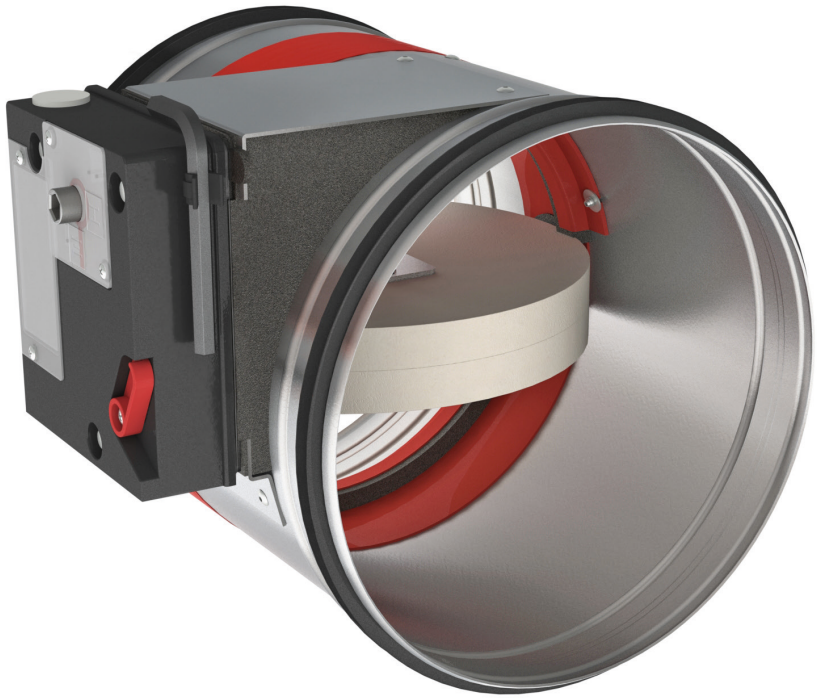
CR2

Circular fire damper for large diameters



Rf-t

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www.rft.be

C1-G 01/2017

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Explanation of the abbreviations and pictograms

Wn = nominal width
Hn = nominal height
Dn = nominal diameter
E = integrity
I = thermal insulation
S = smoke leakage
Pa = pascal
ve = vertical wall penetration
ho = horizontal floor penetration
o -> i = meets the criteria from the outside (o) to the inside (i)
i <-> o = fire side not important
V AC = Volt alternating current
V DC = Volt direct current
E.ALIM = power supply magnet
E.TELE = power supply motor
V = volt
W = watt
Auto = automatic
Tele = remote controlled
Pnom = nominal capacity
Pmax = maximum capacity
GKB (type A) / GKF (type F): "GKB" stands for standard plasterboards (type A according to EN 520) while "GKF" plasterboards offer a higher fire resistance for a similar plate thickness (type F according to EN 520)
Cal-Sil = calcium silicate
OP = option (delivered with the product)
KIT = kit (delivered separately for repair or upgrade)
PG = connection flange to the duct
Sn = free air passage
ζ [-] = pressure loss coefficient
Q = air flow
ΔP = static pressure drop
v = air speed in the duct
Lwa = A-weighted sound power level
Lw oct = sound power level per octave midband
dB(A)a = A-weighted decibel value
ΔL = correction factor

	large dimensions		air tightness in accordance with EN 1751: class B (class C in option)
	suitable for built-in installation		sealing with fire resistant stone wool boards allowed, also for asymmetric opening

DECLARATION OF PERFORMANCE

1. Unique identification code of the product-type:	**CR2**
2. Intended use/es:	Circular fire damper to be used in conjunction with partitions to maintain fire compartments in heating, ventilating and air conditioning installations.
3. Manufacturer:	Rf-Technologies NV, Lange Ambachtstraat 40, B-9860 Oosterzele
4. System/s of AVCP:	System 1
5. Harmonised standard / European Assessment Document; notified body / European Technical Assessment, Technical Assessment Body, notified body; certificate of constancy of performance:	EN 15650:2010, BCCA with identification number 0749; BC1-606-0464-15650.01-2517
6. Declared performance according to EN 15650:2010	(Fire resistance according to EN 1366-2 and classifications according to EN 13501-3)

Essential characteristics					Performance
Range	Wall type	Wall	Sealing	Installation	Classification
Ø 200-630 mm	Rigid wall	Aerated concrete ≥ 100mm	Mortar	1	EI 120 (v_e i ↔ o) S - (500 Pa)
			Stone wool + coating ≥ 150 kg/m³	1	EI 90 (v_e i ↔ o) S - (300 Pa)
	Rigid floor	Aerated concrete ≥ 150mm	Mortar	1	EI 120 (h_o i ↔ o) S - (500 Pa)
			Stone wool + coating ≥ 150 kg/m³	1	EI 120 (h_o i ↔ o) S - (300 Pa)
	Flexible wall	Metal studs gypsum plasterboard Type A (EN 520) ≥ 100mm	Stone wool ≥ 40 kg/m³ + cover plates	1	EI 60 (v_e i ↔ o) S - (500 Pa)
			Stone wool + coating ≥ 150 kg/m³	1	EI 60 (v_e i ↔ o) S - (300 Pa)
		Metal studs gypsum plasterboard Type F (EN 520) ≥ 100mm	Stone wool ≥ 40 kg/m³ + cover plates	1	EI 90 (v_e i ↔ o) S - (300 Pa)
			Stone wool + coating ≥ 150 kg/m³	1	EI 90 (v_e i ↔ o) S - (300 Pa)
		Gypsum blocks ≥ 70mm	Block glue	1	EI 120 (v_e i ↔ o) S - (500 Pa)

1 Type of installation: built-in, 0-360°

Harmonised standard EN 15650:2010

Nominal activation conditions/sensitivity:	Pass
Response delay (response time): closure time	Pass
Operational reliability: cycling	CFTH - 50 cycles; MANO - 300 cycles; B(L) F(T) - 10000 cycles; BFL(T) - 10000 cycles; BFN(T) - 10000 cycles; ONE - 10000 cycles; UNIQ - 300 cycles
Durability of response delay:	Pass
Durability of operational reliability:	Pass
Protection against corrosion according to EN 60068-2-52:	Pass
Damper casing leakage according to EN 1751:	≥ class B

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:
Barbara Willems, Technical Manager

Oosterzele, 01/2017

Product presentation CR2

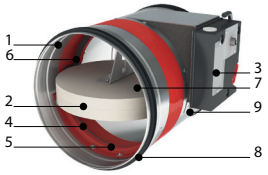
Product presentation CR2

Circular fire damper available in the largest dimensions (up to a diameter of 630 mm) with a fire resistance up to 120 minutes. Its refractory tunnel is made of galvanised steel and its blade consists of asbestos-free panels, which are resistant to humidity.

Fire dampers are installed where air ducts penetrate fire-resistant compartment walls. Their role is to restore the fire resistance grade of the penetrated wall and to prevent smoke propagation. Fire dampers are distinguished by their degree of fire resistance, by their aeraulic properties as well as by their installation ease. Rf-Technologies' fire dampers are all CE marked. They can be equipped with various types of mechanisms depending on the specific needs linked to the project or to the local regulations.

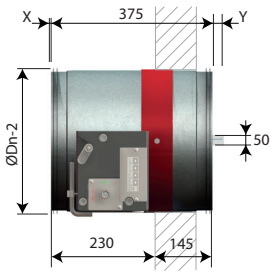
- ☑ large dimensions
- ■ suitable for built-in installation
- ■ suitable for rigid wall, rigid floor and light wall (metal stud gypsum plasterboard wall, gypsum blocks)
- ■ sealing with fire resistant stone wool boards allowed, also for asymmetric opening
- ■ air tightness in accordance with EN 1751: class B (class C in option)
- ■ tested according to EN 1366-2 up to 500 Pa
- ■ operating mechanism outside the wall
- ■ maintenance-free
- ■ for indoor use
- ■ operating temperature: max. 50°C

1. casing in galvanised steel
2. damper blade
3. operating mechanism
4. sealing cold smoke
5. blade bumper
6. intumescent strip
7. fusible link
8. rubber sealing ring
9. product identification



Range and dimensions CR2

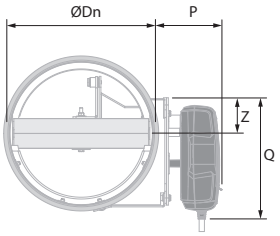
Exceeding blade: X = on the mechanism side, Y = on the wall side



ØDn [mm]	315	355	400	450	500	560	630
x	-	-	-	-	-	15	50
y	24	44	66	91	116	146	181

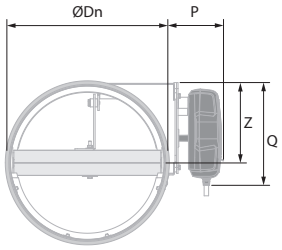
ØDn [mm]	200	250	315	355	400	450	500	560	630	

ØDn < 315 mm



	CFTH	ONE	BFL(T)	UNIQ
P	81	105	101	115
Q	182	199	110	298
Z	58	60	80	60

ØDn ≥ 315 mm

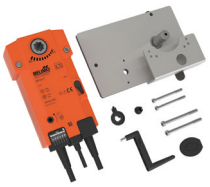
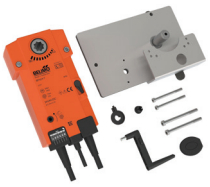
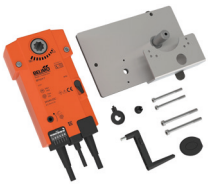
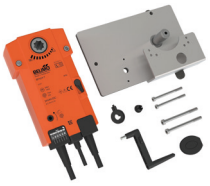
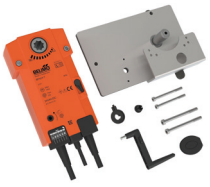
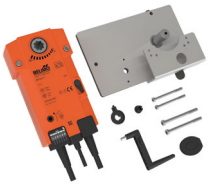


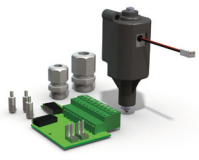
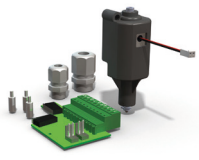
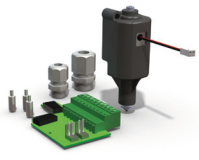
	CFTH	ONE	BFL(T)	BFN(T)	UNIQ
P	85	105	104	104	115
Q	182	199	110	110	298
Z	156	157	179	179	157

Evolution - kits

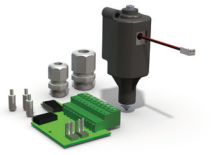
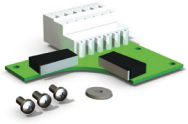
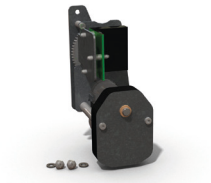
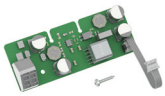
	KITS CFTH	Automatic unlocking mechanism CFTH with FCU and without FTH 72
	KITS MANO EVO	Upgradeable automatically unlocking mechanism
	KITS BFL24	Spring return actuator BFL 24V
	KITS BFL24-ST	Spring return actuator BFL 24V with plug (ST)
	KITS BFLT24	Spring return actuator BFL 24V with thermo-electric fuse (T)
	KITS BFLT24-ST	Spring return actuator BFL 24V with thermo-electric fuse (T) and plug (ST)

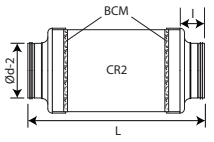
Evolution - kits

	KITS BFL230	Spring return actuator BFL 230V
	KITS BFLT230	Spring return actuator BFL 230V with thermo-electric fuse (T)
	KITS BFN24	Spring return actuator BFN 24V (BFN kits must be used instead of BFL kits for fire dampers produced before 1/7/2015)
	KITS BFN24	Spring return actuator BFN 24V
	KITS BFN24-ST	Spring return actuator BFN 24V with plug (ST)
	KITS BFNT24	Spring return actuator BFN 24V with thermo-electric fuse (T)
	KITS BFNT24-ST	Spring return actuator BFN 24V with thermo-electric fuse (T) and plug (ST)
	KITS BFN230	Spring return actuator BFN 230V
	KITS BFNT230	Spring return actuator BFN 230V with thermo-electric fuse (T)

	KITS BF24	Spring return actuator BF 24V (BF kits must be used instead of BFN kits for fire dampers produced before 1/7/2015)
	KITS ONE T 24 FDCU	Spring return actuator ONE 24V (with fusible link T) + unipolar beginning- and end-of-range switch
	KITS ONE T 24 FDCB	Spring return actuator ONE 24V (with fusible link T) + bipolar beginning- and end-of-range switch
	KITS ONE T 230 FDCU	Spring return actuator ONE 230V (with fusible link T) + unipolar beginning- and end-of-range switch
	KITS ONE T 230 FDCB	Spring return actuator ONE 230V (with fusible link T) + bipolar beginning- and end-of-range switch
	UNIQ VD/VM FDCU	Operating mechanism UNIQ (with fusible link) + unipolar beginning- and end-of-range switch
	UNIQ VD/VM FDCB	Operating mechanism UNIQ (with fusible link) + bipolar beginning- and end-of-range switch
	KITS VD24 MAN EVO FDCU	Natural magnet 24 V DC + FDCU
	KITS VD48 MAN EVO FDCU	Natural magnet 48 V DC + FDCU
	KITS VM24 MAN EVO FDCU	Electromagnet 24 V DC + FDCU

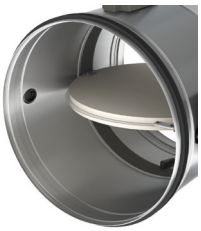
Evolution - kits

	KITS VM48 MAN EVO FDCU	Electromagnet 48 V DC + FDCU
	KITS FDC CFTH	1 Beginning or end of range switch FCU/DCU/FCB/DCB
	KITS FDCU MAN	Unipolar beginning and end of range switch
	KITS FDCB MAN	Bipolar beginning and end of range switch
	KITS SN2 BFL/BFN	Bipolar beginning and end of range switch
	KITS ME MANO EVO	Resetting motor ME 24V/48V (AC, DC)
	KITS ME UNIQ	Resetting motor ME 24V/48V (AC, DC)
	KITS FTH72	Fusible link FTH 72°C (for CFTH)
	KITS FT72 MANO EVO	Fusible link FTH 72°C
	KITS ZBAT 72	Black spare part for thermo-electric fuse for BFLT/BFNT

	**FUS72 ONE**	Fusible link 72°C
	**FUS72 UNIQ**	Fusible link 72°C
	**MECT**	Testbox for mechanisms (magnet, motor, beginning and end of range switches)
	**RCVF**	Circular reduction piece for connection to a duct with a diameter smaller than the diameter of the damper (delivered per piece).
	**EPP CR2**	Kit with 4 cover plates (gypsum plasterboard 12.5 mm) for CR2 in light wall.
	**INSPECAM**	Sturdy digital endoscope for the internal inspection of fire dampers through an optional inspection opening. The endoscope features a 1 meter long probe with a diameter of 8,2 mm equipped with a dimmable LED, a removable 4x zoom, a colour LCD monitor 3.5". Photographic capture 3MP and video capture 720P.

Dn RCVF	80	100	125	150	160	180	225
Dn CR2	200	200	200	200	200	200	250
L	665	545	525	500	495	595	625
l	145	85	75	60	60	110	125
#	1	1	1	1	1	1	1

Options - at the time of order

	**UL**	Inspection opening to visually determine the state and the position of the damper, by using an endoscope.
	**EN1751_C**	Air-tightness class C (note: for CU2 H>600 or W>800 / for CR2 Ø>315).

Storage and handling

Storage and handling

As this product is a safety element, it should be stored and handled with care.

Avoid:

- any kind of impact or damage
- contact with water
- deformation of the casing

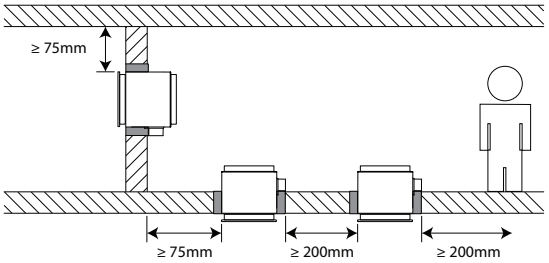
It is recommended:

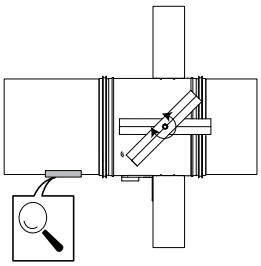
- to unload in a dry area
- not to flip or roll the product to move it
- not to use the damper as a scaffold, working table, etc.
- not to store smaller dampers inside larger ones

Installation

General points

- The installation must comply with the installation manual delivered with the product and the classification report.
- Axis orientation: see the declaration of performance.
- Avoid obstruction of adjoining ducts.
- Product installation: always with closed damper blade.
- Verify if the blade can move freely.
- Please observe safety distances with respect to other construction elements.
- The air tightness class will be maintained if the damper is installed according to the installation manual.
- Rf-t fire dampers are always tested in standardised constructions according to EN 1366-2. The achieved results are valid for similar supporting constructions with a fire resistance, thickness and density equal or superior to the supporting construction used during the test.
- The damper must remain accessible for inspection and maintenance.
- Schedule at least two running checks each year.

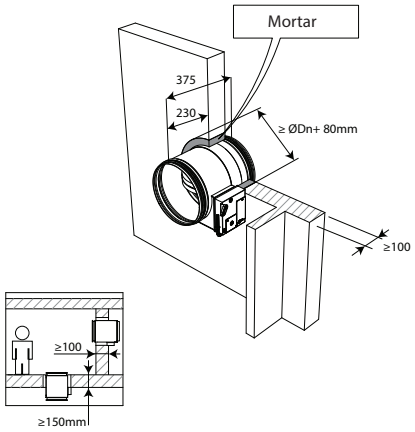


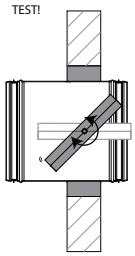


Installation in rigid wall and floor

The product was tested and approved in:

Range	Wall type		Sealing	Classification
Ø 200-630 mm	Rigid wall	Aerated concrete ≥ 100mm	Mortar	EI 120 (v_e i ↔ o) S - (500 Pa)
Ø 200-630 mm	Rigid floor	Aerated concrete ≥ 150mm	Mortar	EI 120 (h_o i ↔ o) S - (500 Pa)

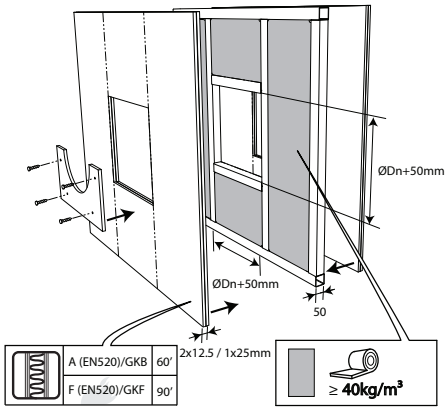


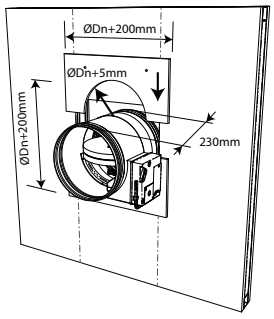


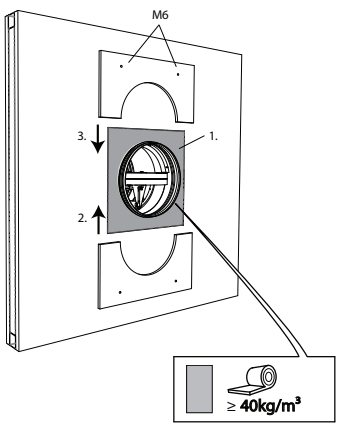
Installation in flexible wall (metal stud gypsum plasterboard wall)

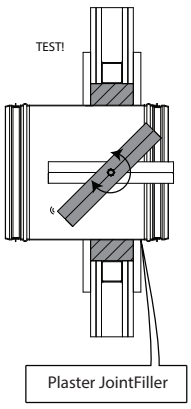
The product was tested and approved in:

Range	Wall type		Sealing	Classification
Ø 200-630 mm	Flexible wall	Metal studs gypsum plasterboard Type F (EN 520) ≥ 100mm	Stone wool ≥ 40 kg/m^3 + cover plates	EI 90 (v_e i ↔ o) S - (300 Pa)
Ø 200-630 mm	Flexible wall	Metal studs gypsum plasterboard Type A (EN 520) ≥ 100mm	Stone wool ≥ 40 kg/m^3 + cover plates	EI 60 (v_e i ↔ o) S - (500 Pa)





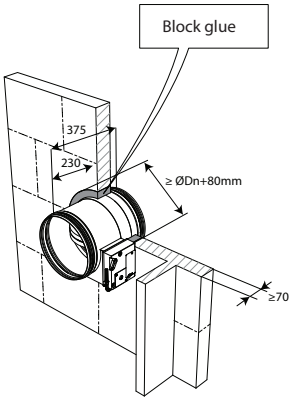


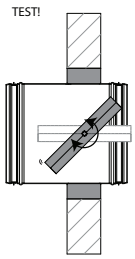


Installation in gypsum block wall

The product was tested and approved in:

Range	Wall type		Sealing	Classification
Ø 200-630 mm	Flexible wall	Gypsum blocks ≥ 70mm	Block glue	EI 120 (v_e i ↔ o) S - (500 Pa)

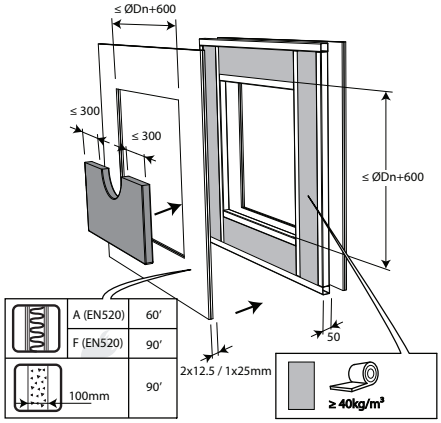


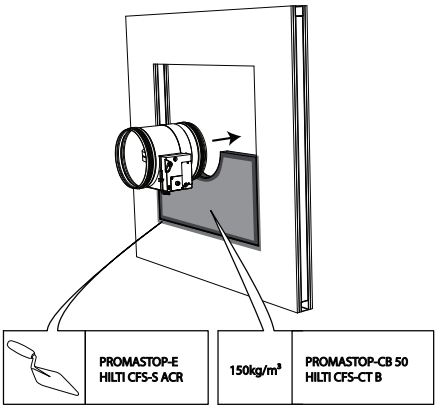


Installation in flexible and rigid wall, sealing with rigid rock wool boards with coating

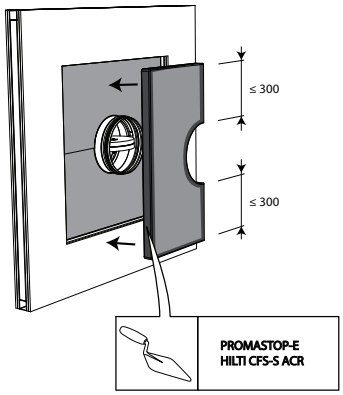
The product was tested and approved in:

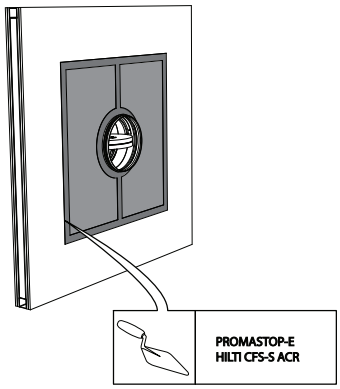
Range	Wall type		Sealing	Classification
Ø 200-630 mm	Rigid wall	Aerated concrete ≥ 100mm	Stone wool + coating ≥ 150 kg/m^3	EI 90 (v_e i ↔ o) S - (300 Pa)
Ø 200-630 mm	Flexible wall	Metal studs gypsum plasterboard Type A (EN 520) ≥ 100mm	Stone wool + coating ≥ 150 kg/m^3	EI 60 (v_e i ↔ o) S - (300 Pa)
Ø 200-630 mm	Flexible wall	Metal studs gypsum plasterboard Type F (EN 520) ≥ 100mm	Stone wool + coating ≥ 150 kg/m^3	EI 90 (v_e i ↔ o) S - (300 Pa)



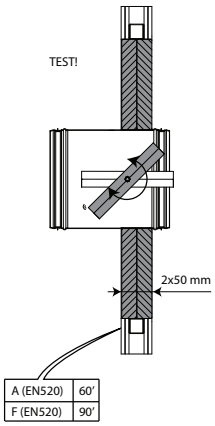


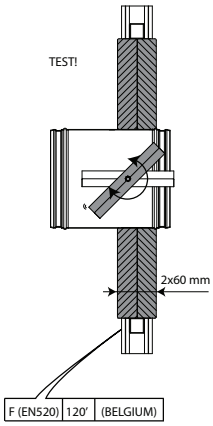
The opening around the damper is sealed with 2 layers of 50 mm-thick mineral wool panels with fire resistant coating on one side (type PROMASTOP-CB 50 or HILTI CFS-CT B).

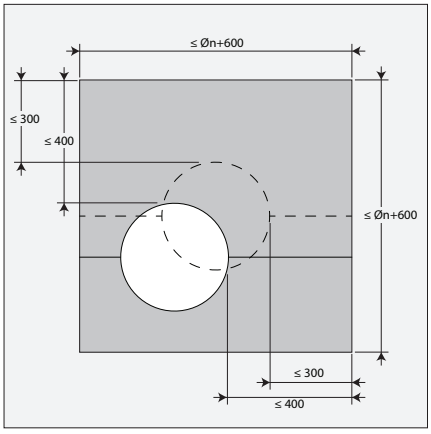




The joints on these 2 layers must be installed staggered and covered all around the edge with endothermic coating (type PROMASTOP-E or HILTI CFS-S-ACR).





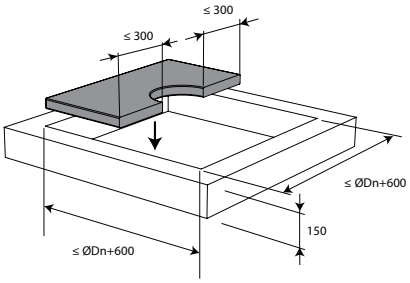


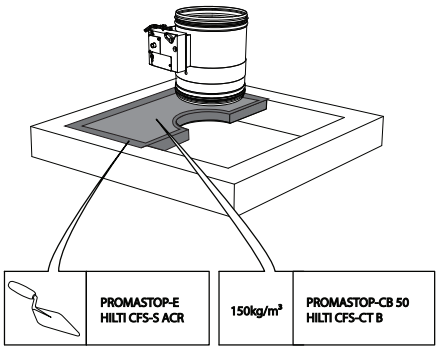
The damper does not need to be centered in the opening (with max dimensions fire damper + 600 mm). The maximal distance between the damper and the edge of the opening is 400 mm.

Installation in rigid floor, sealing with rigid rock wool boards with coating

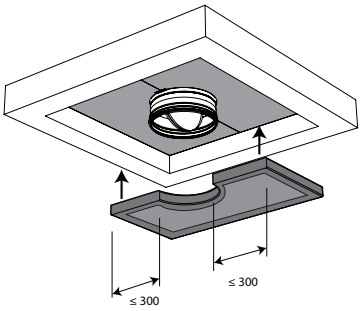
The product was tested and approved in:

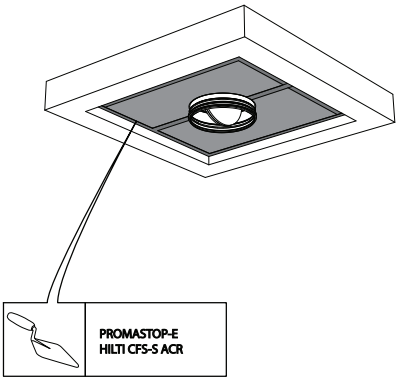
Range	Wall type		Sealing	Classification
Ø 200-630 mm	Rigid floor	Aerated concrete ≥ 150mm	Stone wool + coating ≥ 150 kg/m^3	EI 120 (h_o i ↔ o) S - (300 Pa)



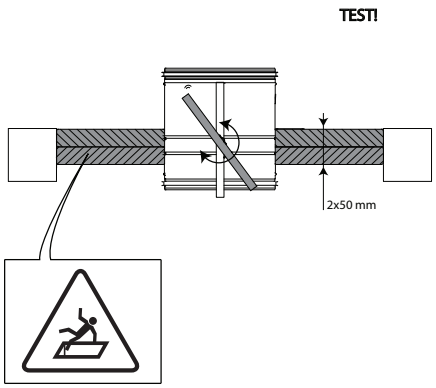


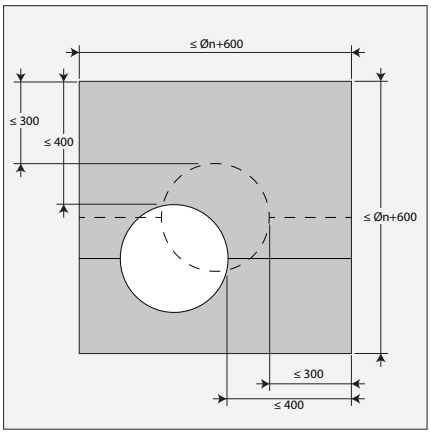
The opening around the damper is sealed with 2 layers of 50 mm-thick mineral wool panels with fire resistant coating on one side (type PROMASTOP-CB 50 or HILTI CFS-CT B).





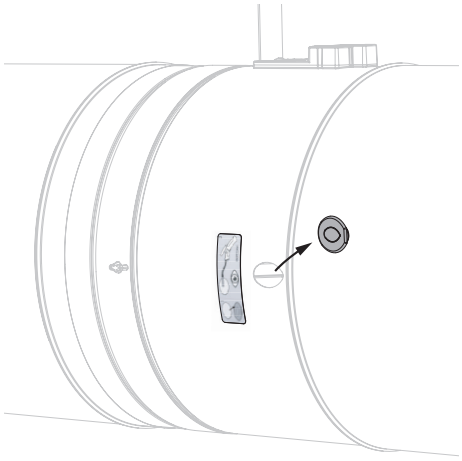
The joints on these 2 layers must be installed staggered and covered all around the edge with endothermic coating (type PROMASTOP-E or HILTI CFS-S-ACR).



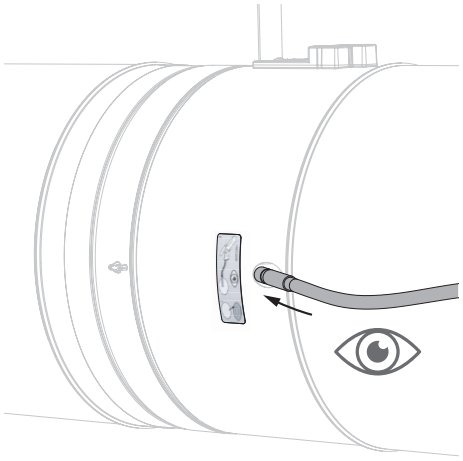


The damper does not need to be centered in the opening (with max dimensions fire damper + 600 mm). The maximal distance between the damper and the edge of the opening is 400 mm.

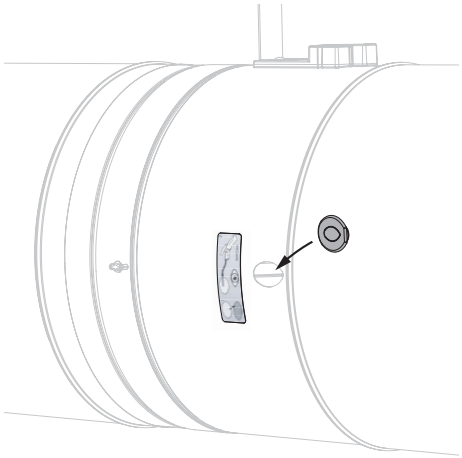
Inspection of the damper



Remove the air-tight plug from the damper.



Insert the camera of the endoscope (for example Inspecam Rf-t) through the opening and inspect the inside of the damper.



After inspection, replace the air-tight plug thoroughly on the damper opening. The position is crucial in order to maintain the air-tightness of the fire damper.

Maintenance

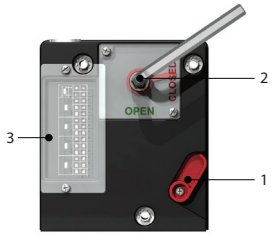
- No specific maintenance required.
- Schedule at least two running checks each year.
- Remove dust and all other particles before start-up.
- Follow the local maintenance regulations (i.e. BS9999 Annex V; NF S 61-933) and EN13306.
- Read the maintenance instructions on our website: http://www.rft.be/Upload/main/Brochures%20Marketing/NT-K136%20Maintenance%20C.pdf

Operation and mechanisms

CFTH Automatically unlocking mechanism

The unlocking mechanism CFTH automatically unlatches the damper blade when the temperature in the duct rises above 72°C. The damper can also be unlocked and reset manually.

1. unlocking button
2. resetting handle
3. cable entrance



Options - at the time of order

FCU	Unipolar end of range switch
DCU	Unipolar beginning of range switch (order with FCU)
FCB	Bipolar end of range switch
DCB	Bipolar beginning of range switch (order with FCB)

Unlocking

- **manual unlocking**: use the unlocking button (1).
- **automatic unlocking**: when the fusible link melts at 72° C.
- **remote unlocking**: n/a

Resetting

- **manual resetting**: use the enclosed Hex key and turn clockwise(2).
- **motorised resetting**: n/a

Caution:

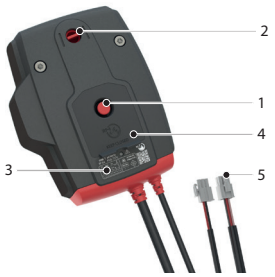
⚠ The mechanism may never be tested on its own, without being attached to the damper. Such a test might damage the mechanism or the operator might be injured.

Operation and mechanisms

ONE Spring return actuator for remote control

The spring-return actuator ONE is designed to easily operate Rf-t fire dampers of all sizes, automatically or remotely.Five models are available, 24 or 230 volt, with FDCU or FDCB position switches; and 24 volt with plug (ST).

1. unlocking button
2. blade position indicator
3. LED
4. battery compartment to reset motor
5. plug (ST)



Options - at the time of order

IXI-R1	Universal field controller (Modbus, BACnet or analog connection), pre-mounted on the damper.
IXI-R2	Universal field controller (Modbus, BACnet), pre-mounted on the damper and with a connection for a second damper.

Unlocking

- **manual unlocking**: shortly press the unlocking button (1) once.
- **automatic unlocking**: the fusible link reacts as soon as the temperature in the duct reaches 72°C.
- **remote unlocking**: by interrupting the power supply.

Resetting

- **manual resetting**: open the battery compartment (4) and press a 9V battery against the contact springs. Hold this position until the LED (3) emits a continuous light. Check whether the indicator (2) shows that the damper blade is in the open position. Remove the battery, the LED fades away. Close the battery compartment.
- **motorised resetting**: switch off the power supply for at least 5 sec. Power the actuator (respect the prescribed voltage) for at least 75 sec. The resetting stops automatically when the end of range is reached (damper open).

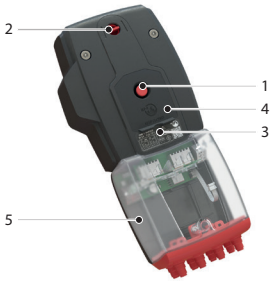
Caution:

- If the LED (3) flickers fast (3x/sec.), the battery is discharged: use a new battery.
- If the LED (3) flickers slowly (1x/sec.), the resetting is in progress.
- If the LED (3) is continuously on, the resetting is complete and the motor is powered.
- If the actuator detects voltage on the power cable, a brief contact of the battery is enough to start the resetting process.
- The power supply of this actuator cannot be individually replaced. If the cable is damaged, the whole unit must be discarded and replaced.
- The housing of the mechanism contains a temperature sensor. When the temperature in the housing exceeds 72°C, the mechanism unlocks. The LED flashes twice per second. When the temperature drops below 72°C, the mechanism can only be reset in a motorised manner after a manual reset (with a battery).
- The end of range switches need 1 second after operation to adopt a stable position.

UNIQ Upgradeable operating mechanism for remote control

Compliant with NF S 61-937, the UNIQ operating mechanism is designed to operate Rf-t fire dampers of all sizes, easily and remotely. Four models are available: with FDCU or FDCB position switches and with or without ME resetting motor. All models are dual-voltage 24/48V and with an electrical impulse triggering (VD) with a possibility to change to power interruption triggering (VM) by removing a jumper.

1. unlocking button
2. blade position indicator
3. LED
4. battery compartment to reset motor
5. connection compartement



Unlocking

- **manual unlocking**: shortly press the unlocking button (1) once.
- **automatic unlocking**: the fusible link reacts as soon as the temperature in the duct reaches 72°C.
- **remote unlocking**: by sending an electrical impulse (VD) or by interrupting the power supply (VM) to the magnet connection.

Resetting

- **manual resetting**: open the battery compartment (4) and press a 9V battery against the contact springs. Hold this position until the LED (3) stops flickering. Check whether the indicator (2) shows that the damper blade is open. Remove the battery and close the battery compartment.
- **motorised resetting**: switch off the power supply to the motor (ME) connection for at least 5 sec. Power the ME motor (respect the prescribed voltage) for at least 45 sec. The resetting stops automatically when the end of range is reached (damper open).

Caution:

- ⚠ If the LED (3) flickers fast (3x/sec.), the battery is discharged: use a new battery.
- ⚠ If the LED (3) flickers slowly (1x/sec.), the resetting is in progress.
- ⚠ After the reset, the LED reflects the status of the magnet: Magnet powered = LED lit; no power supply to magnet = LED off
- ⚠ The housing of the mechanism contains a temperature sensor. When the temperature in the housing exceeds 72°C, the mechanism unlocks. The LED flashes twice per second. When the temperature drops below 72°C, the mechanism can only be reset in a motorised manner after a manual reset (with a battery).

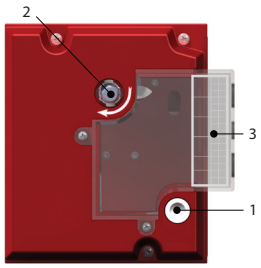
Caution:

- ⚠ Connect the mechanism according to the wiring diagram and NF S 61-932.
- ⚠ When connecting the cables, it is necessary to use the cable-ties, as shown in the drawing included in the bag containing the cable-ties.

MANO EVO Upgradeable automatically unlocking mechanism

The fusible link of the upgradeable unlocking mechanism MANO EVO automatically unlatches the damper blade when the temperature in the duct rises above 72°C. It is easy to upgrade the automatic MANO EVO mechanism into a remote controlled mechanism (remote electrical unlocking) or into a motorised mechanism (remote resetting).

1. unlocking button
2. resetting handle
3. cable entrance



Options - at the time of order

VD24	Natural magnet 24 VDC (order with FDCU)
VD48	Natural magnet 48 V DC (order with FDCU)
VM24	Electromagnet 24 V DC (order with FDCU)
VM48	Electromagnet 48 V DC (order with FDCU)
FDCU	Unipolar beginning and end of range switch
FDCB	Bipolar beginning and end of range switch (incl. FDCU)
ME	Resetting motor ME 24V/48V (AC, DC)

Unlocking

- **manual unlocking**: use the unlocking button (1).
- **automatic unlocking**: when the fusible link melts at 72° C.
- **remote unlocking**: (option VD/VM MAN EVO FDCU) by sending an electrical impulse (VD) or by interrupting the power supply (VM) to the magnet.

Resetting

- **manual resetting**: turn 90° clockwise with a Torcq key 13 mm (2).
- **motorised resetting**: (option ME MANO EVO) switch off the power supply for at least 10 sec. Power the actuator for at least 30 sec. (respect the prescribed voltage and polarity). The resetting stops automatically if a torque > 15 Nm is detected.

Caution:

- ⚠ Switch off the power supply after resetting.
- ⚠ Switch off the power supply for at least 15 sec. in between each resetting cycle.

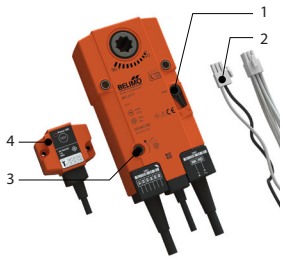
Caution:

- ⚠ The mechanism may never be tested on its own, without being attached to the damper. Such a test might damage the mechanism or the operator might be injured.

BFL(T) Remotely controlled spring return actuator

The spring return actuator BFL(T) is specially designed to remotely control fire dampers. The BFL(T) model is intended for fire dampers with smaller dimensions (ø ≤ 400 mm or W+H ≤ 1200 mm/1400 mm for CU-LT, CU-LT-1s).

1. locking button
2. plug (ST)
3. access for manual resetting
4. thermo-electric tripping device (T)



Options - at the time of order

SN2 BFL/BFN	Bipolar beginning and end of range switch
IXI-R1	Universal field controller (Modbus, BACnet or analog connection), pre-mounted on the damper.
IXI-R2	Universal field controller (Modbus, BACnet), pre-mounted on the damper and with a connection for a second damper.

Unlocking

- **manual unlocking**: place the locking button on "unlock". (In case of BFLT: the damper can alternatively be unlocked by pushing the "test" button on the thermo-electric fuse)
- **automatic unlocking**: the thermo-electric fuse reacts as soon as the temperature reaches 72°C (type BFLT).
- **remote unlocking**: by interrupting the power supply.

Caution:

⚠ The thermo-electric fuse will not move the damper into its safety position (when the temperature reaches 72°C) if the motor is not powered.

Resetting

- **manual resetting**: turn the enclosed handle anti-clockwise. To block the motor, place the locking button on "lock"
- **motorised resetting**: switch off the power supply for at least 10 seconds. Supply the actuator (respect the prescribed voltage) for at least 75 seconds. The resetting stops automatically when the end of range is reached (damper open) - it takes about 60 seconds to reset the damper - or when the power supply is interrupted.

Caution:

⚠ Do not use a drill or screwing machine.
⚠ Stop as soon as the motor is completely rearmed (end of range).

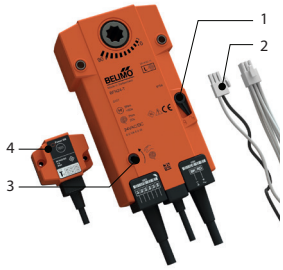
	prod. < 1/7/2015				prod. ≥ 1/7/2015			
	CR60(1s) CR120	CU-LT CU-LT-1s	CR2≤400 CU2≤1200	CR2>400 CU2>1200	CR60(1s) CR120	CU-LT CU-LT-1s	CR2≤400 CU2≤1200	CR2>400 CU2>1200
Kit BFL					●	●	●	
Kit BFN	●	●	●					●
Kit BF				●				

Operation and mechanisms

BFN(T) Remotely controlled spring return actuator

The spring return actuator BFN(T) is specially designed to remotely control fire dampers. The BFN(T) model is intended for fire dampers with large dimensions (ø > 400 mm (CR2) or W+H > 1200 mm (CU2, CA2, CU2_15, CU4)) or for dampers CU-LT(-1s), CR60, CR120 with a production date before 1 July 2015.

1. locking button
2. plug (ST)
3. access for manual resetting
4. thermo-electric tripping device (T)



Options - at the time of order

SN2 BFL/BFN	Bipolar beginning and end of range switch
IXI-R1	Universal field controller (Modbus, BACnet or analog connection), pre-mounted on the damper.
IXI-R2	Universal field controller (Modbus, BACnet), pre-mounted on the damper and with a connection for a second damper.

Unlocking

- **manual unlocking**: place the locking button on “unlock”. (In case of BFNT: the damper can alternatively be unlocked by pushing the “test” button on the thermo-electric fuse)
- **automatic unlocking**: the thermo-electric fuse reacts as soon as the temperature reaches 72°C (type BFNT).
- **remote unlocking**: by interrupting the power supply.

Caution:

⚠ The thermo-electric fuse will not move the damper into its safety position (when the temperature reaches 72°C) if the motor is not powered.

Resetting

- **manual resetting**: turn the enclosed handle anti-clockwise. To block the motor, place the locking button on “lock”
- **motorised resetting**: switch off the power supply for at least 10 seconds. Supply the actuator (respect the prescribed voltage) for at least 75 seconds. The resetting stops automatically when the end of range is reached (damper open) - it takes about 60 seconds to reset the damper - or when the power supply is interrupted.

Caution:

⚠ Do not use a drill or screwing machine.
⚠ Stop as soon as the motor is completely rearmed (end of range).

Caution:

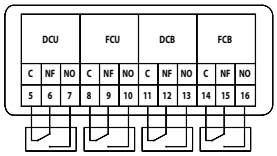
⚠ The mechanism may never be tested on its own, without being attached to the damper. Such a test might damage the mechanism or the operator might be injured.

	prod. < 1/7/2015				prod. ≥ 1/7/2015			
	CR60(1s) CR120	CU-LT CU-LT-1s	CR2≤400 CU2≤1200	CR2>400 CU2>1200	CR60(1s) CR120	CU-LT CU-LT-1s	CR2≤400 CU2≤1200	CR2>400 CU2>1200
Kit BFL					●	●	●	
Kit BFN	●	●	●					●
Kit BF				●				

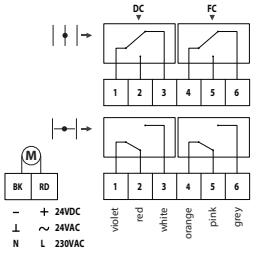
Electrical connection

Electrical connection

CFTH

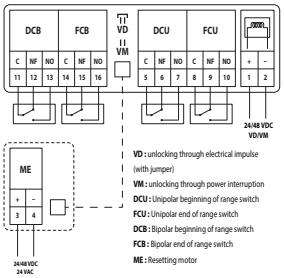


ONE



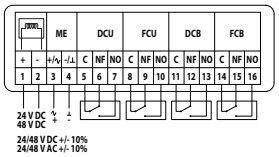
DC : Switch open position fire damper
FC : Switch closed position fire damper

UNIQ

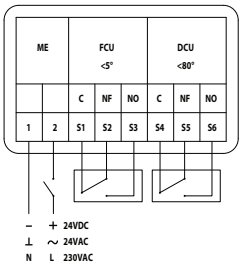


VD : unlocking through electrical impulse (with jumper)
VM : unlocking through power interruption
DCU : Unipolar beginning of range switch
FCU : Unipolar end of range switch
DCB : Bipolar beginning of range switch
FCB : Bipolar end of range switch
ME : Resetting motor

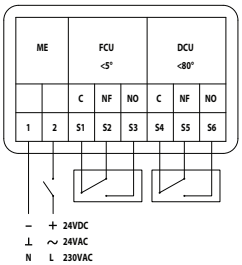
MANO EVO



BFL(T)



BFN(T)



Electrical connection

MEC	Nominal voltage motor	Nominal voltage magnet	Power consumption (stand-by)	Power consumption (operating)	standard switches	
CFTH	N/A	N/A	N/A	N/A	1mA...6A, DC 5V...AC 250V	
ONE T 24 FDCU	24 V AC/DC (-10/+20%)	N/A	0,12W	4,2W	10mA...100mA 60V	
ONE T 24 FDCB	24 V AC/DC (-10/+20%)	N/A	0,12W	4,2W	10mA...100mA 60V	
ONE T 230 FDCU	230 V AC (-15/+15%)	N/A	0,12W	4,2W	10mA...100mA 60V	
ONE T 230 FDCB	230 V AC (-15/+15%)	N/A	0,12W	4,2W	10mA...100mA 60V	
ONE T 24 FDCU ST	24 V AC/DC (-10/+20%)	N/A	0,12W	4,2W	10mA...100mA 60V	
UNIQ VD/VM FDCU	N/A	24/48 V DC (-15/+20%) (automatic conversion)	VD: 0W ; VM: 0,12W	VD: 3,5W ; VM: 0W	10mA...100mA 60V	
UNIQ VD/VM FDCB	N/A	24/48 V DC (-15/+20%) (automatic conversion)	VD: 0W ; VM: 0,12W	VD: 3,5W ; VM: 0W	10mA...100mA 60V	
UNIQ VD/VM FDCU ME	24 V AC/DC 48 V DC (-15/+20%) (automatic conversion)	24/48 V DC (-15/+20%) (automatic conversion)	VD: 0W ; VM: 0,12W ; ME: 0W	VD: 3,5W ; VM: 0W ; ME: 4,2W	10mA...100mA 60V	
UNIQ VD/VM FDCB ME	24 V AC/DC 48 V DC (-15/+20%) (automatic conversion)	24/48 V DC (-15/+20%) (automatic conversion)	VD: 0W ; VM: 0,12W ; ME: 0W	VD: 3,5W ; VM: 0W ; ME: 4,2W	10mA...100mA 60V	
MANO EVO	24 V DC / 24 V AC / 48 V DC / 48 V AC	24/48 V DC	VM: 1,5W / VD: - / ME: -	VD: 3,5W / ME: Pmax 20W (24V)/40W (48V)	1mA...1A, DC 5V...AC 48V	
BFL24	24 V AC/DC	N/A	0,7W	2,5W	1mA...3A, AC 250V	
BFL24-ST	24 V AC/DC	N/A	0,7W	2,5W	1mA...3A, AC 250V	
BFLT24	24 V AC/DC	N/A	0,8W	2,5W	1mA...3A, AC 250V	
BFLT24-ST	24 V AC/DC	N/A	0,8W	2,5W	1mA...3A, AC 250V	
BFL230	230 V AC	N/A	1,1W	3,5W	1mA...3A, AC 250V	
BFLT230	230 V AC	N/A	1,4W	4W	1mA...3A, AC 250V	
BFN24	24 V AC/DC	N/A	1W	4W	1mA...3A, AC 250V	
BFN24-ST	24 V AC/DC	N/A	1W	4W	1mA...3A, AC 250V	
BFNT24	24 V AC/DC	N/A	1,1W	4W	1mA...3A, AC 250V	
BFNT24-ST	24 V AC/DC	N/A	1,1W	4W	1mA...3A, AC 250V	
BFN230	230 V AC	N/A	1,5W	5W	1mA...3A, AC 250V	
BFNT230	230 V AC	N/A	1,8W	5,5W	1mA...3A, AC 250V	

	resetting time motor	running time spring	noise level motor	noise level spring	cable supply / control	cable auxiliary switch	Protection class
	N/A	1 s	N/A	N/A			IP 42
	< 75 s (cabled) / <85 s (battery)	< 30 s	< 58 dB (A)	< 60 dB (A)	1 m, 2 x 0.75 mm²	1 m, 6 x 0.75 mm²	IP 54
	< 75 s (cabled) / <85 s (battery)	< 30 s	< 58 dB (A)	< 60 dB (A)	1 m, 2 x 0.75 mm²	(2x) 1 m, 6 x 0,75 mm²	IP 54
	< 75 s (cabled) / <85 s (battery)	< 30 s	< 58 dB (A)	< 60 dB (A)	1 m, 2 x 0.75 mm²	1 m, 6 x 0.75 mm²	IP 54
	< 75 s (cabled) / <85 s (battery)	< 30 s	< 58 dB (A)	< 60 dB (A)	1 m, 2 x 0.75 mm²	(2x) 1 m, 6 x 0,75 mm²	IP 54
	< 75 s (cabled) / <85 s (battery)	< 30 s	< 58 dB (A)	< 60 dB (A)	1 m, 2 x 0.75 mm²	1 m, 6 x 0.75 mm²	IP 54
	N/A	< 30 s	N/A	< 60 dB (A)	Cables not supplied, with connection compartment. Connector Push-in 2 x 2 x (0,2 - 1,5 mm²).	Cables not supplied, with connection compartment. Connector: 6 x (0,08 - 1,5 mm²) lever operated.	IP 42
	N/A	< 30 s	N/A	< 60 dB (A)	Cables not supplied, with connection compartment. Connector Push-in 2 x 2 x (0,2 - 1,5 mm²).	Cables not supplied, with connection compartment. Connector: (2x) 6 x (0,08 - 1,5 mm²) lever operated.	IP 42
	< 45 s (cabled) / <85 s (battery)	< 30 s	< 58 dB (A)	< 60 dB (A)	Cables not supplied, with connection compartment. Connector Push-in 2 x 2 x (0,2 - 1,5 mm²).	Cables not supplied, with connection compartment. Connector: 6 x (0,08 - 1,5 mm²) lever operated.	IP 42
	< 45 s (cabled) / <85 s (battery)	< 30 s	< 58 dB (A)	< 60 dB (A)	Cables not supplied, with connection compartment. Connector Push-in 2 x 2 x (0,2 - 1,5 mm²).	Cables not supplied, with connection compartment. Connector: (2x) 6 x (0,08 - 1,5 mm²) lever operated.	IP 42
	< 30 s	1 s	≤ 50 dB (A)	N/A			IP 42
	< 60 s	20 s	< 43 dB (A)	< 62 dB (A)	1 m, 2 x 0.34 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)	IP 54
	< 60 s	20 s	< 43 dB (A)	< 62 dB (A)	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)	IP 54
	< 60 s	20 s	< 43 dB (A)	< 62 dB (A)	1 m, 2 x 0.34 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)	IP 54
	< 60 s	20 s	< 43 dB (A)	< 62 dB (A)	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)	IP 54
	< 60 s	20 s	< 43 dB (A)	< 62 dB (A)	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)	IP 54
	< 60 s	20 s	< 43 dB (A)	< 62 dB (A)	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)	IP 54
	< 60 s	20 s	≤ 55 dB (A)	ca. 70 dB (A)	1 m, 2 x 0.34 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)	IP 54
	< 60 s	20 s	≤ 55 dB (A)	ca. 70 dB (A)	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)	IP 54
	< 60 s	20 s	≤ 55 dB (A)	ca. 70 dB (A)	1 m, 2 x 0.34 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)	IP 54
	< 60 s	20 s	≤ 55 dB (A)	ca. 70 dB (A)	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)	IP 54
	< 60 s	20 s	≤ 55 dB (A)	ca. 70 dB (A)	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)	IP 54
	< 60 s	20 s	≤ 55 dB (A)	ca. 70 dB (A)	1 m, 2 x 0.75 mm² (halogen-free)	1 m, 6 x 0.75 mm² (halogen-free)	IP 54

Weights

Weights

CR2 + CFTH

ØDn [mm]	200	250	315	355	400	450	500	560	630	
kg	6,9	8,0	11,0	13,0	16,0	18,0	21,0	24,0	28,0	

CR2 + ONE T

ØDn [mm]	200	250	315	355	400	450	500	560	630	
kg	7,7	8,8	11,8	13,8	16,8	18,8	21,8	24,8	28,8	

CR2 + UNIQ

ØDn [mm]	200	250	315	355	400	450	500	560	630	
kg	7,8	8,9	11,9	13,9	16,9	18,9	21,9	24,9	28,9	

CR2 + MANO EVO

ØDn [mm]	200	250	315	355	400	450	500	560	630	
kg	6,9	8,0	11,0	13,0	16,0	18,0	21,0	24,0	28,0	

CR2 + BFL

ØDn [mm]	200	250	315	355	400	450	500	560	630	
kg	7,0	8,1	11,1	13,1	16,1	-	-	-	-	

CR2 + BFLT

ØDn [mm]	200	250	315	355	400	450	500	560	630	
kg	7,1	8,2	11,2	13,2	16,2	-	-	-	-	

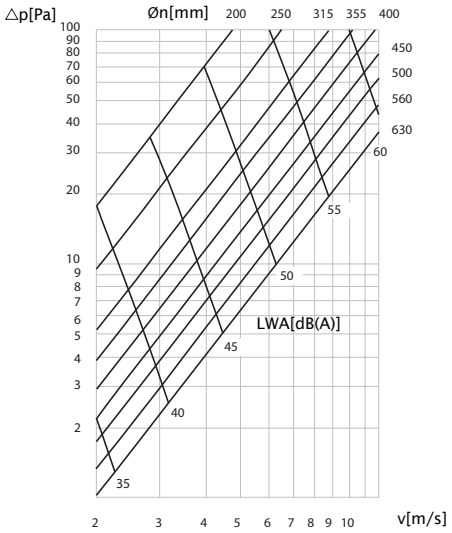
CR2 + BFN

ØDn [mm]	200	250	315	355	400	450	500	560	630	
kg	-	-	-	-	-	18,4	21,4	24,4	28,4	

CR2 + BFNT

ØDn [mm]	200	250	315	355	400	450	500	560	630	
kg	-	-	-	-	-	18,5	21,5	24,5	28,5	

Selection graphs



$$\Delta p\ [Pa] = \zeta * v^2 * 0{,}6$$

ØDn [mm]	200	250	315	355	400	450	500	560	630	
ζ [-]	7,42	3,96	2,17	1,62	1,21	0,92	0,72	0,56	0,43	

Example

Data
Dn= 315mm, v= 4m/s

Requested
Δp= ca. 21 Pa (Cfr. selection graph)
LWA= ca. 47 dB(A)

Calculation
$\Delta p = 2.17 * (4m/s)^2 * 0.6 = 20.83Pa$

Correction factor ΔL

Selection data

CR2 - A-weighted sound power level in the duct

ØDn [mm]	200	250	315	355	400	450	500	560	630		
Sn [m^2]	0,0129	0,0253	0,0472	0,0640	0,0859	0,1139	0,1459	0,1895	0,2474		
Sn [%]	41,54	51,89	60,94	64,99	68,67	71,94	74,60	77,19	79,62		
Q [m^3/h]	318,71	553,27	967,77	1.288,09	1.710,71	2.261,11	2.897,55	3.781,33	4.982,51		**45 dB**
Δp [Pa]	35,37	23,27	15,51	12,68	10,41	8,60	7,28	6,09	5,39		
Q [m^3/h]	226,89	393,88	688,96	916,99	1.217,86	1.609,69	2.062,78	2.691,94	3.547,07		**40 dB**
Δp [Pa]	17,92	11,80	7,86	6,43	5,28	4,36	3,69	3,09	2,73		
Q [m^3/h]	161,52	280,40	490,47	652,81	867,00	1.145,95	1.468,50	1.916,40	2.525,17		**35 dB**
Δp [Pa]	9,08	5,98	3,98	3,26	2,67	2,21	1,87	1,56	1,39		
Q [m^3/h]	114,99	199,62	349,17	464,74	617,22	815,80	1.045,43	1.364,30	1.797,68		**30 dB**
Δp [Pa]	4,60	3,03	2,02	1,65	1,36	1,12	0,95	0,79	0,70		
Q [m^3/h]	81,86	142,11	248,57	330,85	439,40	580,77	744,24	971,25	1.279,78		**25 dB**
Δp [Pa]	2,33	1,54	1,02	0,84	0,69	0,57	0,48	0,40	0,36		

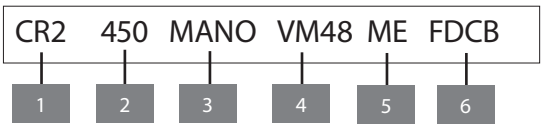
Every air flow lower than the above mentioned maximum value, will meet the listed A-weighted sound power level for the respective dimension.

Correction factor ΔL

To obtain the sound power level for the octave midband: LW oct = ΔL + Lwa

[Hz]	63	125	250	500	1000	2000	4000	8000
2 - 4 m/s	22	6	3	-14	-22	-25	-23	-17
6 - 8 m/s	19	9	1	-5	-10	-13	-20	-16
10 - 12 m/s	13	5	0	-4	-7	-10	-20	-19

Sample order



1. product
2. diameter
3. mechanism type
4. option: type magnet and voltage
5. option: resetting motor
6. option: uni/bipolar switches

Approvals and certificates

All our dampers are submitted to a number of tests by official test institutes. Reports of these tests form the basis for the approvals of our dampers.

CE	BC1-606-0464-15650.01-2517
NF Clapets coupe-feu et Volets de désenfumage D.A.S. Organisme Certificateur AFNOR Certification - www.marque-nf.com	05.14
SP Certifiering	SC0647-15
VKF AEAI	26814
SYSTEM CERTIFICATION ISO 9001:2008 SGS	9001: 2008

The NF-label guarantees: conformity with the standard NF S 61-937 Parts 1 and 5: “Systèmes de Sécurité Incendie Dispositifs Actionnés de Sécurité”; conformity with the national decree of March 22, 2004, changed on 14 March 2011 for the classification of fire resistance; the values of the characteristics mentioned in this document. Organisme Certificateur: AFNOR Certification, 11 Rue Francis de Pressensé, F93571 La Plaine Saint-Denis Cedex; Website: http://www.afnor.org http://www.marque-nf.com; Phone: +33 (0)1.41.62.80.00, Fax: +33 (0)1.49.17.90.00, Email: certification@afnor.org