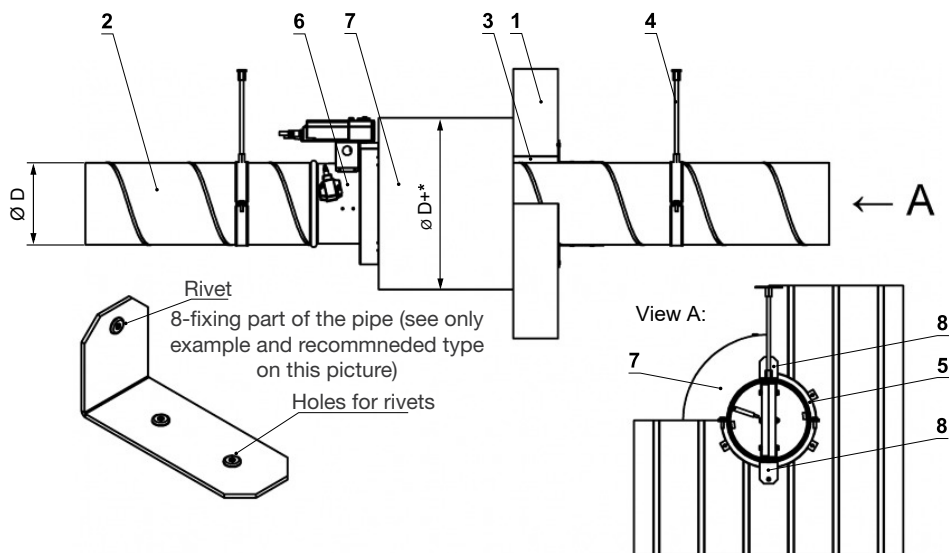
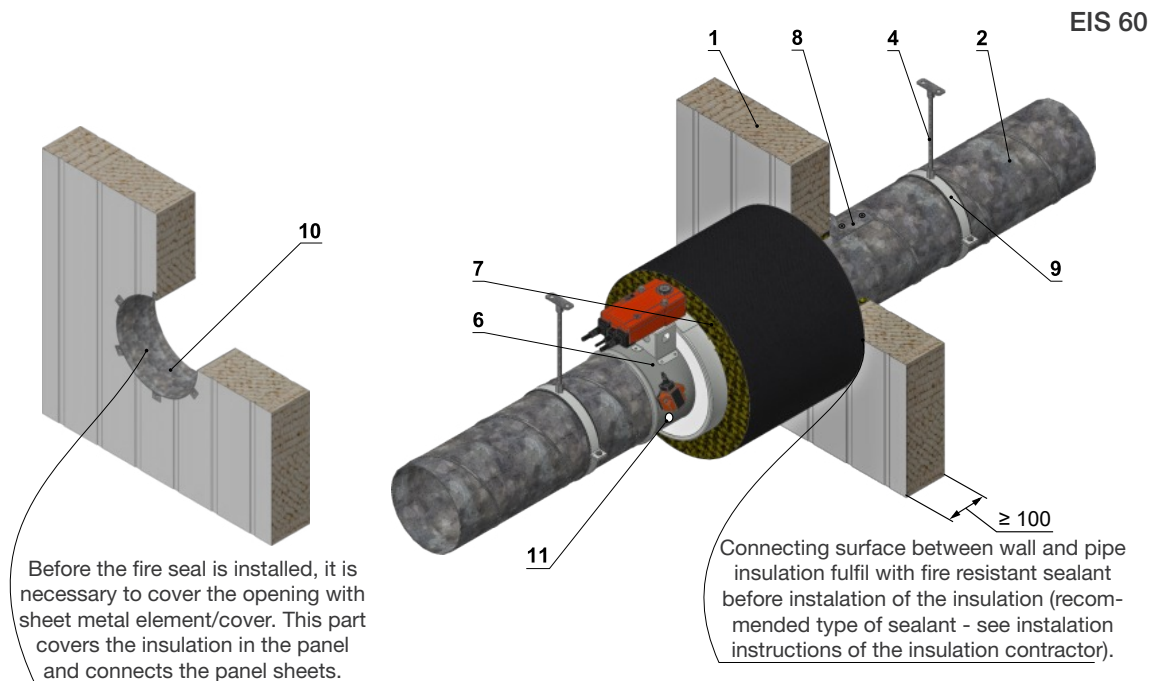
Damper on the insulated wall panels



Position:

- 1 - Insulated wall construction (e.g. KINGSPAN - type KS1150 FR)
- 2 - Spiral pipe
- 3 - Fire resistant fill (for recommended materials see separate table)
- 4 - Threaded rod and anchor to the wall (or ceiling) (e.g. threaded rod M8 and anchor type according pipe weight)
- 5 - Fire protection mastic min. thickness 1mm (e.g. PROMASTOP-P or K)
- 6 - Fire damper FDMS
- 7 - Anchor for damper collar (threaded rod and nuts M8)
- 8 - Fixing part of the pipe between wall and pipe (only recommended)
- 9 - Hanging ring (e.g. FISCHER - type LGS)
- 10 - Permeation shielding (sheet metal element is not included in supply of manufacturer)
- 11 - Inspection hole for camera covered with removable air-tight rubber cap

Damper outside the insulated wall panels



\* Material properties:  
ISOVER with min. density 66 kg/m<sup>3</sup>, min. th. 100 mm  
PAROC with min. density 80 kg/m<sup>3</sup>, min. th. 50 mm

Position:

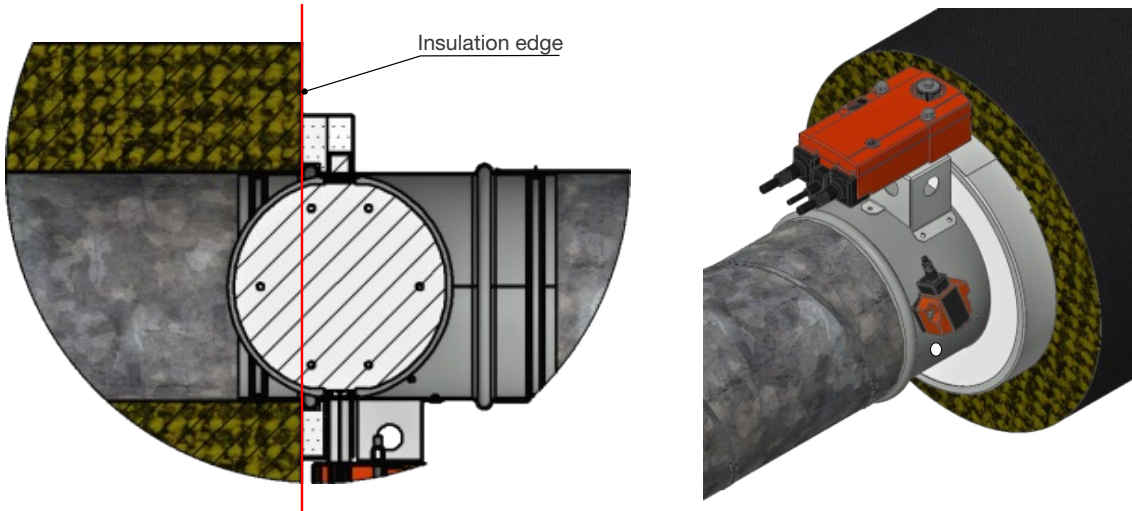
- 1 - Insulated wall construction (e.g. KINGSPAN - type KS1150 FR)
- 2 - Spiral pipe
- 3 - Fire resistant fill (for recommended materials see separate table)
- 4 - Threaded rod and anchor to the wall (or ceiling) (e.g. threaded rod M8 and anchor type according pipe weight)
- 5 - Fire protection mastic min. thickness 1 mm (e.g. PROMASTOP-P or K)
- 6 - Fire damper FDMS
- 7 - Pipe insulation with min. fire resistance EI60 (e.g. ISOVER Ulimat protect Wired MAT 4.0 ALU1, PAROC hvac Fire Mat BlackCoat)\*
- 8 - Fixing part of the pipe between wall and pipe (only recommended)
- 9 - Hanging ring (e.g. FISCHER - type LGS)
- 10 - Permeation shielding (sheet metal element is not included in supply of manufacturer)
- 11 - Inspection hole for camera covered with removable air-tight rubber cap

\* Installation of pipe insulation perform according instructions of the manufacturer.



Connecting points between air duct insulation and damper collar

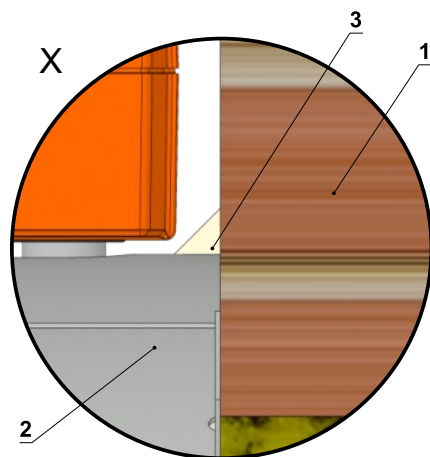
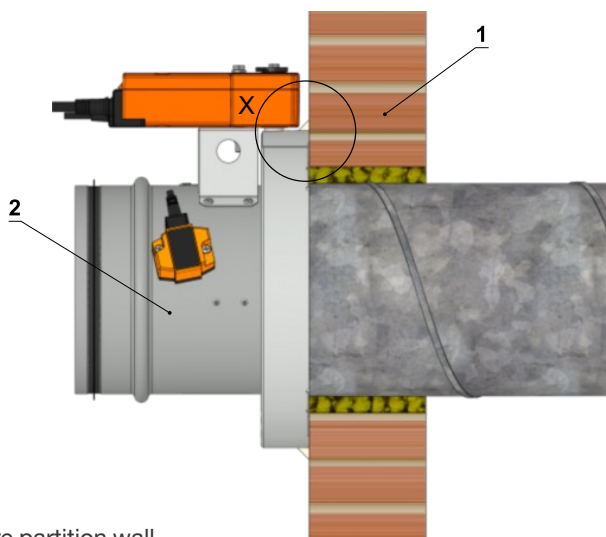
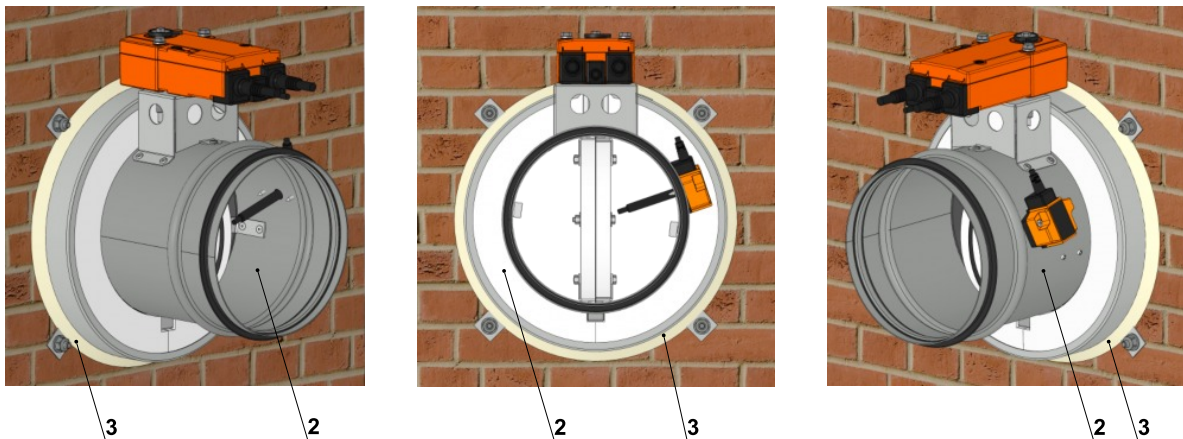
The insulation of the air duct must cover the damper collar from back side.



Substituted method of sealing instead of sealing between the collar and the wall

Substituted method of sealing around collar, sealing joint between FDMS and wall

Leaks and joints are sealed with Hilti CFS-S ACR fire sealant.



Position:

- 1 - Fire partition wall
- 2 - Fire damper FDMS
- 3 - Hilti CFS-S ACR fire sealant

### 13. Inspection, Testing

The appliance is constructed and preset by the manufacturer, its operation is dependent on proper installation and adjustment.

### 14. Transport and Storage

Dampers are transported on trucks, on transport palettes or boxes, so that the fire dampers are protected from direct water impact. During transportation, handling and installation processes. The ambient temperature must not exceed +40°C. During transport, the damper blade must be in CLOSE position. Dampers are stored indoor in environment without any aggressive vapors, gases or dust. Indoor temperature must be in the range from -30 °C to +40 °C and maximum relative humidity 95 % (avoid condensation on the damper body). Dampers must be protected against mechanic damages when transported and manipulated.

### 15. Assembly, Attendance, Maintenance and Revisions

All effective safety standards and directives must be observed during fire damper assembly. To ensure reliable fire damper function it is necessary to avoid blocking the closing mechanism and contact surfaces with collected dust, fiber and sticky materials and solvents. Assembly, maintenance and damper function check can be done only by qualified and trained person, i.e. "AUTHORIZED PERSON" according to the manufacturer documentation. All works done on the fire dampers must be done according international and local norms and laws.

### 16. Entry Into Service and Revisions

Before entering the dampers into operation after their assembly and by sequential checks, the following checks must be carried out. Visual inspection of proper damper integration, inside damper area, damper blade, contact surfaces and silicon sealing. Check of thermal protective fuse and closing mechanism. Check the closing function of the damper blade. This can be done by removing of thermal fuse from damper body.

Before entering the dampers with actuating mechanism into operation after their assembly and by sequential checks. Check of blade displacement into the breakdown position „CLOSED” can be done after cutting off the actuating mechanism supply (e.g. by pressing the RESET button at the thermoelectrical starting mechanism BAT or cutting off the supply from ELECTRICAL FIRE SIGNALISATION). Check of blade displacement back into the „OPEN” position can be done after restoration of power supply (e.g. by releasing the RESET button or restoration of supply from ELECTRICAL FIRE SIGNALISATION).

Without power supply, the damper can be operated manually and fixed in any required position. Release of the locking mechanism can be achieved manually or automatically by applying the supply voltage. It is recommended to provide periodical checks, maintenance and service actions on Fire Equipment by Authorized persons. The authorized persons can be trained by Producer, or by authorized Distributor. All effective safety standards and directives must be observed during fire damper assembly.

For regular or exceptional inspection of interior of fire damper, micro-camera device can be used. On each fire damper is inspection hole. In the case of inspection by camera, take out the black rubber cap, insert the camera inside the damper, check interior and at the end of inspection, put the rubber cap back tightly to cover the empty hole.



### ETS NORD AS

Address: Peterburi tee 53  
11415 Tallinn  
Estonia

Phone: +372 680 7360

info@etsnord.ee  
www.etsnord.ee

### ETS NORD Finland

Address: Pakkasraitti 4  
04360 Tuusula  
Finland

Phone: +358 40 184 2842

info@etsnord.fi  
www.etsnord.fi

### ETS NORD Sweden

Address: Järsjögatan 7  
692 35 Kumla  
Sweden

Phone: +46 19 554 20 50

Address: Pinjegatan 5  
213 63 Malmö  
Sweden

Phone: +46 40 94 68 70

Address: Förrådsvägen 5  
151 58 Södertälje  
Sweden

Phone: +46 8 550 301 40

info@etsnord.se  
www.etsnord.se

### ETS NORD International

info@etsnord.com  
www.etsnord.com



*Let's move the air together!*