



## NRWG

Natural smoke and heat exhaust ventilator

### Contents

|   |    |
|---|----|
| Function and use .....                        | 2  |
| Areas of application and requirements .....   | 2  |
| Capacity and classification.....              | 3  |
| Processing.....                               | 4  |
| MODEL NRWG-180/ NRWG-190.....                 | 5  |
| Drives NRWG-180/ NRWG-190.....                | 6  |
| Accessories .....                             | 7  |
| Cross-sections and opening surface areas..... | 8  |
| Dimensions NRWG-180 .....                     | 9  |
| Dimensions NRWG-190 .....                     | 10 |
| Installation information.....                 | 11 |
| Installation NRWG-180 .....                   | 12 |
| Installation NRWG-190 .....                   | 12 |
| Installation accessories NRWG-190 .....       | 13 |
| Weather protection hood (-WSH) .....          | 16 |
| CE marking.....                               | 18 |
| NRWG order code.....                          | 19 |
| FLDS order code .....                         | 20 |
| Order code WSH .....                          | 20 |
| Specification text .....                      | 21 |
| Prior to assembly and commissioning .....     | 22 |
| Maintenance and function .....                | 22 |

### Declaration of Performance

09-53-DoP- JK-180MB-2014-11-01

09-53-DoP-JK-190-2014-11-01

### EC Certificate of Conformity

1368-CPD-C-004/2013

### Performance Reliability Certificate

1368-CPR-C-7050

## FUNCTION AND USE

A natural smoke and heat exhaust ventilator (NRWG) is an important part of a smoke and heat exhaust ventilation system (RWA). In case of fire, it is used to remove hot gases from a building in order to protect people, material property and the environment.

In case of fire, smoke and heat exhaust ventilation systems are supposed to ensure a smoke-free layer near the floor by removing a sufficient amount of the smoke gas from the smoke section. Moreover, in the initial fire, their function is to remove the hot smoke gases released by the fire.

The use of smoke and heat exhaust ventilation systems for creating smoke-free areas under a stable smoke layer is a recognised smoke removal practice. It keeps rescue routes free from smoke, thus assisting the evacuation of people. At the same time, this method can reduce the damage and financial losses caused by the fire. Moreover, this smoke removal method facilitates the fire department's work:

- by improving visibility
- by removing the heat from the roof area
- and by delaying horizontal fire propagation.

This is why a smoke and heat exhaust ventilation system (RWA) constitutes an important safety device that serves for preventive fire protection and must therefore be subjected to regular tests and maintenance. The NRWG described in this brochure is used as an integral part of an RWA overall system.

"EN 12101-2 Smoke and heat control systems, Part 2: Specification for natural smoke and exhaust ventilators" specifies the requirements of an NRWG and regulates the test methods for natural smoke and exhaust ventilators in the roof and façade areas.

### Application range according to DIN 18232-2

"This standard applies to the measurement and installation of natural smoke removal systems (NRA) for rooms with vertical smoke removal via the roof by thermal buoyancy according to DIN 18232-1 for single-storey buildings and the top floor of multi-storey buildings. This standard also applies to the measurement and installation of NRA for rooms with horizontal smoke removal through exterior walls. This standard contains information and definitions that have to be observed when applying these measurement rules and installing NRA."

### Measurement basis according to 18232-2

"The measurement of natural smoke removal systems (NRA) depends on the energy release rate, the calculated fire surface area or measurement group and on the desired thickness of the low-smoke layer and on the room height.

The calculated values given for determining the above-mentioned influence variables are auxiliary variables for measurement and serve exclusively for measurement as specified in this standard.

## AREAS OF APPLICATION AND REQUIREMENTS

The multi-leaf dampers NRWG-180 and NRWG-190 are suitable as natural smoke and exhaust ventilator for installation in the façade area (wall) and roof area<sup>1)</sup> (ceiling).

### REQUIREMENTS

of NRWG systems according to EN 12101-2:

#### Trigger element

Trigger devices must be used that either must be connected to a smoke detector according to EN 54-7 or heat detectors according to EN 54-5 or a different electrical signal that responds to smoke or heat.

Furthermore, prEN 12101-9 and EN 12101-10 must be observed.

#### Opening mechanism

Each NRWG is equipped with an opening mechanism - spring return actuator or direct current actuator.

#### Opening of NRWG

According to EN 12101-2, the NRWG corresponds to type B and can be opened to assume its functional position and closed again by remote control.

#### Inputs and outputs

Inputs and outputs must be present in order to connect the NRWG to the control panel according to EN 12101-9 and power supplies according to EN 12101-10.

-----  
<sup>1)</sup> Installation in a flat roof or slightly inclined roof (max. 10°) with 500 mm flat-roof plinth and mounted louvre hood or roof hood

## CAPACITY AND CLASSIFICATION

### Summary

The classifications for NRWG-180/ NRWG-190 are highlighted in colour.

| Operational safety                           | Snow load | Low ambient temperature | Wind load | Resistance to heat |
|--|-----------|-------------------------|-----------|--------------------|
| Possible classes according to DIN EN 12101-2 |           |                         |           |                    |
| Re A*  | SL A*     | T A*                    | WL A*     | B A*               |
| Re 50  | SL 0      | T 0°C                   | WL 1500   | B 300              |
| Re 1000                                      | SL 125    | T -5°C                  | WL 3000   | B 600              |
|  | SL 250    | T -15°C                 |           |                    |
|  | SL 500    | T -25°C                 |           |                    |
|  | SL 1000   |                         |           |                    |

\*) A is used as wild card for a certain value specified by the manufacturer

### Aerodynamically active opening area

- Geometric opening area multiplied by the flow rate coefficient
- Flow rate coefficient determined experimentally either directly or indirectly from the test results of NRWGs of different sizes or from scaled-down models

### Operational safety

- Proof that the NRWG opens and closes during the number of specified cycles
- The designations A, 50 and 1000 indicate how often the NRWG was opened in the initial test without external load.
- The functional position must be reached within 60 sec.
- When used additionally for ventilation purposes, the functional test must not be carried until the NRWG has been opened 10.000 times in the ventilation position.

### Snow load

- Proof that the NRWG opens and remains open under wind and snow loads
- Indicates the test snow load in Pa (N/m<sup>2</sup>) applied when the opening process is tested.
- When the inclination of the recommended minimum installation angle exceeds 45°, the NRWG may be assigned to class SL 0.

### Low ambient temperature

- Proof of reliable functioning of the opening mechanism of the NRWG at lower temperatures
- Indicates the temperature in °C at which the NRWG will be tested
- NRWGs are suitable for use in buildings in which the temperatures exceed 0 °C.
- For T(00), no low temperature test is required.

### Wind load

- Proof that the NRWG when exposed to wind load remains intact, remains closed and can be opened to assume its functional position after the exposure to the wind load is over.
- Indicates the test load (wind load) in Pa applied during the test
- When exposed to the relevant wind load, the NRWG must not open and not exhibit any permanent deformation.
- Following the test, it must open within 60 sec. after being actuated.

### Resistance to heat

- Proof that the installed NRWG when exposed to fire will open within 60 sec. to assume its functional position and remain there.
- Indicates the temperature in °C at which the NRWG will be tested

## PROCESSING

---

### Frame

---

- Profiled galvanised sheet steel 1,5 mm
- Dimensionally stable
- NRWG-180 - for flush-mounted installation with 180 mm frame depth and mounting plate
- NRWG-190 - for surface-mounted installation with 190 mm frame depth
- Bores for fastening the accessories

### Blades

---

- Hollow-body aluminium blades
- Flow-favouring and torsion-resistant
- Block adjustment in opposite directions

### Seal

---

- EPDM rubber profile

### Bearing

---

- Sintered bearing

### Gear wheels

---

- plastic PA6
- Arranged on one side
- The flow-favouring aluminium blades are jointly adjusted in opposite directions via external plastic gear wheels
- A cover plate protects the gear wheels from external contamination and reduces the risk of injury to persons during assembly and maintenance

### Temperature resistance

---

- Temperature-resistant 0 °C...+80 °C
- Operational safety up to +300 °C according to EN 12101-2
- Allowed ambient temperature actuator -20 °C to +50 °C

### **NOTE**

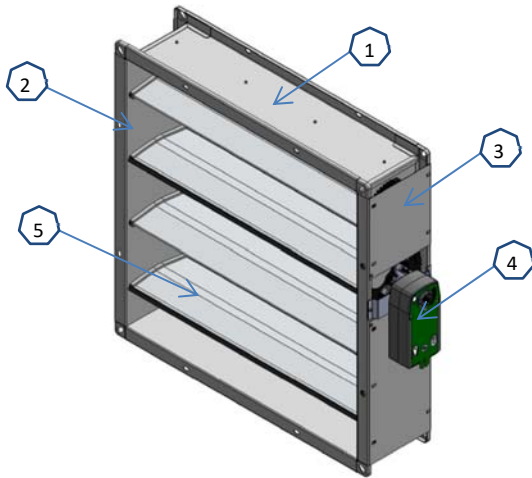
The plastic PA6 has the property of changing its dimensions as a function of the relative humidity. The gear wheels are preconditioned for normal climate 23 °C, 50% of relative humidity. If the multi-leaf damper is to be used in rooms in which the relative humidity is permanently <20% or >80%, it is recommended using stainless steel gear wheels made of V2A instead of plastic gear wheels. Extra charge upon request.

### **NOTE**

For maintenance, service, retrofitting, etc., the required access must be ensured on site.

## MODEL NRWG-180/ NRWG-190

### Components of the multi-leaf damper



### Size chart

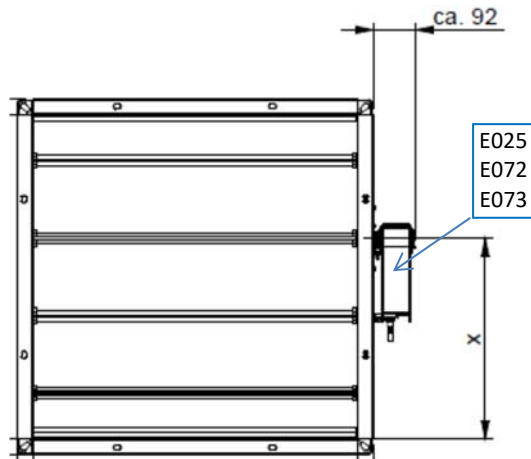
B and H components can be freely selected

| Size Part B in mm | Size Part H in mm | Number of blades | Distance X in mm |
|-------------------|-------------------|------------------|------------------|
| 360               | 360               | 2                | 264              |
| 530               | 530               | 3                | 265              |
| 700               | 700               | 4                | 434              |
| 860               | 860               | 5                | 430              |
| 1030              | 1030              | 6                | 599              |
| 1200              | 1200              | 7                | 600              |

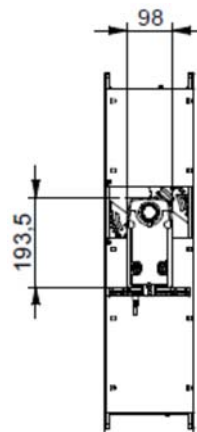
- 1 = Frame (B part)
- 2 = Frame (H part)
- 3 = Actuator side (gear wheel cover)
- 4 = Actuator
- 5 = Blade

### Views and cross-sections

#### Front view



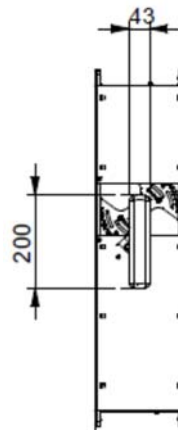
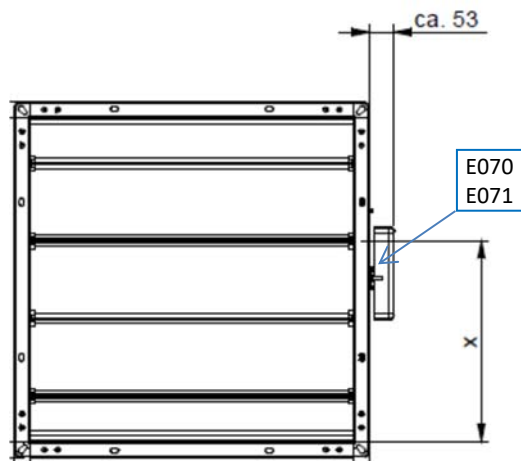
#### Drive side



#### Gear wheels

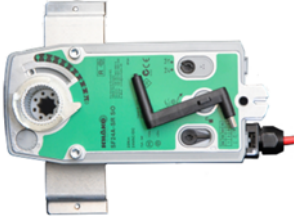


#### Blades



## DRIVES NRWG-180/ NRWG-190

### ACTUATOR



Spring return actuator with emergency control function (currentless open) for adjusting air dampers. For use in openings for smoke removal and in daily ventilation operation. Suitable for interior assembly only.

#### Electrical, with spring return (currentless OPEN)

20 Nm, 24 V AC, 2/3-point (-E025)

20 Nm, 24 V AC/DC, 0-10 V DC with RJ45 plug (-E072)

20 Nm, 24 V AC/DC, 0-10 V DC (-E073)

#### Electrical, with integrated limit switches (accessories)

Actuator with 2 limit switches "CLOSED" and "OPEN" (-IS2) (-E039)

#### Technical data

Technical data and circuit / connection diagrams can be found in the current technical documentation of the Belimo drive.

### DIRECT-CURRENT ACTUATOR (ONLY AVAILABLE ON REQUEST)



Actuator for electromotive opening and closing of NRWG multi-leaf dampers. For use in openings for smoke removal and in daily ventilation operation. Suitable for interior assembly only.

#### Electrical, as DC motor

10 Nm, 24 V DC (-E070)

10 Nm, 24 V DC with RJ45 plug (-E071)

#### Technical data

|                            |                               |
|----------------------------|-------------------------------|
| Type                       | JDSA 10                       |
| Power supply               | 24 VDC + 15%                  |
| Rated current              | 1 A                           |
| Torque                     | 10 Nm                         |
| Breaking load square shaft | 30 Nm                         |
| Angle of rotation          | 90°                           |
| Running time               | approx. 4 sec.                |
| Lifetime                   | >10.000 cycles                |
| Cycle time                 | 30% (running time 10 minutes) |
| Degree of protection       | IP40                          |
| Temp. range                | -5°C...+75°C                  |
| Connection                 | 2,5 m silicone cable          |

### Actuator selection

|        |      | B [mm] |     |     |     |      |      |
|--------|------|--------|-----|-----|-----|------|------|
|        |      | 360    | 530 | 700 | 860 | 1030 | 1200 |
| H [mm] | 360  |        |     |     |     |      |      |
|        | 530  |        |     |     |     |      |      |
|        | 700  |        |     |     |     |      |      |
|        | 860  |        |     |     |     |      |      |
|        | 1030 |        |     |     |     |      |      |
|        | 1200 |        |     |     |     |      |      |

| Drives |  | E025/E039 | E072 | E073 | E070 | E071 |
|--------|--|-----------|------|------|------|------|
|        |  | E025/E039 | E072 | E073 |      |      |

## ACCESSORIES

---

### NRWG-180

---

#### Mounting plate (-MB1)

- Preassembled
- For flush-mounted installation
- Galvanised sheet steel 1,5 mm
- Fastening materials
  - Allen screw
  - Washer
  - Cage nut

#### Wall anchor package 1 (-M1)

Fastening material for fastening mounting plate to masonry

- Anchor bolt
- Sealing tape
- Spacer sleeves
- O-ring

### NRWG-190

---

#### Wall anchor package 2 (-M2)

Fastening material for fastening multi-leaf damper to masonry

- Anchor bolt
- Sealing tape
- Spacer sleeves
- O-ring

#### Wall anchor package 3 (-M3)

Fastening material for fastening accessories to masonry

- Anchor bolt
- Sealing tape
- Spacer sleeves
- O-ring

#### Support sheet (-AB1)

Sheet metal bracket serves for offsetting the fastening holes to avoid chipping on the wall edge

- 2-part
- Galvanised sheet steel 1,5 mm
- Not preassembled
- Incl. screw package for fastening to the NRWG damper

#### Installation frame edge mounting (-ER1 / -ER2)

Installation frame for fastening to ceiling on three sides and for fastening to wall on one side (definition H or B side)

- 2-part
- Galvanised sheet steel 1,5 mm
- Preassembled, but not fastened to the multi-leaf damper
- Incl. screw package for fastening to the NRWG damper

#### Installation frame corner mounting (-ER3 / -ER4)

Installation frame for fastening to ceiling on two sides and for fastening to wall on two sides

- 2-part
- Galvanised sheet steel 1,5 mm
- Preassembled, but not fastened to the multi-leaf damper
- Incl. screw package for fastening to the NRWG damper

#### NOTE

Screw package 1

- for B and H dimensions <1030 mm
  - M6 screws
  - M6 cage nuts
  - M6 U-washers
  - M6 nuts

Screw package 2

- for B or H dimensions <1030 mm
  - M6 screws
  - M6 cage nuts
  - M6 U-washers
  - M6 nuts

### WEATHER PROTECTION HOOD (-WSH)

---

Design as plinth with roof hood (-D) or louvre hood (-L)

- Bird protection grille on the entire ventilation surface area
- Galvanised sheet steel 1.2 mm
- Hood spot welded and riveted

### FLAT-ROOF PLINTH (-FLDS)

---

Model depends on the choice of NRWG

- Condensate channel with drain pipe in plinth part
- Galvanised sheet steel 1,2 mm
- Plinth spot welded

## CROSS-SECTIONS AND OPENING SURFACE AREAS

### GEOMETRIC OPENING SURFACE AREA (AV)

| Av [m <sup>2</sup> ] |      | B [mm] |       |       |       |       |       |
|----------------------|------|--------|-------|-------|-------|-------|-------|
|                      |      | 360    | 530   | 700   | 860   | 1030  | 1200  |
| H<br>[mm]            | 360  | 0,130  | 0,191 | 0,525 | 0,310 | 0,371 | 0,432 |
|                      | 530  | 0,191  | 0,281 | 0,371 | 0,456 | 0,546 | 0,636 |
|                      | 700  | 0,252  | 0,371 | 0,490 | 0,602 | 0,721 | 0,840 |
|                      | 860  | 0,310  | 0,456 | 0,602 | 0,740 | 0,886 | 1,032 |
|                      | 1030 | 0,371  | 0,546 | 0,721 | 0,886 | 1,061 | 1,236 |
|                      | 1200 | 0,432  | 0,636 | 0,840 | 1,032 | 1,236 | 1,440 |

### FREE CROSS-SECTION (FQ)

| FQ [m <sup>2</sup> ] |      | B [mm] |       |       |       |       |       |
|----------------------|------|--------|-------|-------|-------|-------|-------|
|                      |      | 360    | 530   | 700   | 860   | 1030  | 1200  |
| H<br>[mm]            | 360  | 0,104  | 0,154 | 0,203 | 0,249 | 0,299 | 0,348 |
|                      | 530  | 0,157  | 0,231 | 0,305 | 0,374 | 0,448 | 0,522 |
|                      | 700  | 0,209  | 0,307 | 0,406 | 0,499 | 0,597 | 0,696 |
|                      | 860  | 0,261  | 0,384 | 0,508 | 0,624 | 0,747 | 0,870 |
|                      | 1030 | 0,313  | 0,461 | 0,609 | 0,748 | 0,896 | 1,044 |
|                      | 1200 | 0,365  | 0,538 | 0,711 | 0,873 | 1,045 | 1,218 |

### FLOW RATE COEFFICIENT (CV)

| Cv [m <sup>2</sup> ] |      | B [mm] |      |      |      |      |      |
|----------------------|------|--------|------|------|------|------|------|
|                      |      | 360    | 530  | 700  | 860  | 1030 | 1200 |
| H<br>[mm]            | 360  | 0,67   | 0,67 | 0,68 | 0,69 | 0,70 | 0,71 |
|                      | 530  | 0,68   | 0,68 | 0,68 | 0,69 | 0,70 | 0,71 |
|                      | 700  | 0,68   | 0,68 | 0,68 | 0,69 | 0,70 | 0,71 |
|                      | 860  | 0,68   | 0,68 | 0,69 | 0,69 | 0,70 | 0,70 |
|                      | 1030 | 0,69   | 0,69 | 0,69 | 0,70 | 0,70 | 0,70 |
|                      | 1200 | 0,69   | 0,69 | 0,69 | 0,70 | 0,70 | 0,70 |

### AERODYNAMICALLY ACTIVE OPENING SURFACE AREA

#### (AA)

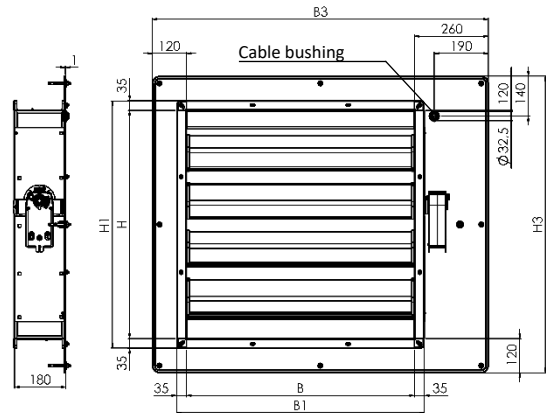
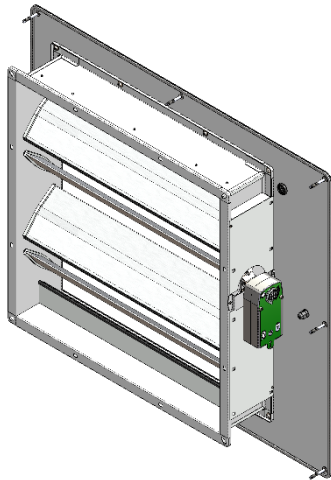
| Aa [m <sup>2</sup> ] |      | B [mm] |       |       |       |       |       |
|----------------------|------|--------|-------|-------|-------|-------|-------|
|                      |      | 360    | 530   | 700   | 860   | 1030  | 1200  |
| H<br>[mm]            | 360  | 0,087  | 0,128 | 0,171 | 0,214 | 0,260 | 0,307 |
|                      | 530  | 0,130  | 0,191 | 0,252 | 0,315 | 0,382 | 0,452 |
|                      | 700  | 0,171  | 0,252 | 0,333 | 0,415 | 0,505 | 0,596 |
|                      | 860  | 0,211  | 0,310 | 0,415 | 0,510 | 0,620 | 0,722 |
|                      | 1030 | 0,256  | 0,377 | 0,497 | 0,620 | 0,743 | 0,865 |
|                      | 1200 | 0,298  | 0,439 | 0,580 | 0,722 | 0,865 | 1,008 |

### AERODYNAMICALLY ACTIVE OPENING SURFACE AREA WITH WEATHER PROTECTION HOOD

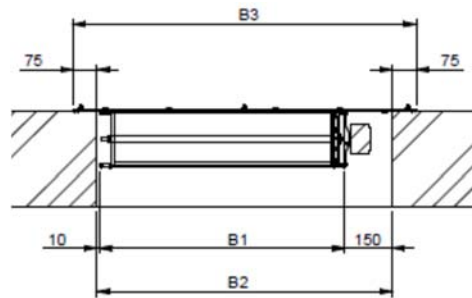
When using the NRWG multi-leaf damper with weather protection hood, the value of the aerodynamically active opening surface area of the weather protection hood must be taken into account.



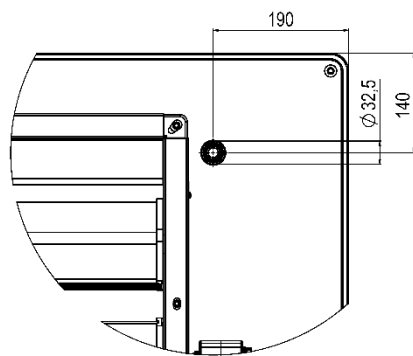
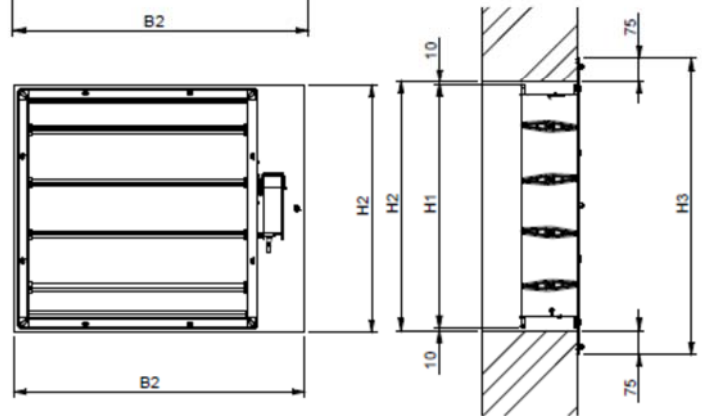
**DIMENSIONS NRWG-180**



| Clear opening | External dimension frame | Wall opening | Mounting plate |
|---------------|--------------------------|--------------|----------------|
| B             | B1                       | B2           | B3             |
| 360           | 430                      | 590          | 740            |
| 530           | 600                      | 760          | 910            |
| 700           | 770                      | 930          | 1080           |
| 860           | 930                      | 1090         | 1240           |
| 1030          | 1100                     | 1260         | 1410           |
| 1200          | 1270                     | 1430         | 1580           |



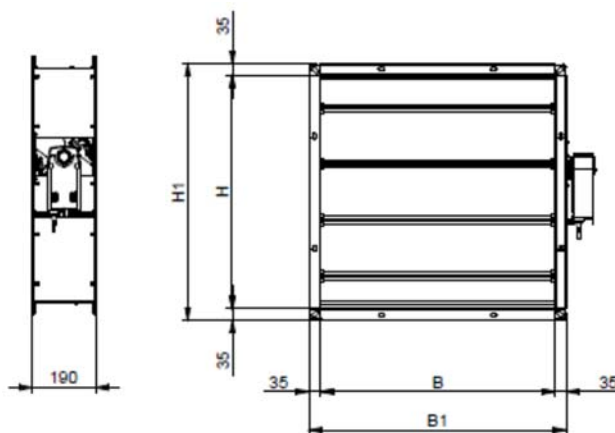
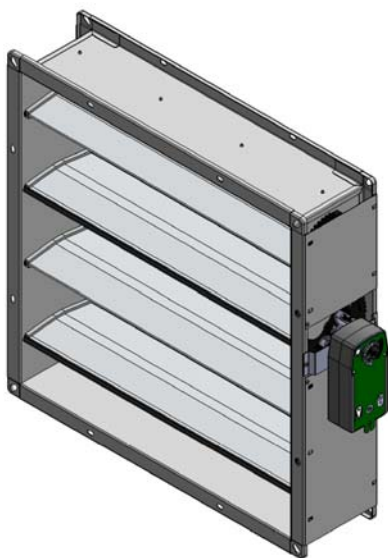
| Clear opening | External dimension frame | Wall opening | Mounting plate |
|---------------|--------------------------|--------------|----------------|
| H             | H1                       | H2           | H3             |
| 360           | 430                      | 450          | 600            |
| 530           | 600                      | 620          | 770            |
| 700           | 770                      | 790          | 940            |
| 860           | 930                      | 950          | 1100           |
| 1030          | 1100                     | 1120         | 1270           |
| 1200          | 1270                     | 1290         | 1440           |



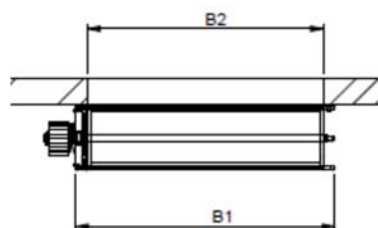
**Cable bushing in the mounting plate**

In order to be able to feed a cable through the mounting plate area, a stepped spigot is mounted in factory. If necessary, this stepped spigot can be cut during the assembly to feed a cable through and can be used for cables with a diameter between 13 and 26,5 mm. The cable bushing has the degree of protection IP55.

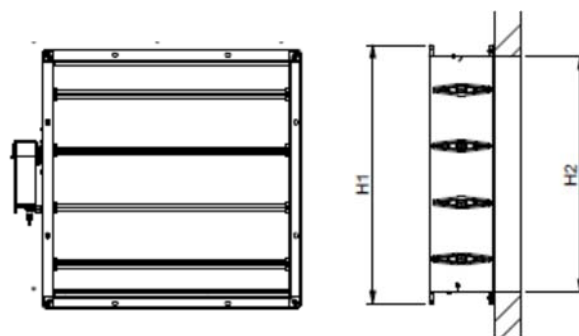
**DIMENSIONS NRWG-190**



| Clear opening | External dimension frame | Wall opening |
|---------------|--------------------------|--------------|
| <b>B</b>      | <b>B1</b>                | <b>B2</b>    |
| <b>360</b>    | 430                      | 360          |
| <b>530</b>    | 600                      | 530          |
| <b>700</b>    | 770                      | 700          |
| <b>860</b>    | 930                      | 860          |
| <b>1030</b>   | 1100                     | 1030         |
| <b>1200</b>   | 1270                     | 1200         |



| Clear opening | External dimension frame | Wall opening |
|---------------|--------------------------|--------------|
| <b>H</b>      | <b>H1</b>                | <b>H2</b>    |
| <b>360</b>    | 430                      | 360          |
| <b>530</b>    | 600                      | 530          |
| <b>700</b>    | 770                      | 700          |
| <b>860</b>    | 930                      | 860          |
| <b>1030</b>   | 1100                     | 1030         |
| <b>1200</b>   | 1270                     | 1200         |



## INSTALLATION INFORMATION

The multi-leaf dampers must not be tilted during installation. Otherwise, this may result in problems with the adjustment mechanism or in leaks.

The multi-leaf dampers are delivered in open position (currentless OPEN) and must be mounted as such.

NRWGs must be installed such that external forces do not impair their permanent functioning.

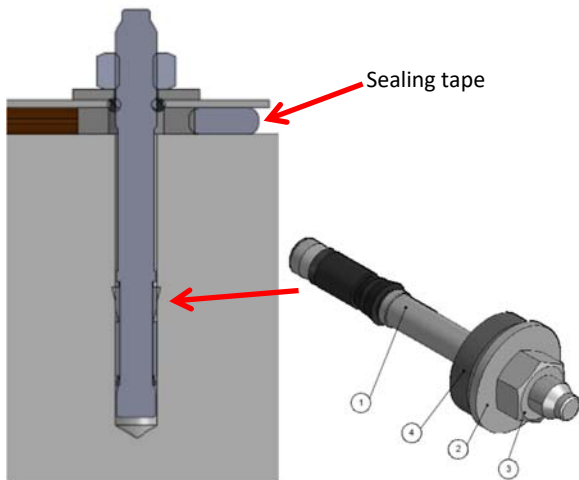
They must be fastened by means of suitable mounting materials approved by the building supervisory authorities (see Accessories) in accordance with the mounting instructions.

Protection from weather conditions must be guaranteed on site!

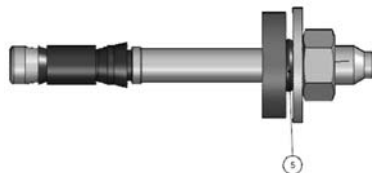
### Fastening materials

#### Multi-leaf damper / Accessories - Masonry

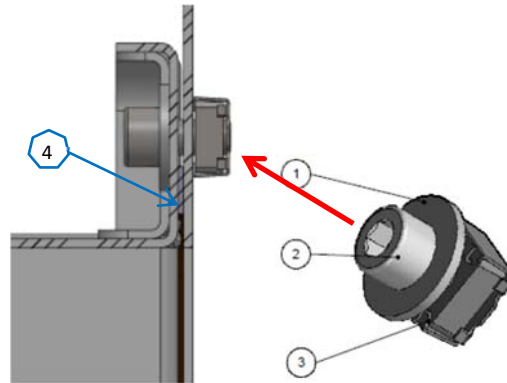
Anchor bolt: drilling depth = 75 mm; drilling diameter = 8 mm



- 1 = Anchor bolt
- 2 = Washer
- 3 = Hexagon nut
- 4 = Spacer disc
- 5 = O-ring



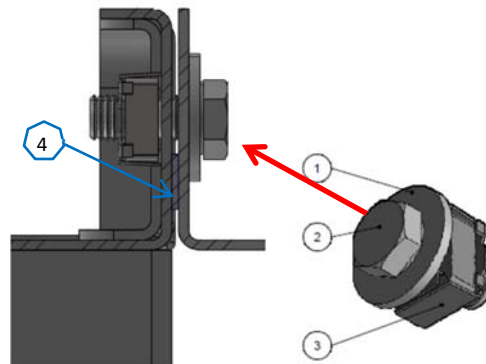
#### Multi-leaf damper – Mounting plate (NRWG-180)



- 1 = Washer
- 2 = Allen screw
- 3 = Cage nut
- 4 = Sealing tape

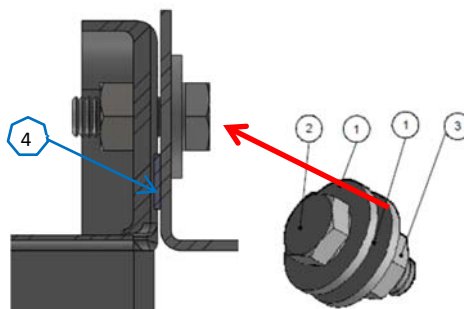
#### Multi-leaf damper - Accessories (NRWG-190)

##### B and H sides



- 1 = Washer
- 2 = Allen screw
- 3 = Cage nut
- 4 = Sealing tape

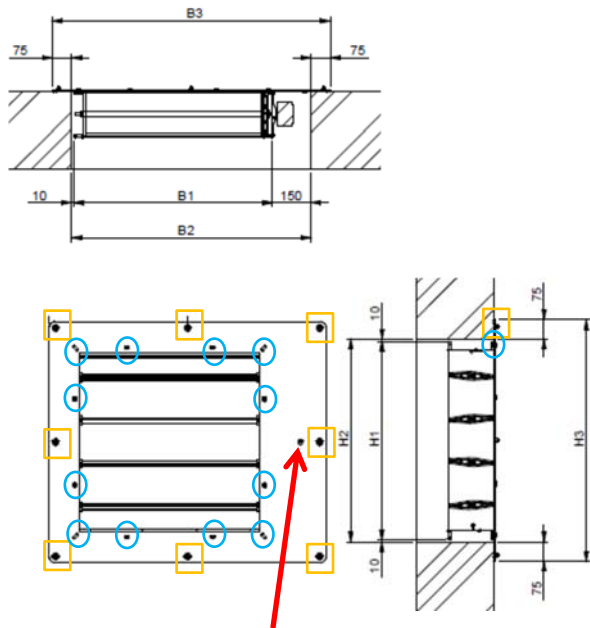
##### Corner



- 1 = Washer
- 2 = Allen screw
- 3 = Hexagon nut
- 4 = Sealing tape

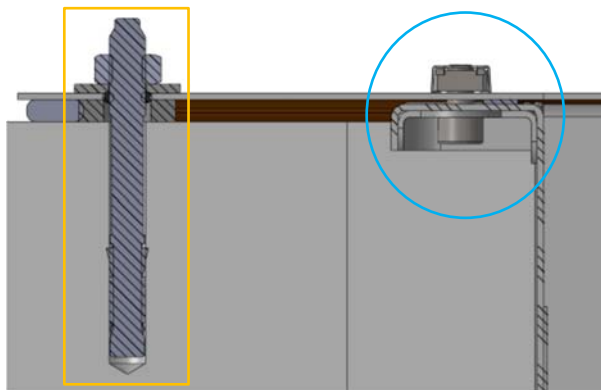
## INSTALLATION NRWG-180

### Fastening points



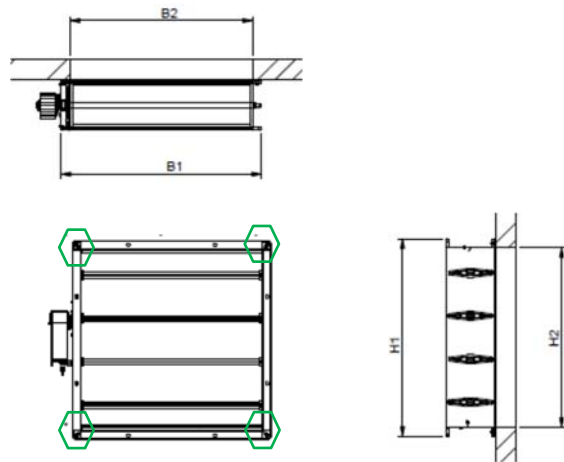
If required, the connecting cable of the actuator must be run through the opening provided in the mounting plate and fastened using the cable traction relief premounted on the connecting cable.

### Detail

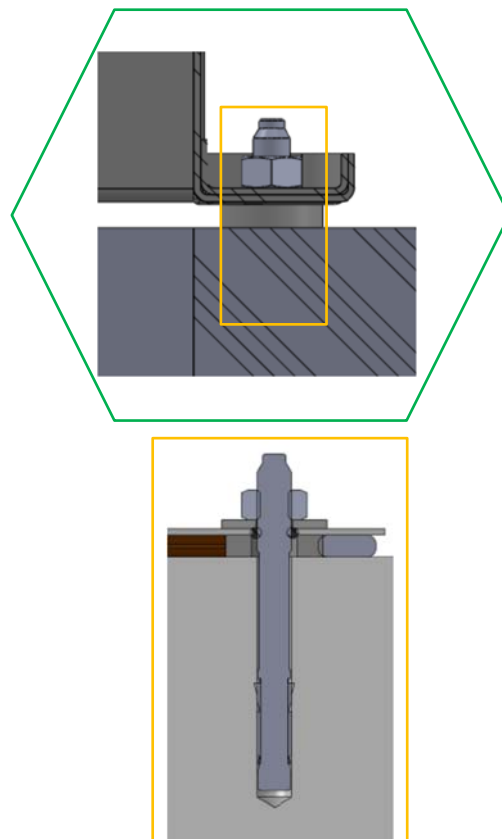


## INSTALLATION NRWG-190

### Fastening points

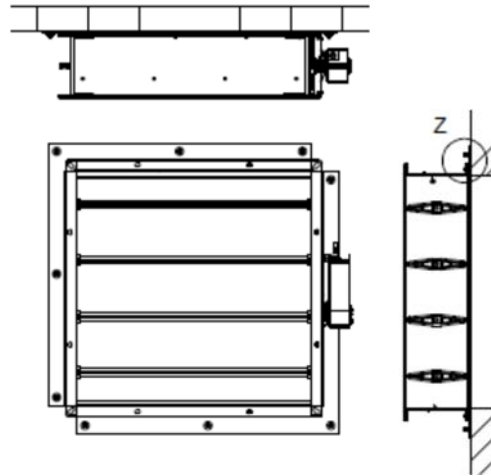
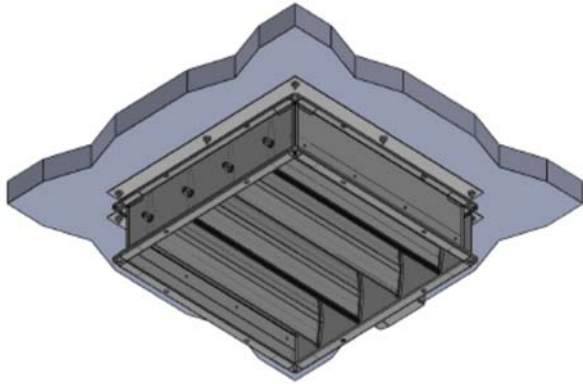


### Detail

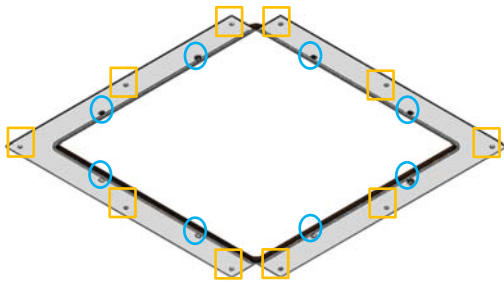


## INSTALLATION ACCESSORIES NRWG-190

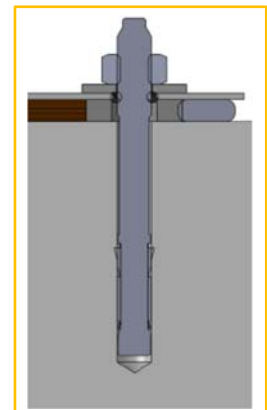
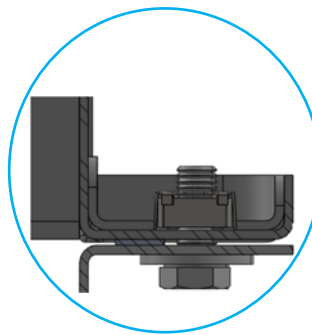
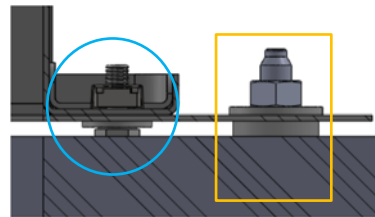
### Support sheet (-AB1)



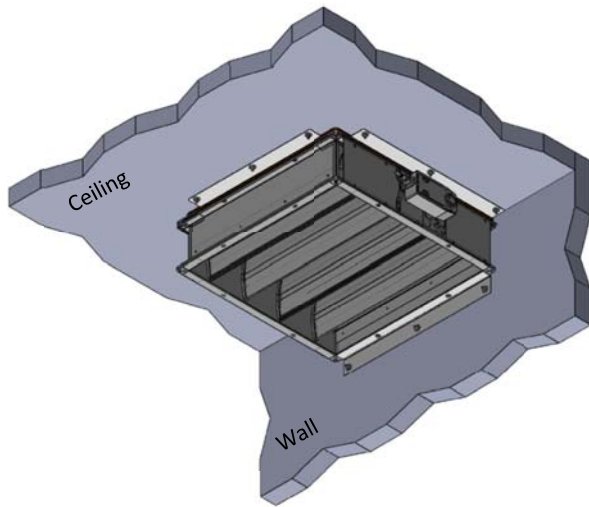
### Fastening points



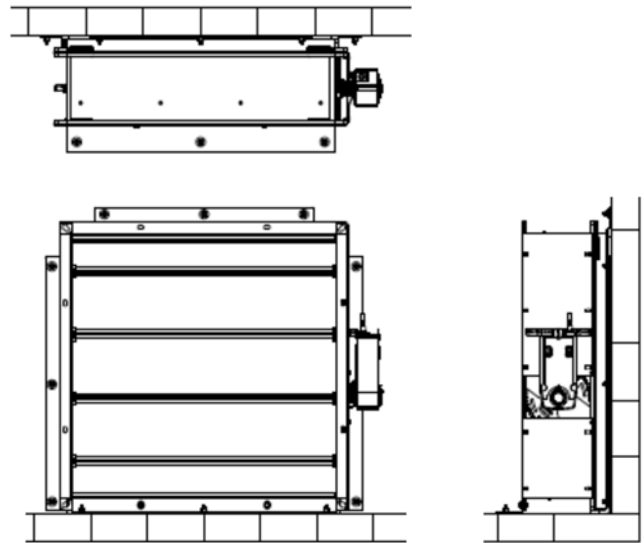
### Detail



**Installation frame edge mounting (-ER1 / -ER2)**



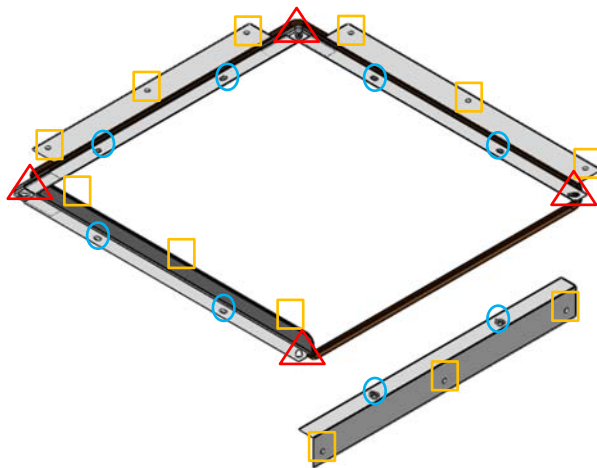
shown: -ER2



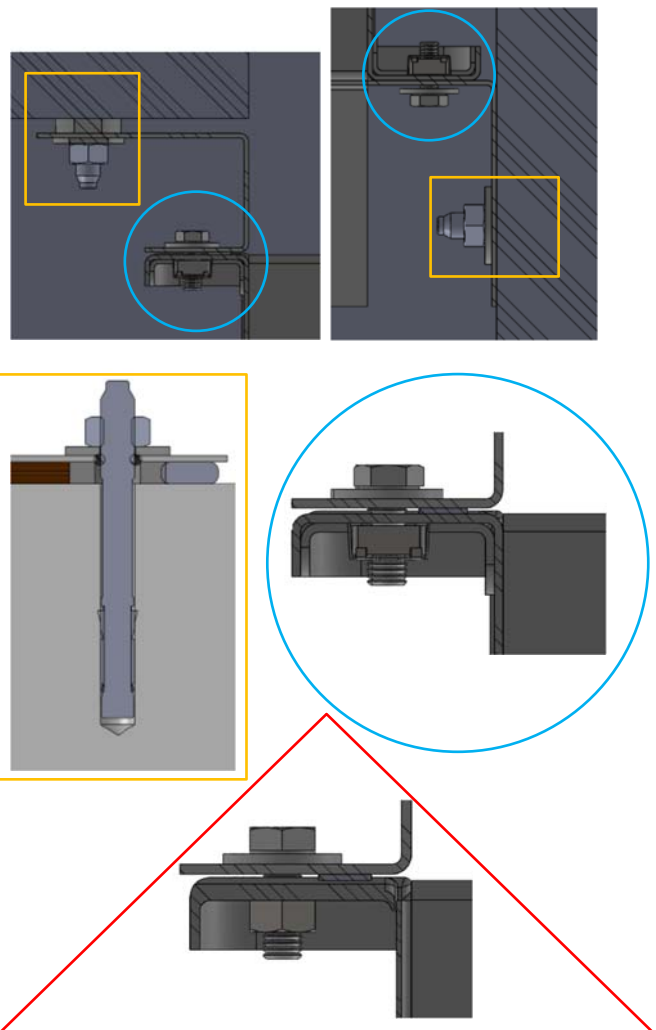
**Selection**

- ER1 fastened to the wall via the bracket on the **H** part of the multi-leaf damper (opposite side of the actuator)
- ER2 fastened to the wall via the bracket on one of the two **B** parts of the multi-leaf damper

**Fastening points**

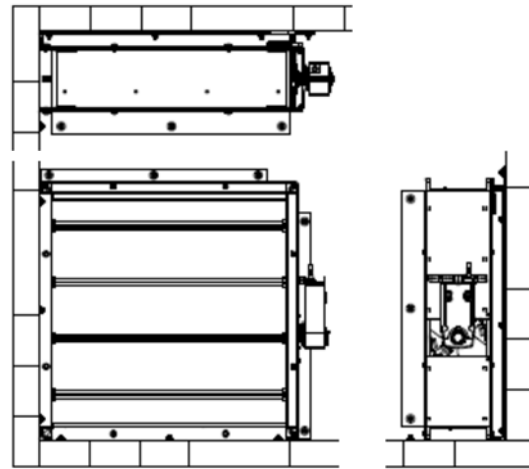
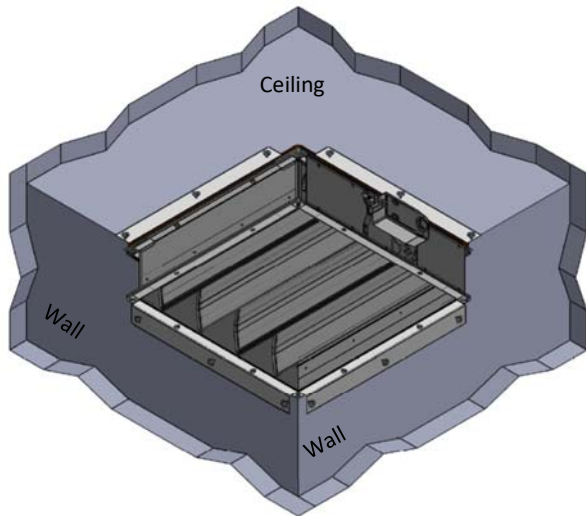


**Detail**

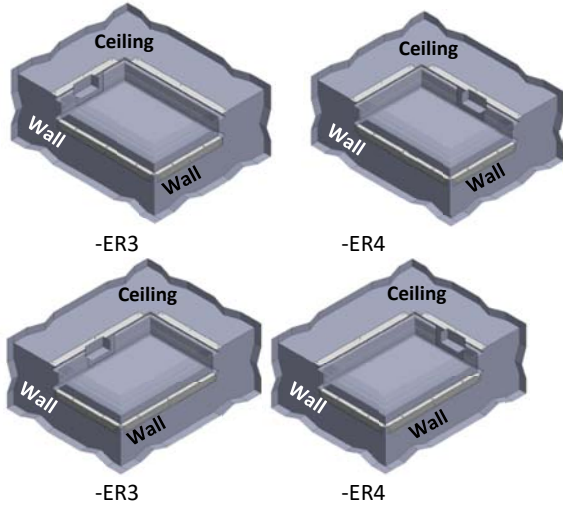




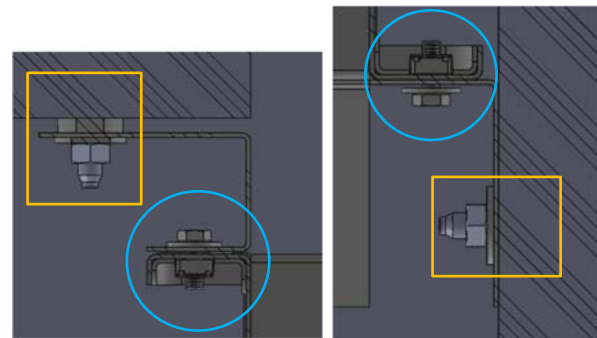
**Installation frame corner mounting (-ER3 / -ER4)**



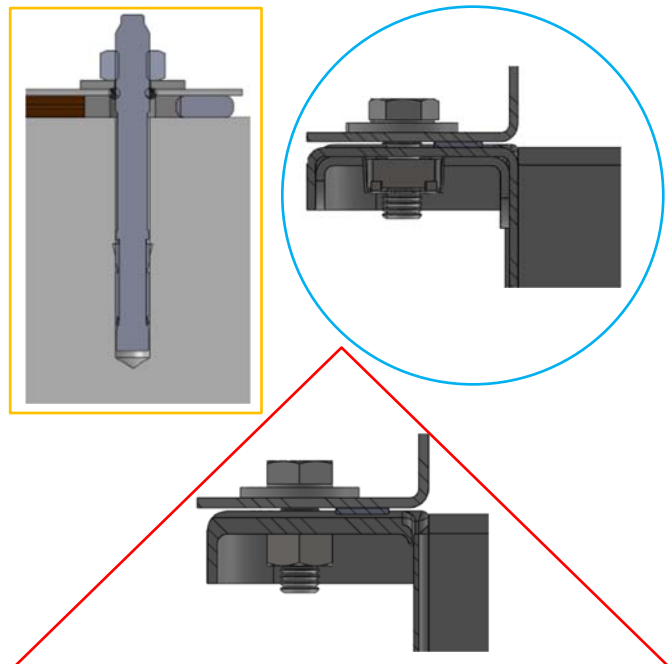
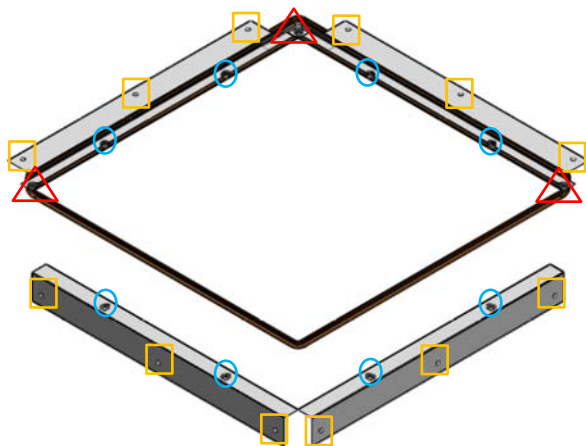
**Selection (viewing direction from inside to outside)**



**Detail**



**Fastening points**

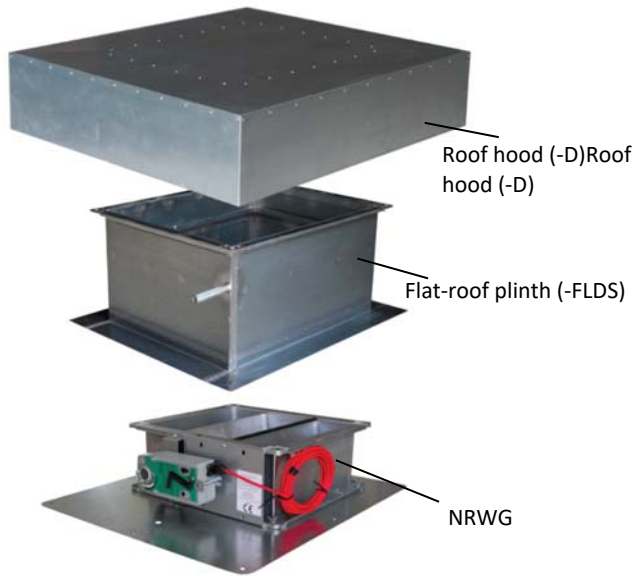


### WEATHER PROTECTION HOOD (-WSH)

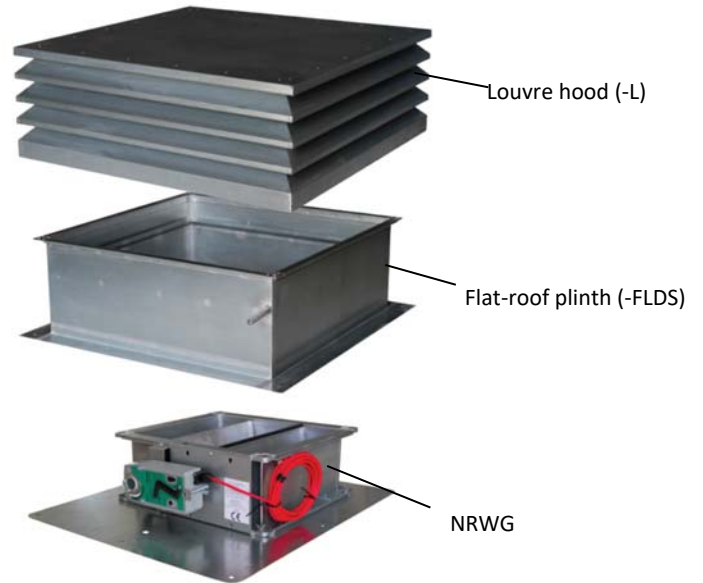
- Flat-roof plinth (-FLDS) with connection point on multi-leaf damper
- Roof hood or louvre hood as weather protection
- Access possible to NRWG for maintenance and actuator replacement
- To be mounted before attaching the thermal roof insulation (connection to insulation on site)

#### MODELS:

##### Roof hood (-D)Roof hood (-D)



##### Louvre hood (-L)



#### Aerodynamically active opening area - Roof hood

| Aa [m <sup>2</sup> ] |      | B [mm] |       |       |       |       |       |
|----------------------|------|--------|-------|-------|-------|-------|-------|
|                      |      | 360    | 530   | 700   | 860   | 1030  | 1200  |
| H [mm]               | 360  | 0,060  | -     | -     | -     | -     | -     |
|                      | 530  | -      | 0,130 | -     | -     | -     | -     |
|                      | 700  | -      | -     | 0,240 | -     | -     | -     |
|                      | 860  | -      | -     | -     | 0,360 | -     | -     |
|                      | 1030 | -      | -     | -     | -     | 0,500 | -     |
|                      | 1200 | -      | -     | -     | -     | -     | 0,660 |

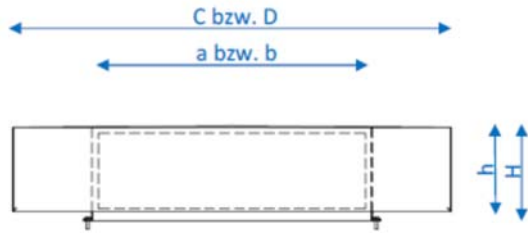
#### Aerodynamically active opening area - Louvre hood

| Aa [m <sup>2</sup> ] |      | B [mm] |       |       |       |       |       |
|----------------------|------|--------|-------|-------|-------|-------|-------|
|                      |      | 360    | 530   | 700   | 860   | 1030  | 1200  |
| H [mm]               | 360  | 0,040  | -     | -     | -     | -     | -     |
|                      | 530  | -      | 0,080 | -     | -     | -     | -     |
|                      | 700  | -      | -     | 0,150 | -     | -     | -     |
|                      | 860  | -      | -     | -     | 0,230 | -     | -     |
|                      | 1030 | -      | -     | -     | -     | 0,340 | -     |
|                      | 1200 | -      | -     | -     | -     | -     | 0,460 |



### Hood design

#### Roof hood (-D)



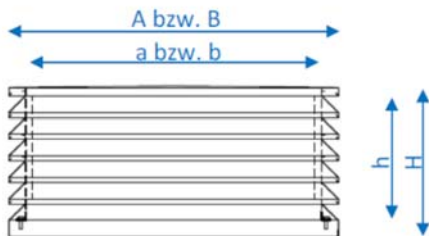
#### Rectangular roof hood (NRWG-180)

| C    | D    | a    | b    | H   | h   |
|------|------|------|------|-----|-----|
| 870  | 750  | 570  | 450  | 250 | 220 |
| 1040 | 920  | 740  | 620  | 250 | 220 |
| 1210 | 1090 | 910  | 790  | 250 | 220 |
| 1470 | 1350 | 1070 | 950  | 300 | 270 |
| 1640 | 1520 | 1240 | 1120 | 350 | 320 |
| 1910 | 1790 | 1410 | 1290 | 400 | 370 |

#### Square roof hood (NRWG-190)

| C    | D    | a    | b    | H   | h   |
|------|------|------|------|-----|-----|
| 690  | 690  | 390  | 390  | 250 | 220 |
| 860  | 860  | 560  | 560  | 250 | 220 |
| 1030 | 1030 | 730  | 730  | 250 | 220 |
| 1390 | 1390 | 890  | 890  | 300 | 270 |
| 1560 | 1560 | 1060 | 1060 | 350 | 320 |
| 1730 | 1730 | 1230 | 1230 | 400 | 370 |

#### Louvre hood (-L)



#### Rectangular louvre hood (NRWG-180)

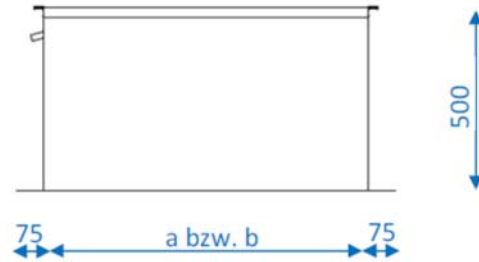
| A    | B    | a    | b    | H   | h   |
|------|------|------|------|-----|-----|
| 670  | 550  | 570  | 450  | 320 | 245 |
| 840  | 720  | 740  | 620  | 320 | 245 |
| 1010 | 890  | 910  | 790  | 320 | 245 |
| 1170 | 1050 | 1070 | 950  | 385 | 310 |
| 1340 | 1220 | 1240 | 1120 | 450 | 375 |
| 1510 | 1390 | 1410 | 1290 | 515 | 440 |

#### Square louvre hood (NRWG-190)

| A    | B    | a    | b    | H   | h   |
|------|------|------|------|-----|-----|
| 490  | 490  | 390  | 390  | 320 | 245 |
| 660  | 660  | 560  | 560  | 320 | 245 |
| 830  | 830  | 730  | 730  | 385 | 310 |
| 990  | 990  | 890  | 890  | 450 | 375 |
| 1160 | 1160 | 1060 | 1060 | 450 | 375 |
| 1330 | 1330 | 1230 | 1230 | 515 | 440 |

### Plinth design

#### Flat-roof plinth (-FLDS)



#### rectangular (NRWG-180)



| FQ [m <sup>2</sup> ] |          | B (a) |       |       |       |       |       |      |
|----------------------|----------|-------|-------|-------|-------|-------|-------|------|
| H (b)                | NRWG-180 | 360   | 530   | 700   | 860   | 1030  | 1200  |      |
|                      |          | Base  | 570   | 740   | 910   | 1070  | 1240  | 1410 |
| 360                  | 450      | 0,104 |       |       |       |       |       |      |
| 530                  | 620      |       | 0,231 |       |       |       |       |      |
| 700                  | 790      |       |       | 0,406 |       |       |       |      |
| 860                  | 950      |       |       |       | 0,624 |       |       |      |
| 1030                 | 1120     |       |       |       |       | 0,896 |       |      |
| 1200                 | 1290     |       |       |       |       |       | 1,218 |      |

#### square (NRWG-180)



| FQ [m <sup>2</sup> ] |          | B (a) |       |       |       |       |       |      |
|----------------------|----------|-------|-------|-------|-------|-------|-------|------|
| H (b)                | NRWG-180 | 360   | 530   | 700   | 860   | 1030  | 1200  |      |
|                      |          | Base  | 390   | 560   | 730   | 890   | 1060  | 1230 |
| 360                  | 390      | 0,104 |       |       |       |       |       |      |
| 530                  | 560      |       | 0,231 |       |       |       |       |      |
| 700                  | 730      |       |       | 0,406 |       |       |       |      |
| 860                  | 890      |       |       |       | 0,624 |       |       |      |
| 1030                 | 1060     |       |       |       |       | 0,896 |       |      |
| 1200                 | 1230     |       |       |       |       |       | 1,218 |      |

**CE MARKING**

**NRWG-180**

|  |    |
|--|----|
| <br>1368  | 13 |
| SCHAKO Klima-Luft<br>Ferdinand Schad KG<br>Steigstraße 25–27<br>78600 Kolbingen<br>2019<br>09-53-DoP-JK-180MB-2014-11-01   |    |
| <b>EN 12101-2:2003-09</b><br>Natürliches Rauch- und Wärmeabzugsgerät<br>Natural smoke and heat exhaust ventilator<br>Typ   type<br><b>NRWG-180-0360-0360-E072-MB1-M0</b> |    |
| $A_a / A_v = 0,087 / 0,130 \text{ m}^2$<br>Re 1000 (Typ B) mit Doppelfunktion,<br>SL0, T(-00), WL150, B300   |    |
|    |    |

**NRWG-190**

|  |    |
|--|----|
| <br>1368  | 13 |
| SCHAKO Klima-Luft<br>Ferdinand Schad KG<br>Steigstraße 25–27<br>78600 Kolbingen<br>2019<br>09-53-DoP-JK-190-2014-11-01   |    |
| <b>EN 12101-2:2003-09</b><br>Natürliches Rauch- und Wärmeabzugsgerät<br>Natural smoke and heat exhaust ventilator<br>Typ   type<br><b>NRWG-190-0360-0360-E072-ER0-M0</b> |    |
| $A_a / A_v = 0,087 / 0,130 \text{ m}^2$<br>Re 1000 (Typ B) mit Doppelfunktion,<br>SL0, T(-00), WL150, B300   |    |
|   |    |

## NRWG ORDER CODE

| 01             | 02    | 03    | 04     | 05       | 06        | 07              |
|----------------|-------|-------|--------|----------|-----------|-----------------|
| Type           | Model | Width | Height | Actuator | Fastening | Mounting (wall) |
| <b>Example</b> |       |       |        |          |           |                 |
| NRWG           | -180  | -0360 | -0360  | -E025    | -MB1      | -M0             |

All fields must be filled when ordering.

### Sample

**NRWG-180-0360-0360-E024-ER0-M0**

Multi-leaf dampers, rectangular design as a natural smoke and heat exhaust ventilator | for flush-mounted installation in wall/ceiling, with frame depth 180 mm and mounting plate | width 360 mm | height 360 mm | actuator with spring return, 20 Nm, 24 V AC/DC, 2/3-point | with mounting plate | without wall anchor package

### ORDER DETAILS

#### 01 - Type

NRWG= multi-leaf dampers, rectangular design as a natural smoke and heat exhaust ventilator

#### 02 - Model

180 = for flush-mounted installation in wall and ceiling with 180 mm frame depth and mounting plate (Standard)

190 = for mounting in front of the wall/ceiling (surface-mounted installation) with 190 mm frame depth

#### 03 - Width

0360 = 360 mm

0530 = 530 mm

0700 = 700 mm

0860 = 860 mm

1030 = 1030 mm

1200 = 1200 mm

#### 04 - Height

0360 = 360 mm

0530 = 530 mm

0700 = 700 mm

0860 = 860 mm

1030 = 1030 mm

1200 = 1200 mm

#### 05 - Actuator

E025 = actuator with spring return, 20 Nm, 24 V AC/DC, 2/3-point

E072 = actuator with spring return, 20 Nm, 24 V AC/DC, 0-10 V DC with RJ45 plug (standard)

E073 = actuator with spring return, 20 Nm, 24 V AC/DC, 0-10 V DC

E039 = actuator with spring return, 20 Nm, 24 V AC/DC, 2/3 point, with 2 limit switches "CLOSED" and "OPEN" (-IS2)

#### 06 - Fastening

ER0 = without mounting frame (only possible for NRWG-190)

MB1 = with mounting plate, part of NRWG-180 (not possible for NRWG-190)

AB1 = with support sheet (incl. screw package) (only available for NRWG-190)

ER1 = with installation frame for fastening to ceiling on three sides and for fastening to wall on one side on H part (incl. screw package) (only possible for NRWG-190)

ER2 = with installation frame for fastening to ceiling on three sides and for fastening to wall on one side on B part (incl. screw package) (only possible for NRWG-190)

ER3 = with installation frame for fastening to ceiling on two sides and for fastening to wall on two sides with actuator position on the right (incl. screw package) (only available for NRWG-190)

ER4 = with installation frame for fastening to ceiling on two sides and for fastening to wall on two sides with actuator position on the left (incl. screw package) (only available for NRWG-190)

#### 07 - Mounting (wall)

M0 = without wall anchor package (standard)

M1 = with wall anchor package 1 for fastening mounting plate to masonry (only for NRWG-180)

M2 = with wall anchor package 2 for fastening multi-leaf damper to the masonry (width and height <1030 mm) (for NRWG-190 only)

M3 = with wall anchor package 3 for fastening multi-leaf damper to the masonry (width or height >1030 mm) (for NRWG-190 only)

### FLDS ORDER CODE

| 01             | 02      | 03       |
|----------------|---------|----------|
| Type           | Width a | Length b |
| <b>Example</b> |         |          |
| FLDS           | -0860   | -1030    |

All fields must be filled when ordering.

**Sample**  
**FLDS-0860-1030**

Flat-roof plinth for NRWG-180 / -190 | width 0860 mm | length 1030 mm

#### ORDER DETAILS

##### 01 - Type

FLDS = Flat-roof plinth for NRWG-180 / -190

##### 02 - Width a

xxxx = depending on the size of NRWG-180 / -190  
 (always with 4 digits in mm)

##### 03 - Length b

xxxx = depending on the size of NRWG-180 / -190  
 (always with 4 digits in mm)

### ORDER CODE WSH

| 01             | 02          | 03    | 04     |
|----------------|-------------|-------|--------|
| Type           | Hood design | Width | Length |
| <b>Example</b> |             |       |        |
| WSH            | -D          | -0860 | -1030  |

All fields must be filled when ordering.

**Sample**  
**WSH-D-0860-1030**

Weather protection hood for NRWG-180 / -190 | roof hood | width 0860 mm | length 1030 mm

#### ORDER DETAILS

##### 01 - Type

WSH = Weather protection hood for NRWG-180 / -190

##### 02 - Hood design

D = roof hood  
 L = louvre hood

##### 03 - Width C or A

xxxx = depending on the width of the plinth design  
 (always with 4 digits in mm)

##### 04 - Length D or B

xxxx = depending on the length of the plinth design  
 (always with 4 digits)

## SPECIFICATION TEXT

### NRWG-180

NRWG multi-leaf damper, housing leakage class C and leakage with closed damper leaf class 3 to DIN EN 1751, consisting of a dimensionally stable profiled frame made of 1,5 mm galvanised sheet steel, frame depth 180 mm with joint flow-favouring hollow-body blades adjustable in opposite directions made of torsion-resistant aluminium profile.

The blades are adjusted by means of external plastic gear wheels arranged on one side.

- with sintered bearing
- TÜV inspected according to VDI 6022 Sheets 1+2 and DIN EN1751
- With mounting plate for flush-mounted installation in wall and ceiling<sup>2)</sup>

Electric actuator with spring return (currentless OPEN)

- 20 Nm, 24 V AC/DC, 2/3-point (-E025)
- 20 Nm, 24 V AC/DC, 0-10 V DC with RJ45 plug(-E072)
- 20 Nm, 24 V AC/DC, 0-10 V DC (-E073)

Electric actuator with integrated limit switches

- 2 limit switches, CLOSED and OPEN (-IS2)

Direct-current actuator

- 10 Nm, 24 V DC (-E070)
- 10 Nm, 24 V DC with RJ45 plug (-E071)

Accessories:

- Wall anchor package 1 (-M1)
- Weather protection hood (-WSH)
  - Flat-roof plinth (-FLDS)
  - Roof hood (-D) / Louvre hood (-L)

Tested and certified to DIN EN 12101-2 in at least the following model:

- Re1000
- SLO
- T(00)
- WL1500
- B300
- Type B with double function

Product: SCHAKO type NRWG-180  
 Nominal size: ..... x ..... mm,  
 Aa = ..... m<sup>2</sup>  
 Empty space in the building shell: ..... x ..... mm  
 Installation position: wall / ceiling<sup>2)</sup>

### NRWG-190

NRWG multi-leaf damper, housing leakage class C and leakage with closed damper leaf class 3 to DIN EN 1751, consisting of a dimensionally stable profiled frame made of 1.5 mm galvanised sheet steel, frame depth 190 mm with joint flow-favouring hollow-body blades adjustable in opposite directions made of torsion-resistant aluminium profile.

The blades are adjusted by means of external plastic gear wheels arranged on one side.

- with sintered bearing
- TÜV inspected according to VDI 6022 Sheets 1+2 and DIN EN 1751
- For mounting on wall and ceiling<sup>3)</sup> (surface mounting)

Electric actuator with spring return (currentless OPEN)

- 20 Nm, 24 V AC/DC, 2/3-point (-E025)
- 20 Nm, 24 V AC/DC, 0-10 V DC with RJ45 plug(-E072)
- 20 Nm, 24 V AC/DC, 0-10 V DC (-E073)

Electric actuator with integrated limit switches

- 2 limit switches, CLOSED and OPEN (-IS2)

Direct-current actuator

- 10 Nm, 24 V DC (-E070)
- 10 Nm, 24 V DC with RJ45 plug (-E071)

Accessories:

- Wall anchor package 2 (-M2)
- Wall anchor package 3 (-M3)
- Support sheet (-AB1)
- Installation frame edge mounting (-ER1 / -ER2)
- Installation frame corner mounting (-ER3 / -ER4)
- Weather protection hood (-WSH)
  - Flat-roof plinth (-FLDS)
  - Roof hood (-D) / Louvre hood (-L)

Tested and certified to DIN EN 12101-2 in at least the following model:

- Re1000
- SLO
- T(00)
- WL1500
- B300
- Type B with double function

Product: SCHAKO type NRWG-190  
 Nominal size: ..... x ..... mm,  
 Aa = ..... m<sup>2</sup>  
 Empty space in the building shell: ..... x ..... mm  
 Installation position: wall / ceiling<sup>2)</sup>

<sup>2)</sup> Weather protection must be taken into account

**PRIOR TO ASSEMBLY AND COMMISSIONING**



Each SCHAKO product comes with instructions on [Safety / Transport / Disposal] and [Installation / Commissioning / Maintenance]. For safety reasons, they must be read and observed. Multi-leaf dampers may not be lifted at the louvres and not be used as "ladder".

At the gear wheels and cutting edges, there is a risk of injury. Mounting to the wall/ceiling must take place without deformation, without tensions, level and without angular errors. The multi-leaf dampers must be installed in open position.

**MARKING**



The product is labelled with the marking shown opposite in accordance with the Construction Products Regulation (BauPVO) EU 305/2011.

The CE marking is located on the actuator side.

The operating safety of the devices is only guaranteed when used in accordance with their designated use.

**DISPOSAL**

After its final decommissioning, the multi-leaf damper must be properly disposed of by a competent body.

**TESTS AND STANDARDS**

The NRWG multi-leaf damper has been certified by the Notified Body according to EN 12101-2 and additionally inspected in accordance with the following regulations:

Completed inspections

- VDI 6022, Sheet 1: Hygienic requirements of ventilation and air-conditioning systems
- VDI 6022, Sheet 2: Hygienic requirements of ventilation and air-conditioning systems - Measurement methods and investigations during hygienic controls and hygienic inspections
- DIN EN 1751: Ventilation of buildings – units of the air distribution system:
  - Housing leakage class C
  - Leakage with closed damper leaf class 3

Applied standards

- EN 12101-2
- DIN EN 1751
- VDI 6022
- EMC 2004/108/EC
- Low voltage 2006/95/EC

Measurement, requirements and installation of natural smoke removal systems (NRA) according to DIN 18232-2

**MAINTENANCE AND FUNCTION**

It is recommended performing regular maintenance and functional checks of the entire smoke and heat exhaust ventilation system. Maintenance must be performed in accordance with legal regulations (at yearly intervals). Accordingly, functional checks should also be carried out at regular intervals. Maintenance must always be performed by personnel trained for this purpose.

Note

Unclean and humid air can impair the continuous operational safety. If maintenance agreements are concluded for RWA systems, the functional checks of the NRWG should be included in these maintenance agreements.

**VERIFICATION**

Visual inspection

- Check NRWGs for damage and contamination
- Carry out necessary cleaning work
- When cleaning, please note that cleaning agents may damage seals.

Functional check

- Check actuator for perfect functioning and condition (observe manufacturer's operating instructions)
- Check actuators and fastening for tight fit
- Check entire opening and closing process of the NRWG:
  - Spring return
  - DC motor
  - Alternatively: Actuate a ventilation switch (if available)
  - It may only be actuated via the drive shaft provided for this purpose. Actuation by rotating louvre is prohibited.