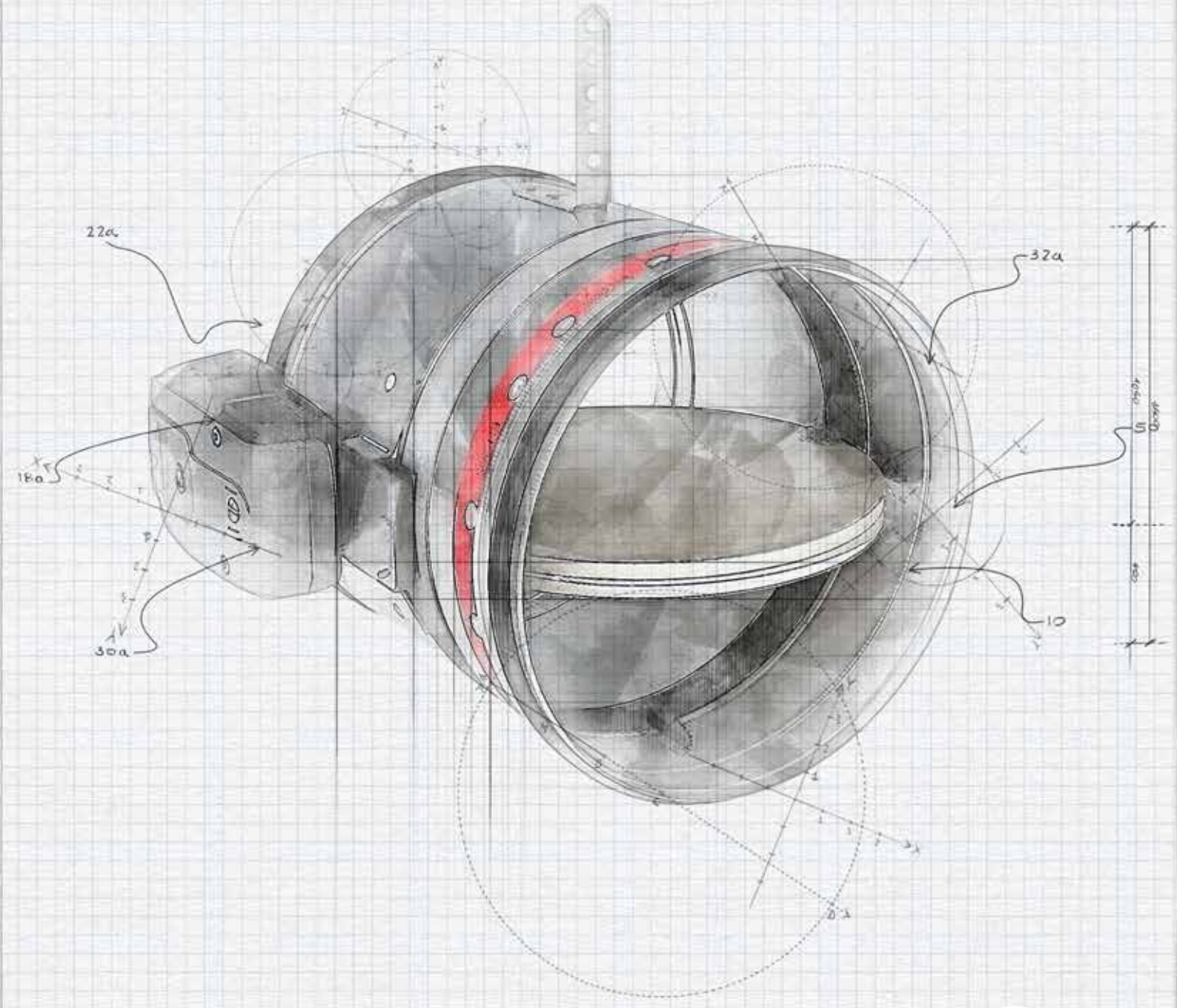
CR120

OPTIMISED CIRCULAR FIRE DAMPER UP TO EI120S

Product guide



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1 GENERAL INFO

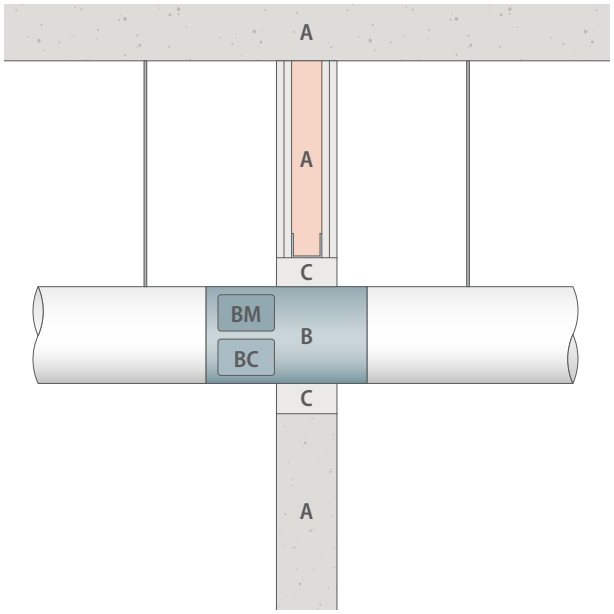
We address this guide to all parties requiring detailed technical information on the fire damper, its installation and technically and regulatory relevant aspects. From designer and design office, to contractor and maintenance engineer. This document aims to provide a clear overview of the various aspects involved in selecting, installing and maintaining a fire damper.

This guide is intended as a supplement to our existing product documentation. Price information can be found in our product catalogue or price list. For a step-by-step guide to installation, we refer you to our technical product sheet.

The logical structure of this document prioritizes ease of use first. The first chapter covers general relevant information. The second chapter delves into the technical aspects of the different models and versions of the fire damper. The third chapter guides the user through the correct installation of the fire damper.

The installation of fire dampers is based on several key principles. Chapter 3 addresses each of these aspects in a clear and concise manner:

- The (load-bearing) structures in which the fire dampers are installed (compartment boundaries). These are indicated by the letter 'A'. Details are covered in chapter 3.1.
- The sealing of fire dampers is represented by the letter 'C'. Details of this are discussed in chapter 3.2.
- The various installation options, depending on the desired fire resistance, are documented in detail in chapter 3.3.
- Fire dampers are connected to ventilation ducts that are suspended and/or supported. This suspension is discussed in chapter 3.4.
- More info on the connection of the fire damper to the ventilation duct is given in chapter 3.5.



A (Load-bearing) construction
W Fire damper
BM: mechanism
BC: communication
C Sealing

1.1 APPLICATION

Fire dampers are part of the fire safety measures in a building. Fire dampers are installed where ventilation ducts cross a wall or floor with a fire resistance (compartment boundary). Their purpose is to ensure that the fire resistant properties and smoke tightness of the compartment boundaries are maintained. Rf-Technologies' dampers are CE marked. They can be equipped with different types of mechanisms according to the specific needs of the project and local regulations.

The CR120 is an optimised round fire damper with a fire resistance of up to 120 minutes. Minimal pressure drop is guaranteed by the thin damper blade, the fusible link in line with the damper blade and the transmission located outside the tunnel. The damper is available in small diameters (from 100 mm). The galvanised steel tunnel contributes to the damper's low weight. The CR120 fire damper stands out thanks to its fire resistance, universal installation options and optimal air technical properties.

1.2 STANDARDS AND CERTIFICATES

All Rf-Technologies fire dampers are CE certified according to the harmonised European product standard for fire dampers, EN 15650: 2010. The declarations of performance can be consulted at www.rft.eu/dop.

- BCCA-0749-CPR-BC1-606-0464-15650.02-0464 & 2517: certificate of constancy of performance
- EN 1366-2: test standard for the fire resistance of fire dampers
- EN 13501-3: classification standard up to EI 120 (ve, ho, i ↔ o) S (500Pa)
- EN 60068-2-52: corrosion protection
- EN 1751 ≥ class 3 (leakage through closed damper blade)
- EN 1751 ≥ class ATC 3 (formerly C) (casing leakage)
- (EU) No. 305/2011: in accordance with the Construction Products Regulation
- EN 15882-5 combined penetrations

- The NF label ensures conformity with standard NF S 61-937 parts 1 and 5: 'Systèmes de Sécurité Incendie Dispositifs Actionnés de Sécurité'. It guarantees the classification of fire resistance in accordance with the National Decree of 22 March 2004 and its amendment of 14 March 2011. It guarantees the other properties of the product as mentioned in this document.
- VKF - no. 30522
- SP Certificate: SC0649-15
- UKCA Certificate 2822-UKCA-CPR-0055
- Hygiene_Konformitätsprufung CR120 W-379335-23-Zd

1.3 GENERAL INSTALLATION GUIDELINES

- Rf-Technologies products should be installed according to the rules of good workmanship, in accordance with the technical manual as well as locally applicable laws, standards and regulations.
- Rf-t fire dampers are always tested in standardised (load-bearing) structures according to EN 1366-2. The results are valid for similar (load-bearing) structures with a fire resistance, thickness and density equal to or greater than the (load-bearing) test structure.
- Rf-t fire dampers can be connected to the ventilation system on one or both sides. For single-sided connections, the other side must be fitted with a non-combustible, sealing grille to prevent access to the damper blade and to ensure no risk of entrapment.
- Rf-t fire dampers can be connected to both combustible and non-combustible ventilation ducts.
- During installation, safety distances from other construction elements must be respected. The operating mechanism must remain accessible: allow a minimal clearance of 200 mm between the operating mechanism and any structural element or other systems.
- Prevent obstruction of the free movement of the damper blade by adjoining ducts or fastening materials.
- Axial orientation of the damper blade: see Declaration of Performance.
- The airflow direction is arbitrary.
- To guarantee air tightness at all times, the connection between fire damper and duct must be executed correctly following best practices.
- Fire dampers are intended for indoor use and must be protected from outdoor exposure and weather conditions.
- Operating temperature between -30°C and 50°C.
- Use the damper in environments with a maximum of 95% non-condensing humidity (no droplet formation).
- It is recommended to keep the damper blade closed during installation.
- After installation, check that the damper blade can move freely.
- The damper must be accessible for inspection and maintenance.
- Rf-Technologies provides several kits to modify the operating mechanism after installation. Only use these official kits and install them according to the instructions to ensure that the fire dampers classification remains unchanged.
- Transformations or repairs made by third parties without prior written consent from Rf-T are not covered under the company's responsibility.

1.4 SAFETY

- Improper use can lead to both material damage or personal injury. We emphasize the importance of adhering to general and specific safety guidelines for installers, particularly when working at heights.
- Injuries caused by sharp edges are a real risk. Wearing appropriate gloves, safety shoes and a safety helmet helps prevent accidents.
- Always pay attention to ergonomic factors when handling and installing fire dampers.
- During damper testing, ensure fingers or hands are not trapped by the damper blade.
- Electrical connections must be made by qualified personnel to avoid electrical shocks. It is recommended to switch off the power during installation work.

1.5 INSPECTION AND MAINTENANCE

A fire damper is maintenance-free. However, the fire damper and its mechanisms must always remain accesible. After installation, the correct mechanism of the fire damper (opening and closing of the damper blade) must be checked immediately. Subsequently, the damper must be checked every six months to identify potential damage in a timely manner (see art. 8.3 of EN 15650 - product standard for fire dampers). Local inspection regulations and EN 13306 must also be followed.

Record the findings in a logbook. While this is not mandatory, it is highly practical.

The owner or user of the installation is responsible for ensuring its proper operation.

POINTS OF ATTENTION:

During installation, sealing materials may contaminate the fire damper. Ensure no dirt remains inside the damper, and the damper blade must be able to move freely. Clean the damper thoroughly inside if necessary. Keeping the damper blade closed during installation can be helpful.

The sealing materials used must also not impair the operation of the mechanism. This can be verified by manually opening and closing the fire damper after installation. It is recommended to shield the mechanism and moving components during installation where needed.

If using a monitoring and control system, validate the mechanism by opening and closing the fire damper using the control system. At the same time, confirm the proper functioning of the status indicators for the start and end position contacts.

RECOMMENDED INSPECTIONS:

- ☑ Damper cleanliness: clean where necessary with a dry or damp cloth. Local regulations often dictate how the ventilation system should be cleaned.
- ☑ Inspect the condition of the damper, its damper blade, and the connection to the structure.
- ☑ Test the control mechanism's functionality by manually opening and closing the damper blade.
- ☑ Check the wiring for the power supply and the start and end position contacts (if applicable).
- ☑ Validate the operation of the start and end contacts (if applicable).
- ☑ When using a monitoring and control system: check the opening and closing of the damper blade through the system and confirm that the fire damper performs its function correctly within the system (if applicable).
- ☑ After the inspection, ensure that the fire damper is returned to its open position.

Contact Rf-Technologies in case of any problems (service@rft.eu / contact details at www.rft.eu).

CLEANING THE FIRE DAMPER:

We recommend regularly cleaning ventilation ducts and fire dampers. Cleaning the fire damper can be done with a dry or damp cloth. Household cleaning agents are permitted, as long as it does not contain abrasive components. Mechanical cleaning with rotating and/or telescopic brushes is not allowed.

If hygiene requirements apply, use disinfectants that comply with applicable regulations, e.g. disinfectants according to the list of the Robert Koch Institute. Here, consider the damper's corrosion resistance.

1.6 STORAGE AND LOGISTICS

As the product is a safety component, special care must be taken during storage and handling. Avoid shocks and damage, contact with water and deformation of the product.

Hidden defects are only covered by the warranty if they are reported to Rf-Technologies within 5 days of discovery.

It is recommended to

- ☑ unload in a dry area
- ☑ not tilt the damper to move it
- ☑ not use the damper as a shelf, work table, etc.
- ☑ not store smaller dampers inside larger ones
- ☑ -30°C ≤ operating temperature ≤ 50°C
- ☑ Sort the packaging in an environmentally conscious manner.

2 TECHNICAL DATA

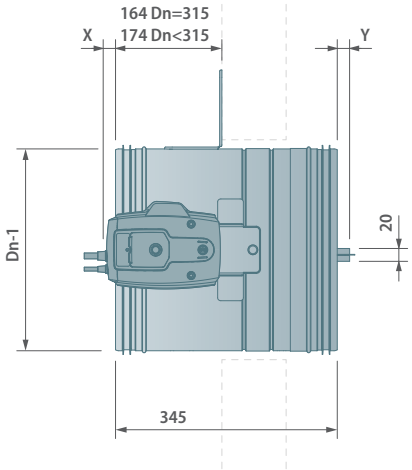
2.1 FIRE DAMPER

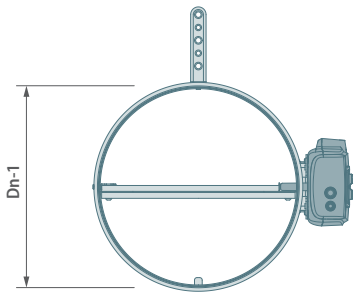
2.1.1 CR120

The CR120 is an optimised circular fire damper with a fire resistance of up to 120 minutes. Minimal pressure drop is guaranteed by the thin damper blade, the fusible link in line with the damper blade and the transmission located outside the tunnel. The damper is available in small diameters (from 100 mm). The tunnel in galvanised steel contributes to the low weight of the damper.

RANGE AND DIMENSIONS

	≥	≤
Ø Dn [mm	100	315

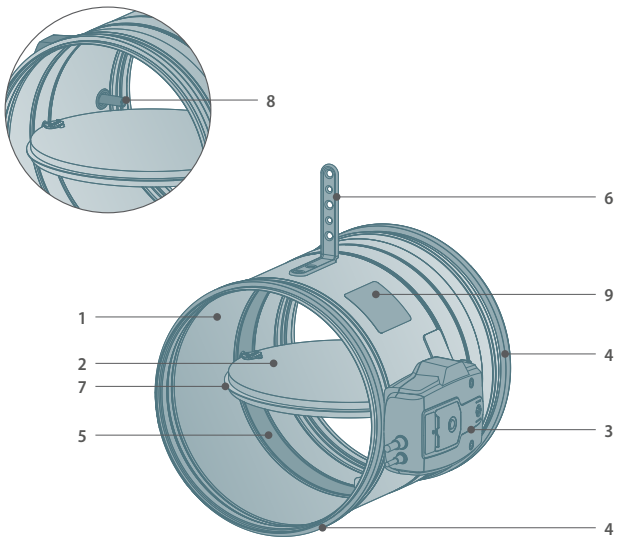




Exceeding blade: X = on the mechanism side, Y = on the wall side.

Ø Dn [mm]	315
X	-
Y	20

Components



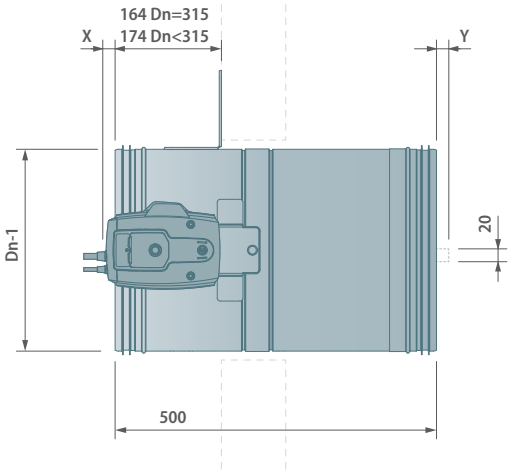
1. tunnel in galvanised steel
2. damper blade
3. operating mechanism
4. rubber sealing ring
5. intumescent strip
6. installation stop
7. damper blade sealing ring
8. fusible link
9. product identification

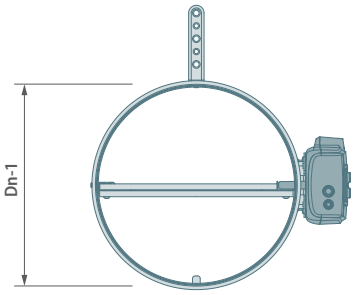
2.1.2 CR120-L500

CR120 fire damper with extended tunnel on the wall side to facilitate ducht connection if walls thicker than 100 mm. Furthermore, there is no exceeding damper blade, allowing a grille or a bend to be connected directly.

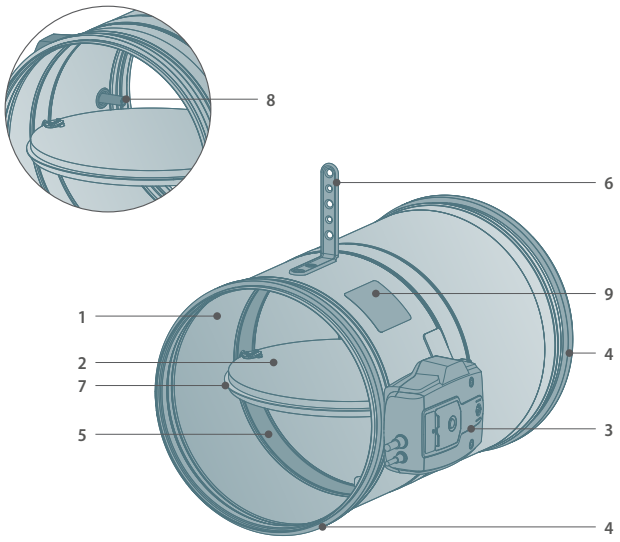
RANGE AND DIMENSIONS

	≥	≤
Ø Dn [mm]	100	315





Components



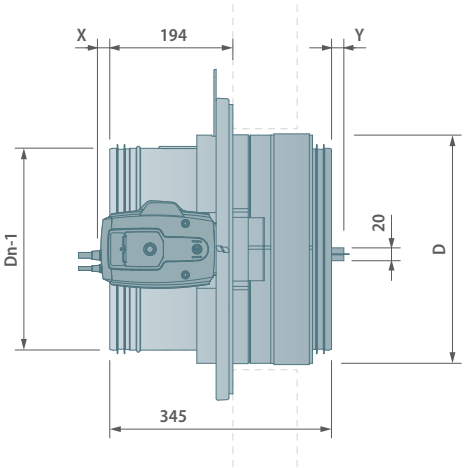
1. galvanised steel tunnel
2. damper blade
3. operating mechanism
4. rubber sealing ring
5. intumescent strip
6. installation stop
7. damper blade sealing ring
8. fusible link
9. product identification

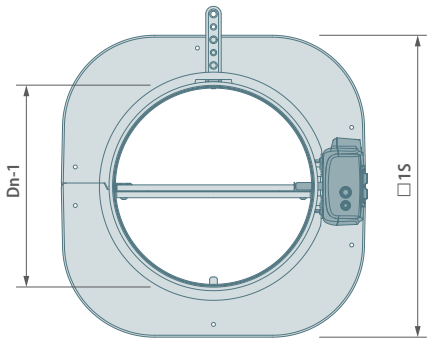
2.1.3 CR120-1S

The CR120-1S is an optimised circular fire damper for surface mounting with a fire resistance of up to 120 minutes. A collar for circular surface-mount ensures quick (dry) installation that requires no further sealing. Minimal pressure drop is guaranteed by the thin damper blade, the fusible link in line with the damper blade and the transmission located outside the tunnel. The damper is available in small diameters (from 100 mm).

RANGE AND DIMENSIONS:

	≥	≤
Ø Dn [mm]	100	315

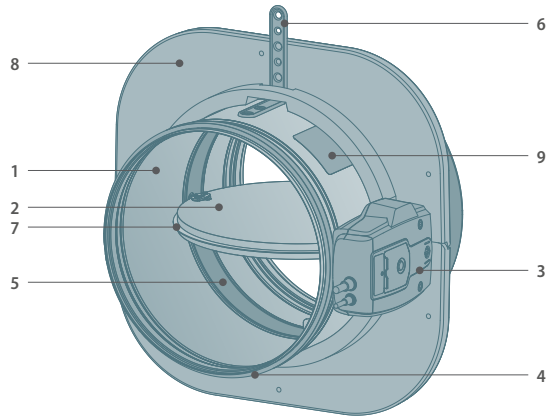


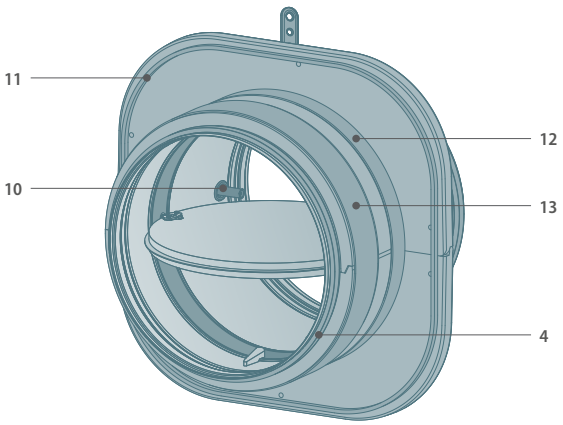


Exceeding blade: X = on the mechanism side, Y = on the wall side

Ø Dn [mm]	100	125	160	200	250	315
X	-	-	-	-	-	-
Y	-	-	-	-	-	20
□1s	279	299	339	374	419	474
Ød	160	180	220	255	300	355

Components





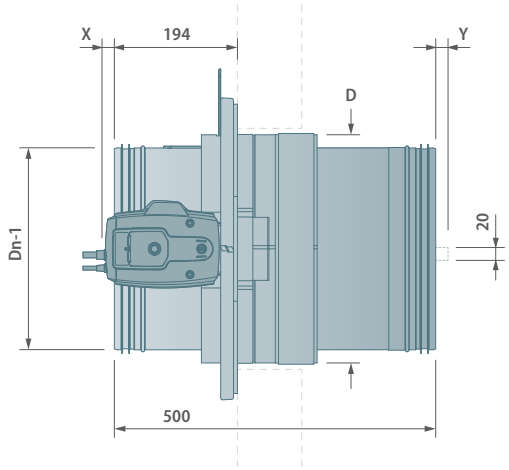
1. galvanised steel tunnel
2. damper blade
3. operating mechanism
4. rubber sealing ring
5. intumescent strip
6. installation stop
7. damper blade sealing ring
8. collar for circular surface mount
9. product identification
10. fusible link
11. cold smoke seal
12. graphite strip
13. graphite strip

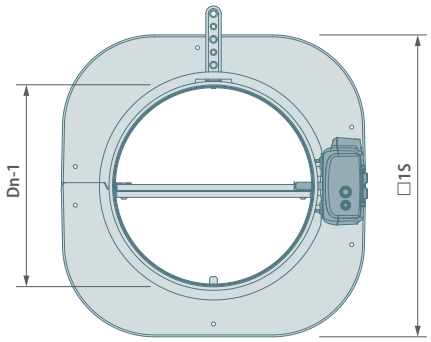
2.1.4 CR120-1S-L500

CR120-1S-L500 damper with extended tunnel on the wall side to simplify the connection of ducts to walls thicker than 100 mm. Furthermore, there is no exceeding damper blade, allowing a grille or a bend to be connected directly.

RANGE AND DIMENSIONS

	≥	≤
Ø Dn [mm]	100	315

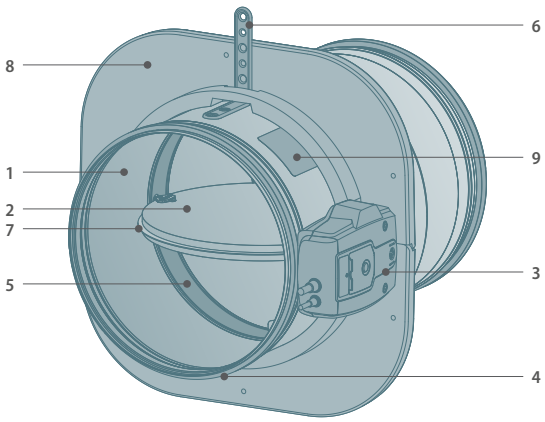


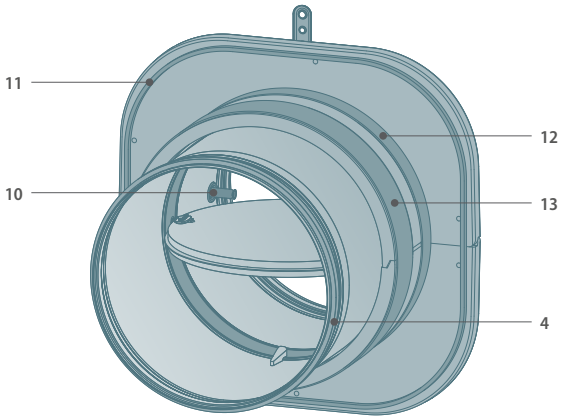


Exceeding damper blad: X = on the mechanism side, Y = on the wall side

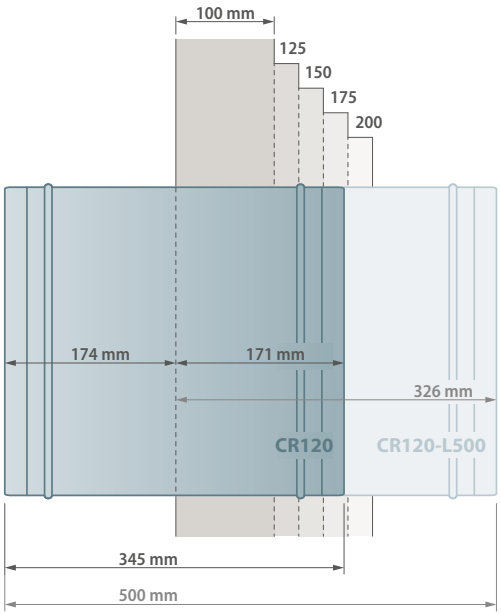
Ø Dn [mm]	100	125	160	200	250	315
X	-	-	-	-	-	-
Y	-	-	-	-	-	-
□1s	279	299	339	374	419	474
Ød	160	180	220	255	300	355

Components





1. galvanised steel tunnel
2. damper blade
3. operating mechanism
4. rubber sealing ring
5. intumescent strip
6. installation stop
7. sealing ring damper blade
8. collar for circular surface mount
9. product identification
10. fusible link
11. cold smoke seal
12. graphite strip
13. graphite strip

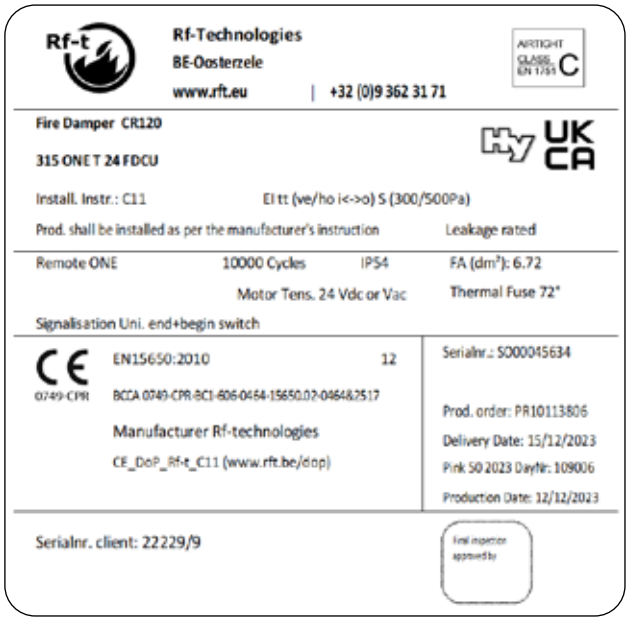


Extended dampers can facilitate installation in wider walls, for example. For ease of installation, the CR120(-1S), with a standard length of 345 mm, can be replaced by a longer version of 500 mm (CR120(-1S)-L500).

2.1.5 Product label

The product label of the fire damper specifies unique information that allows individual traceability of the fire damper. It is possible to add an additional customer reference per fire damper on the product label. For more information, please contact Rf-t.

In addition, each fire damper is supplied with a QR-linked manual.



①	Manufacturer Air tightness class	
②	Description of the damper and its options Display of the damper classification	
③	Description operating mechanism and performance	
④	CE marking DoP web address with declaration of performance Reference standard Certified body	Production log
⑤	Customer order reference	

2.2 MECHANISMS

2.2.1 Overview

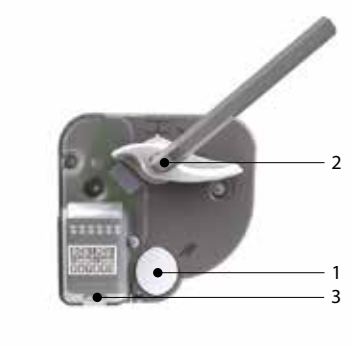
The CR120 fire damper can be equipped with different types of mechanisms.

	MECHANISM	TYPE	VERSION	
CR120(-L500) CR120-1S(-L500)	Fusible link	MFUS	Standard	
			MFUS + FDCU	
	Motorised	ONE	24 V	Unipolar limit switch with or without plug FDCU(-ST)
				Bipolar auxiliary limit switch FDCB
			230 V	Unipolar limit switch with or without plug FDCU(-ST)
				Bipolar auxiliary limit switch FDCB
		BELIMO	24 V	With or without thermoelectric fusible link/plug BFL(T)(-ST)
			230 V	With or without thermoelectric fusible link/plug BFL(T)(-ST)
	Motorised with integrated field module	ONE-X	24 V	ONE-X 24
			230 V	ONE-X 230

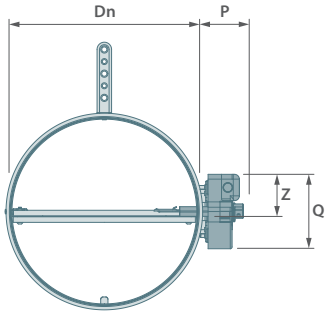
2.2.2 CR120 WITH FUSIBLE LINK MECHANISM MFUS

The MFUS release mechanism automatically closes the damper blade when the temperature in the duct exceeds 72°C. The temperature rise causes the fusible link to react. This causes a strained, internal torsion spring to relax and brings the damper blade to its safety position (closed). The proper functioning of the fire damper can be tested periodically by manual release and reset.

The position of the damper blade can optionally be monitored. A start and end run switch (FDCU) indicates an open or a closed position of the damper blade.



1. release button
2. reset lever
3. cable entry



MFUS

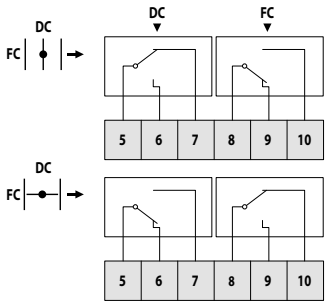
	MFUS
P	72
Q	123
Z	70

Detailed features

RUN TIME SPRING RETURN	POSITION SWITCHES STANDARD
1s	1mA...1A, DC 5V...AC 48V

OPERATIONAL RELIABILITY	PROTECTION CLASS
50 cycles	IP 42

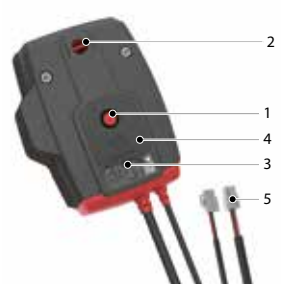
Electrical connection diagram



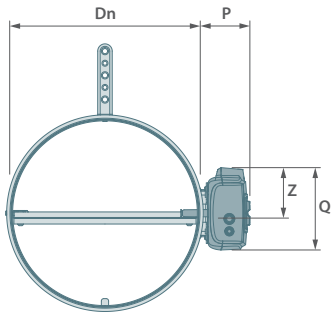
DC : Switch open position fire damper
FC : Switch closed position fire damper

2.2.3 CR120 with spring return actuator ONE

The Rf-t spring return actuator ONE has been specially developed to easily monitor and automatically and remotely control Rf-t fire dampers of all sizes. The ONE is available in 24V and 230V versions. A thermal fusible link reacts when the temperature exceeds 72°C. The ONE comes standard with a start and end switch (FDCU) but can also be fitted with a double set of start and end switches contacts (FDCB). It can also be optionally equipped with plug (ST) to facilitate connection.



1. release button
2. damper blade position indicator
3. LED
4. battery compartment for rearming
5. plug (ST) (optional)



ONE

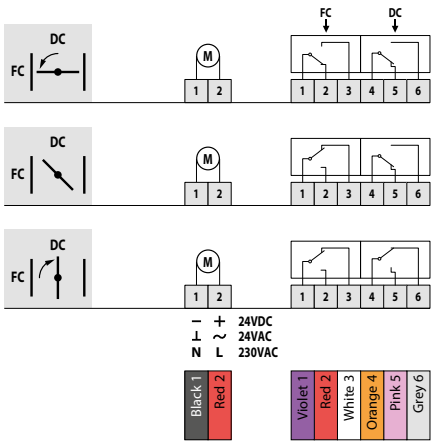
	ONE
P	80
Q	136
Z	75

Detailed features

ONE T	NOMINAL MOTOR VOLTAGE	POWER (AT REST)	POWER (IN USE)
24 FDCU	24 V AC/DC (-10/+20%)	0,28W	4,2W
230 FDCU	230 V AC (-15/+15%)	0,57W	4,2W
24 FDCU ST	24 V AC/DC (-10/+20%)	0,28W	4,2W
230 FDCU ST	230 V AC (-15/+15%)	0,57W	4,2W
24 FDCB	24 V AC/DC (-10/+20%)	0,28W	4,2W
230 FDCB	230 V AC (-15/+15%)	0,57W	4,2W

ONE T	POSITION SWITCHES STANDARD	MOTOR REINFORCEMENT TIME
24 FDCU	1mA...1A 60V	< 75 s (wired) / < 85 s (battery)
230 FDCU	1mA...100mA 230V	< 75 s (wired) / < 85 s (battery)
24 FDCU ST	1mA...1A 60V	< 75 s (wired) / < 85 s (battery)
230 FDCU ST	1mA...100mA 230V	< 75 s (wired) / < 85 s (battery)
24 FDCB	1mA...1A 60V	< 75 s (wired) / < 85 s (battery)
230 FDCB	1mA...1A 60V	< 75 s (wired) / < 85 s (battery)

Electrical connection diagram

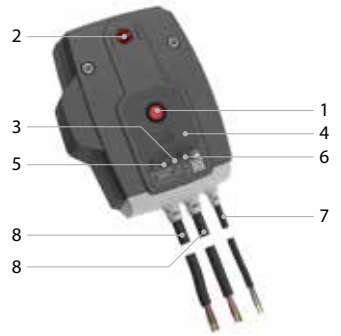


DC : Switch open position fire damper
FC : Switch closed position fire damper

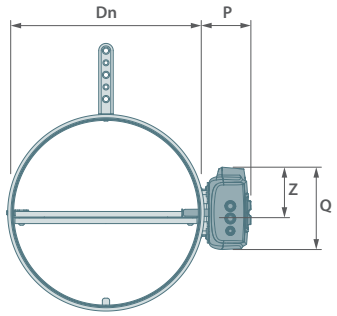
ONE T	SPRING OPERATING TIME	OPERATIONAL RELIABILITY	PROTECTION CLASS	CABLE POWER SUPPLY	SWITCH CABLE
24 FDCU	< 30 s	10,000 cycles	IP 54	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)
230 FDCU	< 30 s	10,000 cycles	IP 54	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)
24 FDCU ST	< 30 s	10,000 cycles	IP 54	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)
230 FDCU ST	< 30 s	10,000 cycles	IP 54	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)
24 FDCB	< 30 s	10,000 cycles	IP 54	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (2x) (halogen-free)
230 FDCB	< 30 s	10,000 cycles	IP 54	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (2x) (halogen-free)

2.2.4 CR120 WITH SPRING RETURN ACTUATOR ONE-X

The ONE-X is a spring return actuator with an integrated communication module. The ONE-X allows automatic and remote control of the full range of Rf-t fire dampers. When the spring return actuator is energised, it brings the damper blade into its waiting position. If the voltage is interrupted or the temperature in the ventilation duct exceeds 72°C, the internally tensioned spring brings the damper into safety position. Manual rearming of the spring return actuator is done using a standard 9V battery. Thanks to the integrated communication module, using a ZENiX controller, you can read the status of the fire damper and control it remotely. Via bus communication, it is possible to read the status of the fire damper even when the power supply on the fire damper is not yet connected. 3 LEDs on the ONE-X display the status of the damper, of the bus communication and any error messages. The ONE-X exists in 2 variants: 24V and 230V.



1. release button
2. damper blade position indicator
3. LED red: status
4. battery compartment
5. LED blue: communication
6. LED orange: error message
7. power supply
8. bus cable



ONE-X

	ONE-X
P	80
Q	136
Z	75

Detailed features

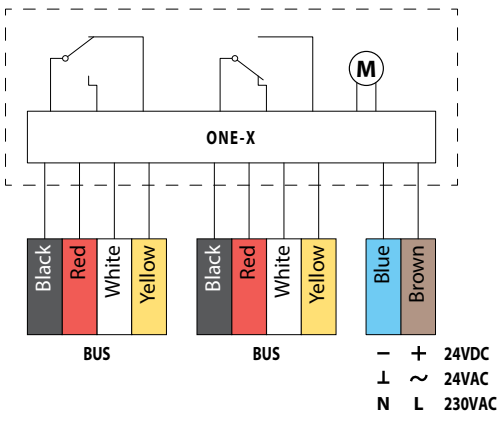
ONE-X	NOMINAL MOTOR VOLTAGE	POWER (AT REST)	POWER (IN USE)
ONE-X 24	24 V AC/DC (-10/+20%)	0,28W	4,2W
ONE-X 230	230 V AC (-15/+15%)	0,57W	4,2W

ONE-X	POSITION SWITCHES STANDARD	MOTOR REINFORCEMENT TIME
ONE-X 24	1mA...1A 60V	< 75 s (wired) / < 85 s (battery)
ONE-X 230	1mA...1A 60V	< 75 s (wired) / < 85 s (battery)

ONE-X	RUNNING TIME SPRING	OPERATIONAL RELIABILITY	PROTECTION CLASS
ONE-X 24	< 30 s	10,000 cycles	IP 54
ONE-X 230	< 30 s	10,000 cycles	IP 54

ONE-X	CABLE POWER SUPPLY	CABLE BUS
ONE-X 24	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 4 x 0.75 mm² (2x) (halogen-free)
ONE-X 230	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 4 x 0.75 mm² (2x) (halogen-free)

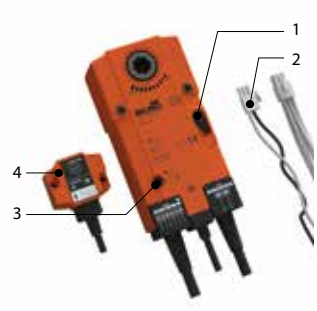
Electrical connection diagram



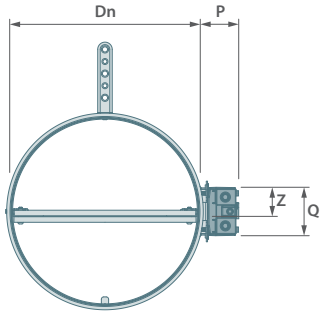
2.2.5 CR120 WITH SPRING RETURN ACTUATOR BELIMO

The spring return actuator BFL(T)(-ST) is specially designed for remote control of fire dampers and is available in 24V and 230V versions. A thermo-electric fuse (T) that reacts when the temperature exceeds 72°C is optional, as is a plug (ST) to facilitate connection.

The motor is equipped with a beginning -and end of range switch as standard, but can also be equipped with a double set of beginning -and end of range switch contacts (SN2).



1. locking button
2. plug connection (ST) (optional)
3. access for manual rearming
4. thermoelectric fuse (T)



BFL

	BFL(T)
P	80
Q	136
Z	75

Detailed features

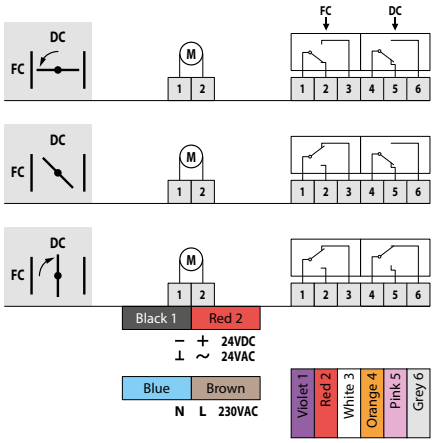
BFL(T)	MOTOR RATED VOLTAGE	POWER (AT REST)	POWER (IN USE)
BFL24(-ST)	24 V AC/DC	0,7W	2,5W
BFL230	230 V AC	0,9W	3W
BFLT24(-ST)	24 V AC/DC	0,8W	2,5W
BFLT230(-ST)	230 V AC	1,1W	3,5W

BFL(T)	POSITION SWITCHES STANDARD	MOTOR REINFORCEMENT TIME	RUNNING TIME SPRING
BFL24(-ST)	1mA...3A, AC 250V	< 60 s	20 s
BFL230	1mA...3A, AC 250V	< 60 s	20 s
BFLT24(-ST)	1mA...3A, AC 250V	< 60 s	20 s
BFLT230(-ST)	1mA...3A, AC 250V	< 60 s	20 s

BFL(T)	ENDURANCE TEST	PROTECTION CLASS
BFL24(-ST)	10,000 cycles	IP 54
BFL230	10,000 cycles	IP 54
BFLT24(-ST)	10,000 cycles	IP 54
BFLT230(-ST)	10,000 cycles	IP 54

BFL(T)	CABLE POWER SUPPLY	CABLE SWITCH
BFL24(-ST)	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)
BFLT24	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)
BFLT24(-ST)	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)
BFLT230(-ST)	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)

Electrical connection diagram



DC : Switch open position fire damper
FC : Switch closed position fire damper

2.3 MONITORING AND CONTROL OF FIRE DAMPERS

Fire dampers with spring return actuators need to be monitored and controlled remotely. A bus network-based control and monitoring system can be used for this purpose. Such a system allows continuous and individual monitoring of all fire dampers (including non-motorised ones). It can automate function tests and provide the necessary reporting. In case of fire, the control system will automatically and immediately execute the programmed scenarios (close the necessary fire dampers so that other compartments remain protected from fire and smoke).

Rf-Technologies has developed its own control and monitoring system to ensure optimal cooperation with our products.

The ZENiX system is a full-fledged system for controlling fire dampers, smoke control dampers and shutters, inputs and outputs. It permanently monitors the status of all components in the bus network and adjusts where necessary.

Flexibility characterises the ZENiX system: fire dampers can not only be controlled by a pre-programmed scenario. It is also possible to handle a matrix of scenarios defining different fire zones. The Zenix system can be interfaced with all common fire and building management systems or operate standalone.

The ONE-X is a unique component of the ZENiX system: a fire damper actuator with an integrated ZENiX field module. It comes pre-assembled on the fire damper, requires no addressing or configuration and is immediately ready to be connected. The ONE-X saves installation time, reduces wiring errors and saves installation space.

2.4 WEIGHTS

2.4.1 CR120

Weight of the damper without mechanism (kg)

Ø Dn [mm]	100	125	150	160	180	200	250	300	315
kg	1,2	1,4	1,6	1,7	2,1	2,2	2,9	3,7	3,8

Weight of the mechanism (incl. mounting plate) (kg)

MFUS	ONE(X)	BFL(T)
0,4	1,6	1,2

2.4.2 CR120-L500

Weight of damper without mechanism (kg)

Ø Dn [mm]	100	125	150	160	180	200	250	300	315
kg	1,5	1,9	2,2	2,3	2,8	3,0	3,8	4,9	5,0

Weight of mechanism (incl. mounting plate) (kg)

MFUS	ONE(X)	BFL(T)
0,4	1,6	1,2

2.4.3 CR120-1S

Weight of the damper without mechanism (kg)

Ø Dn [mm]	100	125	160	200	250	315
kg	5,7	6,5	7,9	9,5	11,0	12,3

Weight of mechanism (incl. mounting plate) (kg)

MFUS	ONE(X)	BFL(T)
0,4	1,6	1,2

2.4.4 CR120-1S-L500

Weight of the damper without mechanism (kg)

Ø Dn [mm]	100	125	160	200	250	315
kg	5,9	6,8	8,7	10,1	11,7	13,2

Weight of the mechanism (incl. mounting plate) (kg)

MFUS	ONE(X)	BFL(T)
0,4	1,6	1,2

2.5 NET PASSAGE

Below you will find an overview of the net passage for the different dimensions of our fire damper. Discover the complete aeraulic data via our BIM library (https://bim.rft.eu).

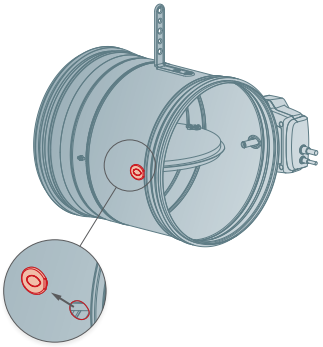
Ø Dn [mm]	100	125	150	160	180	200	250	300	315
Sn (m^2)	0,005	0,008	0,013	0,015	0,02	0,025	0,041	0,061	0,067

2.6 OPTIONS

2.6.1 INSPECTION OPENING (UL)

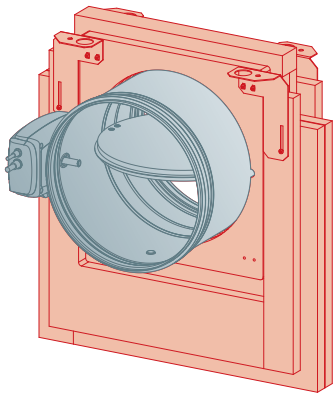
The inspection opening (UL) allows visual inspection of the condition of the damper and damper blade using an endoscope. A digital endoscope suitable for internal inspection of fire dampers is available.

For fire dampers equipped with the ONE mechanism, it is possible to insert the endoscope into the fire damper through the fusible link opening.



2.6.2 GDA (SLIDING CEILING CONNECTION)

Mounting frame with a sliding ceiling connection (up to 40 mm height difference) for installation in flexible walls (=metal stud walls). This option guarantees the fire resistance of the fire damper if the ceiling deflects due to high loads from the floors above. The GDA allows quick, easy and safe installation, directly against or with a gap of up to 75 mm under rigid ceilings.



2.6.3 EPOXY

The fire damper can be fitted with an epoxy coating along the inside of the damper for higher resistance to corrosive influences and/or very high humidity. This is recommended for swimming pool environments due to the presence of chlorine-containing air. Information on specific resistance in different environments is available on request.

Rf-t fire dampers have been successfully fire tested after undergoing a salt spray test. The salt spray test is a method of testing the corrosion resistance of a material or product via artificial/accelerated ageing.

2.6.4 Hygiene certificate

Hygiene-Konformitätsprüfung CR120 W-379335-23-Zd

This fire damper complies with the requirements according to VDI 6022-1, VDI 3803-1, DIN 1946-4, Ö-norm H 6020 and H 6021 and SWKI. During the assessment, the components of the fire damper were tested for resistance to mould and bacteria (in accordance with EN ISO 846). It was found that the components of the fire damper do not favour the growth of micro-organisms (moulds, bacteria), thus reducing the risk of infection for humans.

The fire damper was exposed to various disinfectants during the assessment with good results. The fire damper is suitable for use in hospitals and similar environments. Standard disinfectants and methods may be used for decontaminating the fire damper (in accordance with the list drawn up by the Robert Koch Institute).

2.7 VARIA

2.7.1 FLEXIBLE CONNECTION

Flexible connections may be used. For example, based on local or regional regulations or guidelines (e.g. M-LüAR, DW145).

The designer and/or installer of the ventilation ducts selects the way these flexible connections are realised and applied. Both elastic connections and flexible ventilation ducts are possible to avoid possible forces on the installed fire damper. The ventilation ducts are then suspended independently of the fire damper.

Take grounding into account and provide an equipotential connection to ensure conductivity if necessary.

2.7.2 INSULATION

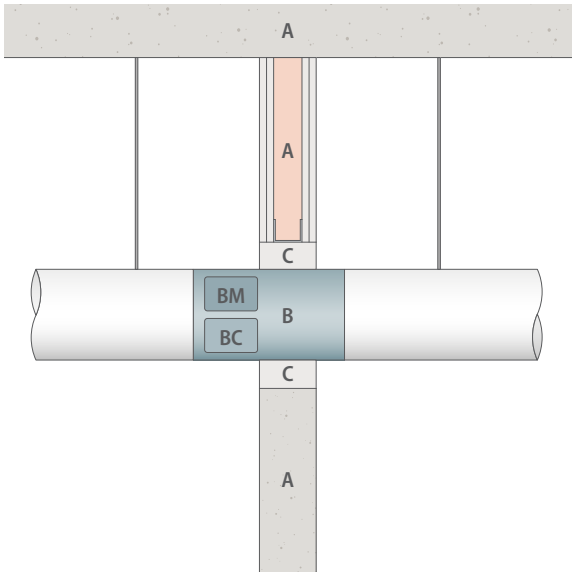
Ventilation ducts can be insulated to avoid condensation, to save energy or to make them fire-resistant. The flanges of fire dampers may also be insulated according to the rules of good workmanship and to the specifications of the insulation product. The operating mechanism of the fire damper must be accessible at all times. The fire damper should be sealed as indicated in the declaration of performance (DoP) and installation instructions.

If condensation is a concern, we recommend using fire batts, which ensures continuous insulation at the level of the penetration.

3 INSTALLATION

The installation of fire dampers relies on several key principles. This third chapter deals with each of these aspects in a clear and concise manner:

- The (load-bearing) structures in which the fire dampers are installed (compartment boundaries). These are indicated by the letter 'A'. Details are covered in chapter 3.1.
- The sealing of fire dampers is represented by the letter 'C'. Details of this are discussed in chapter 3.2.
- The various installation options, depending on the desired fire resistance, are documented in detail in chapter 3.3.
- Fire dampers are connected to ventilation ducts that are suspended and/or supported. This suspension is discussed in chapter 3.4.
- More info on the connection of the fire damper to the ventilation duct is given in chapter 3.5.



A (Load-bearing) construction
W Fire damper
BM: mechanism
BC: communication
C Sealing

3.1 (LOAD-BEARING) CONSTRUCTIONS

3.1.1 GENERAL

Rf-t fire dampers are tested in standardised (load-bearing) structures according to EN 1366-2. The results obtained apply to similar (load-bearing) structures with a fire resistance, thickness and density equal to or greater than the tested (load-bearing) structure.

According to the test standard, it is possible in certain cases to transfer the solutions of one (load-bearing) structure to another (load-bearing) structure.

The test results obtained in an aerated concrete (load-bearing) construction are applicable in rigid (load-bearing) structures made of hollow blocks provided that the hollow blocks in the cavity are filled with mortar suitable for the required fire resistance before sealing the cavity around the fire damper.

For flexible structures, it is possible to extend the test results to:

- A rigid construction with a thickness and fire resistance greater than or equal to that of the tested wall. The sealing here should be the same as the sealing tested in the flexible wall.
- A flexible construction without insulation between the plasterboard sheets, even if the test was carried out with insulation. Provided, however, that the non-insulated wall has at least the same fire resistance as the tested wall including insulation.

Common extensions are listed in the table below.

		TESTED (LOAD-BEARING) CONSTRUCTION										
		SHAFT WALL		FLEXIBLE WALL			RIGID WALL			RIGID FLOOR		
Possible extension to:		Metal stud gypsum plasterboard F (EN 520)	Aerated concrete	Metal stud gypsum plasterboard A (EN 520)	Metal stud gypsum plasterboard F (EN 520)	Gypsum blocks	Aerated concrete	Concrete	Reinforced concrete	Aerated concrete	Concrete	Reinforced concrete
Shaft wall	Metal stud gypsum plasterboard F	•										
	Aerated concrete	•	•									
Flexible wall	Metal stud gypsum plasterboard A			•								
	Uninsulated metal stud gypsum plasterboard A			•								
	Metal stud gypsum plasterboard F			•	•							
	Uninsulated metal stud gypsum plasterboard F			•	•							
	Gypsum blocks					•						
Rigid wall	Aerated concrete			•	•		•					
	Concrete			•	•		•	•				
	Reinforced concrete			•	•		•	•	•			
	Masonry hollow brick			•	•		•	•	•			
	Masonry solid brick			•	•		•	•	•			
Rigid floor	Aerated concrete									•		
	Prestressed concrete units									•		
	Concrete									•	•	
	Reinforced concrete									•	•	•

3.1.2 FLEXIBLE WALL TYPE A

Flexible walls type A are constructed with metal studs as specified in European standard EN 13501-2. The walls are constructed in accordance with the manufacturer's guidelines or locally applicable standards.

The wall thickness is at least 98 mm, with 2 x 12.5 mm double-sided gypsum plasterboard, namely gypsum (cardboard) boards of type A according to EN 520 (GKB according to DIN 18180). The internal cavity ≥ 48 mm is filled with stone wool ≥ 40 mm of 40 kg/m^3.

According to EN 1366-2, the insulation of the flexible wall may be omitted. Addition of additional layers use of thicker boards and wider metal studs is allowed.

The horizontal metal profiles consist of at least 0.6 mm thick galvanised steel and are fixed every ≤ 800 mm by Ø 6 mm steel screws and 6 mm anchors to the rigid (load-bearing) construction. The vertical metal profiles are at least 0.6 mm thick galvanised steel and are placed centre-to-centre at maximum 625 mm apart (see manufacturer's instructions). A clearance of 5 mm accommodates thermal expansion. The profiles conform to EN 14195. The profiles are fixed together with Ø 3.5 mm screws, with pop rivets or with metal stud fixing pliers.

The cladding is fixed to the metal profiles with screws Ø 3.5 mm.

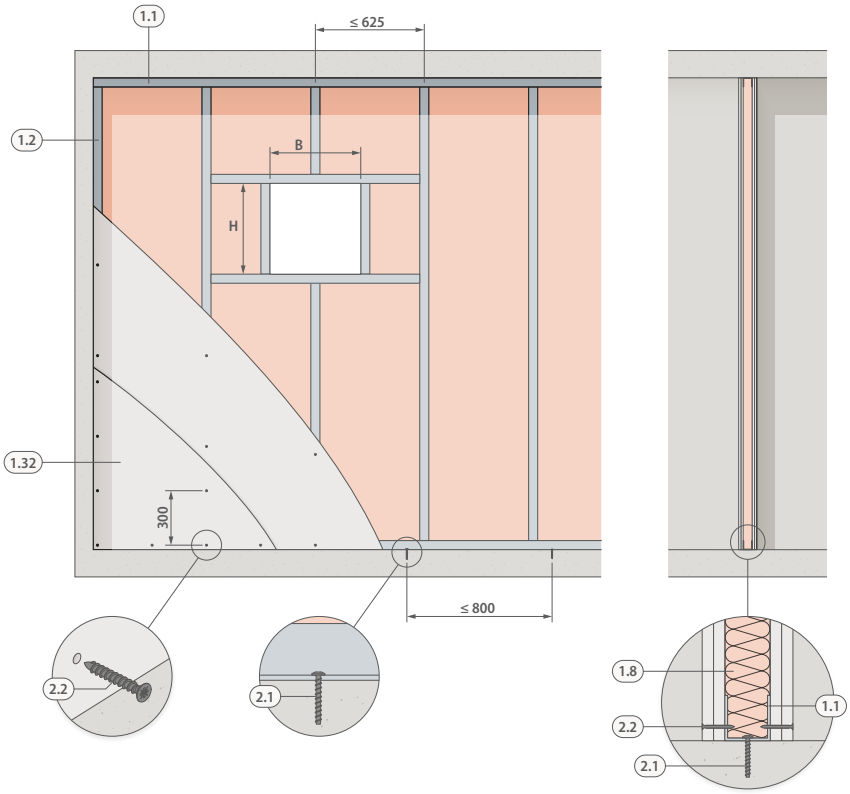
The visible joints and the connection with the (load-bearing) construction are finished with covering tape and joint filler, as specified by the manufacturer. The screw heads are being greased.

A reinforcement of metal horizontal and vertical profiles is provided around the damper, which is fixed to the metal framework of the wall construction (unless otherwise specified). These profiles are spaced ‘s’ around the fire damper, which is the gap to be provided for sealing the fire damper. If the distance between fire damper and (load-bearing) construction on the one hand or between fire damper and a second fire damper on the other hand is less than 75 and 200 mm respectively as prescribed by the standard, it is not required to provide a profile at this location (see "3.1.8 Installation at minimal distance").

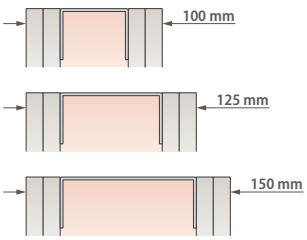
Rf-t tests fire dampers without drywall or anchors in the day edges. The addition of such components does not negatively affect the classification of the fire dampers.

Flexible walls type A are typically used in installation methods for fire resistance of 60 minutes.

The solutions in these flexible wall constructions are also applicable to rigid walls.

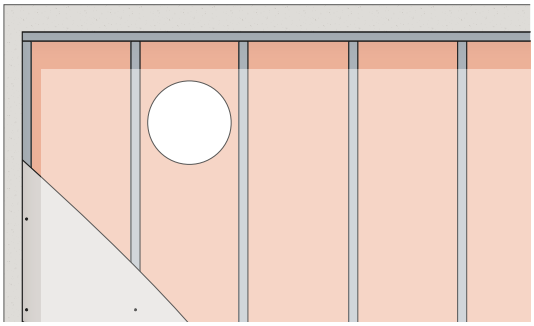


1.1	horizontal profile
1.2	vertical profile
1.32	plasterboard
2.1	mounting screws Ø 6 mm
2.2	mounting screws Ø 3.5 mm
1.8	stone wool 40 kg/m^3



Alternative: without horizontal reinforcement.

When installing a fire damper in a flexible metal stud wall, some installation methods do not require reinforcing profiles around the wall opening from a fire technical point of view. Where applicable, this alternative is shown with the installation methods in section 3.3.



When constructing this type of wall, always take into account the general instructions of the manufacturer of these wall systems.

3.1.3 FLEXIBLE WALL TYPE F

Flexible walls type F are built using metal studs as specified in European standard EN 1363-1. The walls are constructed according to the manufacturer's guidelines or to the standards in force locally.

The wall thickness is at least 98 mm, with 2 x 12.5 mm double-sided gypsum plasterboard, namely gypsum (cardboard) boards type F according to EN 520 (GKF according to DIN 18180). The internal cavity ≥ 48 mm is filled with stone wool ≥ 40 mm of 40 kg/m^3.

According to EN 1366-2, the insulation of the flexible wall may be omitted. Addition of additional layers use of thicker boards and wider metal studs is allowed.

The horizontal metal profiles consist of at least 0.6 mm thick galvanised steel and are fixed every ≤ 800 mm by Ø 6 mm steel screws and 6 mm anchors to the rigid (load-bearing) construction. The vertical metal profiles are at least 0.6 mm thick galvanised steel and are placed centre-to-centre at maximum 625 mm apart (see manufacturer's instructions). A clearance of 5 mm accommodates thermal expansion. The profiles conform to EN 14195. The profiles are attached to each other with Ø 3.5 mm screws, with pop rivets or with metal stud fixing pliers.

The cladding is fixed to the metal profiles with screws Ø 3.5 mm.

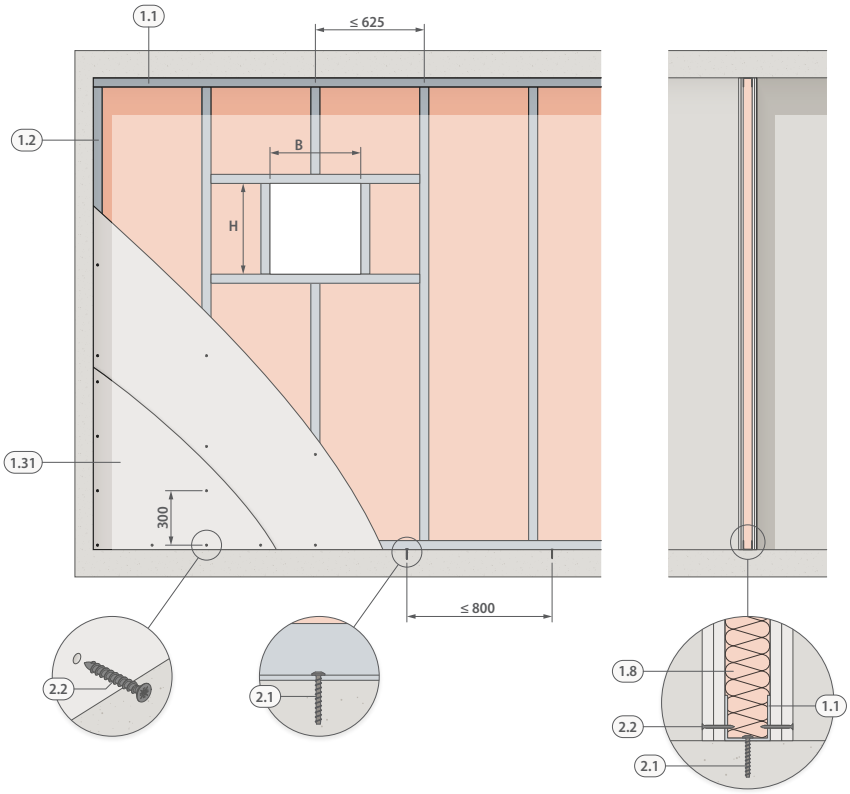
The visible joints and the connection with the (load-bearing) construction are finished with covering tape and joint filler, as specified by the manufacturer. The screw heads are being greased.

A reinforcement of metal horizontal and vertical profiles is provided around the damper, which is fixed to the metal framework of the wall construction (unless otherwise specified). These profiles are spaced 's' around the fire damper, which is the gap to be provided for sealing the fire damper. If the distance between fire damper and (load-bearing) construction on the one hand or between fire damper and a second fire damper on the other hand is less than 75 and 200 mm respectively as prescribed by the standard, it is not required to provide a profile at this location (see "3.1.8 Installation at minimal distance").

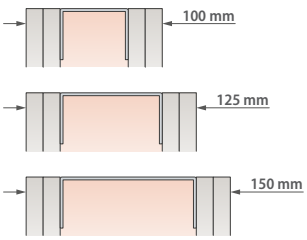
Rf-t tests fire dampers without drywall or anchors in the day edges. The addition of such components does not negatively affect the classification of the fire dampers.

Flexible walls type F are typically used in installation methods for fire resistance of 90 or 120 minutes.

The solutions in these flexible wall constructions are also applicable to rigid walls.

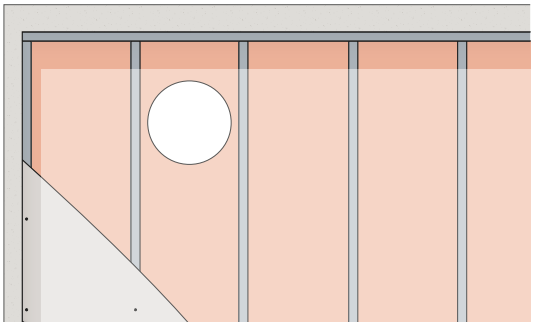


1.1	horizontal profile
1.2	vertical profile
1.31	plasterboard
2.1	mounting screws Ø 6 mm
2.2	mounting screws Ø 3.5 mm
1.8	stone wool 40 kg/m^3



Alternative: without horizontal reinforcement.

When installing a fire damper in a flexible metal stud wall, some installation methods do not require reinforcing profiles around the wall opening from a fire technical point of view. Where applicable, this alternative is shown with the installation methods in section 3.3.



Always follow the general instructions of the manufacturer of these wall systems when constructing this type of wall.

3.1.4 GYPSUM BLOCK WALL

A gypsum block wall is a non-load-bearing partition wall made of prefabricated gypsum blocks with a density ≥ 850 kg/m^3 (EN 12859). The blocks are lined (half-brick bond) with gypsum-based block glue. The joint thickness is about 2 mm, larger gaps can be sealed with block glue according to the manufacturer's specifications.

3.1.5 RIGID WALL

Rigid walls are walls made of cellular concrete, concrete or masonry with a minimum density of 650 ± 200 kg/m^3 (EN 1363-1) and can also be applied to rigid walls made of hollow blocks. Any hollow spaces around the fire damper should be filled. The solutions in flexible wall constructions are also applicable to rigid walls.

3.1.6 RIGID FLOOR

Rigid floors are cellular concrete or concrete floors with a density of at least 650 ± 200 kg/m^3 (EN 1363-1). Any voids around the fire damper should be filled.

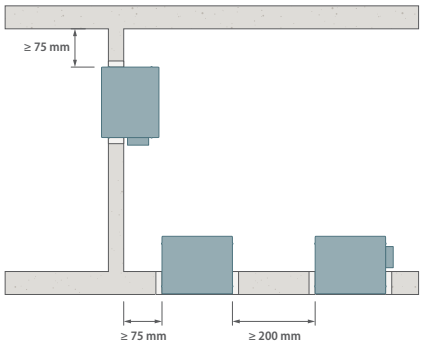
Rf-t fire dampers can be installed either with mechanism below or above the floor.

3.1.7 RIGID FLOOR OF REINFORCED CONCRETE

Rigid floor made of reinforced concrete with a specific mass of 2200 ± 200 kg/m^3.

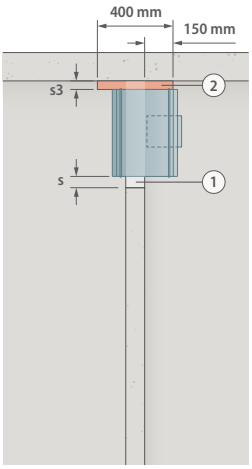
3.1.8 INSTALLATION AT MINIMAL DISTANCE

According to European test standard EN 1366-2, the minimum required distance between 2 fire dampers is 200 mm and between a fire damper and another (load-bearing) construction 75 mm. Rf-t fire dampers were successfully tested and may be installed at a shorter nominal distance than the minimum specified by the standard, both in vertical wall and floor/ceiling.



Standard installation according to EN 1366-2 ➲

The certified solution for Rf-t fire dampers consists of the following elements: on the one hand, to apply a **universal sealing** where the distance between fire damper and a second fire damper or to a structural component is smaller than the minimum specified by the standard and, on the other hand, to apply the **approved sealing methods** according to our existing classifications where the distance is equal to or greater than specified by the standard:



Universal sealing for distance smaller than specified by the standard

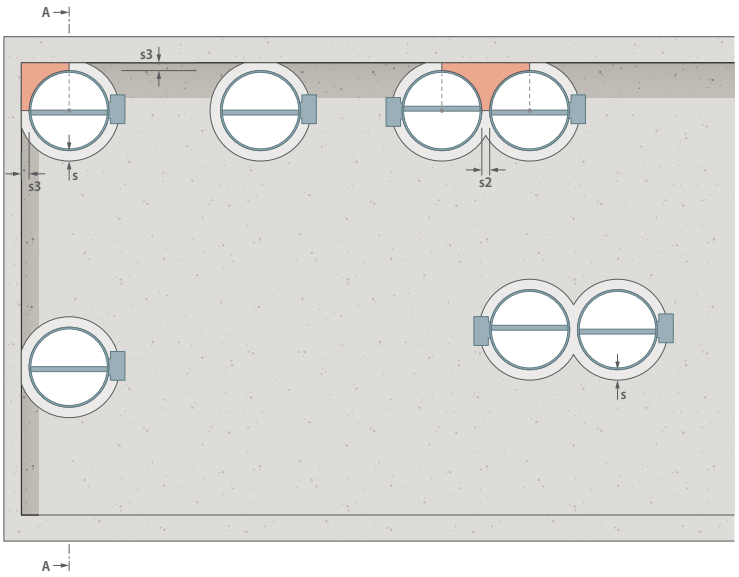
s3 Spacing between fire damper and vertical or horizontal (load-bearing) construction:
30 ≤ s3 < 75 mm
② Stone wool sheets ≥ 150 kg/m^3 over a depth of 400 mm, including 150 mm on the mechanism side of the wall[*]. The area of this sealing is determined by the central axes of the fire dampers among themselves, or from the fire damper to the structural member.

s2 Spacing between two fire dampers: **30 ≤ s2 < 200 mm**
② Stone wool sheets ≥ 150 kg/m^3 over a depth of 400 mm, including 150 mm on the mechanism side of the wall[*]. The area of this sealing is determined by the central axes of the fire dampers among themselves, or from the fire damper to the structural member.

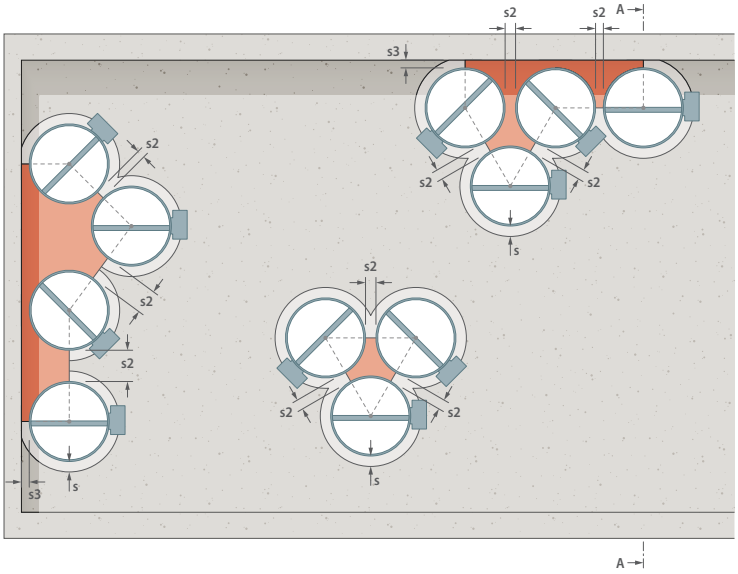
Sealing according to pre-existing solutions

s Recess
① E.g. mortar, gypsum or fire batts. Also applicable for (see also illustration below): 2 dampers placed between 30 and 200mm apart but more than 75mm away from a construction part or one fire damper placed between 30 and 75mm from a (load-bearing) construction. (C.x)

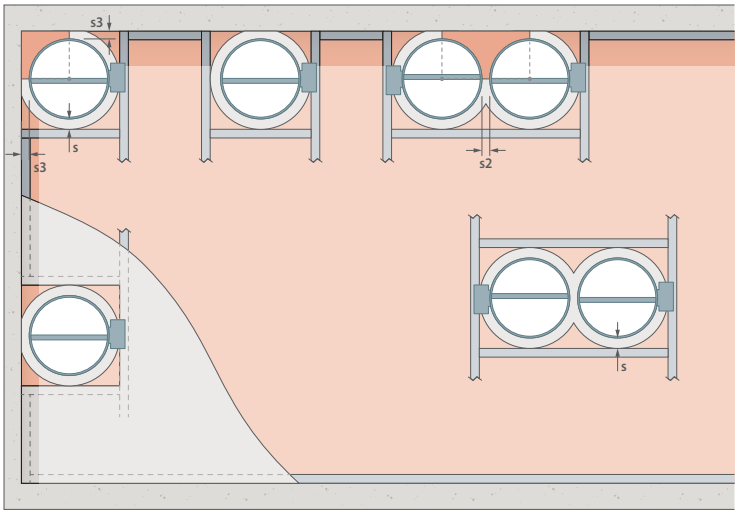
[*]For a wall thickness of > 250 mm, stone wool should be applied over a depth of > 400 mm until the entire wall thickness is filled.



- The minimal distance is calculated to the tunnel wall of the fire damper.
- The axis direction of the damper blade is indicated in the installation instructions.
- A maximum of 3 circular dampers may be installed next to each other at a minimal distance, both vertically and horizontally, with a cluster of a maximum of 4 dampers.
- The operating mechanism must remain accessible at all times for inspection and/or servicing.



When installing Rf-t fire dampers at minimal distance in a lightweight partition wall, no metal profiles should be placed between the fire damper and the (load-bearing) structure or between the fire dampers themselves.



Information on each wall/sealing combination is further detailed in this manual.

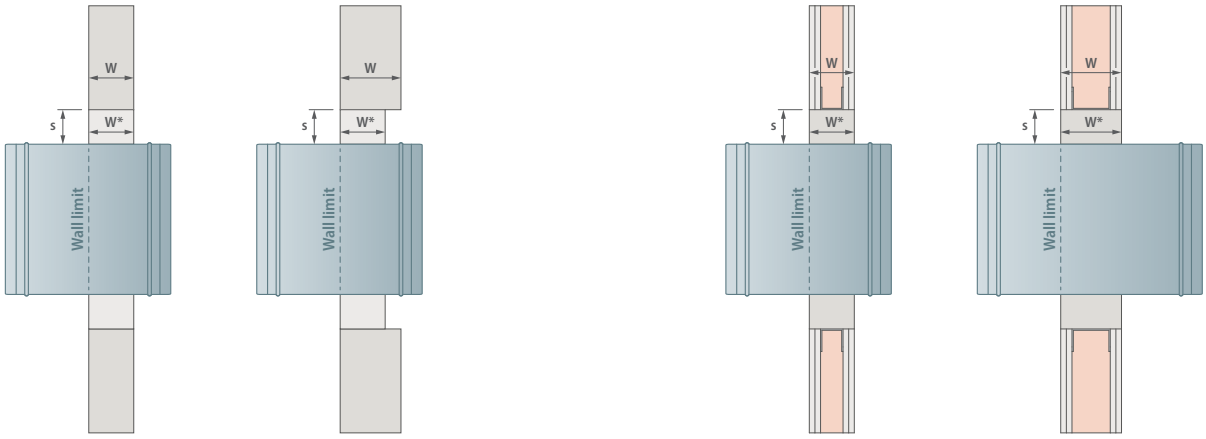
3.2 SEALING AND INSTALLATION MATERIALS

3.2.1 SEALING AND DIMENSIONS

The size of the sealing is determined by the minimum sealing depth/length (w*) and the sealing width (s).

For rigid walls, rigid floors and plaster block walls, the minimum wall thickness (w) and minimum sealing depth (w*) can be different. For example, if a rigid (load-bearing) structure is at least 100 mm thick with a sealing depth of at least 100 mm, then e.g. w = 200 mm and w* ≥ 100 mm provided that the sealing is realised at the height of the damper blade

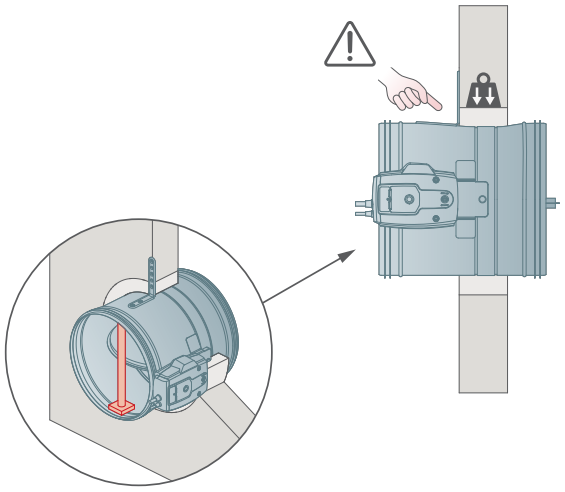
For flexible walls and sandwich panel system walls, the minimum wall thickness (w) and the minimum sealing depth (w*) are always the same.



If the opening around the fire damper is larger than stated in the technical data sheet, the following options are available: reduce the opening in the wall using the same material as the wall; apply a different sealing system; seek alternative advice from a competent local authority (possibly in consultation with Rf-t). Always take into account the stability of the wall and the proper functioning of the fire damper.

When using a wet sealing method (mortar or gypsum), deformation of the fire damper must be avoided due to excessive stress on the fire damper. If necessary, precautions should be provided at wall level. A temporary (wooden) brace can also help to prevent deformation of the fire damper during installation.

If a wet sealing method is used, Rf-t recommends protecting the fire damper (actuator and damper blade) during installation to prevent sealing material from compromising the correct operation of the damper.

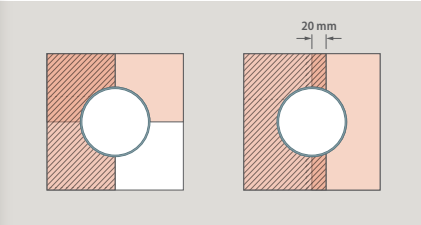


w	wall thickness	minimum thickness of the (load-bearing) construction
w*	sealing depth	minimum sealing depth in the (load-bearing) construction
s	general clearance	The width of the sealing recess 's' is determined by the tested distance during official fire tests. If the recess around the fire damper is larger than stated in the technical data sheet, the following options are available: reduce the opening in the wall with the same material as the wall; apply a different sealing system; seek alternative advice from a competent local authority (possibly in consultation with Rf-t). Always take into account the stability of the wall and the proper functioning of the fire damper.
s2	s2 min distance	minimal distance between two fire dampers
s3	s3 min distance	minimal distance between fire damper and (load-bearing) construction

3.2.2 OVERVIEW OF SEALING SYSTEMS

Below you will find an overview of the various systems and sealing materials that can be used when installing our fire dampers. Each system has been assigned a code beginning with the letter C. The installation details further on in this document always refer to this code with a brief description of the system in question. Below and in the legend at the end of this document, you will find all the details relating to the various systems and specific instructions on how to apply them.

Standard sealing

C.01	Mortar	Mortar according to EN 998-2: class M2.5 to M10 or fire-resistant mortar class M2.5 to M10. Mortar according to DIN 1053: groups II, IIa, III, IIIa or fire-resistant mortar groups II, III. Equivalent mortars, gypsum mortar or concrete.
C.02	Gypsum	Gypsum (mortar)
C.03	Block glue	Gypsum-based block glue
C.2	1s mounting kit	1S - the round fire damper is equipped with a collar for circular surface-mount that is screwed onto the (load-bearing) construction and does not require any further sealing.
C.23	Cover plates	Type A or type F plasterboard (according to EN 520) as indicated in the declaration of performance. The cover plates follow the contours of the fire damper and shall be provided with recesses around the mechanism where necessary. Spacing between fire damper and cover plate ≤ 5mm.
C.31	Fire batt 2 x 50 mm	Single-sided coated stone wool (3.6) 2 x 50 mm When sealing with coated fire batt sheets, the saw cuts of the sheets must not coincide: the sheets are therefore installed (min 20 mm) angled to promote strength. 
C.04	Fire-resistant gypsum	fire-resistant gypsum
C.53	remote 2 x 50 - fire batt	fire damper remote from the wall, sealing with fire batts 2 x 50 mm (3.6)
C.56	remote 2 x 50 - mortar	fire damper remote from the wall, sealing with fire batts 2 x 50 mm and mortar

Generic sealing for installation at minimal distance

C.10	Stone wool 150 kg/m^3	Stone wool ≥ 150 kg/m^3 over a depth of 400 mm, of which 150 mm on the mechanism side of the wall. For wall thicknesses of > 250 mm, the stone wool slab must be applied over a depth of > 400 mm until the entire wall thickness is filled. For rectangular fire dampers, flat stone wool panels can be used. For round fire dampers, 50 mm thick moulded pieces can be cut out to fit between the dampers (s2) and/or the wall construction (s3). By combining several layers of 50 mm, 150 mm (3 x 50 mm) sealing can be achieved on the mechanism side and 250 mm (5 x 50 mm) in the wall and on the non-mechanism side (depending on the thickness of the wall). The stonewool has a layer thickness of 50 mm, a density of 150 kg/m^3, thermal conductivity of l = 0.041 W/mK at 50 °C, water vapour absorption of 0.02% and Euroclass A1.

3.3 INSTALLATION METHODS

This chapter provides an overview of our certified installation methods. Correct installation that meets the desired fire resistance can only be achieved if the fire damper, the (load-bearing) construction and the sealing system are properly coordinated.

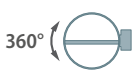
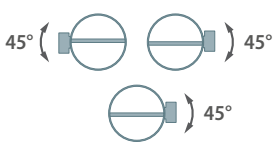
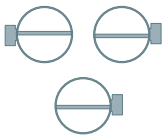
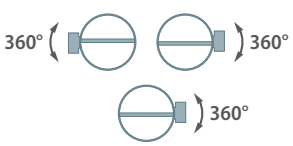
The overview table below allows you to quickly find the installation methods that are suitable for your specific application, depending on the required fire resistance (classification) and the type and thickness of the (load-bearing) construction.

The installation drawings further on in this chapter provide a clear picture of the finished installation, both for a single installation and for installation with several fire dampers next to each other. For installation drawings showing the installation sequence in different steps, please refer to our technical product data sheets.

After installation, the correct operation of the fire damper (opening and closing of the damper blade) must always be checked immediately.

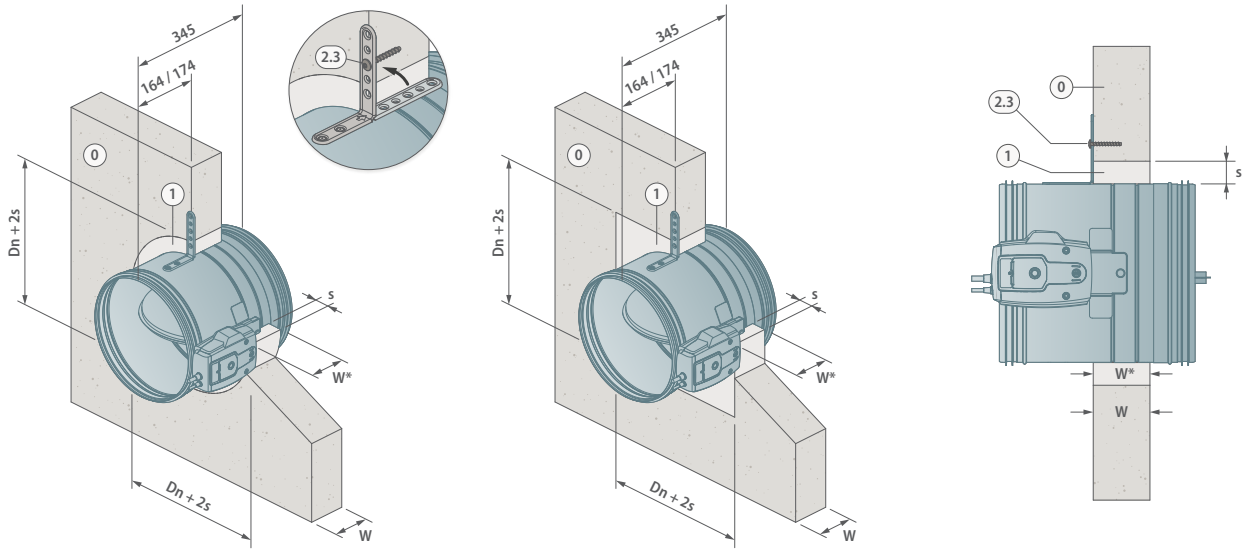
Overview of installation details

(LOAD-BEARING) CONSTRUCTION	INSTALLATION WITH	WALL THICKNESS	CLASSIFICATION	PAGE
CR120 (-L500)				
Rigid wall	mortar	≥ 100 mm	EI120S	35
	gypsum	≥ 100 mm	EI120S	36
	fire batt	≥ 100 mm	EI60S / EI90S / EI120S	37
	at a distance from the wall - mortar	≥ 100 mm	EI90S	39
	at a distance from the wall - fire batt	≥ 100 mm	EI90S	41
Rigid floor	mortar	≥ 150 mm	EI120S	43
		≥ 100 mm	EI90S	44
	fire batt	≥ 150 mm	EI90S / EI120S	45
Flexible wall	mortar	≥ 100 mm	EI120S	47
	gypsum	≥ 100 mm	EI60S / EI90S	48
	fire batt	≥ 100 mm	EI60S / EI90S / EI120S	49
	stone wool & cover plates	≥ 100 mm	EI60S	51
	sliding ceiling connection (GDA)	≥ 100 mm	EI90S	52
	at a distance from the wall - fire batt	≥ 100 mm	EI90S	53
Gypsum block wall	block glue	≥ 70 mm	EI120S	55
CR120-1S(-L500)				
Rigid wall	1S surface mounting	≥ 100 mm	EI120S	56
Flexible wall	1S surface mounting	≥ 100 - ≤ 125 mm	EI120S	57

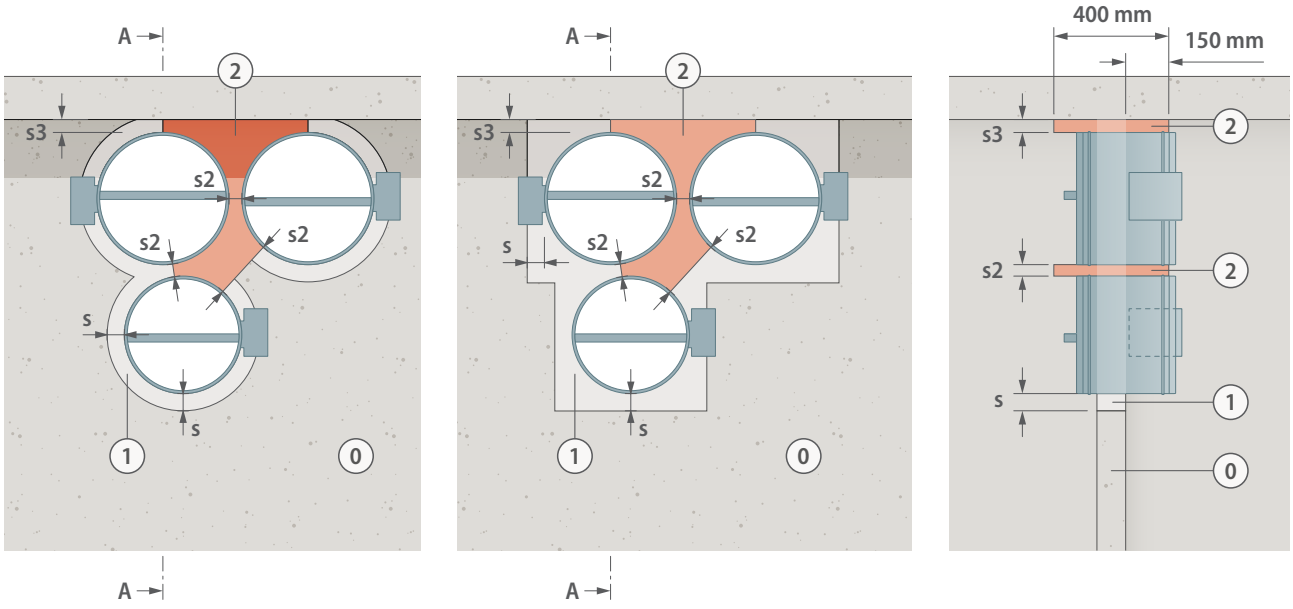
		I	II	III	IV
Axis orientation	Standard installation				
	Minimal distance				

3.3.1 RIGID WALL - MORTAR

Ø 100-315 mm	w ≥ 100, w* ≥ 100	EI120 (v_e i ↔ o)S	I



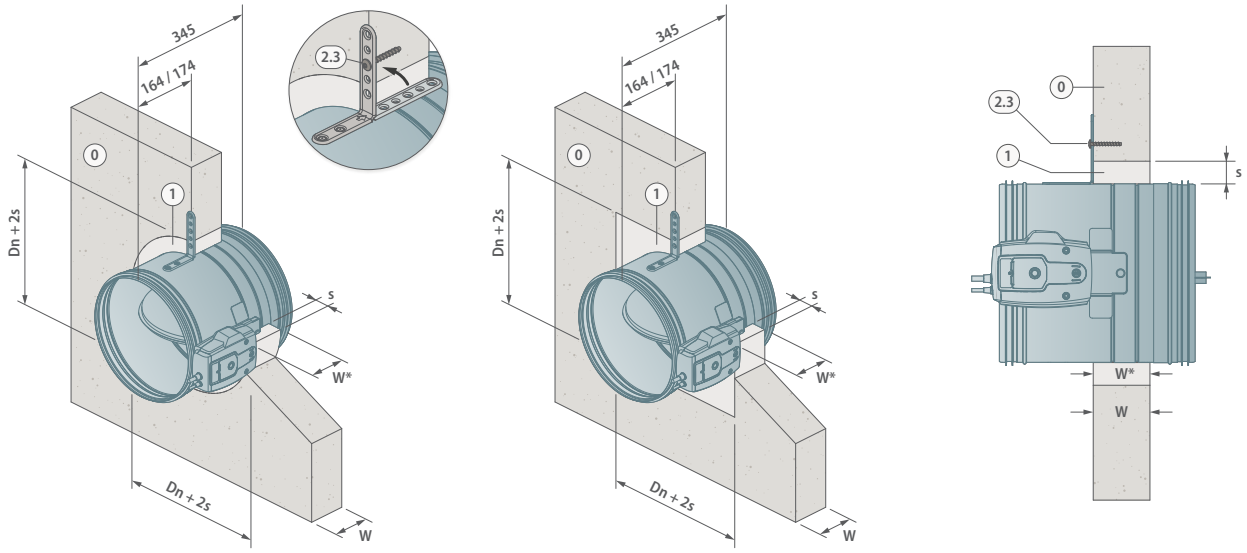
Minimal distance



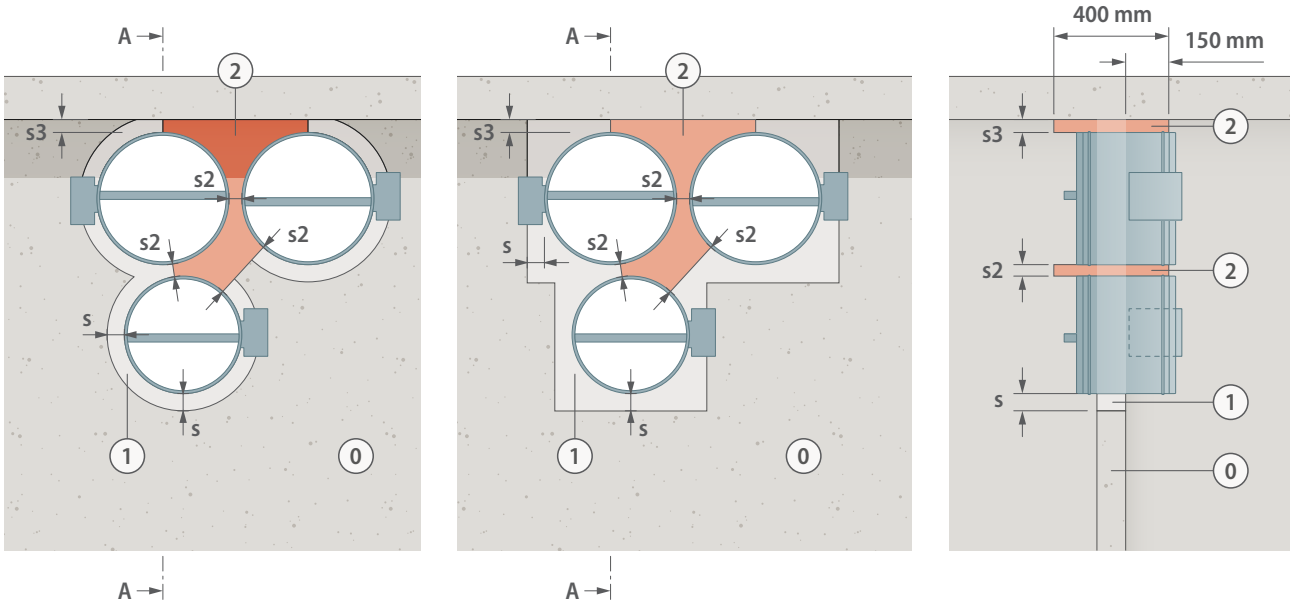
⓪	A.4	Rigid wall		
①	C.01	Mortar	20 ≤ s ≤ 50	
	2.3	Universal screw (optional)		
②	C.10	Stone wool 150 kg/m³	30 ≤ s2 < 200	30 ≤ s3 < 75 (to wall/ceiling)

3.3.2 RIGID WALL - GYPSUM

Ø 100-315 mm	w ≥ 100, w* ≥ 100	EI120 (v_e i ↔ o)S	I



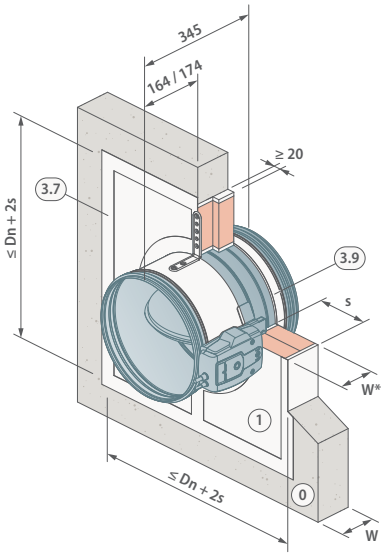
Minimal distance

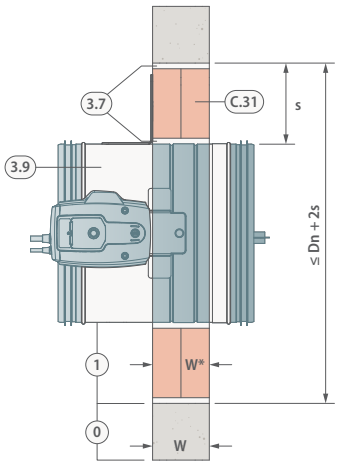


⓪	A.4	Rigid wall		
①	C.02	Gypsum	20 ≤ s ≤ 50	
	2.3	Universal screw (optional)		
②	C.10	Stone wool 150 kg/m³	30 ≤ s2 < 200	30 ≤ s3 < 75 (to wall/ceiling)

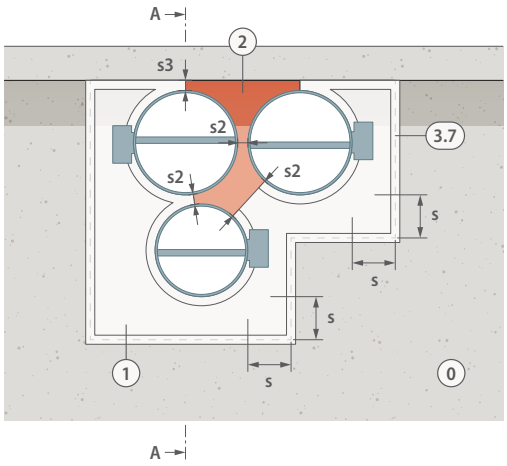
3.3.3 RIGID WALL - FIRE BATT

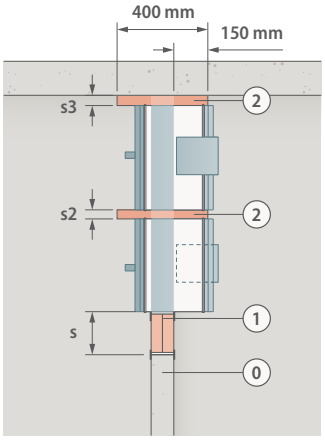
Ø 100-315 mm	w ≥ 100, w* ≥ 100	EI120 (v_e i ↔ o)S	I





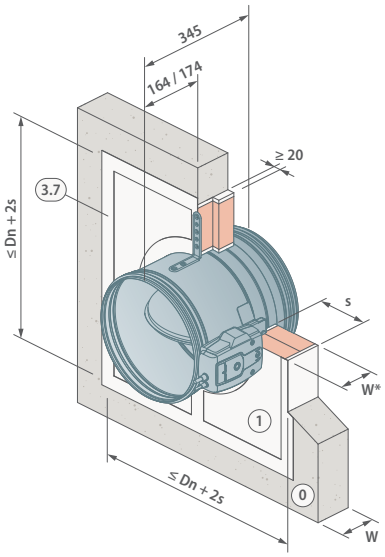
Minimal distance

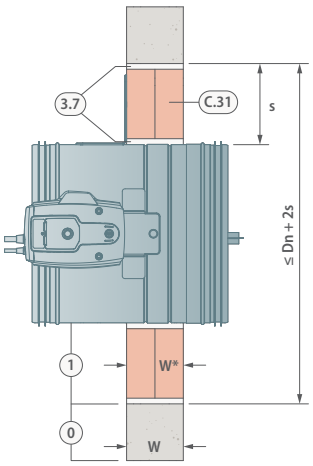




⓪	A.4	Rigid wall		
①	C.31	Fire batt 2 x 50 mm (Promat, Hilti, SVT) (no minimal distance for SVT)		20 ≤ s ≤ 400; 2s ≤ 600
	3.7	Coating end faces and joints		
	3.9	Coating tunnel		
	2.3	Universal screw (optional)		
②	C.10	Stone wool 150 kg/m³	30 ≤ s2 < 200	30 ≤ s3 < 75 (towards wall/ceiling)

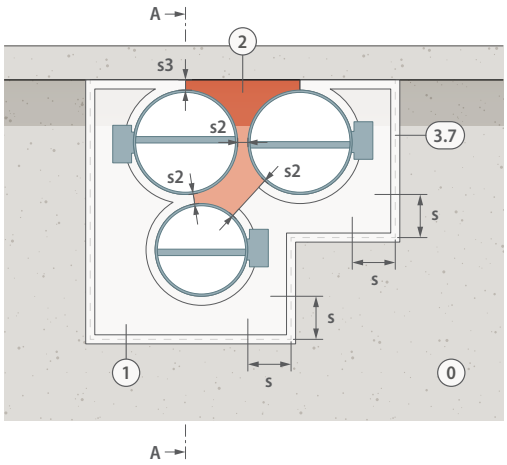
Ø 100-315 mm	w ≥ 100, w* ≥ 100	EI90 (v_e i ↔ o)S	I	Promat, Hilti, SVT
Ø 100-315 mm	w ≥ 100, w* ≥ 100	EI60 (v_e i ↔ o)S	I	Mulcol

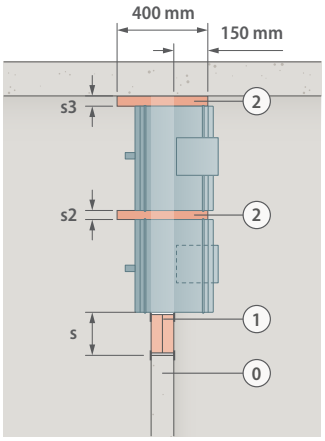




Minimal distance

Only for Promat or Hilti:



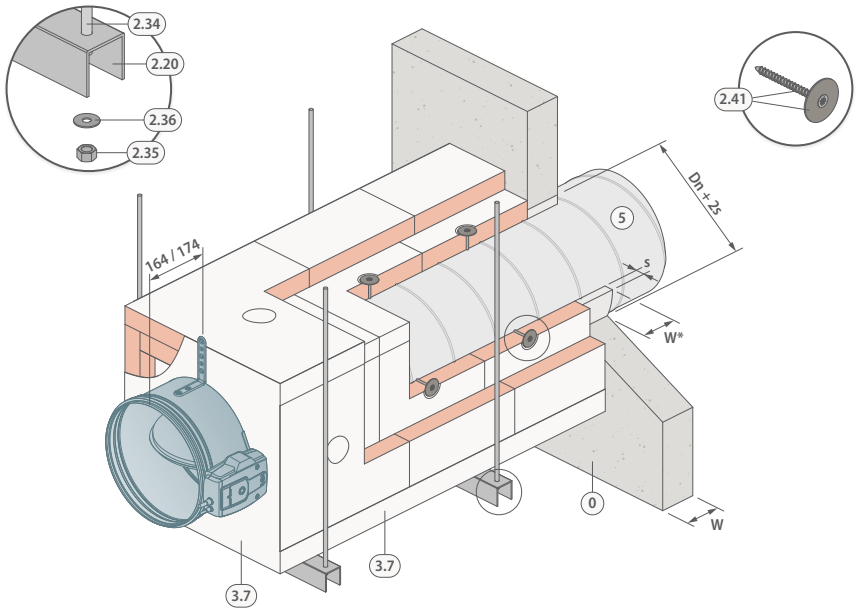


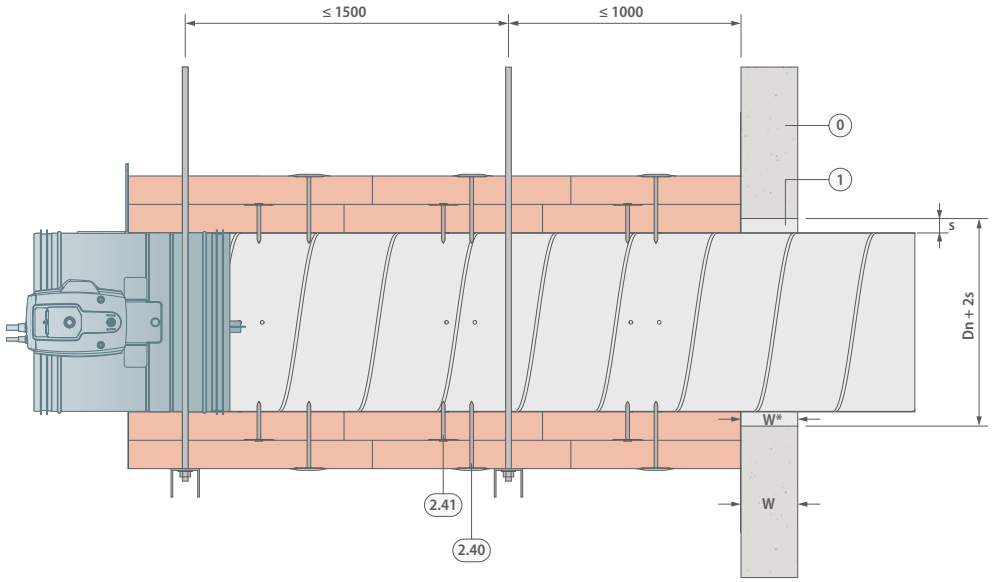
⓪	A.4	Rigid wall		
①	C.31	Fire batt 2 x 50 mm		20 ≤ s ≤ 400; 2s ≤ 600
	3.7	Coating of end faces and joints		
	2.3	Universal screw (optional)		
②	C.10	Stone wool 150 kg/m³	30 ≤ s2 < 200	30 ≤ s3 < 75 (to wall/ceiling)

3.3.4 RIGID WALL - REMOTE FROM THE WALL WITH FIRE BATT AND MORTAR

■ **C.56 FIREDAMPER REMOTE FROM THE WALL, INSTALLATION WITH FIRE BATT 2 X 50 MM AND MORTAR**

Ø 100-315 mm	w ≥ 100, w* ≥ 100	EI90 (v_e i ↔ o)S	II





Minimal distance

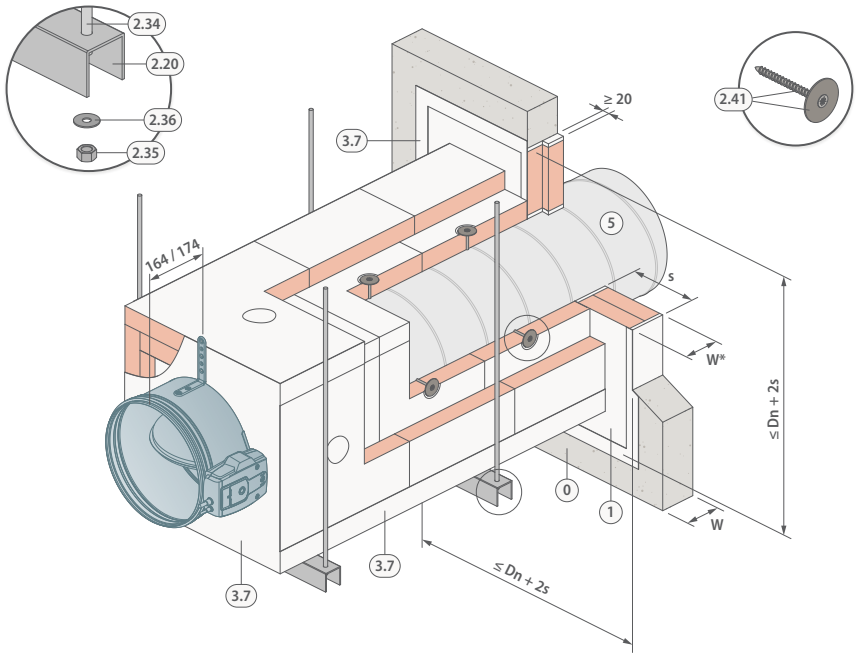
With this installation method, it is permissible to install the fire damper at a minimal distance from another fire damper or a (load-bearing) construction. Please contact Rf-t for more information about the installation guidelines for this specific configuration.

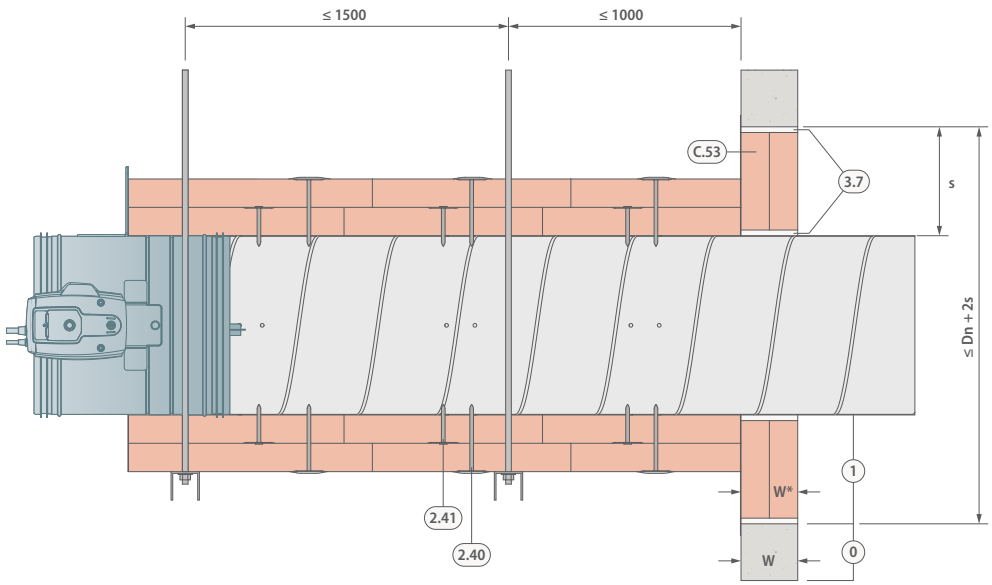
⓪	A.4	Rigid wall	
①	C.56	Mortar	20 ≤ s ≤ 40
	3.6	Fire batt 2 x 50 mm (Promat or Hilti)	
	3.7	Coating of end faces and joints	
	2.20	U-profile 50x50x3	
	2.34	M10 threaded rod	
	2.35	M10 nut	
	2.36	M10 washer	
	2.40	Universal screw Ø5x120 + washer M6x44 (9/m^2) (coated)	
	2.41	Universal screw Ø5x90 + washer M6x44 (9/m^2) (to be coated)	
	2.50	Mounting bracket ØDn	
	5	Galvanised duct	

3.3.5 RIGID WALL - REMOTE FROM THE WALL WITH FIRE BATT

■ **C.53 FIREDAMPER REMOTE FROM THE WALL, INSTALLATION WITH FIRE BATTS 2 X 50 MM**

Ø 100-315 mm	w ≥ 100, w* ≥ 100	EI90 (v_e i ↔ o)S	II





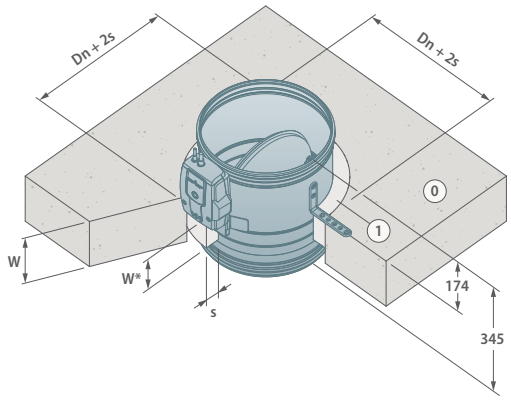
Minimal distance

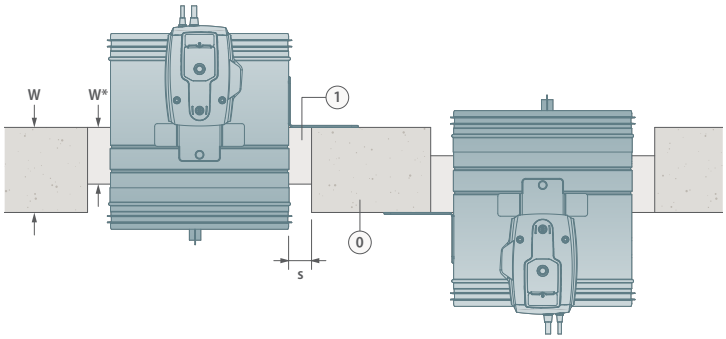
With this installation method, it is permitted to install the fire damper at a minimal distance from another fire damper or a (load-bearing) construction. Please contact Rf-t for more information about the installation guidelines for this specific configuration.

⓪	A.4	Rigid wall	
①	C.53	Remote fire batt 2 x 50 mm (Promat or Hilti)	20 ≤ s ≤ 400; 2s ≤ 600
	3.7	Coating of end faces and joints	
	2.20	U-profile 50x50x3	
	2.34	M10 threaded rod	
	2.35	M10 nut	
	2.36	M10 washer	
	2.40	Universal screw Ø5x120 + washer M6x44 (9/m^2) (coated)	
	2.41	Universal screw Ø5x90 + washer M6x44 (9/m^2) (coated)	
	2.50	Mounting bracket ØDn	
	5	Galvanised duct	

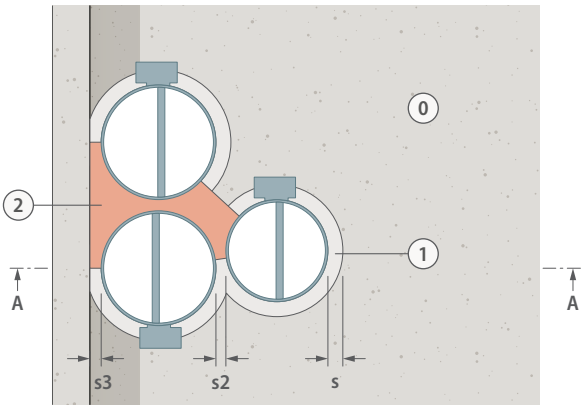
3.3.6 RIGID FLOOR - MORTAR

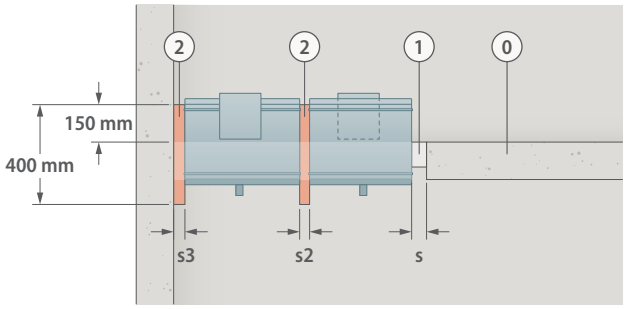
Ø 100-315 mm	w ≥ 150, w* ≥ 100	EI120 (h_o i ↔ o)S	IV





Minimal distance

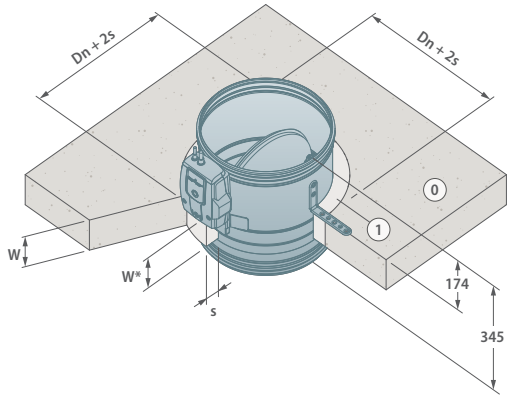


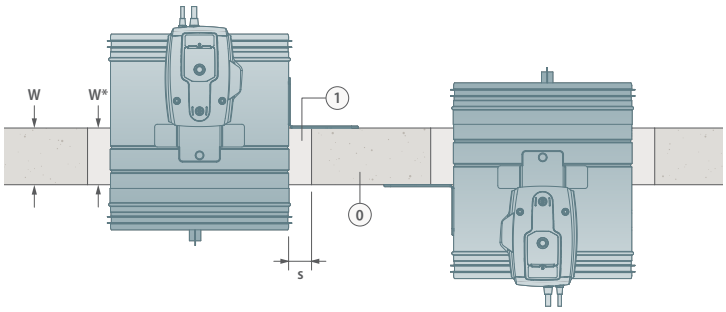


⓪	A.8	Rigid floor of reinforced concrete		
①	C.01	Mortar	20 ≤ s ≤ 40	
	2.3	Universal screw (optional)		
②	C.10	Stone wool 150 kg/m^3	30 ≤ s2 < 200	30 ≤ s3 < 75 (to wall)

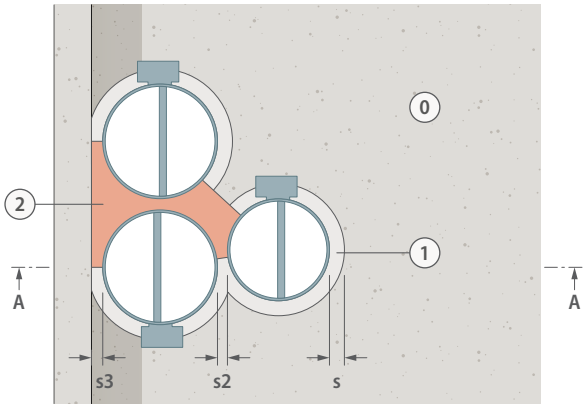
CR120

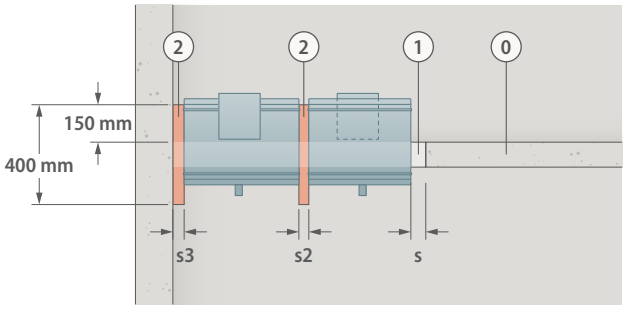
Ø 100-315 mm	w ≥ 100, w* ≥ 100	EI90 (h_o i ↔ o)S	IV





Minimal distance

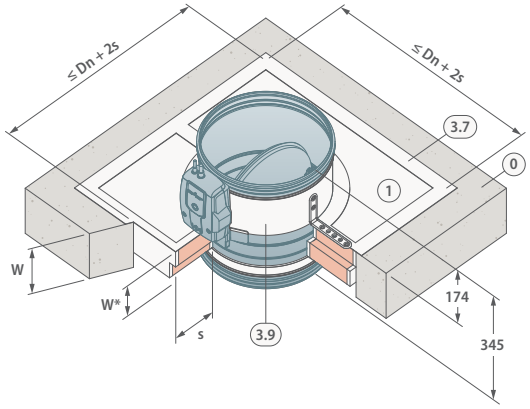


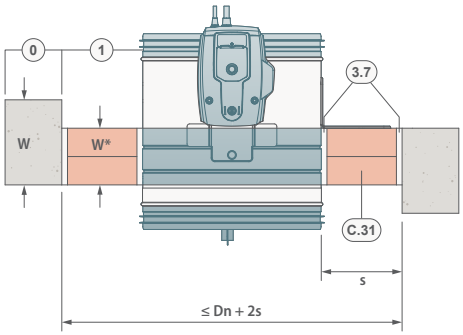


⓪	A.7	Rigid floor		
①	C.01	Mortar	20 ≤ s ≤ 40	
	2.3	Universal screw (optional)		
②	C.10	Stone wool 150 kg/m³	30 ≤ s2 < 200	30 ≤ s3 < 75 (to wall)

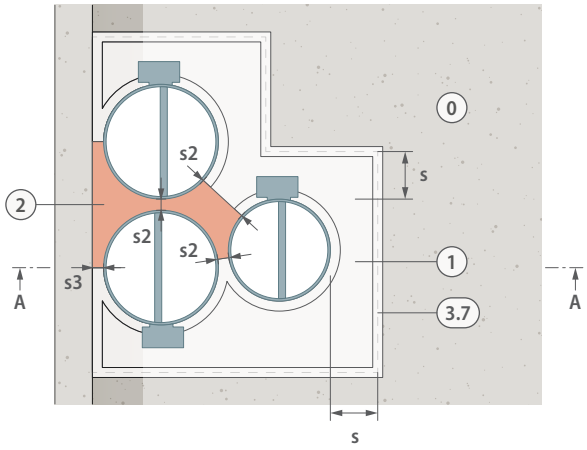
3.3.7 RIGID FLOOR - FIRE BATT

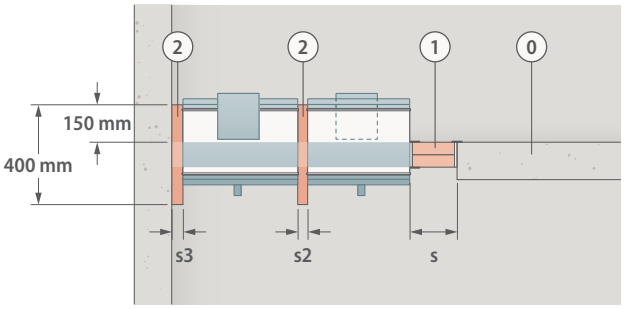
Ø 100-315 mm	w ≥ 150, w* ≥ 100	EI120 (h_o i ↔ o)S	IV





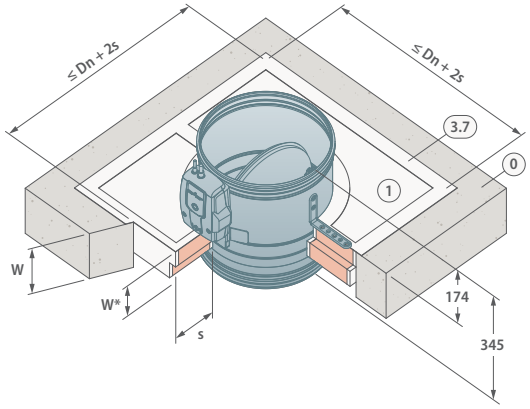
Minimal distance

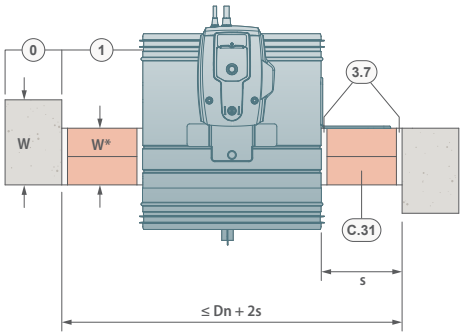




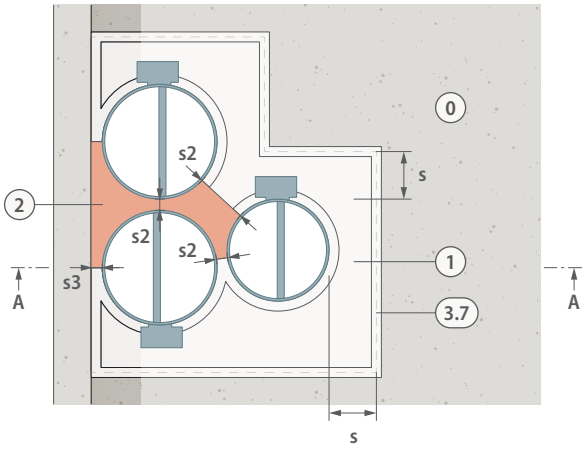
⓪	A.7	Rigid floor		
①	C.3	Fire batt 2 x 50 mm (Promat or Hilti)		20 ≤ s ≤ 400; 2s ≤ 600
	3.7	Coating of end edges and seams		
	3.9	Coating on tunnel		
②	C	Stone wool 150 kg/m^3	30 ≤ s2 < 200	30 ≤ s3 < 75 (to wall)

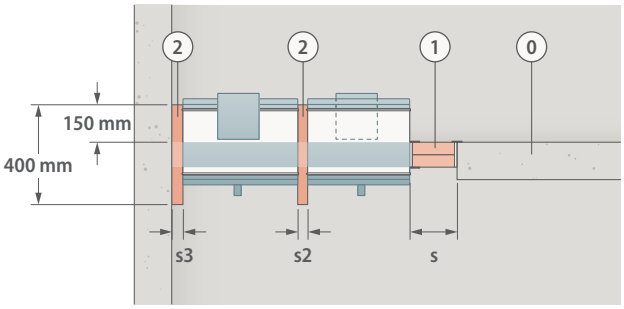
Ø 100-315 mm	w ≥ 150, w* ≥ 100	EI90 (h_o i ↔ o)S	IV





Minimal distance

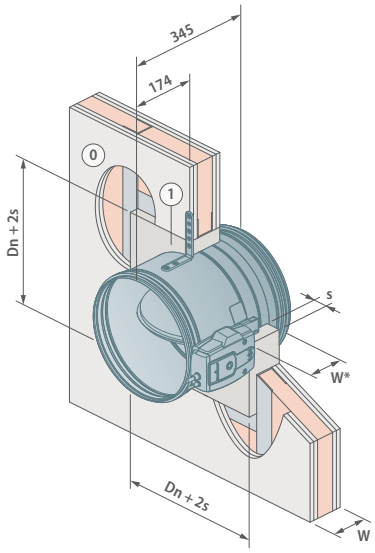


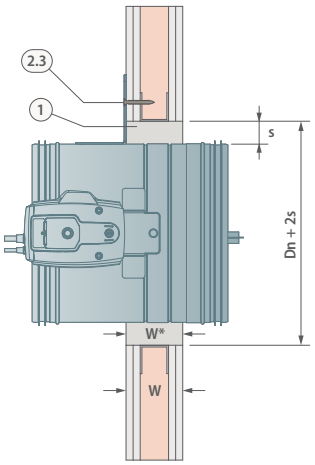


⓪	A.7	Rigid floor		
①	C.31	Fire batt 2 x 50 mm (Promat or Hilti)		20 ≤ s ≤ 400; 2s ≤ 600
	3.7	Coating of end edges and seams		
②	C.10	Stone wool 150 kg/m³	30 ≤ s2 < 200	30 ≤ s3 < 75 (to wall)

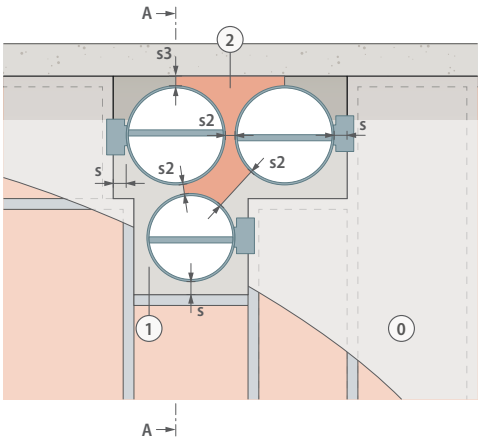
3.3.8 FLEXIBLE WALL - MORTAR

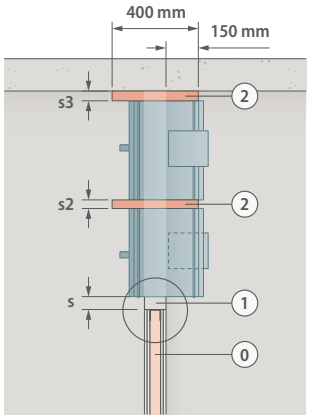
Ø 100-315 mm	A.2 Type F	w ≥ 100, w* = w	EI120 (v_e i ↔ o)S	I

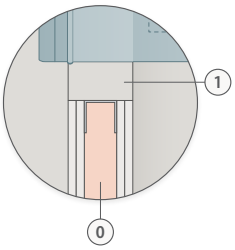




Minimal distance





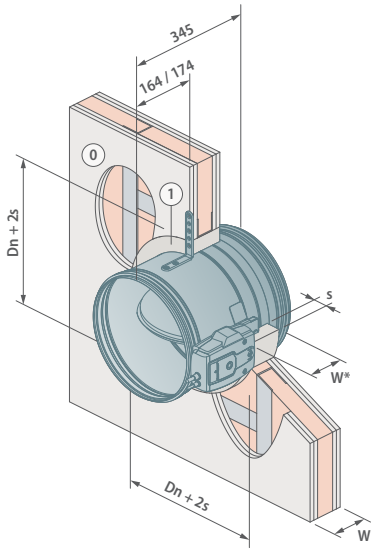


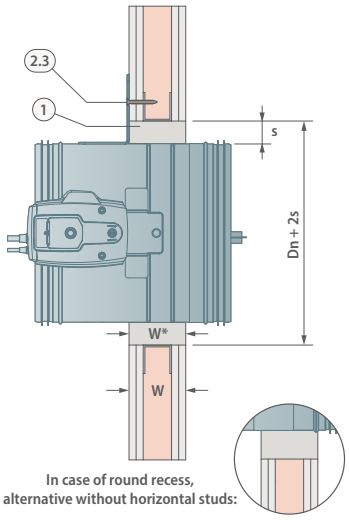
⓪	A.2	Flexible wall		
①	C.01	Mortar	20 ≤ s ≤ 50	
	2.3	Universal screw (optional)		
②	C.10	Stone wool 150 kg/m³	30 ≤ s2 < 200	30 ≤ s3 < 75 (to wall/ceiling)

- It is permitted to provide (single or double) cladding on the edges, but this is not required. In this case, the plasterboards must be fixed to the metal profiles using screws.
- Anchoring the mortar seal with anchor points is permitted, but not required to meet the intended fire resistance.

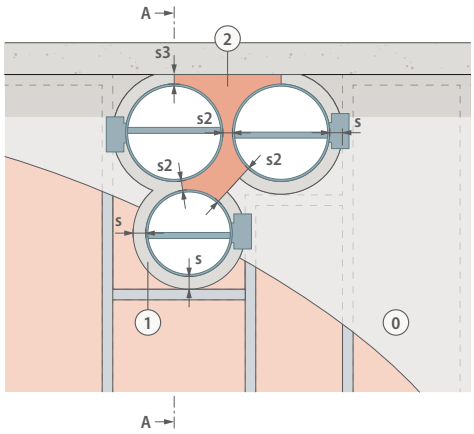
3.3.9 FLEXIBLE WALL - GYPSUM

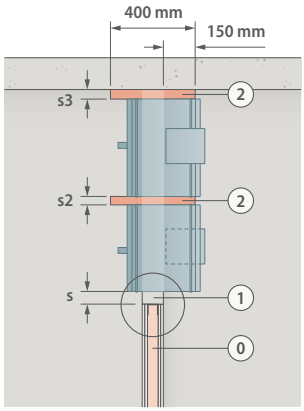
Ø 100-315 mm	A.2 Type F	w ≥ 100, w* = w	EI90 (v_e i ↔ o)S	I
Ø 100-315 mm	A.1 Type A	w ≥ 100, w* = w	EI60 (v_e i ↔ o)S	I

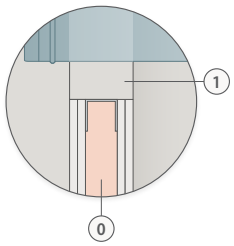




Minimal distance



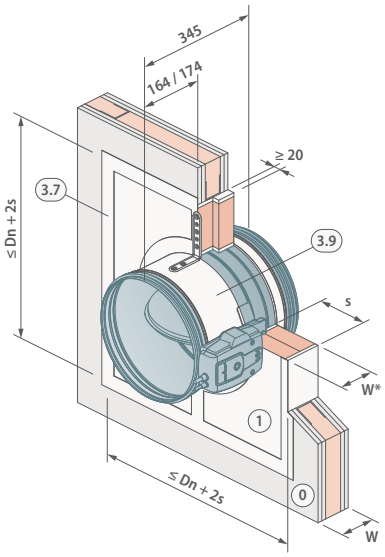


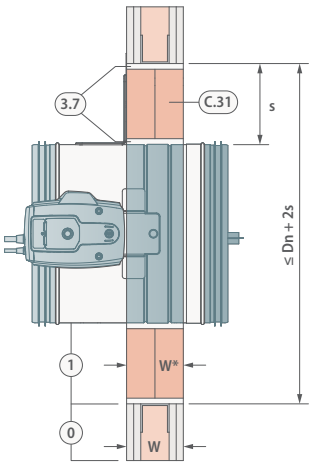


⓪	A.1 / A.2	Flexible wall		
①	C.02	Gypsum	20 ≤ s ≤ 40	
	2.3	Universal screw (optional)		
②	C.10	Stone wool 150 kg/m³	30 ≤ s2 < 200	30 ≤ s3 < 75 (to wall/ceiling)

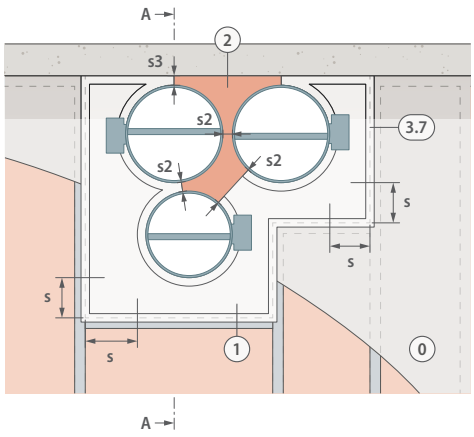
3.3.10 FLEXIBLE WALL - FIRE BATT

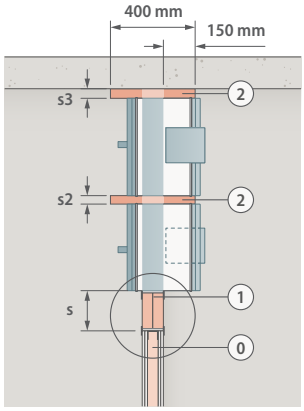
Ø 100-315 mm	A.2 Type F	w ≥ 100, w* = w	EI120 (v_e i ↔ o)S	I

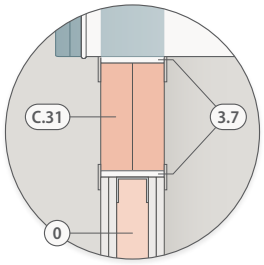




Minimal distance

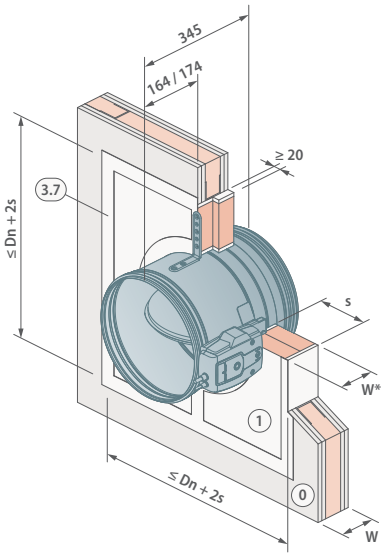


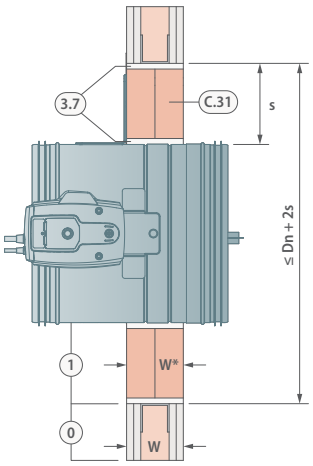




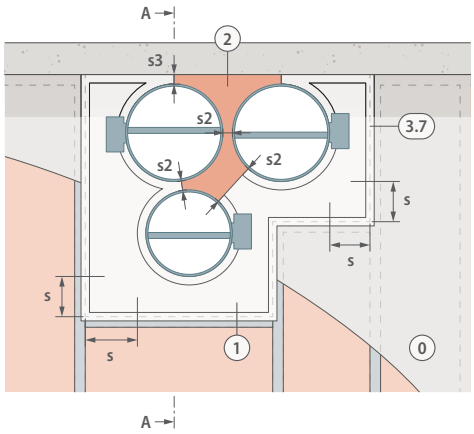
⓪	A.2	Flexible wall		
①	C.31	Fire batt 2 x 50 mm (Promat or Hilti)		20 ≤ s ≤ 400; 2s ≤ 600
	3.7	Coating of end edges and seams		
	3.9	Coating on tunnel		
②	C.10	Stone wool 150 kg/m³	30 ≤ s2 < 200	30 ≤ s3 < 75 (to wall/ceiling)

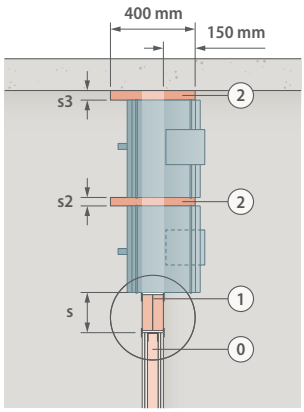
Ø 100-315 mm	A.2 Type F	w ≥ 100, w* = w	EI90 (v_e i ↔ o)S	I	Promat, Hilti, SVT
Ø 100-315 mm	A.2 Type F	w ≥ 100, w* = w	EI60 (v_e i ↔ o)S	I	Mulcol
Ø 100-315 mm	A.1 Type A	w ≥ 100, w* = w	EI60 (v_e i ↔ o)S	I	Mulcol

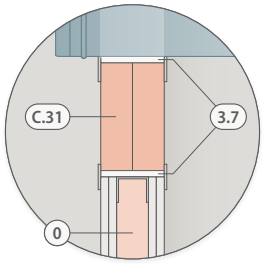




Minimal distance



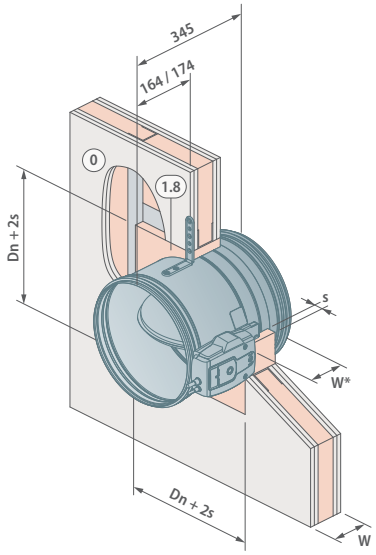


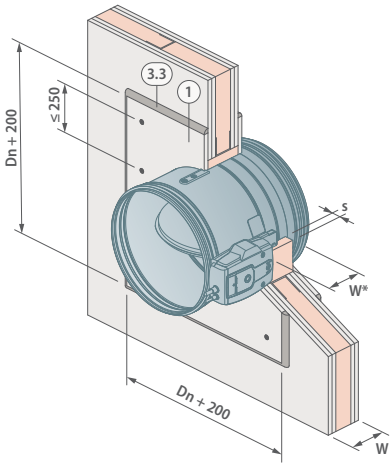


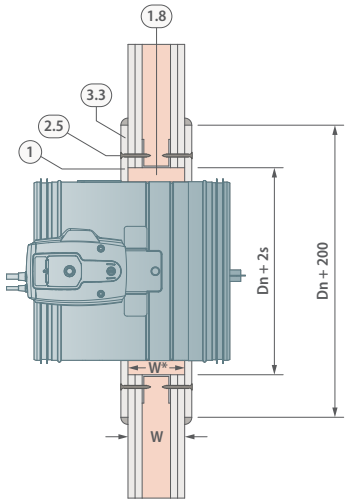
⓪	A.1 / A.2	Flexible wall		
①	C.31	Fire batt 2 x 50 mm (For EI60S: Mulcol. For EI90S: Promat, Hilti or SVT. Installation minimal distance: only with Promat or Hilti)		20 ≤ s ≤ 400; 2s ≤ 600
	3.7	Coating of end edges and seams		
②	C.10	Stone wool 150 kg/m^3	30 ≤ s2 < 200	30 ≤ s3 < 75 (to wall/ceiling)

3.3.11 FLEXIBLE WALL - STONE WOOL & COVER PLATES

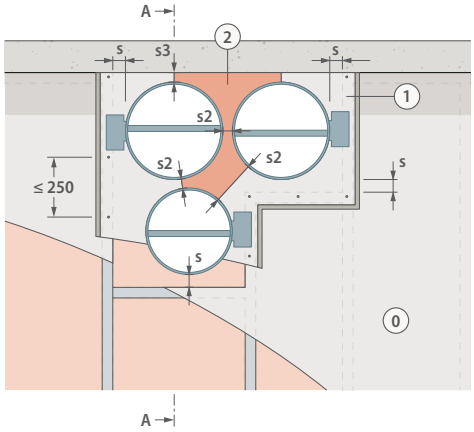
Ø 100-250 mm	A.1 Type A	w ≥ 100, w* = w	EI60 (v_e i ↔ o)S	I

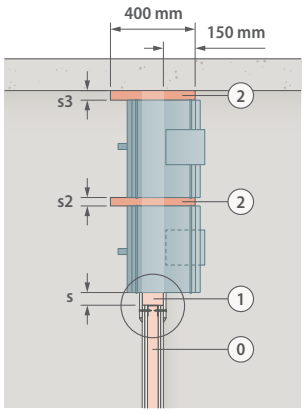


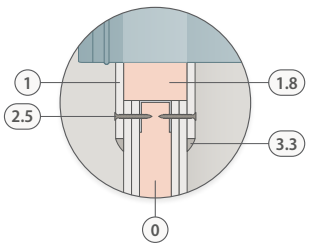




Minimal distance



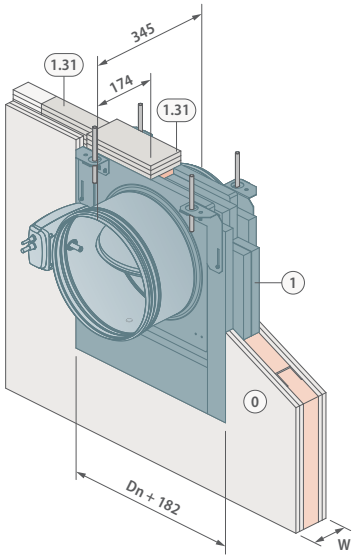


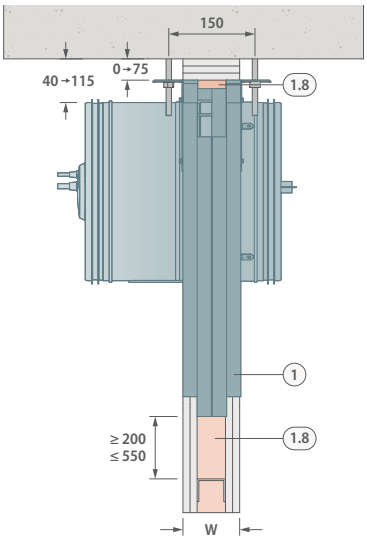


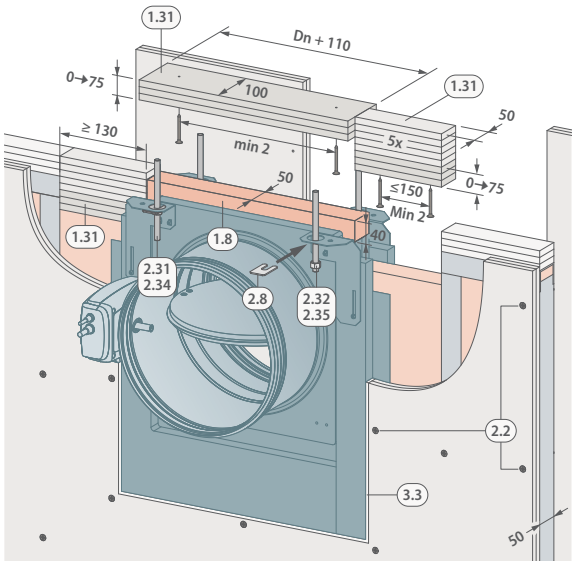
⓪	A.1	Flexible wall		
①	C.23	Cover plates		
	1.8	Stone wool 40 kg/m³	20 ≤ s ≤ 25	
	3.3	Joint filler		
	2.5	Universal screw 6 x 50 mm (fix in the metal stud frame)		
②	C.10	Stone wool 150 kg/m³	30 ≤ s2 < 200	30 ≤ s3 < 75 (to wall/ceiling)

3.3.12 FLEXIBLE WALL - SLIDING CEILING CONNECTION (GDA)

Ø 100-315 mm	A.2 Type F	w = 100	EI90 (v_e i ↔ o)S	IV







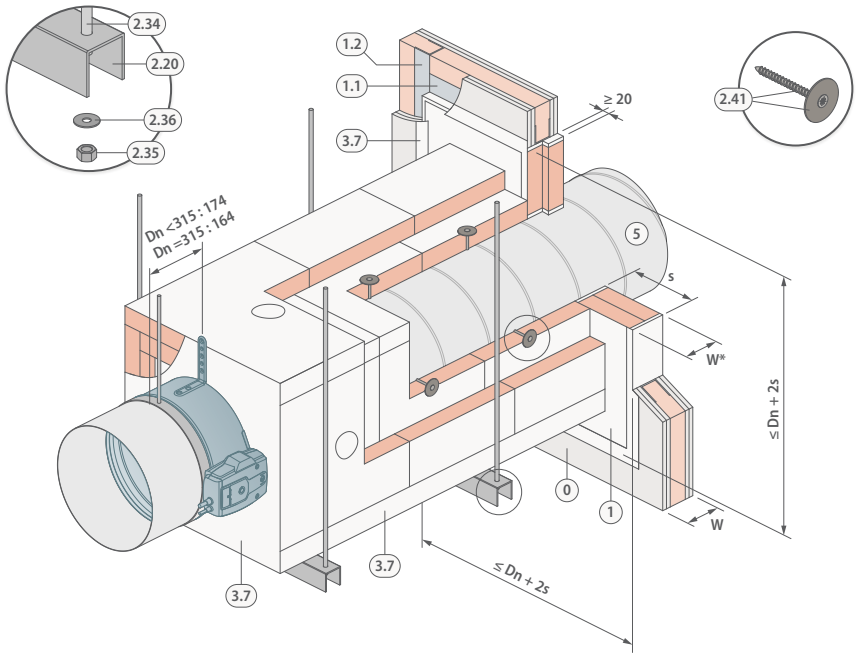
⓪	A.2	Flexible wall type F
①	C.4	Sliding ceiling connection*
	1.31	plasterboard 12.5 mm type F
	1.8	stone wool 40kg/m^3
	2.2	mounting screws Ø3.5mm
	2.31	M8 threaded rod
	2.32	M8 nut
	2.34	M10 threaded rod (alternative)
	2.35	M10 nut (alternative)
	2.8	U-shaped spacer plate
	3.3	Joint filler

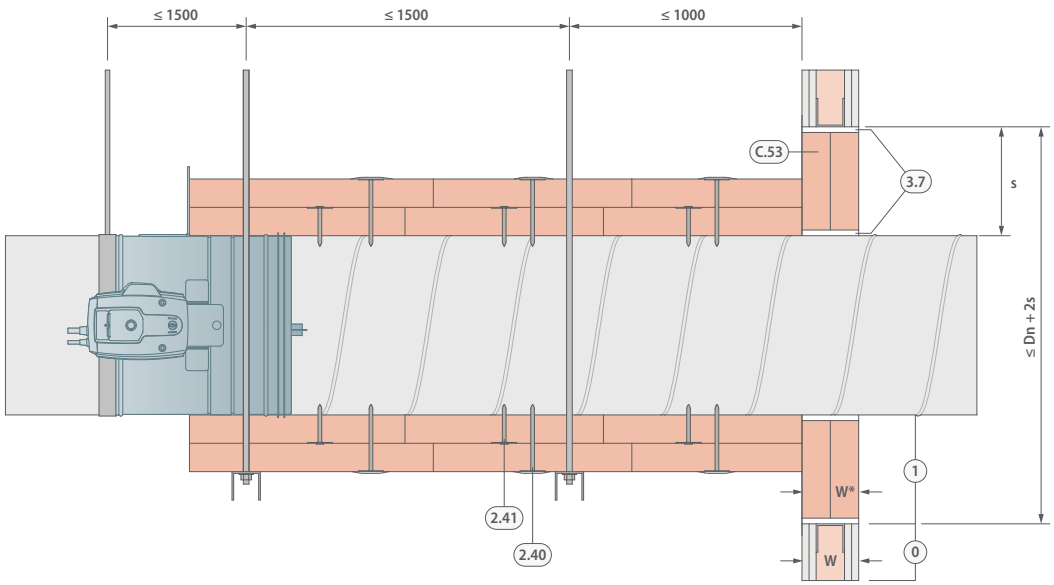
*see supplier's instructions

3.3.13 FLEXIBLE WALL REMOTE FROM THE WALL WITH FIRE BATT

■ **C.53 FIRE DAMPER REMOTE FROM THE WALL, INSTALLATION WITH FIRE BATTS 2 X 50 MM**

Ø 100-315 mm	A.2 Type F	w ≥ 100, w* = w	EI90 (v_e i ↔ o)S	II





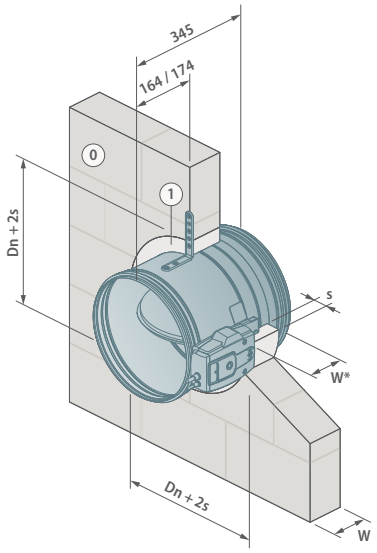
Minimal distance

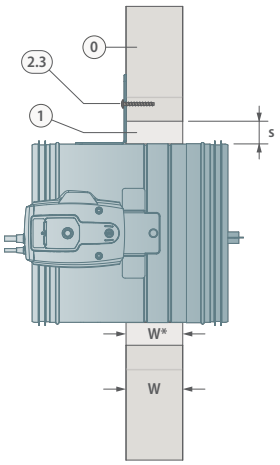
With this installation method, it is permitted to install the fire damper at a minimal distance from another fire damper or a (load-bearing) construction. Please contact Rf-t for more information regarding the installation guidelines for this specific configuration.

⓪	A.2	Flexible wall type F	
①	C.53	Remote 2 x 50 - fire batt (Promat or Hilti)	20 ≤ s ≤ 400; 2s ≤ 600
	1.1	Horizontal profile	
	1.2	Vertical profile	
	3.7	Coating of end faces and joints	
	2.20	U-profile 50x50x3mm	
	2.34	M10 threaded rod	
	2.35	M10 nut	
	2.36	M10 washer	
	2.40	Universal screw Ø5x120 + washer M6x44 (9/m^2) (coated)	
	2.41	Universal screw Ø5x90 + washer M6x44 (9/m^2) (coated)	
	2.50	Mounting bracket ØDn	
	5	Galvanised duct	

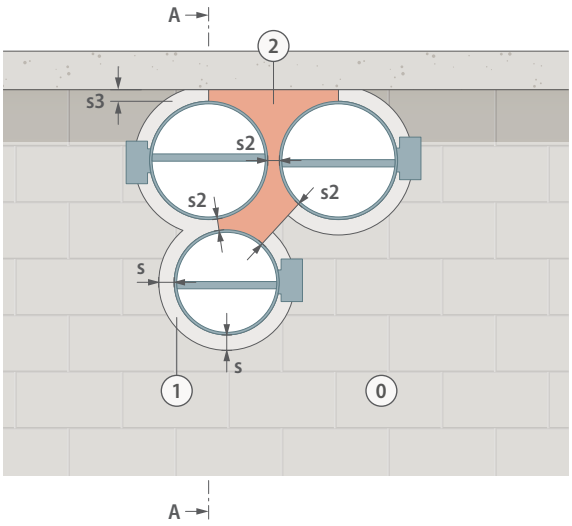
3.3.14 GYPSUM BLOCK WALL

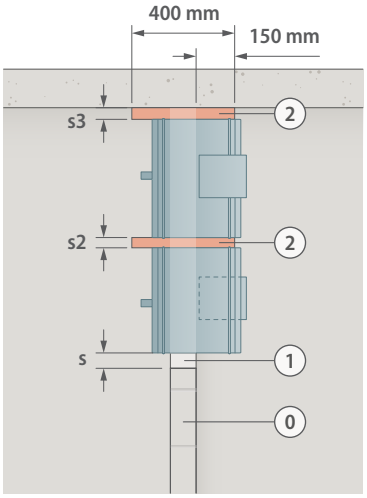
Ø 100-315 mm	w ≥ 70, w* ≥ 70	EI120 (v_e i ↔ o)S	I





Minimal distance

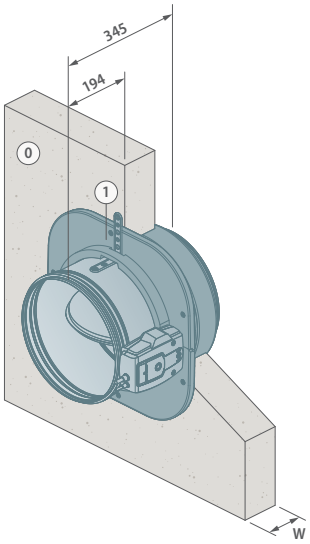


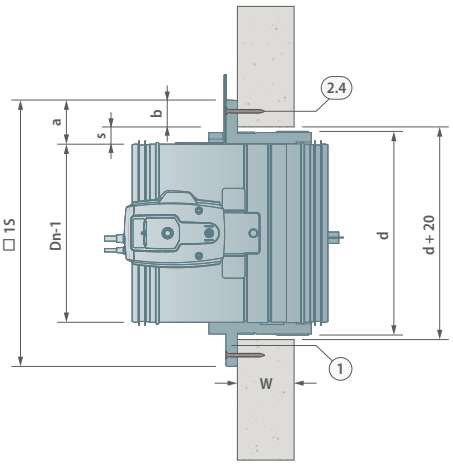


⓪	A.3	Gypsum block wall		
①	C.03	Block glue based on gypsum	20 ≤ s ≤ 40	
	2.3	Universal screw (optional)		
②	C.10	Stone wool 150 kg/m³	30 ≤ s2 < 200	30 ≤ s3 < 75 (to wall/ceiling)

3.3.15 RIGID WALL - SURFACE MOUNTING WITH CR120-1S

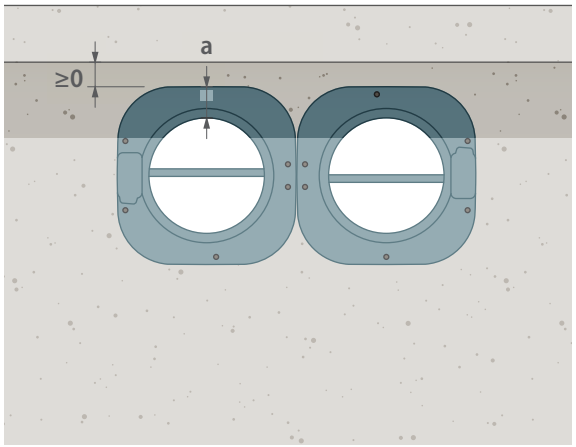
Ø 100-315 mm	w ≥ 100	EI120 (v_e i ↔ o)S	II





Dn	□ 1S	d	Ø	a
100	279	160	180	89,5
125	299	180	200	87
160	339	220	240	89,5
200	374	255	275	87
250	419	300	320	84,5
315	474	355	375	79,5

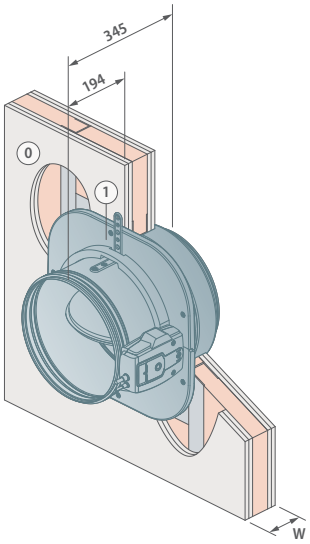
Minimal distance

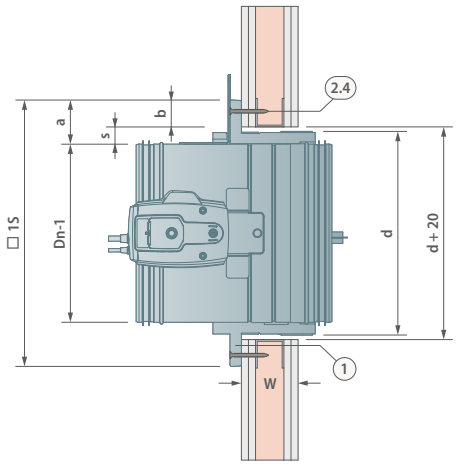


⓪	A.4	Rigid wall
①	C.21	1S mounting kit
	2.4	Universal screw Ø 5 x 70 mm (6x)

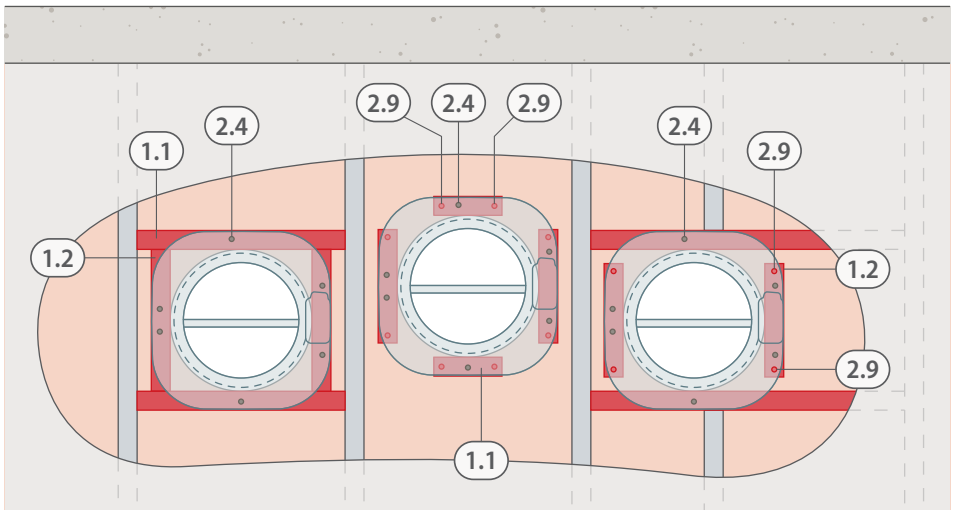
3.3.16 FLEXIBLE WALL - SURFACE MOUNTING WITH CR120-1S

Ø 100-315 mm	A.2 Type F	100 ≤ w ≤ 125	EI120 (v_e i ↔ o)S	II

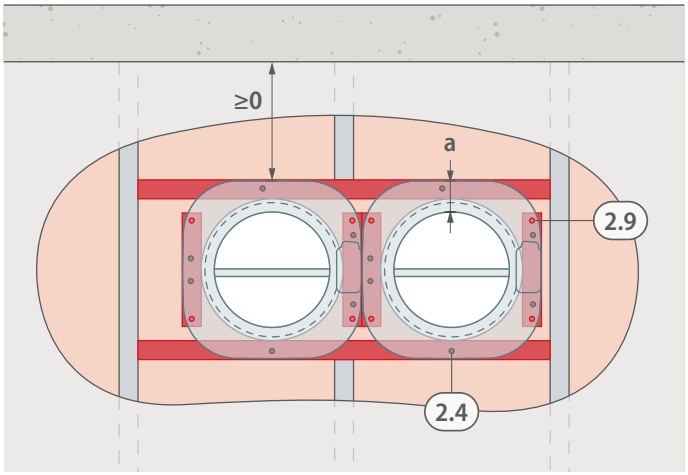


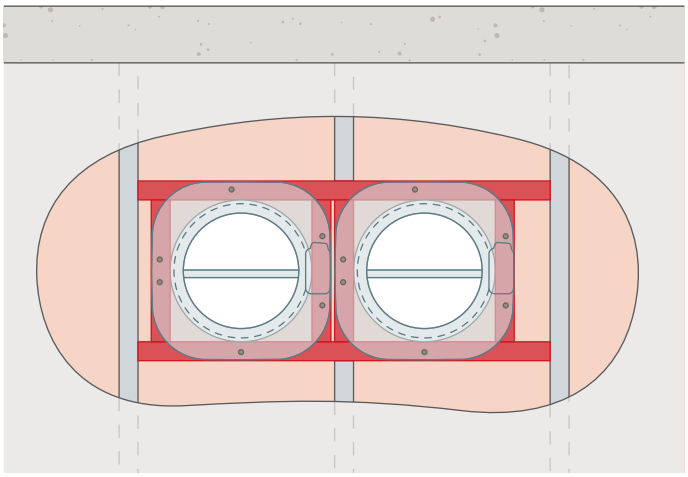


Dn	□ 1S	d	Ø	a
100	279	160	180	89,5
125	299	180	200	87
160	339	220	240	89,5
200	374	255	275	87
250	419	300	320	84,5
315	474	355	375	79,5



Minimal distance





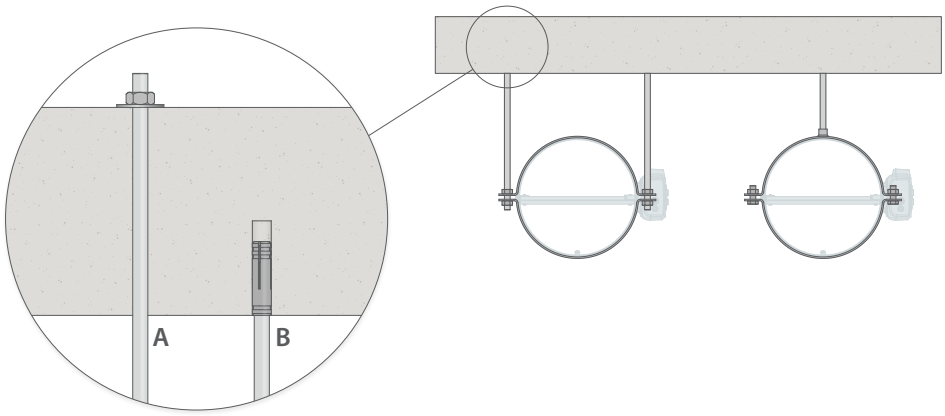
⓪	A.2	Flexible wall type F
①	C.21	1S mounting set
	1.1	Horizontal profile
	1.2	Vertical profile
	2.4	Universal screw Ø 5 x 70 mm (6x)
	2.9	Plasterboard screw Ø 3.5 x 35 mm

3.4 SUSPENSION OF THE FIRE DAMPER

3.4.1 SUSPENSION OF THE FIRE DAMPER IN A VERTICAL (LOAD-BEARING) CONSTRUCTION

Rf-Technologies' fire dampers are usually tested in a vertical (load-bearing) construction (wall) without suspension. An exception to this are fire dampers located outside the wall, installation in Paroc Sandwich panel system or with sliding ceiling connection, technical details of suspension in these situations are documented in the relevant installation sheet.

In some regions, when connecting a ventilation duct to the fire damper, it must be avoided that this duct exerts forces on the fire damper that prevent proper operation. In case of fire, under the influence of heat, duct dilation, or duct sag, or wall deflection may impact the installation of the fire damper in a flexible wall or when sealing with coated fire batts. According to local regulations or customs, it may be appropriate or mandatory to provide elastic or combustible duct connections between the fire damper and the ventilation duct, or to work with flexible ventilation ducts, thus avoiding possible forces on the fire damper. The fire damper is then supported independently of the ventilation duct. Ventilation ducts, suspension structures or fixings must be made according to the manufacturer's guidelines.

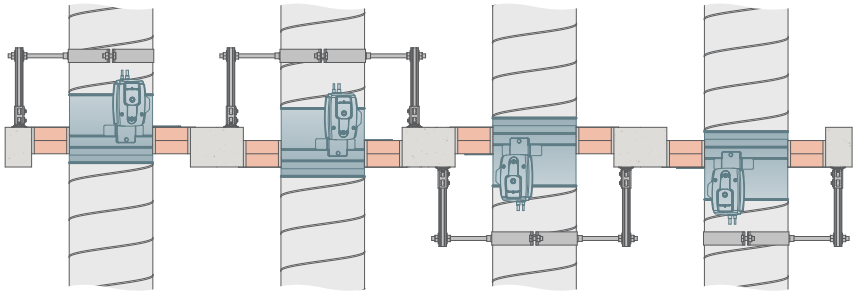


If it is opted to support the fire dampers, the dimensioned threaded rods of the suspensions can be fixed through the floor on the one hand (A). On the other hand, the threaded rods can be fixed in the ceiling with impact sleeves or screws (B) according to the manufacturer's specifications and taking into account fire protection requirements.

The support of fire dampers is possible with different materials (some examples image) applied according to the manufacturer's specifications.

3.4.2 SUSPENSION OF THE FIRE DAMPER IN A HORIZONTAL (LOAD-BEARING) CONSTRUCTION, SEALED WITH FIRE BATTS.

The ventilation ducts are supported according to the rules of good craftsmanship in accordance with the instructions provided by the manufacturers of the fastening materials.



3.5 VENTILATION DUCT CONNECTION

The flange of the fire damper is equiped with a sealing ring over which the ventilation duct is slid.

Flexible connections may be used, e.g. based on local or regional regulations or guidelines (e.g. M-LüAR, DW145). In accordance with the requirements, the designer and/or installer of the ventilation ducts determines how these flexible connections are realised and where they are applied. Both elastic connections and flexible ventilation ducts are possible to avoid possible forces on the installed fire damper. The ventilation ducts are then suspended independently of the fire damper. Take earthing into account and provide an equipotential connection where necessary.

Connected ventilation ducts must be installed according to the rules of good workmanship, in compliance with local regulations and with attention to an airtight finish. The ventilation duct suspension elements are made of steel and are dimensioned according to the values in the table below (source: EN 1366-1 §13.6.1 - Table 7). The table only takes into account the static load and not the stress of the installation.

	Maximum stress (N/mm2)	
Type of load	t < 60 min	60 min < t < 120 min
Tensile stress in all vertically oriented components	9	6
Shear stress in screws of property class 4.6 according to EN ISO 898-1	15	10

Fixing materials are used as described in the manufacturer's documentation. Different installation is possible subject to acceptance by an accredited test institute or an inspection body. Extension of suspensions in case of fire and stress levels can be calculated. Suspensions longer than 1.5m must be protected from fire in accordance with EXAP rules EN 15882-1 and in accordance with the instructions of the manufacturer of the relevant system.

3.6 COMBINED PENETRATIONS

Mixed penetrations are referred to when techniques evaluated according to different test standards pass through the same recess in the (load-bearing) construction and are sealed in the same way. Fire dampers are tested according to EN 1366-2 and are usually given an EIS classification. Fire dampers are subjected to high pressure differentials during fire tests, which include checking the damper's smoke resistance.

Techniques tested according to EN 1366-3 (including combustible ducts, non-combustible ducts and electrical cables) are usually assigned an EI classification. The scope of test standard EN 1366-3 explicitly excludes the testing of ventilation applications.

An EXAP standard (Extended application of results from fire resistance tests) has recently been released that covers this domain (EN 15882-5). One can expect tested solutions according to this standard to be added to the classifications in the near future.

Please consult Rf-Technologies for more information on this.

3.7 DISCLAIMER

RF-Technologies has prepared this document with the necessary care. However, it is the responsibility of the installer to comply with project-specific and regulatory requirements. RF-Technologies cannot be held responsible for design errors. RF-Technologies is not liable for errors in the use of the products and for the consequences thereof. RF-Technologies accepts no liability for administrative errors and reserves the right to change information without prior notice. This document does not create, specify, modify or replace any new or existing contractual obligations agreed in writing between RF-Technologies and the user.

3.8 OVERVIEW LEGEND

(LOAD-BEARING) CONSTRUCTIONS		
A.1	Flexible wall type A	Flexible walls type A are constructed with metal studs as specified in European standard EN 13501-2. The walls are constructed according to the manufacturer's guidelines or standards in force locally. The wall thickness is 98 mm minimum, with 2 x 12.5 mm double-sided gypsum plasterboard, namely gypsum (cardboard) boards type A according to EN520 (GKB according to DIN 18180). The internal cavity ≥ 48 mm is filled with stone wool ≥ 40 mm of 40 kg/m^3. According to EN1366-2, the insulation of the flexible wall may be omitted. Addition of additional layers use of thicker boards and wider metal studs is allowed. The horizontal metal profiles are at least 0.6mm thick galvanised steel and are fixed every ≤ 800 mm by Ø 6 mm steel screws and Ø 6mm anchors to the rigid (load-bearing) construction. The vertical metal profiles are at least 0.6mm thick galvanised steel and are placed centre to centre ≤ 625mm apart. A clearance of 5mm accommodates thermal expansion. The profiles conform to EN 14195. The profiles are attached to each other with Ø 3.5mm screws, with rivets or with metal stud fixing pliers. The cladding is fixed to the metal profiles with Ø 3.5 mm screws. The visible joints and the connection with the (load-bearing) construction are finished with covering tape and joint filler, as specified by the manufacturer. The screw heads are smeared. A reinforcement of metal horizontal and vertical profiles is provided around the damper, which is fixed to the metal framework of the wall construction (unless otherwise specified). These profiles are spaced 's' around the fire damper, which is the gap to be provided for sealing the fire damper. If the distance between fire damper and (load-bearing) construction on the one hand or between fire damper and a second fire damper on the other hand is less than 75 and 200 mm respectively as prescribed by the standard, it is not required to provide a profile at this location (see 'Placement at minimal distance'). The solutions in flexible wall constructions also apply to rigid walls. Flexible walls type A are usually applied in installation methods for a fire resistance of 60 minutes.
A.2	Flexible wall type F	Flexible walls type F are constructed using metal studs as specified in European standard EN 13501-2. The walls shall be constructed according to the manufacturer's guidelines or standards in force locally. The wall thickness is 98 mm minimum, with 2 x 12.5 mm double-sided gypsum plasterboard, namely gypsum (cardboard) boards type F according to EN520 (GKF according to DIN 18180). The internal cavity ≥ 48 mm is filled with stone wool ≥ 40 mm of 40 kg/m^3. According to EN1366-2, the insulation of the flexible wall may be omitted. Addition of additional layers use of thicker boards and wider metal studs are allowed. The horizontal metal profiles consist of at least 0.6 mm thick galvanised steel and are fixed every ≤ 800 mm by Ø 6 mm steel screws and 6 mm anchors to the rigid (load-bearing) construction. The vertical metal profiles are at least 0.6 mm thick galvanised steel and are placed centre-to-centre at maximum 625 mm apart. A clearance of 5 mm accommodates thermal expansion. The profiles conform to EN 14195. The profiles are attached to each other with Ø 3.5 mm screws, with pop rivets or with metal stud fixing pliers. The cladding is fixed to the metal profiles with screws Ø 3.5 mm. The visible joints and the connection with the supporting structure are finished with cover tape and joint filler, as specified by the manufacturer. The screw heads are smeared. A reinforcement of metal horizontal and vertical profiles is provided around the damper, which is fixed to the metal framework of the wall construction (unless otherwise specified). These profiles are spaced 's' around the fire damper, which is the gap to be provided for sealing the fire damper. If the distance between fire damper and (load-bearing) construction on the one hand or between fire damper and a second fire damper on the other hand is less than 75 and 200 mm respectively as prescribed by the standard, it is not required to provide a profile at this location (see 'Placement at minimal distance'). The solutions in flexible wall constructions also apply to rigid walls. Flexible walls type F are usually applied in installation methods for fire resistance of 90 or 120 minutes.
A.3	Gypsum block wall	A gypsum block wall is a non-load-bearing partition wall made of prefabricated gypsum tiles with a density ≥ 850 kg/m^3 (EN 12859). The tiles are lined up (half-brick bond) with block glue. The joint thickness is approximately 2 mm, larger gaps can be sealed with block glue according to the manufacturer's specifications.

A.4	Rigid wall	Rigid walls are walls made of cellular concrete, concrete or masonry with a minimum specific gravity of 650 ± 200 kg/m^3 (EN 1363-1) and can also be applied to rigid walls made of hollow blocks. Any hollow spaces around the fire damper should be filled. The solutions in flexible wall constructions are also applicable to rigid walls.
A.7	Rigid floor	Rigid floors are cellular concrete or concrete floors with a specific gravity of 650 ± 200 kg/m^3 (EN 1363-1). Any voids around the fire damper should be filled.
A.8	Rigid floor of reinforced concrete	Rigid floor of reinforced concrete with a specific mass of at least 2200 ± 200 kg/m^3.

DISTANCES		
w	Wall thickness	Minimum thickness of the (load-bearing) construction.
w	Sealing depth	Minimum sealing depth in the (load-bearing) construction.
s	General clearance	The width of the sealing recess 's' is determined by the tested distance during official fire tests. If the gap around the fire damper is larger than stated in the technical data sheet, the following options are available: reduce the gap in the wall with the same material as the wall; apply a different sealing system; seek alternative advice from a competent local authority (possibly in consultation with Rf-t). Always take into account the stability of the wall and the proper functioning of the fire damper.
s2	s2 min distance	Minimal distance between two fire dampers
s3	s3 min distance	Minimum distance between fire damper and (load-bearing) construction

SEALING SYSTEMS		
C.01	Mortar	Mortar according to EN 998-2: class M2.5 to M10 or fire-resistant mortar class M2.5 to M10. Mortar according to DIN 1053: groups II, IIa, III, IIIa or fire-resistant mortar groups II,III. Equivalent mortars, gypsum mortar or concrete
C.02	Gypsum	Gypsum mortar
C.03	Block glue	Gypsum based block glue
C.10	Stone wool 150 kg/m^3	Stone wool ≥ 150 kg/m^3 over a depth of 400 mm, of which 150 mm on the mechanism side of the wall. For wall thicknesses of > 250 mm, the stone wool slab must be installed over a depth of > 400 mm until the entire wall thickness is filled. Flat stone wool slabs can be used for rectangular fire dampers. For round fire dampers, 50 mm thick moulded pieces can be cut out to fit between the dampers (s2) and/or the wall construction (s3). By combining several layers of 50 mm, 150 mm (3 x 50 mm) sealing can be achieved on the mechanism side and 250 mm (5 x 50 mm) in the wall and on the non-mechanism side (depending on the thickness of the wall). The stone wool has a layer thickness of 50 mm, a density of 150kg/m^3, heat conduction of l = 0.041 W/mK at 50 °C, water vapour absorption 0.02 %, Euroclass A1)
C.21	1S mounting kit	1S - the round fire damper is fitted with a collar for circular surface-mount that is screwed onto the (load-bearing) construction and does not require any further sealing.
C.23	Cover plates	Type A or type F plasterboards (according to EN 520) as specified in the declaration of performance. The cover plates follow the contours of the fire damper and are provided with cut-outs around the mechanism where necessary. Cut-out between fire damper and cover plate ≤ 5 mm.
C.31	Fire batt 2 x 50 mm	Single-sided fire batt (3.6) 2 x 50 mm When sealing with fire batts, the saw cuts of the fire batts must not coincide: the fire batts must therefore be installed offset (min. 20 mm) to improve stability.
C.4	Sliding ceiling connection	Sliding ceiling connection (GDA)
C.53	Remote 2 x 50- fire batt	Fire damper at a distance from the wall, sealing with fire batt 2 x 50 mm (3.6)
C.56	remote 2 x 50 - mortar	Fire damper at a distance from the wall, sealing with fire batts 2 x 50 mm and mortar

ACCESSORIES	
1.1	Horizontal profile
1.2	Vertical profile
1.31	Plasterboard 12.5 mm type F
1.32	Plasterboard 12.5 mm type A
1.8	Stone wool 40 kg/m^3
2.1	Mounting screws Ø6 mm (anchored to the (load-bearing) construction)
2.2	Mounting screws Ø3.5 mm
2.3	Universal screw (optional)
2.4	Universal screw Ø 5 x 70 mm
2.5	Universal screw Ø 6 x 50 mm
2.20	U-profile 50x50x3mm
2.34	M10 threaded rod
2.35	M10 nut
2.36	M10 washer
2.40	Universal screw Ø5x120 + washer M6x44 (9/m^2) (coated)
2.41	Universal screw Ø5x90 + washer M6x44 (9/m^2) (coated)
2.50	Mounting bracket ØDn
2.7	Universal screw Ø 4.2x13mm
2.8	U-shaped spacer plate
2.9	Plasterboard screw Ø 3.5 x 35 mm
3.3	Joint filler
3.6	Single-sided fire batt ≥ 140kg/m^3 - the hard fire batts are coated on one side with a 1mm fire-resistant coating and is installed with a ≥ 20mm offset. The coated side is always installed as the visible side. **Stone wool board types:** Promastop-CB 50 (CC); Hilti CFS-CT W; Mulcol Multimastic FB1; SVT PYRO-SAFE® Flammotect-A (MFP) * Hilti: Flumroc (Flumroc 341), Isover (Fireprotect 150, Orsil Pyro, Orsil S, Orsil T, Protect BSP 150, Stropoterm), Knauf (Heralan BS-15, Heralan DDP-S, Heralan DP-15), Paroc (FPS 14, FPS 17, Pyrotech Slab 140, Pyrotech Slab 160), Rockwool (Hardrock II, RP-XV, RPB-15; * Promat: Rockwool (RP-XV, Hardrock 040/ Hardrock II, Rockwool 360, Taurox D-C, Taurox Duo NP, Rockwool Panel 755), Knauf (DP-15, FDB D150), Paroc OY AB (Pyrotech slab 140-180, Paroc Pro Roof Slab), Isover (Orsil T-N). * Mulcol: Isover (BSP). Sealing with Mulcol stone wool is certified for rigid and flexible walls. Not for minimal distances, fire dampers protruding from the wall or fire dampers sealed in a rigid floor. * SVT: Sealing with SVT rock wool batt is certified in rigid and flexible walls. Not for minimal distances, fire dampers protruding from the wall or fire dampers sealed in a rigid floor.
3.7	Coating on the connection with the damper in the wall thickness (w*) - without coating of the fire damper: Promastop-E/CC 6-10 mm; Hilti CFS-S ACR ≤1 mm; Mulcol Multimastic SP - with coating of the fire damper: Promatstop-E/CC 1-2 mm; Hilti CFS-S ACR < 1 mm.
3.9	Coating tunnel/duct; Promastop E/CC > 1 mm; Hilti CFS-CT >1 mm
5	Galvanised duct