

VUW120

Rectangular smoke control damper for installation in a wall.



CE
1812








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Explanation of the abbreviations and pictograms

| | | |
|--|---------------------------------|---|
| Wn = nominal width | hod = horizontal duct | OP = option (delivered with the product) |
| Hn = nominal height | vew = vertical wall penetration | KIT = kit (delivered separately for repair or upgrade) |
| Sn = free air passage | V = volt | PG = connection flange to the duct |
| E = integrity | W = watt | 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) |
| I = thermal insulation | V AC = Volt alternating current | Cal-Sil = calcium silicate |
| S = smoke leakage | V DC = Volt direct current | ζ [-] = pressure loss coefficient |
| 60/120 = fire resistance time | E.TELE = power supply magnet | Q = air flow |
| Pa = pascal | E.ALIM = power supply motor | ΔP = static pressure drop |
| o -> i = meets the criteria from the outside (o) to the inside (i) | Auto = automatic | v = air speed in the duct |
| i <-> o = fire side not important | Tele = remote controlled | Lwa = A-weighted sound power level |
| AA = automatic activation | Pnom = nominal capacity | ME = motorised |
| multi = multi compartment | Pmax = maximum capacity | H = habitat |
| ved = vertical duct | DAS MOD = modular product | |

| | | | |
|---|--|---|--|
|  | large dimensions |  | optimal free air passage and minimal pressure loss |
|  | superior air tightness (tested at 1500 Pa) |  | suitable for installation in rigid wall |
|  | intermediate dimensions on request | | |

DECLARATION OF PERFORMANCE

CE_DoP_Rf-t_V27_EN = A-03/2019

| | | | |
|--|--|----------------|--|
| 1. Unique identification code of the product-type: | VUW120 | | |
| 2. Intended use/s: | Smoke control damper to be used in smoke control systems, in multi-compartment applications at fire temperatures, or in single-compartment applications. | | |
| 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 12101-8:2011, Efectis with identification number 1812; Efectis_1812_CPR_1596 | | |
| 6. Declared performance according to EN 12101-8:2011 | (fire resistance according to EN 1366-10, classification according to EN 13501-4) | | |
| Essential characteristics | Wall | Sealing | Performance Classification |
| Range | Wall type | Mortar | EI 120 (V _{0,se} ¹ ↔ o) S 1500 AA multi C10000 |
| 300x300 mm ≤ VUW120 ≤ 1500x1000 mm | Rigid wall | | |
| 1 | Type of installation: built-in 0/180° | | |
| <p>Nominal activation conditions/sensitivity: Response delay (response time): closure time Operational reliability: cycling Durability of response delay: Durability of operational reliability: High operational temperature (HOT 400/30):</p> <p>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.</p> | | | |
| <p>Installation</p> | | | |
| 1 | | | |
| <p>Harmonised standard EN 12101-8:2011</p> | | | |
| <p>Pass - automatic activation Pass - automatic activation BLE - 10000 cycles (C10000) (no load) Pass Pass NPD (no performance determined)</p> | | | |

Signed for and on behalf of the manufacturer by:
Mathieu Steenland, Technical Manager



Mathieu Steenland

Oosterzele, 03/2019

Product presentation VUW120

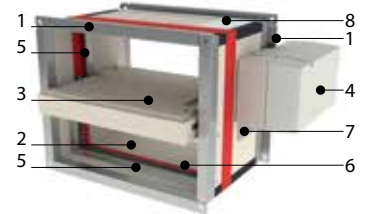
The rectangular VUW120 smoke control damper is suitable for installation in a wall and offers a fire-resistance up to 120 minutes. The damper is available in large dimensions and with an optional thermal housing for the operating mechanism.

Smoke control shutters and dampers are suitable for use in ventilating protected lobbies, venting to shafts either naturally or mechanically. They open to evacuate smoke in emergency situations whilst maintaining fire resistant integrity in standby position.

- ☑ superior air tightness (tested at 1500 Pa)
- ☑ optimal free air passage and minimal pressure loss
- ☑ large dimensions
- tested according to EN 1366-10
- compliant with EN 12101-8
- suitable for installation in rigid wall
- maintenance-free
- for indoor use
- intermediate dimensions on request
- air tightness in accordance with EN 1751: class B (class C in option)

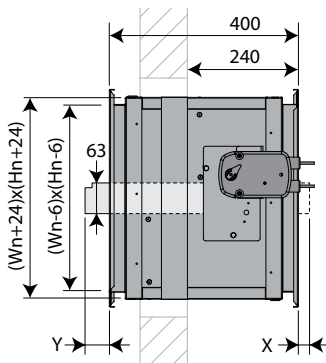


1. connection flange PG30
2. casing made of refractory material
3. damper blade
4. operating mechanism in thermal housing (option)
5. sealing and blade bumper
6. intumescent strip
7. transmission
8. product identification



Range and dimensions VUW120

Wn/Hn per step of 50 mm
Exceeding blade: X = on the mechanism side, Y = on the wall side

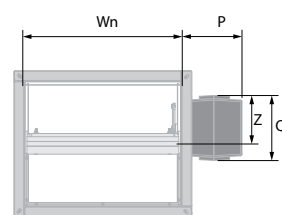
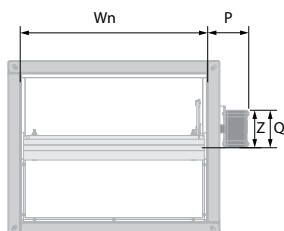


| Hn (mm) | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| x | - | - | - | - | - | 1 | 26 | 51 | 76 | 101 | 126 | 151 | 176 | 201 | 226 |
| y | 2 | 27 | 52 | 77 | 102 | 127 | 152 | 177 | 202 | 227 | 252 | 277 | 302 | 327 | 352 |

| | ≥ | ≤ |
|--------------|---------|-----------|
| (Wn x Hn) mm | 300x300 | 1500x1000 |

VUW120+BLE


VUW120 + BLE + BOX




| | BLE |
|---|-----|
| P | 112 |
| Q | 110 |
| Z | 98 |

| | BLE |
|---|-----|
| P | 193 |
| Q | 205 |
| Z | 152 |

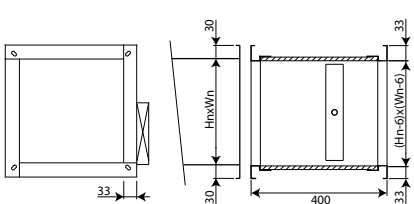
Evolution - kits

| | | |
|---|----------------------|---|
|  | KITS BLE24 | BLE 24V actuator for smoke control dampers |
| | KITS BLE24-ST | BLE 24V actuator for smoke control dampers with plug (ST) |
| | KITS BLE230 | BLE 230V actuator for smoke control dampers |
| | MECT | Testbox for mechanisms 24/48 V (magnet, motor, beginning and end of range switches) |

Options - at the time of order

| | | |
|--|-----------------|---|
|  | UL | Inspection shutter (set of 2) |
| | EQ | Equipotential connection |
| | EN1751_C | Air-tightness class C |
| | BOX | The BOX is an optional thermal protection housing. It is specially designed to protect the motor against high temperatures. |

Flange types - at the time of order

| | |
|---|---|
|  | <p>PG30</p> <p>Connection to ducts with 30 mm flanges (either by sliding profile, or with bolts, or with clamps). Elliptical holes \varnothing 8,5 x 16 mm.</p> |
|---|---|

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

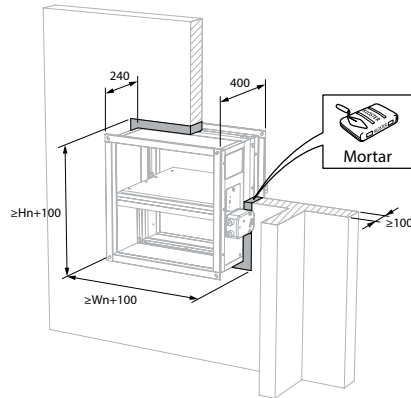
- The installation must comply with the installation manual and the classification report.
- The installation of the shaft must comply with the classification report delivered by the shaft manufacturer.
- Axis orientation: see the declaration of performance.
- Avoid the obstruction of adjoining shafts.
- Verify if the blade can move freely.
- Rf-t smoke dampers may be applied to ducts that have been tested according to EN 1366-8 and EN 1366-9 as appropriate, constructed from similar materials with a fire resistance, thickness and density equal or superior to these of the tested materials.
 - ⚠ Caution: when fitting, the product should be handled with care and remain protected from any sealing products.
 - ⚠ Caution: before putting the installation into operation, clean off all the dust and dirt.
 - ⚠ Caution: bear in mind the blade's clearance inside the smoke evacuation duct.

Installation in rigid wall

The product was tested and approved in:

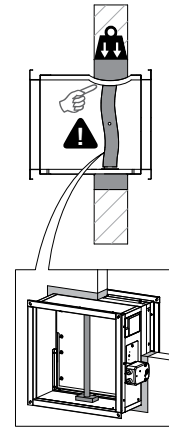
| Range | Wall type | Sealing | Classification |
|------------------------------------|------------|---------------------------|--|
| 300x300 mm ≤ VUW120 ≤ 1500x1000 mm | Rigid wall | Aerated concrete ≥ 100 mm | Mortar |
| | | | EI 120 (v _e w i ↔ o) S 1500 AA multi C10000 |

1



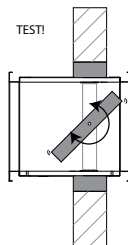
1. Make the necessary openings ($W_n + 100$ mm) x ($H_n + 100$ mm) in the wall.
Mount the damper in the opening.
Seal the rest of the opening with standard mortar.

2



2. Support the body and block the damper blade in its closed position to prevent deformation of the body during the drying process of the sealing.

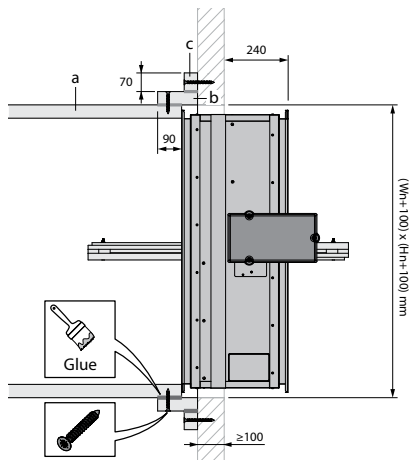
3



3. Check the movement of the damper blade.
Run a test on the mechanism of the damper.

Installation in a multi / single compartment application

1



1. The multi compartment smoke extraction duct (a), made of refractory material of ≥ 50 mm thickness, is positioned against the flange of the damper. A frame (b), made of the same refractory material of ≥ 50 mm, connects the smoke extraction duct with the wall. This frame has an overlay on the duct of at least 90mm. The frame is connected to the duct using screws ($\varnothing 5 \times 90$ mm) every 150 mm and corresponding duct glue. An additional flange (c) of 70 mm height, made of the same refractory material of 50 mm or thicker, is screwed to the wall using screws suitable for that wall.

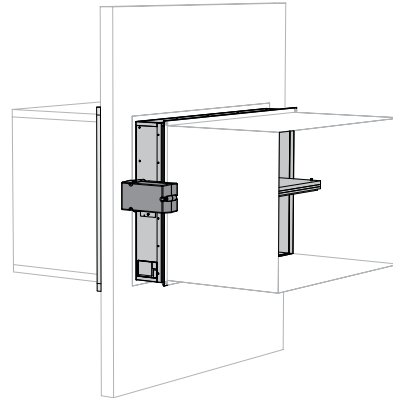
Material used:

Promatect L500 ≥ 50 mm

Duct glue: Promat K84

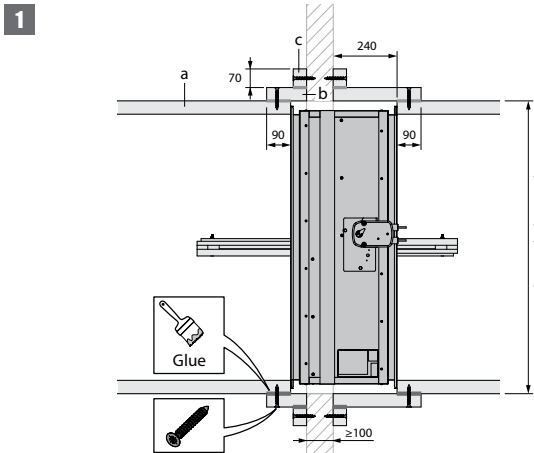
Screws: coarse thread $\varnothing 5 \times 90$

2



2. If required, connect single compartment smoke extraction ducts using the PG30 flange on the VUW120. The actuator could be protected by a thermal insulating box. This is not a requirement for the AA classification.

Installation with multi compartment application on both sides



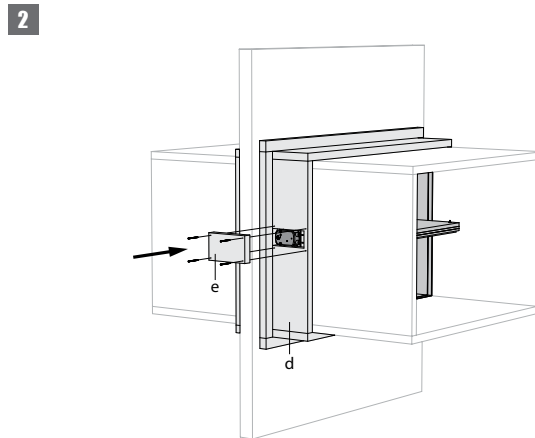
1. The multi compartment smoke extraction ducts (a), made of refractory material of ≥ 50 mm thickness, is positioned on both sides of the damper. A frame (b), made of the same refractory material of ≥ 50 mm, connects the smoke extraction ducts to the wall. These frames have an overlay on the duct of at least 90mm. The frames are connected to the duct using screws ($\varnothing 5 \times 90$ mm) every 150 mm and corresponding duct glue. Additional flanges (c) of 70mm height, made of the same refractory material of 50mm or thicker, are screwed to the wall using screws suitable for that wall.

Material used:

Promatect L500 ≥ 50 mm

Duct glue: Promat K84

Screws: coarse thread $\varnothing 5 \times 90$



2. On the mechanism side, make an opening in frame (d) of 230 x 110 mm to access the actuator. Make a cover plate (e) of 280 x 210 mm made of the same refractory material of 50 mm or thicker. This will be used to cover the actuator, using 4 screws of $\varnothing 5 \times 90$ mm. Caulk around the electrical cables with fire resistant sealant (such as BMS f.e.).

Maintenance

- No specific maintenance required.
- Schedule at least two running visual 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



BLE Actuator for remote control of smoke control dampers

The actuator B(L)E is specially designed to remotely control smoke control dampers. The BLE model is intended for VU90-HOT dampers with small dimensions ($W+H < 1800$ mm) and for VU120 and VUW120 dampers.

1. access for manual resetting
2. plug (ST)



Unlocking

- **manual unlocking:** VUW120: turn the enclosed handle clockwise / VU120 - VU90-HOT: turn the enclosed handle anti-clockwise.
- **automatic unlocking:** n/a
- **remote unlocking:** power cables 1 and 2.

Caution:

⚠ Do not use a drill or screwing machine.

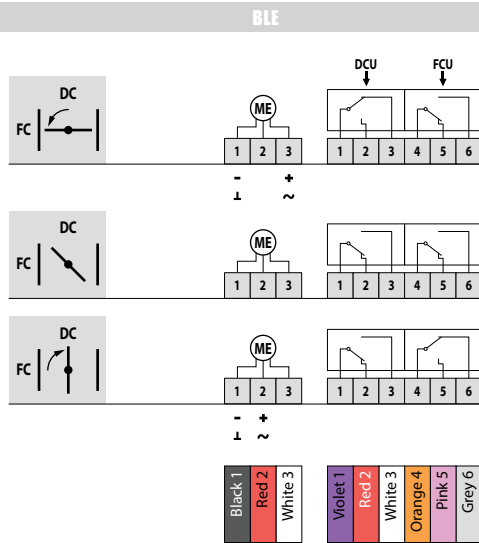
Resetting

- **manual resetting:** VUW120: turn the enclosed handle anti-clockwise / VU120 - VU90-HOT: turn the enclosed handle clockwise.
- **motorised resetting:** power cables 1 and 3.

Caution:

⚠ Do not use a drill or screwing machine.

Electrical connection



DC : Switch closed position smoke evacuation shutter

FC : Switch open position smoke evacuation shutter

| MEC | Nominal voltage motor | Nominal voltage magnet | Power consumption (stand-by) | Power consumption (operating) | Standard switches |
|----------|-----------------------|------------------------|------------------------------|-------------------------------|---------------------------|
| BLE24 | 24 V AC/DC | N/A | 0,5W | 7,5W | 1mA...3A, DC 5V...AC 250V |
| BLE24-ST | 24 V AC/DC | N/A | 0,5W | 7,5W | 1mA...3A, DC 5V...AC 250V |
| BLE230 | 230 V AC | N/A | 1W | 5W | 1mA...3A, DC 5V...AC 250V |

| MEC | Resetting time motor | Running time spring | Noise level motor | Cable supply / control | Cable auxiliary switch | Protection class |
|----------|----------------------|---------------------|-------------------|---|---|------------------|
| BLE24 | < 30 s (90°) | N/A | ca. 62 dB (A) | 1 m, 3 x 0.75 mm ² (halogen-free) | 1 m, 6 x 0.75 mm ² (halogen-free) | IP 54 |
| BLE24-ST | < 30 s (90°) | N/A | ca. 62 dB (A) | 1 m, 3 x 0.75 mm ² (halogen-free), with plug connectors, suitable for IXI-R1, IXI-R2(-230), BKNE230-24 | 1 m, 6 x 0.75 mm ² (halogen-free), with plug connectors, suitable for IXI-R1, IXI-R2(-230), BKNE230-24 | IP 54 |
| BLE230 | < 30 s (90°) | N/A | ca. 62 dB (A) | 1 m, 3 x 0.75 mm ² (halogen-free) | 1 m, 6 x 0.75 mm ² (halogen-free) | IP 54 |

Weights

VUW120 + BLE24 / BLE24-ST / BLE230

| Hn\Wn (mm) | | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|-------------|----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 300 | kg | 18,8 | 20,4 | 21,9 | 23,5 | 25,0 | 26,6 | 28,1 | 29,7 | 31,2 | 32,8 | 34,3 | 35,9 | 37,4 | 39,0 | 40,5 |
| 350 | kg | 20,4 | 22,1 | 23,7 | 25,4 | 27,0 | 28,7 | 30,4 | 32,0 | 33,7 | 35,4 | 37,0 | 38,7 | 40,4 | 42,0 | 43,7 |
| 400 | kg | 21,9 | 23,7 | 25,4 | 27,2 | 29,0 | 30,8 | 32,6 | 34,4 | 36,1 | 37,9 | 39,7 | 41,5 | 43,3 | 45,1 | 46,8 |
| 450 | kg | 23,4 | 25,3 | 27,2 | 29,1 | 31,0 | 32,9 | 34,8 | 36,7 | 38,6 | 40,5 | 42,4 | 44,3 | 46,2 | 48,1 | 50,0 |
| 500 | kg | 24,9 | 26,9 | 28,9 | 30,9 | 32,9 | 35,0 | 37,0 | 39,0 | 41,0 | 43,0 | 45,0 | 47,0 | 49,1 | 51,1 | 53,1 |
| 550 | kg | 26,4 | 28,5 | 30,6 | 32,8 | 34,9 | 37,0 | 39,2 | 41,3 | 43,4 | 45,6 | 47,7 | 49,8 | 52,0 | 54,1 | 56,2 |
| 600 | kg | 27,8 | 30,1 | 32,3 | 34,6 | 36,8 | 39,1 | 41,3 | 43,8 | 46,1 | 48,3 | 50,6 | 52,8 | 55,1 | 57,3 | 59,6 |
| 650 | kg | 29,3 | 31,7 | 34,1 | 36,4 | 38,8 | 41,2 | 43,8 | 46,1 | 48,5 | 50,9 | 53,2 | 55,6 | 58,0 | 60,3 | 62,7 |
| 700 | kg | 30,8 | 33,3 | 35,8 | 38,3 | 40,8 | 43,5 | 46,0 | 48,5 | 50,9 | 53,4 | 55,9 | 58,4 | 60,9 | 63,4 | 65,8 |
| 750 | kg | 32,3 | 34,9 | 37,5 | 40,1 | 43,0 | 45,6 | 48,2 | 50,8 | 53,4 | 56,0 | 58,6 | 61,2 | 63,8 | 66,4 | 69,0 |
| 800 | kg | 33,8 | 36,6 | 39,3 | 42,2 | 44,9 | 47,7 | 50,4 | 53,1 | 55,8 | 58,5 | 61,2 | 64,0 | 66,7 | 69,4 | 72,1 |
| 850 | kg | 35,3 | 38,2 | 41,2 | 44,1 | 46,9 | 49,7 | 52,6 | 55,4 | 58,2 | 61,1 | 63,9 | 66,7 | 69,6 | 72,4 | 75,2 |
| 900 | kg | 36,8 | 40,0 | 43,0 | 45,9 | 48,9 | 51,8 | 54,8 | 57,7 | 60,7 | 63,6 | 66,6 | 69,5 | 72,7 | 75,7 | 78,6 |
| 950 | kg | 38,6 | 41,6 | 44,7 | 47,8 | 50,8 | 53,9 | 57,0 | 60,0 | 63,1 | 66,2 | 69,2 | 72,5 | 75,6 | 78,7 | 81,7 |
| 1000 | kg | 40,1 | 43,3 | 46,4 | 49,6 | 52,8 | 56,0 | 59,2 | 62,3 | 65,5 | 68,7 | 72,1 | 75,3 | 78,5 | 81,7 | 84,9 |

| Hn\Wn (mm) | | 1050 | 1100 | 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 | 1500 | | | | |
|-------------|----|------|------|------|------|-------|-------|-------|-------|-------|-------|--|--|--|--|
| 300 | kg | 42,1 | 43,6 | 45,2 | 46,7 | 48,3 | 49,8 | 51,4 | 52,9 | 54,5 | 56,0 | | | | |
| 350 | kg | 45,4 | 47,0 | 48,7 | 50,4 | 52,0 | 53,7 | 55,4 | 57,0 | 58,7 | 60,4 | | | | |
| 400 | kg | 48,6 | 50,4 | 52,2 | 54,0 | 55,7 | 57,5 | 59,3 | 61,1 | 62,9 | 64,7 | | | | |
| 450 | kg | 51,9 | 53,8 | 55,7 | 57,6 | 59,5 | 61,3 | 63,3 | 65,2 | 67,0 | 68,9 | | | | |
| 500 | kg | 55,1 | 57,1 | 59,1 | 61,2 | 63,2 | 65,2 | 67,2 | 69,2 | 71,2 | 73,2 | | | | |
| 550 | kg | 58,4 | 60,5 | 62,6 | 64,8 | 66,9 | 69,0 | 71,2 | 73,3 | 75,4 | 77,5 | | | | |
| 600 | kg | 61,8 | 64,1 | 66,3 | 68,6 | 70,8 | 73,1 | 75,3 | 77,6 | 79,8 | 82,1 | | | | |
| 650 | kg | 65,1 | 67,4 | 69,8 | 72,2 | 74,5 | 76,9 | 79,3 | 81,6 | 84,0 | 86,4 | | | | |
| 700 | kg | 68,3 | 70,8 | 73,3 | 75,8 | 78,2 | 80,7 | 83,2 | 85,7 | 88,2 | 90,7 | | | | |
| 750 | kg | 71,6 | 74,2 | 76,8 | 79,4 | 82,0 | 84,6 | 87,2 | 89,8 | 92,4 | 95,0 | | | | |
| 800 | kg | 74,8 | 77,5 | 80,3 | 83,0 | 85,7 | 88,4 | 91,1 | 93,8 | 96,5 | 99,3 | | | | |
| 850 | kg | 78,1 | 80,9 | 83,7 | 86,6 | 89,4 | 92,2 | 95,1 | 97,9 | 100,7 | 103,6 | | | | |
| 900 | kg | 81,6 | 84,5 | 87,5 | 90,4 | 93,3 | 96,3 | 99,3 | 102,2 | 105,1 | 108,1 | | | | |
| 950 | kg | 84,8 | 87,9 | 90,9 | 94,0 | 97,1 | 100,1 | 103,2 | 106,3 | 109,3 | 112,4 | | | | |
| 1000 | kg | 88,1 | 91,2 | 94,4 | 97,6 | 100,8 | 104,0 | 107,2 | 110,3 | 113,5 | 116,7 | | | | |

Selection graphs

$$\Delta p = 0,6 \times v^2 \times \zeta$$

| Hn\Wn [mm] | | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|-------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 300 | ζ [-] | 1,04 | 0,94 | 0,87 | 0,82 | 0,79 | 0,76 | 0,73 | 0,71 | 0,70 | 0,68 | 0,67 | 0,66 | 0,65 | 0,64 | 0,63 |
| 350 | ζ [-] | 0,92 | 0,83 | 0,77 | 0,73 | 0,69 | 0,67 | 0,64 | 0,63 | 0,61 | 0,60 | 0,59 | 0,58 | 0,57 | 0,57 | 0,56 |
| 400 | ζ [-] | 0,82 | 0,75 | 0,69 | 0,65 | 0,62 | 0,60 | 0,58 | 0,56 | 0,55 | 0,54 | 0,53 | 0,52 | 0,51 | 0,51 | 0,50 |
| 450 | ζ [-] | 0,75 | 0,68 | 0,63 | 0,59 | 0,57 | 0,55 | 0,53 | 0,51 | 0,50 | 0,49 | 0,48 | 0,48 | 0,47 | 0,46 | 0,46 |
| 500 | ζ [-] | 0,69 | 0,63 | 0,58 | 0,55 | 0,52 | 0,50 | 0,49 | 0,47 | 0,46 | 0,45 | 0,45 | 0,44 | 0,43 | 0,43 | 0,42 |
| 550 | ζ [-] | 0,65 | 0,58 | 0,54 | 0,51 | 0,49 | 0,47 | 0,45 | 0,44 | 0,43 | 0,42 | 0,41 | 0,41 | 0,40 | 0,40 | 0,39 |
| 600 | ζ [-] | 0,60 | 0,55 | 0,51 | 0,48 | 0,46 | 0,44 | 0,42 | 0,41 | 0,40 | 0,39 | 0,39 | 0,38 | 0,38 | 0,37 | 0,37 |
| 650 | ζ [-] | 0,57 | 0,51 | 0,48 | 0,45 | 0,43 | 0,41 | 0,40 | 0,39 | 0,38 | 0,37 | 0,37 | 0,36 | 0,35 | 0,35 | 0,35 |
| 700 | ζ [-] | 0,54 | 0,49 | 0,45 | 0,43 | 0,41 | 0,39 | 0,38 | 0,37 | 0,36 | 0,35 | 0,35 | 0,34 | 0,34 | 0,33 | 0,33 |
| 750 | ζ [-] | 0,51 | 0,46 | 0,43 | 0,40 | 0,39 | 0,37 | 0,36 | 0,35 | 0,34 | 0,33 | 0,33 | 0,32 | 0,32 | 0,31 | 0,31 |
| 800 | ζ [-] | 0,49 | 0,44 | 0,41 | 0,39 | 0,37 | 0,35 | 0,34 | 0,33 | 0,33 | 0,32 | 0,31 | 0,31 | 0,30 | 0,30 | 0,30 |
| 850 | ζ [-] | 0,47 | 0,42 | 0,39 | 0,37 | 0,35 | 0,34 | 0,33 | 0,32 | 0,31 | 0,30 | 0,30 | 0,29 | 0,29 | 0,29 | 0,28 |
| 900 | ζ [-] | 0,45 | 0,40 | 0,38 | 0,35 | 0,34 | 0,32 | 0,31 | 0,31 | 0,30 | 0,29 | 0,29 | 0,28 | 0,28 | 0,28 | 0,27 |
| 950 | ζ [-] | 0,43 | 0,39 | 0,36 | 0,34 | 0,32 | 0,31 | 0,30 | 0,29 | 0,29 | 0,28 | 0,28 | 0,27 | 0,27 | 0,26 | 0,26 |
| 1000 | ζ [-] | 0,42 | 0,38 | 0,35 | 0,33 | 0,31 | 0,30 | 0,29 | 0,28 | 0,28 | 0,27 | 0,27 | 0,26 | 0,26 | 0,25 | 0,25 |

| Hn\Wn [mm] | | 1050 | 1100 | 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 | 1500 | | | | | |
|-------------|-------|------|------|------|------|------|------|------|------|------|------|--|--|--|--|--|
| 300 | ζ [-] | 0,63 | 0,62 | 0,62 | 0,61 | 0,61 | 0,60 | 0,60 | 0,60 | 0,59 | 0,59 | | | | | |
| 350 | ζ [-] | 0,55 | 0,55 | 0,54 | 0,54 | 0,53 | 0,53 | 0,53 | 0,53 | 0,52 | 0,52 | | | | | |
| 400 | ζ [-] | 0,50 | 0,49 | 0,49 | 0,48 | 0,48 | 0,47 | 0,47 | 0,47 | 0,47 | 0,47 | | | | | |
| 450 | ζ [-] | 0,45 | 0,45 | 0,45 | 0,44 | 0,43 | 0,43 | 0,43 | 0,43 | 0,43 | 0,43 | | | | | |
| 500 | ζ [-] | 0,42 | 0,41 | 0,41 | 0,41 | 0,40 | 0,40 | 0,40 | 0,40 | 0,39 | 0,39 | | | | | |
| 550 | ζ [-] | 0,39 | 0,38 | 0,38 | 0,38 | 0,37 | 0,37 | 0,37 | 0,37 | 0,37 | 0,37 | | | | | |
| 600 | ζ [-] | 0,36 | 0,36 | 0,36 | 0,35 | 0,35 | 0,35 | 0,34 | 0,34 | 0,34 | 0,34 | | | | | |
| 650 | ζ [-] | 0,34 | 0,34 | 0,34 | 0,33 | 0,33 | 0,33 | 0,33 | 0,33 | 0,32 | 0,32 | | | | | |
| 700 | ζ [-] | 0,32 | 0,32 | 0,32 | 0,32 | 0,31 | 0,31 | 0,31 | 0,31 | 0,30 | 0,30 | | | | | |
| 750 | ζ [-] | 0,31 | 0,30 | 0,30 | 0,30 | 0,30 | 0,29 | 0,29 | 0,29 | 0,29 | 0,29 | | | | | |
| 800 | ζ [-] | 0,29 | 0,29 | 0,29 | 0,29 | 0,28 | 0,28 | 0,28 | 0,28 | 0,28 | 0,28 | | | | | |
| 850 | ζ [-] | 0,28 | 0,28 | 0,28 | 0,28 | 0,27 | 0,27 | 0,27 | 0,27 | 0,27 | 0,26 | | | | | |
| 900 | ζ [-] | 0,27 | 0,27 | 0,27 | 0,27 | 0,26 | 0,26 | 0,26 | 0,25 | 0,25 | 0,25 | | | | | |
| 950 | ζ [-] | 0,26 | 0,26 | 0,26 | 0,26 | 0,25 | 0,25 | 0,25 | 0,25 | 0,24 | 0,24 | | | | | |
| 1000 | ζ [-] | 0,25 | 0,25 | 0,25 | 0,25 | 0,24 | 0,24 | 0,24 | 0,24 | 0,24 | 0,23 | | | | | |

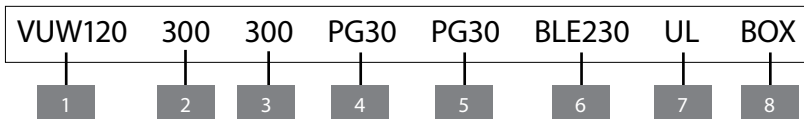
Free air passage (m²)

| Hn\Wn [mm] | | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 |
|------------|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 300 | Sn [m ²] | 0,0531 | 0,0631 | 0,0732 | 0,0832 | 0,0933 | 0,1033 | 0,1134 | 0,1234 | 0,1335 | 0,1435 | 0,1536 | 0,1636 | 0,1737 |
| | Sn [%] | 61,39 | 62,41 | 63,16 | 63,75 | 64,22 | 64,60 | 64,91 | 65,18 | 65,41 | 65,61 | 65,78 | 65,94 | 66,07 |
| 350 | Sn [m ²] | 0,0663 | 0,0788 | 0,0914 | 0,1039 | 0,1165 | 0,1290 | 0,1416 | 0,1541 | 0,1667 | 0,1792 | 0,1918 | 0,2043 | 0,2169 |
| | Sn [%] | 65,52 | 66,60 | 67,41 | 68,04 | 68,53 | 68,94 | 69,28 | 69,57 | 69,81 | 70,02 | 70,21 | 70,37 | 70,52 |
| 400 | Sn [m ²] | 0,0795 | 0,0945 | 0,1096 | 0,1246 | 0,1397 | 0,1547 | 0,1698 | 0,1848 | 0,1999 | 0,2149 | 0,2300 | 0,2450 | 0,2601 |
| | Sn [%] | 68,60 | 69,73 | 70,58 | 71,23 | 71,76 | 72,18 | 72,54 | 72,84 | 73,09 | 73,32 | 73,51 | 73,68 | 73,83 |
| 450 | Sn [m ²] | 0,0927 | 0,1102 | 0,1278 | 0,1453 | 0,1629 | 0,1804 | 0,1980 | 0,2155 | 0,2331 | 0,2506 | 0,2682 | 0,2857 | 0,3033 |
| | Sn [%] | 70,99 | 72,16 | 73,03 | 73,71 | 74,25 | 74,69 | 75,06 | 75,37 | 75,64 | 75,87 | 76,07 | 76,24 | 76,40 |
| 500 | Sn [m ²] | 0,1059 | 0,1259 | 0,1460 | 0,1660 | 0,1861 | 0,2061 | 0,2262 | 0,2462 | 0,2663 | 0,2863 | 0,3064 | 0,3264 | 0,3465 |
| | Sn [%] | 72,89 | 74,09 | 74,99 | 75,69 | 76,24 | 76,70 | 77,07 | 77,39 | 77,67 | 77,90 | 78,11 | 78,29 | 78,45 |
| 550 | Sn [m ²] | 0,1191 | 0,1416 | 0,1642 | 0,1867 | 0,2093 | 0,2318 | 0,2544 | 0,2769 | 0,2995 | 0,3220 | 0,3446 | 0,3671 | 0,3897 |
| | Sn [%] | 74,44 | 75,67 | 76,59 | 77,30 | 77,87 | 78,33 | 78,72 | 79,04 | 79,32 | 79,56 | 79,77 | 79,96 | 80,12 |
| 600 | Sn [m ²] | 0,1323 | 0,1573 | 0,1824 | 0,2074 | 0,2325 | 0,2575 | 0,2826 | 0,3076 | 0,3327 | 0,3577 | 0,3828 | 0,4078 | 0,4329 |
| | Sn [%] | 75,74 | 76,99 | 77,92 | 78,64 | 79,22 | 79,69 | 80,08 | 80,41 | 80,70 | 80,94 | 81,16 | 81,35 | 81,51 |
| 650 | Sn [m ²] | 0,1455 | 0,1730 | 0,2006 | 0,2281 | 0,2557 | 0,2832 | 0,3108 | 0,3383 | 0,3659 | 0,3934 | 0,4210 | 0,4485 | 0,4761 |
| | Sn [%] | 76,83 | 78,10 | 79,04 | 79,78 | 80,36 | 80,84 | 81,24 | 81,57 | 81,86 | 82,11 | 82,33 | 82,52 | 82,69 |
| 700 | Sn [m ²] | 0,1587 | 0,1887 | 0,2188 | 0,2488 | 0,2789 | 0,3089 | 0,3390 | 0,3690 | 0,3991 | 0,4291 | 0,4592 | 0,4892 | 0,5193 |
| | Sn [%] | 77,76 | 79,05 | 80,01 | 80,75 | 81,34 | 81,82 | 82,23 | 82,57 | 82,86 | 83,11 | 83,33 | 83,52 | 83,69 |
| 750 | Sn [m ²] | 0,1719 | 0,2044 | 0,2370 | 0,2695 | 0,3021 | 0,3346 | 0,3672 | 0,3997 | 0,4323 | 0,4648 | 0,4974 | 0,5299 | 0,5625 |
| | Sn [%] | 78,57 | 79,87 | 80,84 | 81,59 | 82,19 | 82,67 | 83,08 | 83,42 | 83,72 | 83,97 | 84,19 | 84,39 | 84,56 |
| 800 | Sn [m ²] | 0,1851 | 0,2201 | 0,2552 | 0,2902 | 0,3253 | 0,3603 | 0,3954 | 0,4304 | 0,4655 | 0,5005 | 0,5356 | 0,5706 | 0,6057 |
| | Sn [%] | 79,28 | 80,59 | 81,56 | 82,32 | 82,93 | 83,42 | 83,83 | 84,17 | 84,47 | 84,73 | 84,95 | 85,15 | 85,32 |
| 850 | Sn [m ²] | 0,1983 | 0,2358 | 0,2734 | 0,3109 | 0,3485 | 0,3860 | 0,4236 | 0,4611 | 0,4987 | 0,5362 | 0,5738 | 0,6113 | 0,6489 |
| | Sn [%] | 79,90 | 81,22 | 82,21 | 82,97 | 83,58 | 84,07 | 84,49 | 84,84 | 85,13 | 85,39 | 85,62 | 85,82 | 86,00 |
| 900 | Sn [m ²] | 0,2115 | 0,2515 | 0,2916 | 0,3316 | 0,3717 | 0,4117 | 0,4518 | 0,4918 | 0,5319 | 0,5719 | 0,6120 | 0,6520 | 0,6921 |
| | Sn [%] | 80,45 | 81,78 | 82,78 | 83,54 | 84,16 | 84,66 | 85,07 | 85,42 | 85,72 | 85,98 | 86,21 | 86,41 | 86,59 |
| 950 | Sn [m ²] | 0,2247 | 0,2672 | 0,3098 | 0,3523 | 0,3949 | 0,4374 | 0,4800 | 0,5225 | 0,5651 | 0,6076 | 0,6502 | 0,6927 | 0,7353 |
| | Sn [%] | 80,95 | 82,29 | 83,28 | 84,06 | 84,67 | 85,18 | 85,60 | 85,95 | 86,25 | 86,51 | 86,74 | 86,94 | 87,12 |
| 1000 | Sn [m ²] | 0,2379 | 0,2829 | 0,3280 | 0,3730 | 0,4181 | 0,4631 | 0,5082 | 0,5532 | 0,5983 | 0,6433 | 0,6884 | 0,7334 | 0,7785 |
| | Sn [%] | 81,39 | 82,74 | 83,74 | 84,52 | 85,14 | 85,65 | 86,07 | 86,42 | 86,73 | 86,99 | 87,22 | 87,42 | 87,60 |

| Hn\Wn [mm] | | 950 | 1000 | 1050 | 1100 | 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 | 1500 |
|------------|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 300 | Sn [m ²] | 0,1837 | 0,1938 | 0,2038 | 0,2139 | 0,2239 | 0,2340 | 0,2440 | 0,2541 | 0,2641 | 0,2742 | 0,2842 | 0,2943 |
| | Sn [%] | 66,19 | 66,30 | 66,40 | 66,49 | 66,57 | 66,65 | 66,72 | 66,78 | 66,84 | 66,90 | 66,95 | 66,99 |
| 350 | Sn [m ²] | 0,2294 | 0,2420 | 0,2545 | 0,2671 | 0,2796 | 0,2922 | 0,3047 | 0,3173 | 0,3298 | 0,3424 | 0,3549 | 0,3675 |
| | Sn [%] | 70,65 | 70,76 | 70,87 | 70,96 | 71,05 | 71,13 | 71,21 | 71,27 | 71,34 | 71,39 | 71,45 | 71,50 |
| 400 | Sn [m ²] | 0,2751 | 0,2902 | 0,3052 | 0,3203 | 0,3353 | 0,3504 | 0,3654 | 0,3805 | 0,3955 | 0,4106 | 0,4256 | 0,4407 |
| | Sn [%] | 73,97 | 74,09 | 74,20 | 74,30 | 74,39 | 74,48 | 74,55 | 74,62 | 74,69 | 74,75 | 74,81 | 74,86 |
| 450 | Sn [m ²] | 0,3208 | 0,3384 | 0,3559 | 0,3735 | 0,3910 | 0,4086 | 0,4261 | 0,4437 | 0,4612 | 0,4788 | 0,4963 | 0,5139 |
| | Sn [%] | 76,54 | 76,67 | 76,78 | 76,89 | 76,98 | 77,07 | 77,15 | 77,22 | 77,29 | 77,35 | 77,41 | 77,47 |
| 500 | Sn [m ²] | 0,3665 | 0,3866 | 0,4066 | 0,4267 | 0,4467 | 0,4668 | 0,4868 | 0,5069 | 0,5269 | 0,5470 | 0,5670 | 0,5871 |
| | Sn [%] | 78,59 | 78,72 | 78,84 | 78,95 | 79,05 | 79,13 | 79,22 | 79,29 | 79,36 | 79,43 | 79,49 | 79,54 |
| 550 | Sn [m ²] | 0,4122 | 0,4348 | 0,4573 | 0,4799 | 0,5024 | 0,5250 | 0,5475 | 0,5701 | 0,5926 | 0,6152 | 0,6377 | 0,6603 |
| | Sn [%] | 80,27 | 80,40 | 80,52 | 80,63 | 80,73 | 80,82 | 80,91 | 80,98 | 81,05 | 81,12 | 81,18 | 81,24 |

| Hn\Wn [mm] | | 950 | 1000 | 1050 | 1100 | 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 | 1500 | |
|------------|----------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--|
| 600 | Sn [m ²] | 0,4579 | 0,4830 | 0,5080 | 0,5331 | 0,5581 | 0,5832 | 0,6082 | 0,6333 | 0,6583 | 0,6834 | 0,7084 | 0,7335 | |
| | Sn [%] | 81,66 | 81,80 | 81,92 | 82,03 | 82,13 | 82,22 | 82,31 | 82,39 | 82,46 | 82,53 | 82,59 | 82,65 | |
| 650 | Sn [m ²] | 0,5036 | 0,5312 | 0,5587 | 0,5863 | 0,6138 | 0,6414 | 0,6689 | 0,6965 | 0,7240 | 0,7516 | 0,7791 | 0,8067 | |
| | Sn [%] | 82,84 | 82,98 | 83,10 | 83,21 | 83,32 | 83,41 | 83,50 | 83,58 | 83,65 | 83,72 | 83,78 | 83,84 | |
| 700 | Sn [m ²] | 0,5493 | 0,5794 | 0,6094 | 0,6395 | 0,6695 | 0,6996 | 0,7296 | 0,7597 | 0,7897 | 0,8198 | 0,8498 | 0,8799 | |
| | Sn [%] | 83,85 | 83,99 | 84,11 | 84,22 | 84,33 | 84,42 | 84,51 | 84,59 | 84,67 | 84,74 | 84,80 | 84,86 | |
| 750 | Sn [m ²] | 0,5950 | 0,6276 | 0,6601 | 0,6927 | 0,7252 | 0,7578 | 0,7903 | 0,8229 | 0,8554 | 0,8880 | 0,9205 | 0,9531 | |
| | Sn [%] | 84,72 | 84,86 | 84,99 | 85,10 | 85,21 | 85,30 | 85,39 | 85,47 | 85,55 | 85,62 | 85,68 | 85,74 | |
| 800 | Sn [m ²] | 0,6407 | 0,6758 | 0,7108 | 0,7459 | 0,7809 | 0,8160 | 0,8510 | 0,8861 | 0,9211 | 0,9562 | 0,9912 | 1,0263 | |
| | Sn [%] | 85,48 | 85,62 | 85,75 | 85,87 | 85,97 | 86,07 | 86,16 | 86,24 | 86,32 | 86,39 | 86,45 | 86,51 | |
| 850 | Sn [m ²] | 0,6864 | 0,7240 | 0,7615 | 0,7991 | 0,8366 | 0,8742 | 0,9117 | 0,9493 | 0,9868 | 1,0244 | 1,0619 | 1,0995 | |
| | Sn [%] | 86,15 | 86,30 | 86,42 | 86,54 | 86,65 | 86,75 | 86,84 | 86,92 | 86,99 | 87,07 | 87,13 | 87,19 | |
| 900 | Sn [m ²] | 0,7321 | 0,7722 | 0,8122 | 0,8523 | 0,8923 | 0,9324 | 0,9724 | 1,0125 | 1,0525 | 1,0926 | 1,1326 | 1,1727 | |
| | Sn [%] | 86,75 | 86,89 | 87,02 | 87,14 | 87,25 | 87,35 | 87,44 | 87,52 | 87,60 | 87,67 | 87,74 | 87,80 | |
| 950 | Sn [m ²] | 0,7778 | 0,8204 | 0,8629 | 0,9055 | 0,9480 | 0,9906 | 1,0331 | 1,0757 | 1,1182 | 1,1608 | 1,2033 | 1,2459 | |
| | Sn [%] | 87,28 | 87,43 | 87,56 | 87,68 | 87,78 | 87,88 | 87,97 | 88,06 | 88,14 | 88,21 | 88,28 | 88,34 | |
| 1000 | Sn [m ²] | 0,8235 | 0,8686 | 0,9136 | 0,9587 | 1,0037 | 1,0488 | 1,0938 | 1,1389 | 1,1839 | 1,2290 | 1,2740 | 1,3191 | |
| | Sn [%] | 87,76 | 87,91 | 88,04 | 88,16 | 88,27 | 88,37 | 88,46 | 88,54 | 88,62 | 88,69 | 88,76 | 88,82 | |

Sample order



1. product
2. width
3. height
4. frame on the side of the mechanism
5. frame on the side of the wall
6. mechanism type
7. option: inspection shutter
8. option: thermal protection housing

Approvals and certificates

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



Efectis_1812_CPR_1596

If the product is manipulated in any other way than described in this manual, Rf-Technologies will decline any responsibility and the guarantee will expire!