

GENERAL INFORMATION

Description

- 1.1.** Fire dampers are shutters in duct systems of air-conditioning devices that prevent spreading the fire and combustion products from one fire segment to the other one by means of closing the air duct in the points of fire separating constructions.

Dampers blade automatically closes air duct using a shutting spring.

The damper is sealed with a plastic foam packing against smoke penetration after closing the blade. At the same time, the damper blade is bedded in a material which enlarges its capacity and air-proofs the air duct.

Fire damper can be directly equipped with a dish valve in both combinations - exhaust and supply.

CFDM



CFDM-V with supply and exhaust dish valve



- 1.2.** Damper characteristics

- CE certified acc. to EN 15650
- Tested in accordance with EN 1366-2
- Classified acc. to EN 13501-3+A1
- Fire resistance EIS 120, EIS 90, EIS 60
- Internal leakage class 2 acc. to EN 1751, external leakage is equal to ducting system
- Corrosion resistant acc. to EN 15650
- ES Certificate No. 1391-CPR-2018/0129
- Declaration of Performance No. PM/CFDM/01/16/1

- 1.3.** Working conditions

Exact damper function is provided under the following conditions:

- a) Maximum air circulation speed: 12 m.s⁻¹
Maximum pressure difference: 1500 Pa
- b) The air circulation in the whole damper section must be secured as steady on whole surface.

Operation of the damper does not depend on the direction of air circulation. The dampers can be located in an arbitrary position.

Dampers are suitable for ventilation systems, where air does not content any abrasive, chemical or adhesive particles.

Dampers are designed for macroclimatic areas with mild climate according to EN 60 721-3-3. Temperature in the place of installation is permitted to range from -30°C to +50°C.

Damper design

2.1. Design with mechanical control

Design .01

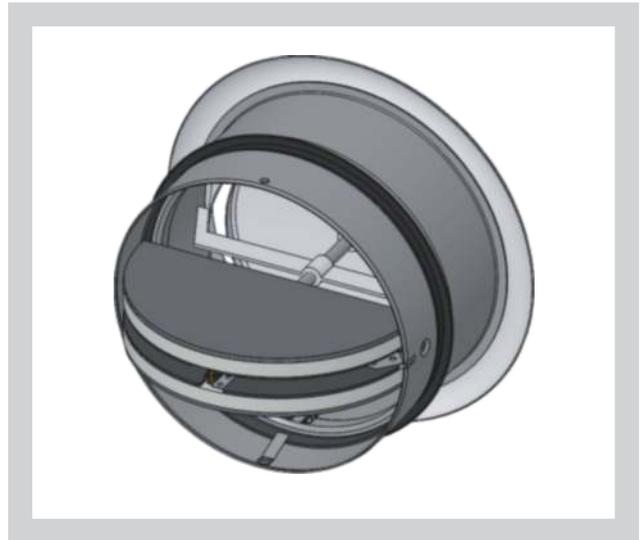
Design with mechanical control with a thermal protective fuse (inner mechanical control) which actuates the shutting device within 120 seconds at latest after the nominal start temperature 72°C has been reached. Automatic initiation of the shutting device is not activated if the temperature does not exceed 70°C.

By CFDM the design .01 with mechanical control can be equipped by one or two limit switches signalling position of the damper blade "CLOSED". But in the case of the CFDM-V there is no place to lead cables of the limit switches out of the duct - the dish valve is in the way.

CFDM



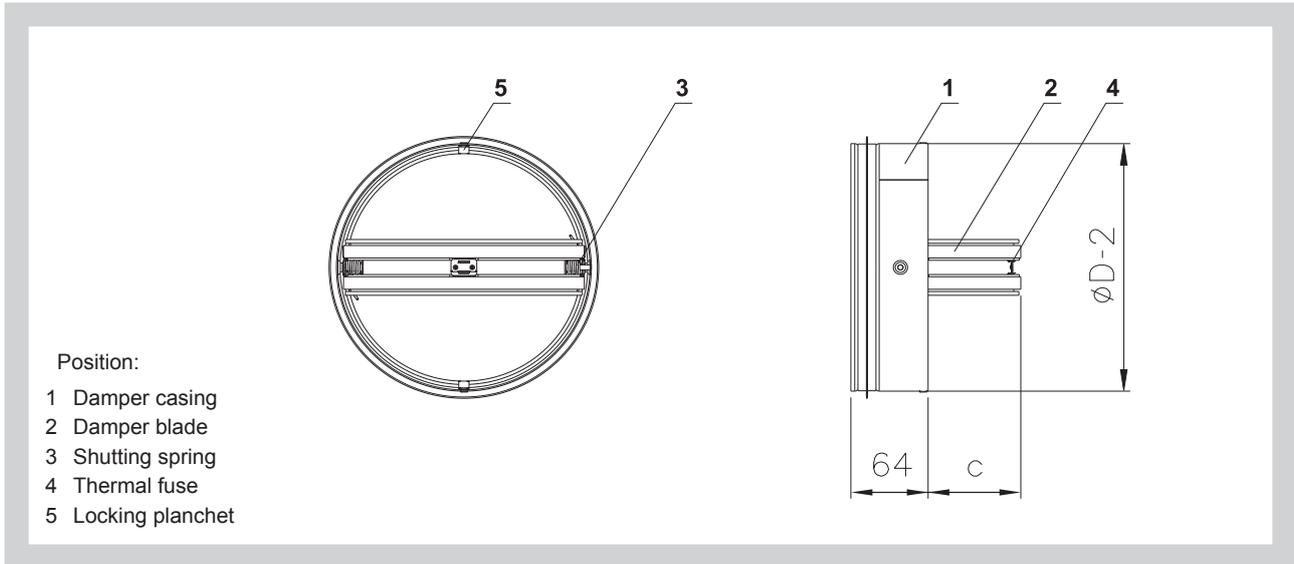
CFDM-V with dish valve



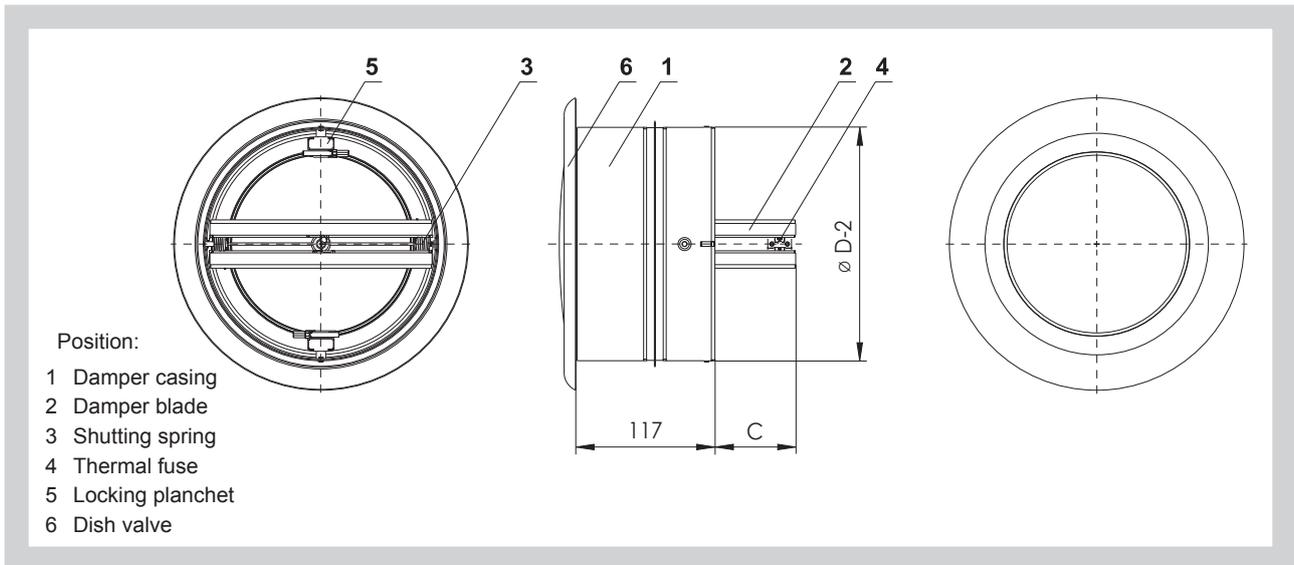
Dimensions, weights

3.1. Dimensions

CFDM



CFDM-V with dish valve



3.2. Weights and effective area CFDM / CFDM-V

Tab. 3.2.1. Weights and effective area CFDM / CFDM-V

Size $\varnothing D$ [mm]	Weight CFDM [kg]	Weight CFDM-V * [kg]	Weight TVPM [kg]	Weight TVOM [kg]	Effective area S_{ef} [m ²]	Blade overlap "c" [mm]
100	0,3	0,45	0,19	0,17	0,0030	17,5
125	0,4	0,58	0,27	0,23	0,0060	30,2
160	0,55	0,79	0,42	0,38	0,0119	48
200	0,75	1	0,59	0,51	0,0209	68

* It is necessary to add the weight of selected dish valve to the CFDM-V (TVPM or TVOM).

Placement and assembly

- 4.1. Fire dampers are suitable for installation in arbitrary position in vertical and horizontal passages of fire separating constructions. Duct assembly procedures must be done so as all load transfer from the fire separating constructions to the duct in the placement of fire damper installation is absolutely excluded. Installation gap must be filled by approved material perfectly in all the installation space volume (installation gap).

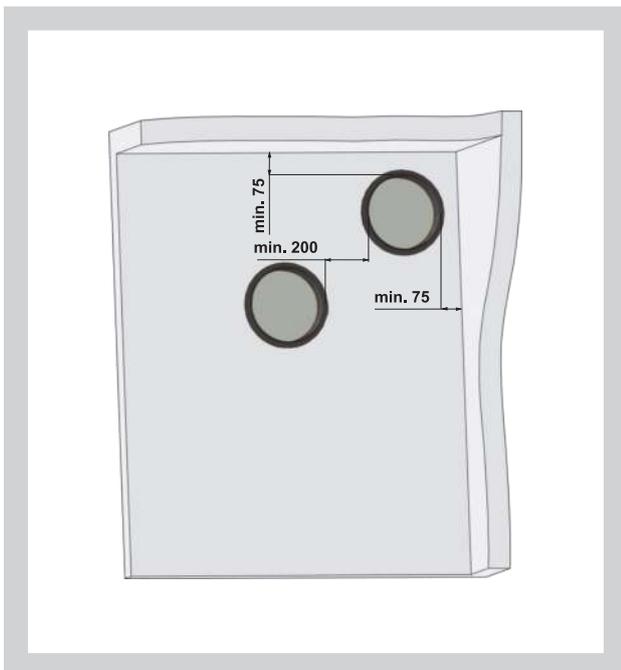
To provide needed access space to the control device, all other objects must be situated at least 350 mm from the control parts of the damper. Inspection hole must be accessible.

Notice: Damper has to be accessible for regular checks and maintenance.

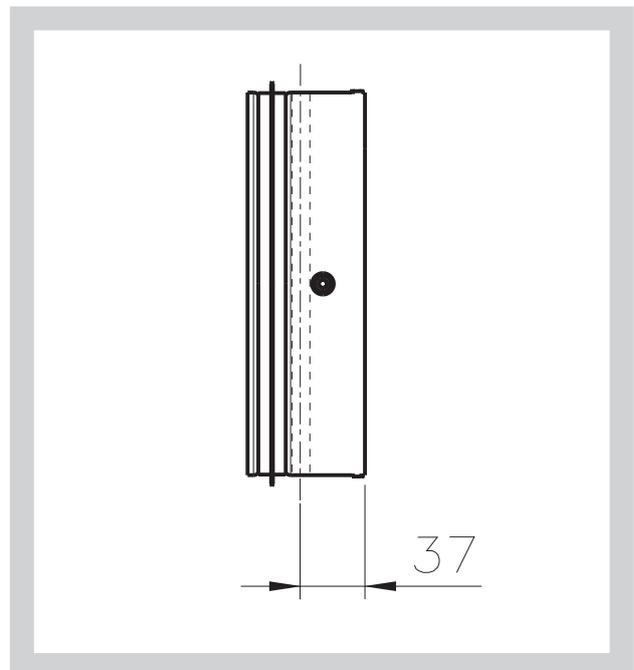
Fire damper is inserted inside the duct. Blade has to be inside of fire separating construction (after closing).

The distance between the fire damper and the construction (wall, ceiling) must be at least 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 13.5.

Construction

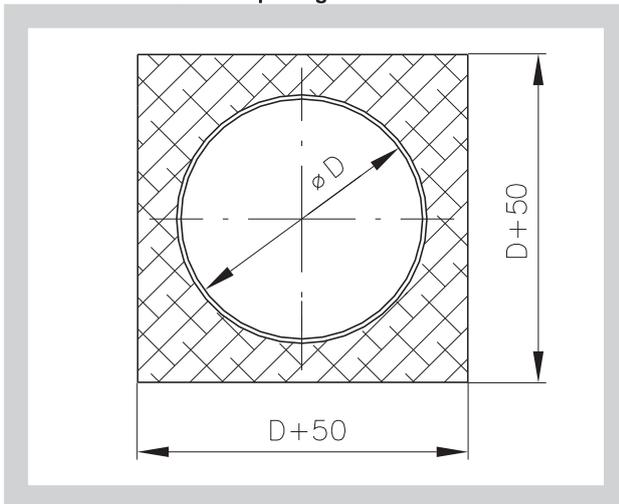


Blade axis

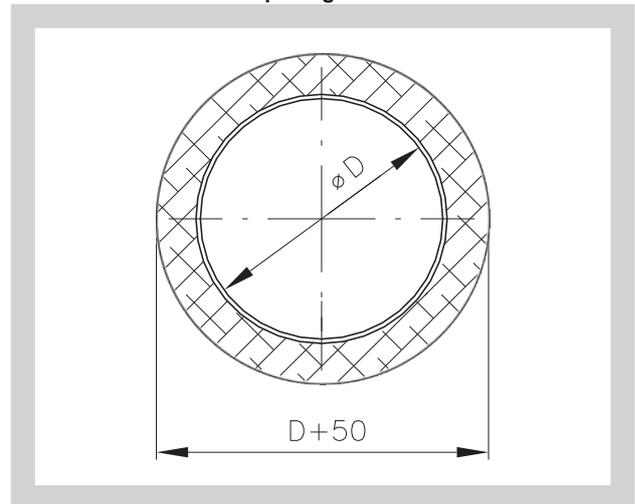


4.2. Installation opening dimensions

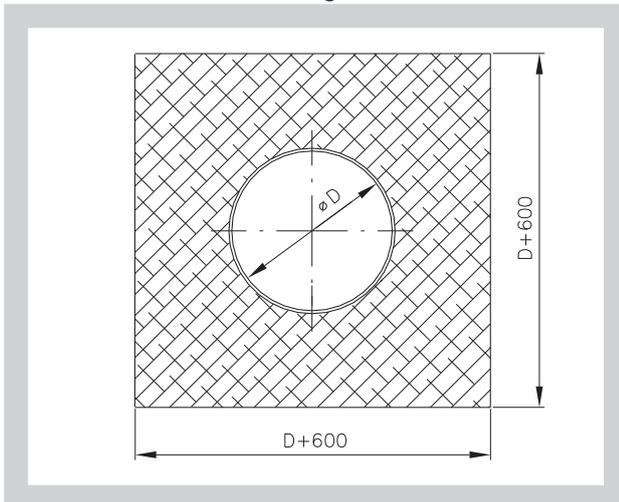
Installation opening



Installation opening



Installation opening - mineral wool boards with fire resistant coating



4.3. Examples of fire damper installing

The fire damper can be integrated into a solid wall construction made e.g. of normal concrete/ masonry, porous concrete with minimum thickness 100 mm or into solid ceiling construction made e.g. of normal concrete with minimum thickness 110 mm or porous concrete with minimum thickness 125 mm.

The fire damper can be integrated into a gypsum wall construction with fire classification EI 120 or EI 90.

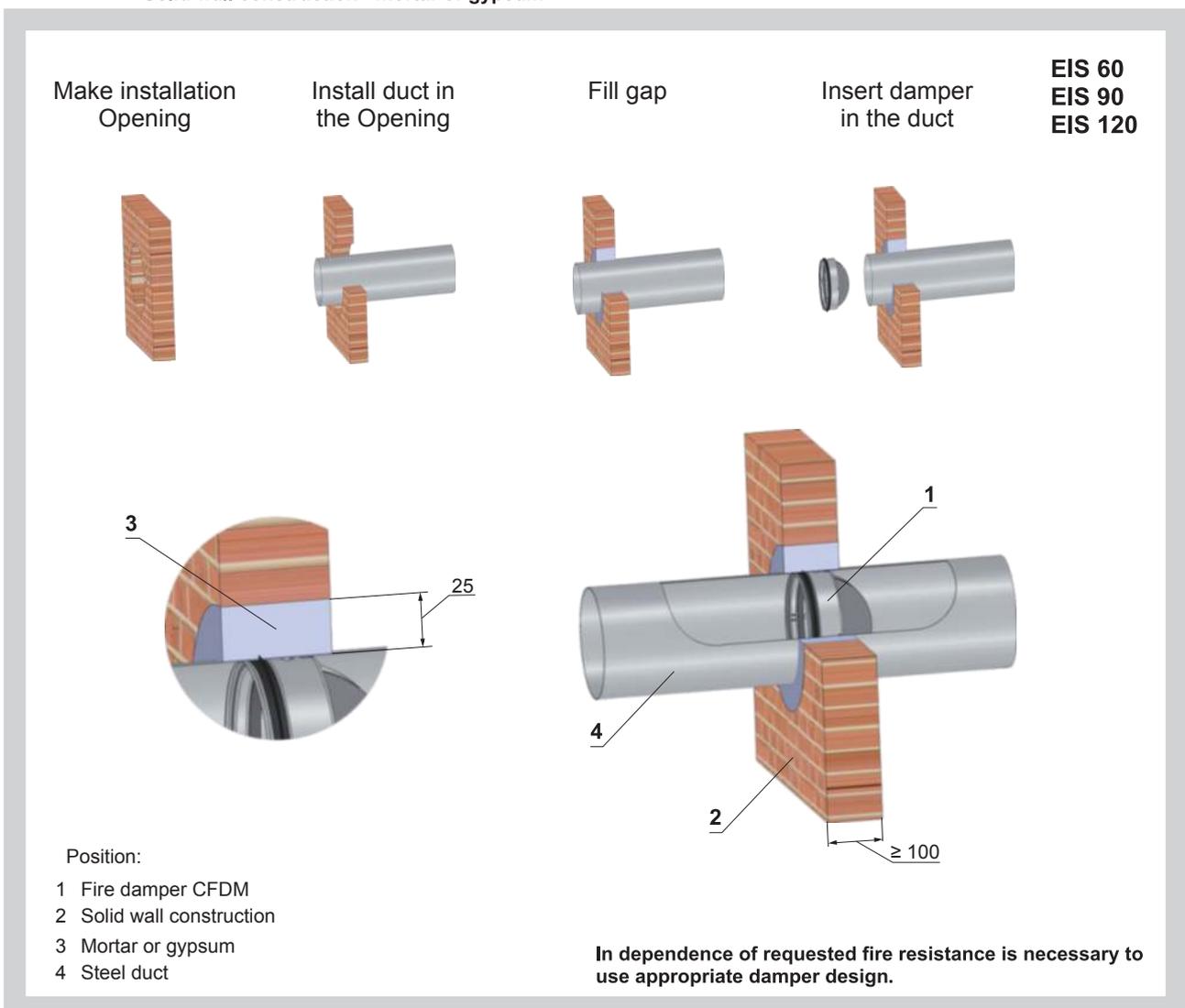
Statement of installations

5.1. Statement of installations the fire dampers CFDM / CFDM-V

Tab. 5.1.1. Statement of installations the fire dampers

Construction	Installation	Material of stuffing box	Figure
Solid wall construction	Wet	mortar or gypsum	14
	Dry	mineral wool boards with fire resistant coating	15
	Dry	Mineral stone wool with fire stop coating and cement lime plate	16
Gypsum wall construction	Wet	mortar or gypsum	17
	Dry	mineral wool boards with fire resistant coating	18
	Dry	Mineral stone wool with fire stop coating and cement lime plate	19
Solid ceiling construction	Wet	mortar or gypsum	20
	Dry	mineral wool boards with fire resistant coating	21

Solid wall construction - mortar or gypsum



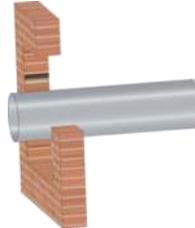
Solid wall construction - mineral wool boards with fire resistant coating

EIS 60
EIS 90

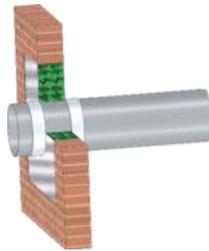
Make installation
Opening



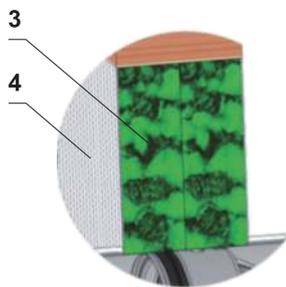
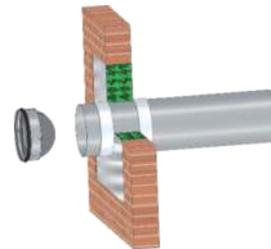
Install duct
in the Opening



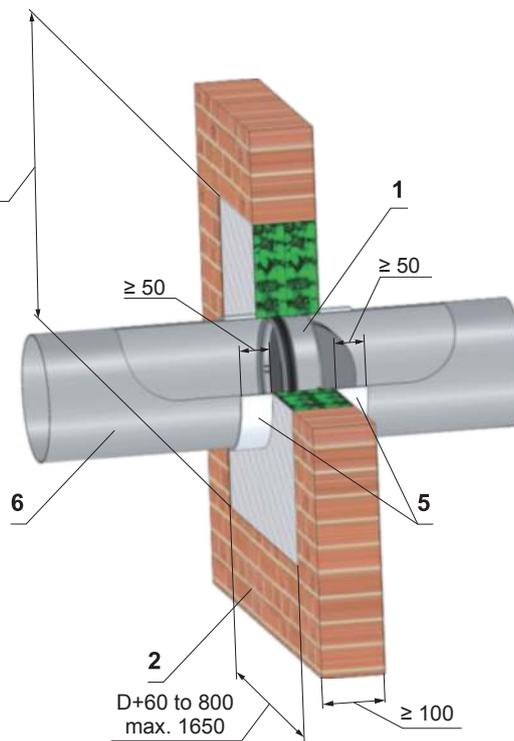
Fill gap and cover
duct by fire resistant
coating



Insert damper
in the duct



D+60 to 800
max. 2050



Used materials - example*:

- 3 - Hilti CFS-CT B 1S 140/50
- 4 - Hilti CFS-CT

Position:

- 1 Fire damper CFDM
- 2 Solid wall construction
- 3 Fire resistant board
- 4 Fire stop coating thickness 1 mm
- 5 Glass fiber felt with aluminium foil width 50 mm, thickness 5 mm
- 6 Steel duct

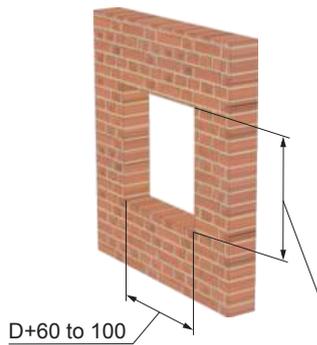
Notice:

* Fire resistant board and fire stop coating can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

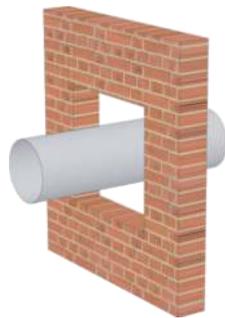
In dependence of requested fire resistance is necessary to use appropriate damper design.

Solid wall construction - mineral stone wool with fire stop coating and cement lime plate

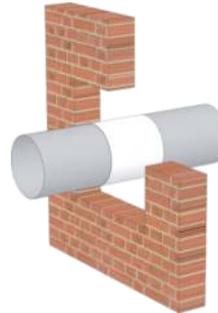
Make installation Opening



Install duct in the Opening

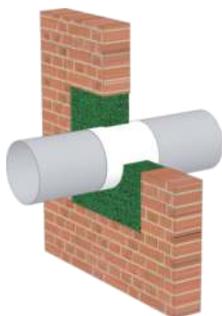


Apply the stop coating on duct with overlapping outside the wall min. 70 mm from each side

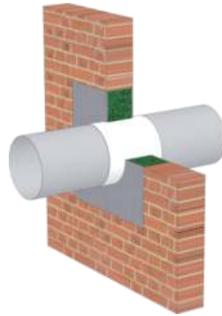


**EIS 60
EIS 90
EIS 120**

Fill the gap between damper and construction by mineral stone wool



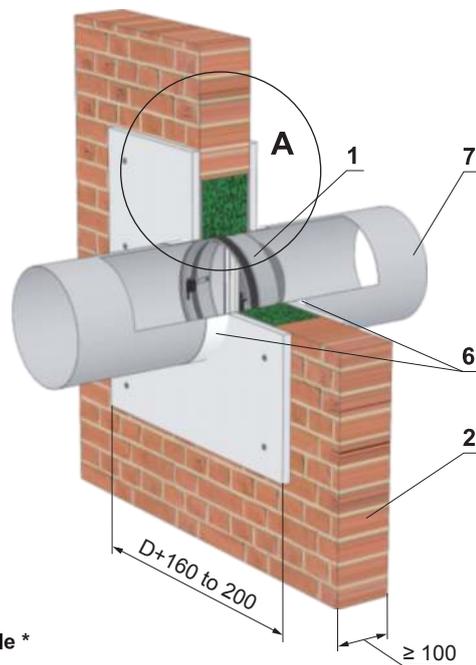
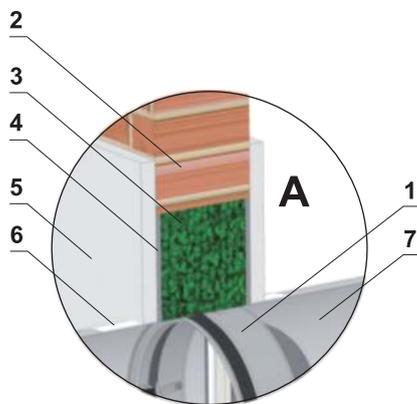
Apply the fire sealant on both sides



Screw cement lime plates from both sides



Insert damper in the duct



**** Thickness according to the selected fire resistance:**

EIS 60 - thickness of cement lime plate 15 mm

EIS 90 - thickness of cement lime plate 25 mm

EIS 120 - thickness of cement lime plate 25 mm

Used materials - example *

3 - Mineral stone wool min. density 65 kg/m³

4 - PROMASTOP-P (-I), Hilti CFS-S ACR

6 - PROMASTOP-E (-CC), Hilti CFS-CT

Position:

1 Fire damper CFDM

2 Solid wall construction

3 Mineral stone wool

4 Fire sealant thickness 1 mm

5 Cement lime plate in min. density 500 kg/m³ **

6 Fire stop coating thickness 1 mm

7 Duck

Notice

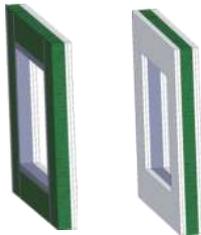
* Fire resistant board and fire stop coating can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

In dependence of requested fire resistance is necessary to use appropriate damper design.

Gypsum wall construction - mortar or gypsum

EIS 60
EIS 90
EIS 120

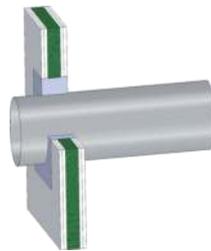
Make installation Opening



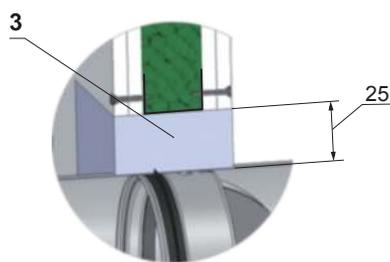
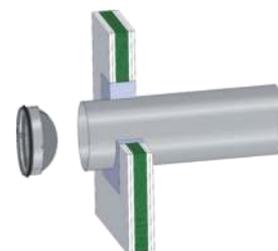
Install duct in the Opening



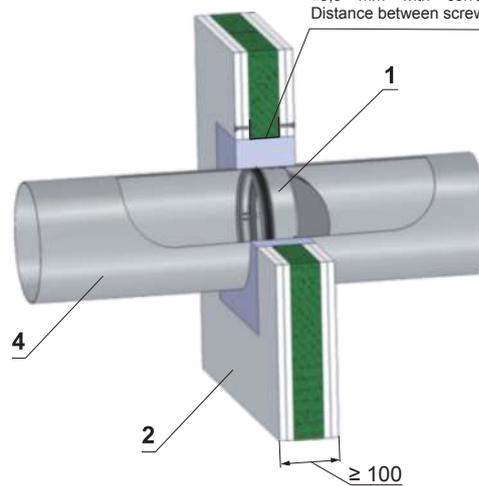
Fill gap



Insert damper in the duct



Installation opening has to be reinforced by profile (UW, CW). Profil is fixed by screws $\geq 3,5$ mm with corresponding length. Distance between screws ≤ 200 mm.



Position:

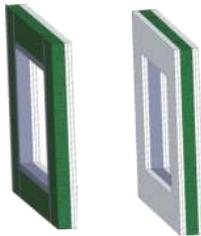
- 1 Fire damper CFDM
- 2 Solid wall construction
- 3 Mortar or gypsum
- 4 Steel duct

In dependence of requested fire resistance is necessary to use appropriate damper design.

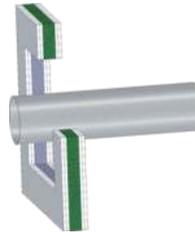
Gypsum wall construction - mineral wool boards with fire resistant coating

EIS 60
EIS 90

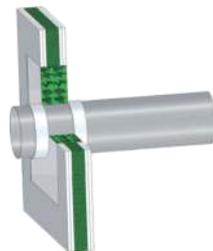
Make installation Opening



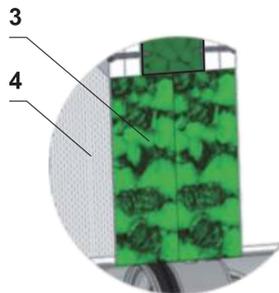
Install duct in the Opening



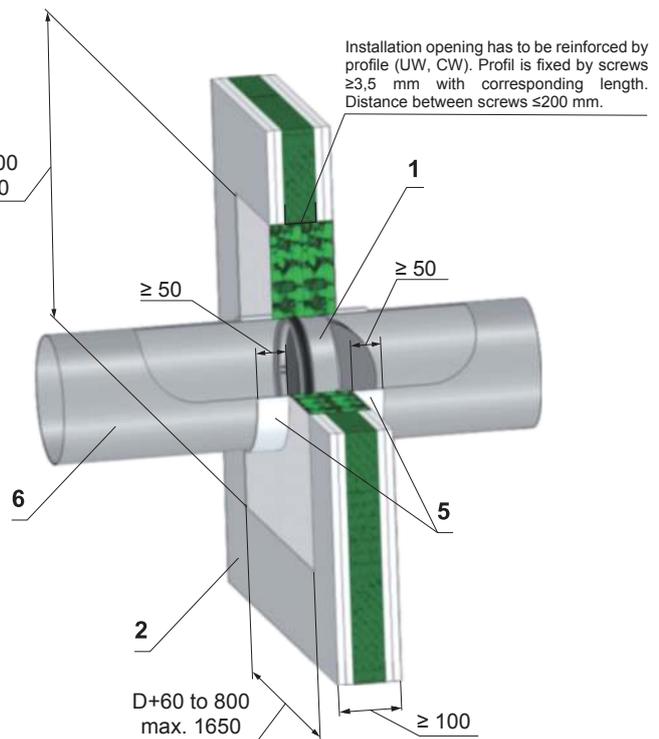
Fill gap and cover duct by fire resistant coating



Insert damper in the duct



D+60 to 800
max. 2050



Used materials - example*:

- 3 - Hilti CFS-CT B 1S 140/50
- 4 - Hilti CFS-CT

Position:

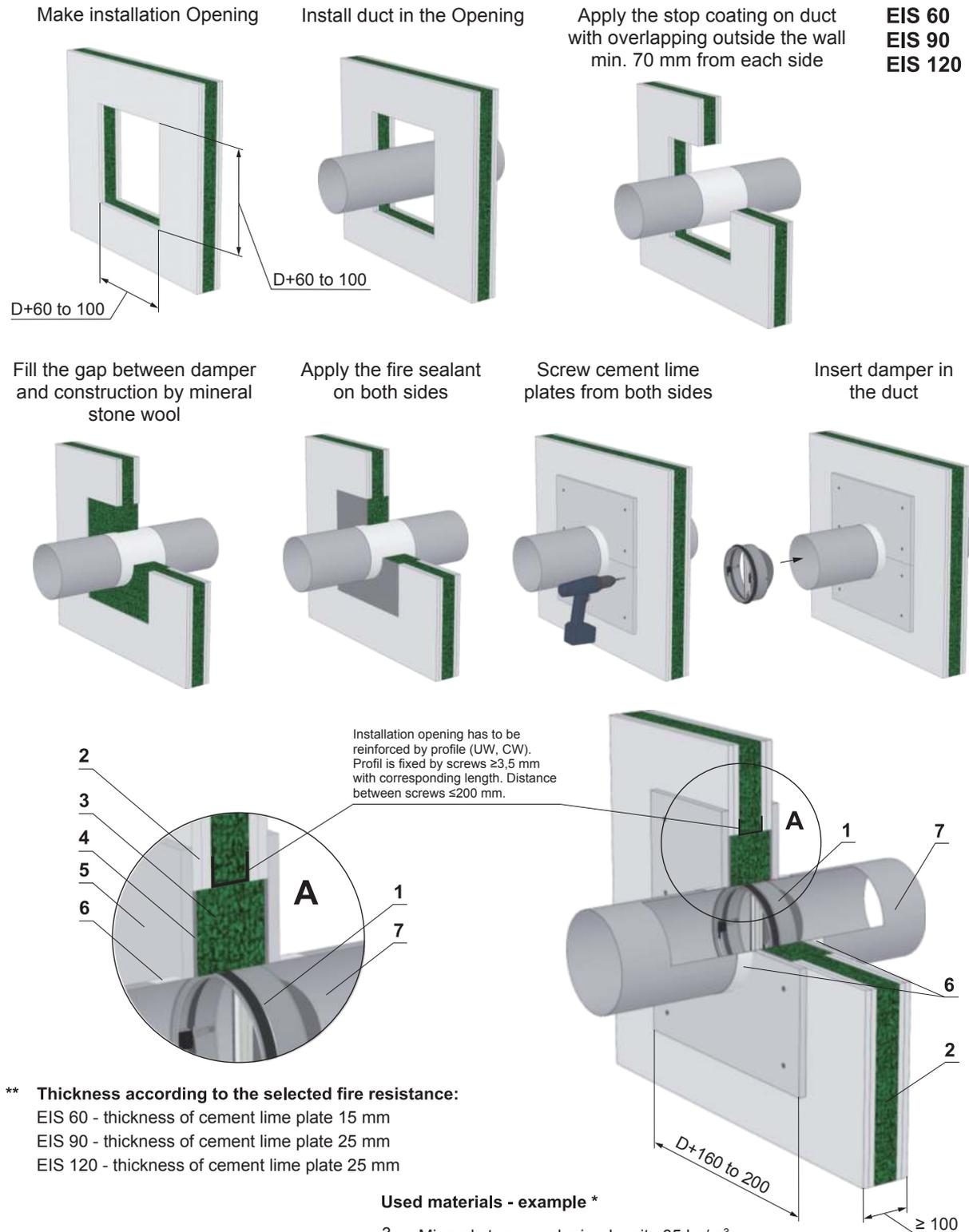
- 1 Fire damper CFDM
- 2 Gypsum wall construction
- 3 Fire resistant board
- 4 Fire stop coating thickness 1 mm
- 5 Glass fiber felt with aluminium foil width 50 mm, thickness 5 mm
- 6 Steel duct

Notice:

* Fire resistant board and fire stop coating can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

In dependence of requested fire resistance is necessary to use appropriate damper design.

Gypsum wall construction – mineral stone wool with fire stop coating and cement lime plate



**** Thickness according to the selected fire resistance:**
 EIS 60 - thickness of cement lime plate 15 mm
 EIS 90 - thickness of cement lime plate 25 mm
 EIS 120 - thickness of cement lime plate 25 mm

Used materials - example *

- 3 - Mineral stone wool min. density 65 kg/m³
- 4 - PROMASTOP-P (-I), Hilti CFS-S ACR
- 6 - PROMASTOP-E (-CC), Hilti CFS-CT

Position:

- 1 Fire damper CFDM
- 2 Gypsum wall construction
- 3 Mineral stone wool
- 4 Fire sealant thickness 1 mm
- 5 Cement lime plate in min. density 500 kg/m³ **
- 6 Fire stop coating thickness 1 mm
- 7 Duck

Notice

* Fire resistant board and fire stop coating can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

In dependence of requested fire resistance is necessary to use appropriate damper design.

Solid ceiling construction - mortar or gypsum

EIS 60
EIS 90

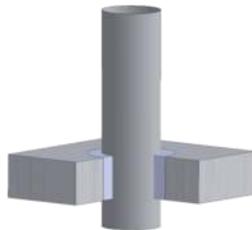
Make installation Opening



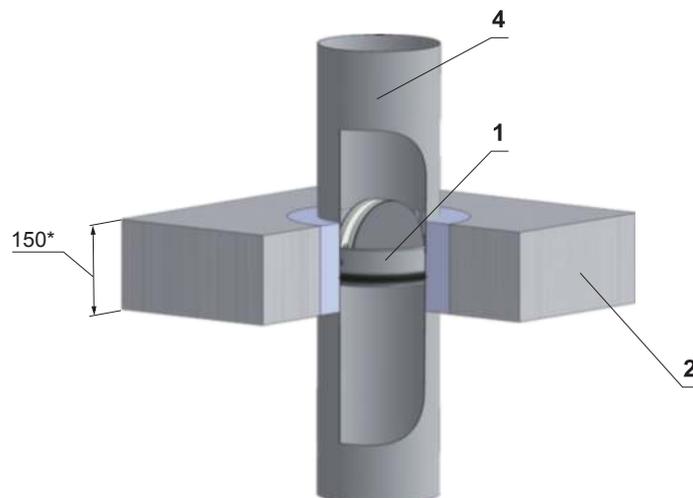
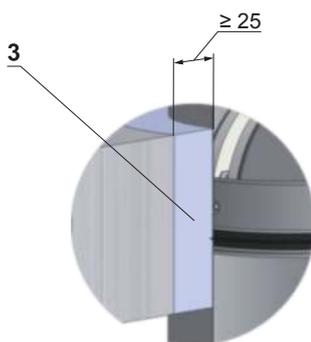
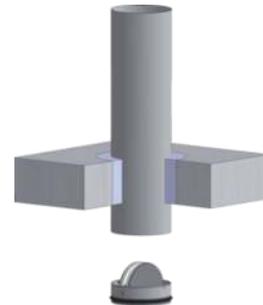
Install duct in the Opening



Fill gap



Insert damper in the duct



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

Position:

- 1 Fire damper CFDM
- 2 Solid wall construction
- 3 Mortar or gypsum
- 4 Steel duct

In dependence of requested fire resistance is necessary to use appropriate damper design.

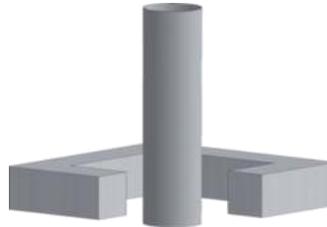
Solid ceiling construction - mineral wool boards with fire resistant coating

EIS 60
EIS 90

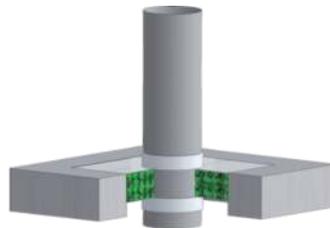
Make installation
Opening



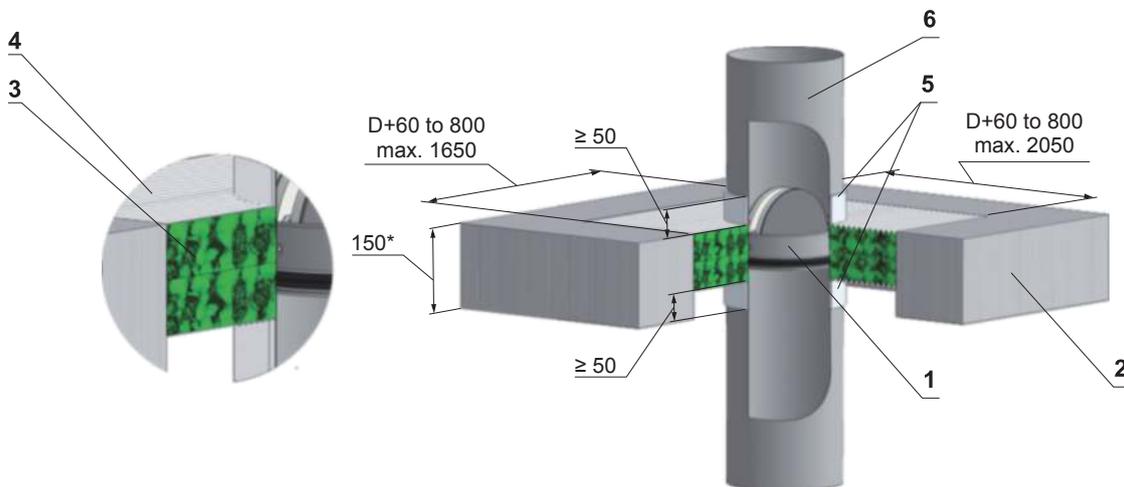
Install duct in
the Opening



Fill gap and cover
duct by fire resistant
coating



Insert damper
in the duct



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

Used materials - example*:

- 3 - Hilti CFS-CT B 1S 140/50
- 4 - Hilti CFS-CT

Notice:

* Fire resistant board and fire stop coating can be replaced by another approved fire sealing system for damper installation with equivalent material properties.

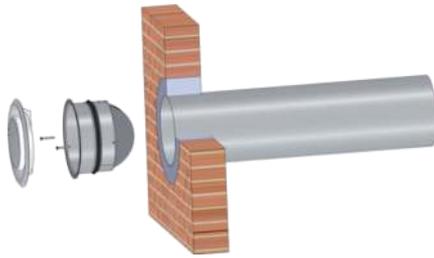
In dependence of requested fire resistance is necessary to use appropriate damper design.

Position:

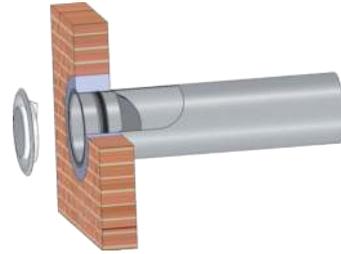
- 1 Fire damper CFDM
- 2 Ceiling wall construction
- 3 Fire resistant board
- 4 Fire stop coating thickness 1 mm
- 5 Glass fiber felt with aluminium foil width 50 mm, thickness 5 mm
- 6 Steel duct

Installation with dish valve

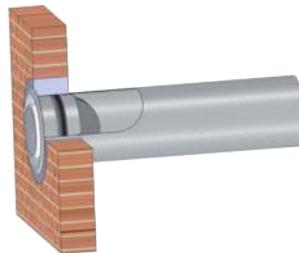
Install duct together with construction edge



Insert valve housing in the duct and screw to the construction



Insert valve in the housing

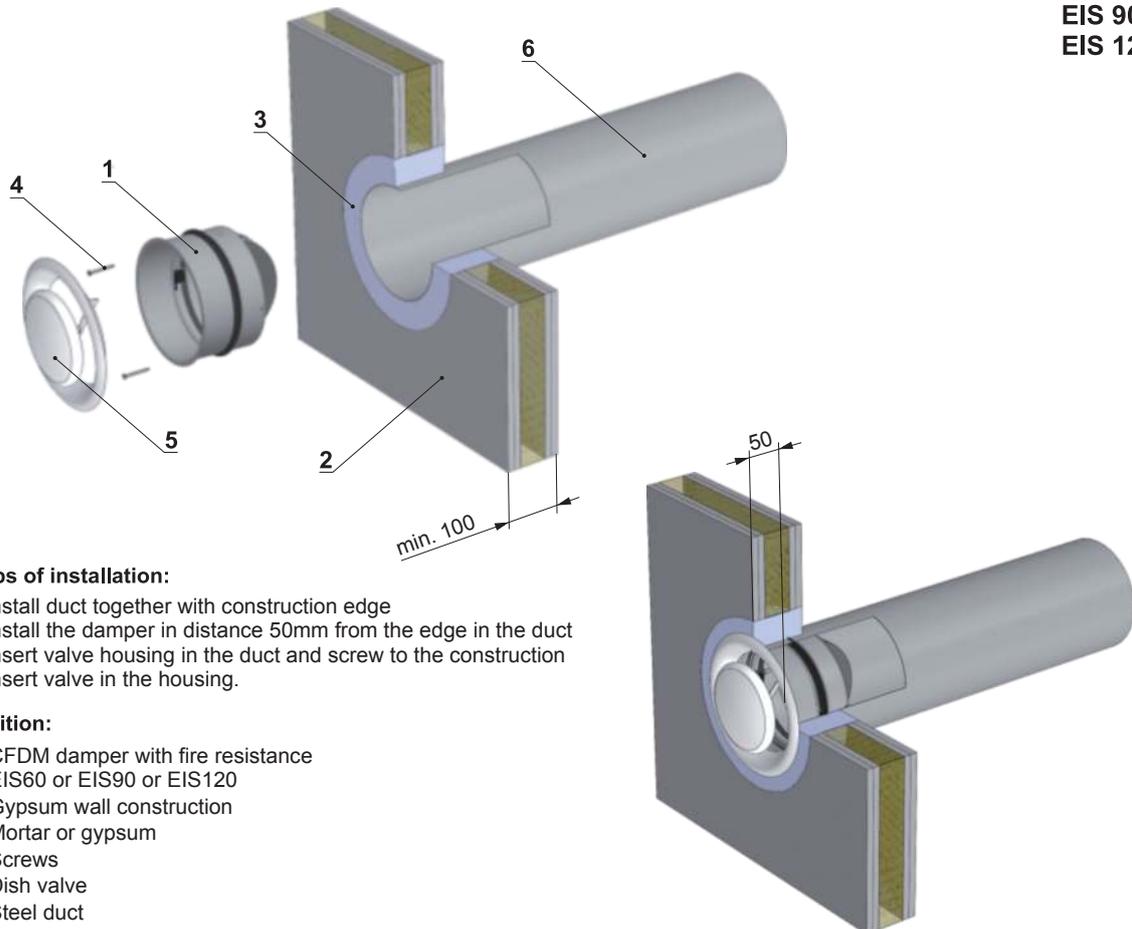


More information about dish valve in TPM 028/03

Installation of the CFDM damper with dish valve in gypsum wall construction

Fire classification of the installation depend on fire resistance of the used damper and can be:

EIS 60
EIS 90
EIS 120



Steps of installation:

- 1) Install duct together with construction edge
- 2) Install the damper in distance 50mm from the edge in the duct
- 3) Insert valve housing in the duct and screw to the construction
- 4) Insert valve in the housing.

Position:

- 1 CFDM damper with fire resistance EIS60 or EIS90 or EIS120
- 2 Gypsum wall construction
- 3 Mortar or gypsum
- 4 Screws
- 5 Dish valve
- 6 Steel duct

TECHNICAL DATA

Pressure loss of CFDM

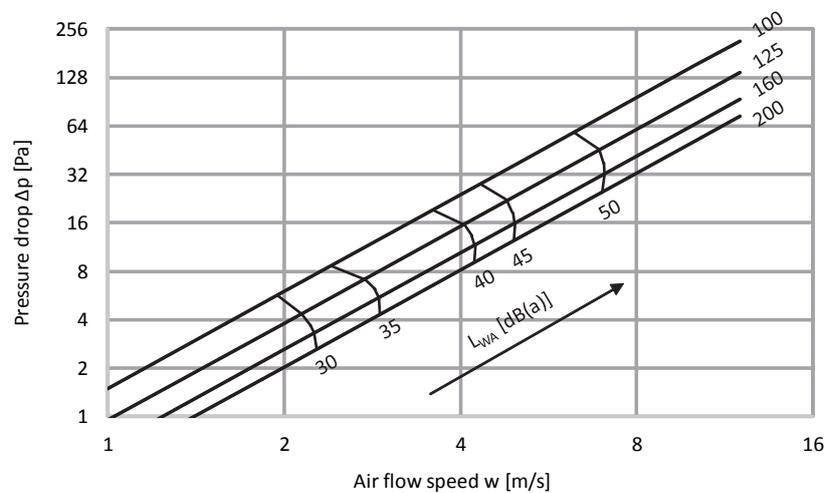
6.1. Pressure loss calculation

$$\Delta p = \xi \cdot \rho \cdot \frac{w^2}{2}$$

Δp [Pa]	pressure loss
w [m.s ⁻¹]	air flow speed in nominal damper section
ρ [kg.m ⁻³]	air density
ξ [-]	coefficient of local pressure loss for the nominal damper section

6.2. Determination of pressure loss by using Diagram 1 $\rho = 1,2 \text{ kg.m}^{-3}$ and noise data

Diagram 1 Pressure losses for air density $\rho = 1,2 \text{ kg.m}^{-3}$



Coefficient of local pressure loss of CFDM

7.1. Coefficient of local pressure loss ξ (-)

Tab. 7.1.1. Coefficient of local pressure loss [m/s]

D	100	125	160	200
ξ	2,502	1,591	1,086	0,848

Calculation example

Given data	Fire damper CFDM 200 $\dot{V} = 600 \text{ m}^3.\text{h}^{-1}$ $\rho = 1,2 \text{ kg.m}^{-3}$
Tab. 3.2.1.	$S_{ef} = 0,0209 \text{ m}^2$
Calculation:	$w [\text{m.s}^{-1}] = (\dot{V} [\text{m}^3.\text{h}^{-1}] / 3600) / S_{ef} [\text{m}^2]$ $w = 7,97 \text{ m.s}^{-1}$
Tab. 7.1.1.	$\xi = 0,848$
Calculation:	$\Delta p = \xi \cdot \rho \cdot (w^2/2) = 0,848 \cdot 1,2 \cdot (7,97^2/2) = 32,3 \text{ Pa}$
Diagram 1	$L_{WA} = 52 \text{ dB}$

Basic parameters of CFDM-V

8.1. Basic data

\dot{V}	[m ³ .h ⁻¹]	volumetric air flow per one damper
s	[mm]	distance of valve disc from zero position
Δp_c	[Pa]	pressure loss at $\rho = 1,2 \text{ kg/m}^3$
L_{wa}	[dB(A)]	level of acoustic power

Tab. 8.1.1. Fire damper CFDM-V with exhaust dish valve

Size	100	125	160	200
\dot{V}_{max} [m ³ .h ⁻¹]	90	150	200	250

Tab. 8.1.2. Fire damper CFDM-V with supply dish valve

Size	100	125	160	200
\dot{V}_{max} [m ³ .h ⁻¹]	90	150	200	250

8.2. Pressure loss and sound data of CFDM-V

8.2.1. Damper with valve for air supply (TVPM)

Diagram 2 CFDM-V - TVPM 100

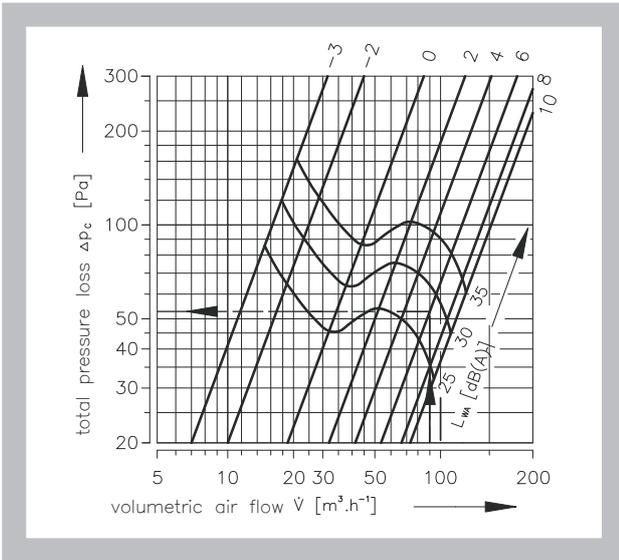


Diagram 3 CFDM-V - TVPM 125

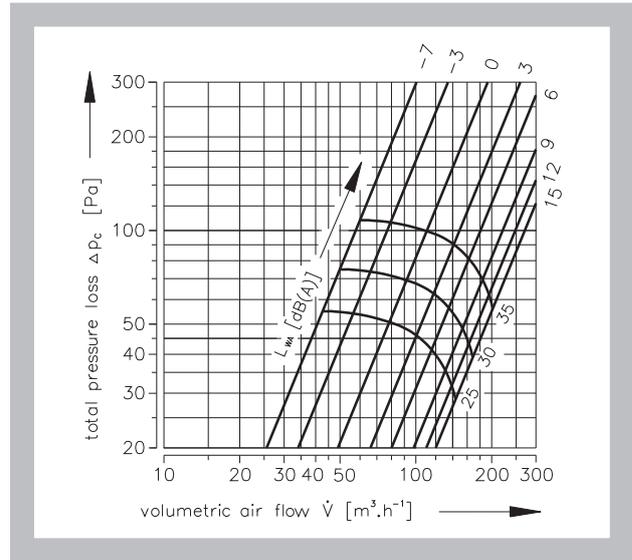


Diagram 4 CFDM-V - TVPM 160

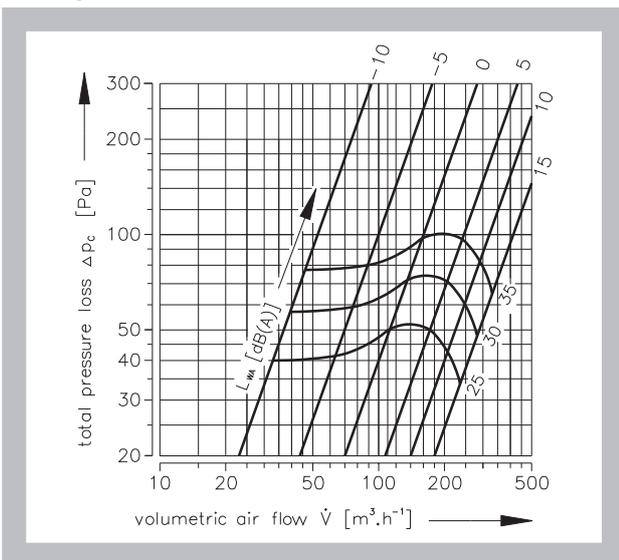
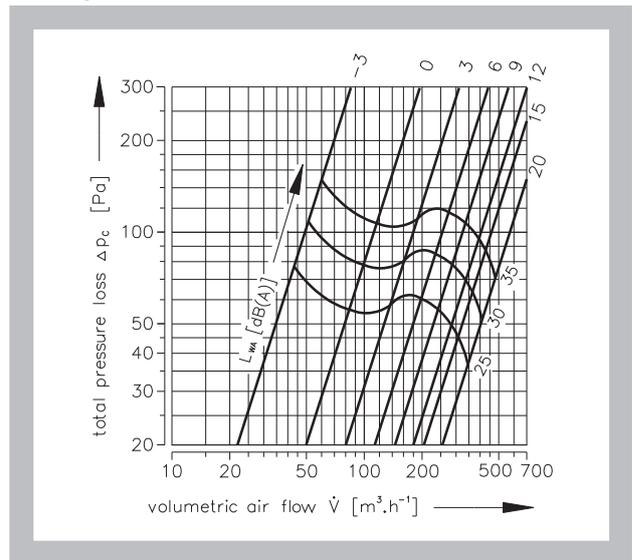


Diagram 5 CFDM-V - TVPM 200



Example

Given data: Damper with valve TVPM 100
 $\dot{V} = 80 \text{ m}^3 \cdot \text{h}^{-1}$
 $s = 8 \text{ mm}$

Diagram 1: $L_{WA} = 28 \text{ dB(A)}$
 $\Delta p_c = 43 \text{ Pa}$

8.2.2. Damper with valve for air outlet (TVOM)

Diagram 6 CFDM-V - TVOM 100

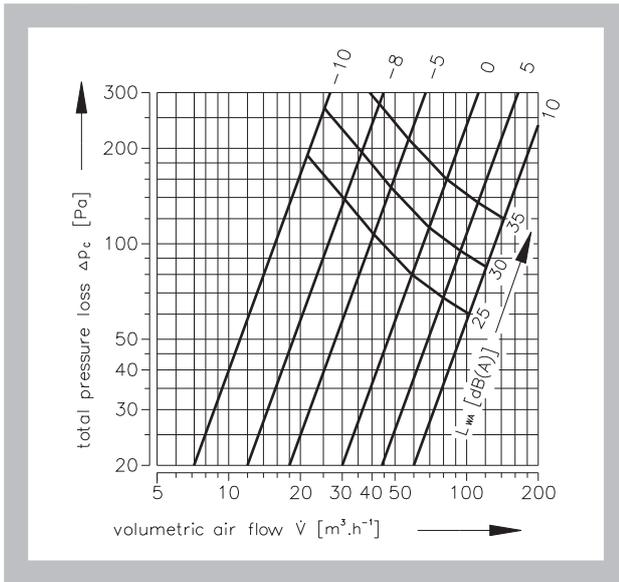


Diagram 7 CFDM-V - TVOM 125

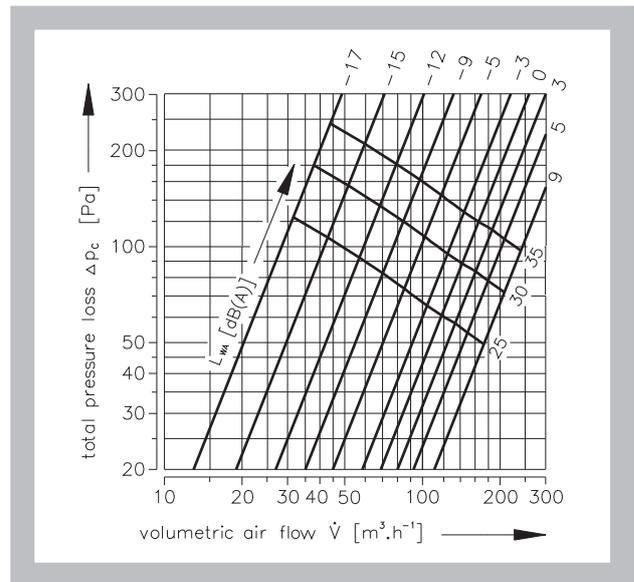


Diagram 8 CFDM-V - TVOM 160

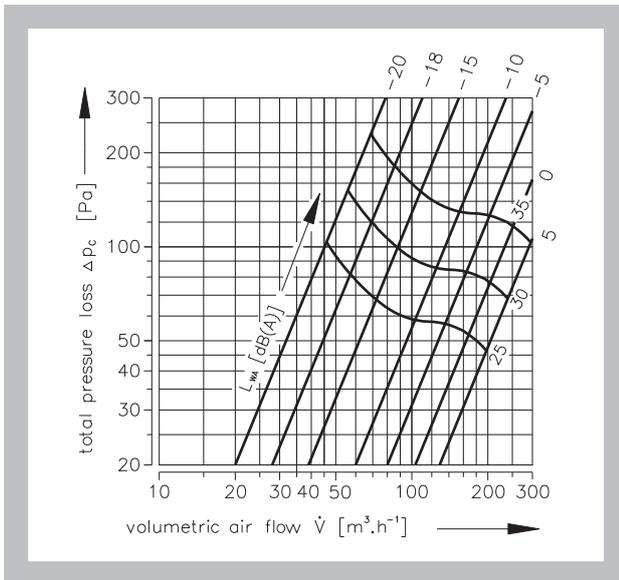
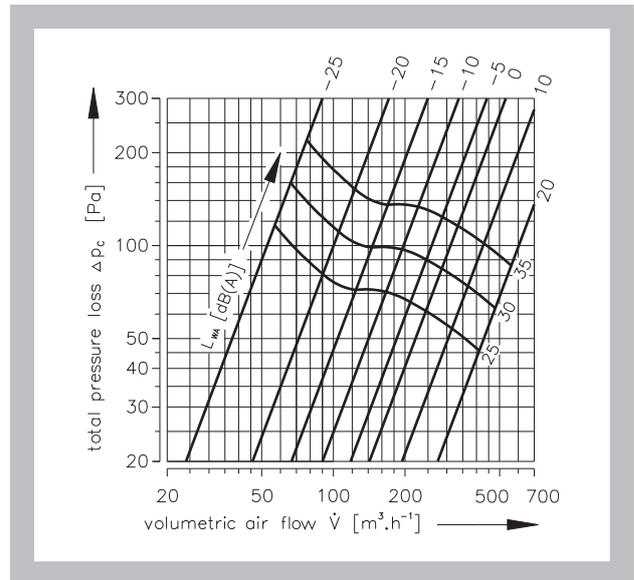


Diagram 9 CFDM-V - TVOM 200



MATERIAL, FINISHING

Material

- 9.1.** Damper casing are supplied in the design made of galvanized sheet without any other surface finishing.
 Damper blades are made of fire resistant asbestos free boards made of mineral fibres.
 Damper controls are made of stainless steel with no other surface finish.
 Springs are made of stainless steel.
 Thermal protective fuses are made of sheet brass, thickness = 0,5 mm.
 Fasteners are galvanized.
- 9.2.** According to the customer's requirements damper casing can be finished by color acc. RAL.

V. INSPECTION, TESTING

Inspection, testing

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

VI. TRANSPORTATION AND STORAGE

Logistic terms

- 11.1.** Dampers are transported by box freight vehicles without direct weather impact, there must not occur any sharp shocks and ambient temperature must not exceed +40°C. Dampers must be protected against mechanic damages when transported and manipulated. During transportation, the damper blade must be in the "CLOSED" position.
- 11.2.** Dampers are stored indoor in environment without any aggressive vapours, 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.

VII. ASSEMBLY, ATTENDANCE, MAINTENANCE AND REVISIONS

Assembly

- 12.1.** All effective safety standards and directives must be observed during fire damper assembly.
- 12.2.** To ensure reliable fire damper function it is necessary to avoid blocking the closing mechanism and contact surfaces with collected dust, fibre and sticky materials and solvents.

Entry into service and revisions

- 13.1.** 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.
- 13.2.** It is recommended to provide periodical checks, maintenance and service actions on Fire Equipment by Authorized persons schooled by Producer.

DATA OF THE PRODUCT

Data label

14.1. Data label is placed on the casing of fire damper.

Data label CFDM

		CFDM Požární klapka / Fire damper / Brandschutzklappe / Clapet coupe-feu	
Klasifikace / Classification / Feuerwiderstand / Classification		EI90 (ve, ho-i↔o)S	
Certifikace / Certificate / Zulassungs-Nr. / Certifikat		1391-CPR-2018/0129	16
Rozměr / Size / Grösse / Taille		200	EN 15650:2010
Výr. číslo / Serial number / Fert. Nr. / Numéro de serie		SAMPLE	TPM 118/16
Provedení / Design / Ausführung / Conception		.01	EIS 90  1391
Hmotnost / Weight / Gewicht / Poids		0,5	

Data label CFDM-V

		CFDM-V Požární klapka / Fire damper / Brandschutzklappe / Clapet coupe-feu	
Klasifikace / Classification / Feuerwiderstand / Classification		EI90 (ve, ho-i↔o)S	
Certifikace / Certificate / Zulassungs-Nr. / Certifikat		1391-CPR-2018/0129	16
Rozměr / Size / Grösse / Taille		200	EN 15650:2010
Výr. číslo / Serial number / Fert. Nr. / Numéro de serie		SAMPLE	TPM 118/16
Provedení / Design / Ausführung / Conception		.01/TVOM	EIS 90  1391
Hmotnost / Weight / Gewicht / Poids		1,34	

Quick review

Tab. 15.1.1. Quick review

Damper	CFDM / CFDM-V			
Size				ø 100 - 200
Fire separating construction	Wall/Ceiling	Installation	Fire resistance	Fig.
	Min. thickness [mm]			
Solid wall construction	100	Mortar or gypsum	EIS 120 EIS 90 EIS 60	14
	100	Mineral wool boards with fire resistant coating	EIS 90 EIS 60	15
	100	Mineral stone wool with fire stop coating and cement lime plate	EIS 120 EIS 90 EIS 60	16
Gypsum wall construction	100	Mortar or gypsum	EIS 120 EIS 90 EIS 60	17
	100	Mineral wool boards with fire resistant coating	EIS 90 EIS 60	18
	100	Mineral stone wool with fire stop coating and cement lime plate	EIS 120 EIS 90 EIS 60	19
Solid ceiling construction	150	Mortar or gypsum	EIS 90 EIS 60	20
	150	Mineral wool boards with fire resistant coating	EIS 90 EIS 60	21