

ERK-SO

Smoke extraction damper

USABILITY CERTIFICATES

- **Performance Reliability Certificate**
0761 – CPR – 0506
- **Declaration of Performance**
DoP-ERK-SO-2016-07-01

CLASSIFICATION AND STANDARDS

- **Classification**
according to EN 13501-4 is EI 90 (v_{edw} , h_{ow}
 $i \leftrightarrow o$) S 1000 C₁₀₀₀₀ MA multi, depending on
the mounting situation
- **Product standard**
EN 12101-8
- **Test standards**
EN 1366-2 and EN 1366-10

PERFORMANCE DATA

- For ventilating smoke in smoke extraction systems and for providing the necessary supply air within the smoke extraction installation
- For use in solid walls, ceilings and smoke extraction lines
- For automatic (AA) or manual (MA) triggering

SPECIAL FEATURES

- Thermally insulated actuator housing
- The installation position does not depend on the air flow direction or the position of the damper blade axle
- Reversible OPEN/CLOSED actuator with 24 V AC/DC or 230 V AC supply voltage
- Optional actuator with Powerline SLC bus technology possible.
In conjunction with additional communication devices it is possible to retrieve further data, for example indication of end position, keeping timeframe (<60 s) or torque monitoring.

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DESCRIPTION

The smoke extraction damper ERK-SO conforms to EN 12101-8, EN 13501-4, EN 1366-2 and EN 1366-10. The ERK-SO has been tested according to EN 1366-2 and EN 1366-10 in accordance with the Declaration of Performance No. DoP-ERK-SO-2016-07-01. It is in possession of the Performance Reliability Certificate according to EU-BauPVO 0761 - CPR - 0506. Its classification according to EN 13501-4, depending on the mounting situation is:
EI 90 (V_{edw} , h_{ow} $i \leftrightarrow o$) S 1000 C₁₀₀₀₀ MA multi.

Smoke extraction dampers are intended for ventilating smoke in smoke extraction systems and for providing necessary supply air within the smoke extraction installation. The smoke extraction dampers are driven by a reversible OPEN / CLOSE actuator with 24 V AC/DC or 230 V AC supply voltage. It is located in a thermally insulated actuator housing to ensure correct opening and closing of the smoke extraction damper under fire conditions.

Optionally, the ERK-SO can be equipped with the EK12 (SEL 1.90 SLC, 24 V AC/DC) / EK14 (EK12 + SPMa-1SR) actuator. Each smoke extraction damper is connected only with one two-wire line by means of the SLC technology, thus allowing detection or reporting of short-circuit or line break of the SLC lines through constant monitoring. The function of the actuator EK12 is only active when an additional required communication device (e.g. EK14 = EK12 + SPMa-1SR) is connected.

Suitable communication devices, for example SPMa1SR or SPLM-4S OSD Mod. allow retrieving data, such as indication of end position, keeping timeframe (<60 s) or torque monitoring.

For use in solid walls and ceilings for supplying air or ventilating smoke, also in combination with smoke extraction lines in compliance with EN 121017 which have been tested according to EN 13668 or EN 13669.

The national standards and guidelines must be observed in connection with this technical documentation, installation, mounting and operating instructions.

For functional test, service, retrofitting, etc., inspection openings must be provided on site in suspended ceilings, shaft walls, connected ventilation ducts etc., if necessary. They must be built in sufficient numbers and size and must not impair the functioning of the smoke extraction dampers.

- Housing and damper blade made of silicate structural panel, optionally (at an extra charge):
 - SR internal impregnation (ex works only) for protection against aggressive media
- With circumferential stop bar seals to meet the cold and hot leakage requirements
- Horizontal or vertical position of the damper blade axle (axle made of stainless steel)
- The installation position does not depend on the air flow direction
- The connection to smoke extraction ducts made of wall boards is done according to inspected duct-specific constructions. The connection to the tested sheet steel lines or flexible spigots is carried out via the profile connection frame type PAR. Smoke extraction systems with mechanical vents require a secure power supply in case of fire. A power supply above the public supply, through a power producing installation (replacement power) depends on each case of public and legal requirements.

QUALITY ASSURANCE

Production is performed according to certified QM processes in accordance with EN ISO 9001. Furthermore, an in-factory production control (WPK) and continuous monitoring of the latter by an accredited body take place.

ATTENTION

Building systems have to be arranged, installed and maintained in such a way that they prevent fire and propagation of fire and smoke (fire propagation) and allow evacuation of persons and animals as well as efficient fire extinguishing work.

MODELS AND DIMENSIONS

Dimensions

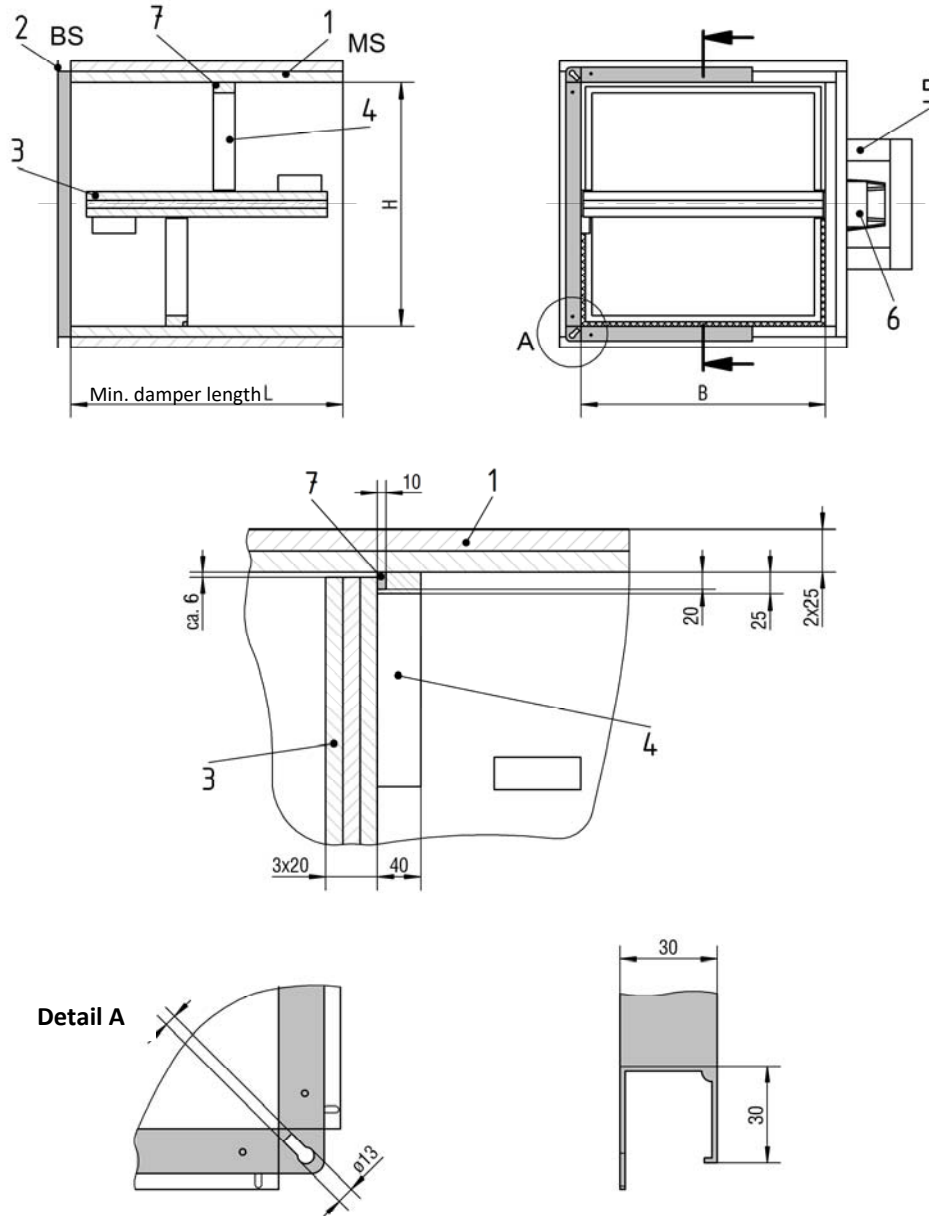


Figure 1 - Dimensions ERK-SO

- 1-- ERK-SO housing (consisting of 2 x 25 mm silicate structural panels)
- 2-- Profile connection frame PAR (optional)
- 3-- Damper blade (consisting of 3 x 20 mm silicate structural panels)
- 4-- Stop bar (40 x 20 mm with milled recess for the seal)
- 5-- Actuator housing incl. cover
- 6-- Actuator
- 7-- Stop bar seal (to meet the cold and hot leakage requirements)

Available sizes [mm]

The minimal length of the damper L depends on the height H. To avoid projecting ends of the damper blade, the lengths L (standard) are assigned to the heights H. On request, larger L dimensions are also possible.

Length L [mm]

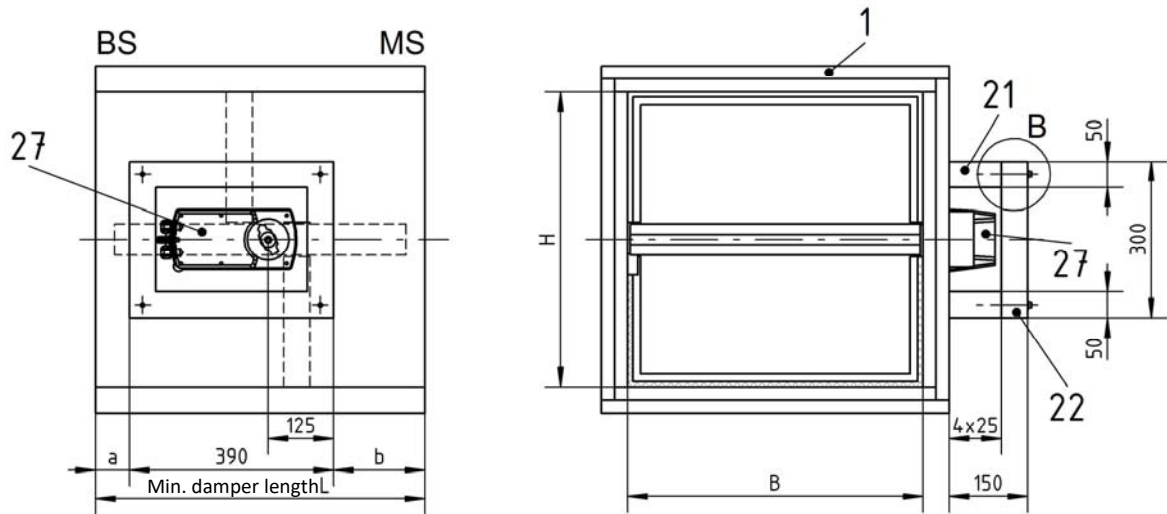
| | | Width B [mm] | | | | | | | | | | | | | | | | | | | |
|---------------|------------|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 |
| Height H [mm] | 200 | | | | | | | | | | | | | | | | | | | | |
| | 250 | 530 | | | | | | | | | | | | | | | | | | | |
| | 300 | (630/700/800) * | | | | | | | | | | | | | | | | | | | |
| | 350 | | | | | | | | | | | | | | | | | | | | |
| | 400 | | | | | | | | | | | | | | | | | | | | |
| | 450 | 630 | | | | | | | | | | | | | | | | | | | |
| | 500 | (700/800) * | | | | | | | | | | | | | | | | | | | |
| | 550 | | | | | | | | | | | | | | | | | | | | |
| | 600 | | | | | | | | | | | | | | | | | | | | |
| | 650 | 700 | | | | | | | | | | | | | | | | | | | |
| | 700 | (800) * | | | | | | | | | | | | | | | | | | | |
| 750 | | | | | | | | | | | | | | | | | | | | | |
| 800 | 800 | | | | | | | | | | | | | | | | | | | | |

Other B or H dimensions (1 mm steps) are available at an extra charge

* (further standard lengths at an extra charge)

Table 1 - Available sizes

ERK-SO shown without profile connection frame PAR



Detail B of the actuator housing
 Standard motor installation is horizontal as shown, vertical design is also possible on request

Picture showing an enlargement of the actuator enclosure (ex-works only)
 * The enlargement (in 25 mm steps) depends on the existing requirement

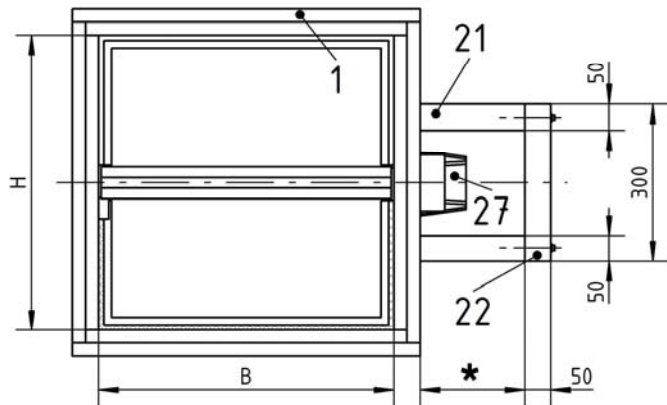
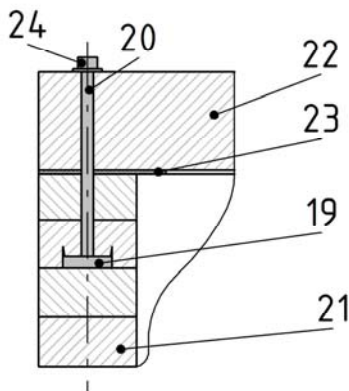


Figure 2 - Actuator housing

| H | L | a (BS) | b (MS) ** |
|---------------|-----|--------|-----------|
| 200 ≤ H ≤ 400 | 530 | 65 | 75 |
| 401 ≤ H ≤ 565 | 630 | 65 | 175 |
| 566 ≤ H ≤ 634 | 630 | 50 | 190 |
| 635 ≤ H ≤ 711 | 700 | 85 | 255 |
| 712 ≤ H ≤ 800 | 800 | 135 | 275 |

** A housing extension of the b side (MS) is only possible by a dimension resulting in a maximum total housing length (L) of 800 mm (in exceptional cases 1000 mm).

Table 2 - Dimensions of the actuator housing

- 1 -- Housing of ERK-SO (shown without profile connection frame PAR)
- 27-- Actuator
- 21/22/23 -- Actuator housing (consisting of the actuator casing and the cover with seal made of Insulfrax paper)
- 19/20/24 -- Fastening set for the inspection of the actuator (by loosening the hexagon screws M6 x 100 mm)

Use

The smoke extraction damper type ERK-SO can be fitted as shown in the following table.

| Use | Installation | Material/Model | Minimum thickness [mm] | Minimum distance of two ERK-SO from one another [mm] | Fire resistance class | For notes, see page |
|-----------------------|---|------------------|------------------------|--|---|---------------------|
| WALL | solid Apparent density $\geq 450 \text{ kg/m}^3$ | in | 100 | 0 (4) ¹⁾ 200 ²⁾ | EI 90($v_{ew}, i \leftrightarrow o$)S 1000 C ₁₀₀₀₀ MA multi | 8 |
| | | on ³⁾ | 100 | 200 | EI 90($v_{ew}, i \leftrightarrow o$)S 1000 C ₁₀₀₀₀ MA multi | 14 |
| CEILING | solid Apparent density $\geq 650 \pm 200 \text{ kg/m}^3$ | in ³⁾ | 150 | 200 | EI 90($h_{ow}, i \leftrightarrow o$)S 1000 C ₁₀₀₀₀ MA multi | 17 |
| | | to ⁴⁾ | 150 | 200 | EI 90($h_{ow}, i \leftrightarrow o$)S 1000 C ₁₀₀₀₀ MA multi | 20 |
| SMOKE EXTRACTION DUCT | horizontal Apparent density $\geq 520 \text{ kg/m}^3$ | in ⁵⁾ | 35 | 200 | EI 90($v_{ed}, i \leftrightarrow o$)S 1000 C ₁₀₀₀₀ MA multi | 21 |
| | | on ⁵⁾ | 35 | 200 | EI 90($v_{ed}, i \leftrightarrow o$)S 1000 C ₁₀₀₀₀ MA multi | 21 |
| | | to ⁶⁾ | 35 | 200 | EI 90($v_{ed}, i \leftrightarrow o$)S 1000 C ₁₀₀₀₀ MA multi | 22 |

¹⁾ when installed next to each other

²⁾ when installed on top of each other

³⁾ in connection with mounting brackets WE-S and on-site suspensions and horizontal damper blade axle

⁴⁾ in connection with ceiling frame DR-S

⁵⁾ in connection with on-site suspensions

⁶⁾ in connection with on-site fastening frames and suspensions

Table 3 - Usability

General information

- During mounting or installation, there is a risk of injuries. To avoid injuries, personal protective equipment (PPE) must be worn.
- Smoke extraction dampers must be installed such that external forces do not impair their functioning. During mounting it may be required to provide reinforcements for the housing or the like. The requirement of statically load-bearing lintels may have to be taken into consideration.
- Improper transport/handling may result in damage/functional impairment. In addition to that, the film of the transport packaging must be removed and the delivery inspected for completeness.
- In storage, smoke extraction dampers must be protected from dust, dirt, moisture and the effects of extreme temperatures. They must not be exposed to direct effects of the weather.
- The smoke extraction dampers must be protected from dirt and damage. After installation is complete, any dirt must be removed immediately.
- Enough space must be provided for installation, mortar lining, etc.
- Carry out a functional check of the smoke extraction damper before and after mounting and ensure ready access.
- Electrical installations or work on electrical components may only be carried out by skilled electricians. The supply voltage must be switched off when performing this work.
- Always check whether the housing needs to be extended on the b side (MS) for the corresponding installation situations (e.g. the thickness of the supporting structure and a possible connection to the smoke extraction duct must be considered).

INSTALLATION DETAILS

Installation in solid walls

- Installation in solid walls (shaft walls, shafts, ducts and fire walls) made of, for example, concrete, masonry according to EN 1996 or DIN 1053; solid plaster wall boards according to EN 12859 or DIN 18163; apparent density $\geq 450 \text{ kg/m}^3$ and wall thickness $W \geq 100 \text{ mm}$.
- Distance to the bearing adjacent components (wall / solid ceiling) is minimum 75 mm.

Wet installation

- Circumferential gaps "s" must be completely filled with mortar of category M2.5 to M15 in accordance with EN 998-2 (previously: MG II to III according to DIN 1053) or fire protection mortar of suitable grades. The minimum gap size s_{\min} is 10 mm; maximum gap size $s_{\max} \leq 60 \text{ mm}$. The mortar lining must be executed such that it is permanent and, for example no mortar breaks occur. The information given by the mortar manufacturer must be observed.
- If the smoke extraction damper is installed during the construction of the wall, the gaps "s" can be omitted. The mortar bed depth must be executed in the minimum wall thickness and may not be less than 100 mm. When performing a mortar lining or direct installation, make sure that the housing is not pressed toward the inside (reinforcement). If necessary, a statically active lintel must be provided.
- In case of dry installation next to each other, the smoke extraction dampers (max. 2 pieces) can be installed without clearance.
- In case of wet installation on top of each other, the distance between the smoke extraction dampers must be at least 200 mm.

Dry installation

- Circumferential gaps "s" must be completely filled with mineral wool (non-flammable EN 13501-1, apparent/packing density approx. 100 kg/m^3 , melting point $\geq 1000 \text{ }^\circ\text{C}$) and secured with a circumferential frame made of silicate structural panels. The minimum gap size s_{\min} is 10 mm; maximum gap size $s_{\max} \leq 20 \text{ mm}$.
- In case of dry installation, the distance of the smoke extraction dampers to one another must be at least 200 mm.

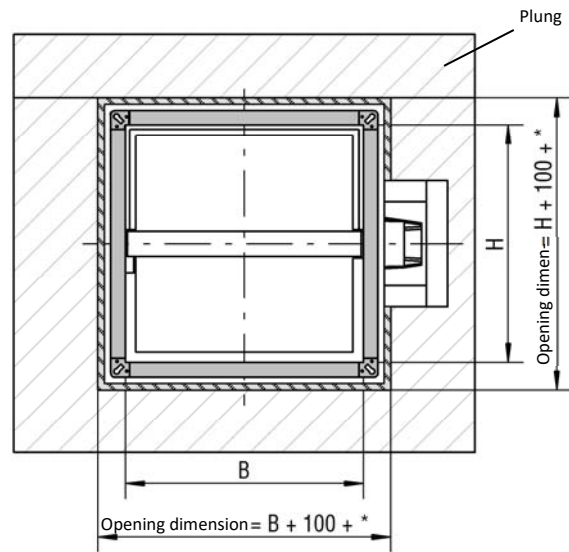


Figure 3 - Opening dimensions of the solid wall

* Please note

Fill circumferential gaps "s" approx. $15 \pm 5 \text{ mm}$ with mineral wool (in case of wall installation only) (non-flammable EN 13501-1, apparent/packing density approx. 100 kg/m^3 , melting point $\geq 1000 \text{ }^\circ\text{C}$) or mortar (at least 10 to $\leq 60 \text{ mm}$) of category M2.5 to M15 in accordance with EN 998-2 (previously: MG II to III according to DIN 1053) or fire protection mortar of suitable grades.

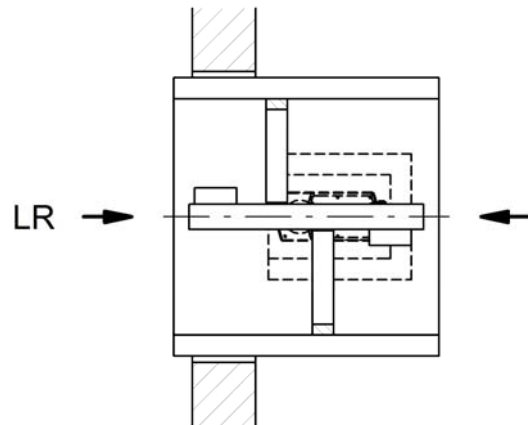
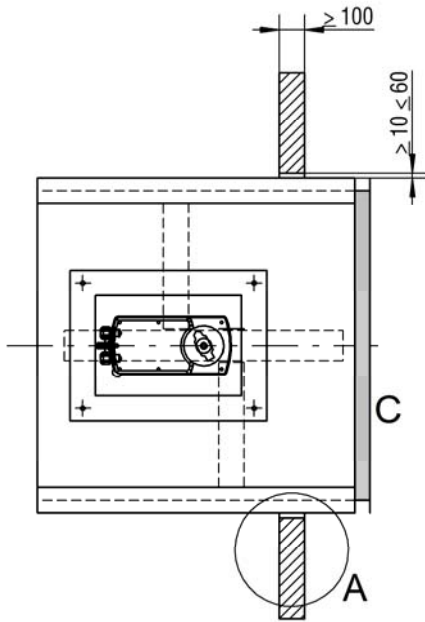
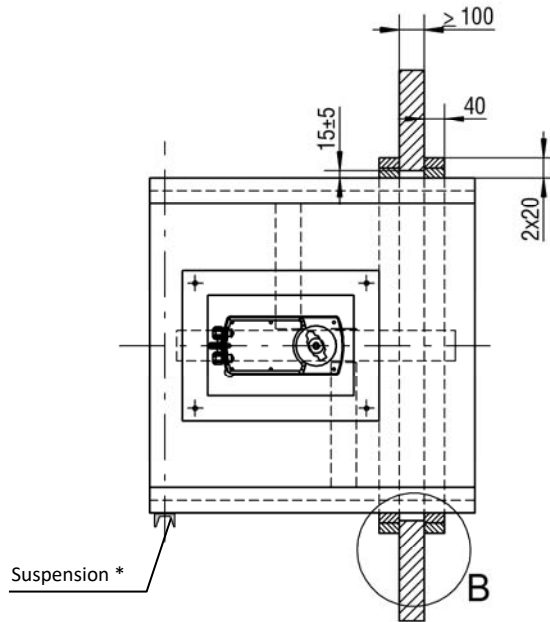


Figure 4 - Air flow direction

Wet installation



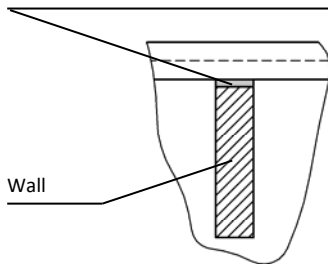
Dry installation



* the dimensions of the threaded rods and the U-steel can be found on pages 24 - 27.

Detail A

Mortar of category M2.5 to M15 in accordance with EN 998-2 (previously: MG II to III according to DIN 1053) or fire protection mortar of suitable grades. Gap $\geq 10 \leq 60$ mm

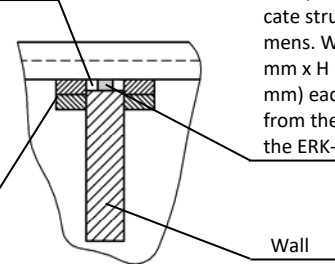


Detail B

Mineral wool A1, melting point ≥ 1000 °C / gap 15 ± 5 mm

In the lower gap, place (only in case of filling with mineral wool) 2 spacers made of silicate structural panel (dimens. $W = 20$ mm x $L = 50$ mm x $H =$ gap height $10 - 20$ mm) each approx. 50 mm from the outer housing of the ERK-SO.

Circumferential frame 40 x 40 made of silicate structural panel at a distance of 150 mm screwed to the ERK-SO housing with Spax screws 5 x 80 and glued with water glass glue (SBK 2000).



Detail C

Profile connection frame PAR

Installation example with profile connection frame PAR when connected with a continuation smoke extraction duct made of sheet metal for use within the fire area from which smoke is to be extracted.

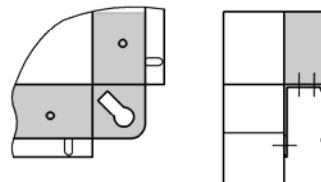


Figure 5 - Installation in solid walls

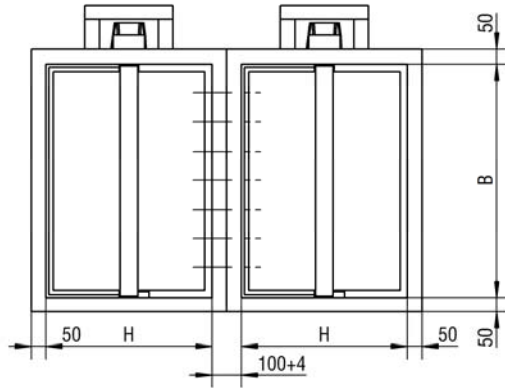
Please note

If $H \leq 400$ mm, the housing must be extended for this arrangement. If the wall thickness is > 100 mm, always check whether the housing needs to be extended on the b side (MS) - see page 6 Table 2 - (the available wall thickness and a possible connection to the smoke extraction duct must be taken into account).

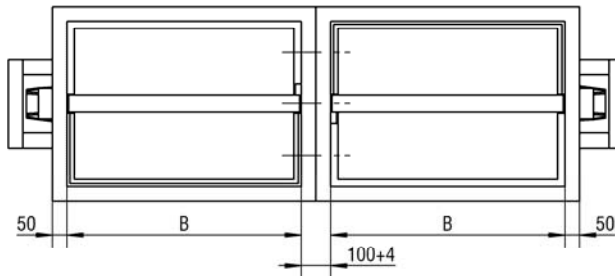
Installation positions

Arrangement of the ERK-SO when installed next to each other without clearance

With this arrangement, an additional accessory package is required for the connection to the smoke extraction dampers as a function of the dimension

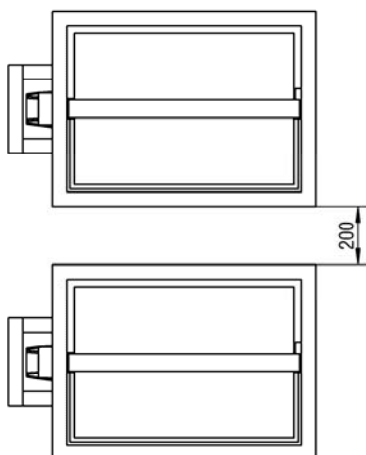


vertical position of the damper blade axle
 (independent of the actuator position)

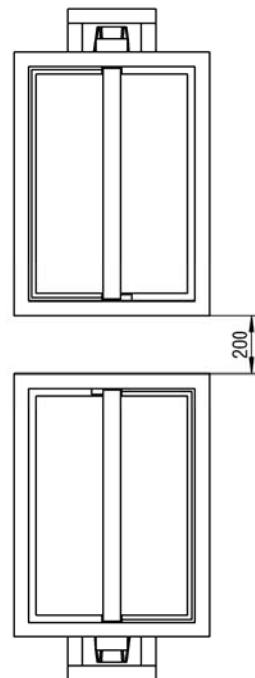


horizontal position of the damper blade axle

Arrangement of the ERK-SO when installed on top of each other with a clearance of 200 mm



horizontal position of the damper blade axle



vertical position of the damper blade axle

Figure 6 - Minimum distances of the ERK-SO in solid wall

Accessory package for installation next to each other without clearance

The suitable accessory package for installation of the ERK-SO without clearance next to each other must be determined as a function of the dimension and the position of damper blade axle as specified in the tables below (Table 4 or Table 5).

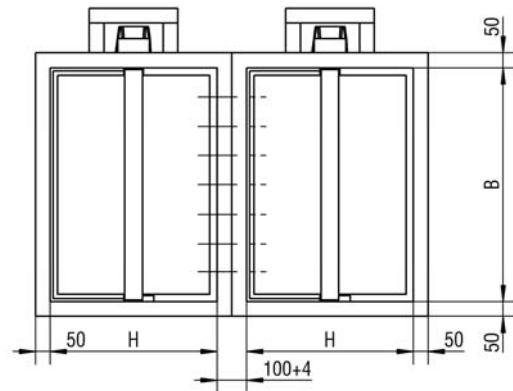
The accessory package consists of the corresponding amount of Insulfrax paper, water glass glue and the number of required screw connections.

Except for the application of the Insulfrax paper ex works (applied using water glass glue), the work must be carried out on site.

When ordering, please specify connection side (B or H side).

Vertical position of the damper blade axle

For the connection on the side (vertical position of the damper blade axle), the position of the actuators (operation) must be additionally specified.



| | | Width B [mm] | | | | | | | | | | | | | | | | | | | | | | | | |
|----------|-----|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----|
| | | 200 | 225 | 250 | 275 | 300 | 325 | 350 | 375 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | |
| Height H | 200 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | III | III | III | III | III | III | III | |
| | 225 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | III | III | III | III | III | III | III | III |
| | 250 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | III | III | III | III | III | III | III | III |
| | 275 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | III | III | III | III | III | III | III | III |
| | 300 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | III | III | III | III | III | III | III | III |
| | 325 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | III | III | III | III | III | III | III | III |
| | 350 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | III | III | III | III | III | III | III | III |
| | 375 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | III | III | III | III | III | III | III | III |
| | 400 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | III | III | III | III | III | III | III | III |
| | 440 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | III | III | III | III | III | III | III | III |
| | 450 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | III | III | III | III | III | III | III | III |
| | 500 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | III | III | III | III | III | III | III | III |
| | 550 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | III | III | III | III | III | III | III | III |
| | 600 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | III | III | III | III | III | III | III | III |
| | 650 | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | III | III | III | III | III | III | III | III |
| | 700 | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | III | III | III | III | III | III | III | III |
| 750 | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | III | III | III | III | III | III | III | III | |
| 800 | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | III | III | III | III | III | III | III | III | |

Table 4 - Accessory packages for vertical damper blade axle position

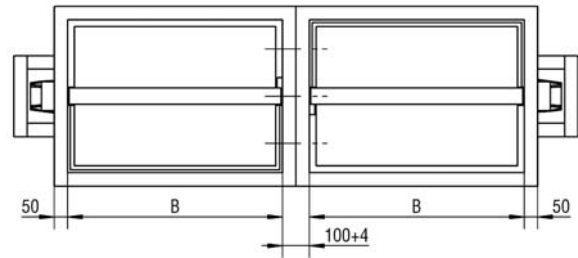
Accessory package I I

Accessory package II II

Accessory package III III

Horizontal position of the damper blade axle

For the connection on the H sides (horizontal position of the damper blade axle), the heads of the hexagon screws must be countersunk.



| | | Width B [mm] | | | | | | | | | | | | | | | | | | | | | | | |
|----------|-----|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | 200 | 225 | 250 | 275 | 300 | 325 | 350 | 375 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 |
| Height H | 200 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | II | II | II | II | II | II | II |
| | 225 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | II | II | II | II | II | II | II |
| | 250 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | II | II | II | II | II | II | II |
| | 275 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | II | II | II | II | II | II | II |
| | 300 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | II | II | II | II | II | II | II |
| | 325 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | II | II | II | II | II | II | II |
| | 350 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | II | II | II | II | II | II | II |
| | 375 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | II | II | II | II | II | II | II |
| | 400 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | II | II | II | II | II | II | II |
| | 440 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | II | II | II | II | II | II | II |
| | 450 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | II | II | II | II | II | II | II |
| | 500 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | II | II | II | II | II | II | II |
| | 550 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | II | II | II | II | II | II | II |
| | 600 | I | I | I | I | I | I | I | I | I | I | I | I | I | II | II | II | II | II | II | II | II | II | II | II |
| | 650 | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II |
| | 700 | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II |
| | 750 | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II |
| 800 | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | II | |

Table 5 - Accessory packages for horizontal damper blade axle position

| | |
|----------------------|----|
| Accessory package I | I |
| Accessory package II | II |

Installation directly on solid walls

- Installation in solid walls (shaft walls, shafts, ducts and fire walls) made of, for example, concrete, masonry according to EN 1996 or DIN 1053; solid plaster wall boards according to EN 12859 or DIN 18163; apparent density $\geq 450 \text{ kg/m}^3$ and wall thickness $W \geq 100 \text{ mm}$.
- Installation with horizontal damper blade axle only
- The distance to load-bearing, adjacent components (wall / solid ceiling) is (due to the construction) at least 100 mm.
- Additional suspension required with U-steel (pole brace).

Smoke extraction duct made of silicate structural panel (in accordance with EN 12101-7, tested according to EN 1366-8) or smoke extraction duct made of sheet steel tested according to EN 13669

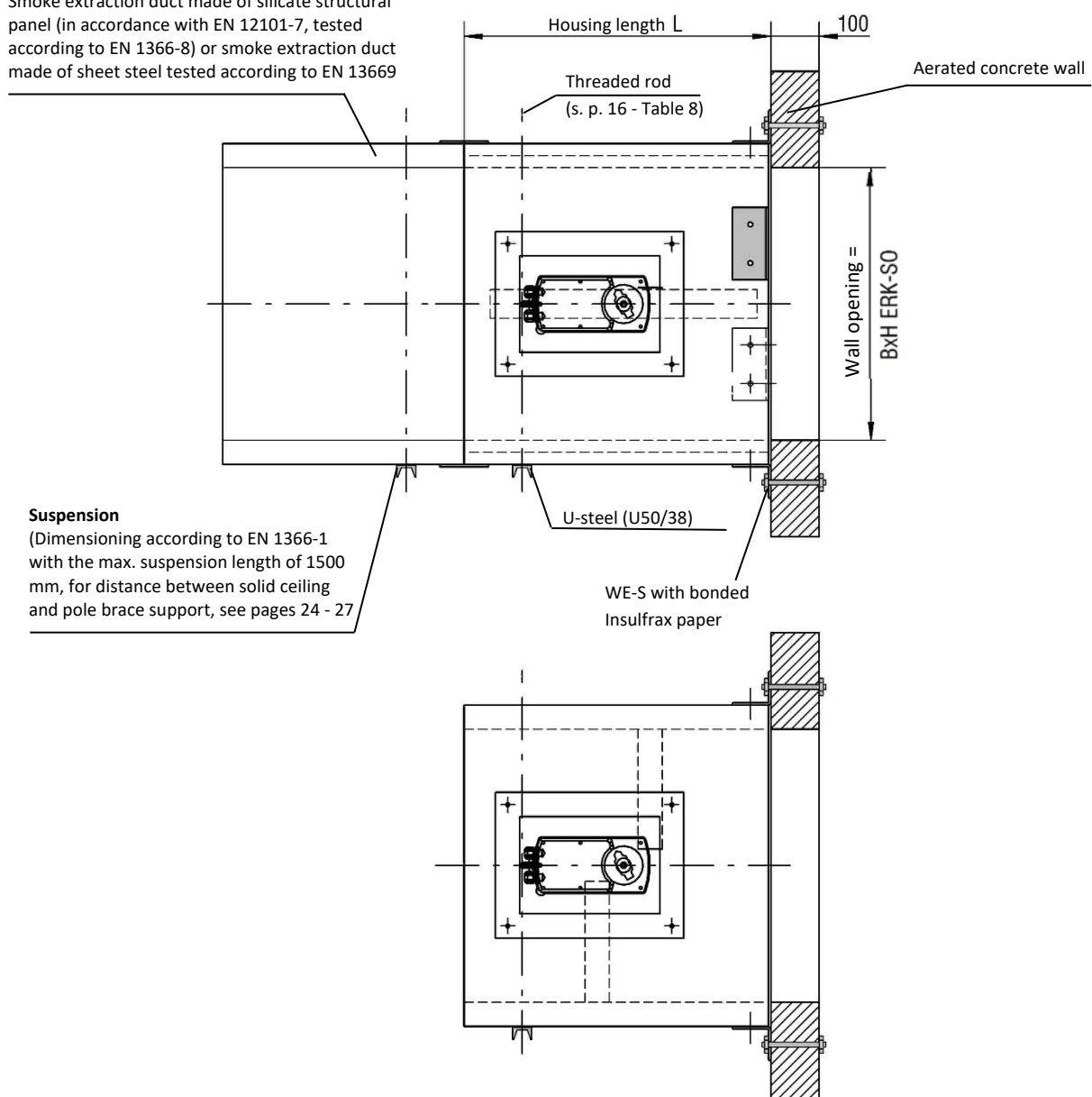
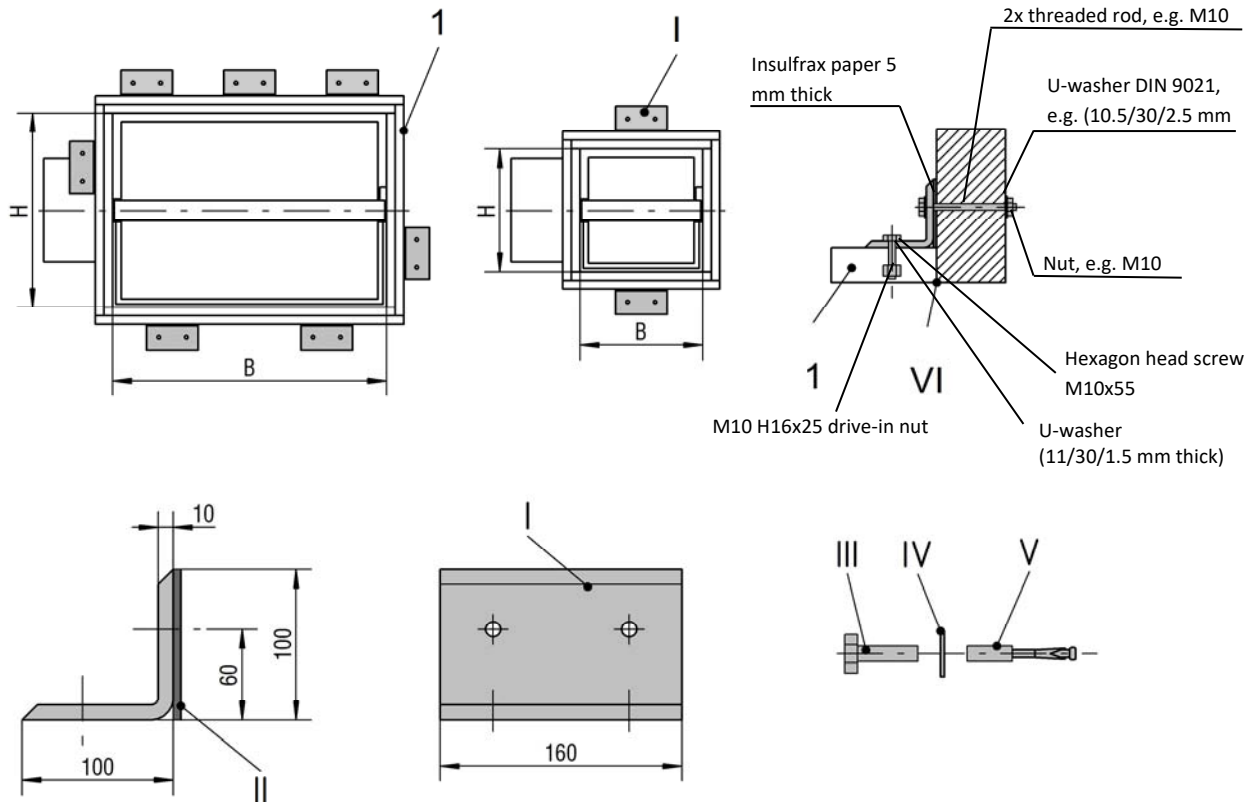


Figure 8 - Installation on solid walls

Picture showing mounting bracket WE-S on ERK-SO and solid wall



- 1 -- Housing made of silicate structural panels (t=50 mm)
- I -- Mounting bracket type WE-S
(galvanised steel 100 x 100 x 160 mm long)
- II -- Seal (bonded) made of Insulfrax paper
(100 x 160 x 5 mm dick)
- III -- Hexagon head screw to DIN 931 (e.g. M 10 x 30 mm)
- IV -- U-washers DIN 125-A
- V -- Fire protection dowels, e.g. type KMU-F10 (with reinforced concrete walls only) or threaded rods (on site)
- VI -- Seal bonded to ERK-SO (front side to the wall made of Insulfrax paper 50 x 5 mm thick)

Proposed installation ERK-SO in front of the concrete wall with suspension. The brackets are fastened to the reinforced concrete wall as a function of the dimension (s. Table 6 + Table 7) with, for example, fire protection dowels type KMU-F10 . On solid walls (e.g. aerated concrete), continuous threaded rods must be used for fastening. Damper length L depends on W x H.

Number and arrangement of mounting brackets WE-S

Please note

The exact arrangement and number of mounting brackets WE-S and U-steel are defined by SCHAKO according to the ERK-SO dimensions and can be found in the following tables!

Figure 9 - Fastening WE-S on ERK-SO and solid wall

Number of mounting brackets type WE-S

| | | Width B [mm] | | | | | | | | | | | | | | | | | | | | Length L [mm] | | | | |
|---------------|-----|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|---------------|------|------|------|------|
| | | 200 | 225 | 250 | 275 | 300 | 325 | 350 | 375 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 900 | 1000 | 1100 | | 1200 | 1300 | 1400 | 1500 |
| Height H [mm] | 200 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 530 |
| | 225 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | |
| | 250 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | |
| | 275 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | |
| | 300 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | |
| | 325 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | |
| | 350 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | |
| | 375 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | |
| 400 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | | |
| Height H [mm] | 450 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 630 |
| | 500 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | |
| | 550 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | |
| | 600 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | |
| Height H [mm] | 650 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 700 |
| | 700 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | |
| Height H [mm] | 750 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 800 |
| | 800 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | |

Table 6 - Number of mounting brackets WE-S for installation on solid wall

Number with specification of the arrangement and wall fastening

| | | | | | | | | | |
|--|---------------|-----|-----|-----|-----|-----|-----|-----|---|
| Total number of WE-S (as a function of dimensions) | 2 | 2 | 4 | 5 | 4 | 5 | 6 | 7 | |
| Positioning of the WE-S brackets | Top B side | 1 | 1 | 2 | 3 | 1 | 2 | 2 | 3 |
| | Bottom B side | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 |
| | Left H side | - | - | - | - | 1 | 1 | 1 | 1 |
| | Right H side | - | - | - | - | 1 | 1 | 1 | 1 |
| On-site wall fastening per WE-S bracket with 2 units | M12 | M10 | M10 | M10 | M12 | M10 | M10 | M10 | |

Table 7 - Arrangement of WE-S and wall fastening for installation on solid wall

Dimensioning of the suspension (threaded rods) for U-steel

| | | Width B [mm] | | | | | | | | | | | | | | | | | | | | Length L [mm] | | | | | | | |
|---------------|-----|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|---------------|------|------|------|------|-----|-----|-----|
| | | 200 | 225 | 250 | 275 | 300 | 325 | 350 | 375 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 900 | 1000 | 1100 | | 1200 | 1300 | 1400 | 1500 | | | |
| Height H [mm] | 200 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | 530 | | |
| | 225 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | | M12 | |
| | 250 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | | M12 | |
| | 275 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | | M12 | M12 |
| | 300 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | | M12 | M12 |
| | 325 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | | M12 | M12 |
| | 350 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | | M12 | M12 |
| | 375 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | | M12 | M12 |
| Height H [mm] | 400 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | M12 | M12 | M12 | |
| | 450 | M8 | M8 | M8 | M8 | M8 | M8 | M8 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | M12 | M12 | M12 | | |
| | 500 | M8 | M8 | M8 | M8 | M8 | M8 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | M12 | M12 | M14 | | |
| | 550 | M8 | M8 | M8 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | M12 | M12 | M14 | M14 | |
| Height H [mm] | 600 | M8 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | M12 | M14 | M14 | M14 | |
| | 650 | M8 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | M12 | M14 | M14 | M14 | |
| Height H [mm] | 700 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | M12 | M14 | M14 | M14 | |
| | 750 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | M12 | M14 | M14 | M14 | |
| 800 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M10 | M12 | M12 | M14 | M14 | M16 | |

Table 8 - Suspension (threaded rods) for U-steel for installation on solid wall

Installation in solid ceilings

- Installation in solid ceilings made, for example, of concrete, aerated concrete, apparent density $\geq 650 \pm 200 \text{ kg/m}^3$ and ceiling thickness $D \geq 150 \text{ mm}$.
- Installation with complete mortar lining:
 Circumferential gaps "s" must be completely filled with mortar of category M2.5 to M15 in accordance with EN 998-2 (previously: MG II to III according to DIN 1053) or fire protection mortar of suitable grades. The minimum gap size s_{\min} is 10 mm; maximum gap size $s_{\max} \leq 60 \text{ mm}$.
 The mortar lining must be executed such that it is permanent and, for example no mortar breaks occur. The information given by the mortar manufacturer must be observed.
 If the smoke extraction damper is installed during the construction of the ceiling, the gaps "s" can be omitted. The mortar bed depth must be executed in the minimum ceiling thickness and may not be less than 150 mm. When performing a mortar lining or direct installation, make sure that the housing is not pressed toward the inside (reinforcement).
 For load carrying when installed in solid ceilings (vertical/suspended), additional mounting brackets WE-S are required.
- The distance of the smoke extraction dampers to one another must be at least 200 mm.
- The distance to load-bearing, adjacent components (wall) is at least 75 mm.

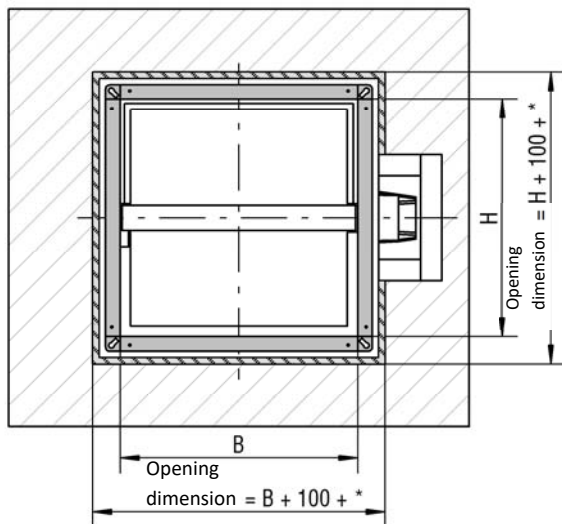


Figure 10 - Opening dimensions of the solid ceiling

*** Please note**

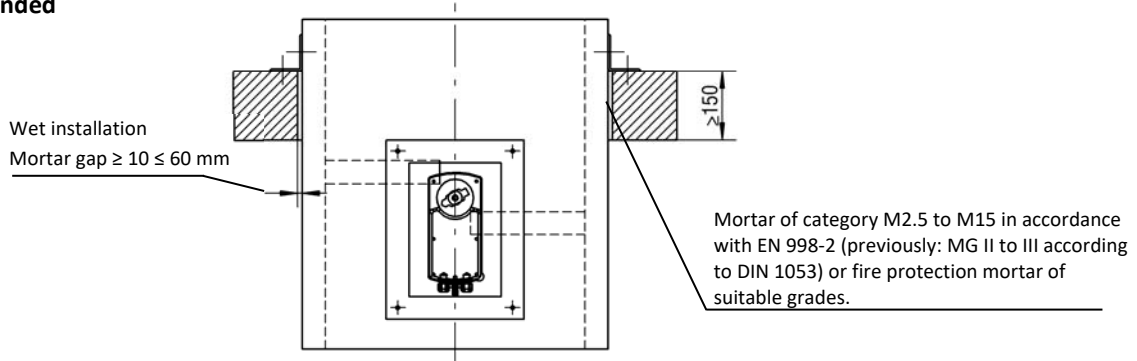
Circumferential gaps "s" (at least 10 to $\leq 60 \text{ mm}$) must be filled with mortar of category M2.5 to M15 in accordance with EN 998-2 (previously: MG II to III according to DIN 1053) or fire protection mortar of suitable grades.

Suspended/vertical installation in solid ceilings

For the correct number and positioning of the mounting brackets, the installation situation ((suspended/vertical) must be specified when ordering.

Remarks:
 When installed suspended in solid ceilings, the mounting brackets WE-S must usually be positioned and mounted on site. Otherwise, if installed ex works, the ERK-SO could not be inserted into the ceiling recess.

suspended



vertical in

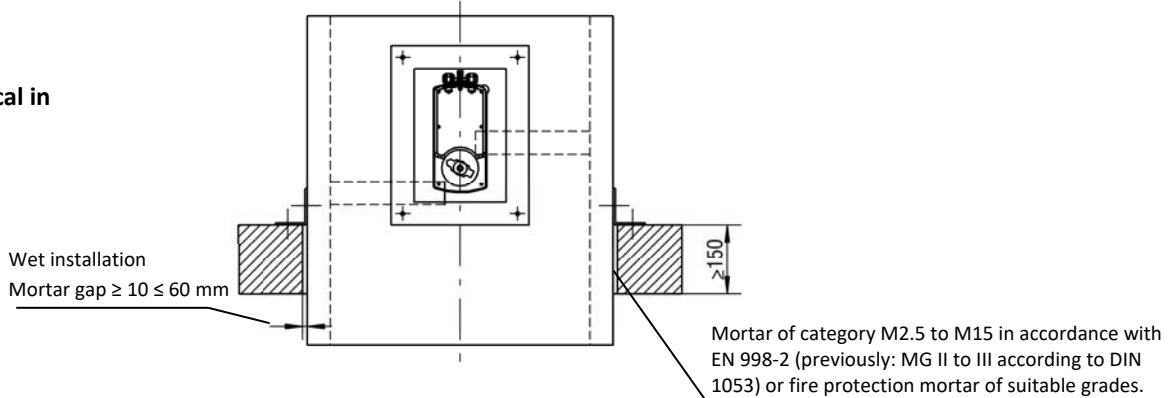


Figure 11 - Installation in solid ceilings

Example of load carrying in solid ceilings

Top view

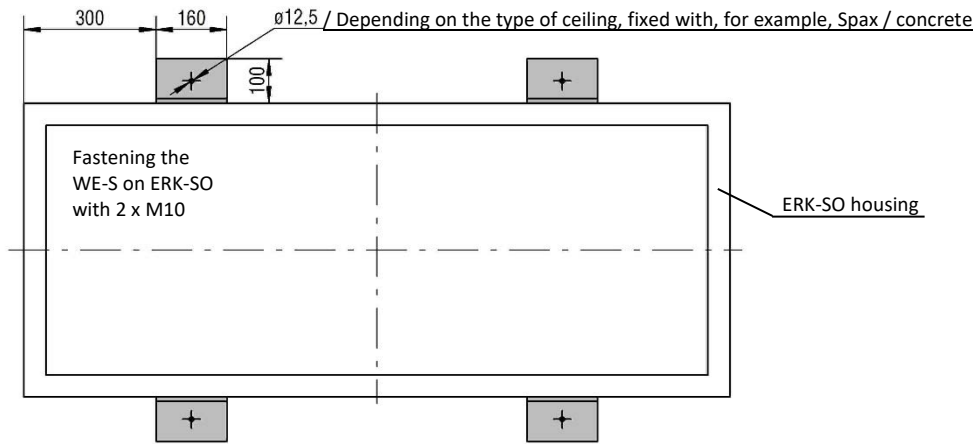


Figure 12 - Arrangement of WE-S when installed in solid ceilings

Please note

The exact arrangement and number of mounting brackets WE-S are defined by SCHAKO according to the ERK-SO dimensions! (s. table below). When installing in solid ceilings, always check whether the housing needs to be extended on the b side (MS) - see page 6 Table 2 - [the available ceiling thickness, the WE-S brackets for load carrying, especially for suspended installation (operation from below), and a possible connection to the smoke extraction duct must be taken into account].

Number of mounting brackets WE-S for installation in solid ceiling

| | | Width B [mm] | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|-----|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | 200 | 225 | 250 | 275 | 300 | 325 | 350 | 375 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 |
| Height H [mm] | 200 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 225 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 250 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 275 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 300 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 325 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 350 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 375 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 400 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 440 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 450 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 500 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 550 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 600 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 650 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 700 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 750 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| 800 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |

Table 9 - Number of mounting brackets WE-S for installation in solid ceiling

Vertical installation on solid ceilings

- Vertical installation on solid ceilings made, for example, of concrete, aerated concrete, apparent density $\geq 650 \pm 200 \text{ kg/m}^3$ and ceiling thickness $D \geq 150 \text{ mm}$.
- The required ceiling breakthrough must correspond to the nominal dimensions (WxH) of the ERK-SO. The installation is possible only in connection with the ceiling frame DR-S (accessories).
- The distance of the smoke extraction dampers to one another must be at least 200 mm.
- The distance to load-bearing, adjacent components (wall) is (due to the construction) at least 100 mm.

Mounting information

- Adjust connection between ERK-SO and ceiling with water glass glue (SBK 2000).
- Additional mounting brackets made of steel (2 pieces) are required up to dimensions W and H = 500 mm (included in accessories of ceiling frame DR-S).

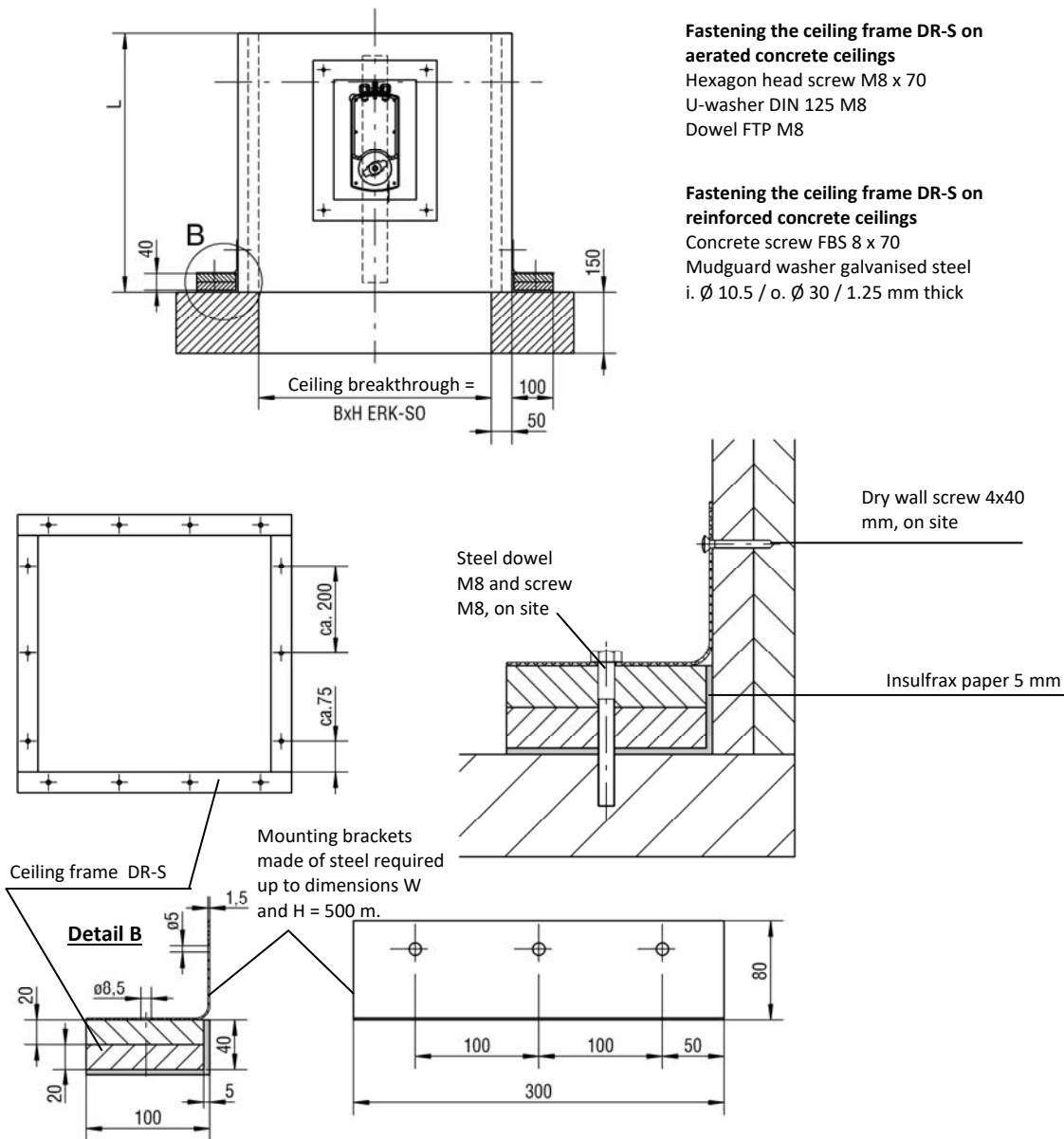


Figure 13 - Vertical installation on solid ceiling

CONNECTION TO SMOKE EXTRACTION DUCTS

Connection options on or in horizontal smoke extraction ducts
in accordance with EN 12101-7, tested according to EN 1366-8

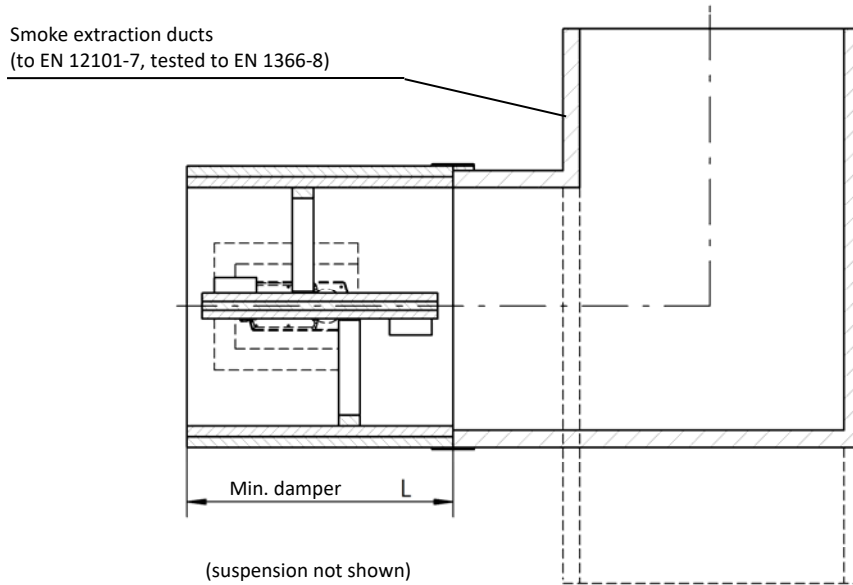


Figure 14 - Connection to horizontal smoke extraction duct

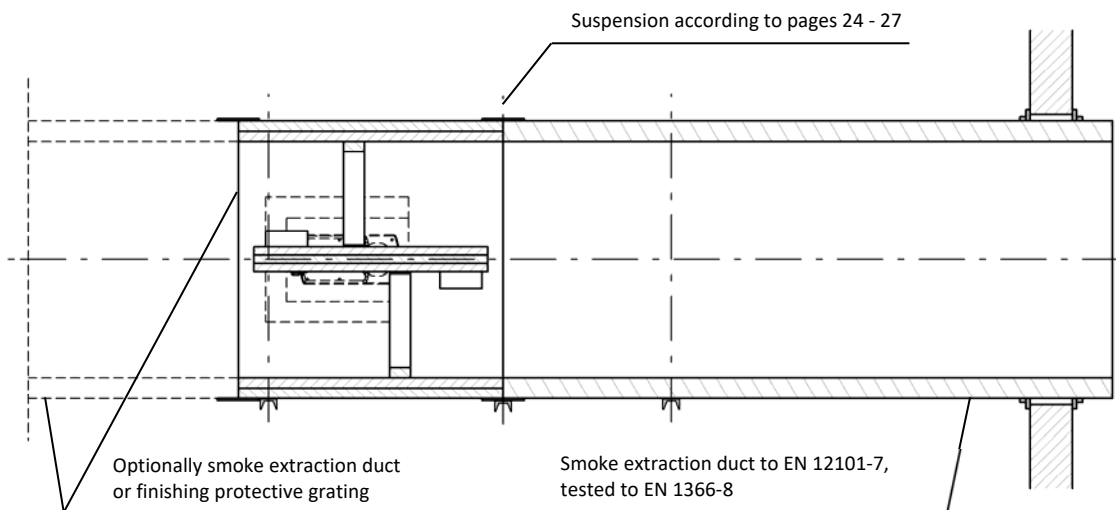
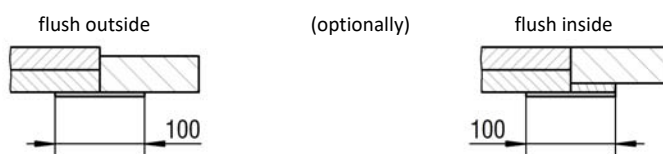


Figure 15 - Connection in horizontal smoke extraction duct

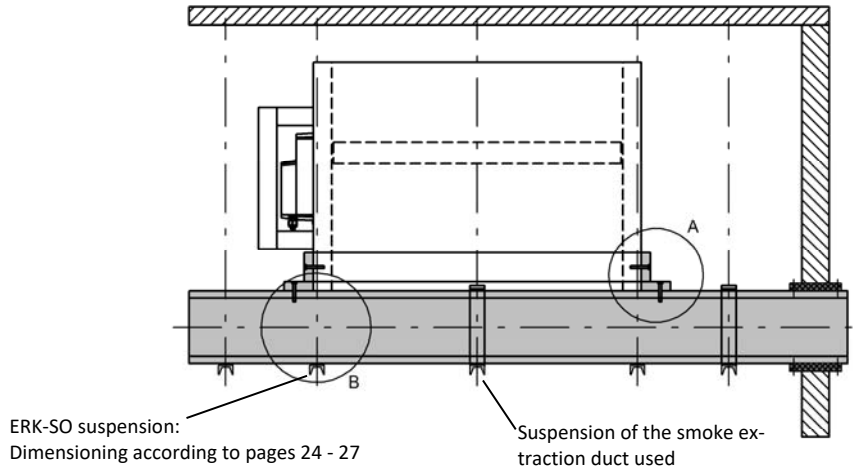
Examples of connection to smoke extraction duct



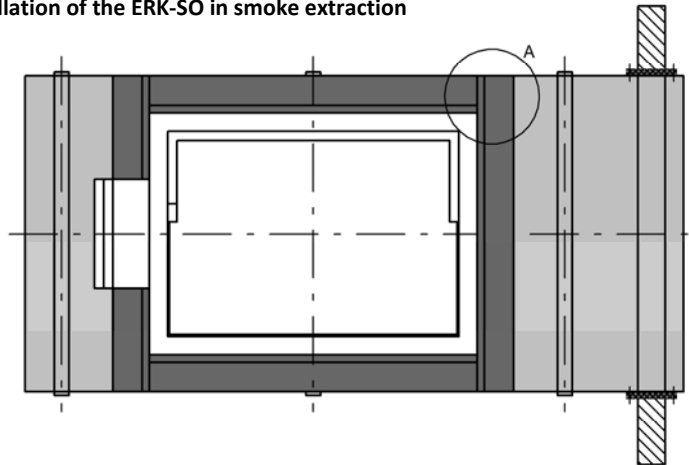
Details and design as specified by duct manufacturer.

Figure 16 - Examples of connection to smoke extraction duct

Connection options on horizontal smoke extraction ducts in accordance with EN 12101-7, tested according to EN 1366-8



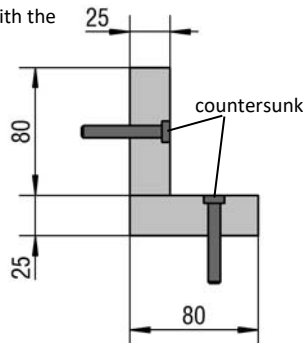
Top view: Installation of the ERK-SO in smoke extraction duct



Detail A

Circumferential fastening frame (on site) for connecting the ERK-SO with the smoke extraction duct used.

Spax screws at a distance of ≤ 120 mm, countersunk, (incl. water glass glue (SBK 2000) between ERK-SO or smoke extraction duct and fastening frame. (on site)



Detail B

Arrangement of the duct reinforcement in the smoke extraction duct. The arrangement depends on the size of the ERK-SO and the smoke extraction duct.

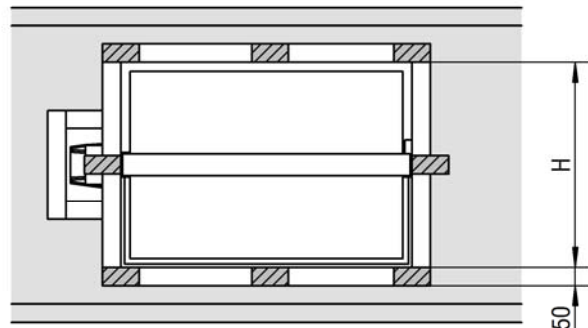


Figure 17 - Connection on horizontal smoke extraction duct

Connection instructions for smoke extraction duct made of sheet metal

Use is allowed only within the fire area from which smoke is to be extracted.

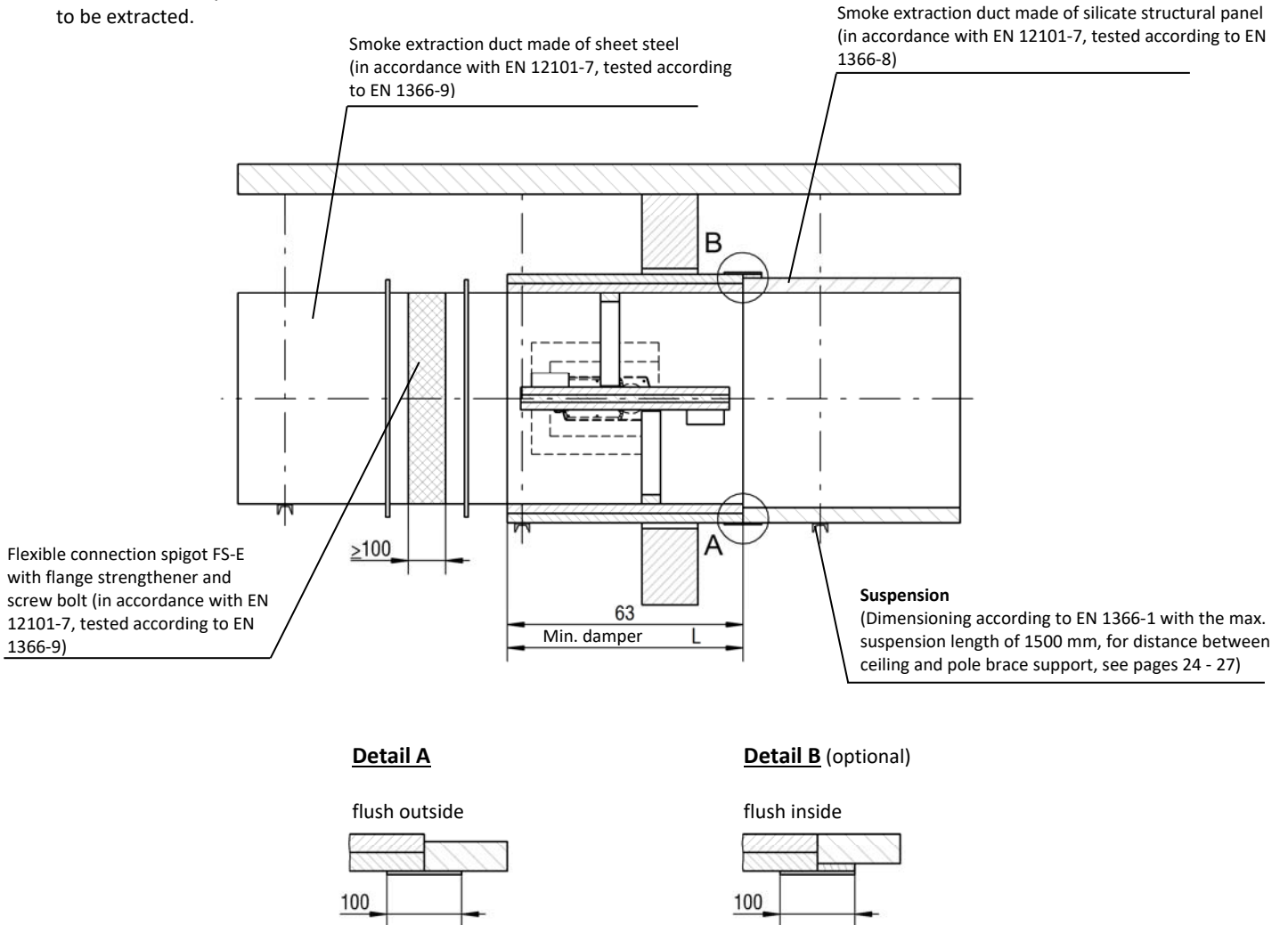


Figure 18 - Connection to smoke extraction duct made of sheet metal

Please note

For suspensions from fire-resistant smoke extraction ducts, observe the specifications of the associated usability certificate (e.g. abP, ETA, etc.).

SUSPENSIONS AND WEIGHTS

Fire safety dowels with European technical approval
 ETA-04/0026 for suspending the smoke extraction dampers

M8 to M12

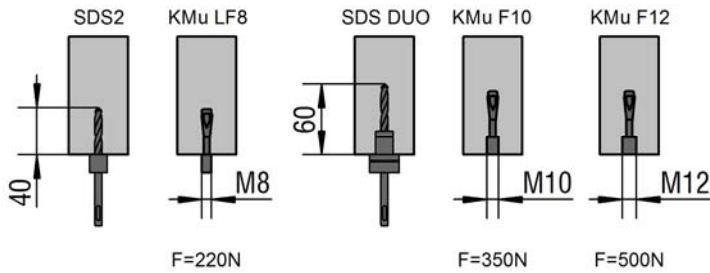


Figure 19 - Suspension fastening M8 to M12

M16 and M20

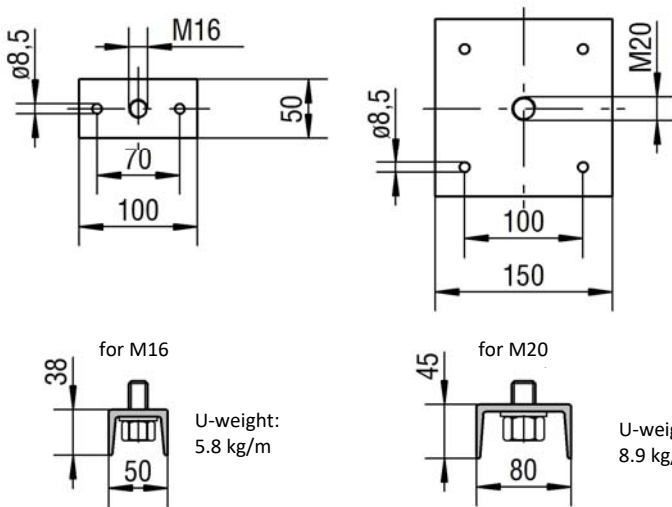
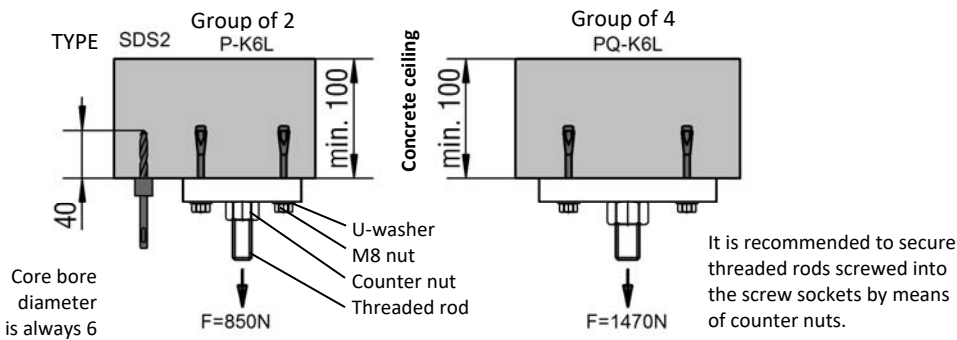


Figure 20 - Suspension fastenings M16 and M20

Suspensions

The uncovered threaded rods must be dimensioned such that the calculated tension of 6 N/mm² is not exceeded (this applies to a max. length of 1.5 m). The suspending brackets must be guided in U-shape around the duct (EN 13661).

Note regarding steel dowels with general building supervisory approval:

The suspending brackets must be fastened using expansion dowels M8 made of steel. The dowels must be installed according to the specifications of the valid approval notifications of the Institute of Structural Engineering and, in addition, the installation length must be twice as deep as required in the approval notification unless stated otherwise in the approval notification; the calculated tensile load per dowel must not exceed 500 N. Special dowels with a maximum tensile load of 700 N can be also used.

| Nominal dimension | Rod weight [kg/m] | * Stress cross-section [mm ²] | Load at 6 N/mm ² per threaded rod | |
|-------------------|-------------------|---|--|--------|
| | | | [N] | [kP] |
| M6 | 0.18 | 20.1 | 120.6 | 12.29 |
| M8 | 0.32 | 36.6 | 219.6 | 22.38 |
| M10 | 0.50 | 58.0 | 348.0 | 35.47 |
| M12 | 0.73 | 84.3 | 505.8 | 51.55 |
| M14 | 0.97 | 115.0 | 690.0 | 70.33 |
| M16 | 1.35 | 157.0 | 942.0 | 96.02 |
| M20 | 2.08 | 245.0 | 1470.0 | 149.84 |
| M24 | 3.00 | 353.0 | 2118.0 | 215.90 |
| M30 | 4.75 | 561.0 | 3366.0 | 343.11 |

Table 10 - Suspensions

* Stressed cross-sections of threaded rods with metric ISO thread to DIN 13, part 28

Weight table ERK-SO [kg]

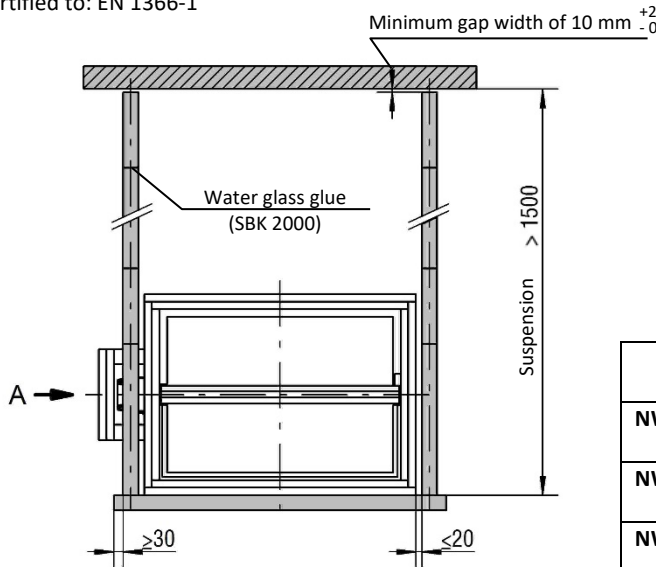
| | Width B [mm] | | | | | | | | | | | | | | | | | | | Length L [mm] | | |
|---------------|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|---------------|------|-----|
| | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | | 1500 | |
| Height H [mm] | 200 | 44 | 48 | 50 | 54 | 57 | 60 | 64 | 68 | 72 | 74 | 77 | 81 | 84 | 89 | 96 | 104 | 113 | 118 | 123 | 129 | 530 |
| | 250 | 47 | 50 | 54 | 58 | 61 | 65 | 69 | 71 | 75 | 78 | 81 | 85 | 88 | 95 | 102 | 110 | 116 | 122 | 129 | 137 | |
| | 300 | 51 | 54 | 59 | 63 | 65 | 69 | 72 | 76 | 80 | 83 | 87 | 90 | 93 | 101 | 108 | 117 | 122 | 130 | 137 | 143 | |
| | 350 | 54 | 58 | 63 | 65 | 69 | 72 | 76 | 80 | 83 | 87 | 90 | 94 | 98 | 105 | 112 | 121 | 130 | 138 | 143 | 150 | |
| | 400 | 58 | 61 | 65 | 70 | 72 | 78 | 81 | 84 | 88 | 91 | 95 | 99 | 102 | 111 | 118 | 126 | 137 | 142 | 149 | 157 | 630 |
| | 450 | 67 | 72 | 76 | 80 | 84 | 88 | 94 | 97 | 102 | 106 | 110 | 114 | 117 | 128 | 137 | 146 | 155 | 164 | 172 | 181 | |
| | 500 | 71 | 75 | 80 | 85 | 89 | 94 | 98 | 104 | 107 | 112 | 116 | 120 | 125 | 134 | 143 | 153 | 163 | 173 | 180 | 189 | |
| | 550 | 74 | 79 | 84 | 89 | 93 | 97 | 103 | 107 | 113 | 118 | 121 | 124 | 127 | 139 | 149 | 160 | 166 | 177 | 187 | 195 | |
| | 600 | 79 | 84 | 90 | 93 | 97 | 102 | 108 | 113 | 120 | 123 | 126 | 131 | 135 | 145 | 156 | 164 | 175 | 182 | 193 | 201 | 700 |
| | 650 | 83 | 90 | 97 | 100 | 106 | 112 | 117 | 122 | 126 | 132 | 137 | 140 | 143 | 154 | 164 | 176 | 182 | 196 | 205 | 213 | |
| 700 | 92 | 97 | 103 | 108 | 113 | 118 | 123 | 128 | 134 | 140 | 146 | 151 | 155 | 165 | 177 | 187 | 198 | 209 | 220 | 230 | | |
| 750 | 103 | 109 | 115 | 120 | 125 | 131 | 136 | 143 | 149 | 155 | 161 | 167 | 173 | 184 | 196 | 207 | 219 | 231 | 244 | 255 | 800 | |
| 800 | 109 | 115 | 121 | 128 | 133 | 139 | 145 | 151 | 157 | 163 | 169 | 176 | 181 | 193 | 206 | 219 | 230 | 242 | 254 | 266 | | |

Table 11 - Weight table

Covered suspending brackets - suspension height > 1.5 m ≤ M12

The uncovered threaded rods must be dimensioned such that the calculated tension of 6 N/mm² is not exceeded (this applies to a max. length of 1.5 m). The max. extension when exposed to temperature according to ETK (approx. 1000 °C) for 90 min. with regard to threaded rods with a length of 1.5 m is 40 mm. Due to larger extension, suspensions with a length of more than 1.5 m must be covered to provide safe fire protection.

Certified to: EN 1366-1



View A

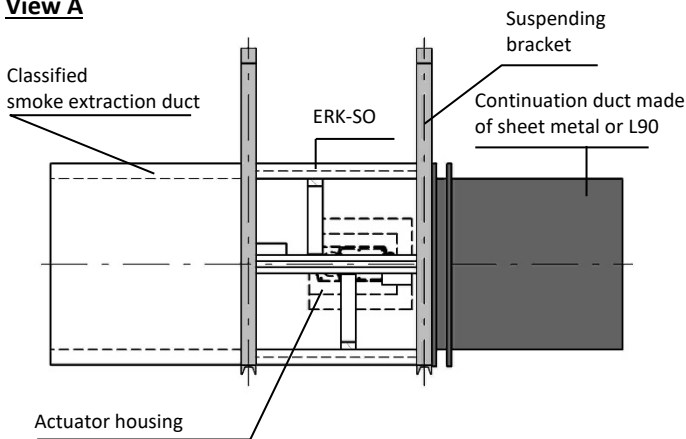
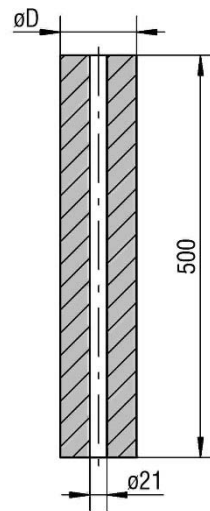


Figure 21 - Covered suspending brackets ≤ M12



(All dimensions in mm)

| Nominal size ød | Outer di-men. øD |
|-----------------|------------------|
| 71 | 75 |
| 80 | 85 |
| 90 | 95 |

Figure 22 - Dimensions of the suspension covering

| | Field of application | Weights of the suspension covering for each 0.5 m |
|--------------|---------------------------------------|---|
| NW 71 | up to max. suspension height of 2.5 m | approx. 3.6 kg |
| NW 80 | up to max. suspension height of 3 m | approx. 4.9 kg |
| NW 90 | up to max. suspension height of 4 m | approx. 5.9 kg |

other lengths on request.

Table 12 - Suspension coverings

Please note:

The weights of the suspension covering must be added to the weights of the smoke extraction damper, pole brace and threaded rods.

Covered suspending brackets - suspension height > 1.5 m from M14 to M20

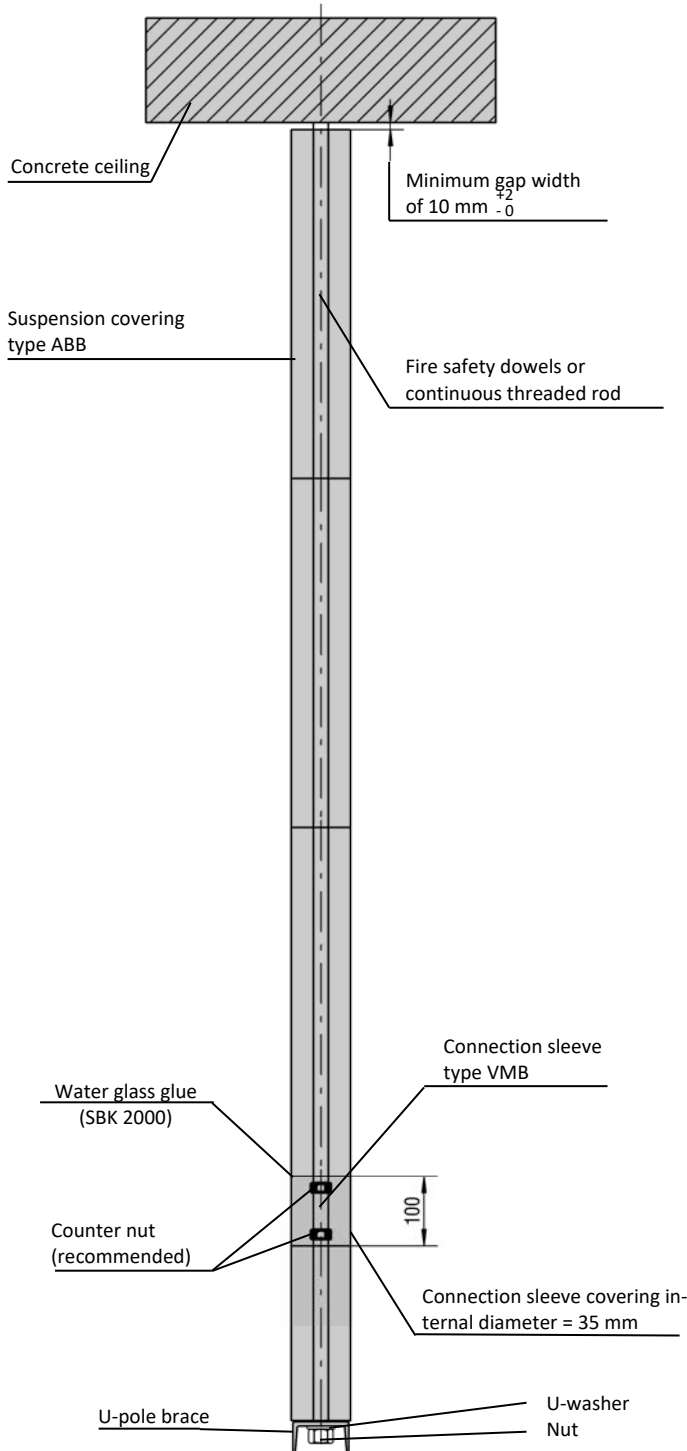


Figure 23 - Covered suspending brackets M14 to M20

Mounting instructions

The suspension coverings consist of a pipe made of sheet steel with internal fireproof lining.

In the centre of it, there is an at least 21 mm large bore for mounting the threaded rod. Starting from suspension M14, the connection sleeve for two threaded rods cannot be located in the area of the suspension covering any more, therefore a connection sleeve covering as shown opposite must be mounted.

Example of dimensioning

Given: ERK-SO with the dimensions
 W = 800 mm
 H = 400 mm
 Suspension height = 4 m

The following weights must be added:

| | |
|---|-----------------|
| ERK-SO according to table on page 25 | 102 kg |
| U-pole brace (U 80), see page 24 | 12 kg |
| Threaded rod M20 2 x (L = 4 m) see page 25 | 33.5 kg |
| Covering Ø 90 16 x 5.9 kg see page 26 | 94.5 kg |
| | Σ=242 kg |
| | : 2 |
| | = 121 kg |
| ± M20 according to table on page 25 | |

Order example

(only accessories for covering)
 16 units Suspension covering NW 90, L = 0.5 m

2 pieces connection sleeve covering (depending on the dimensions of the threaded rods used on site)

MINIMUM DISTANCES AND PROJECTING ENDS

The dimensions given must be considered an installation recommendation for the ERK-SO and may differ, depending on the local situation. The smoke extraction damper must be installed in accordance with the technical documentation, installation, mounting and operating instructions. For functional test, service, retrofitting, etc., inspection openings must be provided on site in suspended ceilings, shaft walls, connected ventilation ducts etc., if necessary. They must be built in sufficient numbers and size and must not impair the functioning of the smoke extraction dampers; they may lead to increasing the distances.

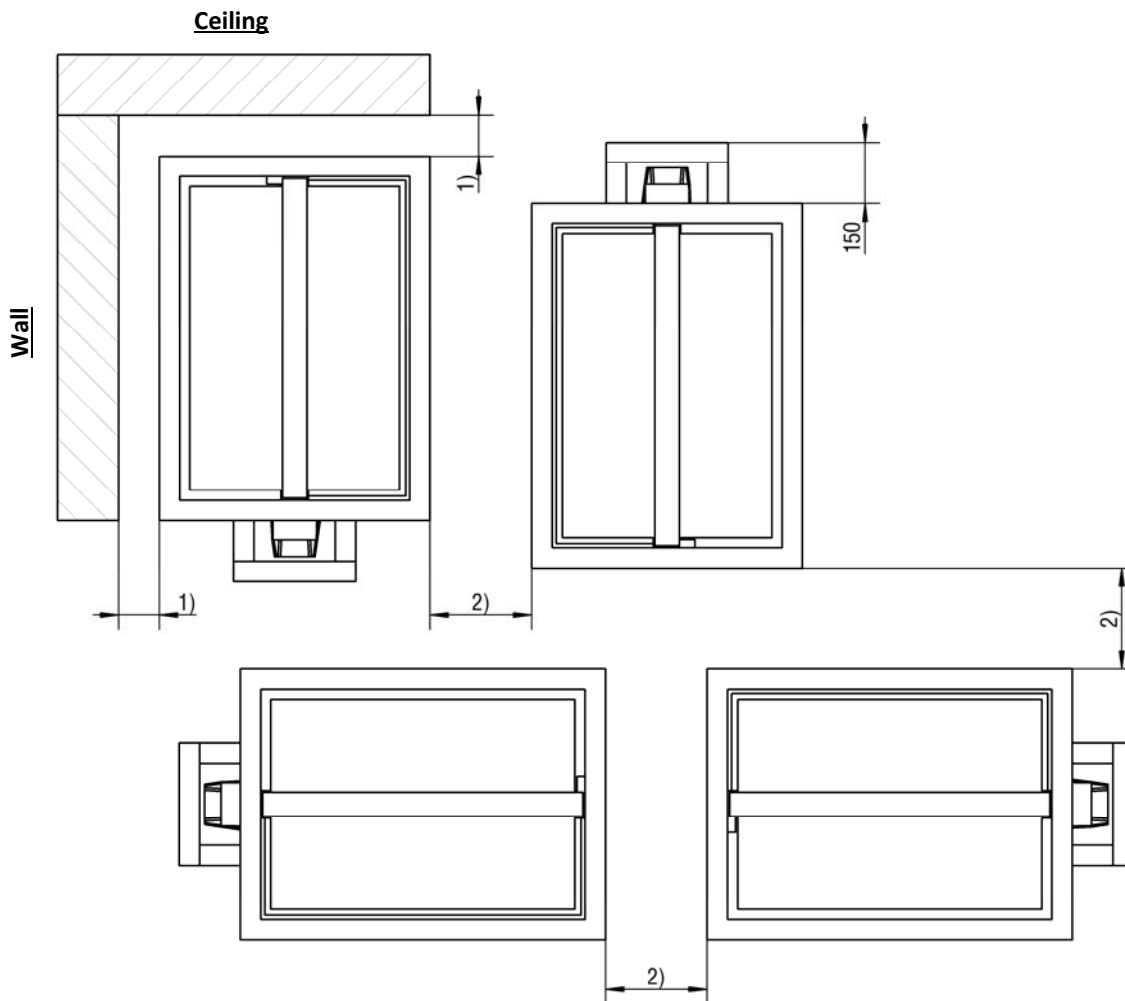


Figure 24: Minimum distances to walls and ceilings and ERK-SO to one another

- 1) The distance between smoke extraction damper and load-carrying component (wall/ceiling) must be determined according to the particular installation situation or adjusted to the dimensions of the projecting ends (actuator housing) and is at least 75 mm.
- 2) The distance between two smoke extraction dampers depends on the particular installation situation and is described in the corresponding installation situations. (p. 7 and the following pages).

TECHNICAL DATA

Pressure loss Δp_t [Pa] and noise level L_{WA} [dB (A)]

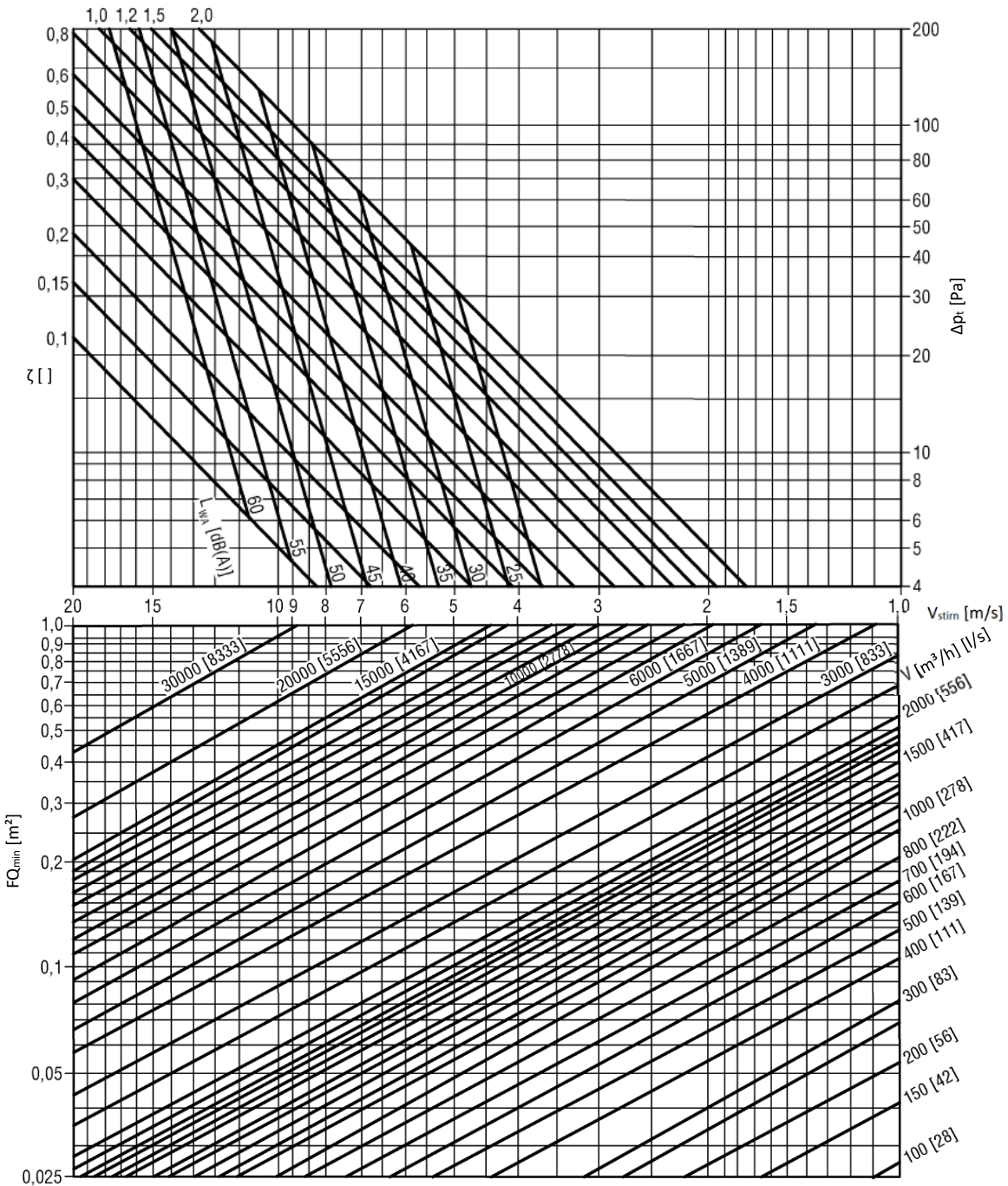


Diagram 1 - Design diagram

Correction table for octave weighting [dB/Oct]

| | | | | | | | | |
|----------------|----|-----|-----|-----|------|------|------|------|
| f_m [Hz] | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| KF_o [dB] | -4 | -2 | 0 | -1 | -4 | -9 | -15 | -21 |

Sound power per octave ($L_W = L_{WA} + KF_o$)

| | | | | | | | | |
|---------------|----|-----|-----|-----|------|------|------|------|
| f_m [Hz] | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| L_w [dB] | 37 | 39 | 41 | 40 | 37 | 33 | 26 | 20 |

CALCULATION EXAMPLE

Given: $W = 900 \text{ mm}$
 $H = 400 \text{ mm}$
 $V = 6000 \text{ m}^3/\text{h}$

Solution from dimension table
 $FQ_{min} = 0.247 \text{ m}^3$
 $\zeta = 0.328$

Find: $\Delta p_t = ?$
 $L_{WA} = ?$
 $L_W = ?$

Solution from diagram
 $v_{stirn} = 6.6 \text{ m/s}$
 $\Delta p_t = 8.5 \text{ Pa}$
 $L_{WA} = 39 \text{ dB (A)}$

DESIGN DATA

| Height (mm) | Width (mm) | | | | | | | | | | | | | | | | | | | |
|-------------|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------|
| | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 900 | 1000 | 1200 | 1300 | 1400 | 1500 | |
| 200 | 0.014 | 0.018 | 0.023 | 0.027 | 0.032 | 0.036 | 0.041 | 0.045 | 0.050 | 0.054 | 0.059 | 0.063 | 0.068 | 0.077 | 0.086 | 0.104 | 0.113 | 0.122 | 0.131 | FQ _{min} |
| | 1.356 | 1.232 | 1.158 | 1.085 | 1.017 | 0.915 | 0.848 | 0.821 | 0.780 | 0.740 | 0.700 | 0.660 | 0.633 | 0.599 | 0.565 | 0.537 | 0.509 | 0.480 | 0.452 | ζ |
| | 0.040 | 0.050 | 0.060 | 0.070 | 0.080 | 0.090 | 0.100 | 0.110 | 0.120 | 0.130 | 0.140 | 0.150 | 0.160 | 0.180 | 0.200 | 0.240 | 0.260 | 0.280 | 0.300 | FQ _K |
| 250 | 0.021 | 0.028 | 0.035 | 0.042 | 0.049 | 0.056 | 0.063 | 0.070 | 0.077 | 0.084 | 0.091 | 0.098 | 0.105 | 0.119 | 0.133 | 0.161 | 0.175 | 0.189 | 0.203 | FQ _{min} |
| | 1.209 | 1.085 | 0.961 | 0.836 | 0.757 | 0.735 | 0.678 | 0.658 | 0.629 | 0.599 | 0.569 | 0.540 | 0.520 | 0.486 | 0.452 | 0.429 | 0.407 | 0.384 | 0.362 | ζ |
| | 0.050 | 0.063 | 0.075 | 0.088 | 0.100 | 0.113 | 0.125 | 0.138 | 0.150 | 0.163 | 0.175 | 0.188 | 0.200 | 0.225 | 0.250 | 0.300 | 0.325 | 0.350 | 0.375 | FQ _K |
| 300 | 0.029 | 0.038 | 0.048 | 0.057 | 0.067 | 0.076 | 0.086 | 0.095 | 0.105 | 0.114 | 0.124 | 0.133 | 0.143 | 0.162 | 0.181 | 0.219 | 0.238 | 0.257 | 0.276 | FQ _{min} |
| | 1.062 | 0.938 | 0.836 | 0.735 | 0.667 | 0.644 | 0.588 | 0.570 | 0.543 | 0.517 | 0.490 | 0.464 | 0.446 | 0.418 | 0.396 | 0.373 | 0.350 | 0.328 | 0.305 | ζ |
| | 0.060 | 0.075 | 0.090 | 0.105 | 0.120 | 0.135 | 0.150 | 0.165 | 0.180 | 0.195 | 0.210 | 0.225 | 0.240 | 0.270 | 0.300 | 0.360 | 0.390 | 0.420 | 0.450 | FQ _K |
| 350 | 0.036 | 0.048 | 0.060 | 0.072 | 0.084 | 0.096 | 0.108 | 0.120 | 0.132 | 0.144 | 0.156 | 0.168 | 0.180 | 0.204 | 0.228 | 0.276 | 0.300 | 0.324 | 0.348 | FQ _{min} |
| | 0.915 | 0.791 | 0.712 | 0.633 | 0.576 | 0.554 | 0.497 | 0.482 | 0.458 | 0.435 | 0.412 | 0.388 | 0.373 | 0.350 | 0.339 | 0.316 | 0.294 | 0.271 | 0.249 | ζ |
| | 0.070 | 0.088 | 0.105 | 0.123 | 0.140 | 0.158 | 0.175 | 0.193 | 0.210 | 0.228 | 0.245 | 0.263 | 0.280 | 0.315 | 0.350 | 0.420 | 0.455 | 0.490 | 0.525 | FQ _K |
| 400 | 0.044 | 0.058 | 0.073 | 0.087 | 0.102 | 0.116 | 0.131 | 0.145 | 0.160 | 0.174 | 0.189 | 0.203 | 0.218 | 0.247 | 0.276 | 0.334 | 0.363 | 0.392 | 0.421 | FQ _{min} |
| | 0.836 | 0.712 | 0.644 | 0.576 | 0.542 | 0.475 | 0.452 | 0.439 | 0.420 | 0.401 | 0.382 | 0.363 | 0.350 | 0.328 | 0.294 | 0.280 | 0.266 | 0.251 | 0.237 | ζ |
| | 0.080 | 0.100 | 0.120 | 0.140 | 0.160 | 0.180 | 0.200 | 0.220 | 0.240 | 0.260 | 0.280 | 0.300 | 0.320 | 0.360 | 0.400 | 0.480 | 0.520 | 0.560 | 0.600 | FQ _K |
| 450 | 0.051 | 0.068 | 0.085 | 0.102 | 0.119 | 0.136 | 0.153 | 0.170 | 0.187 | 0.204 | 0.221 | 0.238 | 0.255 | 0.289 | 0.323 | 0.391 | 0.425 | 0.459 | 0.493 | FQ _{min} |
| | 0.757 | 0.644 | 0.582 | 0.520 | 0.486 | 0.452 | 0.429 | 0.415 | 0.394 | 0.373 | 0.352 | 0.331 | 0.316 | 0.294 | 0.283 | 0.266 | 0.249 | 0.232 | 0.215 | ζ |
| | 0.090 | 0.113 | 0.135 | 0.158 | 0.180 | 0.203 | 0.225 | 0.248 | 0.270 | 0.293 | 0.315 | 0.338 | 0.360 | 0.405 | 0.450 | 0.540 | 0.585 | 0.630 | 0.675 | FQ _K |
| 500 | 0.059 | 0.078 | 0.098 | 0.117 | 0.137 | 0.156 | 0.176 | 0.195 | 0.215 | 0.234 | 0.254 | 0.273 | 0.293 | 0.332 | 0.371 | 0.449 | 0.488 | 0.527 | 0.566 | FQ _{min} |
| | 0.701 | 0.610 | 0.542 | 0.475 | 0.429 | 0.418 | 0.407 | 0.393 | 0.371 | 0.350 | 0.329 | 0.308 | 0.294 | 0.283 | 0.249 | 0.237 | 0.226 | 0.215 | 0.203 | ζ |
| | 0.100 | 0.125 | 0.150 | 0.175 | 0.200 | 0.225 | 0.250 | 0.275 | 0.300 | 0.325 | 0.350 | 0.375 | 0.400 | 0.450 | 0.500 | 0.600 | 0.650 | 0.700 | 0.750 | FQ _K |
| 550 | 0.066 | 0.088 | 0.110 | 0.132 | 0.154 | 0.176 | 0.198 | 0.220 | 0.242 | 0.264 | 0.286 | 0.308 | 0.330 | 0.374 | 0.418 | 0.506 | 0.550 | 0.594 | 0.638 | FQ _{min} |
| | 0.678 | 0.596 | 0.527 | 0.458 | 0.417 | 0.404 | 0.390 | 0.377 | 0.357 | 0.337 | 0.318 | 0.298 | 0.284 | 0.270 | 0.239 | 0.228 | 0.217 | 0.206 | 0.195 | ζ |
| | 0.110 | 0.138 | 0.165 | 0.193 | 0.220 | 0.248 | 0.275 | 0.303 | 0.330 | 0.358 | 0.385 | 0.413 | 0.440 | 0.495 | 0.550 | 0.660 | 0.715 | 0.770 | 0.825 | FQ _K |
| 600 | 0.074 | 0.098 | 0.123 | 0.147 | 0.172 | 0.196 | 0.221 | 0.245 | 0.270 | 0.294 | 0.319 | 0.343 | 0.368 | 0.417 | 0.466 | 0.564 | 0.613 | 0.662 | 0.711 | FQ _{min} |
| | 0.644 | 0.575 | 0.504 | 0.432 | 0.398 | 0.383 | 0.364 | 0.353 | 0.335 | 0.317 | 0.302 | 0.284 | 0.269 | 0.251 | 0.224 | 0.213 | 0.203 | 0.193 | 0.182 | ζ |
| | 0.120 | 0.150 | 0.180 | 0.210 | 0.240 | 0.270 | 0.300 | 0.330 | 0.360 | 0.390 | 0.420 | 0.450 | 0.480 | 0.540 | 0.600 | 0.720 | 0.780 | 0.840 | 0.900 | FQ _K |
| 650 | 0.081 | 0.108 | 0.135 | 0.162 | 0.189 | 0.216 | 0.243 | 0.270 | 0.297 | 0.324 | 0.351 | 0.378 | 0.405 | 0.459 | 0.513 | 0.621 | 0.675 | 0.729 | 0.783 | FQ _{min} |
| | 0.610 | 0.554 | 0.480 | 0.407 | 0.379 | 0.362 | 0.339 | 0.328 | 0.313 | 0.297 | 0.286 | 0.270 | 0.254 | 0.232 | 0.209 | 0.199 | 0.189 | 0.179 | 0.170 | ζ |
| | 0.130 | 0.163 | 0.195 | 0.228 | 0.260 | 0.293 | 0.325 | 0.358 | 0.390 | 0.423 | 0.455 | 0.488 | 0.520 | 0.585 | 0.650 | 0.780 | 0.845 | 0.910 | 0.975 | FQ _K |
| 700 | 0.089 | 0.118 | 0.148 | 0.177 | 0.207 | 0.236 | 0.266 | 0.295 | 0.325 | 0.354 | 0.384 | 0.413 | 0.443 | 0.502 | 0.561 | 0.679 | 0.738 | 0.797 | 0.856 | FQ _{min} |
| | 0.576 | 0.533 | 0.457 | 0.381 | 0.359 | 0.340 | 0.314 | 0.304 | 0.290 | 0.276 | 0.266 | 0.252 | 0.239 | 0.213 | 0.194 | 0.185 | 0.176 | 0.166 | 0.157 | ζ |
| | 0.140 | 0.175 | 0.210 | 0.245 | 0.280 | 0.315 | 0.350 | 0.385 | 0.420 | 0.455 | 0.490 | 0.525 | 0.560 | 0.630 | 0.700 | 0.840 | 0.910 | 0.980 | 1.050 | FQ _K |
| 750 | 0.096 | 0.128 | 0.160 | 0.192 | 0.224 | 0.256 | 0.288 | 0.320 | 0.352 | 0.384 | 0.416 | 0.448 | 0.480 | 0.544 | 0.608 | 0.736 | 0.800 | 0.864 | 0.928 | FQ _{min} |
| | 0.542 | 0.511 | 0.434 | 0.356 | 0.340 | 0.319 | 0.288 | 0.280 | 0.268 | 0.256 | 0.246 | 0.234 | 0.225 | 0.194 | 0.179 | 0.171 | 0.162 | 0.153 | 0.144 | ζ |
| | 0.150 | 0.188 | 0.225 | 0.263 | 0.300 | 0.338 | 0.375 | 0.413 | 0.450 | 0.488 | 0.525 | 0.563 | 0.600 | 0.675 | 0.750 | 0.900 | 0.975 | 1.050 | 1.125 | FQ _K |
| 800 | 0.104 | 0.138 | 0.173 | 0.207 | 0.242 | 0.276 | 0.311 | 0.345 | 0.380 | 0.414 | 0.449 | 0.483 | 0.518 | 0.587 | 0.656 | 0.794 | 0.863 | 0.932 | 1.001 | FQ _{min} |
| | 0.520 | 0.497 | 0.418 | 0.339 | 0.328 | 0.305 | 0.271 | 0.264 | 0.254 | 0.243 | 0.232 | 0.222 | 0.215 | 0.181 | 0.170 | 0.161 | 0.153 | 0.144 | 0.136 | ζ |
| | 0.160 | 0.200 | 0.240 | 0.280 | 0.320 | 0.360 | 0.400 | 0.440 | 0.480 | 0.520 | 0.560 | 0.600 | 0.640 | 0.720 | 0.800 | 0.960 | 1.040 | 1.120 | 1.200 | FQ _K |

Table 13 - Design data

ACCESSORIES

available at an extra charge

- Housing and damper blade model with additional SR internal impregnation (ex works only) for protection against aggressive media.
- Enlargement of the actuator housing (ex works only)
- Actuator types
 - EK11 (SEL2.90; 230 V AC)
 - EK12 (SEL1.90 SLC; 24 V AC/DC)
 - EK14 (EK12 + SPMa-1SR)
 - EK20 (BE24; 24 V AC/DC)
 - EK21 (BE230; 230 V AC)
- Communication devices for actuator EK12 / EK14 e.g. SPMa1SR (part of EK14) or SPLM-4S OSD Mod
- Profile connection frame type PAR
- Security grille type ASG-E
- Flexible connection spigot type FS-E
- Mounting bracket type WE-S
- Ceiling frame type DR-S
- Fire safety dowels M8, M10 and M12 type KMU-L(F)
- Suspension plate incl. dowels, F = 850 N type P-K 6 L
- Suspension plate incl. dowels, F = 1500 N type PQ-K 6 L
- Drill bit for dowels \varnothing 6 mm (for suspension M8) type SDS-2
- Drill bit set for dowels \varnothing 6 mm (for suspension M10-M12) type SDS-DUO
- Setting tool of size 8 to 12 type SMU-H

TECHNICAL DATA - ACTUATORS

The following actuator types are available EK10 (SEL1.90; 24 V AC/DC - standard actuator) / EK11 (SEL2.90; 230 V AC) / EK20 (BE24; 24 V AC/DC) / EK21 (BE230; 230 V AC). The actuator EK12 (SEL1.90 SLC; 24 V AC/DC) / EK14 (EK12 + SPMa-1SR) is connected via the so-called 2-wire technology, the corresponding communication devices (e.g. SPMa-1SR or SPLM-4S OSD Mod; **please order separately**) can be used to retrieve data, for example signalling of end position, keeping timeframe (< 60 s) and monitoring of the torque.

The function of the actuator EK12 is only active when an additional required communication device (e.g. EK14 = EK12 + SPMa-1SR) is connected.

Please note

All electrical connections between actuator and power supply must be made according to the valid VDE guidelines.

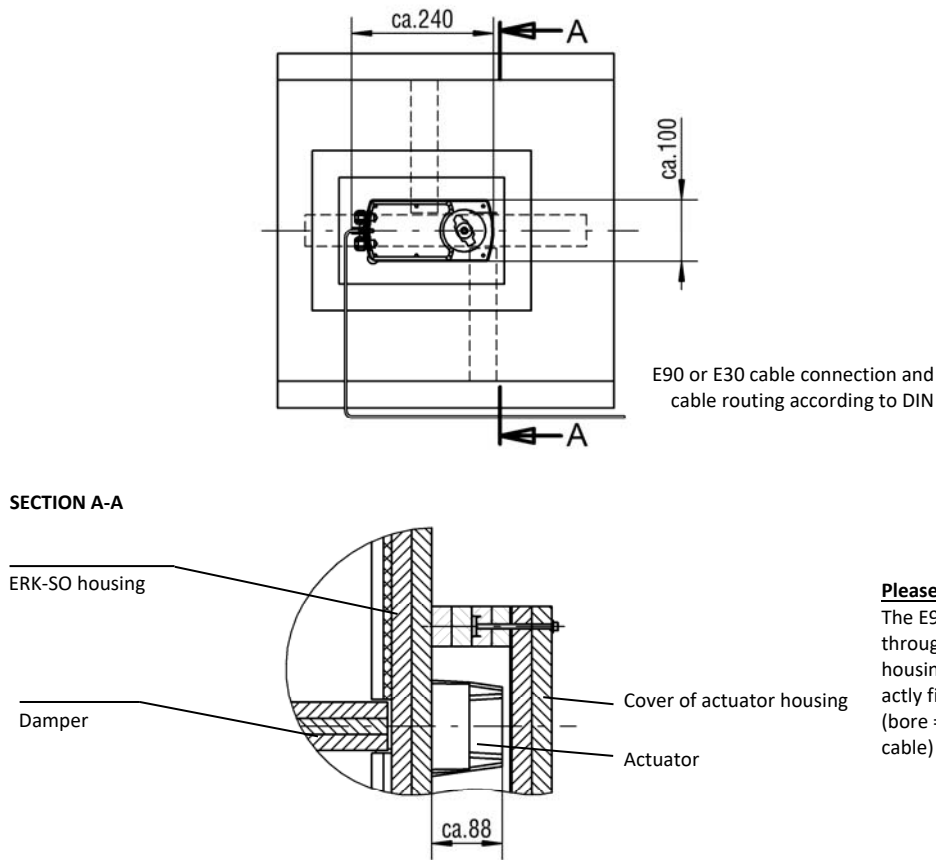
Technical data

| Actuator type | EK10 (SEL 1.90) | EK11 (SEL 2.90) | EK12 (SEL 1.90 SLC) / EK14 (EK12 + SPMa-1SR) |
|--|--------------------------|-----------------|--|
| Rated voltage [V] | AC/DC 24 | AC 230 | In connection with SPMa or SPLM |
| Power consumption during operation [W] | 7 | 12 | 7 |
| Power consumption end position [W] | 0.7 | 3.7 | 0.7 |
| Dimensioning [VA] | 13 | 13 | 8 |
| Degree of protection IEC/EN | IP54 | | |
| Protection class IEC/EN | II protective insulation | | |
| Torque at least [Nm] | 40 | | |
| Running time [s] | < 60 | | |
| Sound power level [dB(A)] | approx. 50 | | |
| Angle of rotation | 93° | | |
| Switching capacity of auxiliary switch | 3 (1.5) A, 230 V | | SLC is omitted |
| Maintenance | maintenance-free | | |
| Weight [kg] | ~ 2.6 | ~ 2.7 | ~ 2.6 |

| Actuator type | EK20 (BE24) | EK21 (BE230) |
|--|------------------------------|--------------------------|
| Rated voltage [V] | AC/DC 24 | AC 230 |
| Power consumption during operation [W] | 12 | 8 |
| Power consumption end position [W] | 0.5 | |
| Dimensioning [VA] | 18 | 15 |
| Degree of protection IEC/EN | IP54 | |
| Protection class IEC/EN | Safety extra low voltage III | II protective insulation |
| Torque at least [Nm] | 40 | |
| Running time [s] | < 60 | |
| Sound power level [dB(A)] | maximum 62 | |
| Angle of rotation | 100° | |
| Switching capacity of auxiliary switch | 2 x EPU, 6 (3) A, AC 250 V | |
| Maintenance | maintenance-free | |
| Weight [kg] | ~ 2.7 | |

Table 14 - Technical data of actuators

Actuator arrangement and cable routing



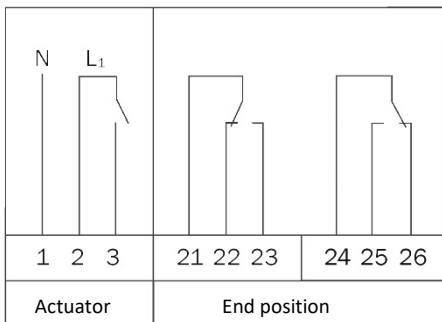
Please note

The E90 or E30 cable is passed through the side wall of the actuator housing (L90) by means of a bore exactly fitting the connection cable (bore = outer diameter of E90 or E30 cable)

Figure 25 - Actuator arrangement and cable routing

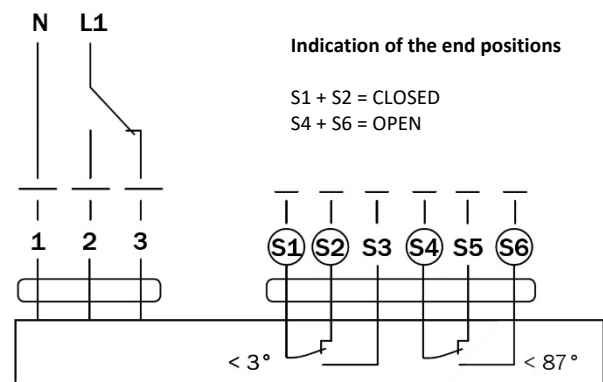
Connection diagram for actuator types EK10 (SEL 1.90; 24 V AC/DC) and EK11 (SEL 2.90; 230 V AC) 2-point or 1-wire control (7-strand)

Picture showing OPEN



| | | |
|---|----|-------------|
| ⊥ | ~ | AC24V ±20% |
| — | + | DC24V ±10% |
| N | L1 | AC230V ±10% |

Connection diagram for actuator types EK20 (BE24; 24 V AC/DC) and EK21 (BE230; 230 V AC) 2-wire control



Connection diagram for actuator type EK12 (SEL 1.90 SLC; 24 V AC/DC) / EK14 (EK12+SPMa-1SR) 2-wire technology (2-strand)

see safety communication modules power line system SLC, type SPMa-1SR or SPLM-4S OSD Mod.

ADD-ON PARTS

Profile connection frame type PAR

The profile connection frame type PAR can be fitted on one or two sides. Model: galvanised sheet steel.

Please specify separately, when ordering:

- mounted ex works (recommended), on one side (operating side [BS] (PAR1) or wall side [MS] (PAR2)) or on both sides (PAR3).
- delivered loose: 1 piece (PAR4)
2 pieces (PAR5).

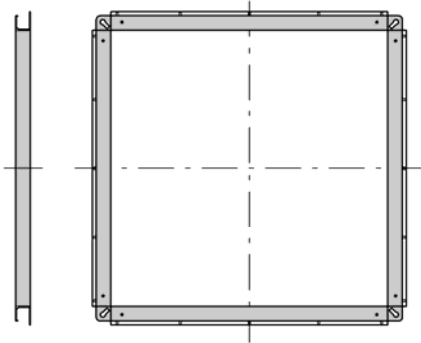


Figure 26 - Profile connection frame type PAR

Security grille type ASG-E

The security grille type ASG-E can be fitted on one or two sides. Model: galvanised sheet steel.

Please specify separately, when ordering:

- mounted ex works (recommended), on one side (operating side [BS] (ASG1) or wall side [MS] (ASG2)) or on both sides (ASG3).
- delivered loose: 1 piece (ASG4)
2 pieces (ASG5)

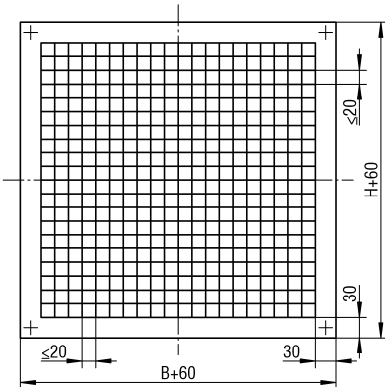


Figure 27 - Security grille type ASG-E

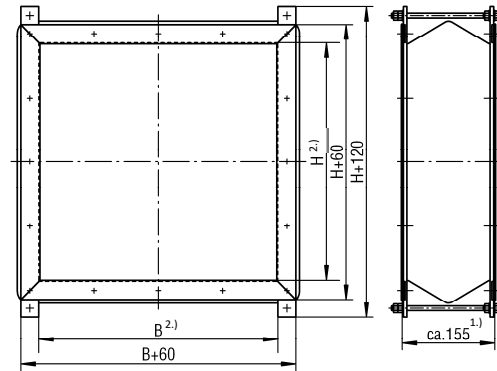
Recommendation: Mounting of the ASG-E in connection with the PAR with W or H > 700 mm.

Flexible connection spigot type FS-E

The flexible spigot type FS-E has a temperature resistance of 600°C and is supplied loose as an accessory. Expansion of at least 100 mm when installed must be provided.

For mounting of the FS-E on the smoke extraction damper type ERK-SO, the profile connection frame PAR is required.

- PAR mounted ex works (recommended) + FS-E loose, on one side (operating side [BS] (PFS1) or wall side [MS] (PFS2)) or on both sides (PFS3).
- delivered loose: 1 piece each (PFS4)
2 pieces each (PFS5).

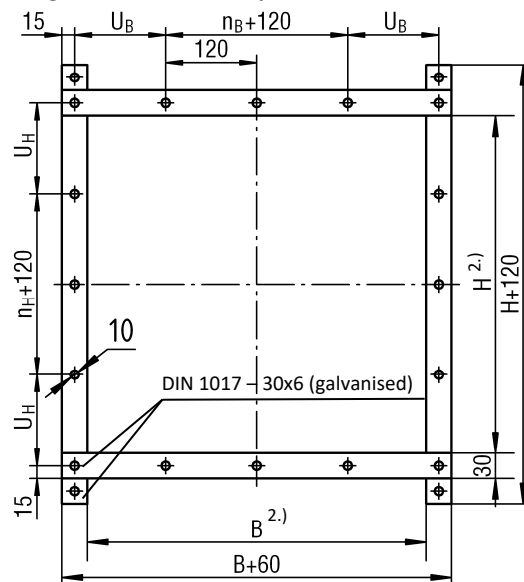


¹⁾ The required installation dimension is 155 mm.

²⁾ clearance of clamping flange

Figure 28 - Flexible connection spigot type FS-E

Flange dimensions / Drill pattern



2.) clearance of clamping flange

Figure 29 - FS-E flange dimensions/drill pattern

LEGEND

| | |
|-----------------------|--|
| Δp_t [Pa] | = Pressure loss |
| v_{stirn} [m/s] | = Intake velocity, blower stream velocity, outflow velocity, relative to A_{stirn} |
| V [m^3/h] [l/s] | = Volumetric flow |
| L_{WA} [dB (A)] | = A-weighted sound power level |
| L_W [dB] | = Sound power level / octave ($L_W = L_{WA} + KF_O$) |
| B [mm] | = Width |
| H [mm] | = Height |
| L [mm] | = Length |
| FQ_{min} [m^2] | = Smallest flow cross-section inside the smoke extraction damper |
| FQ_K [m^2] | = Duct connection cross-section |
| ζ | = Resistance coefficient (duct installation) |
| f_m [Hz] | = Octave centre frequency |
| KF_O [dB] | = Octave correction value |
| ρ [kg/m^3] | = Density |
| BS | = Operating side |
| MS | = Wall side |

ORDER CODE

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 |
|----------------|-------|-------|--------|--------|---------|----------|-------------|---------------------|
| Type | Model | Width | Height | Length | Housing | Actuator | Accessories | Extra bracket/frame |
| Example | | | | | | | | |
| ERK | -SO | -1500 | -750 | -800 | -0 | -EK10 | -PSG1 | -WES |

EXAMPLE

ERK-SO-1500-750-800-0-EK10-PSG1-WES

Smoke extraction damper type ERK | model -SO | width = 1500 mm | height = 750 mm | length = 800 mm | housing without SR internal impregnation | with actuator EK10 = type SEL 1.90 (24 V AC/DC) | with accessory PSG1 (corresponds to PAR+ASG-E, mounted ex works on the operating side BS) | with extra bracket WES (number according installation situation and dimension)

ORDER DETAILS

01 - TYPE

ERK

02 - MODEL

-SO

03 - WIDTH

0200 - 0250 - 0300 - 0350 - 0400 -
 0450 - 0500 - 0550 - 0600 - 0650 -
 0700 - 0750 - 0800 - 0850 - 0900 -
 0950 - 1000 - 1050 - 1100 - 1150 -
 1200 - 1250 - 1300 - 1350 - 1400 -
 1450 - 1500

in mm - always four digits

04 - HEIGHT

200 - 250 - 300 - 350 - 400 - 450 -
 500 - 550 - 600 - 650 - 700 - 750 - 800

in mm - always three digits

05 - LENGTH

530 = 530 (630/700/800) mm (for $200 \leq H \leq 400$)
 630 = 630 (700/800) mm (for $401 \leq H \leq 634$)
 700 = 700 (800) mm (for $635 \leq H \leq 711$)
 800 = 800 mm (for $712 \leq H \leq 800$)

Remark: To avoid projecting ends of the damper blade, the lengths L (standard) are assigned to the heights H.
 At an extra charge, other lengths (bracket values) are possible upon request.

06 - HOUSING

0 = without SR internal impregnation
 1 = enlargement of the actuator housing
 2 = with SR internal impregnation
 3 = enlargement of the actuator housing and with SR internal impregnation

07 - ACTUATOR

EK10 = SEL 1.90 (24 V AC/DC; STANDARD ACTUATOR)
 EK11 = SEL 2.90 (230 V AC)
 EK12 = SEL 1.90 SLC (24 V AC/DC; additional communication device required; please order separately)
 EK14 = EK12 including additional required communication device SPMa-1SR
 EK20 = BE24 (24 V AC/DC)
 EK21 = BE230 (230 V AC)

08 - ACCESSORIES

ZU00 = without accessories

ASG1 = ASG-E - mounted ex works on operating side BS
 ASG2 = ASG-E - mounted ex works on wall side MS
 ASG3 = ASG-E - mounted ex works on both sides
 ASG4 = ASG-E - 1 piece - loose - with fastening screws
 ASG5 = ASG-E - 2 pieces - loose - with fastening screws

PSG1 = PAR + ASG-E - mounted ex works on operating side BS
 PSG2 = PAR + ASG-E - mounted ex works on wall side MS
 PSG3 = PAR + ASG-E - mounted ex works on both sides
 PSG4 = PAR + ASG-E - 1 piece each - loose - with fastening screws
 PSG5 = PAR + ASG-E - 2 pieces each - loose - with fastening screws

PFS1 = PAR mounted ex works on operating side BS + FS-E loose
 PFS2 = PAR mounted ex works on wall side MS + FS-E loose
 PFS3 = PAR on both sides - mounted ex works + FS-E (2 pieces) loose
 PFS4 = PAR + FS - 1 piece each - loose - with fastening screws
 PFS5 = PAR + FS-E - 2 pieces each - loose - with fastening screws

PAR1 = PAR mounted ex works on operating side BS
 PAR2 = PAR mounted ex works on wall side
 PAR3 = PAR - mounted ex works on both sides
 PAR4 = PAR - 1 piece - loose - with fastening screws
 PAR5 = PAR - 2 piece - loose - with fastening screws

09 - EXTRA BRACKET/FRAME

ZU0 = without extra bracket/frame

WES = mounting bracket WE-S required for installation on solid walls and in solid ceilings (delivery in loose form) loose; number according to installation situation and dimension)

DRS = ceiling frame DR-S - required for vertical installation on solid ceilings (delivery in loose form)

SPECIFICATION TEXTS

The smoke extraction damper ERK-SO conforms to EN 12101-8, EN 13501-4, EN 1366-2 and EN 1366-10. The ERK-SO has been tested according to EN 1366-2 and EN 1366-10 in accordance with the Declaration of Performance No. DoP-ERK-SO-2016-07-01. It is in possession of the Performance Reliability Certificate according to EU-BauPVO 0761 - CPR - 0506. Its classification according to EN 13501-4 is EI 90 (v_{edw} , h_{ow} i↔o) S 1000 C₁₀₀₀ MA multi, depending on the mounting situation.

Smoke extraction dampers are intended for ventilating smoke in smoke extraction systems and for providing necessary supply air within the smoke extraction installation.

Housing and damper blade are made of abrasion-resistant, mineral silicate structural panels.

Damper blade axle made of stainless steel is mounted in maintenance-free bronze bushes.

The smoke extraction dampers are driven by a reversible OPEN / CLOSE actuator with 24 V AC/DC or 230 V AC supply voltage. It is located in a thermally insulated actuator housing to ensure correct opening and closing of the smoke extraction damper under fire conditions.

With circumferential stop bar seals.

Can be used with damper blade axle in horizontal or vertical position.

Any accessories that may be required for the respective mounting situation are listed in separate positions of the bill of quantities.

Installation

- in solid walls (when installed next to each other without gap; when installed on top of each other 200 mm)
- on solid walls (in connection with fastening brackets WE-S and on-site suspensions)
- in solid walls (in connection with fastening brackets WE-S and on-site suspensions)
- on solid walls (in connection with ceiling frame DR-S)
- in and on horizontal smoke extraction ducts (in connection with on-site suspensions) and on horizontal smoke extraction ducts (in connection with on-site fastening frames and suspensions)

Product: SCHAKO **type ERK-SO**

Declaration of Performance No. **DoP-ERK-SO-2016-07-01**

Dimensions:

Width (B): mm

Height (H): mm

Length (L): mm

Unless stated otherwise, the actuator EK10 (24 V AC/DC) will be delivered. Moreover, the standard length will be assigned to the height H.

Alternative models or accessories (at an extra charge)

("Select as desired")

- Housing and damper blade with additional SR internal impregnation (ex works) for protection against aggressive media.
- Enlargement of the actuator housing (ex works)
- Actuators with integrated limit switches for indication of the damper end positions
 - EK11 (SEL 2.90; actuator 230 V AC)
 - EK20 (BE 24; actuator 24 V AC / DC)
 - EK21 (BE 230; actuator 230 V AC)
- Actuator with SLC technology for activating and monitoring smoke extraction dampers. The smoke extraction damper is connected with one two-wire line by means of the SLC technology, detecting and reporting short-circuit or line break of the SLC lines by constant monitoring.
 - EK12 (SEL 1.90 SLC; actuator 24 V AC/DC; without additional required communication device)
 Suitable communication devices, for example SPMa1SR (part of EK14) or SPLM-4S OSD Mod. allow retrieving data, such as indication of end position, keeping timeframe (<60 s) or torque monitoring. The function of the actuator EK12 is only active when an additional required communication device is connected.
 - EK14 (EK12; actuator 24 V AC/DC; including communication device SPMa-1SR)

Security grille type ASG-E, made of galvanised sheet steel, mesh size ≤ 20 mm; the damper blade must move freely when damper blade is open, consider elongation of the housing, if required. Recommendation: Mounting of the ASG-E in connection with the PAR with W or H > 700 mm.

- mounted ex works (recommended), on one side (operating side [BS] (ASG1) or wall side [MS] (ASG2) or on both sides (ASG3).
- delivered loose: 1 piece (ASG4)
2 pieces (ASG5)

Product: SCHAKO **type ASG-E**

Dimensions:

Width (B): mm

Height (H): mm

Flexible spigot type FS-E, in accordance with EN 12101-7, tested according to EN 1366-9; with flange strengthener and screw bolt.

Expansion of at least 100 mm when installed. The smoke extraction damper must not be subject to mechanical stress under any circumstances.

Temperature-resistant up to 600°C. For connection to smoke extraction duct made of sheet steel. Profile connection frame PAR is required for mounting.

- PAR mounted ex works (recommended) + FS-E loose, on one side (operating side [BS] (PFS1) or wall side [MS] (PFS2)) or on both sides (PFS3).
- delivered loose: 1 piece each (PFS4)
2 pieces each (PFS5)

Product: SCHAKO **type FS-E**

Dimensions:

Width (B): mm

Height (H): mm

Profile connection frame type PAR, made of galvanised sheet steel, for connecting flexible spigot type FS-E or security grille ASG-E.

- mounted ex works (recommended), on one side (operating side [BS] (PAR1) or wall side [MS] (PAR2)) or on both sides (PAR3).
- delivered loose: 1 piece (PAR4)
2 pieces (PAR5)

Product: SCHAKO **type PAR**

Dimensions:

Width (B): mm

Height (H): mm

Mounting bracket type WE-S, made of galvanised sheet steel, dimensions 100 x 100 x 160 mm. Required for installation on solid walls and in solid ceilings. The exact arrangement and number of mounting brackets WE-S must be selected according to the ERK-SO dimensions.

Product: SCHAKO Mounting bracket type WE-S

Dimensions (W/H according to the damper dimension)

Width (B): mm

Height (H): mm

The mounting brackets WE-S (loose) are delivered only if they have been explicitly ordered and according to specifications for the mounting situation.

Ceiling frame type DR-S, made of silicate structural panels, dimensions 100x40 mm. Required for vertical installation on solid ceilings. Up to dimensions W and H = 500 mm, additional mounting brackets made of steel (2 pieces) are required for ERK-SO. The ceiling frame DR-S is pressed circumferentially against ERK-SO and solid ceiling and screwed to the ceiling. If it is necessary due to the size, the mounting brackets made of steel must be additionally screwed to the ERK-SO housing and ceiling with DR-S.

The connection between ERK-SO and solid ceiling must be adjusted beforehand using water glass glue (SBK 2000) or established.

Product: SCHAKO **Ceiling frame type DR-S**

Dimensions (W/H according to the damper dimension)

Width (B): mm

Height (H): mm

The ceiling frame DR-S (loose) is delivered only if it has been explicitly ordered and according to specifications for the mounting situation.

CE MARKING


| | | |
|---|--|--|
|  0761 | | 16 |
| SCHAKO Klima-Luft Ferdinand Schad KG Werk SO / Weidenäcker 9 D-88605 Meßkirch 2016 DoP-ERK-SO-2016-07-01 | | |
| EN 12101-8:2011 Smoke extraction damper Multi compartment Type/version ERK-SO | | |
| Nominal conditions of activation/response sensitivity: | | MA - passed |
| Opening/closing during the test at the right time and within the allowed time period | | |
| Response delay/closing time: | | MA - passed |
| Operational safety: | | 10,000 switch cycles - passed |
| Fire resistance: | | |
| - Fire integrity - E - Heat insulation - I - Smoke tightness - S - Mechanical dimensional stability (under E) - Maintaining the cross-section (under E) | | EI 90 (Vedw, h _{ow} , i↔o) S 1000 C ₁₀₀₀₀ MA multi |
| Durability of: | | |
| - the response delay | | passed |
| - the operational safety | | passed |

Figure 30 - CE marking

SERVICE

CHECKING THE FUNCTION, CLEANING, REPAIR

Installation information

The assembly must be made in a way that the inner viewing, cleaning and maintenance of the smoke damper is possible. To this end, suitable inspection openings must be provided in the connected smoke extraction ducts, if required. The connection to smoke extraction ducts made of wall boards is done according to inspected duct-specific constructions. The connection to inspected sheet steel ducts or flexible connection pieces is done via the profiled mounting frame type PAR.

Regulations for use and maintenance

- The operator of the smoke extraction installation must ensure that smoke extraction dampers are always kept in a ready-to-operate state and are maintained.
- Smoke extraction dampers must undergo maintenance at a six-month interval. If two consecutive inspections do not show any malfunctions, the maintenance interval of the smoke extraction dampers can be reduced to once a year.
- An inspection report must be produced, and the documents must be kept by the operator of the smoke extraction installation.
 - The smoke extraction dampers must be installed in accordance with the technical documentation, installation, mounting and operating instructions.
 - The work must be carried out by specialised companies only.
 - Observe general accident prevention regulations.
 - The smoke extraction dampers must be installed such that they are accessible.
 - For internal inspection and cleaning of the smoke extraction dampers, install inspection openings in the continuation connection lines.
 - The cover of the temperature-resistant actuator housing can be dismantled for electrical wiring and must be properly remounted (screwed) once the wiring is completed; the actuator itself is maintenance-free.
 - The electrical line installation must be at least E30, according to DIN 4102-12.
 - All electrical connections between actuator and power supply must be made according to the valid VDE guidelines.
 - Observe the general guidelines for service according to DIN 31051 and EN 13306.
 - For and after commissioning, the function of the entire smoke extraction system (interaction of all components) must be regularly checked and documented in writing.
 - The owner or operator must check whether the minimum requirement for his operation is met.
 - The function can be checked from the central unit.
 - Repair work can be carried out only after consultation with the manufacturer.

1 - Inspection for commissioning on site

- Check the smoke extraction damper for damage.
- The smoke extraction damper must be installed in accordance with the technical documentation, installation, mounting and operating instructions.
- Dismount the cover of the temperature-resistant actuator housing.
- The electrical wiring is done by a skilled electrician. Cable is inserted via a bore of exact fit = \varnothing E90 or \varnothing E30 cable through the side wall of the temperature-resistant actuator housing.
- Damper is in closed position, damper blade "CLOSED".
- Connection to electric circuit
- *Motors EK10 (SEL 1.90; 24 V AC/DC) / EK11 (SEL 2.90; 230 V AC): 2-point activation of the smoke extraction damper.
- *Motors EK12 (SEL 1.90 SLC; 24 V AC/DC) / EK14 (EK12 + SPMa-1SR): activation via 2-wire connection (SLC system) only in connection with communication device e.g. SPLM-4S OSD Mod / SPMa-1SR (component of EK14).
- From the switch cabinet, give pulse for open position (smoke extraction) or closed position (fire).
- Damper blade moves to open/closed position; the movement is controlled by motor.
- Limit switches integrated in the actuator indicate the open/closed positions.
- Open / close running time < 60 sec.
- *Torque monitoring: SLC system at least 40 Nm.
- Screw the cover of the temperature-resistant actuator housing again.

2 - Service for commissioning on site

- Remove / clean dirt / soiling detected during inspection.

3 - Inspection after commissioning – every 6 months / once a year

- See Inspection for commissioning.
- Functional test of the smoke extraction damper on site.
- Functional test by external monitoring.

4 - Service after commissioning depending on system equipment and operating conditions

- Internal inspection
- Remove / clean system-specific dirt / soiling which affects safety function.

Measures to be implemented for service must be documented in writing and provide proof.

5 - Repair

- Repair work must be carried out after consultation with the manufacturer.

SAMPLE OF FUNCTIONAL TEST PROTOCOL

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SAMPLE

Functional test protocol for smoke extraction dampers

Cons. No. _____

Smoke extraction damper No.: _____

Declaration of performance no.: _____

Series: _____

Actuator: _____

| The following functional steps have been carried out according to the documents installation, mounting and operating instructions | before commissioning | next functional check in: _____ | next functional test in: _____ | next functional test in: _____ | next functional test in: _____ |
|---|----------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|
| External check: System: _____ Item: _____ | | | | | |
| Internal check: System: _____ Item: _____ | | | | | |
| Additional check: System: _____ Item: _____ | | | | | |
| without defects Date / tester | | | | | |
| with defects (see back) Date / tester | | | | | |
| without defects Date / tester | | | | | |

SAMPLE

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SAMPLE

Functional test protocol for smoke extraction dampers

Cons. No. _____

Defects found during the test on: _____

*Sluggishness due to soiling.
Any remaining mortar must be removed.*

Defects found during the test on: _____

SAMPLE

Defects found during the test on: _____

Defects found during the test on: _____

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