

CU4

Rectangular fire damper 240'



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Explanation of the abbreviations and pictograms

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

	fire resistance 240 minutes		suitable for built-in installation
	intermediate dimensions on request		

DECLARATION OF PERFORMANCE

CE DoP Rf-t C6 EN ■ B-02/2015

1. Unique identification code of the product-type:	Rectangular fire damper			
2. Identification of the construction product:	CU4			
3. Intended use(s) of the construction product:	Rectangular fire damper to be used in conjunction with partitions to maintain fire compartments in heating, ventilating and air conditioning installations.			
4. Name and contact address of the manufacturer:	Rf-Technologies NV, Lange Ambachtstraat 40, B-9860 Oosterzele			
5. System of assessment and verification of constancy of performance of the construction product:	System 1			
6. In case of the declaration of performance concerning a construction product covered by a harmonised standard:	Notified factory production control certification body BCCA with identification number 0749 performed the determination of the product type on the basis of type testing (including sampling), the initial inspection of the manufacturing plant and of factory production control and continuous surveillance, assessment and evaluation of factory production control under system 1 and issued the certificate of constancy of performance BCT-606-0464-15650.04-0464			
7. Declared performance according to EN 15650:2010	(Fire resistance according to EN 1366-2 and classifications according to EN 13501-3)			
Essential characteristics	Wall type	Wall	Sealing	Installation
Range	200x200 mm ≤ CU4 ≤ 1200x800 mm	Rigid wall	Aerated concrete ≥ 150mm	Fire resistant plaster
1	Type of installation: built-in 0/180°			
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			
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:	Pass			
8. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 7. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.	Signed for and on behalf of the manufacturer by: Barbara Willems, Technical Manager			



Product presentation CU4

Product presentation CU4

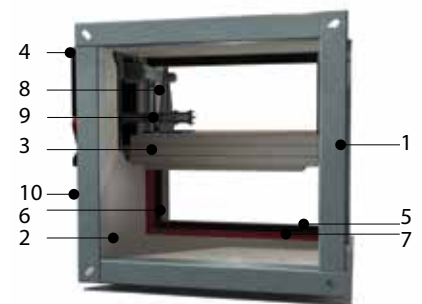
Rectangular fire damper with a 240 minutes fire resistance in concrete walls. Its refractory casing is made of asbestos free panels, which are resistant to humidity.

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.

- ✓ fire resistance 240 minutes
- suitable for built-in installation
- 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
- intermediate dimensions on request
- suitable for installation in rigid wall



1. connection flange PG30
2. casing made of refractory material
3. damper blade
4. operating mechanism
5. sealing cold smoke
6. blade bumper
7. intumescent strip
8. transmission with locking (open/closed)
9. fusible link
10. product identification



Range and dimensions CU4

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

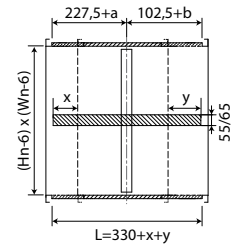
Hn (mm)	300	350	400	450	500	550	600	650	700	750	800
x	-	-	-	-	-	-	25	50	75	100	125
y	1	26	51	51	101	126	151	176	201	226	251

(Wn-6)x(Hn-6)	≥	≤
(W x H) mm	200x200	1200x800

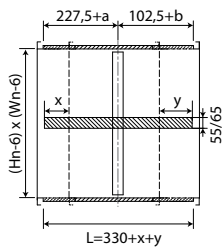
Variant CU4L

Damper with a tunnel casing extension at one or both sides so that the damper blade does not exceed the tunnel. This version allows to connect a grill or a bend directly on the damper flange or to use a circular connection.

- extension: $a = H_n/2 - 230$ mm (on the side of the mechanism);
 $b = H_n/2 - 100$ mm (on the wall side)

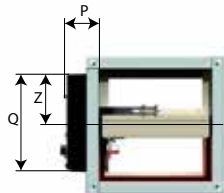


Range and dimensions CU4L

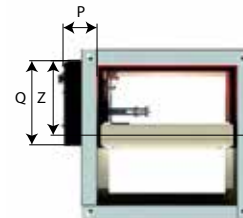


	≥	≤
(W x H) mm	200x200	1200x800

$H_n < 300$ mm



$H_n \geq 300$ mm



	CFTH	MANO	BFL(T)		CFTH	MANO	BFL(T)	BFN(T)
P	65	115	95	P	65	115	95	100
Q	180	190	80	Q	180	190	80	100
Z	60	85	65	Z	155	180	160	170

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)
	KITS BFL230	Spring return actuator BFL 230V
	KITS BFL230	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 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


KITS VM48 MAN EVO FDCU

Electromagnet 48 V DC + FDCU

Options - at the time of order

	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 FTH72	Fusible link FTH 72°C
	KITS FT72 MANO EVO	Fusible link FTH 72°C
	KITS ZBAT 72	Black spare part for thermo-electric fuse for BFLT/BFNT
	MECT	Testbox for mechanisms (magnet, motor, beginning and end of range switches)

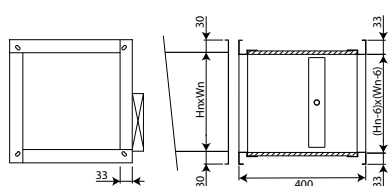
Options - at the time of order



EN1751_C

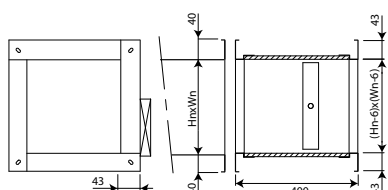
Air-tightness class C

Flange types - at the time of order



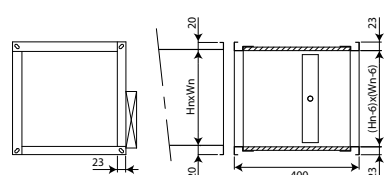
PG30

Connection to ducts with 30 mm flanges (either by sliding profile, or with bolts, or with clamps). Elliptical holes $\varnothing 8,5 \times 16$ mm.



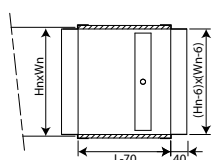
PG40

Connection to ducts with 40mm flanges. Elliptical holes $\varnothing 8,5 \times 16$ mm.



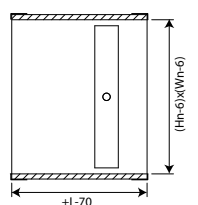
PG20

Connection to ducts with 20 mm flanges. Elliptical holes $\varnothing 6,5 \times 16$ m.



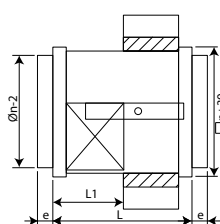
PM

Connection to ducts by insertion. This type of frame is used in case of lack of space for a standard PG30 frame.



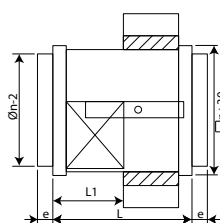
PP

No connection. This type of frame is used on one side of a damper that ends into a room.



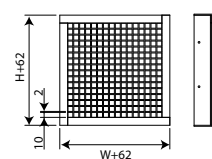
PR

Circular connection on a rectangular damper.



PRI

Circular connection with rubber sealing ring.



PPT

Grill. Very well suited as protection grill on the end piece of a duct system.

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:

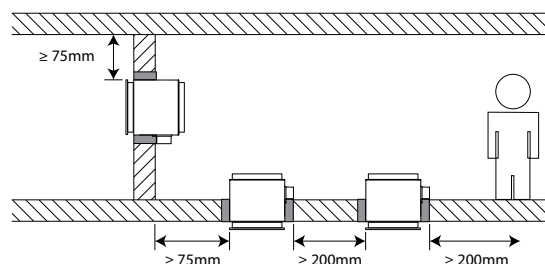
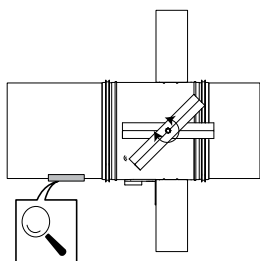
- to unload in a dry area
- not to flip or roll the product to move it
- not to use the damper as a scaffold, working table, etc.
- not to store smaller dampers inside larger ones

Installation

General points

- The installation must comply with the classification report and the installation manual delivered with the product.
- 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 standardized 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.

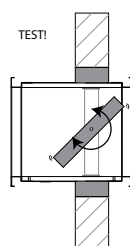
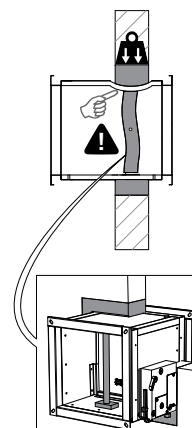
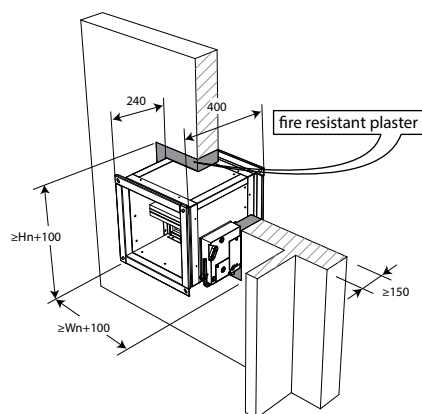
	TEST	
2015	☒	☒
2016	☒	☒
2017	☒	☐
2018	☐	☐
2019	☐	☐



Installation in rigid wall

The product was tested and approved in:

Range	Wall type	Sealing	Classification
$200 \times 200 \text{ mm} \leq \text{CU4} \leq 1200 \times 800 \text{ mm}$	Rigid wall	Aerated concrete $\geq 150 \text{ mm}$ Fire resistant plaster	El 240 (v_e i $\leftrightarrow$ o) S - (500 Pa)



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.

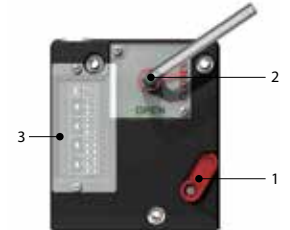
Operation and mechanisms



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:

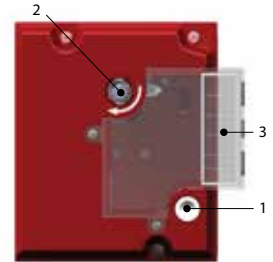
- ⚠ The mechanism may never be tested on its own, without being attached to the damper. Such a test might damage the mechanism or the operator might be injured.



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:

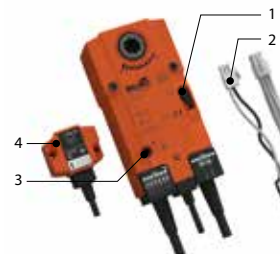
- ⚠ The mechanism may never be tested on its own, without being attached to the damper. Such a test might damage the mechanism or the operator might be injured.



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 ($\varnothing \leq 400$ mm or $W+H \leq 1200$ 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).

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				●				



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 ($\varnothing > 400$ 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/BN	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).

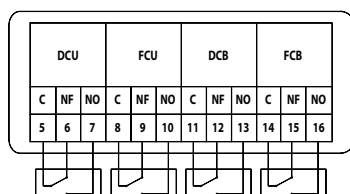
Caution:

- ⚠ 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.

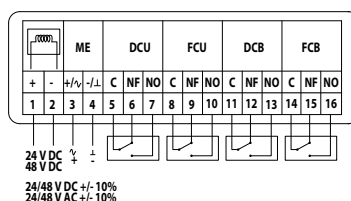
	prod. < 1/7/2015				prod. ≥ 1/7/2015			
	CR60(1s) CR120	CU-LT CU-LT-1s	CR2≤400 CU2≤1200	CR2>400 CU2>1200	CR60(1s) CR120	CU-LT CU-LT-1s	CR2≤400 CU2≤1200	CR2>400 CU2>1200
Kit BFL					●	●	●	
Kit BFN	●	●	●					●
Kit BF				●				

Electrical connection

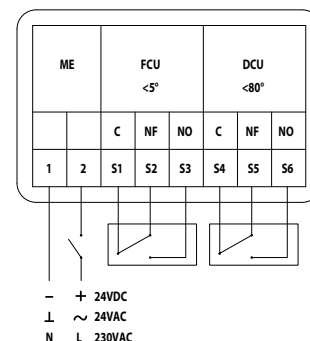
CFTH



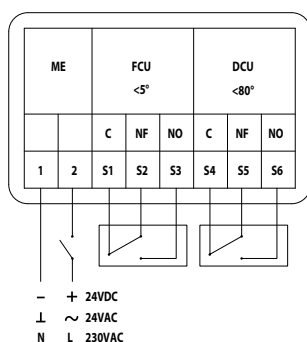
MANO EVO



BFL(T)



BFN(T)



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	
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 / 24 V DC	N/A	0,7W	2,5W	1mA...3A, AC 250V	
BFL24-ST	24 V AC / 24 V DC	N/A	0,7W	2,5W	1mA...3A, AC 250V	
BFLT24	24 V AC / 24 V DC	N/A	0,8W	2,5W	1mA...3A, AC 250V	
BFLT24-ST	24 V AC / 24 V 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 / 24 V DC	N/A	1W	4W	1mA...3A, AC 250V	
BFN24-ST	24 V AC / 24 V DC	N/A	1W	4W	1mA...3A, AC 250V	
BFNT24	24 V AC / 24 V DC	N/A	1,1W	4W	1mA...3A, AC 250V	
BFNT24-ST	24 V AC / 24 V 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	

	running time motor	running time spring	noise level motor	noise level spring	connection supply / control	Connection auxiliary switch	Protection class
	N/A	1 s	N/A	N/A			IP 42
	< 30 s	1 s	≤ 50 dB (A)	N/A			IP 42
	< 60 s	20 s	≤ 45 dB (A)	ca. 63 dB (A)	1 m, 2 x 0.34 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
	< 60 s	20 s	≤ 45 dB (A)	ca. 63 dB (A)	1 m, 2 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
	< 60 s	20 s	≤ 45 dB (A)	ca. 63 dB (A)	1 m, 2 x 0.34 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
	< 60 s	20 s	≤ 45 dB (A)	ca. 63 dB (A)	1 m, 2 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
	< 60 s	20 s	≤ 45 dB (A)	ca. 63 dB (A)	1 m, 2 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
	< 60 s	20 s	≤ 45 dB (A)	ca. 63 dB (A)	1 m, 2 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
	< 60 s	20 s	≤ 55 dB (A)	ca. 70 dB (A)	1 m, 2 x 0.34 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
	< 60 s	20 s	≤ 55 dB (A)	ca. 70 dB (A)	1 m, 2 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
	< 60 s	20 s	≤ 55 dB (A)	ca. 70 dB (A)	1 m, 2 x 0.34 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
	< 60 s	20 s	≤ 55 dB (A)	ca. 70 dB (A)	1 m, 2 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
	< 60 s	20 s	≤ 55 dB (A)	ca. 70 dB (A)	1 m, 2 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
	< 60 s	20 s	≤ 55 dB (A)	ca. 70 dB (A)	1 m, 2 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54
	< 60 s	20 s	≤ 55 dB (A)	ca. 70 dB (A)	1 m, 2 x 0.75 mm ² (halogen-free)	1 m, 6 x 0.75 mm ² (halogen-free)	IP 54

CU4 + CFTH

Hn\Wn [mm]		200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	1000	1050	1100	1150	1200
200	kg	11,1	12,3	13,5	14,8	16,0	17,2	18,4	19,7	20,9	22,1	23,3	24,5	25,8	27,0	28,2	30,7	31,9	33,1	34,3	35,5
250	kg	12,3	13,7	15,0	16,3	17,7	19,0	20,4	21,7	23,1	24,4	25,7	27,1	28,4	29,8	31,1	33,8	35,1	36,5	37,8	39,2
300	kg	13,5	15,0	16,5	17,9	19,4	20,9	22,3	23,8	25,2	26,7	28,2	29,6	31,1	32,5	34,0	36,9	38,4	39,9	41,3	42,8
350	kg	14,8	16,3	17,9	19,5	21,1	22,7	24,3	25,8	27,4	29,0	30,6	32,2	33,7	35,3	36,9	40,1	41,7	43,2	44,8	46,4
400	kg	16,0	17,7	19,4	21,1	22,8	24,5	26,2	27,9	29,6	31,3	33,0	34,7	36,4	38,1	39,8	43,2	44,9	46,6	48,3	50,0
450	kg	17,2	19,0	20,9	22,7	24,5	26,3	28,1	30,0	31,8	33,6	35,4	37,2	39,1	40,9	42,7	46,3	48,2	50,0	51,8	53,6
500	kg	18,4	20,4	22,3	24,3	26,2	28,1	30,1	32,0	34,0	35,9	37,8	39,8	41,7	43,7	45,6	49,5	51,4	53,4	55,3	57,2
550	kg	19,7	21,7	23,8	25,8	27,9	30,0	32,0	34,1	36,1	38,2	40,3	42,3	44,4	46,4	48,5	52,6	54,7	56,7	58,8	60,9
600	kg	20,9	23,1	25,2	27,4	29,6	31,8	34,0	36,1	38,3	40,5	42,7	44,9	47,0	49,2	51,4	55,8	57,9	60,1	62,3	64,5
650	kg	22,1	24,4	26,7	29,0	31,3	33,6	35,9	38,2	40,5	42,8	45,1	47,4	49,7	52,0	54,3	58,9	61,2	63,5	65,8	68,1
700	kg	23,3	25,7	28,2	30,6	33,0	35,4	37,8	40,3	42,7	45,1	47,5	49,9	52,3	54,8	57,2	62,0	64,4	66,9	69,3	71,7
750	kg	24,5	27,1	29,6	32,2	34,7	37,2	39,8	42,3	44,9	47,4	49,9	52,5	55,0	57,5	60,1	65,2	67,7	70,2	72,8	75,3
800	kg	25,8	28,4	31,1	33,7	36,4	39,1	41,7	44,4	47,0	49,7	52,3	55,0	57,7	60,3	63,0	68,3	71,0	73,6	76,3	78,9

CU4 + MANO EVO

H\Wn [mm]		200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
200	kg	11,1	12,3	13,5	14,8	16,0	17,2	18,4	19,7	20,9	22,1	23,3	24,5	25,8	27,0	28,2	29,4	30,7	31,9	33,1	34,3	35,5
250	kg	12,3	13,7	15,0	16,3	17,7	19,0	20,4	21,7	23,1	24,4	25,7	27,1	28,4	29,8	31,1	32,5	33,8	35,1	36,5	37,8	39,2
300	kg	13,5	15,0	16,5	17,9	19,4	20,9	22,3	23,8	25,2	26,7	28,2	29,6	31,1	32,5	34,0	35,5	36,9	38,4	39,9	41,3	42,8
350	kg	14,8	16,3	17,9	19,5	21,1	22,7	24,3	25,8	27,4	29,0	30,6	32,2	33,7	35,3	36,9	38,5	40,1	41,7	43,2	44,8	46,4
400	kg	16,0	17,7	19,4	21,1	22,8	24,5	26,2	27,9	29,6	31,3	33,0	34,7	36,4	38,1	39,8	41,5	43,2	44,9	46,6	48,3	50,0
450	kg	17,2	19,0	20,9	22,7	24,5	26,3	28,1	30,0	31,8	33,6	35,4	37,2	39,1	40,9	42,7	44,5	46,3	48,2	50,0	51,8	53,6
500	kg	18,4	20,4	22,3	24,3	26,2	28,1	30,1	32,0	34,0	35,9	37,8	39,8	41,7	43,7	45,6	47,5	49,5	51,4	53,4	55,3	57,2
550	kg	19,7	21,7	23,8	25,8	27,9	30,0	32,0	34,1	36,1	38,2	40,3	42,3	44,4	46,4	48,5	50,6	52,6	54,7	56,7	58,8	60,9
600	kg	20,9	23,1	25,2	27,4	29,6	31,8	34,0	36,1	38,3	40,5	42,7	44,9	47,0	49,2	51,4	53,6	55,8	57,9	60,1	62,3	64,5
650	kg	22,1	24,4	26,7	29,0	31,3	33,6	35,9	38,2	40,5	42,8	45,1	47,4	49,7	52,0	54,3	56,6	58,9	61,2	63,5	65,8	68,1
700	kg	23,3	25,7	28,2	30,6	33,0	35,4	37,8	40,3	42,7	45,1	47,5	49,9	52,3	54,8	57,2	59,6	62,0	64,4	66,9	69,3	71,7
750	kg	24,5	27,1	29,6	32,2	34,7	37,2	39,8	42,3	44,9	47,4	49,9	52,5	55,0	57,5	60,1	62,6	65,2	67,7	70,2	72,8	75,3
800	kg	25,8	28,4	31,1	33,7	36,4	39,1	41,7	44,4	47,0	49,7	52,3	55,0	57,7	60,3	63,0	65,6	68,3	71,0	73,6	76,3	78,9

CU4 + BFL

[illegible]

CU4 + BFN

Hn\Wn [mm]		200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
200	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32,2	33,5	34,7	35,9
250	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34,1	35,5	36,8	38,2	39,5
300	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35,8	37,3	38,7	40,2	41,7	43,1
350	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37,3	38,8	40,4	42,0	43,6	45,2	46,7
400	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	38,5	40,2	41,9	43,6	45,3	47,0	48,7	50,4
450	kg	-	-	-	-	-	-	-	-	-	-	-	-	39,4	41,2	43,1	44,9	46,7	48,5	50,3	52,2	54,0
500	kg	-	-	-	-	-	-	-	-	-	-	-	40,1	42,1	44,0	45,9	47,9	49,8	51,8	53,7	55,6	57,6
550	kg	-	-	-	-	-	-	-	-	-	-	40,6	42,7	44,7	46,8	48,8	50,9	53,0	55,0	57,1	59,1	61,2
600	kg	-	-	-	-	-	-	-	-	-	40,8	43,0	45,2	47,4	49,6	51,7	53,9	56,1	58,3	60,5	62,6	64,8
650	kg	-	-	-	-	-	-	-	-	40,8	43,1	45,4	47,7	50,0	52,3	54,6	56,9	59,2	61,5	63,8	66,1	68,4
700	kg	-	-	-	-	-	-	-	40,6	43,0	45,4	47,9	50,3	52,7	55,1	57,5	60,0	62,4	64,8	67,2	69,6	72,1
750	kg	-	-	-	-	-	-	40,1	42,7	45,2	47,7	50,3	52,8	55,4	57,9	60,4	63,0	65,5	68,1	70,6	73,1	75,7
800	kg	-	-	-	-	-	39,4	42,1	44,7	47,4	50,0	52,7	55,4	58,0	60,7	63,3	66,0	68,6	71,3	74,0	76,6	79,3

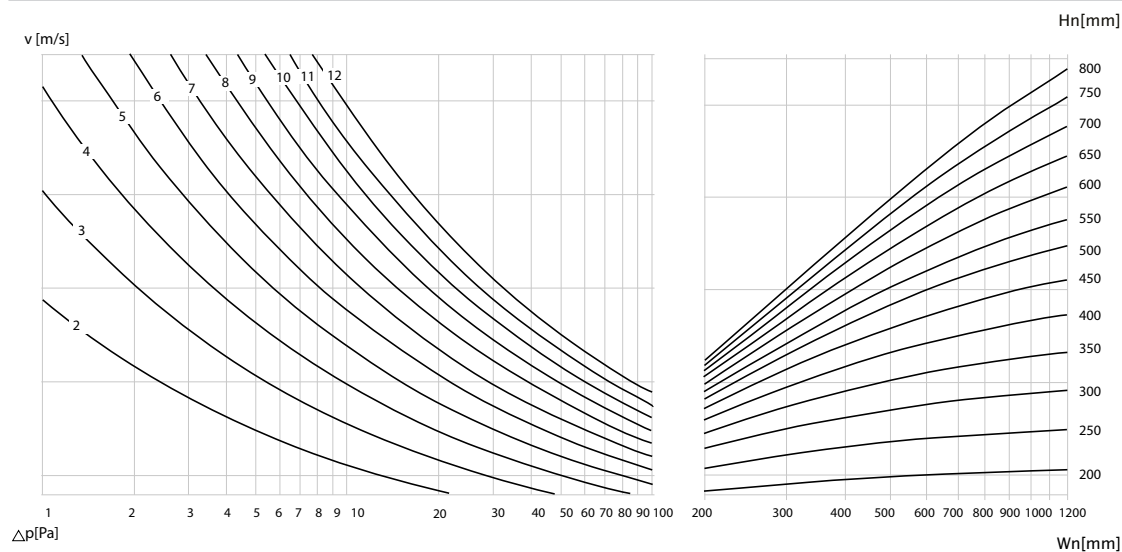
CU4 + BFLT

Hn\Wn [mm]		200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
200	kg	11,2	12,5	13,7	14,9	16,1	17,4	18,6	19,8	21,0	22,3	23,5	24,7	25,9	27,1	28,4	29,6	30,8	-	-	-	-
250	kg	12,5	13,8	15,2	16,5	17,8	19,2	20,5	21,9	23,2	24,5	25,9	27,2	28,6	29,9	31,3	32,6	-	-	-	-	-
300	kg	13,7	15,2	16,6	18,1	19,5	21,0	22,5	23,9	25,4	26,8	28,3	29,8	31,2	32,7	34,2	-	-	-	-	-	-
350	kg	14,9	16,5	18,1	19,7	21,2	22,8	24,4	26,0	27,6	29,1	30,7	32,3	33,9	35,5	-	-	-	-	-	-	-
400	kg	16,1	17,8	19,5	21,2	22,9	24,6	26,3	28,0	29,7	31,4	33,1	34,8	36,6	-	-	-	-	-	-	-	-
450	kg	17,4	19,2	21,0	22,8	24,6	26,5	28,3	30,1	31,9	33,7	35,6	37,4	-	-	-	-	-	-	-	-	-
500	kg	18,6	20,5	22,5	24,4	26,3	28,3	30,2	32,2	34,1	36,0	38,0	-	-	-	-	-	-	-	-	-	-
550	kg	19,8	21,9	23,9	26,0	28,0	30,1	32,2	34,2	36,3	38,3	-	-	-	-	-	-	-	-	-	-	-
600	kg	21,0	23,2	25,4	27,6	29,7	31,9	34,1	36,3	38,5	-	-	-	-	-	-	-	-	-	-	-	-
650	kg	22,3	24,5	26,8	29,1	31,4	33,7	36,0	38,3	-	-	-	-	-	-	-	-	-	-	-	-	-
700	kg	23,5	25,9	28,3	30,7	33,1	35,6	38,0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
750	kg	24,7	27,2	29,8	32,3	34,8	37,4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
800	kg	25,9	28,6	31,2	33,9	36,6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CU4 + BFNT

Hn\Wn [mm]		200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
200	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32,3	33,6	34,8	36,0
250	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34,2	35,6	36,9	38,3	39,6
300	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35,9	37,4	38,8	40,3	41,8	43,2
350	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37,4	38,9	40,5	42,1	43,7	45,3	46,8
400	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	38,6	40,3	42,0	43,7	45,4	47,1	48,8	50,5
450	kg	-	-	-	-	-	-	-	-	-	-	-	-	39,5	41,3	43,2	45,0	46,8	48,6	50,4	52,3	54,1
500	kg	-	-	-	-	-	-	-	-	-	-	-	40,2	42,2	44,1	46,0	48,0	49,9	51,9	53,8	55,7	57,7
550	kg	-	-	-	-	-	-	-	-	-	-	40,7	42,8	44,8	46,9	48,9	51,0	53,1	55,1	57,2	59,2	61,3
600	kg	-	-	-	-	-	-	-	-	-	40,9	43,1	45,3	47,5	49,7	51,8	54,0	56,2	58,4	60,6	62,7	64,9
650	kg	-	-	-	-	-	-	-	-	40,9	43,2	45,5	47,8	50,1	52,4	54,7	57,0	59,3	61,6	63,9	66,2	68,5
700	kg	-	-	-	-	-	-	-	40,7	43,1	45,5	48,0	50,4	52,8	55,2	57,6	60,1	62,5	64,9	67,3	69,7	72,2
750	kg	-	-	-	-	-	-	40,2	42,8	45,3	47,8	50,4	52,9	55,5	58,0	60,5	63,1	65,6	68,2	70,7	73,2	75,8
800	kg	-	-	-	-	-	39,5	42,2	44,8	47,5	50,1	52,8	55,5	58,1	60,8	63,4	66,1	68,7	71,4	74,1	76,7	79,4

Selection graphs



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

Hn\Wn [mm]	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
200 ζ [-]	8,46	7,33	6,67	6,25	5,95	5,73	5,56	5,42	5,31	5,22	5,14	5,08	5,02	4,97	4,93	4,89	4,86	4,83	4,8	4,77	4,75
250 ζ [-]	4,44	3,68	3,24	2,96	2,77	2,63	2,52	2,44	2,37	2,31	2,26	2,22	2,19	2,16	2,13	2,11	2,09	2,07	2,05	2,04	2,02
300 ζ [-]	2,92	2,32	1,99	1,79	1,64	1,54	1,46	1,4	1,35	1,31	1,27	1,25	1,22	1,2	1,18	1,16	1,15	1,14	1,12	1,11	1,1
350 ζ [-]	2,16	1,67	1,4	1,23	1,11	1,03	0,97	0,92	0,88	0,85	0,82	0,8	0,78	0,77	0,75	0,74	0,73	0,72	0,71	0,7	0,69
400 ζ [-]	1,72	1,29	1,06	0,92	0,82	0,75	0,7	0,66	0,63	0,6	0,58	0,56	0,55	0,53	0,52	0,51	0,5	0,5	0,49	0,48	0,48
450 ζ [-]	1,44	1,06	0,85	0,73	0,64	0,58	0,54	0,5	0,48	0,45	0,44	0,42	0,41	0,4	0,39	0,38	0,37	0,36	0,36	0,35	0,35
500 ζ [-]	1,25	0,9	0,71	0,6	0,52	0,47	0,43	0,4	0,38	0,36	0,34	0,33	0,32	0,31	0,3	0,29	0,29	0,28	0,27	0,27	0,27
550 ζ [-]	1,13	0,8	0,63	0,52	0,46	0,41	0,37	0,34	0,32	0,3	0,29	0,28	0,27	0,26	0,25	0,24	0,24	0,23	0,23	0,22	0,22
600 ζ [-]	1,02	0,71	0,55	0,45	0,39	0,35	0,31	0,29	0,27	0,25	0,24	0,23	0,22	0,21	0,21	0,2	0,19	0,19	0,19	0,18	0,18
650 ζ [-]	0,94	0,64	0,49	0,4	0,34	0,3	0,27	0,25	0,23	0,22	0,2	0,19	0,19	0,18	0,17	0,17	0,16	0,16	0,15	0,15	0,15
700 ζ [-]	0,87	0,59	0,44	0,36	0,3	0,27	0,24	0,22	0,2	0,19	0,18	0,17	0,16	0,15	0,15	0,14	0,14	0,13	0,13	0,13	0,13
750 ζ [-]	0,81	0,54	0,41	0,33	0,27	0,24	0,21	0,19	0,18	0,16	0,15	0,15	0,14	0,13	0,13	0,12	0,12	0,12	0,11	0,11	0,11
800 ζ [-]	0,77	0,51	0,38	0,3	0,25	0,22	0,19	0,17	0,16	0,15	0,14	0,13	0,12	0,12	0,11	0,11	0,1	0,1	0,1	0,1	0,09

Example

Data

Hn= 400mm, Wn= 500mm, v= 4m/s

Required

Δp= ca. 6.8 Pa (Cfr. selection graph)

Calculation

Δp= 0.7 * (4m/s)² * 0.6 = 6.72Pa

Selection data

CU4 - Free air passage

Hn\Wn [mm]		200	250	300	350	400	450	500	550	600	650	700	750
200	Sn [m ²]	0,0128	0,0173	0,0217	0,0262	0,0306	0,0351	0,0395	0,0440	0,0484	0,0529	0,0573	0,0618
	Sn [%]	34,05	36,48	38,07	39,21	40,05	40,71	41,23	41,66	42,01	42,31	42,57	42,79
250	Sn [m ²]	0,0200	0,0270	0,0339	0,0409	0,0478	0,0548	0,0617	0,0687	0,0756	0,0826	0,0895	0,0965
	Sn [%]	42,28	45,29	47,28	48,69	49,74	50,55	51,20	51,73	52,17	52,54	52,86	53,14
300	Sn [m ²]	0,0272	0,0367	0,0461	0,0556	0,0650	0,0745	0,0839	0,0934	0,1028	0,1123	0,1217	0,1312
	Sn [%]	47,72	51,11	53,35	54,94	56,13	57,05	57,78	58,38	58,87	59,29	59,65	59,97
350	Sn [m ²]	0,0344	0,0464	0,0583	0,0703	0,0822	0,0942	0,1061	0,1181	0,1300	0,1420	0,1539	0,1659
	Sn [%]	51,57	55,24	57,66	59,38	60,66	61,65	62,44	63,09	63,63	64,08	64,47	64,81
400	Sn [m ²]	0,0416	0,0561	0,0705	0,0850	0,0994	0,1139	0,1283	0,1428	0,1572	0,1717	0,1861	0,2006
	Sn [%]	54,45	58,32	60,88	62,69	64,04	65,09	65,93	66,61	67,18	67,66	68,07	68,42
450	Sn [m ²]	0,0488	0,0658	0,0827	0,0997	0,1166	0,1336	0,1505	0,1675	0,1844	0,2014	0,2183	0,2353
	Sn [%]	56,67	60,71	63,37	65,25	66,66	67,75	68,62	69,33	69,92	70,42	70,85	71,22
500	Sn [m ²]	0,0546	0,0735	0,0925	0,1114	0,1304	0,1493	0,1683	0,1872	0,2062	0,2251	0,2441	0,2630
	Sn [%]	56,95	61,00	63,67	65,57	66,98	68,08	68,96	69,67	70,26	70,76	71,19	71,56
550	Sn [m ²]	0,0618	0,0832	0,1047	0,1261	0,1476	0,1690	0,1905	0,2119	0,2334	0,2548	0,2763	0,2977
	Sn [%]	58,54	62,70	65,45	67,40	68,85	69,98	70,88	71,61	72,22	72,74	73,18	73,56
600	Sn [m ²]	0,0690	0,0929	0,1169	0,1408	0,1648	0,1887	0,2127	0,2366	0,2606	0,2845	0,3085	0,3324
	Sn [%]	59,86	64,12	66,93	68,92	70,41	71,56	72,48	73,23	73,85	74,38	74,83	75,22
650	Sn [m ²]	0,0762	0,1026	0,1291	0,1555	0,1820	0,2084	0,2349	0,2613	0,2878	0,3142	0,3407	0,3671
	Sn [%]	60,97	65,31	68,17	70,20	71,72	72,89	73,83	74,59	75,23	75,77	76,22	76,62
700	Sn [m ²]	0,0834	0,1123	0,1413	0,1702	0,1992	0,2281	0,2571	0,2860	0,3150	0,3439	0,3729	0,4018
	Sn [%]	61,93	66,33	69,24	71,30	72,84	74,03	74,99	75,76	76,41	76,95	77,42	77,82
750	Sn [m ²]	0,0906	0,1220	0,1535	0,1849	0,2164	0,2478	0,2793	0,3107	0,3422	0,3736	0,4051	0,4365
	Sn [%]	62,75	67,22	70,16	72,25	73,81	75,02	75,99	76,77	77,43	77,98	78,45	78,86
800	Sn [m ²]	0,0978	0,1317	0,1657	0,1996	0,2336	0,2675	0,3015	0,3354	0,3694	0,4033	0,4373	0,4712
	Sn [%]	63,48	67,99	70,97	73,09	74,66	75,89	76,86	77,66	78,32	78,88	79,36	79,77

Hn\Wn [mm]		800	850	900	950	1000	1050	1100	1150	1200
200	Sn [m ²]	0,0662	0,0707	0,0751	0,0796	0,0840	0,0885	0,0929	0,0974	0,1018
	Sn [%]	42,99	43,16	43,31	43,45	43,57	43,68	43,78	43,87	43,96
250	Sn [m ²]	0,1034	0,1104	0,1173	0,1243	0,1312	0,1382	0,1451	0,1521	0,1590
	Sn [%]	53,38	53,59	53,78	53,95	54,10	54,24	54,36	54,48	54,58
300	Sn [m ²]	0,1406	0,1501	0,1595	0,1690	0,1784	0,1879	0,1973	0,2068	0,2162
	Sn [%]	60,24	60,48	60,69	60,88	61,05	61,21	61,35	61,48	61,59
350	Sn [m ²]	0,1778	0,1898	0,2017	0,2137	0,2256	0,2376	0,2495	0,2615	0,2734
	Sn [%]	65,10	65,36	65,59	65,80	65,98	66,15	66,30	66,44	66,57
400	Sn [m ²]	0,2150	0,2295	0,2439	0,2584	0,2728	0,2873	0,3017	0,3162	0,3306
	Sn [%]	68,73	69,00	69,25	69,47	69,66	69,84	70,00	70,14	70,28
450	Sn [m ²]	0,2522	0,2692	0,2861	0,3031	0,3200	0,3370	0,3539	0,3709	0,3878
	Sn [%]	71,54	71,83	72,08	72,31	72,51	72,69	72,86	73,01	73,15
500	Sn [m ²]	0,2820	0,3009	0,3199	0,3388	0,3578	0,3767	0,3957	0,4146	0,4336
	Sn [%]	71,89	72,18	72,43	72,66	72,86	73,05	73,21	73,37	73,51
550	Sn [m ²]	0,3192	0,3406	0,3621	0,3835	0,4050	0,4264	0,4479	0,4693	0,4908
	Sn [%]	73,89	74,19	74,45	74,68	74,89	75,08	75,26	75,41	75,56
600	Sn [m ²]	0,3564	0,3803	0,4043	0,4282	0,4522	0,4761	0,5001	0,5240	0,5480
	Sn [%]	75,56	75,86	76,13	76,37	76,58	76,78	76,95	77,12	77,26
650	Sn [m ²]	0,3936	0,4200	0,4465	0,4729	0,4994	0,5258	0,5523	0,5787	0,6052
	Sn [%]	76,97	77,28	77,55	77,79	78,01	78,21	78,39	78,55	78,70
700	Sn [m ²]	0,4308	0,4597	0,4887	0,5176	0,5466	0,5755	0,6045	0,6334	0,6624
	Sn [%]	78,18	78,49	78,76	79,01	79,23	79,43	79,62	79,78	79,94
750	Sn [m ²]	0,4680	0,4994	0,5309	0,5623	0,5938	0,6252	0,6567	0,6881	0,7196
	Sn [%]	79,22	79,53	79,81	80,07	80,29	80,49	80,68	80,85	81,00
800	Sn [m ²]	0,5052	0,5391	0,5731	0,6070	0,6410	0,6749	0,7089	0,7428	0,7768
	Sn [%]	80,13	80,45	80,73	80,99	81,21	81,42	81,61	81,78	81,94

Sample order

CU4	600	600	PG30	PM	CFTH	FCU
1	2	3	4	5	6	7

1. product
2. width
3. height
4. frame on the side of the mechanism
5. Frame on the side of the wall
6. type of mechanism
7. 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.



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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.marquage-nf.com>; Phone: +33 (0)1.41.62.80.00, Fax: +33 (0)1.49.17.90.00, Email: certification@afnor.org