systemair

Handbook

F-C2...VA

Cartridge Fire Damper within Valve

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Description

Fire dampers are passive fire protection and are designed to utilize compartmentalization to prevent the spread of toxic gases, smoke and fire. By default, F-C2 fire dampers are only supplied with spring loaded activation. In case of fire, the fire damper closes automatically when the temperature of the air in the duct reaches 72°C. The F-C2 damper closes after the melting of the thermal fuse. After the closing of the damper blade, it is mechanically locked in the closed position and can only be opened manually. The inspection can be performed via the air terminal device. F-C2-VA is equipped with a valve (BOR-S, BOR-R, Balance-S, Balance-E, EFF, TFF) for supply or extract air. It provides an easy and compact solution for duct penetrating a fire compartment, ended with an air terminal device.

Highlights

- Performance up to 2 hours
- One product fits several resistivities
- Valves are part of the damper delivery
- Saving up installation space and easy to install
- Small diameters
- No power needed
- Easy inspection via the air terminal device

Fire Resistivity

F-C2 fire dampers are CE certified following the Construction Products Regulation according to EN 15650:2010. Dampers are tested according to EN 1366-2:2015 and classified according to EN 13501-3 + A1:2009. The fire damper together with its installation form an inseparable part of the fire resistivity rating. F-C2 fire dampers are designed for the installations listed and described in "Installation".

- Standard supporting construction in accordance with EN 1366-2:2015: up to **EI120 (ve ho i↔o)S**

Types of Product

- 1 - F-C2 damper with BOR-S valve
- 2 - F-C2 damper with BOR-R valve
- 3 - F-C2 damper with Balance-S valve
- 4 - F-C2 damper with Balance-E valve
- 5 - F-C2 damper with EFF valve
- 6 - F-C2 damper with TFF valve

Design

F-C2 have powder coated casings made from galvanized sheet metal. Blades from non-asbestos insulants and an intumescent seal, that expands in a fire situation.

F-C2 is part of the valve.

Activation Types

- **H0**

Fire damper with a spring loaded blades with release by a thermal fuse link set to 72 °C.

Material Composition

The product contains galvanized steel, graphite fire-proof laminate, polyurethane foam. These are processed in accordance with local regulations. The product contains no hazardous substances, except for the solder in the thermofuse, which contains a milligram of lead. Calcium silicate board is used in sizes greater than 125 mm.

BOR-S and BOR-R are manufactured from galvanized sheet metal and powder coated to RAL9003 (signal white) as standard.

BALANCE-S and BALANCE-E are manufactured from recyclable polypropylene. This material withstands most chemicals in small concentrations. Polyether gasket.

TFF and EFF are manufactured from galvanized steel sheet. The products are powder coated to RAL9003 (signal white) as standard.

List of Installation Accessories

• CBR-C2: Set of 4 cover boards mandatory for dry installation of F-C2

Detailed information about other accessories is available in SystemairDESIGN in fire damper accessories section.

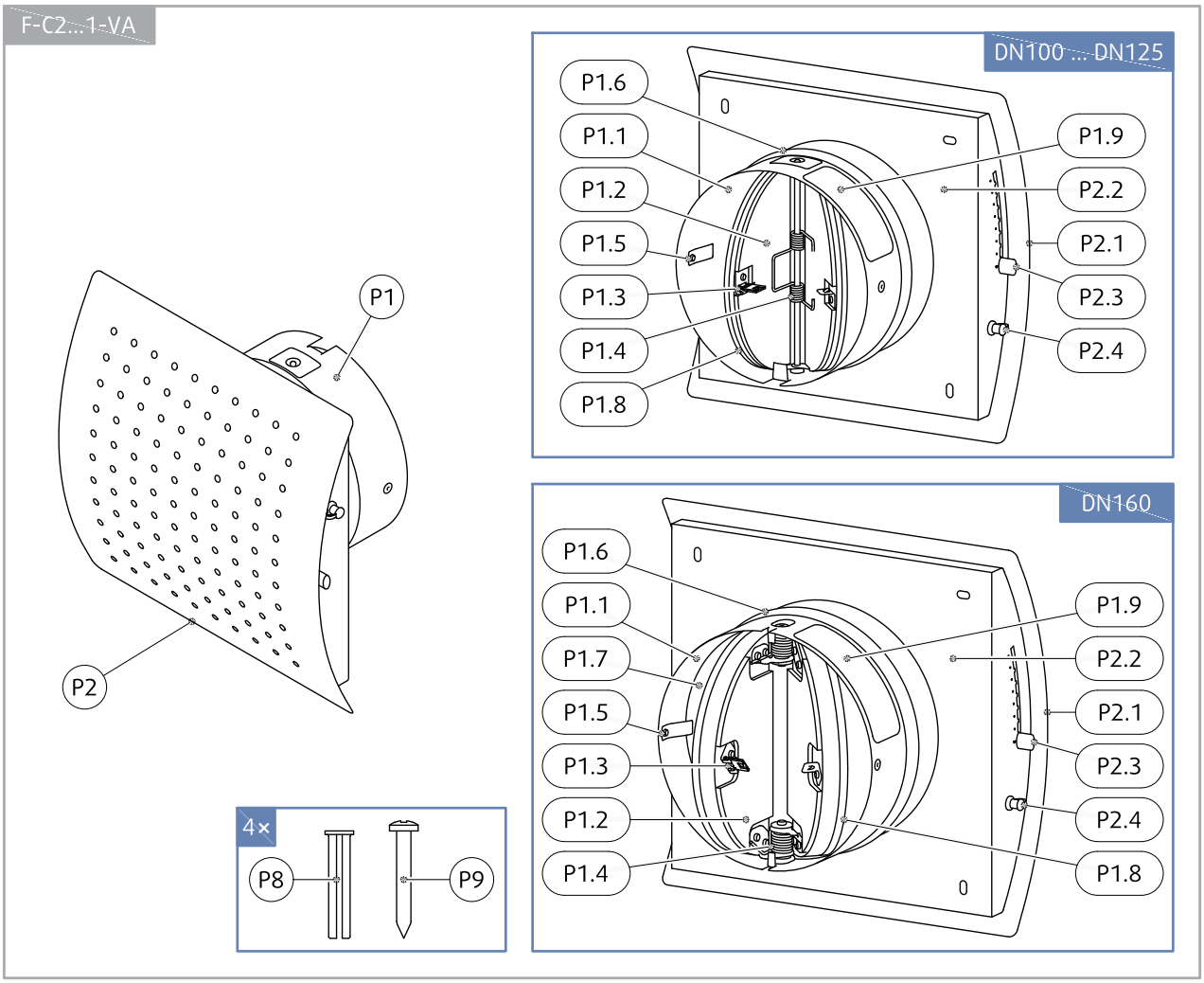
Technical Parameters

Durability Test	
• 50 cycles	• No change of the necessary properties.
Fire Testing Pressure	Under-pressure up to 300 Pa
Safety Position	Closed - In fire scenario the damper closes via spring between blades
Possible Installations	Refer to the "Installation" section
Direction of the Airflow	Both direction
Permitted air Velocity	max. 6 m/s
Side with Fire Protection	Both sides: (i<->o) - symmetrical
Repeated opening	Not possible. Only manual loading of the spring is required when installing. It is not possible to load the spring after reaching activation temperature
Activation Temperature	72 °C
Environmental Conditions for Operation	
Minimum temperature:	0 °C
Maximum temperature:	60 °C for 72 °C thermal fuse link
Relative humidity:	Less than 95% (3K5, EN 60721-3-3)
Product protected from:	Weather, rain and water from other sources
Condensation:	Cannot form on the product
Icing:	Cannot form on the product
Open/Closed indication	No indication
Closing/Opening time	Approximately 1 second
Access for Inspection	The inspection is possible through the air terminal device
Maintenance	Maintenance is not necessary. A dry-cleaning procedure can be mandatory in some countries or when needed.
Inspections	Obey local laws for the minimum time between inspection procedures. When not specified the maximum interval between inspections is 6 months
Allowed pressure	300 Pa
Tightness of the Housing (EN 1751)	Damper is placed within duct, that means the tightness class is equal to duct tightness
Transportation and Storage	The temperature range must be: -20...50 °C

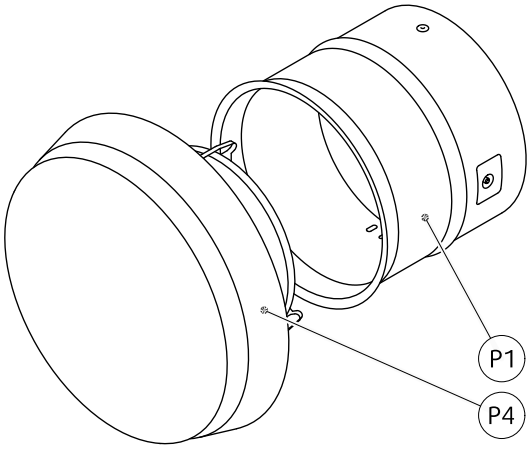
Make sure that the damper blade is in the closed position during transportation and protected from weather disruptions. The storage of the damper must be indoors.

Product Parts

The F-C2 packaging also includes additional product label, that must be attached to the duct next to wall where the F-C2 fire damper is installed.



F-C2...3-VA



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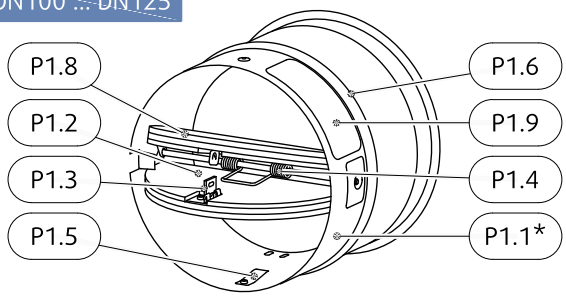

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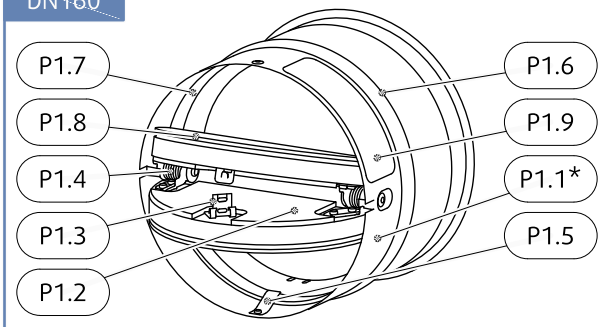
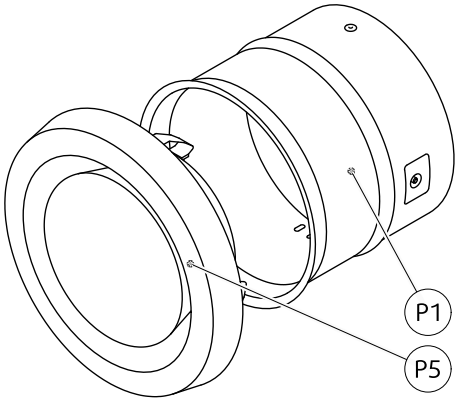


F-C2...4-VA



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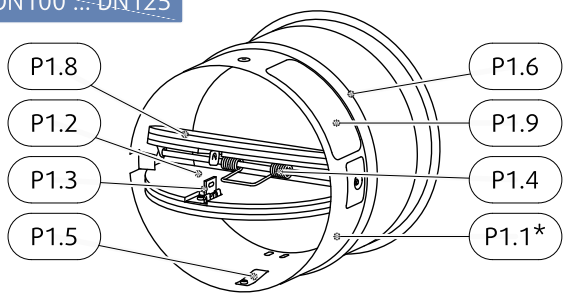

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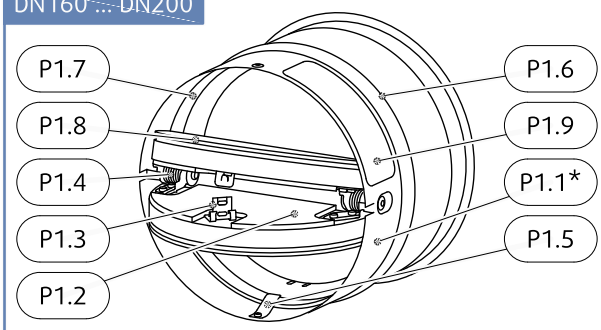
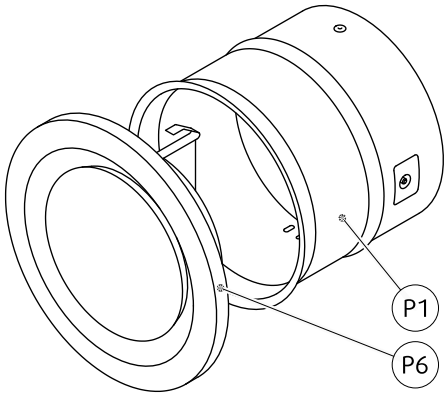


F-C2...5-VA



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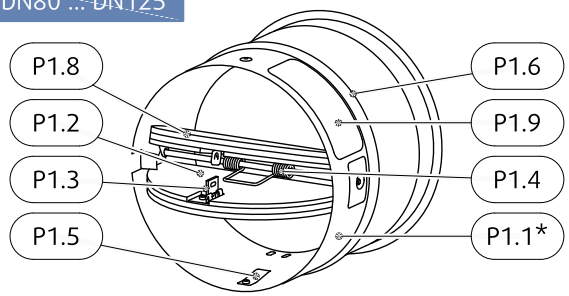

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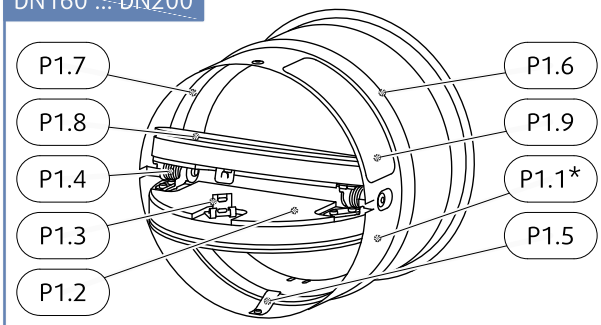
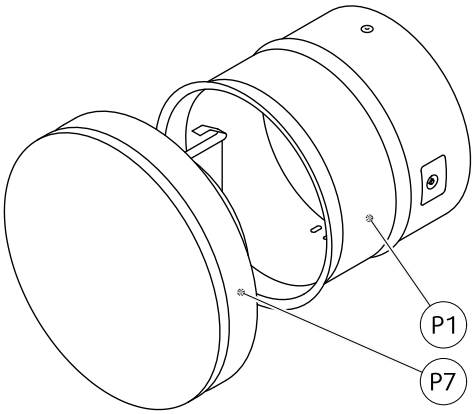


F-C2...6-VA



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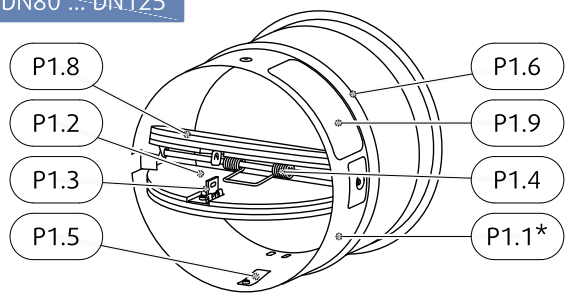

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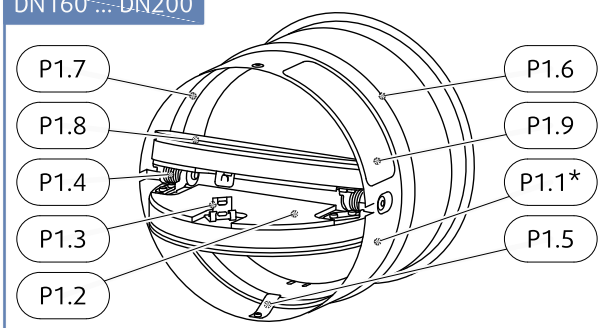


Notes:
Cartridge fire damper F-C2 made with sheet-metal blades, size range from 100 mm up to 125 mm
Cartridge fire damper F-C2 made with calcium silicate blades, size range from 140 mm up to 200 mm

Legend:

P1 - Fire damper (F-C2)
P1.1 - Casing (1-VA, 2-VA)
P1.1* - Casing (3-VA, 4-VA, 5-VA, 6-VA)
P1.2 - Blades
P1.3 - Thermal fuse link
P1.4 - Blades spring
P1.5 - Detent spring
P1.6 - External peripheral sealing
P1.7 - Internal peripheral sealings
P1.8 - Blade surface foams
P1.9 - Product label
P2 - BOR-S
P2.1 - Front panel
P2.2 - Backing box
P2.3 - Adjustment knob
P2.4 - Measurement pin (Δp)
P3 - BOR-R
P3.1 - Front panel
P3.2 - Backing box
P3.3 - Adjustment knob
P3.4 - Measurement pin (Δp)
P4 - BALANCE-S (Supply)
P5 - BALANCE-E (Exhaust)
P6 - EFF (Exhaust)
P7 - TFF (Supply)
P8 - Anchor UniFast 6
P9 - Screw UNI 4×30 mm

Assessed Performance of F-C2

20 **CE** 1396

Systemair Production a.s.

Hlavná 371, 900 43 Kalinkovo, Slovakia
1396-CPR-0183, F-C2

EN 15650 : 2010

Circular fire dampers

Nominal activation conditions/sensitivity - **Pass**

- sensing element load bearing capacity
- sensing element response temperature

Response delay (response time) - **Pass**

- closure time

Operational reliability - **Pass**

- manual cycle = 50 cycles

Fire resistance:

Resistivity depending on installation method and situation
- integrity **E**
- maintenance of the cross section (under E)
- mechanical stability (under E)
- cross section (under E)
- insulation **I**
- smoke leakage **S**

Durability of response delay - **Pass**

- sensing element response temperature and load bearing capacity

Durability of operational reliability - **NPD**

- open and closing cycle

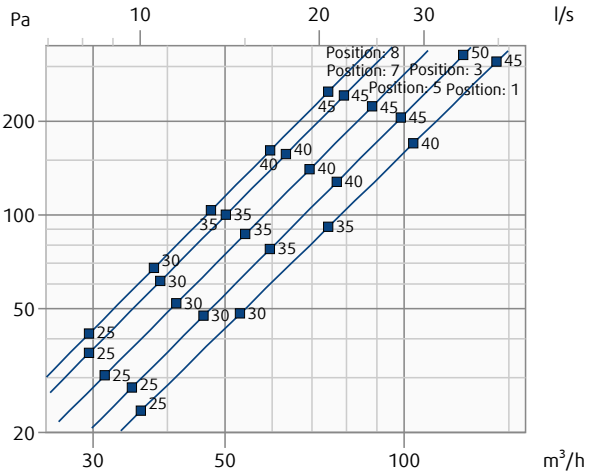
Diagrams

Accessory CBR-C2 and fire resistance class (EI60S, EI90S and EI120S) do not affect the pressure drop and A-weighted total discharged sound power level.

The pressure drop and A-weighted total discharged sound power level depend on the complete product: F-C2 damper together with duct piece and air terminal devices.

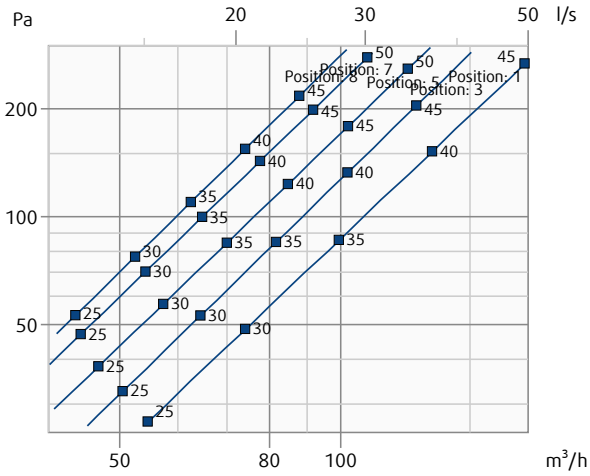
F-C2-100-H0-1-VA

Pressure drop & A-weighted sound power level in dB(A)



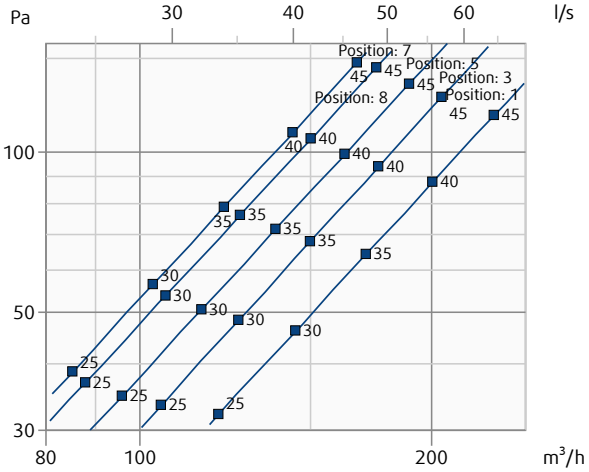
F-C2-125-H0-1-VA

Pressure drop & A-weighted sound power level in dB(A)



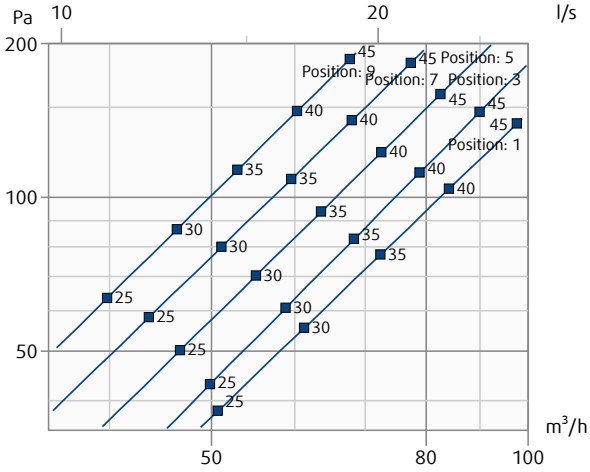
F-C2-160-H0-1-VA

Pressure drop & A-weighted sound power level in dB(A)



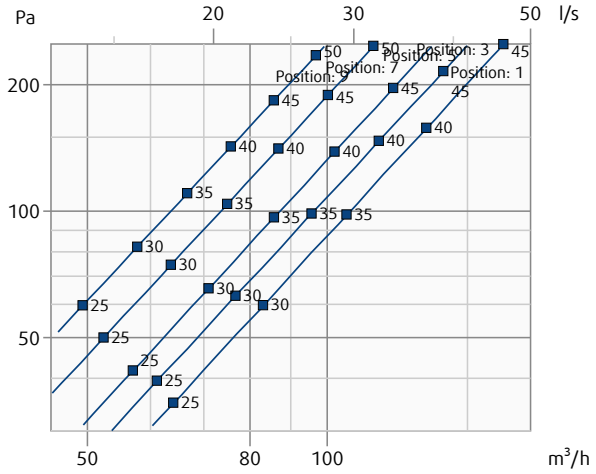
F-C2-100-H0-2-VA

Pressure drop & A-weighted sound power level in dB(A)



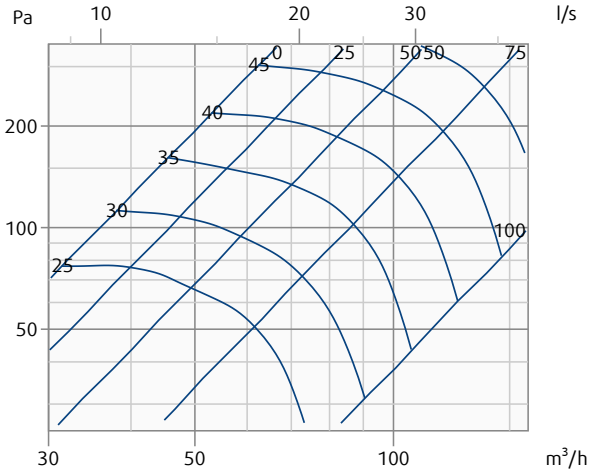
F-C2-125-H0-2-VA

Pressure drop & A-weighted sound power level in dB(A)



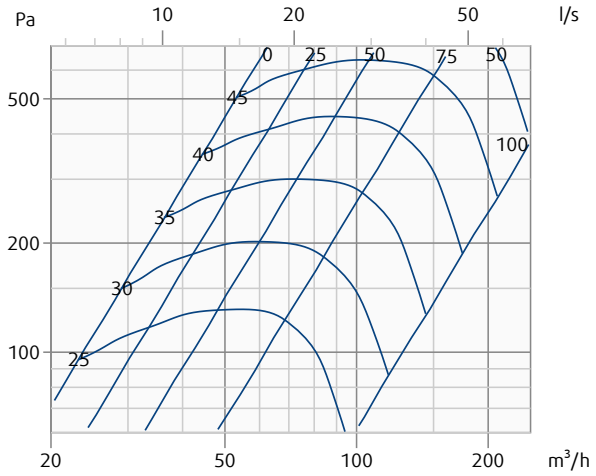
F-C2-100-H0-3-VA

Pressure drop & A-weighted sound power level in dB(A)



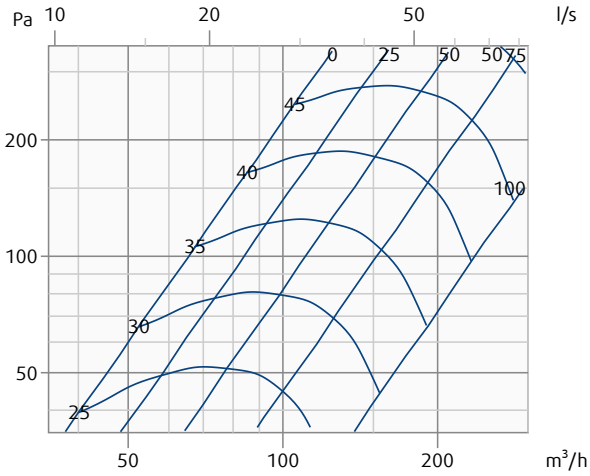
F-C2-125-H0-3-VA

Pressure drop & A-weighted sound power level in dB(A)



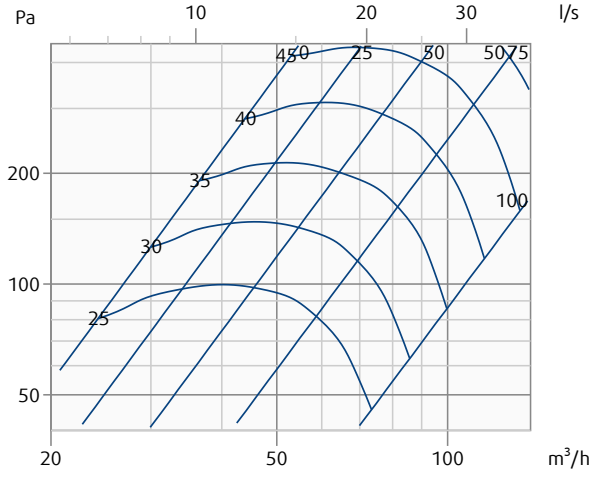
F-C2-160-H0-3-VA

Pressure drop & A-weighted sound power level in dB(A)



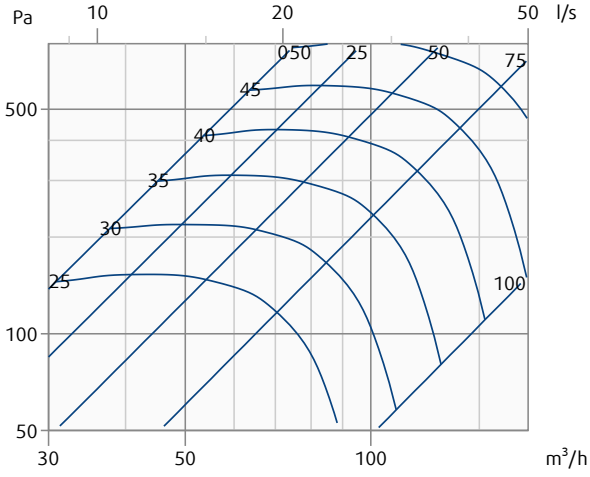
F-C2-100-H0-4-VA

Pressure drop & A-weighted sound power level in dB(A)



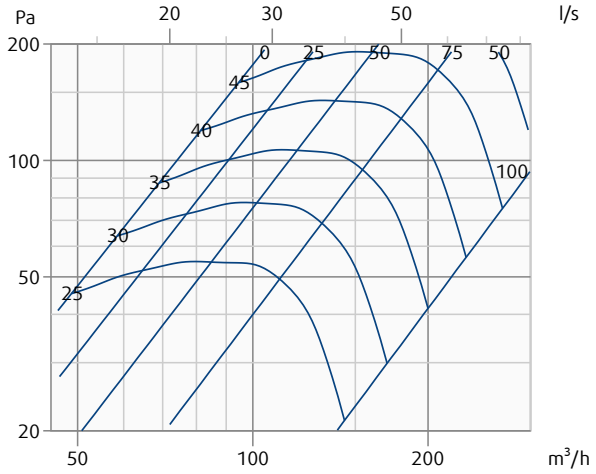
F-C2-125-H0-4-VA

Pressure drop & A-weighted sound power level in dB(A)



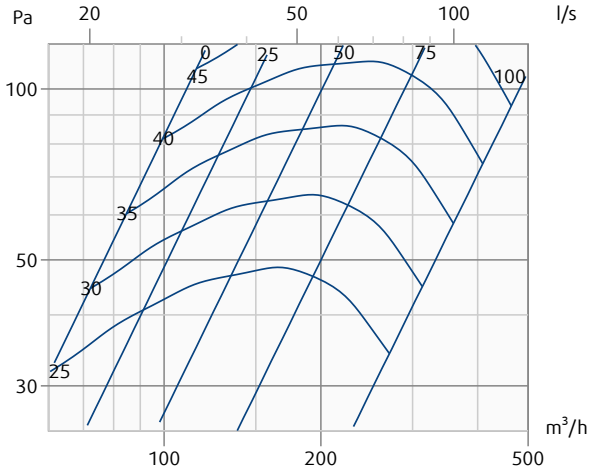
F-C2-160-H0-4-VA

Pressure drop & A-weighted sound power level in dB(A)



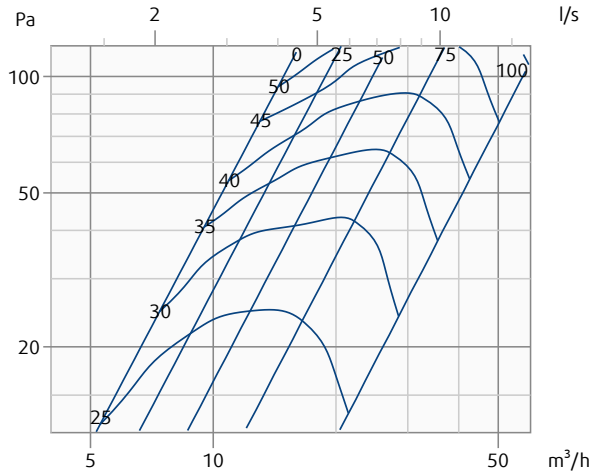
F-C2-200-H0-4-VA

Pressure drop & A-weighted sound power level in dB(A)



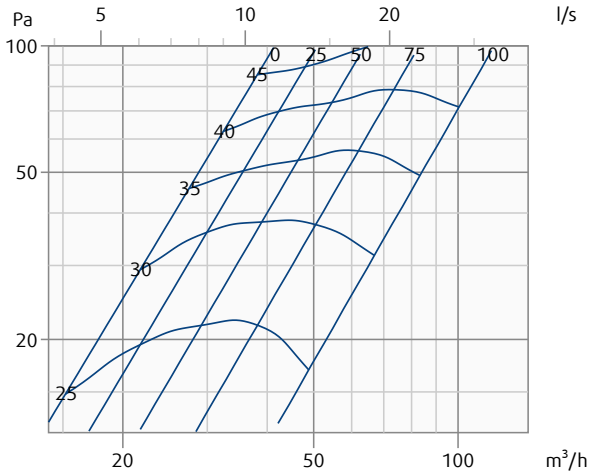
F-C2-80-H0-5-VA

Pressure drop & A-weighted sound power level in dB(A)



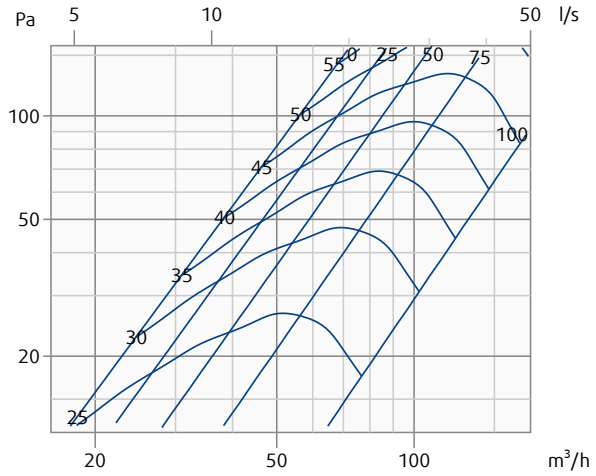
F-C2-100-H0-5-VA

Pressure drop & A-weighted sound power level in dB(A)



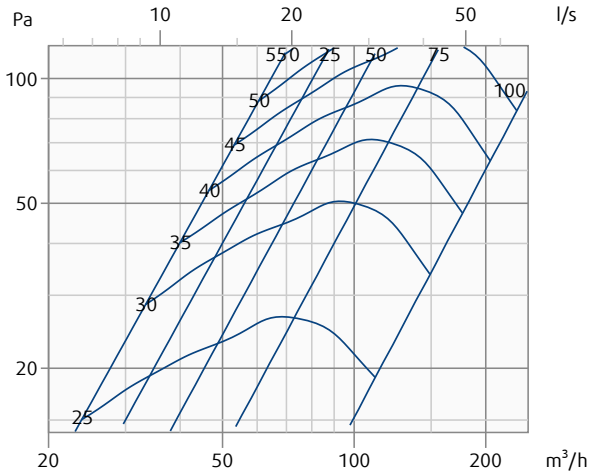
F-C2-125-H0-5-VA

Pressure drop & A-weighted sound power level in dB(A)



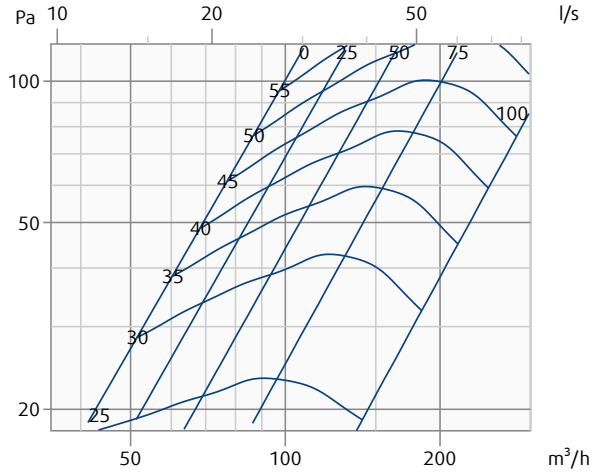
F-C2-160-H0-5-VA

Pressure drop & A-weighted sound power level in dB(A)



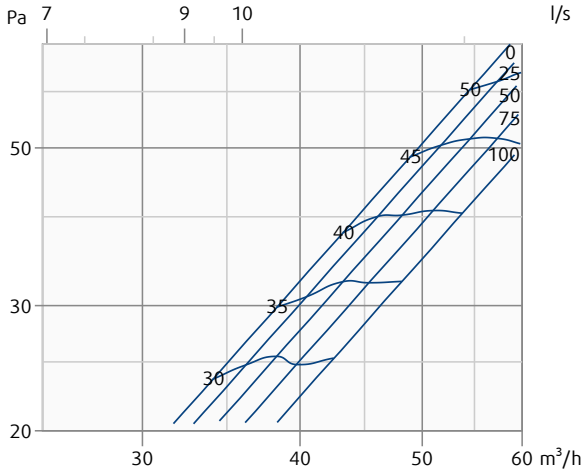
F-C2-200-H0-5-VA

Pressure drop & A-weighted sound power level in dB(A)



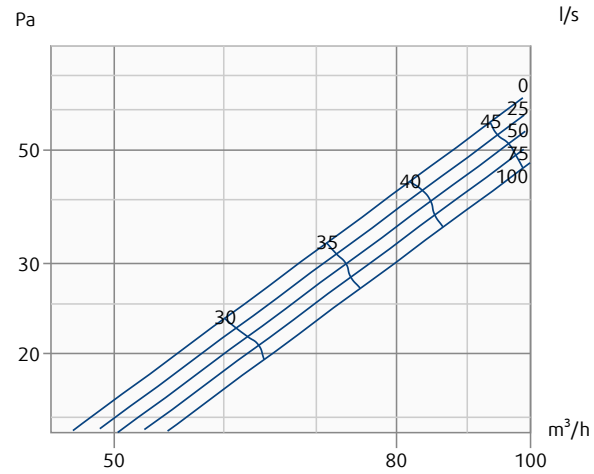
F-C2-80-H0-6-VA

Pressure drop & A-weighted sound power level in dB(A)



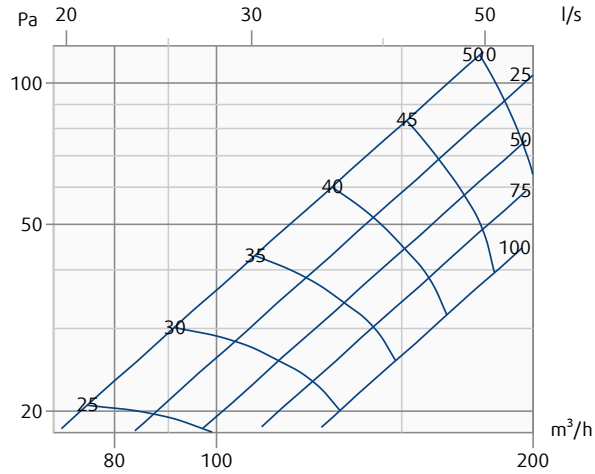
F-C2-100-H0-6-VA

Pressure drop & A-weighted sound power level in dB(A)



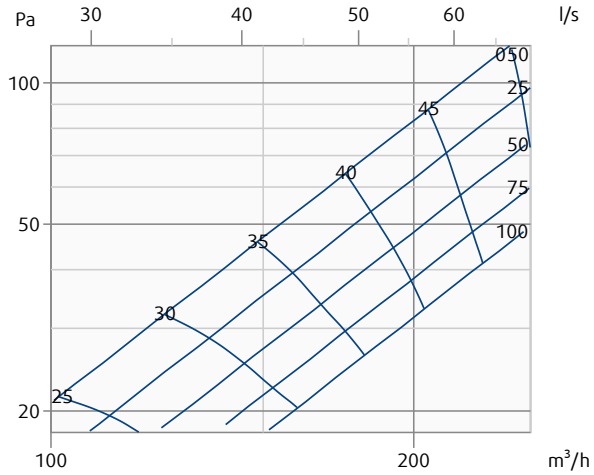
F-C2-125-H0-6-VA

Pressure drop & A-weighted sound power level in dB(A)



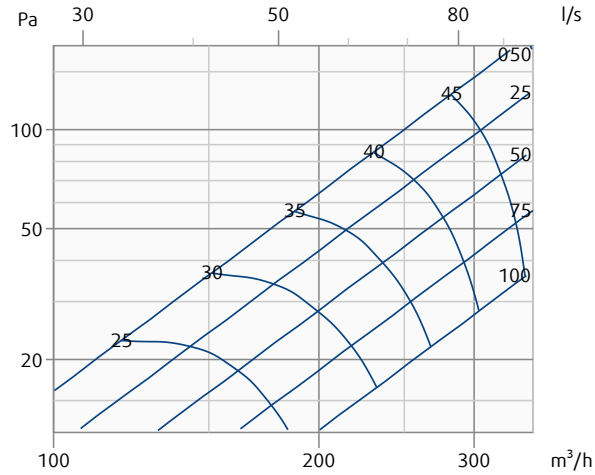
F-C2-160-H0-6-VA

Pressure drop & A-weighted sound power level in dB(A)



F-C2-200-H0-6-VA

Pressure drop & A-weighted sound power level in dB(A)



Legend:

p_s (Pa) - Pressure drop

q_v (m3^/h), (l/s) - Air flow volume

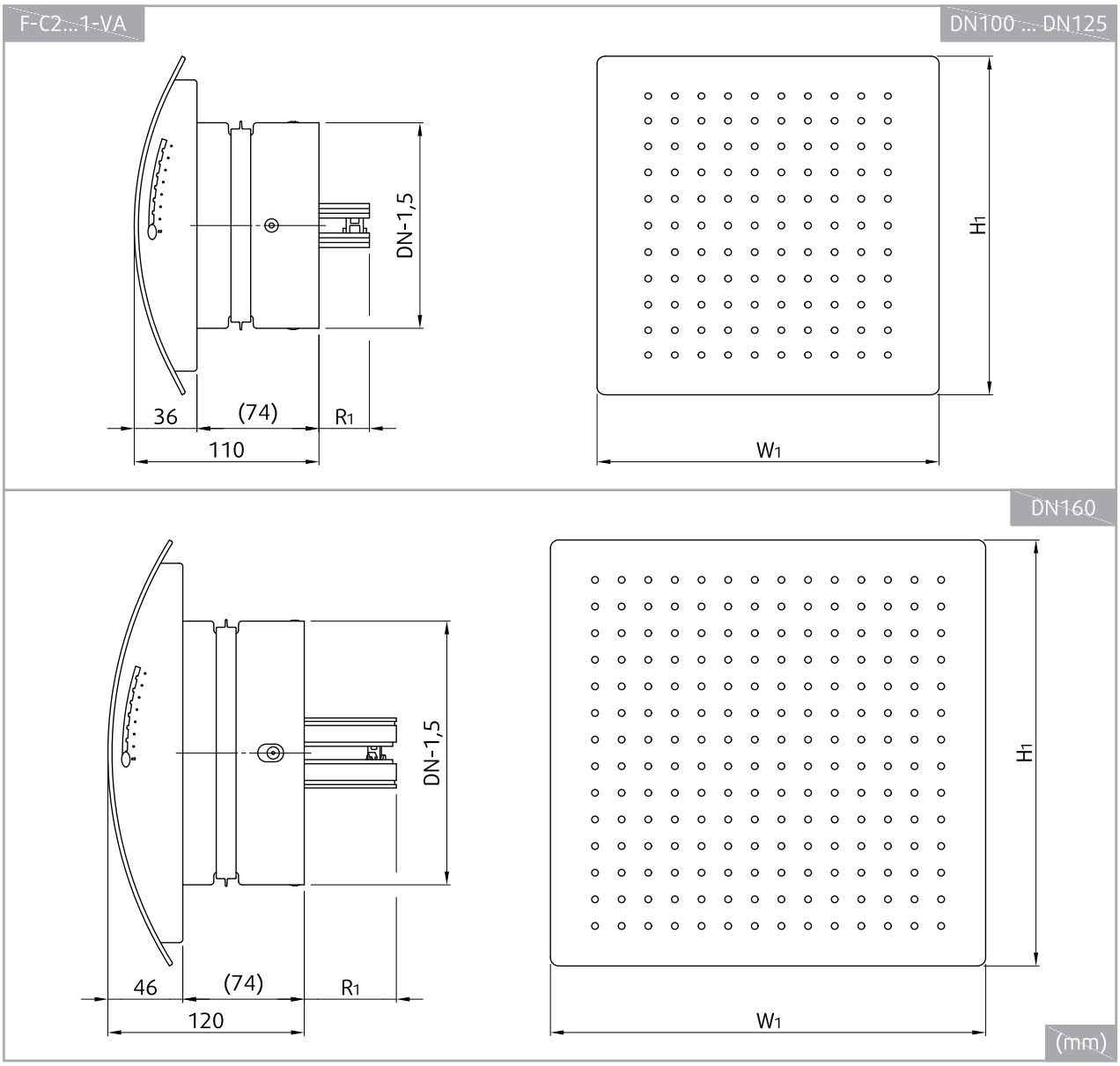
±Δ (%) - Deviation from measured value

L_{wa} (dB(A)) - A-weighted total sound power level

v (m/s) - Air face velocity

Dimensions & Weights

Dimensions of F-C2...1-VA



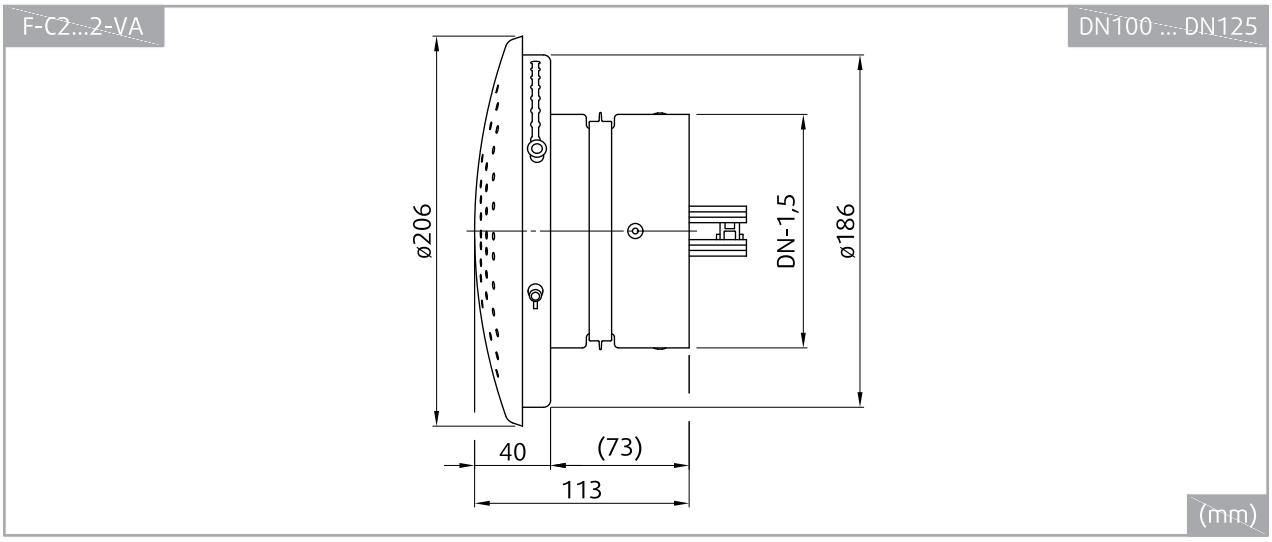
Overhangs and Weights of F-C2...1-VA

F-C2...1-VA				
DN (mm)	R_1	H_1	W_1	m
	mm			kg
100	18,8	204	206	1,3
125	31,3			1,4
160	57,0	256	262	2,1

Free Area of F-C2...1-VA

F-C2...1-VA A_v (m^2)		Pos.								
		1	2	3	4	5	6	7	8	9
DN (mm)	100	0,0023	0,0022	0,0021	0,0020	0,0019	0,0018	0,0017	0,0016	0,0014
	125	0,0031	0,0029	0,0028	0,0027	0,0025	0,0024	0,0022	0,0021	0,0019

Dimensions of F-C2...2-VA



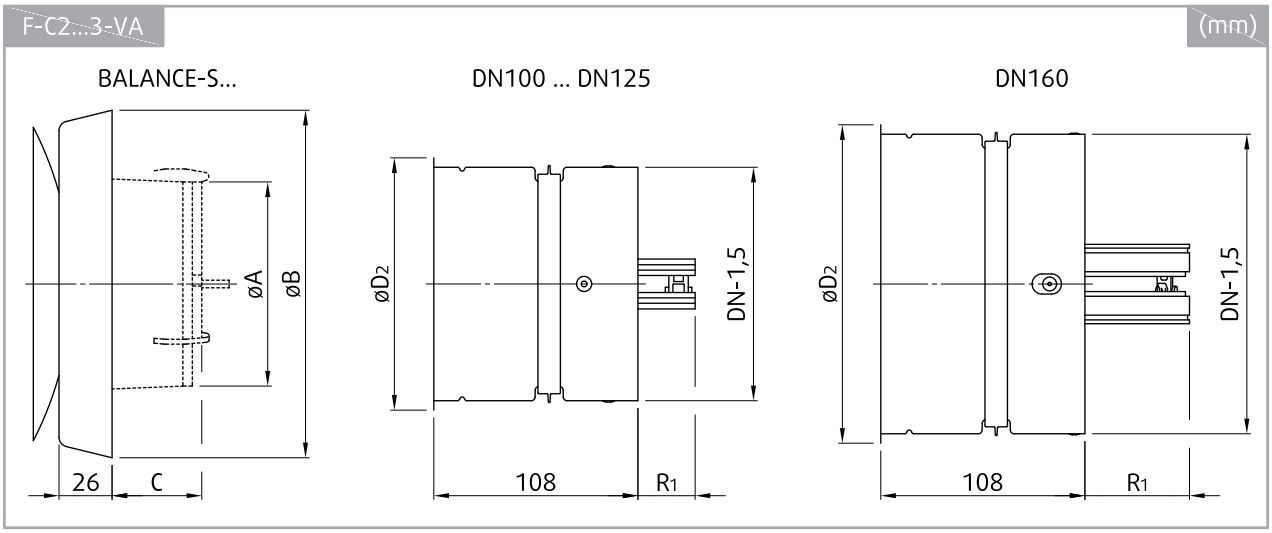
Overhangs and Weights of F-C2...2-VA

F-C2...2-VA		
DN (mm)	R_1	m
	mm	kg
100	18,8	0,9
125	31,3	1,1

Free Area of F-C2...2-VA

F-C2...2-VA A_V (m^2)		Pos.							
		1	2	3	4	5	6	7	8
DN (mm)	100	0,0024	0,0023	0,0021	0,0019	0,0018	0,0017	0,0015	0,0014
	125	0,0032	0,0030	0,0028	0,0026	0,0024	0,0022	0,0020	0,0019
	160	0,0058	0,0055	0,0052	0,0050	0,0048	0,0045	0,0043	0,0041

Dimensions of F-C2...3-VA



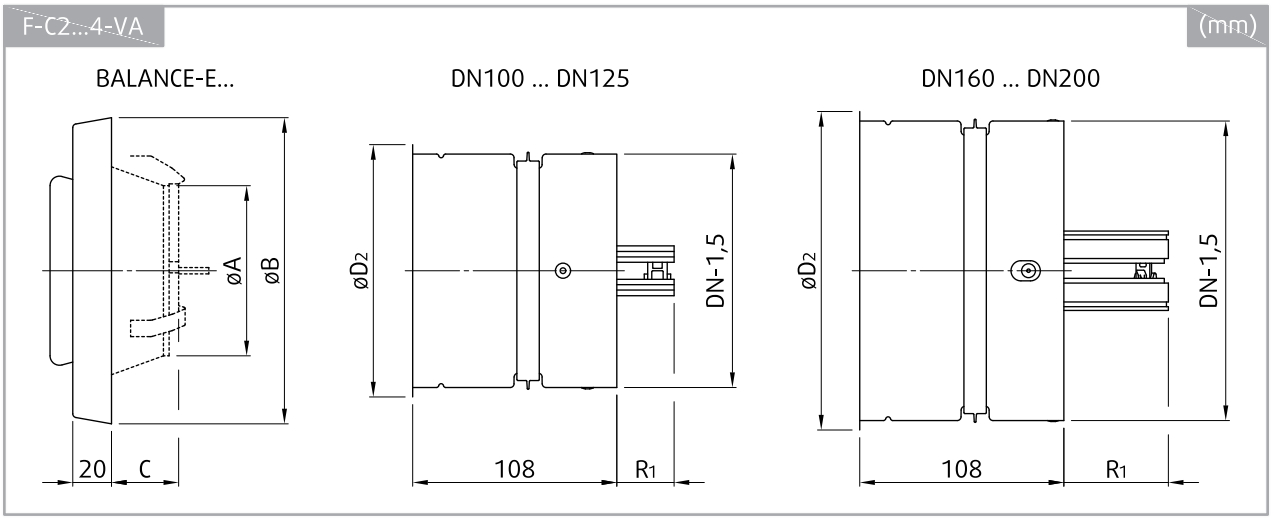
Overhangs and Weights of F-C2...3-VA

F-C2...3-VA						
DN (mm)	R_1	$øD_2$	øA	øB	C	m
	mm					kg
100	18,8	107,1	86	156	46	0,5
125	31,3	132,1	109	182	52	0,7
160	57,0	167,1	125	206	60	1,1

Free area of F-C2...3-VA

F-C2...3-VA A_V (m^2)		Pos. (mm)					
		2,5	4	5	7,5	10	20
DN (mm)	100	0,0012	0,0020	0,0024	0,0037	0,0049	0,0098
	125	0,0014	0,0023	0,0029	0,0043	0,0057	0,0114
	160	0,0016	0,0026	0,0032	0,0049	0,0065	0,0129

Dimensions of F-C2...4-VA



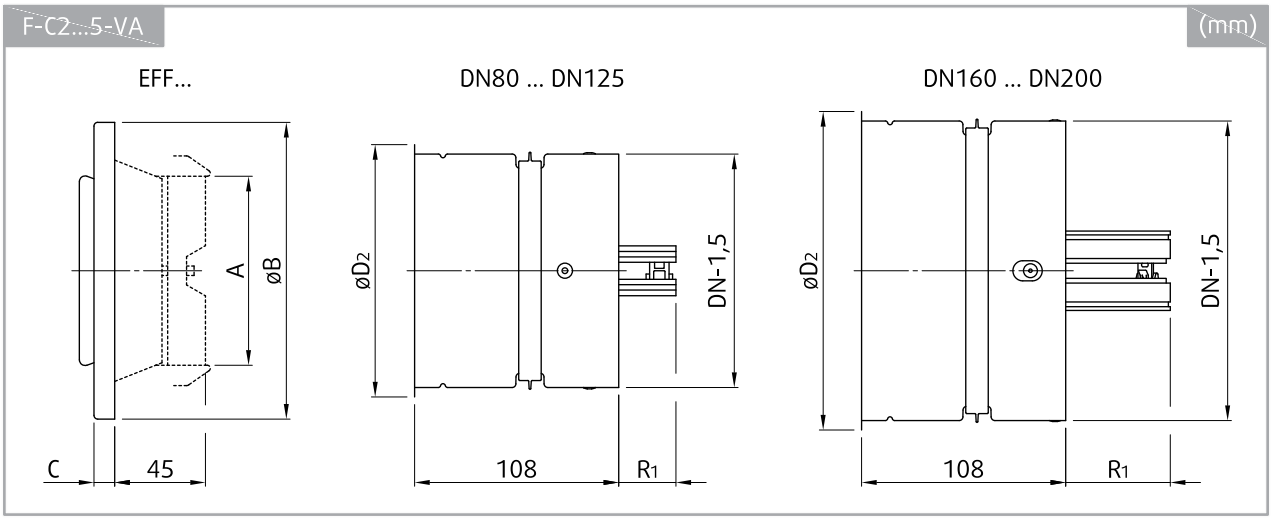
Overhangs and Weights of F-C2...4-VA

F-C2...4-VA						
DN (mm)	R_1	$øD_2$	øA	øB	C	m
	mm					kg
100	18,8	107,1	75	142	41	0,5
125	31,3	132,1	92	160		0,6
160	57,0	167,1	123	195	37	1,0
200	77,0	207,1	172	240	44	1,3

Free Area of F-C2...4-VA

F-C2...4-VA A_v (m^2)		Pos. (mm)					
		-7,5	-5	0	5	10	15
DN (mm)	100	0,0009	0,0011	0,0016	0,0020	0,0025	0,0030
	125	0,0010	0,0013	0,0018	0,0023	0,0029	0,0034
	160	0,0012	0,0015	0,0021	0,0027	0,0033	0,0040
	200	0,0014	0,0018	0,0025	0,0033	0,0040	0,0048

Dimensions of F-C2...5-VA



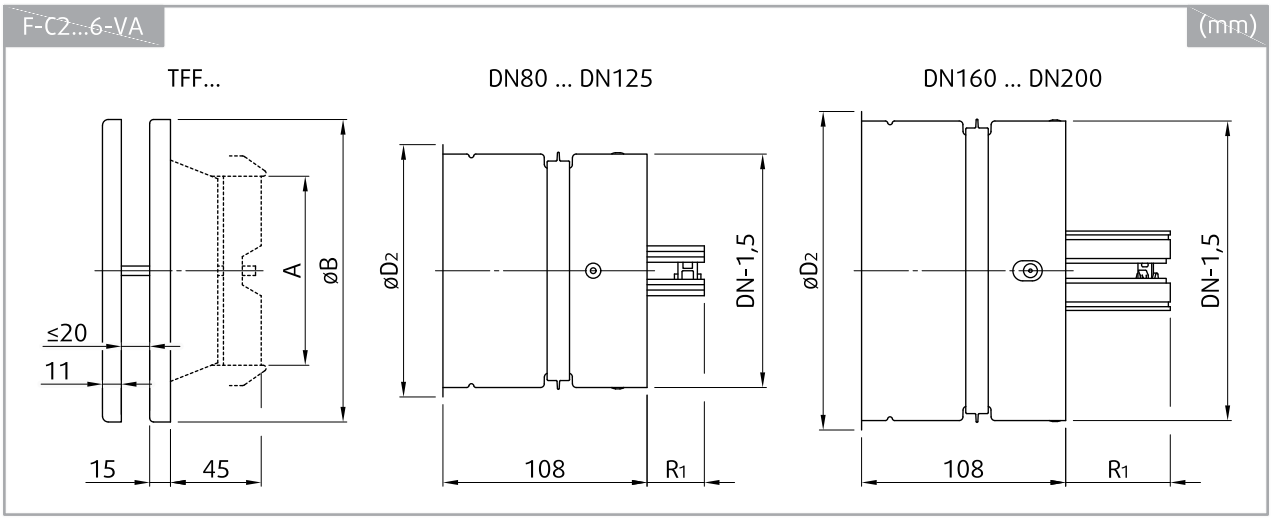
Overhangs and Weights of F-C2...5-VA

F-C2...5-VA						
DN (mm)	R_1	$øD_2$	øA	øB	C	m
	mm					kg
80	8,8	87,1	60	106	15	0,4
100	18,8	107,1	80	135		0,6
125	31,3	132,1	105	160		0,7
160	57,0	167,1	140	195		1,1
200	77,0	207,1	170	238	18	1,5

Free Area of F-C2...5-VA

F-C2...5-VA A_V (m^2)		Pos. (%)			
		25	50	75	100
DN (mm)	80	0,0009	0,0019	0,0029	0,0040
	100	0,0010	0,0021	0,0032	0,0044
	125	0,0010	0,0021	0,0032	0,0044
	160	0,0010	0,0021	0,0032	0,0044
	200	0,0012	0,0024	0,0037	0,0051

Dimensions of F-C2...6-VA



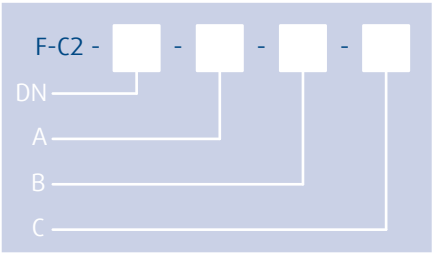
Overhangs and Weights of F-C2...6-VA

F-C2...6-VA					
DN (mm)	R_1	$øD_2$	øA	øB	m
	mm				kg
80	8,8	87,1	60	108	0,5
100	18,8	107,1	80	135	0,7
125	31,3	132,1	105	160	0,8
160	57,0	167,1	140	195	1,2
200	77,0	207,1	170	238	1,7

Free Area of F-C2...6-VA

F-C2...6-VA A_V (m^2)		Pos. (mm)					
		5	10	15	20	25	30
DN (mm)	80	0,0017	0,0034	0,0051	0,0068	-	-
	100	0,0021	0,0042	0,0064	0,0085	0,0106	0,0127
	125	0,0025	0,0050	0,0075	0,0100	-	-
	160	0,0031	0,0061	0,0092	-	-	-
	200	0,0036	0,0072	0,0108	0,0144	0,0181	0,0217

Ordering code



DN

Dimension, øDN:
80, 100, 125, 160, 200 mm

A - Type of Activation

H0 Spring loaded blades, release by a thermal fuse link set to 72 °C., no switches

B - Valve type

1 BOR-S
2 BOR-R
3 Balance-S
4 Balance-E
5 EFF
6 TFF

C - F-C2 Subtype

VA Valve

Example of the F-C2...VA Fire Dampers Ordering Code

F-C2-100-H0-1-VA

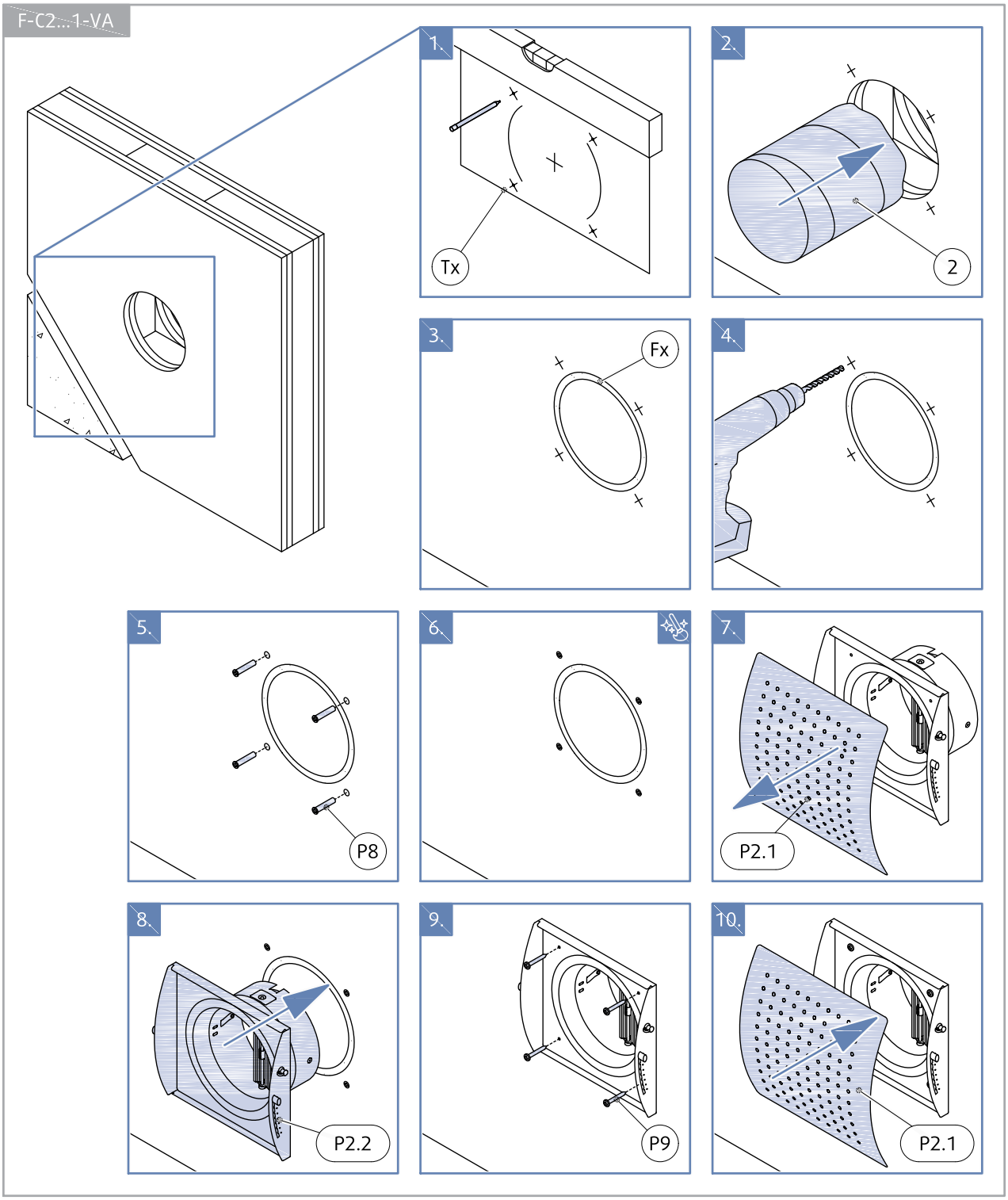
Cartridge fire damper, nominal diameter 100 mm, manually operated activation mechanism with blades released by a thermal fuse link, no switches, valve 1 with BOR-S shape cover.
Note: The fire resistivity depends on the installation method.

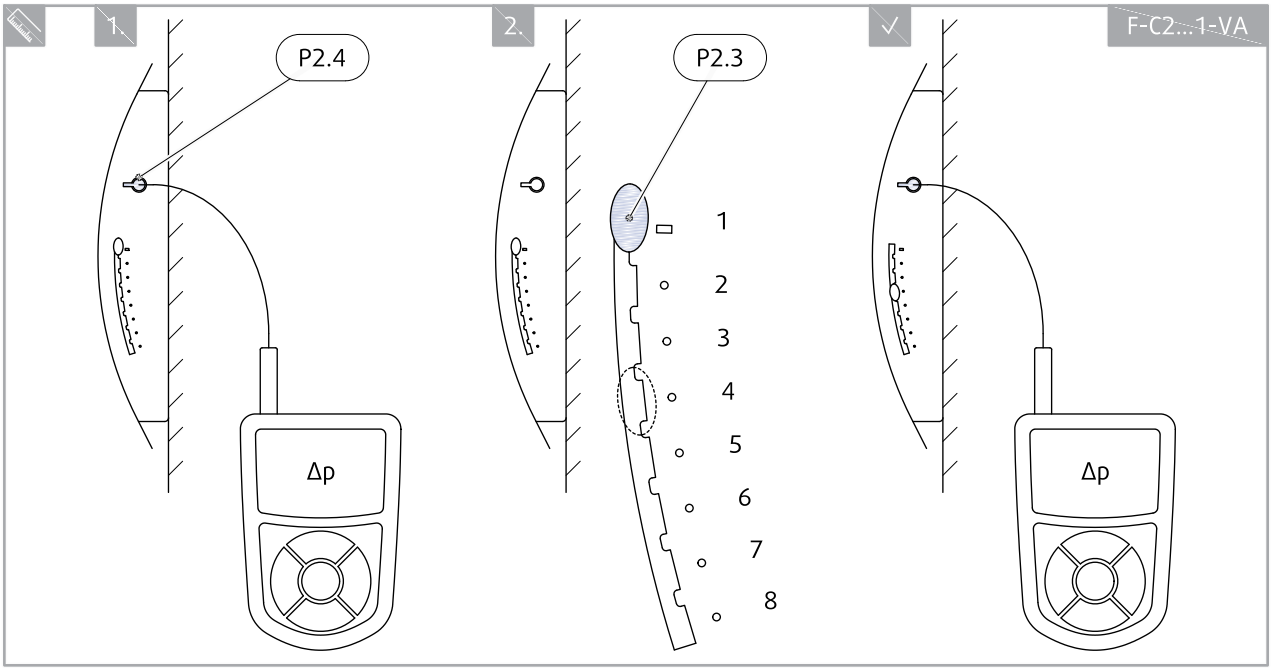
Product Handling

Warning

Some damper parts can have sharp edges. To prevent injuries, use gloves when you install or move the damper.

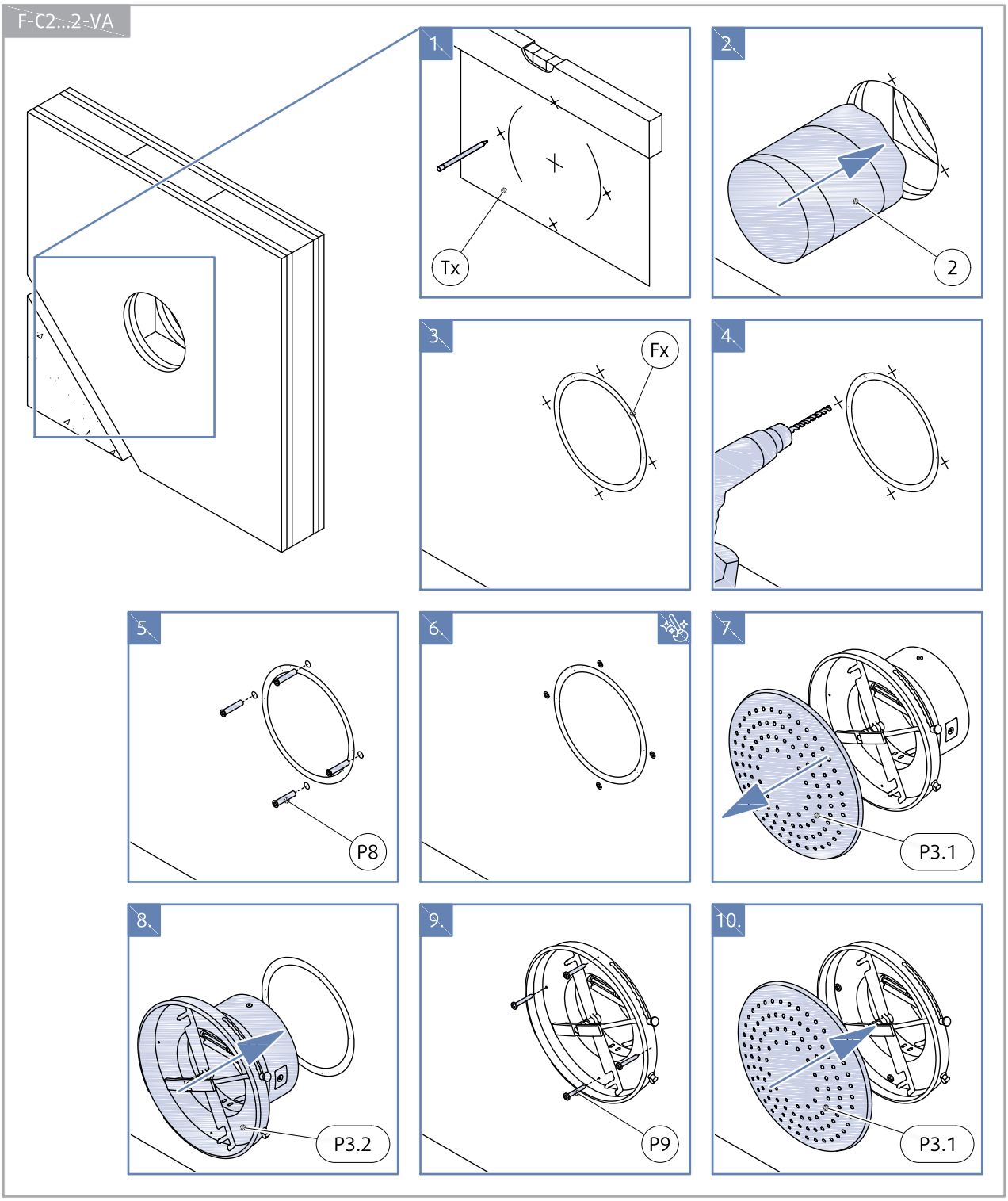
Ensure that installation is performed by a trained person. Please follow the graphic instructions for placing and setting the valve. To perform the filling please follow the instructions at the "Installation rules" for corresponding installation type.

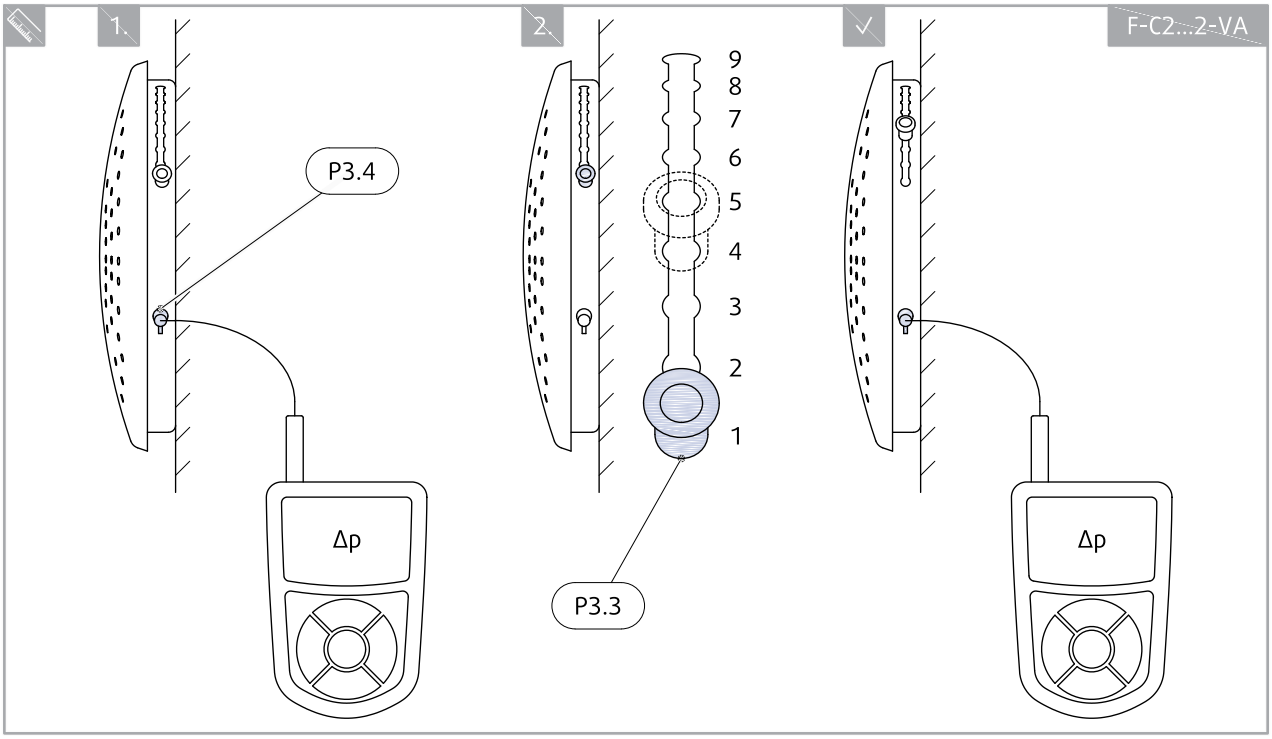




F-C2...1-VA								
Pos.	1	2	3	4	5	6	7	8
DN (mm)	Q (l/s)							
100	2,5	2,3	2,1	2,0	1,8	1,7	1,5	1,4
125	3,3	3,1	2,8	2,6	2,4	2,3	2,1	1,9
160	6,4	5,7	5,5	5,2	4,9	4,6	4,4	4,2

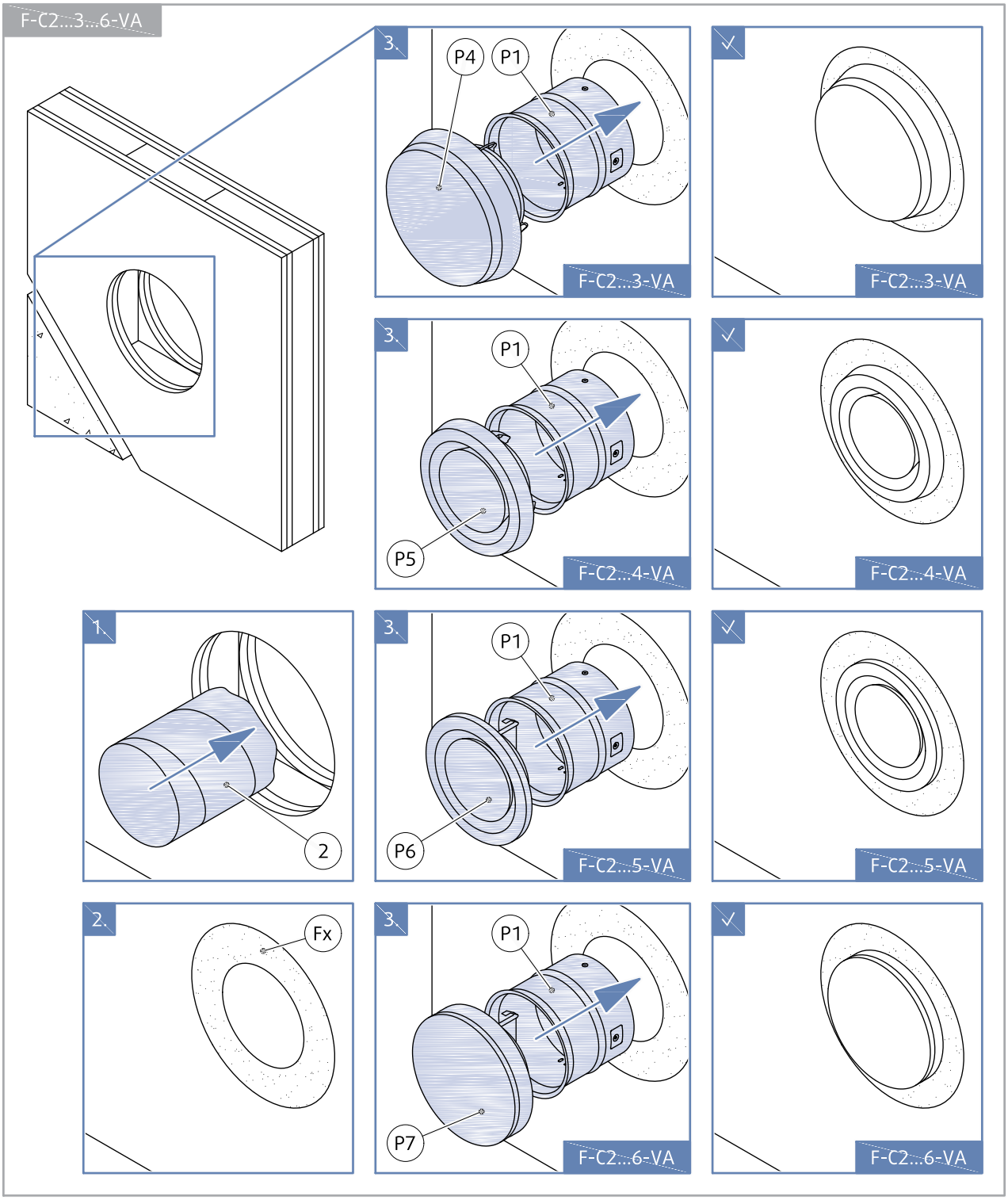
$Q\ (l/s) = k \cdot \sqrt{\Delta p\ (Pa)}$

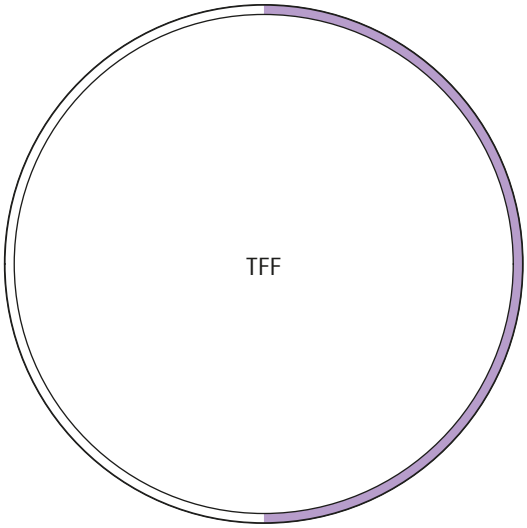

F-C2...2-VA
1.
Tx
2.
2
3.
Fx
4.
5.
P8
6.
7.
P3.1
8.
P3.2
9.
P9
10.
P3.1

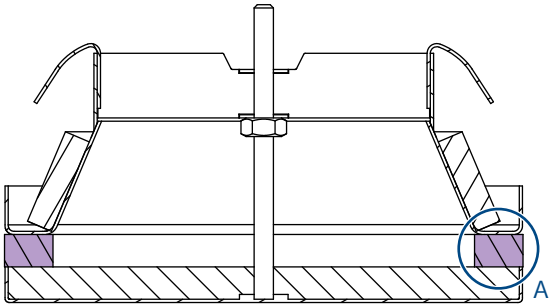


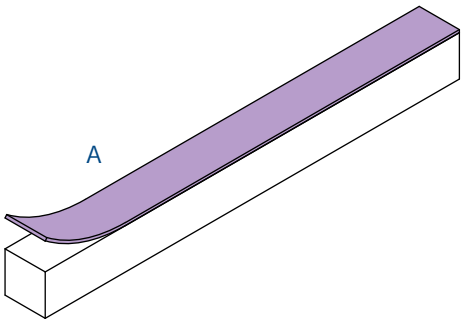
F-C2...2-VA									
Pos.	1	2	3	4	5	6	7	8	9
DN (mm)	Q (l/s)								
100	2,6	2,5	2,4	2,2	2,1	2,0	1,8	1,7	1,6
125	3,3	3,2	3,0	2,8	2,7	2,5	2,3	2,2	2,0

$Q\ (l/s) = k \cdot \sqrt{\Delta p\ (Pa)}$

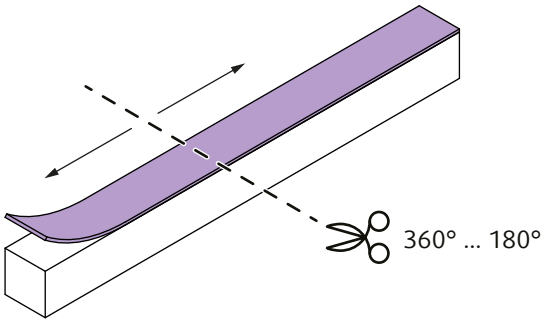

F-C2...3...6-VA
3.
P4
P1
F-C2...3-VA
✓
F-C2...3-VA
3.
P1
P5
F-C2...4-VA
✓
F-C2...4-VA
1.
2
3.
P1
P6
F-C2...5-VA
✓
F-C2...5-VA
2.
Fx
3.
P1
P7
F-C2...6-VA
✓
F-C2...6-VA



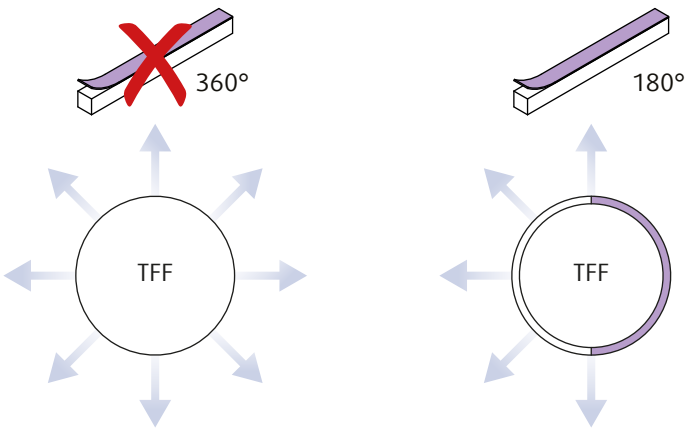




1.



2.



F-C2...3-VA						
Pos. (mm)	2,5	4	5	7,5	10	20
DN (mm)	Q (l/s)					
100	1,1	1,7	2,2	3,1	4,1	5,2
125	1,2	2,0	2,9	3,7	4,8	7,6
160	1,9	2,8	3,4	4,8	6,6	10,3

$Q\ (l/s) = k \cdot \sqrt{\Delta p\ (Pa)}$

F-C2...4-VA						
Pos. (mm)	-7,5	-5	0	5	10	15
DN (mm)	Q (l/s)					
100	0,8	1,1	1,5	2,0	2,3	2,7
125	0,9	1,1	1,6	2,2	2,4	3,5
160	2,0	2,6	3,9	4,5	6,1	7,6
200	4,4	5,7	7,3	8,4	10,2	11,5

$Q\ (l/s) = k \cdot \sqrt{\Delta p\ (Pa)}$

F-C2...5-VA						
Pos. (mm)	-15	-10	-5	0	5	10
DN (mm)	Q (l/s)					
80	0,6	0,8	1,0	1,2	1,3	1,5
100	1,5	1,8	2,1	2,4	2,8	3,1
125	2,1	2,7	3,2	3,7	4,2	4,8
160	2,8	3,6	4,5	5,3	6,1	7,0
200	3,4	4,2	5,1	6,0	6,9	7,8

$Q\ (l/s) = k \cdot \sqrt{\Delta p\ (Pa)}$

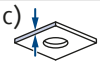
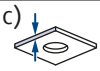
F-C2...6-VA								
Pos. (mm)	5	5	10	10	15	15	20	20
∡	180°	360°	180°	360°	180°	360°	180°	360°
DN (mm)	Q (l/s)							
80	1,3	1,9	1,5	2,1	1,6	2,3	1,7	2,4
100	1,2	3,2	2,0	3,4	2,8	3,5	3,6	3,6
125	1,8	3,8	2,6	5,0	3,5	6,1	4,3	7,2
160	2,2	4,6	3,2	6,5	4,1	8,4	5,0	10,4
200	2,8	5,1	3,7	7,0	4,6	9,0	5,5	10,9

$Q\ (l/s) = k \cdot \sqrt{\Delta p\ (Pa)}$

Legend for Product Handling:

P1 - Fire damper (F-C2)
P1.1* - Casing (3-VA, 4-VA, 5-VA, 6-VA)
P2 - BOR-S
P2.1 - Front panel
P2.2 - Backing box
P2.3 - Adjustment knob
P2.4 - Measurement pin (Δp)
P3 - BOR-R
P3.1 - Front panel
P3.2 - Backing box
P3.3 - Adjustment knob
P3.4 - Measurement pin (Δp)
P4 - BALANCE-S (Supply)
P5 - BALANCE-E (Exhaust)
P6 - EFF (Exhaust)
P7 - TFF (Supply)
P8 - Anchor UniFast 6
P9 - Screw UNI 4×30 mm
2 - Connected metal ductwork
Fx - Plaster/mortar/concrete filling or Mineral wool filling (min. 50 kg/m3)
Tx - Template xxx

Installation

<table>
<tr><td rowspan="6">Wet</td><td rowspan="6">F-C2...VA</td><td>EI 60 (v_e i ↔ o) S</td><td>a)
 
≥ 100 mm</td><td rowspan="2">b)
 
≥ 100 mm
(≥ 500 kg/m³)</td><td rowspan="6">360°</td></tr>
<tr><td>w)
 
 
≥ 120 mm</td></tr>
<tr><td>EI 90 (v_e i ↔ o) S</td><td>a)
 
≥ 125 mm
≥ 100 mm (DN160 ... DN200)</td><td rowspan="2">b)
 
≥ 100 mm
(≥ 500 kg/m³)</td></tr>
<tr><td>EI 120 (v_e i ↔ o) S</td><td>a)
 
≥ 150 mm</td></tr>
<tr><td>EI 60 (h_o i ↔ o) S
EI 90 (h_o i ↔ o) S</td><td>c)
 
≥ 125 mm
(≥ 600kg/m³)</td></tr>
<tr><td>EI 120 (h_o i ↔ o) S</td><td>c)
 
≥ 150 mm
≥ 125 mm (DN160 ... DN200)
(≥ 600 kg/m³)</td></tr>
<tr><td rowspan="3">Dry</td><td rowspan="3">F-C2...VA</td><td>EI 60 (v_e - i ↔ o) S
EI 90 (v_e - i ↔ o) S</td><td>a)
 
≥ 100 mm</td><td>b)
 
≥ 100 mm
(≥ 500 kg/m³)</td><td rowspan="3">360°</td></tr>
<tr><td>EI 120 (v_e i ↔ o) S</td><td>a)
 
≥ 150 mm
≥ 125 mm (DN80 ... DN125)</td><td>b)
 
≥ 150 mm
≥ 125 mm (DN80 ... DN125)
(≥ 500 kg/m³)</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td rowspan="3">Soft</td><td rowspan="3">F-C2...VA</td><td>EI 60 (v_e i ↔ o) S
EI 90 (v_e i ↔ o) S</td><td>a)
 
≥ 100 mm</td><td>b)
 
≥ 100 mm
(≥ 500 kg/m³)</td><td rowspan="3">360°</td></tr>
<tr><td>EI 120 (v_e i ↔ o) S</td><td>a)
 
≥ 150 mm</td><td>b)
 
≥ 150 mm
(≥ 500 kg/m³)</td></tr>
<tr><td colspan="3"></td></tr>
</table>

Notes:

1. Wet - Wet Installation, Using Plaster/Mortar/Concrete Filling

2. Dry - Dry Installation, Using Mineral Wool and Coverplates

3. Soft - Soft Installation, Using Mineral Wool filing

a) - Flexible (plasterboard) wall

b) - Concrete/masonry/cellular concrete (rigid) wall

c) - Concrete/cellular concrete (rigid) floor/ceiling

$\mathbf{v_e}$ - Vertical supporting construction (wall)

$\mathbf{h_o}$ - Horizontal supporting construction (floor/ceiling)

Installation Rules

- The F-C2 fire damper is installed into the duct, in the place where the fire-proof wall is.
- The duct that holds the fire damper must be supported or hung in such a way that the crossing does not carry its weight. The crossing must not support any part of the surrounding construction or wall which could cause damage and consequent damper failure.
- According to the standard EN 1366-2, the distance between ducts that hold F-C2 or between other objects that cross the supporting construction must be at least 200 mm.
- The distance between the wall/ceiling and the duct that holds F-C2 must be at least 75 mm.
- The fire damper is embedded into the fire partition construction into duct in such a way that when the damper blades are in the CLOSED position, that will be entirely situated inside the wall.
- The gap in the installation opening between the fire damper and the wall/ceiling can be increased by up to 50% of the gap area.
- The gap in the installation opening between the duct that holds F-C2 and the wall/ceiling can be decreased to the smallest amount possible that still provides sufficient space for the installation of the seal.
- All F-C2 dampers can be installed with the blade axis in a horizontal position or a vertical position.
- Lists of all permitted installation methods are provided in SystemairDESIGN or in HandBook of the F-C2...VA.

IN ACCORDANCE WITH EN 15650, EACH FIRE DAMPER MUST BE INSTALLED ACCORDING TO THE INSTALLATION INSTRUCTIONS PROVIDED BY THE MANUFACTURER!

Installation, Maintenance & Operation

Some damper parts may have sharp edges – therefore to protect yourself from harm, please use gloves during damper installation and manipulation. In order to prevent electric shock, fire or any other damage which could result from incorrect damper usage and operation, it is important to:

1. ensure that installation is performed by a trained person.
2. follow the written and depicted instructions provided within HandBook closely.
3. perform damper inspection in accordance with HandBook.
4. check the damper's functionality as per the chapter "Fire Damper Functionality Check" before you install the fire damper. This procedure prevents the installation of a damper that has been damaged during transportation or handling.

Information about installation, maintenance and operation is available in the "HandBook_F-C2...VA" document or more can be found at design.systemair.com.

Installation 1. Wet

Using Plaster/Mortar/Concrete Filling

1. The supporting construction opening must be prepared as depicted in wall preparation. Opening surfaces must be even and cleaned off.
2. The opening dimension D1 is driven by the nominal dimensions of the damper with added clearance. The flexible wall opening must be reinforced as per the standards for plasterboard walls when a vertical beam was breached with the opening.
3. Insert the duct in the middle of the opening. End of the duct must be aligned with the wall/ceiling surface on the side of future valve placement.

NOTE To align the duct in the opening, support the duct piece using underlay. To prevent leakage of the filling material, use paneling boards.

4. Fill in the area between the wall and the duct with plaster or mortar or concrete filling (F1).
5. Let the filling harden.
6. Check the damper's functionality.
7. Apply the included additional product label to the duct or wall next to the damper insertion.
8. For inserting the damper with a valve or wall element, follow the instructions at the "Product Handling".

Installation Distances

According to the standard EN 1366-2, the minimum distance from the wall or ceiling to the duct that holds F-C2 is 75 mm. For multiple crossings through a fire resistive wall the minimum distance between two ducts that hold F-C2 is 200 mm. This applies for distances between the duct that holds F-C2 and a nearby foreign object crossing the fire resistive wall.

<table>
<tr><td rowspan="6">Wet</td><td rowspan="6">F-C2...VA</td><td rowspan="2">EI 60 (v_e i ↔ o) S</td><td>a)
≥ 100 mm</td><td rowspan="2">b)
≥ 100 mm
(≥ 500 kg/m³)</td><td rowspan="6">360°</td></tr>
<tr><td>w)
≥ 120 mm</td></tr>
<tr><td>EI 90 (v_e i ↔ o) S</td><td>a)
≥ 125 mm
≥ 100 mm (DN160 ... DN200)</td><td rowspan="2">b)
≥ 100 mm
(≥ 500 kg/m³)</td></tr>
<tr><td>EI 120 (v_e i ↔ o) S</td><td>a)
≥ 150 mm</td></tr>
<tr><td>EI 60 (h_o i ↔ o) S
EI 90 (h_o i ↔ o) S</td><td>c)
≥ 125 mm
(≥ 600kg/m³)</td></tr>
<tr><td>EI 120 (h_o i ↔ o) S</td><td>c)
≥ 150 mm
≥ 125 mm (DN160 ... DN200)
(≥ 600 kg/m³)</td></tr>
</table>

Notes:

1. Wet - Wet Installation, Using Plaster/Mortar/Concrete Filling

a) - Flexible (plasterboard) wall

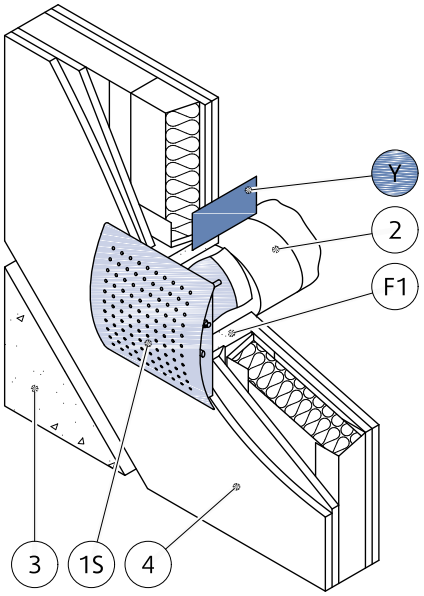
b) - Concrete/masonry/cellular concrete (rigid) wall

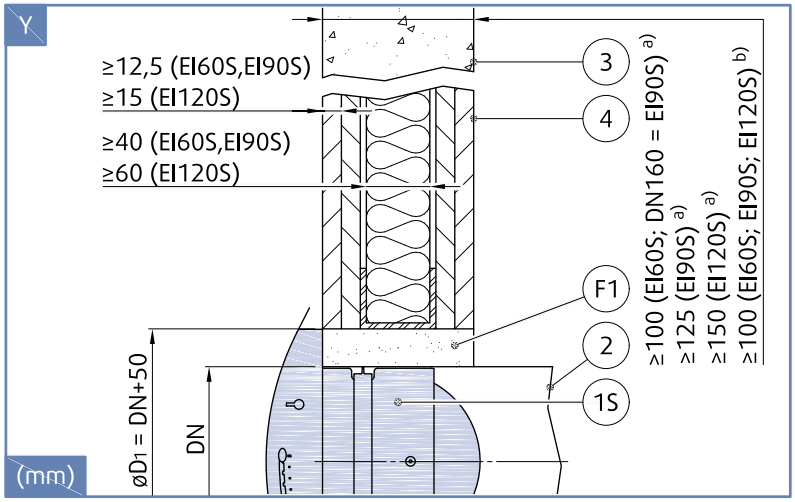
c) - Concrete/cellular concrete (rigid) floor/ceiling

v_e - Vertical supporting construction (wall)

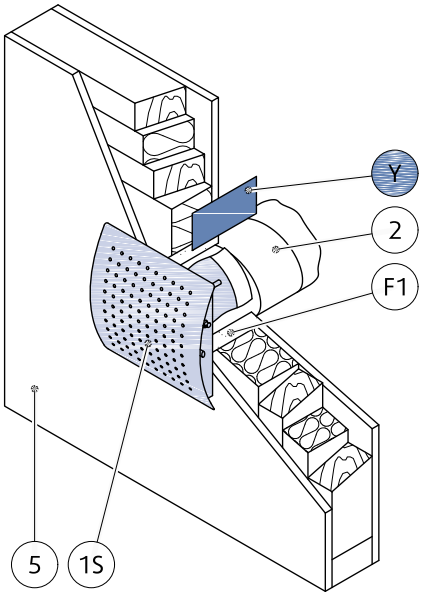
h_o - Horizontal supporting construction (floor/ceiling)

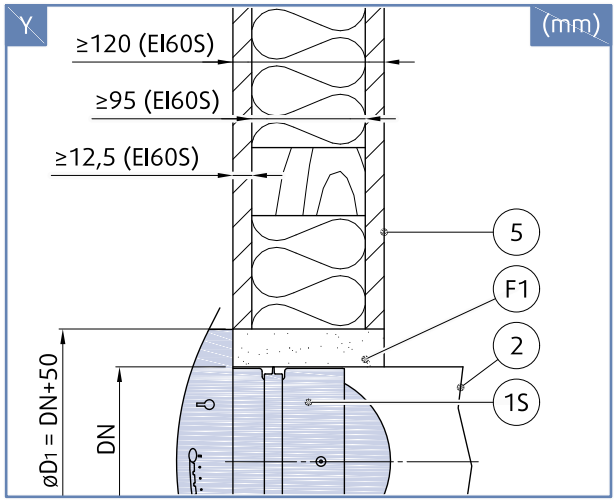
F-C2...1-VA



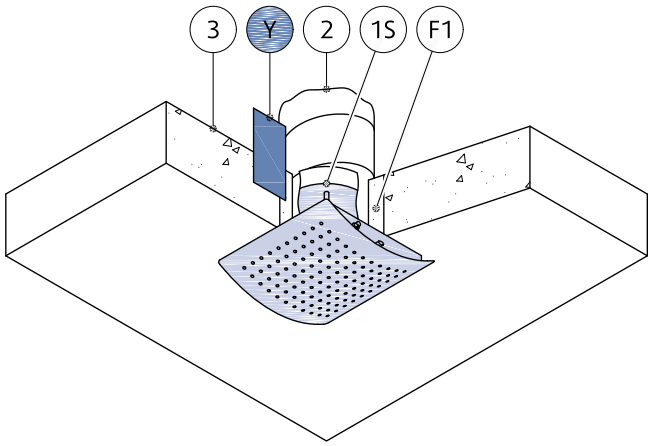


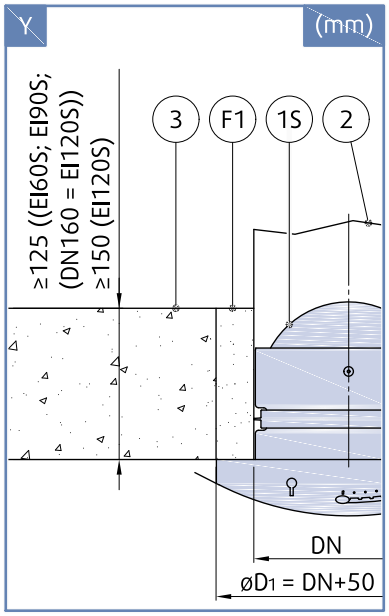
F-C2...1-VA



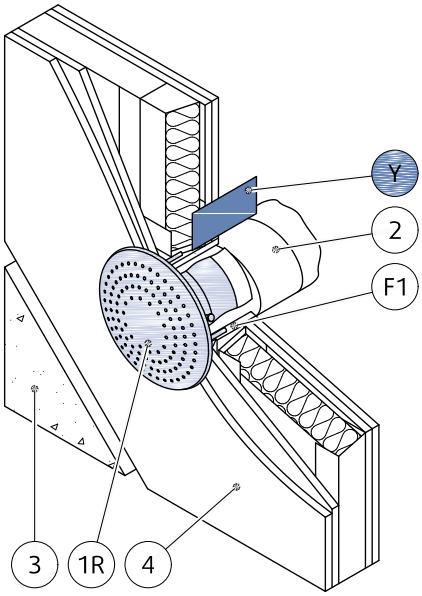


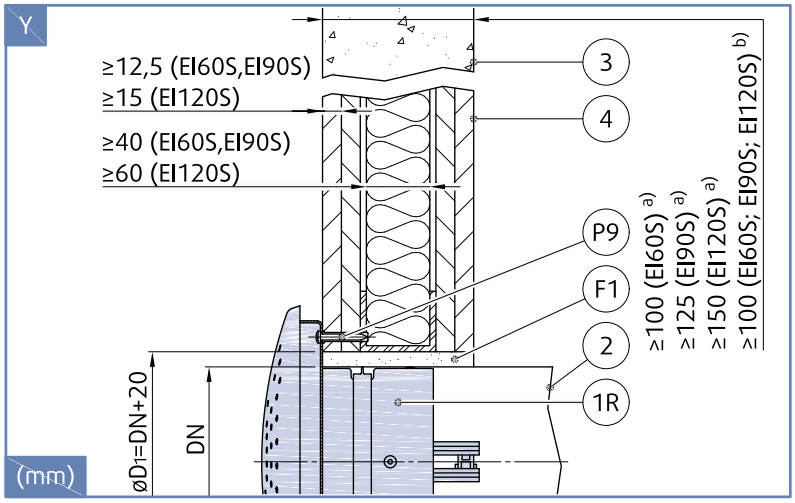
F-C2...1-VA





F-C2...2-VA





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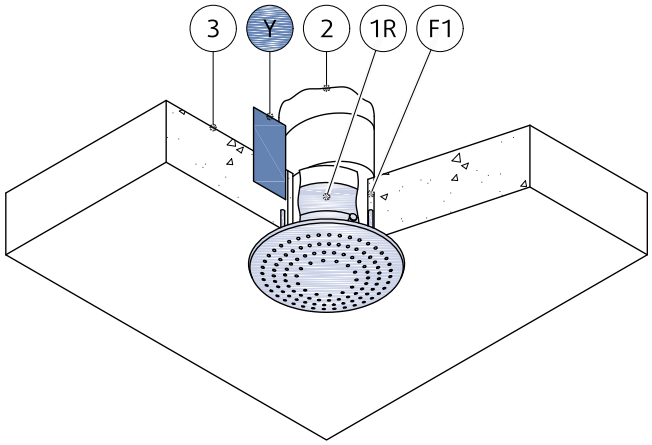

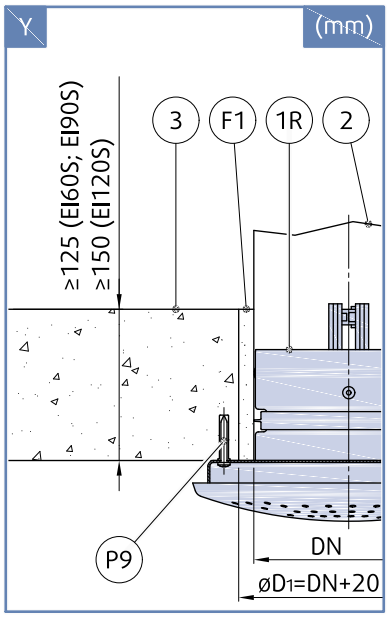

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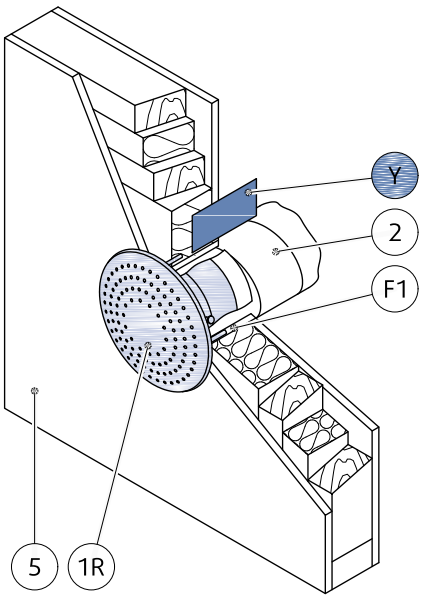

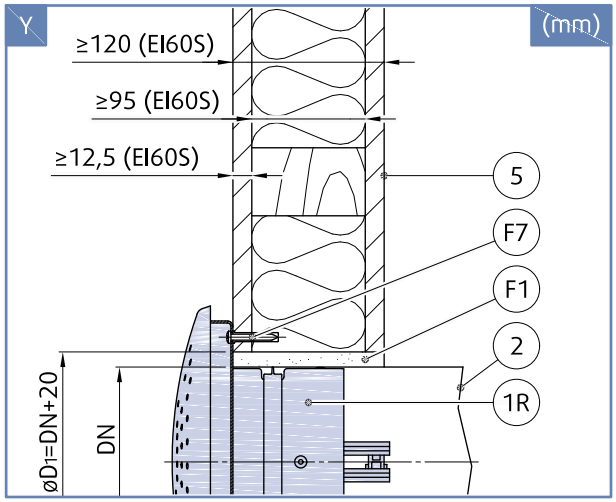

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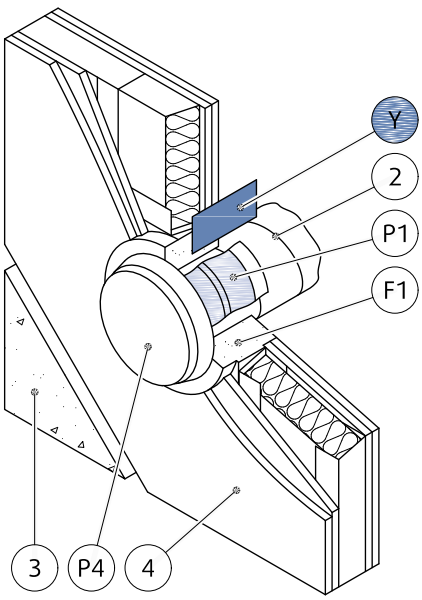

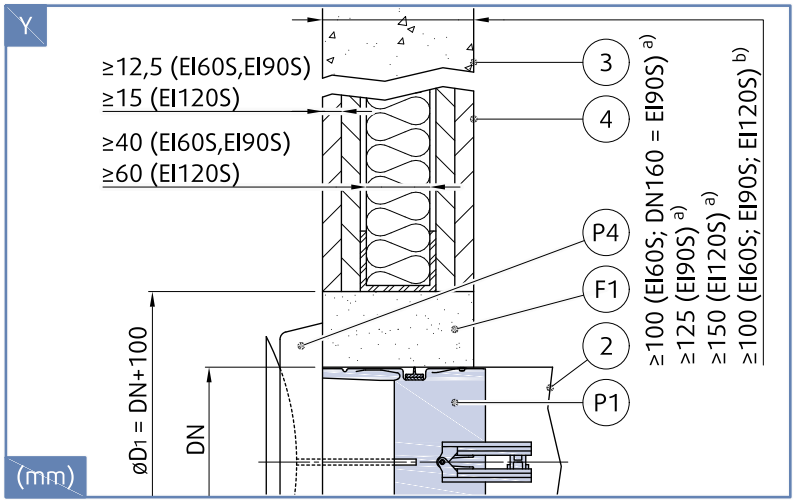

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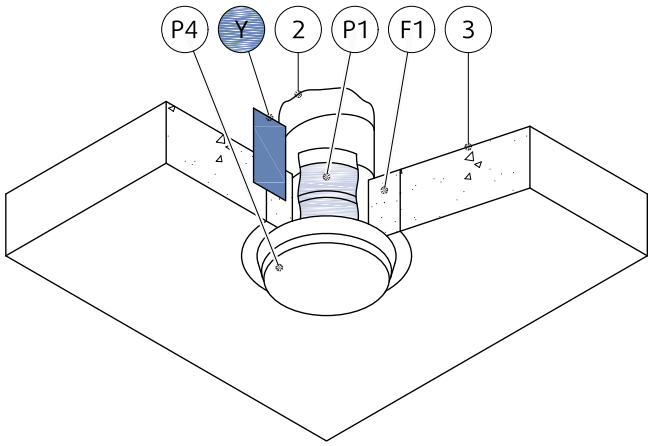
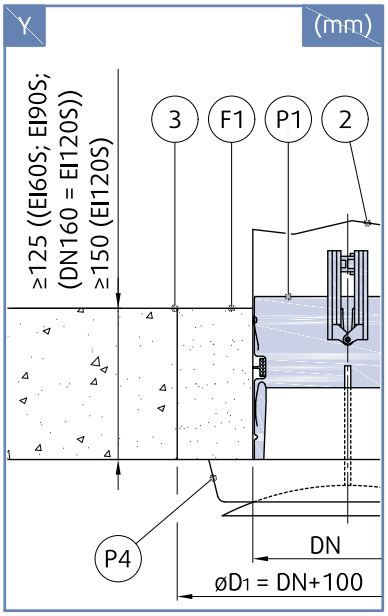
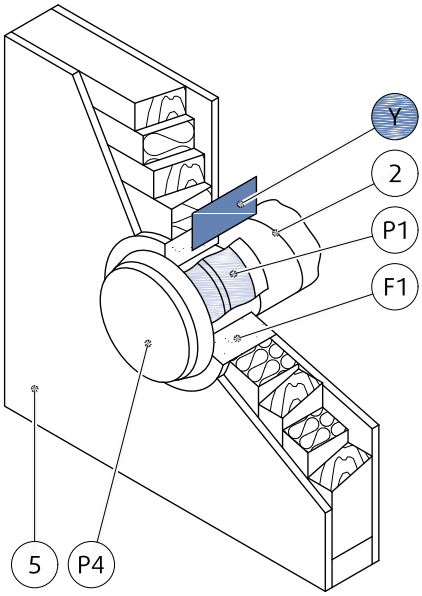
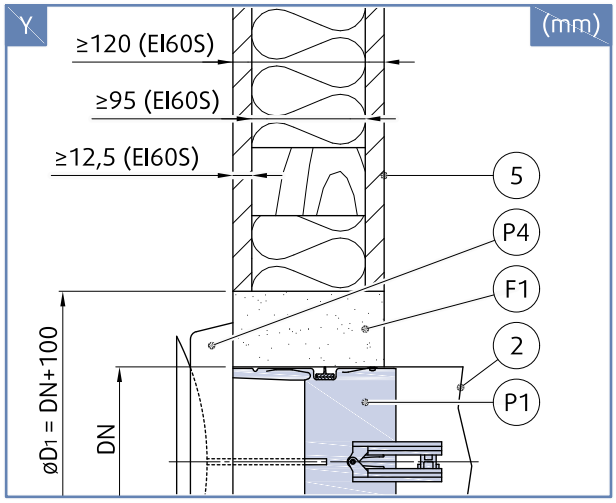


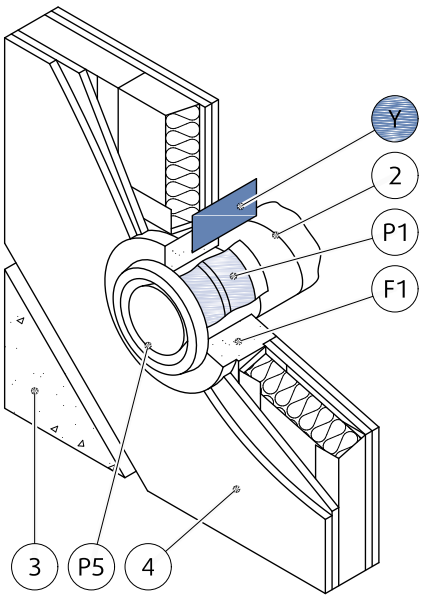


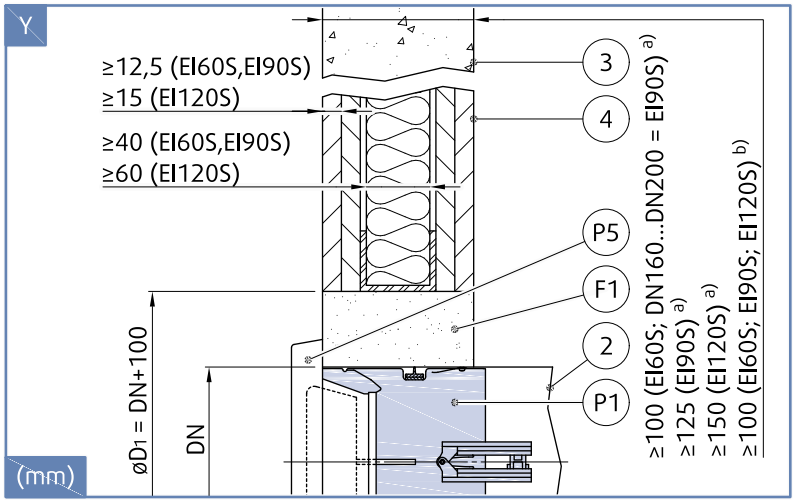
F-C2...3-VA





F-C2...4-VA





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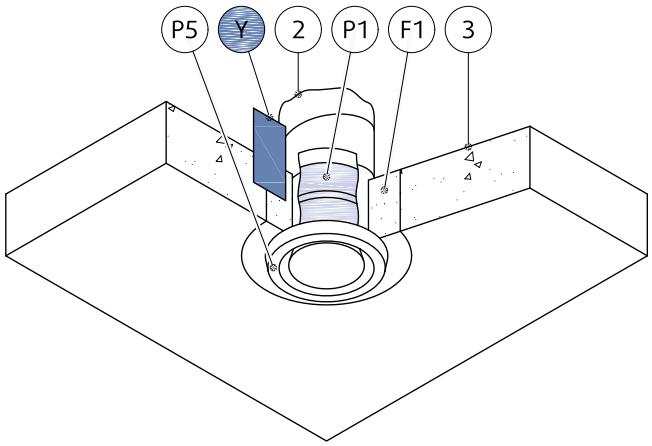
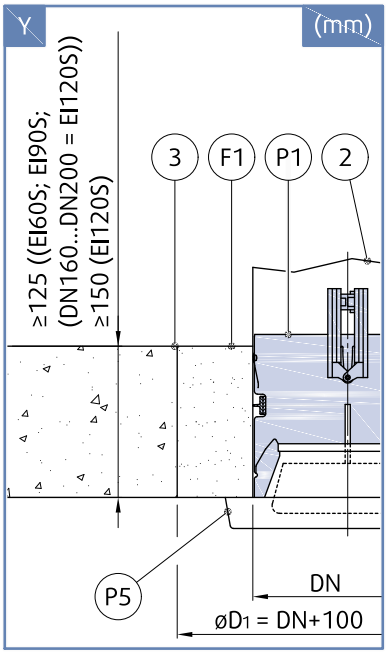
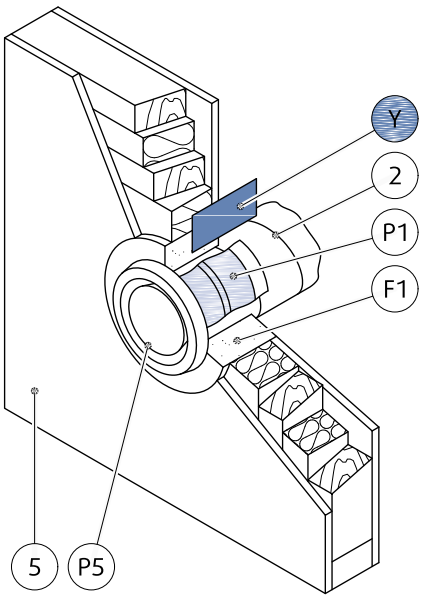
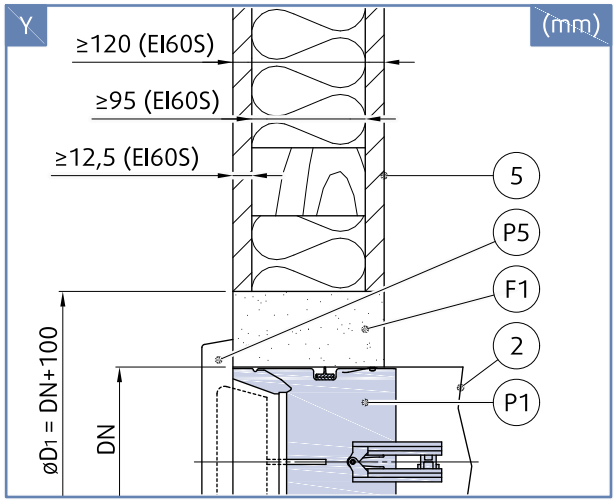


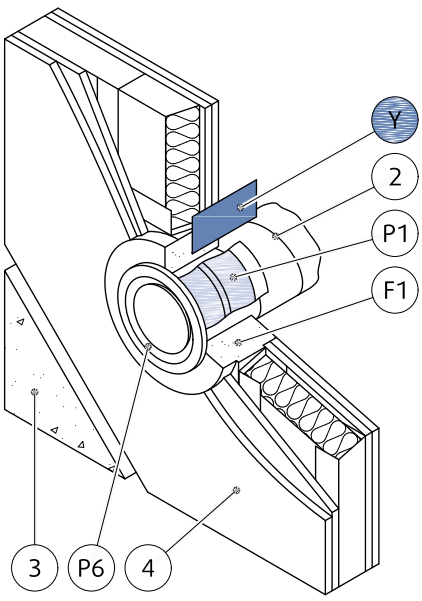


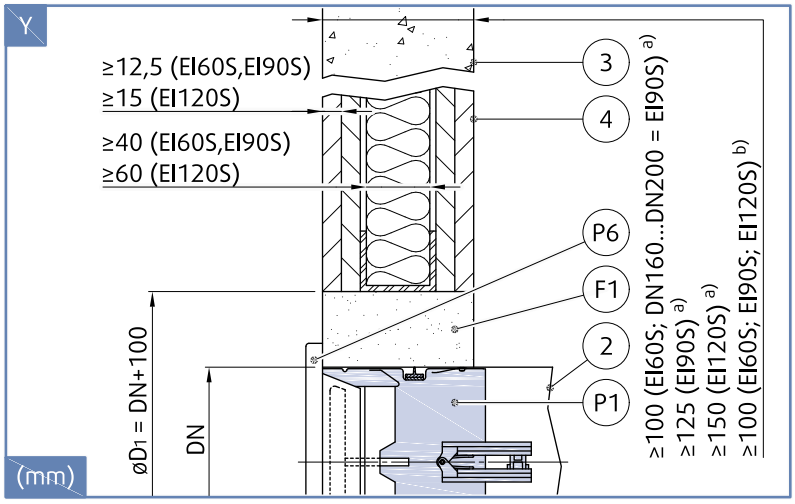
F-C2...4-VA



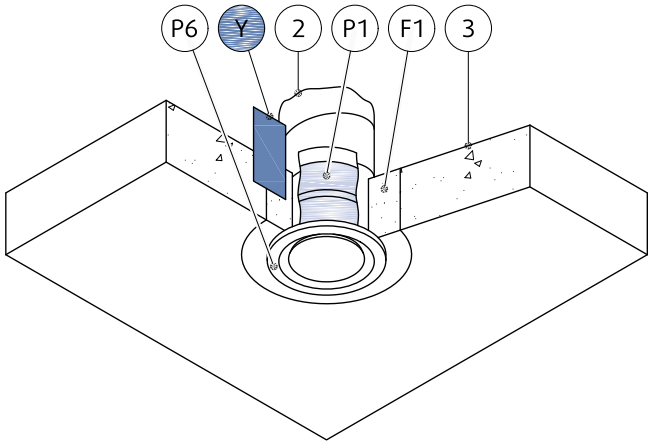


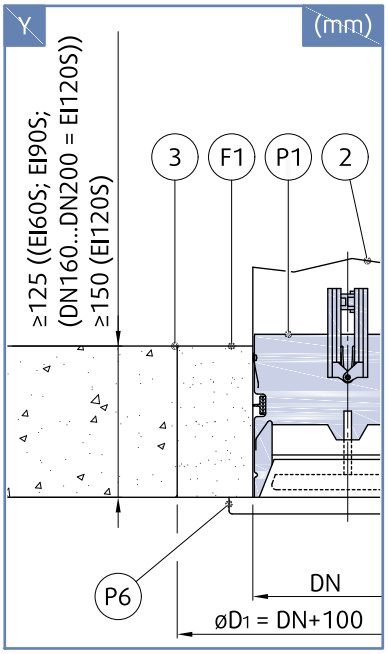
F-C2...5-VA



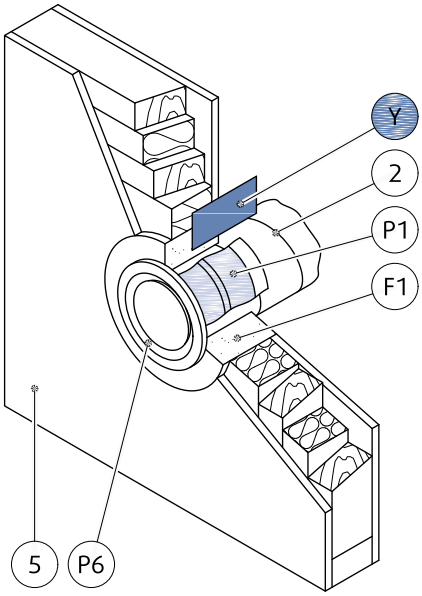


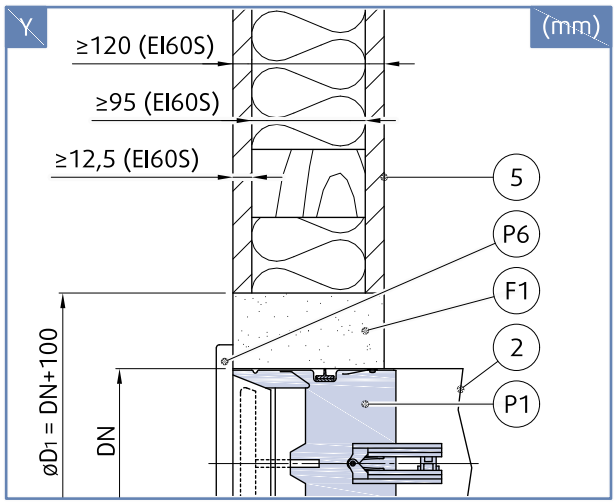
F-C2...5-VA



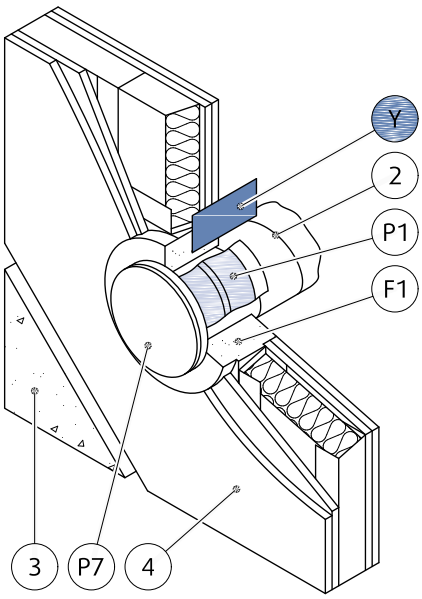


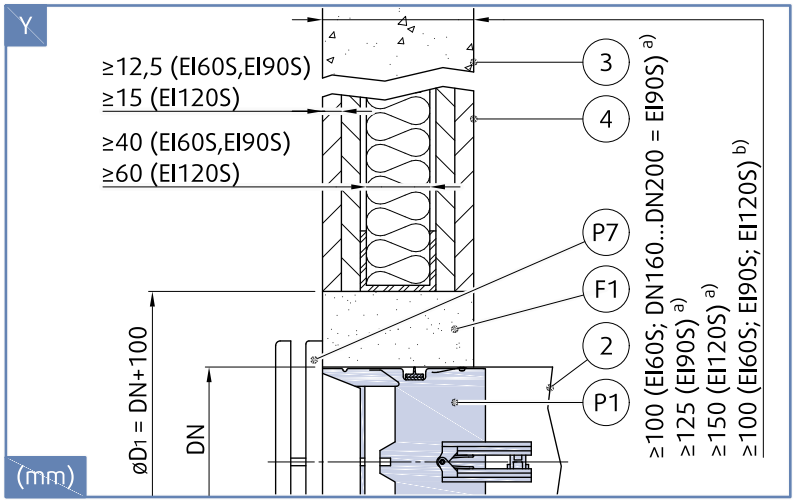
F-C2...5-VA



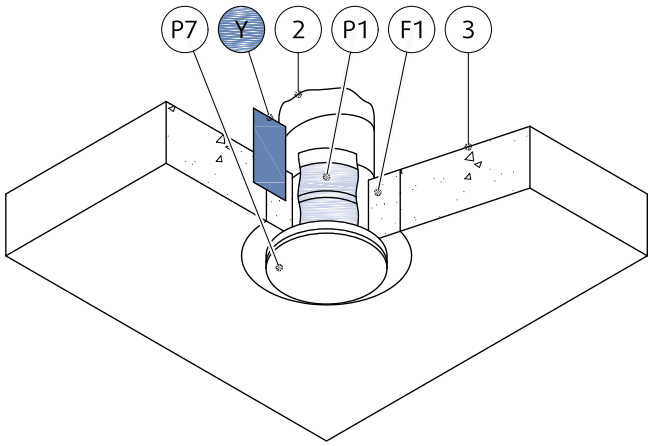


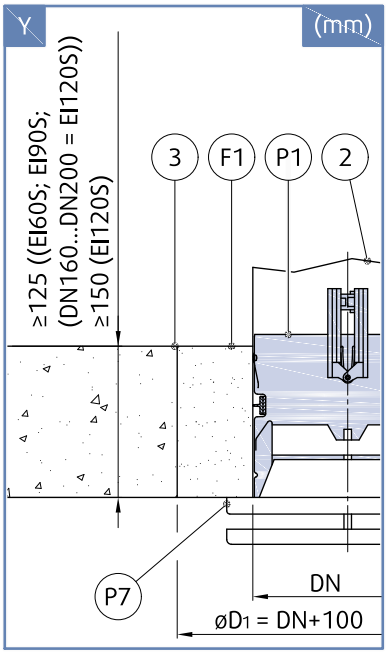
F-C2...6-VA



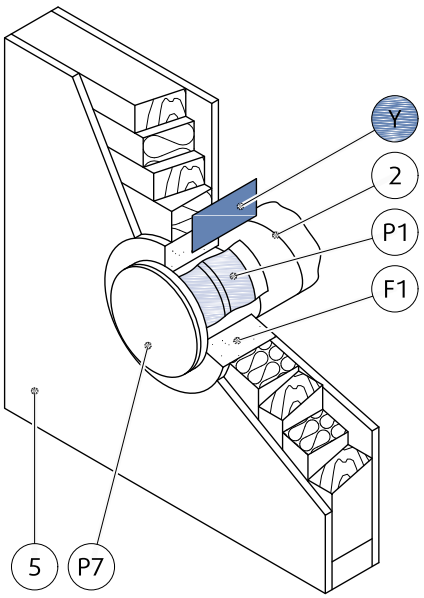


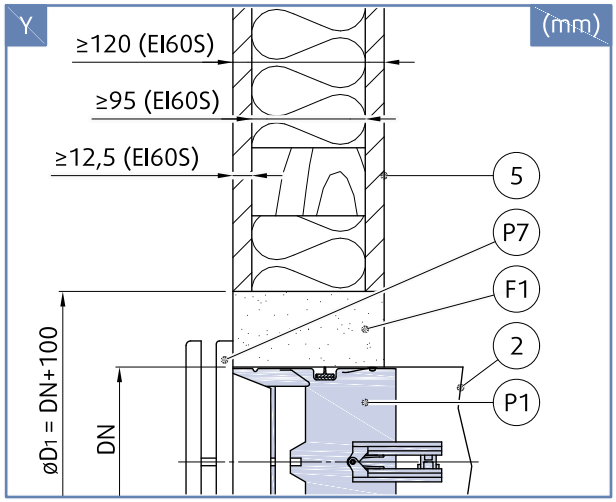
F-C2...6-VA



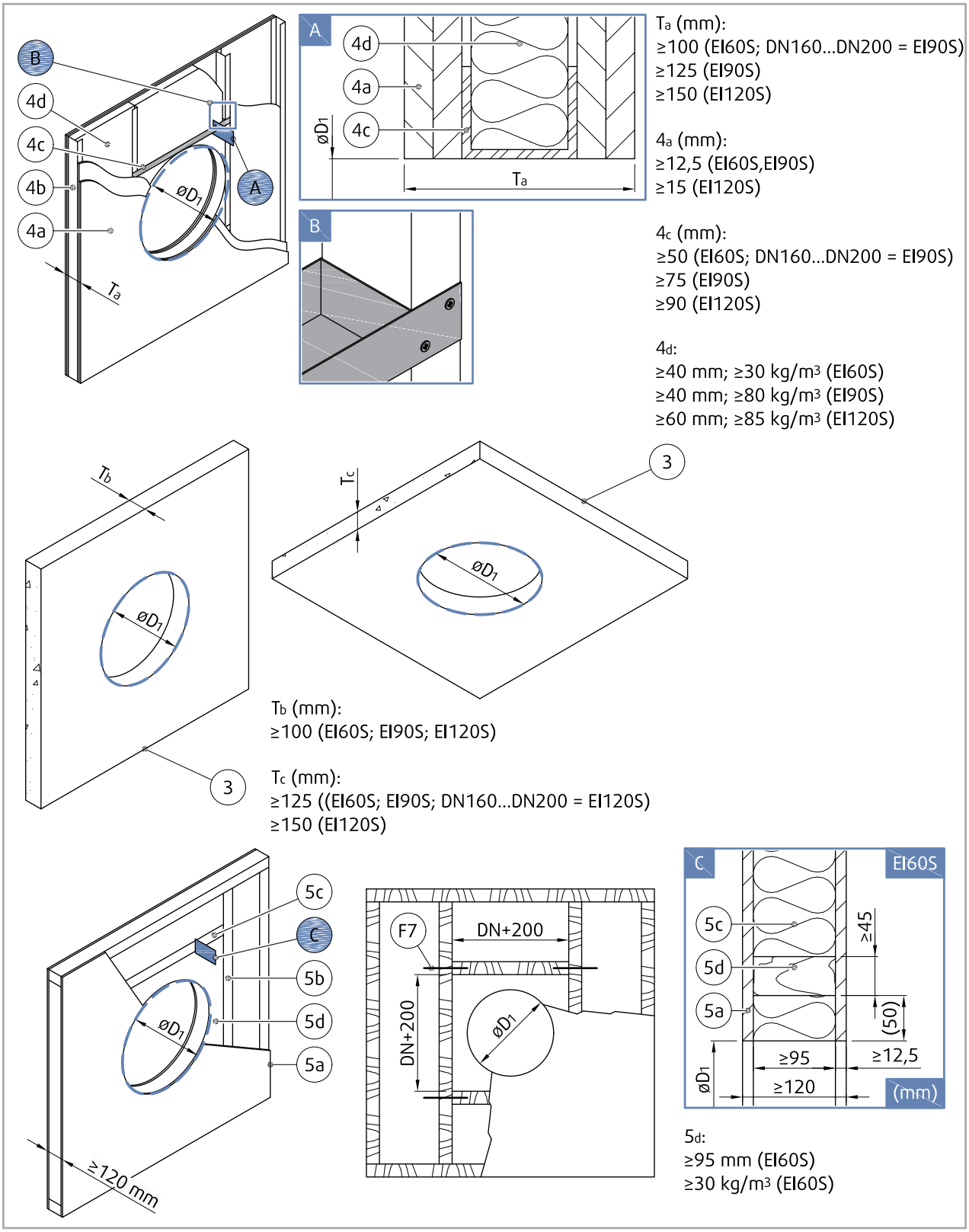


F-C2...6-VA


Y
2
P1
F1
5
P7


Y
(mm)
≥120 (EI60S)
≥95 (EI60S)
≥12,5 (EI60S)
5
P7
F1
2
P1
øD1 = DN+100
DN

Opening and Wall and/or Ceiling Preparations



T_a (mm):
≥100 (EI60S; DN160...DN200 = EI90S)
≥125 (EI90S)
≥150 (EI120S)

4_a (mm):
≥12,5 (EI60S,EI90S)
≥15 (EI120S)

4_c (mm):
≥50 (EI60S; DN160...DN200 = EI90S)
≥75 (EI90S)
≥90 (EI120S)

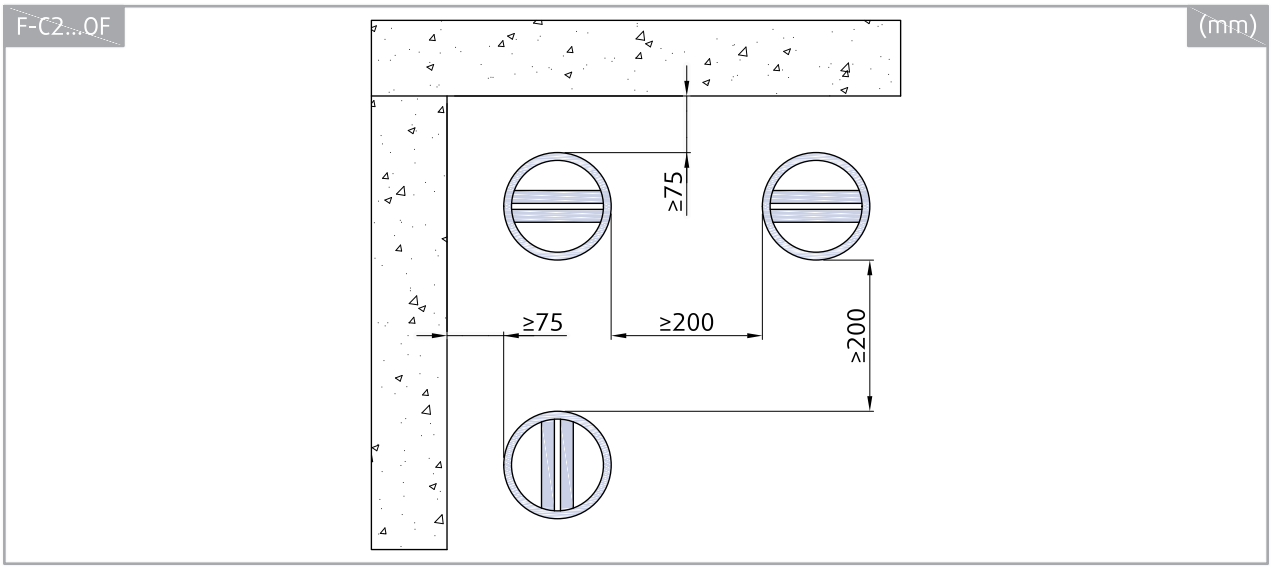
4_d:
≥40 mm; ≥30 kg/m³ (EI60S)
≥40 mm; ≥80 kg/m³ (EI90S)
≥60 mm; ≥85 kg/m³ (EI120S)

T_b (mm):
≥100 (EI60S; EI90S; EI120S)

T_c (mm):
≥125 ((EI60S; EI90S; DN160...DN200 = EI120S)
≥150 (EI120S)

5_d:
≥95 mm (EI60S)
≥30 kg/m³ (EI60S)

Damper Minimum Distances



Legend for Installation 1. Wet

1S - F-C2...1-VA (P1+P2)
1R - F-C2...1-VA (P1+P3)
P1 - Fire damper (F-C2)
P2 - BOR-S
P3 - BOR-R
P4 - BALANCE-S (Supply)
P5 - BALANCE-E (Exhaust)
P6 - EFF (Exhaust)
P7 - TFF (Supply)
P9 - Screw UNI 4×30 mm
2 - Connected metal ductwork
3 - Concrete/masonry/cellular concrete wall
4 - Flexible (plasterboard) wall
4a - 2 layers of plasterboard fireproof plate type F, EN 520
4b - Vertical CW – profiles
4c - Horizontal UW – profiles
4d - Mineral wool; thickness/cubic density see picture
5 - Timber stud wall
5a - 1 layer of plasterboard fireproof plate type F, EN 520
5b - Vertical timber stud ≥95x45
5c - Horizontal timber stud ≥95x45
5d - Mineral wool or Rockwool thickness/cubic density see picture
F1 - Plaster/mortar/concrete filling
Y - Cutting plane

Installation 2. Dry

Using Mineral Wool and Coverplates

1. The supporting construction opening must be prepared as depicted in wall preparation. Opening surfaces must be even and cleaned off.
2. The opening dimension D1 is driven by the nominal dimensions of the damper with added clearance. The flexible wall opening must be reinforced as per the standards for plasterboard walls when a vertical beam was breached with the opening.
3. Insert the duct in the middle of the opening. End of the duct must be aligned with the wall surface on the side of future valve placement.
4. Fill in the area between the wall and the duct with mineral wool (F2) thoroughly but in such a way that will not deform the duct.
5. Close the gap between the damper and the mounting opening, use CBR-C2 cover boards (A1) with screws (F4) through pre-drilled holes.
6. All the gaps between the coverplates, between coverplates and the wall and between coverplates and the duct need to be filled with fire resistive coating (F3).
7. Check the damper's functionality.
8. Apply the included additional product label to the duct or wall next to the damper insertion.
9. For inserting the damper with a valve or wall element, follow the instructions at the "Product Handling".

Installation Distances

According to the standard EN 1366-2, the minimum distance from the wall or ceiling to the duct that holds F-C2 is 75 mm. For multiple crossings through a fire resistive wall the minimum distance between two ducts that hold F-C2 is 200 mm. This applies for distances between the duct that holds F-C2 and a nearby foreign object crossing the fire resistive wall.

<table>
<tr><td rowspan="3"> 
Dry</td><td rowspan="3">F-C2...VA</td><td>EI 60 (v_e - i ↔ o) S</td><td rowspan="2">a) 
≥ 100 mm</td><td rowspan="2">b) 
≥ 100 mm
(≥ 500 kg/m³)</td><td rowspan="3"> 
360°</td></tr>
<tr><td>EI 90 (v_e - i ↔ o) S</td></tr>
<tr><td>EI 120 (v_e i ↔ o) S</td><td>a) 
≥ 150 mm
≥ 125 mm (DN80 ... DN125)</td><td>b) 
≥ 150 mm
≥ 125 mm (DN80 ... DN125)
(≥ 500 kg/m³)</td></tr>
</table>

Notes:

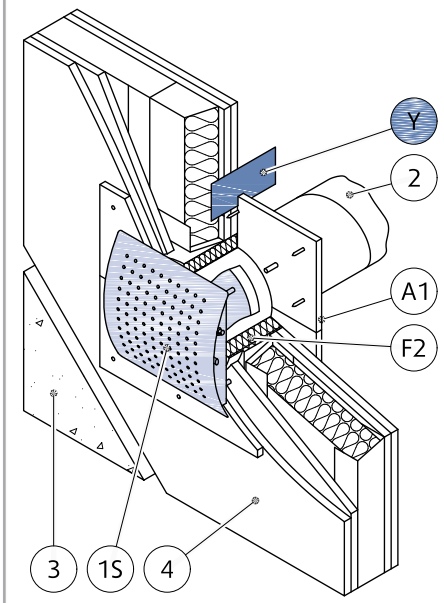
2. Dry - Dry Installation, Using Mineral Wool and Coverplates

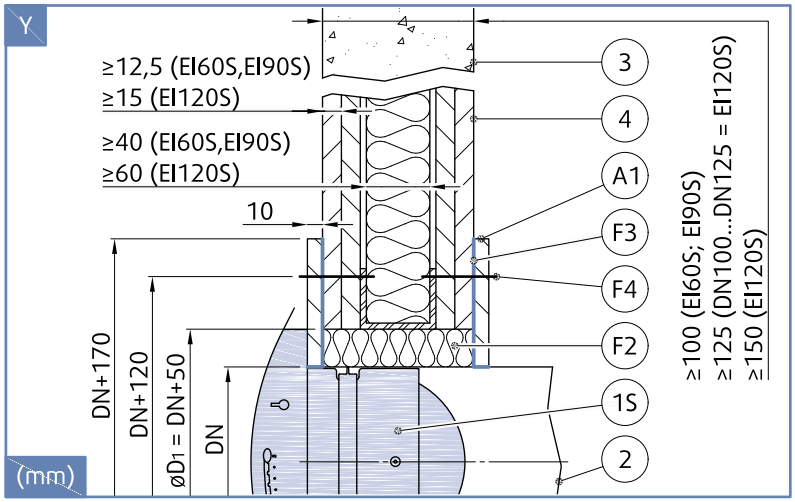
a) - Flexible (plasterboard) wall

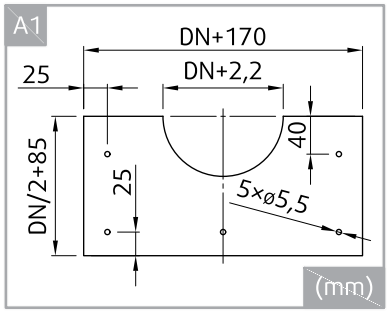
b) - Concrete/masonry/cellular concrete (rigid) wall

v_e - Vertical supporting construction (wall)

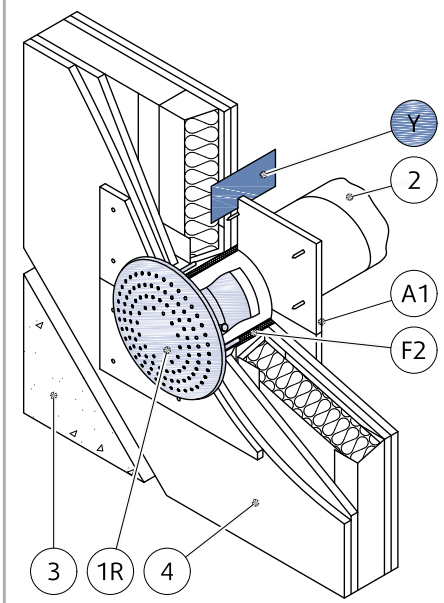
F-C2...1-VA

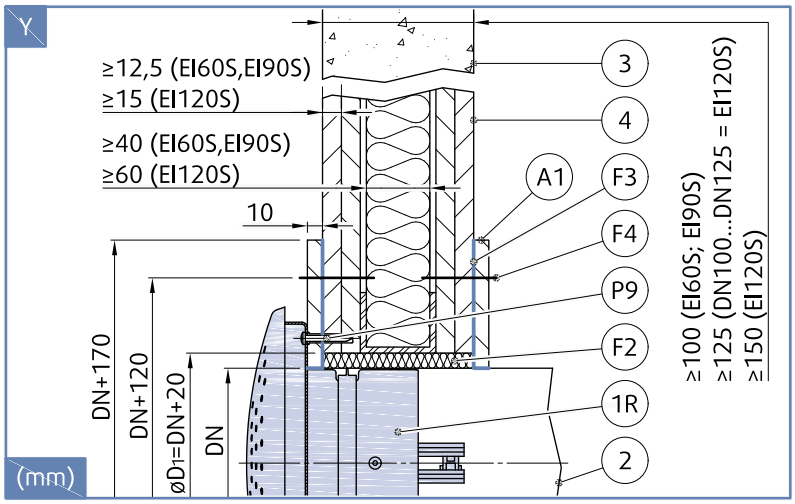


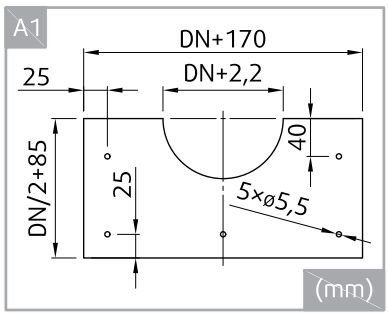




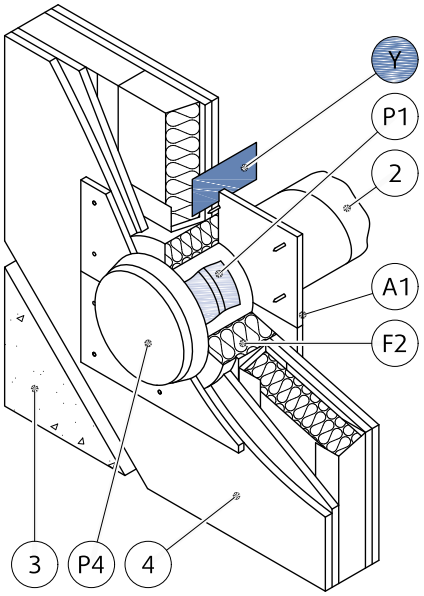
F-C2...2-VA

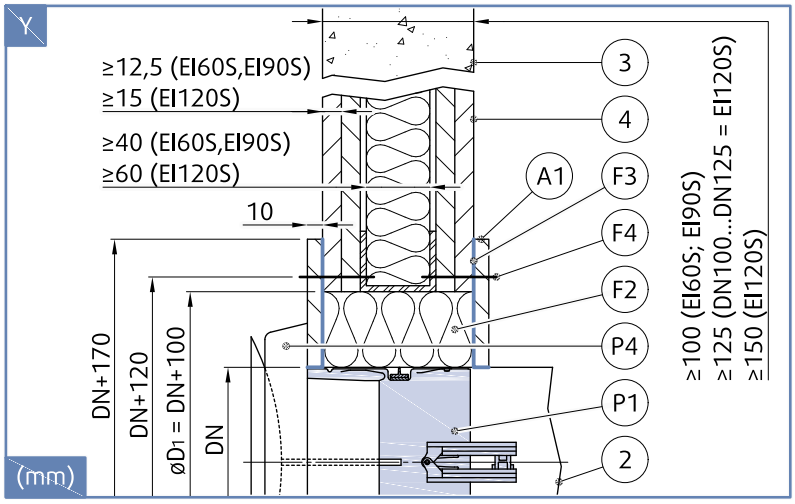


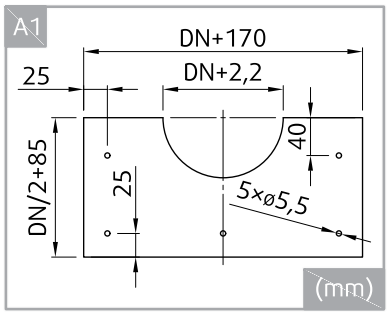




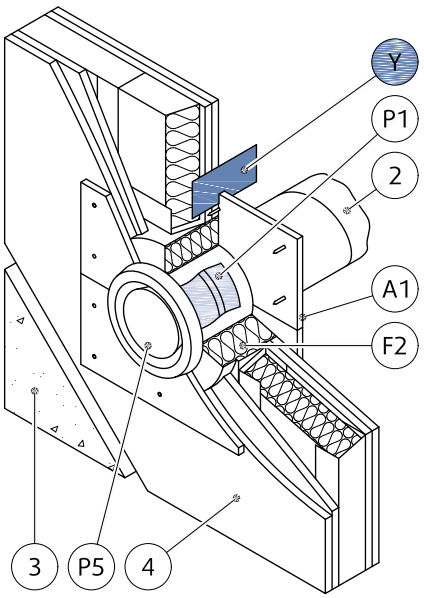
F-C2...3-VA

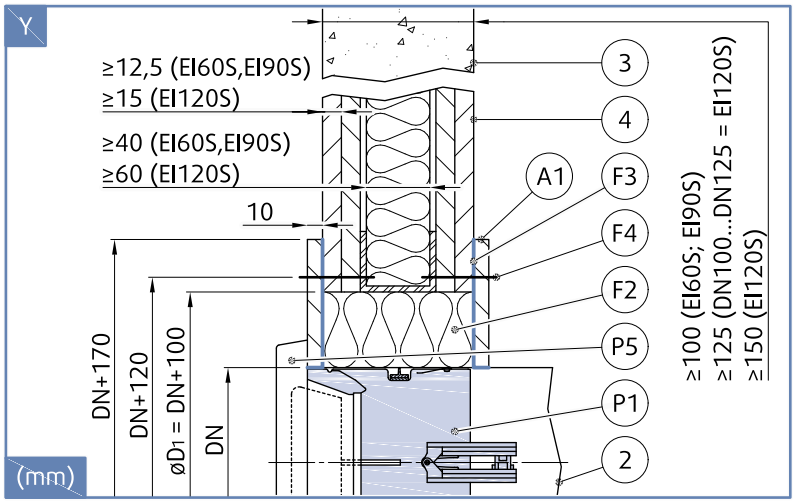


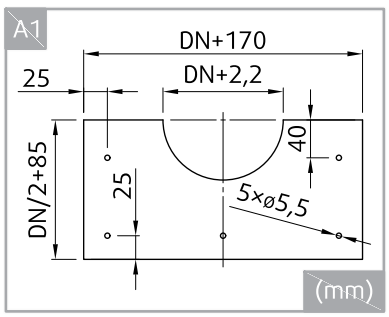




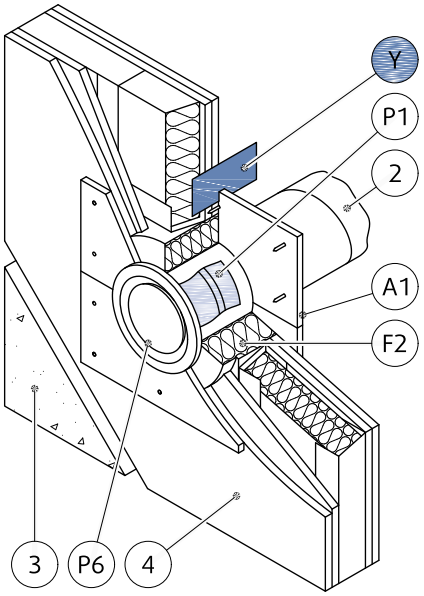
F-C2...4-VA

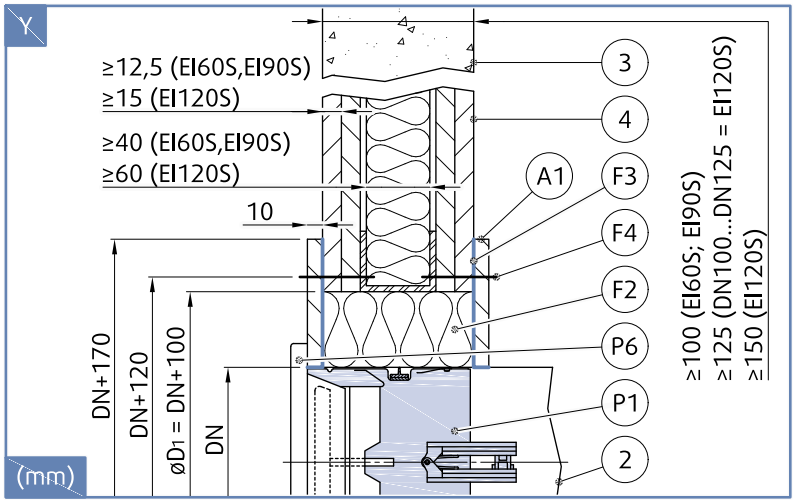


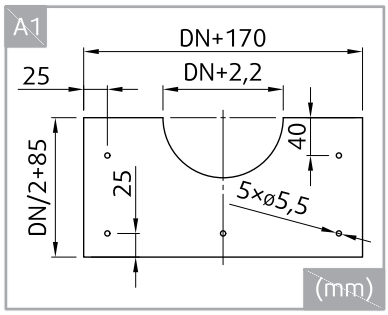




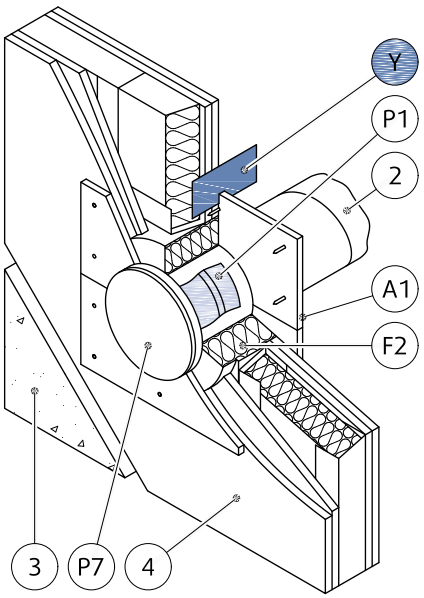
F-C2...5-VA

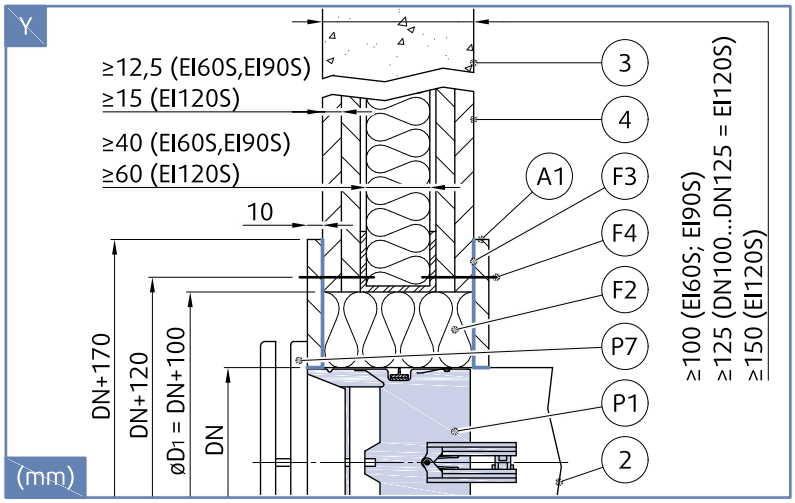


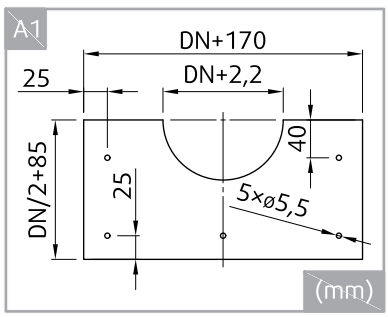




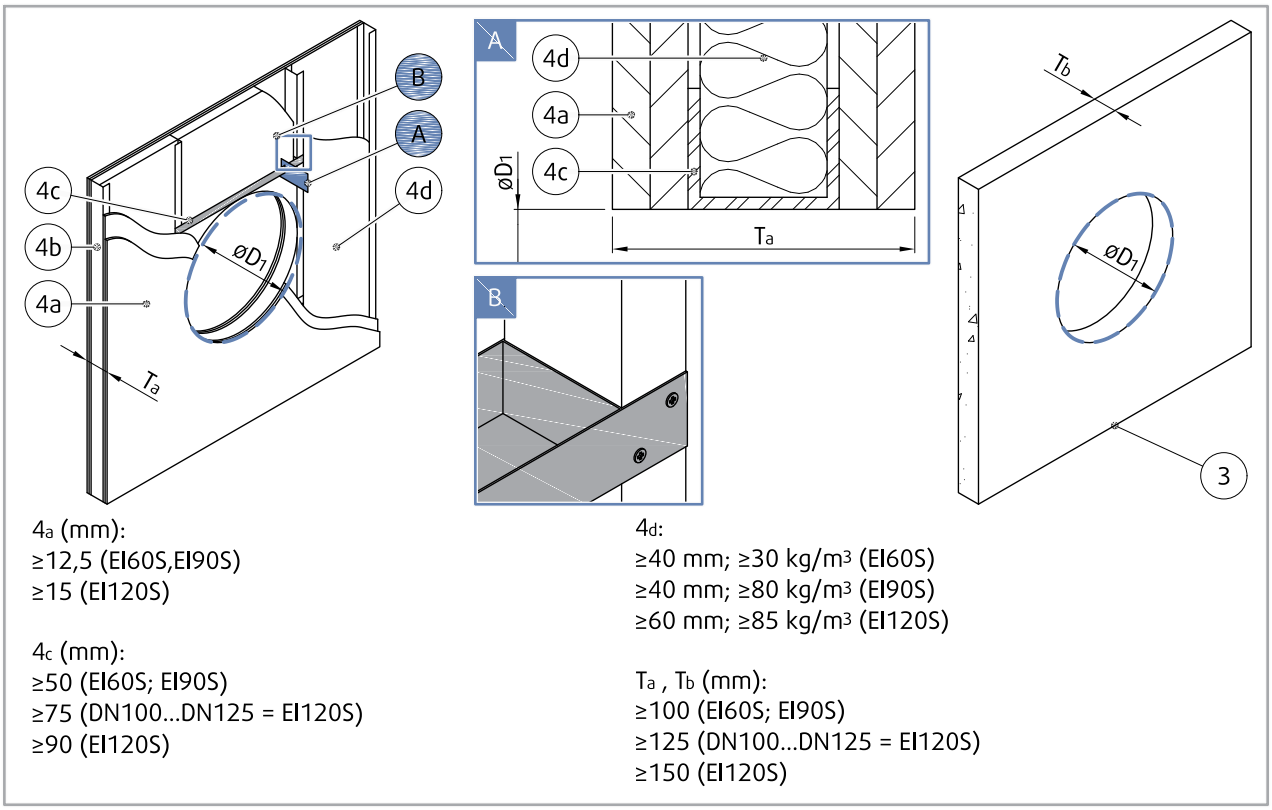
F-C2...6-VA







Opening and Wall and/or Ceiling Preparations



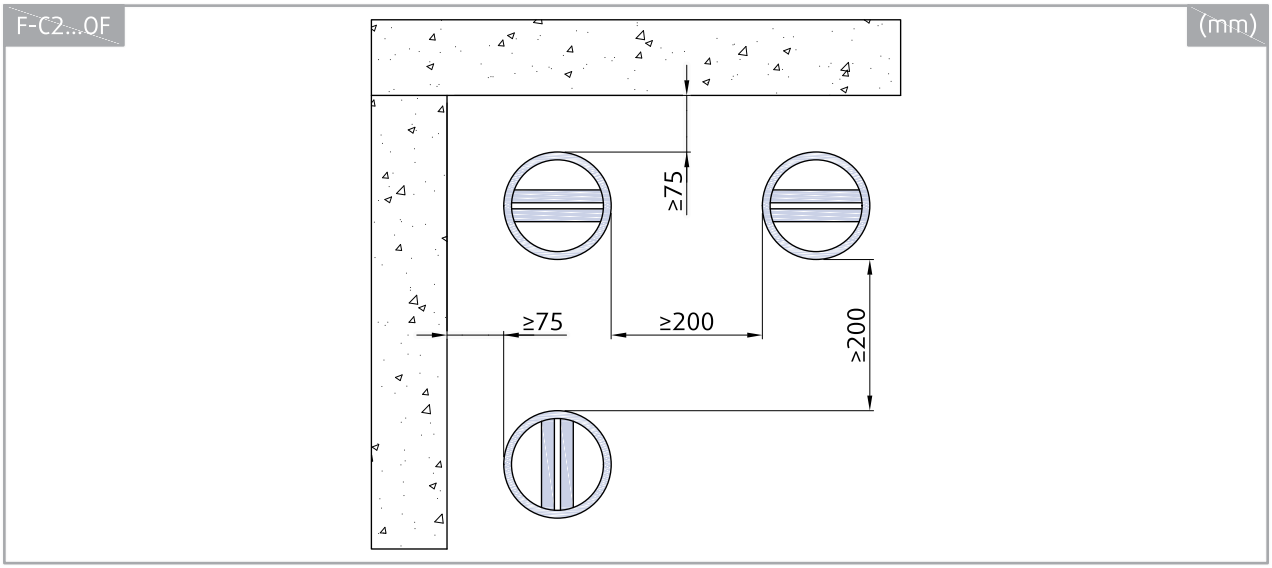
4_a (mm):
≥12,5 (EI60S,EI90S)
≥15 (EI120S)

4_c (mm):
≥50 (EI60S; EI90S)
≥75 (DN100...DN125 = EI120S)
≥90 (EI120S)

4_d:
≥40 mm; ≥30 kg/m³ (EI60S)
≥40 mm; ≥80 kg/m³ (EI90S)
≥60 mm; ≥85 kg/m³ (EI120S)

T_a , T_b (mm):
≥100 (EI60S; EI90S)
≥125 (DN100...DN125 = EI120S)
≥150 (EI120S)

Damper Minimum Distances



Legend for Installation 2. Dry

1S - F-C2...1-VA (P1+P2)
1R - F-C2...1-VA (P1+P3)
P1 - Fire damper (F-C2)
P2 - BOR-S
P3 - BOR-R
P4 - BALANCE-S (Supply)
P5 - BALANCE-E (Exhaust)
P6 - EFF (Exhaust)
P7 - TFF (Supply)
P9 - Screw UNI 4×30 mm
2 - Connected metal ductwork
3 - Concrete/masonry/cellular concrete wall
4 - Flexible (plasterboard) wall
4a - 2 layers of plasterboard fireproof plate type F, EN 520
4b - Vertical CW – profiles
4c - Horizontal UW – profiles
4d - Mineral wool; thickness/cubic density see picture
A1 - Cover boards CBR-C2 (accessory) obligatory
F2 - Mineral wool filling (min. 50 kg/m3)
F3 - Fire resistive coating, e.g. Promastop-CC/Promat
F4 - Screw d=5.5; e.g. DIN7981
Y - Cutting plane

Installation 3. Soft

Installation in a Soft Crossing with fire-resistive coating

With this installation we recommend using flexible connection (see accessory FCR-C2) on one side, due thermal expansion of connected duct during fire.

1. The supporting construction opening must be prepared as depicted in wall preparation. Opening surfaces must be even and cleaned off.
2. The opening dimension D1 is driven by the nominal dimensions of the damper with added clearance. The flexible wall opening must be reinforced as per the standards for plasterboard walls when a vertical beam was breached with the opening.
3. Prepare mineral wool filling (segments) (F5) with thickness of the opening height.
4. Apply the fire-resistive coating (F6) on the external surface of the wool filling where the future duct and hole surface will be located.
5. Immediately after the fire-resistive coating is applied, place the duct into the middle of wall opening together with the wool filling. End of the duct must be aligned with the wall/ceiling surface on the side of future valve placement.
6. Apply the same fire-resistive coating (F6), at least 2 mm thick and 100 mm wide, on the exposed filling and wall edges evenly from both wall sides.
7. Check the damper's functionality.
8. Apply the included additional product label to the duct or wall next to the damper insertion.
9. For inserting the damper with a valve or wall element, follow the instructions at the "Product Handling".

Installation Distances

According to the standard EN 1366-2, the minimum distance from the wall or ceiling to the duct that holds F-C2 is 75 mm. For multiple crossings through a fire resistive wall the minimum distance between two ducts that hold F-C2 is 200 mm. This applies for distances between the duct that holds F-C2 and a nearby foreign object crossing the fire resistive wall.

<table>
<tr><td rowspan="3"> 
Soft</td><td rowspan="3">F-C2...VA</td><td>EI 60 (v_e i ↔ o) S</td><td rowspan="2">a) 
≥ 100 mm</td><td rowspan="2">b) 
≥ 100 mm
(≥ 500 kg/m³)</td><td rowspan="3"> 
360°</td></tr>
<tr><td>EI 90 (v_e i ↔ o) S</td></tr>
<tr><td>EI 120 (v_e i ↔ o) S</td><td>a) 
≥ 150 mm</td><td>b) 
≥ 150 mm
(≥ 500 kg/m³)</td></tr>
</table>

Notes:

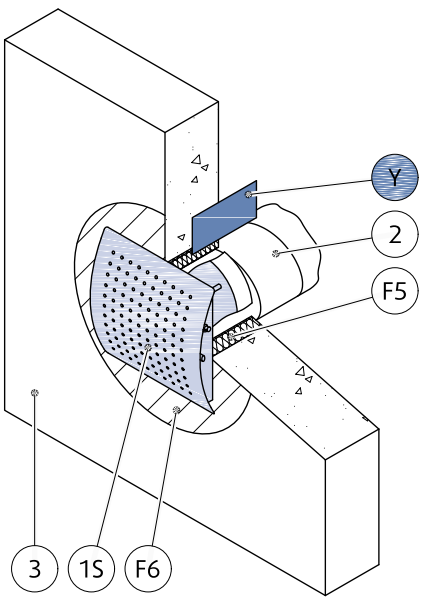
3. Soft - Soft Installation, Using Mineral Wool filing

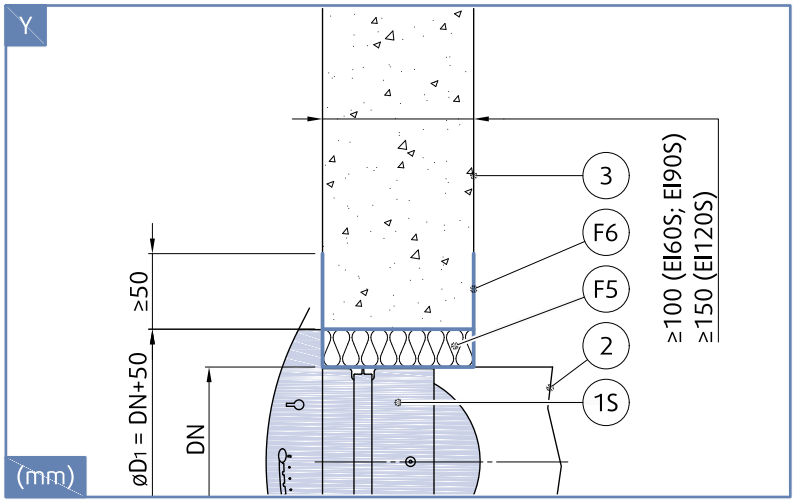
a) - Flexible (plasterboard) wall

b) - Concrete/masonry/cellular concrete (rigid) wall

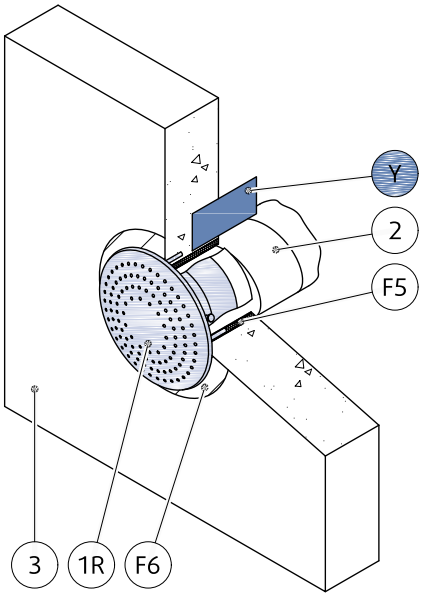
v_e - Vertical supporting construction (wall)

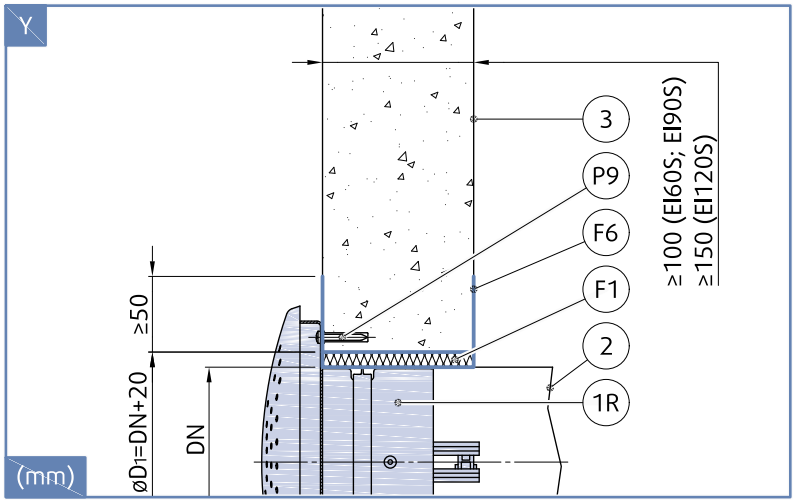
F-C2...1-VA



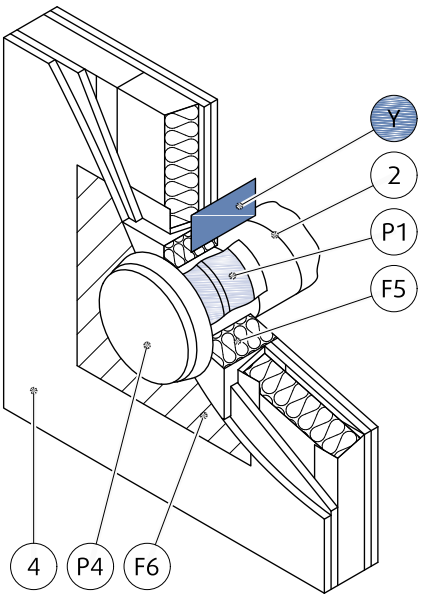


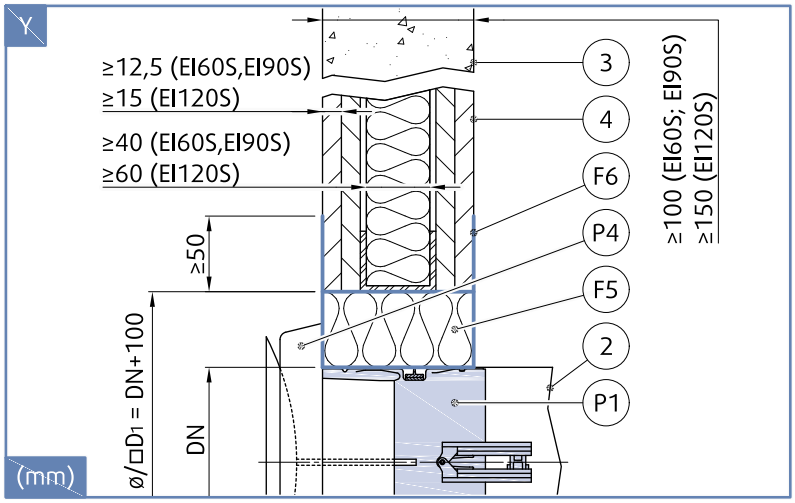
F-C2...2-VA

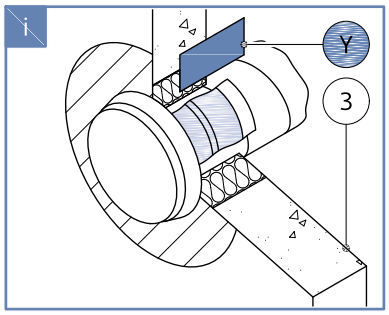




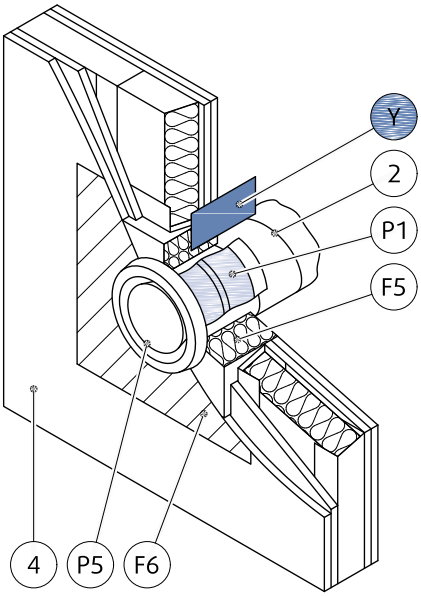
F-C2...3-VA

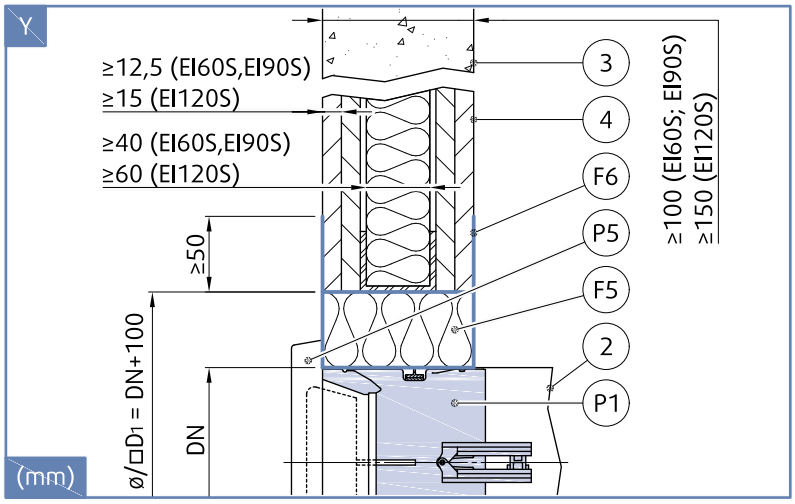


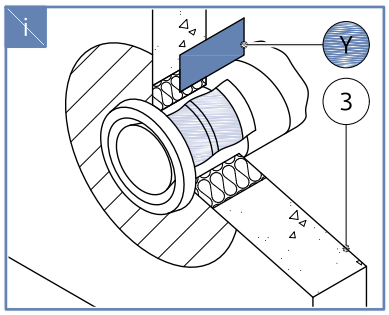




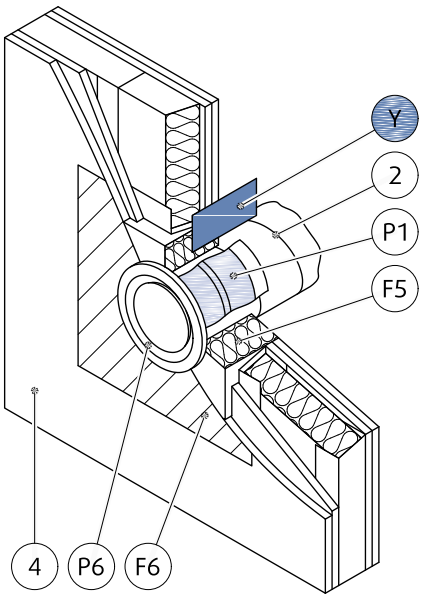
F-C2...4-VA

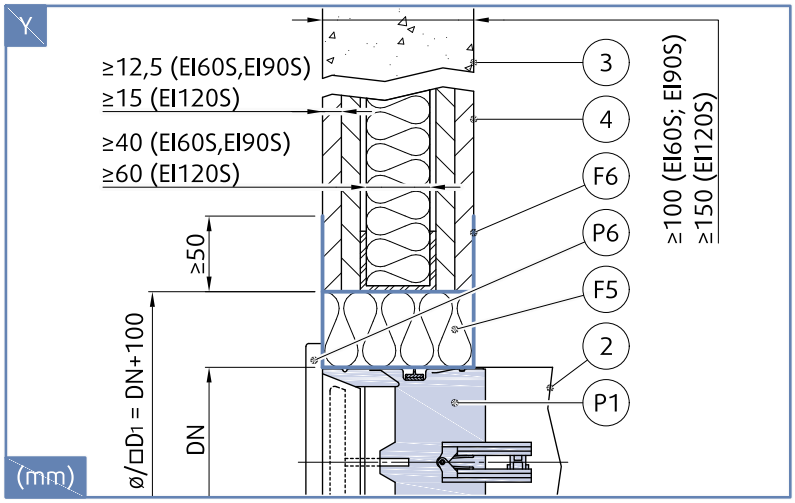


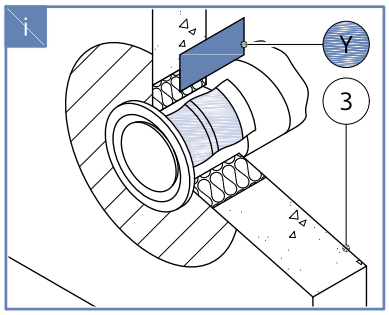




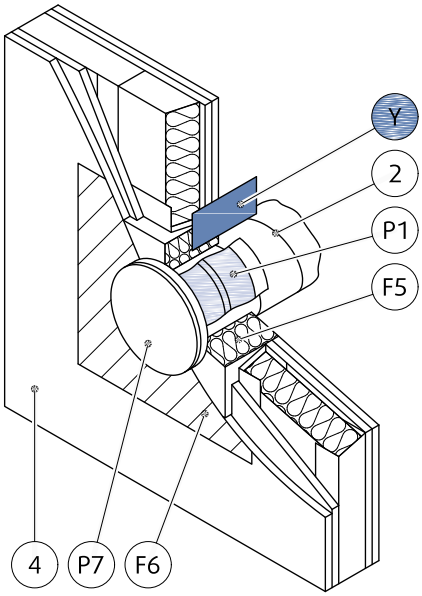
F-C2...5-VA

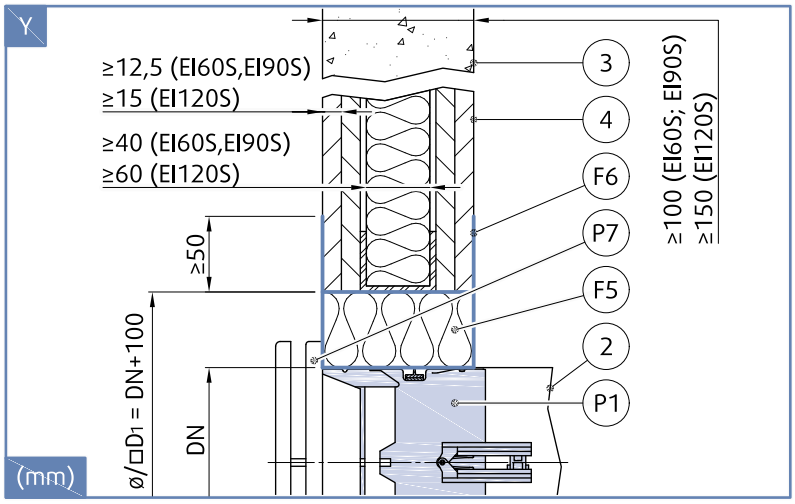


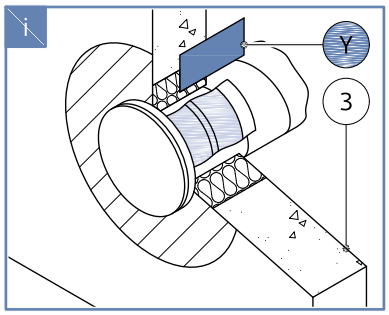




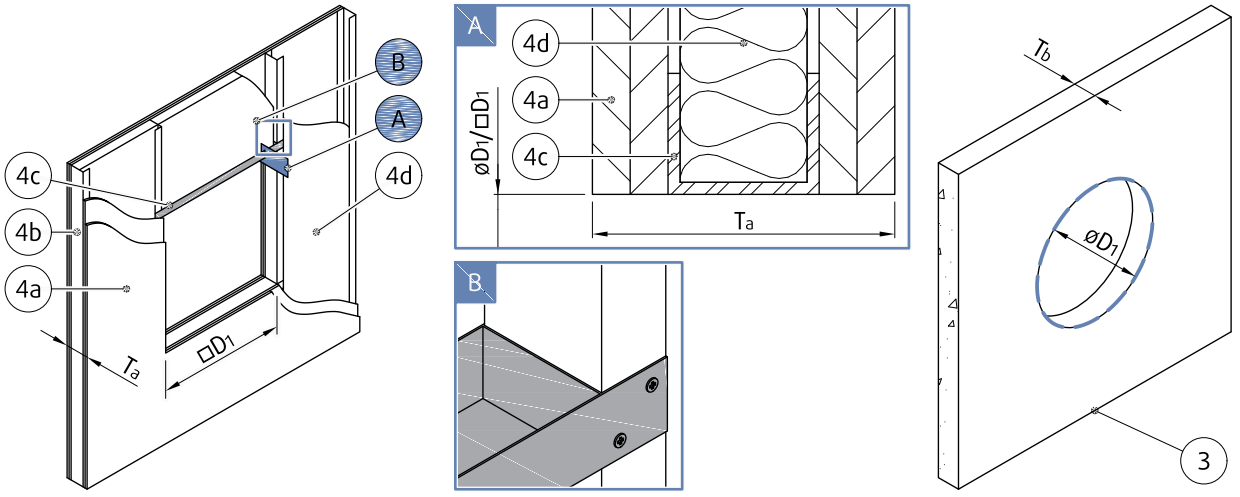
F-C2...6-VA







Opening and Wall and/or Ceiling Preparations



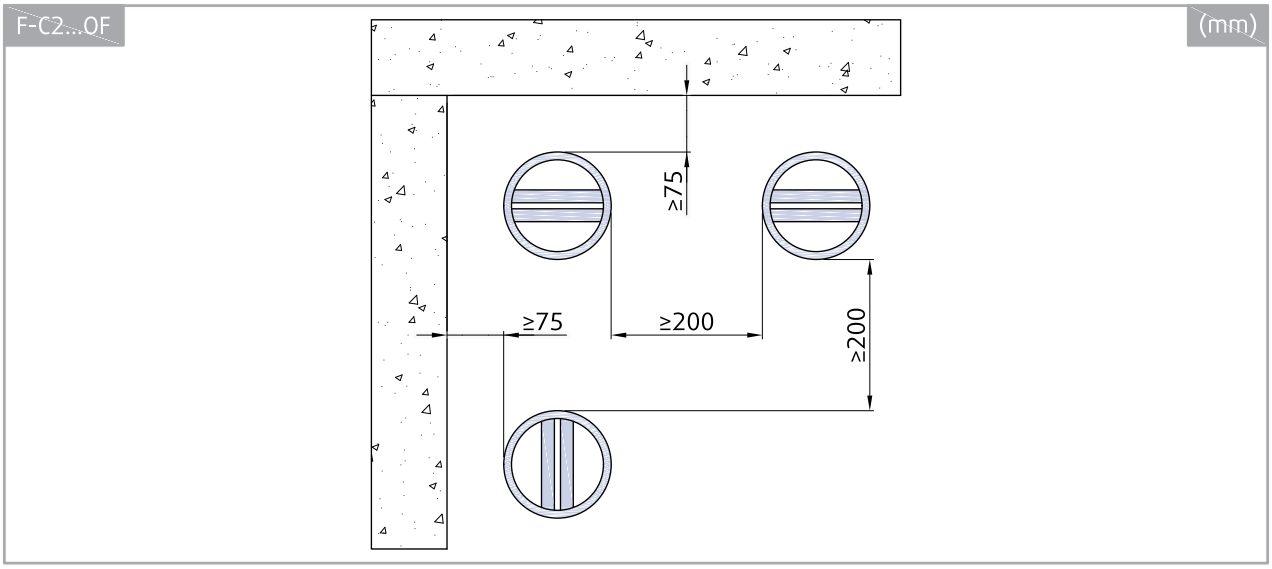
4_a (mm):
≥12,5 (EI60S,EI90S)
≥15 (EI120S)

4_c (mm):
≥50 (EI60S,EI90S)
≥90 (EI120S)

4_d:
≥40 mm; ≥30 kg/m³ (EI60S)
≥40 mm; ≥80 kg/m³ (EI90S)
≥60 mm; ≥85 kg/m³ (EI120S)

T_a , T_b (mm):
≥100 (EI60S, EI90S)
≥150 (EI120S)

Damper Minimum Distances



Legend for Installation 3. Soft

1S - F-C2...1-VA (P1+P2)
1R - F-C2...1-VA (P1+P3)
P1 - Fire damper (F-C2)
P2 - BOR-S
P3 - BOR-R
P4 - BALANCE-S (Supply)
P5 - BALANCE-E (Exhaust)
P6 - EFF (Exhaust)
P7 - TFF (Supply)
P9 - Screw UNI 4×30 mm
2 - Connected metal ductwork
3 - Concrete/masonry/cellular concrete wall
4 - Flexible (plasterboard) wall
4a - 2 layers of plasterboard fireproof plate type F, EN 520
4b - Vertical CW – profiles
4c - Horizontal UW – profiles
4d - Mineral wool; thickness/cubic density see picture
F5 - Mineral wool filling (min. 100 kg/m3)
F6 - Layer of fire resistive coating (Promastop-CC/Promat) at least 2 mm thick for exposed surfaces
Y - Cutting plane

Operation Manual

Warning: Both sides of F-C2 blades are spring loaded in the open position and are closing very quick. To avoid injury, make sure to keep the blades movement area clear while manipulating with F-C2.

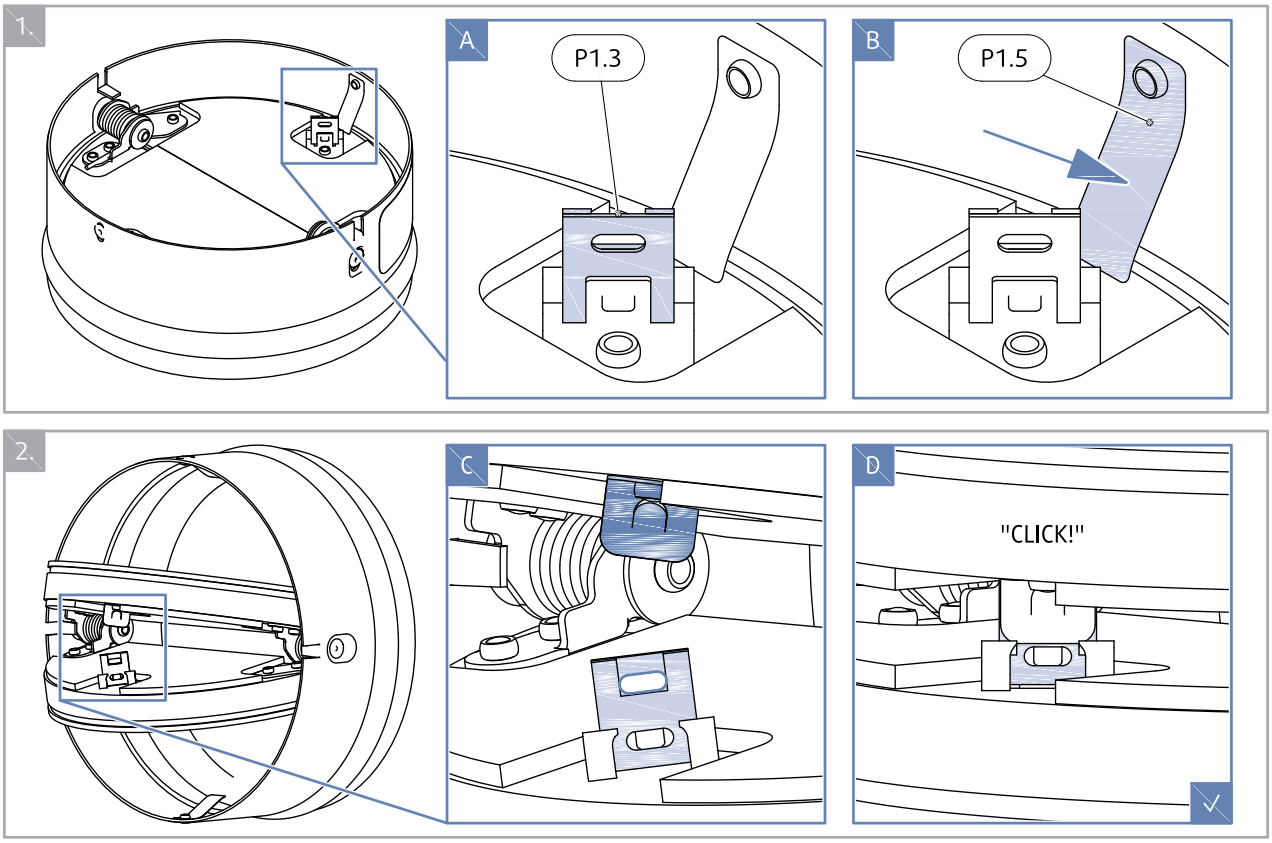
The fire damper is ready for installation when its blades are in open position.
To open the damper follow these steps:

A Check the thermal fuse link. Thermal fuse link is inserted only in one blade and both parts of the link hold together.

B Press detent spring.

C Open the blade into a parallel position with the casing

D Press the blades together and hook the fuse link onto both blades.



Fire Damper Functionality Check

- While performing the check, focus on the thermal fuse link's integrity and a correct position of the damper blades after their detention in the OPEN position – they should be roughly parallel to the longitudinal axis of the duct.
- Perform the damper activity check by taking off the thermal fuse link and releasing the blades to spontaneously close them – the damper blades are closed by a spring return release.
- Open the blades again and detent them in the OPEN position following instructions shown in section "Operation Manual".
- When remounting the damper into the duct it is also essential to check the flexibility of the sealing on the perimeter and in case it shows permanent deformation, it is needed to replace the seal with a new one in order to guarantee a correct fixation of the damper in the duct.

Damper Inspection

The spring mechanism keeps the dampers on stand-by mode throughout their entire operational life. Without the producer's permission, there must be no changes or modifications performed on the dampers' structure.

The operator performs regular inspections of the dampers as per established regulations and standards at least once every 6 months. The inspection needs to be performed by an employee who has been specifically trained for this purpose by the manufacturer. The current fire damper condition determined during the inspection needs to be entered into the "Operating Journal" along with the date of the inspection, the legible name, surname and signature of the employee who performed the inspection. The Operating Journal includes a copy of the employee's authorization.

If any discrepancies are discovered, these need to be entered in the Operating Journal along with a proposal for their removal. The Operating Journal can be found downloaded from design.systemair.com. Before the first installation, it needs to be inspected under the identical conditions as apply to the above mentioned 6-month inspections.

It is needed to inspect the damper's internal casing, the thermal fuse link, the sealing, the foaming substance, the damper blade's condition and its closure while it leans to a backstop in a closed position. There must be no other objects or dirt from the ventilation duct inside the damper.

NEVER INSPECT THE DAMPERS WHEN THERE IS AIR FLOWING IN THE DUCT SYSTEM!

Recommended Inspection Steps According to the EN 15 650:

- Date of inspection
- Check of the end switch's connection for damage if applicable
- Check for damper cleanliness and cleaning if needed
- Check of the blades and sealing, correction and record if needed
- Check of fire damper's safe closure – for details please see the previous section
- Check if the damper moves while being in its open and closed position, correction and record if needed
- Check of the end switch indicating the open and closed position, correction and record if needed
- Check if the damper is moved in its standard position. The F-C2 damper's position is correct when, after the closure, the blades are in between the planes forming the outside surface of the wall – the ideal position is when the blade is in the middle between these planes.

Supplement

Any deviations from the technical specifications contained in SystemairDESIGN or Handbook, and the terms should be discussedwith the manufacturer. We reserve the right to make any changes to the product without prior notice,provided that these changes do not affect the quality of the product and the required parameters.

Handbook_F_C2_VA_en-GB
design.systemair.com
www.systemair.com

Original instructions

2024-02-15

DOCUMENT VERSION 2