

Maintenance-free

FR90 fire dampers in short lengths

for installation in rigid walls and ceilings and in metal stud walls

- Sizes: DN 100 mm to DN 315 mm
- Fire classification: EI 30/60/90/120 ($v_e - h_o, i \leftrightarrow o$) S
- *Options:*
 - Protective grille DN 100 to DN 200 for **air transfer applications**
 - **Non-return valves** DN 160 and DN 200
 - Limit switch for CLOSED position

FR90 fire dampers in short lengths

Fire damper and optional accessories

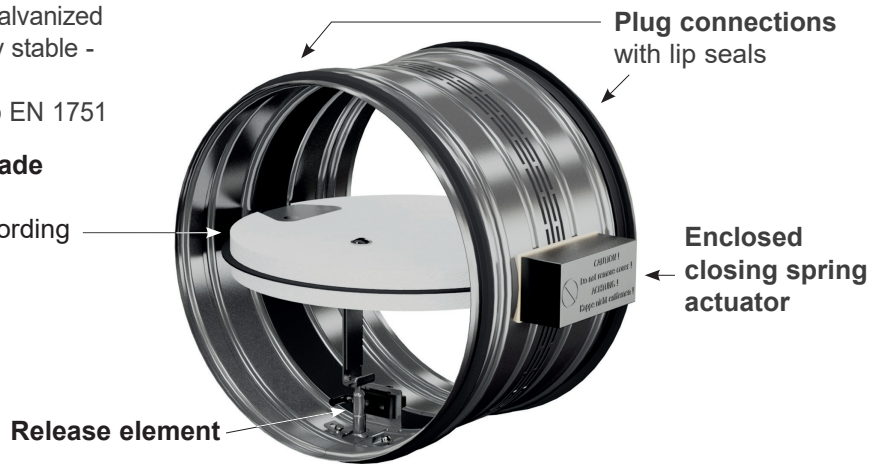
Single-piece steel sheet casing made of galvanized sheet steel, longitudinally welded - extremely stable -

- Air-tight and smoke-tight
- Casing leak tightness class C according to EN 1751

Break-resistant damper blade with elastomer lip seal-
Leak tightness class 3 according to EN 1751

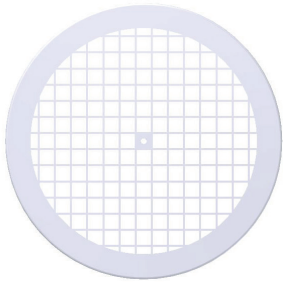
Large free cross-section enables:

- Maximum volume flows
- Minimum pressure loss
- Minimum sound levels

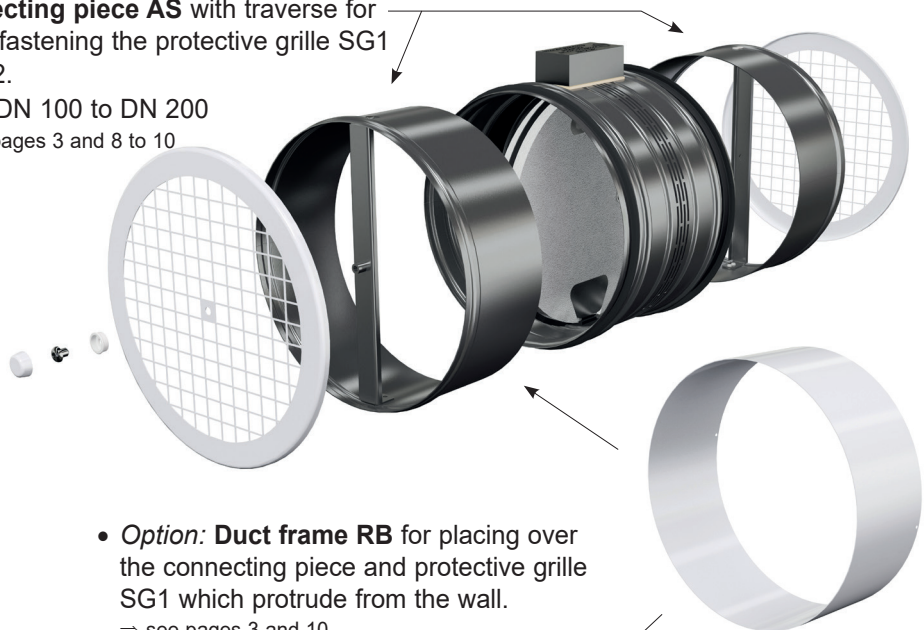


Optional accessories for installation in air transfer applications

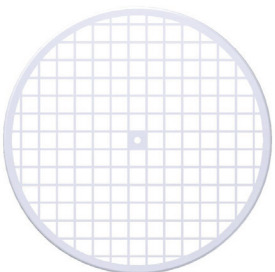
- **Protective grille SG1** with wide edge for installation flush with the wall.
⇒ see pages 3 and 8 to 10



- **Connecting piece AS** with traverse for screw fastening the protective grille SG1 or SG2.
Sizes DN 100 to DN 200
⇒ see pages 3 and 8 to 10



- **Protective grille SG2** with narrow edge for installation with excess lengths.
⇒ see pages 3 and 8 to 10



- **Connecting piece AR with non-return valve** on the non-operation side, with traverse for screw fastening the protective grille SG1 or SG2.
Sizes DN 160 to DN 200.
⇒ see pages 3 and 8 to 10



FR90 fire dampers in short lengths

Description

Maintenance-free **FR90 fire dampers according to EN 15650: FR92K series, short length 150 mm**

Fire classification: EI 30/60/90/120 ($v_e - h_o, i \leftrightarrow o$) S

Declaration of performance: DoP no.: CPR/FR90/003

- FR90 fire dampers are essentially made from non-combustible building materials. Certification: Certificate MPA-BS 6000/593/18
- **Use in air transfer applications is based on compatibility for approval in accordance with the building code in each individual case. Approvals are no longer issued.**

Nominal sizes DN [mm]
100 - 125 - 160 - 200 - 250 - 315

Single-piece casing made of galvanized sheet steel with plug connections and lip seals on both sides.

Release element for 70°C nominal temperature.

Casing leak tightness class C according to EN 1751.

Enclosed, maintenance-free drive mechanism outside the casing wall, sealed drive axles made of stainless steel, with red metal bearings.

For installation in rigid walls and ceilings with a thickness of at least 100 mm and in metal stud walls with a thickness of 95 mm or more. Installation can be carried out with the damper blade axis in the vertical or horizontal position, or anywhere in between. Installation with the connecting piece AR and non-return valve must be in a vertical axis position.

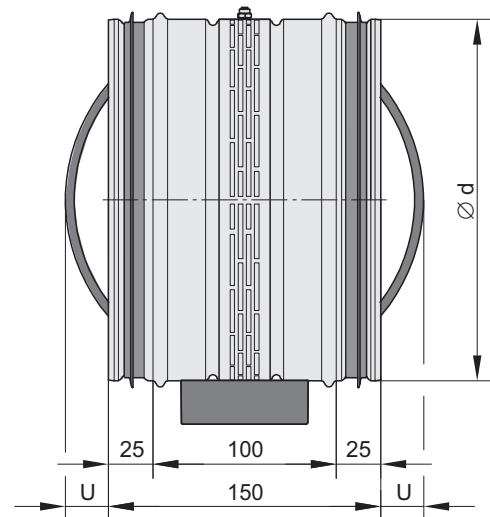
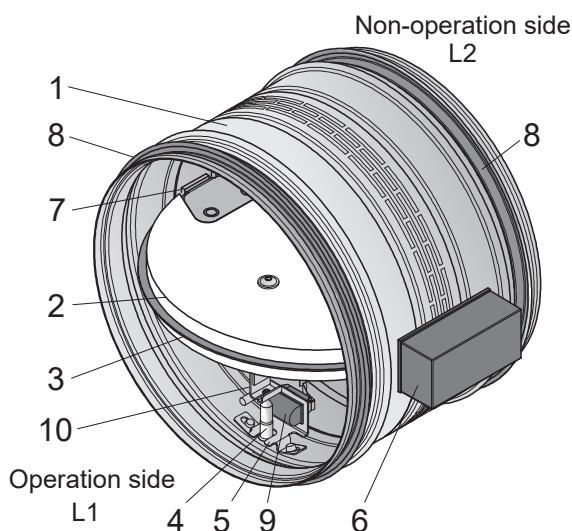
Connection to ventilation ducts made from non-combustible or combustible materials, or with protective grille.

Optional accessories:

- **Limit switch** for damper blade position CLOSED. ⇒ see page 11

Optional accessories:

- **Connecting piece AS** with traverses for screw fastening the protective grille SG1 or SG2 to the operation side L1 or non-operation side L2. Sizes DN 100 to DN 200. ⇒ see pages 2 and 8 to 10
- **Connecting piece AR** with **non-return valve** and traverse for screw fastening the protective grille SG1 or SG2 on the non-operation side L2. Sizes DN 160 to DN 200. ⇒ see pages 2, 8 to 10
- **Protective grille SG1** with wide edge for installation flush with the wall or in combination with the duct frame RB. Sizes DN 100 to DN 200. ⇒ see pages 2 and 8 to 10
- **Protective grille SG2** with narrow edge for installation flush with the connecting piece AS. Sizes DN 100 to DN 200. ⇒ see pages 2, 8 to 10
- **Duct frame RB** for covering connecting piece and protective grille SG1 which protrude from the wall. Sizes DN 100 to DN 200. ⇒ see pages 2 and 8 to 10



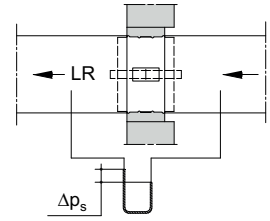
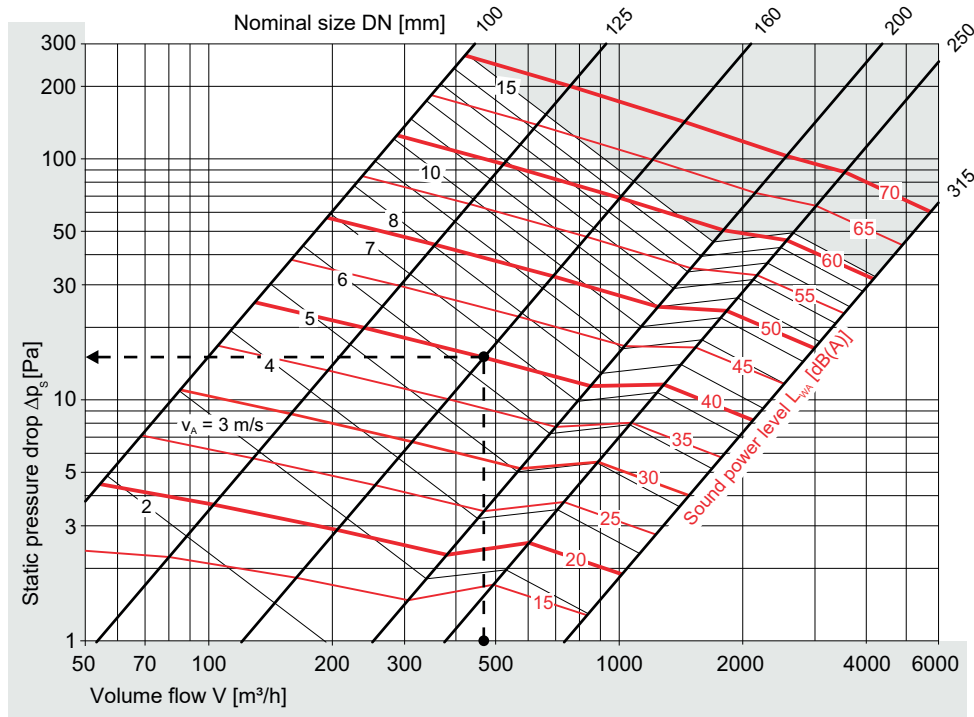
- | | |
|---|--|
| 1 Casing | 6 Enclosed closing spring actuator |
| 2 Damper blade | 7 Bearing axis |
| 3 Damper blade seal | 8 Plug connection with lip seal |
| 4 Release element with pipe fusible link 70°C | 9 Limit switch (optional) |
| 5 Fusible link holder on the casing | 10 Fusible link holder on damper blade |

DN	Fire damper					Protective grille A_{free} [m ²]
	$\varnothing d$ [mm]	U [mm]	A_A [m ²]	A_{free} [m ²]	Weight [kg]	
100	99.3	0	0.0068	0.004	0.565	0.0049
125	124.3	0	0.0110	0.008	0.685	0.0081
160	159.3	5	0.0185	0.014	0.865	0.0138
200	199.3	25	0.0293	0.024	1.105	0.0221
250	249.3	50	0.0465	0.038	1.715	-
315	314.3	85	0.0747	0.064	2.415	-

FR90 fire dampers in short lengths

Dimensioning (1) pressure drop, sound power level with ventilation duct connection on both sides

Installation on both sides with ventilation duct connection



FR90 fire dampers, series FR92K, can be used at a velocity of up to 15 m/s in the inflow cross-section A_A and up to 2500 Pa operating pressure.

Example:

Both sides with ventilation duct connection

- $V = 468$ m³/h
- $DN = 160$ mm
- $v_A = 6.5$ m/s
- $\Delta p_s = 15$ Pa
- $L_{WA} = 40$ dB(A)

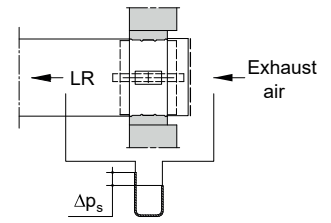
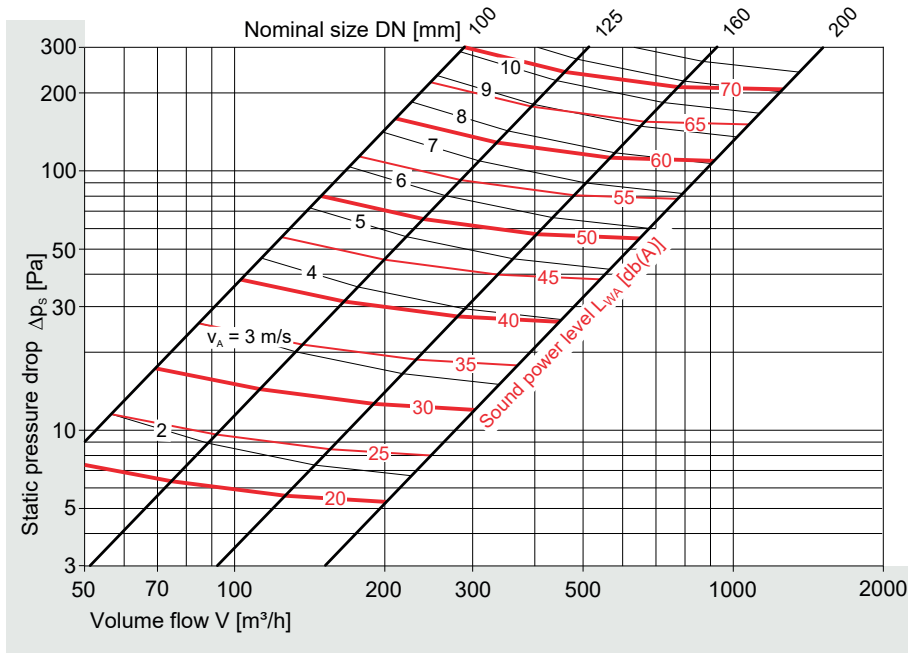
Nomenclature

- DN [mm] Nominal size
- A_A [m²] Inflow cross-section
- A_{free} [m²] Free cross-section fire damper or protective grille
- V [m³/h] Volume flow
- Δp_s [Pa] Static pressure drop
- v_A [m/s] Flow velocity in inflow cross-section (= inflow velocity)
- ΔL [dB] Relative sound power level to L_{WA}
- f [Hz] Octave mid frequency
- L_{WA} [dB(A)] A-weighted, area-corrected sound power level

FR90 fire dampers in short lengths

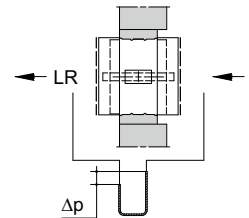
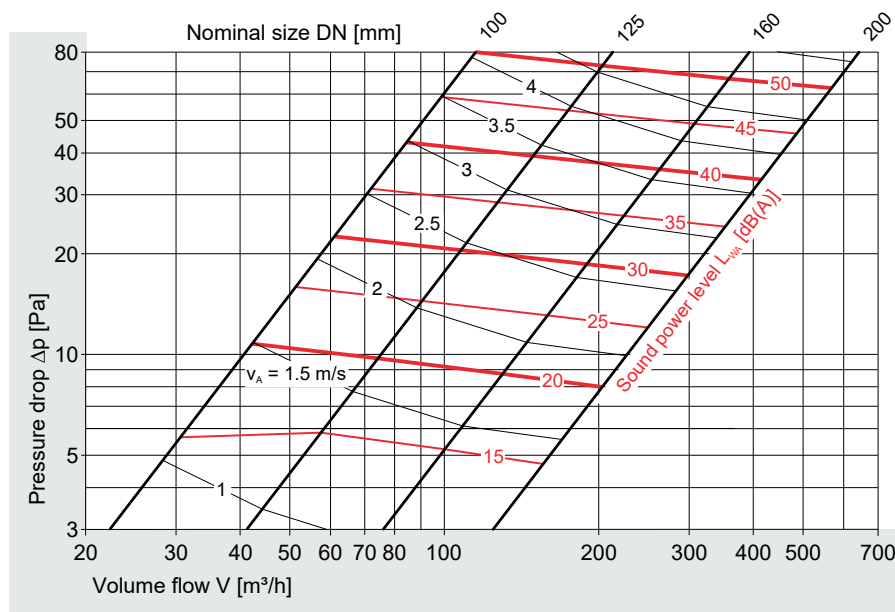
Dimensioning (2) pressure drop, sound power level with protective grilles connection

Installation on one side with ventilation duct connection and protective grille



free incoming flow - exhaust air-

Installation on both sides with protective grille in air transfer applications



Installation on both sides with protective grille and non-return valve in air transfer applications

DN	Volume flow [m ³ /h] in the opening direction at a differential pressure of		Leak tightness class according to EN 1751 with closed non-return valve and 25 to 300 Pa differential pressure in the closing direction
	25 Pa	50 Pa	
160	110	250	≥ 2
200	270	460	≥ 2

FR90 fire dampers in short lengths

Installation in general

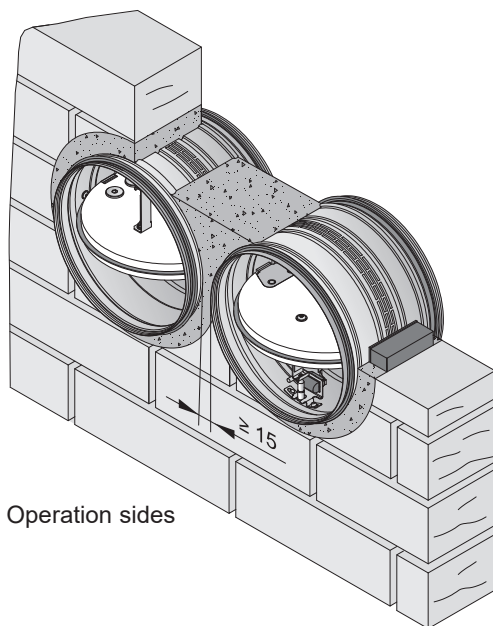
FR90 fire dampers, series FR92K,

must be installed in ≥ 100 mm thick rigid walls and ceilings, or in ≥ 95 mm thick metal stud walls, each with the appropriate fire resistance period.

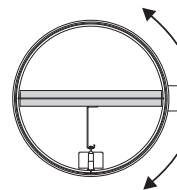
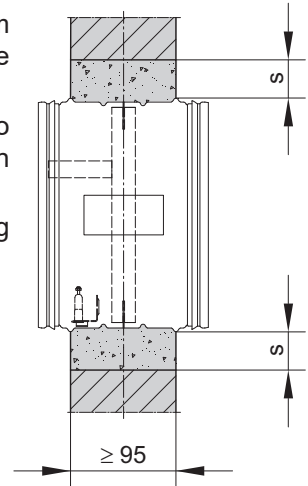
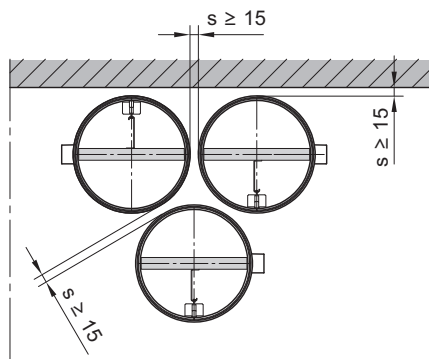
The circumferential gap "s" and the installation gaps between fire dampers must be ≥ 15 mm wide. The **fillings** or **mortaring** must be made as uniformly as possible on both sides of the damper blade, and should be ≥ 95 mm deep overall.

Fillings are made manually or mechanically with mortar of groups II or III according to DIN 1053 or with mortar of classes M2.5, M5, M10 or M20 according to EN 998-2 or with the respective fire protection mortar or gypsum mortar.

Gaps can be additionally filled as required. The same applies in the area of the connecting pieces. Special fillings are indicated below.



Operation sides



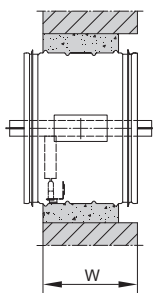
The damper blade axis and the closing spring actuator are shown here in horizontal position.

When using the connecting piece AR and the non-return valve, the damper blade axis and the closing spring actuator must be installed vertically!

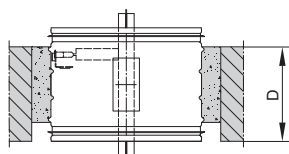
⇒ see page 9

Rotation of the fire damper by up to 360° is also permitted so that intermediate positions with appropriate installation positions of the closing spring actuator are possible.

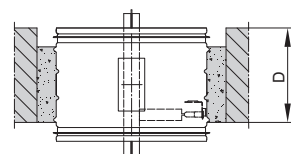
Installation in walls



Installation in ceilings



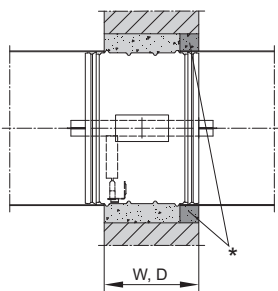
Vertical in ceilings



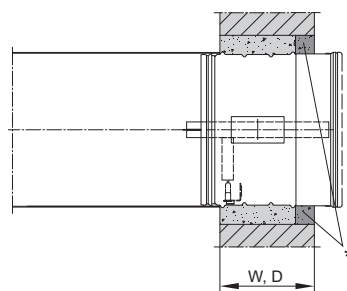
Suspended in ceilings

Connection types

Installation on both sides with duct connection

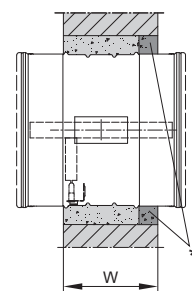


Installation on one side with duct connection and with protective grille on other side

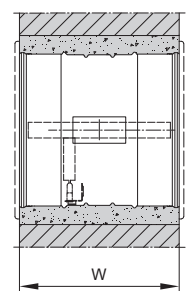


* fill out as required

Installation in air transfer applications with protective grille on both sides



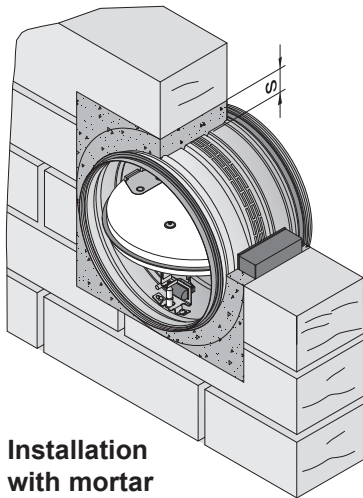
Flush with the duct



Flush with the wall

FR90 fire dampers in short lengths

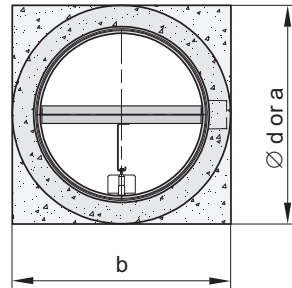
Installation in rigid walls and ceilings and in metal stud walls



Installation with mortar

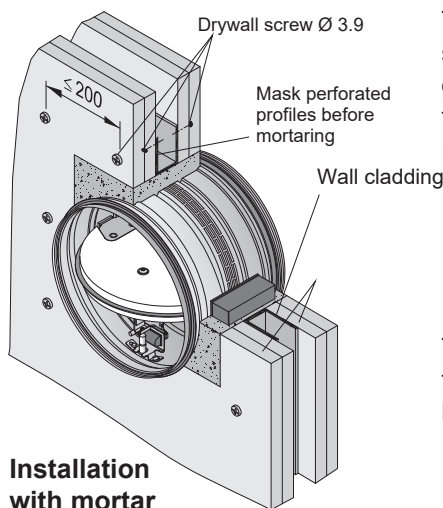
Rigid walls and ceilings can be made of concrete, lightweight concrete, porous concrete (aerated concrete) or plaster. They can be a masonry or wallboard construction and must have a bulk density of $\geq 450 \text{ kg/m}^3$. Walls may also be configured as fire walls, shaft walls, shafts or ducts.

Required **minimum thicknesses** for installation of the fire damper **W, D [mm]**:



Installation opening a x b or Ø d
for mortar filling:
 $a \geq DN + 25 \text{ mm}$
 $b \geq DN + 50 \text{ mm}$
 $d \geq DN + 50 \text{ mm}$

Fire resistance period in minutes	30
	60
	90
	120
Rigid walls	100
Rigid ceilings	100



Installation with mortar

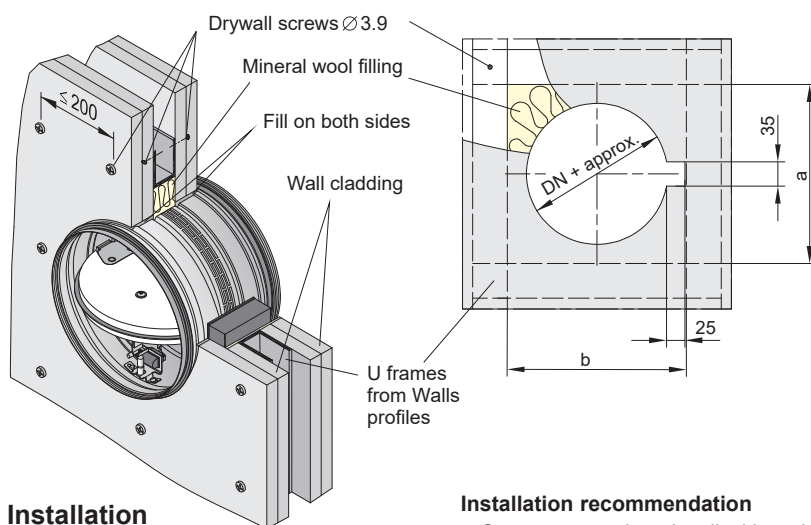
The **metal stud walls** must be clad with at least 2 layers of 12.5 mm DF gypsum boards according to EN 520. GKF gypsum boards, Fermacell boards or other equivalents must be used. The metal stud distances (spans) can be up to 1,000 mm. Profiles for metal stud walls are described in DIN 18182 and EN 14195, constructions in DIN 18183.

Required **minimum thicknesses W** for installation of the fire damper **[mm]**:

Fire resistance period in minutes	30
	60
	90
	120 ¹⁾
Metal stud wall	95

The dimensions of the installation opening for mortar filling can be as above for rigid walls.

¹⁾ for installation with mineral wool up to DN 200 only!



Installation with mineral wool

Installation opening

The following is required in the wall claddings:

- U frame $a \times b \geq DN + \text{approx. } 50 \text{ mm}$
- Installation opening $\varnothing = DN + \text{approx. } 6 \text{ mm}$
- Notch = $35 \times 25 \text{ mm}$ and as follows
 - on one side for a wall thickness of $\geq 125 \text{ mm}$
 - on both sides for a wall thickness $< 125 \text{ mm}$.

The space around the enclosure of the fire damper must be filled with **mineral wool** with a bulk density of $\geq 100 \text{ kg/m}^3$ up to the U frame.

Installation recommendation

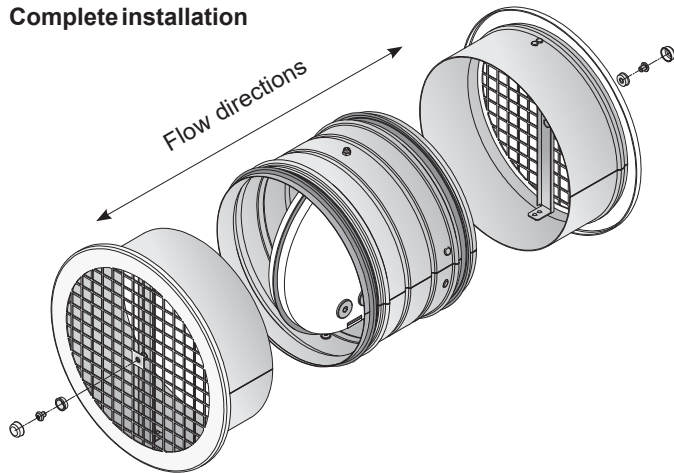
- Construct metal stud wall with an installation opening and apply cladding on the one side.
- Fill installation opening with mineral wool and apply a second cladding.
- Cut installation opening in claddings and mineral wool filling and chamfer them all around.
- Insert and align fire damper.
- Seal remaining joints with gypsum filler or equivalent.

All dimensions in mm

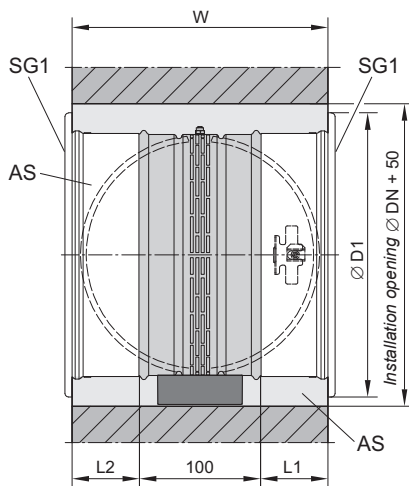
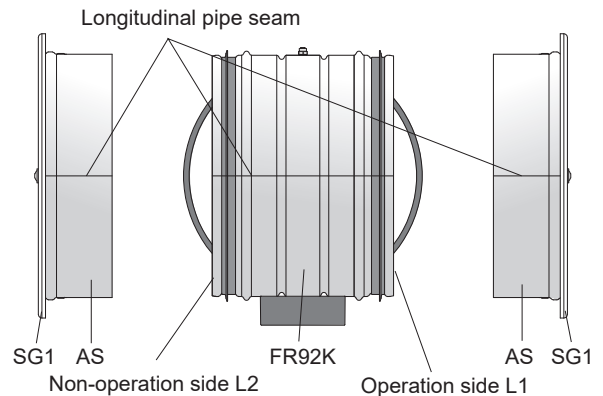
FR90 fire dampers in short lengths

Installation in air transfer applications with protective grille on both sides; **without non-return valve**

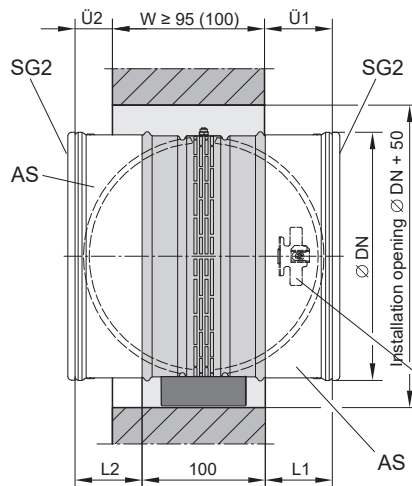
Complete installation



The damper blade can be installed with the axis in the vertical or horizontal position, or anywhere in between; the same applies to the protective grille and connecting pieces.



Installation flush with the wall



Installation with excess lengths \ddot{U}_1 and / or \ddot{U}_2

If $\ddot{U}_1 = L1$, $\ddot{U}_2 = L2 + 100 \text{ mm}$ - wall thickness W

When the fire damper is open, the flow direction can be from both sides.



Connection length on the

- Operation side L1
- Non-operation side L2

Excess length on the

- Operation side \ddot{U}_1
- Non-operation side \ddot{U}_2

All dimensions in mm

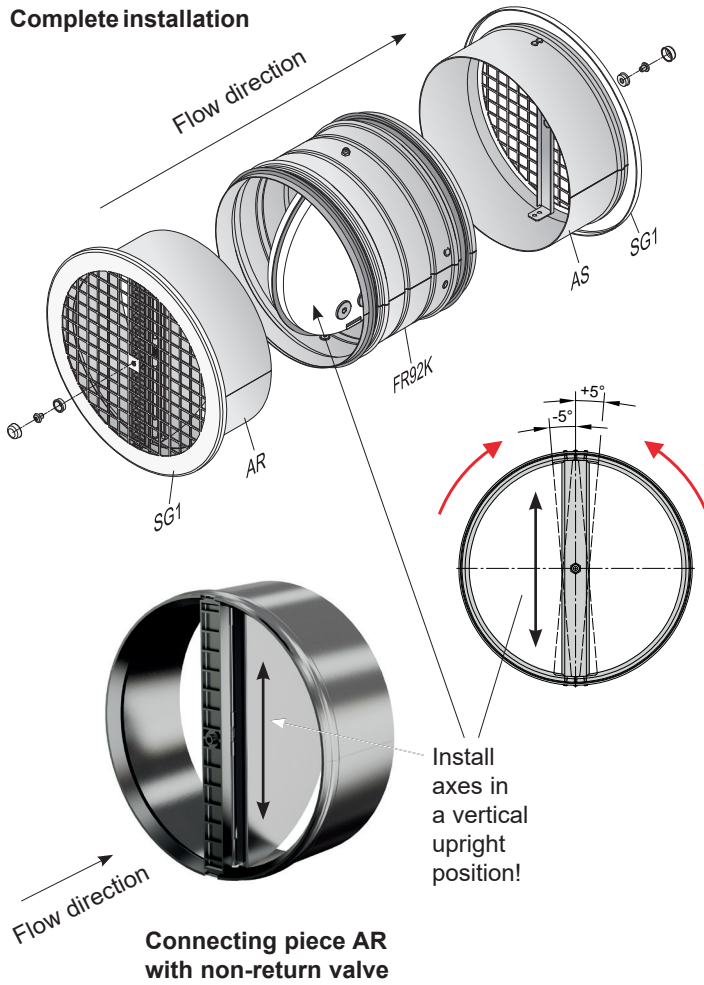
Minimum wall thicknesses for protective grille SG1 installation flush with the wall

DN	Without non-return valve ⇒ see page 8			With non-return valve ⇒ see page 9		
	Wall thickness W [mm]	Connecting piece AS Length L1	Connecting piece AS Length L2	Wall thickness W [mm]	Connecting piece AS Length L1	Connecting piece AR Length L2
100	≥ 210	55	55	≥ 210	55	55
125	≥ 210	55	55	≥ 210	55	55
160	≥ 210	55	55	≥ 210	55	55
200	≥ 220	75 Shorten on-site to 60 mm	75 Shorten on-site to 60 mm	≥ 235	75 Shorten on-site to 60 mm	75

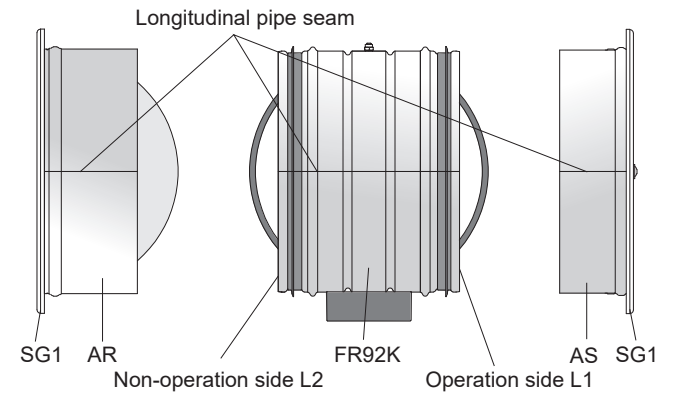
FR90 fire dampers in short lengths

Installation in air transfer applications with protective grille on both sides and with non-return valve

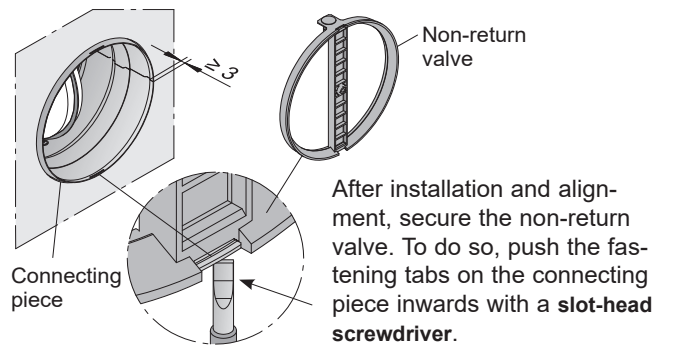
Complete installation



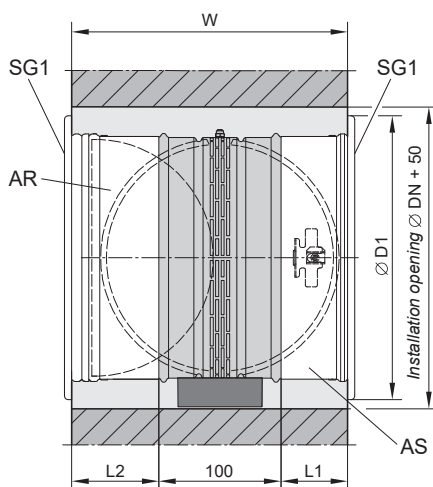
The fire damper and the connecting piece AR with non-return valve must be installed with vertical axes. All longitudinal pipe cuts are then horizontal. A maximum deviation of $\pm 5^\circ$ is permissible.



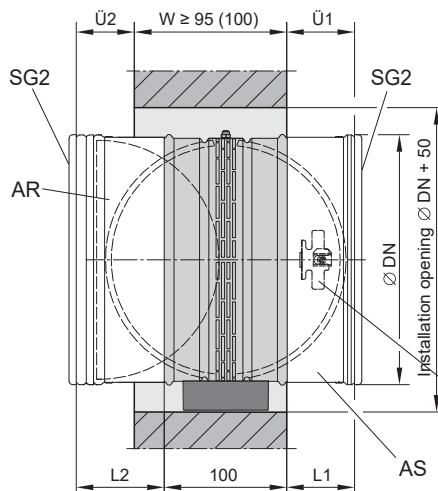
Install connecting piece AR with the non-return valve on non-operation side L2 of the fire damper. To do so ≥ 3 mm excess length from the finished wall surface.



Non-return valve installation



Installation flush with the wall



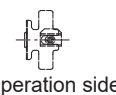
Installation with excess lengths \ddot{U}_1 and/or \ddot{U}_2

If $\ddot{U}_1 = L1$, $\ddot{U}_2 = L2 + 100$ mm - wall thickness W

When the fire damper is open, a single-sided flow direction is possible.



Locking mechanism of the non-return valve



Connection length on the

- Operation side L1
- Non-operation side L2

Excess length on the

- Operation side \ddot{U}_1
- Non-operation side \ddot{U}_2

⇒ see table on page 8

All dimensions in mm

FR90 fire dampers in short lengths

Optional accessories

Connecting pieces AS made of galvanized sheet steel are for fitting onto the fire damper plug connections fitted with lip seals. Traverses are for screw fastening the protective grille SG1 or SG2 to the connecting pieces.

Sizes:	DN 100	DN 125	DN 160	DN 200
Lengths L_1, L_2 [mm]	55, 75 or 100			75, 100

The lengths 75 mm and 100 mm of sizes DN 100, DN 125 and DN 160 can be shortened by the customer to 55 mm, those of the sizes DN 200 can be shortened to 60 mm.

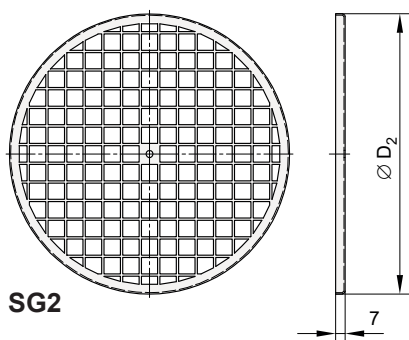
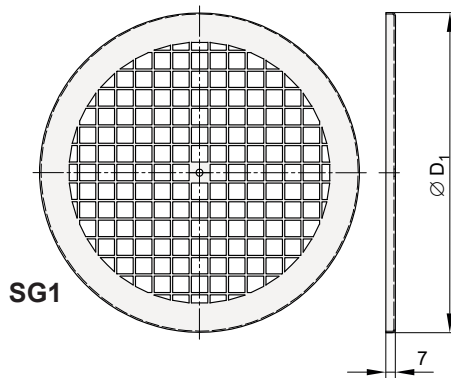
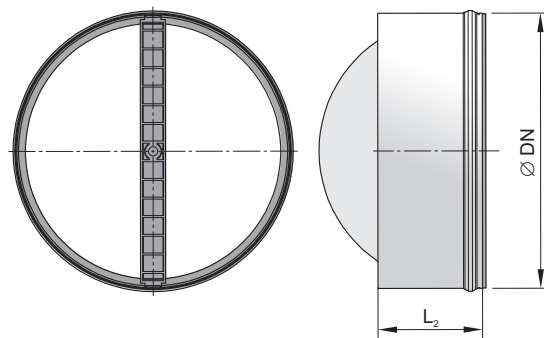
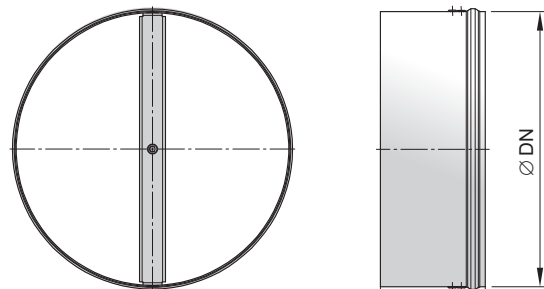
Connecting pieces AR made of galvanized sheet steel with an aluminium **non-return valve** are for fitting onto the inflow side fire damper plug connection fitted with lip seals. Traverses are for screw fastening the protective grille SG1 or SG2 to the connecting piece AR. The non-return valve opens in the specified flow direction automatically and with a pressure delay. It closes if there is a return flow or no flow.

Sizes:	DN 160	DN 200
Lengths L_2 [mm]	55	75

Protective grille SG1 with wide edge made of powder-coated, galvanized sheet steel in the colour RAL 9010 (pure white).

Sizes:	DN 100	DN 125	DN 160	DN 200
$\varnothing D_1$ [mm]	125	145	185	235

Pack: Protective grille SG1, fastening screws M5 x 6 and M5 x 10, mount and screw covers.



Protective grille SG2 with narrow edge made from galvanized sheet steel powder-coated in shade RAL 9010 (pure white).

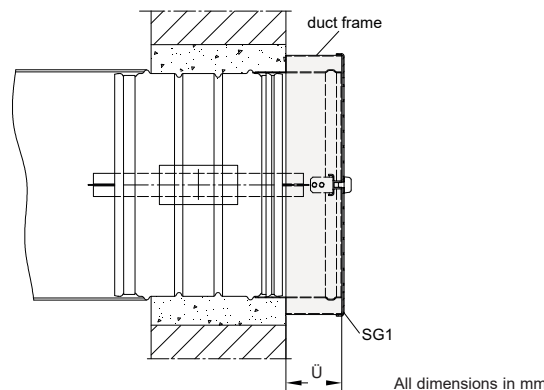
Sizes:	DN 100	DN 125	DN 160	DN 200
$\varnothing D_2$ [mm]	106	131	166	206

Pack: Protective grille SG2, fastening screws M5 x 6 and M5 x 10, mount and screw covers.

Duct frame RB in the RAL colour 9010 (pure white) for covering protruding connecting pieces.

Duct frames must be used together with the protective grille SG1 and can be shortened by the customer to the excess length \ddot{U} . They are secured between the wall and protective grille SG1 with their screw fastening.

Size	DN 100	DN 125	DN 160	DN 200
Length L [mm]	50 or 100			



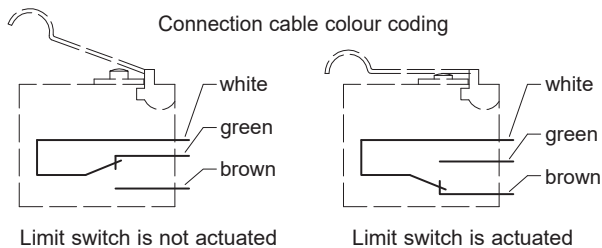
FR90 fire dampers in short lengths

Optional accessories, installation, maintenance-free, functional test and servicing

Limit switches for signalling the damper position CLOSED can be retrofitted and must be installed on site.

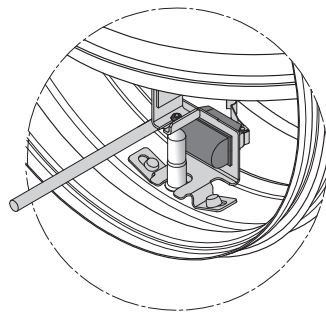
Pack: Limit switch, cable tie, end nipple for casing wall installation, strain relief, installation instructions.

Electrical connection:



Assembly:

The connection cable must be routed towards the outside on the operation side (release element side) of the fire damper. It must not obstruct the cover level or the damper blade.



Installation

- FR90 fire dampers, series FR92K, must be installed according to the instructions in this user manual.

Structural requirements for walls, ceilings, ventilation ducts etc. must be met by the customer.

The technical regulations and national statutory regulations must be observed during installation.

In Germany, this means the “Technical Building Regulations” (VVB TB) and the “Guideline on Fire Protection Requirements Pertaining to Ventilation Systems” (Lüftungsanlagenrichtlinie - LÜAR).

- FR90 fire dampers, series FR92K, may be connected to ventilation ducts made of non-combustible and combustible materials. Thermal expansion in case of fire must not subject the fire dampers to notable forces. Compensatory measures must be provided as required. In general, the compensation is achieved by routing ducts appropriately.

FR90 fire dampers, series FR92K

- Do not need spacing to separate from combustible materials.
- Are suitable for all installation positions.
- Can be installed with a minimum distance of 15 mm, also in metal stud walls.

- Electric wiring** must be performed on site.

Maintenance-free

- FR90 fire dampers, series FR92K, are maintenance-free as a result of the full enclosure, corrosion-resistant materials and precise manufacture.

The stainless steel operation mechanics are situated in an enclosure, not in the air flow. There is no requirement for recurrent cleaning and lubrication.

Damper blades are break-proof. Seals and other materials are engineered to be durable.

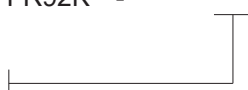
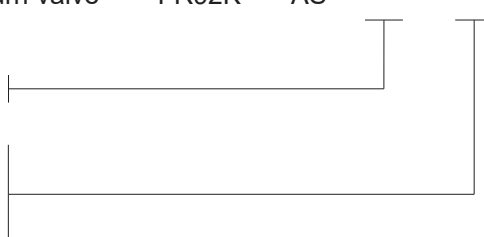
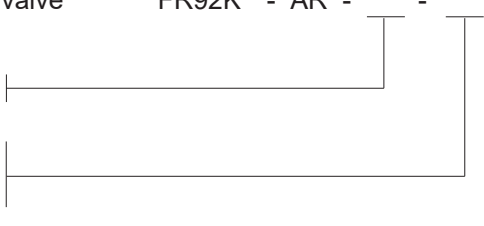

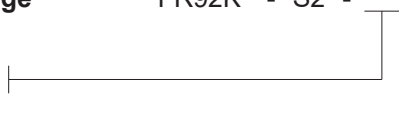
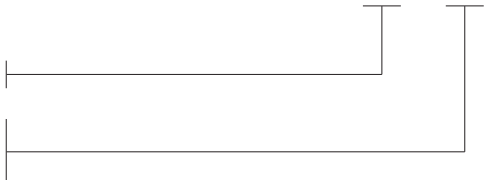
Functional testing and servicing

- Fire dampers must be maintained by the owner. Functional checks should be performed periodically and depend largely on operation of the system. The regulations must be adhered to.
- Repairs or service work are required in the event of malfunctions. Original spare parts must be used.
- Cleaning work required in ventilation systems for hygiene reasons must be performed in an operation-dependent manner, and also includes the fire dampers.

Operating instructions for FR92K series FR90 fire dampers available for download at www.wildeboer.eu

FR90 fire dampers in short lengths

Order data

..... pcs fire damper FR92K								FR92K -	
DN size	100	125	160	200	250	315			
	10	12	16	20	25	31			
..... pcs limit switch ES								FR92K - ES	
..... pcs connecting piece AS without non-return valve								FR92K - AS -	
DN size	100	125	160	200					
	10	12	16	20					
Length L [mm]									
55	5	5	5	-					
75	7	7	7	7					
100	10	10	10	10					
..... pcs connecting piece AR with non-return valve								FR92K - AR -	
DN size	-	-	160	200					
	-	-	16	20					
Length L [mm]									
55	-	-	5	-					
75	-	-	-	7					
..... pcs protective grille SG1 with wide edge								FR92K - S1 -	
DN size	100	125	160	200					
	10	12	16	20					
..... pcs protective grille SG2 with narrow edge								FR92K - S2 -	
DN size	100	125	160	200					
	10	12	16	20					
..... pcs duct frame RB ¹⁾								FR92K - RB -	
DN size	100	125	160	200					
	10	12	16	20					
Length L [mm]									
50	5	5	5	5					
100	10	10	10	10					

¹⁾ Can only be used with protective grille SG1.

Ordering examples:

50 FR92K fire dampers, DN315	50 pcs FR92K-31
15 duct frames RB DN160, length 50 mm	15 pcs FR92K-RB-16-5
15 protective grilles SG1 with wide edge DN160	15 pcs FR92K-S1-16
20 connecting piece AR with non-return valves DN200, length 75 mm	20 pcs FR92K-AR-20-7

All dimensions in mm

FR90 fire dampers in short lengths

Specification text

Maintenance-free fire damper according to EN 15650 with up to 120 minutes fire resistance period. Fire classification EI 30/60/90/120 (ve - ho, i ↔ o) S. Air-tight casing in galvanized sheet steel, leak tightness class C according to EN 1751. With plug connections and lip seals on both sides. Enclosed and maintenance-free operation mechanics arranged outside the casing wall. Drive axles made of stainless steel, red metal bearings. For installation in rigid walls and ceilings and in metal stud walls. Release 70°C.

With electrical limit switch for signalling the blade position CLOSED.

With connecting piece made of galvanized sheet steel on one side / on both sides, and with a traverse for screw fastening a protective grille.

With connecting piece made of galvanized sheet steel on one side, with metal non-return valve, and with a traverse for screw fastening a protective grille.

With protective grille made of galvanized sheet steel on one side / on both sides, powder-coated in the colour RAL 9010. With wide edge and 12 mm mesh size.

With protective grille made of galvanized sheet steel on one side / on both sides, powder-coated in the colour RAL 9010. With narrow edge and 12 mm mesh size.

With duct frames made of galvanized sheet steel on one side / on both sides, powder-coated in the colour RAL 9010.

..... pc

Diameter DN:	mm
Volume flow:	m ³ /h
Pressure drop:	Pa
Sound power level:	dB(A)
Manufacturer:	WILDEBOER	
Type/series:	FR90/FR92K	

deliver:
install:

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WILDEBOER®

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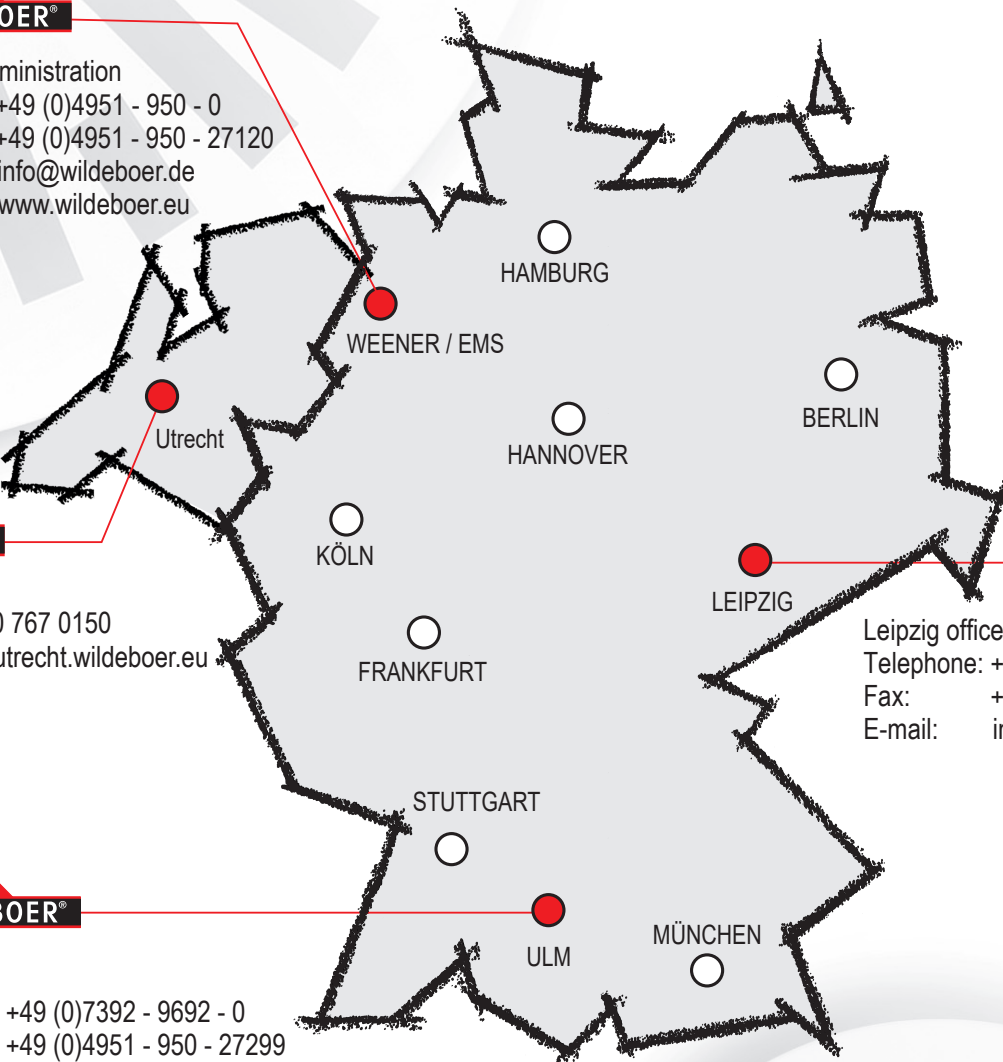
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