FGS Air Transfer Grille ^{User Manual}







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Introduction

This is the original installation, inspection and operating instructions document for FGS air transfer grille. EVERY AIT TRANSFER GRILLE NEEDS TO BE INSTALLED IN ACCORDANCE WITH THIS DOCUMENT!

FGS

Air Transfer Grille Installed in the wall without duct connections Cover mesh on both sides Cold smoke tightness $S_a = 238 \text{ m}^3/(\text{h} \cdot \text{m}^2)$ at 25 Pa according to EN 1364-5 Dimension range (mm) $L \times H = 200 \times 200$ up to 800×1000



NOTE: * Fire resistivity depends on the type of installation (see Tab. 1)



(1) Wet Installation

Maximum performance up to EI90S Using plaster/mortar/concrete filling

$\left(\right)$		
	<u> </u>	

Installation into a Soft Crossing

Maximum performance up to EI90S Using mineral wool segments and a fireproof coating layer



Good to know

Current information on all fire safety products are available at www.systemair.com/FSPoverview





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Warnings

Some grille parts may have sharp edges – therefore to protect yourself from harm, please use gloves during installation and manipulation. In order to prevent electric shock, fire or any other damage which could result from incorrect damper usage and operation, it is important to:

- 1. ensure that installation is performed by a trained person.
- 2. follow the written and depicted instructions provided within this User Manual closely.
- 3. perform air transfer grille inspection in accordance with this User Manual.
- 4. check the damper's functionality as per the chapter "FGS Functionality Check" on page 17 before you can install the grille. This procedure prevents the installation of a damper that has been damaged during transportation or handling.

Do not install non-functioning air transfer grille!

Installation

- The air transfer grille driving mechanism can be placed on either side of the wall, however it needs to be placed so as to ensure easy access during inspection.
- The distance between the air transfer grilles mounting frames must be at least 200 mm according to EN 1634-1.
- The distance between the wall/ceiling and the air transfer grille mounting frame must be at least 250 mm according to EN 1634-1.
- The air transfer grille must be installed into a fire partition supporting construction in such a way that the blades are located inside this supporting construction and the frame suspension plane is aligned with its surface.
- The gap in the installation opening between the air transfer grille and the wall/ceiling can be increased by up to 50% of the gap area, or decreased to the smallest amount possible that still provides sufficient space for the installation of the seal.
- In case of installation into thicker supporting construction than the provided frame its mesh should be mounted on the mounting frame thereby nested in the supporting construction.
- Installation into thinner wall is allowed only if the thickness of the wall in circumference 200 mm from the opening is constructed in the same way and with the same thickness as prescribed in this manual. The resistivity is decreased to the level of the thinner supporting construction.
- All air transfer grilles can be installed only with the blade axis in a horizontal position.
- The air transfer grille must not bear any part of the supporting construction. This could lead to damage and the subsequent failure of the Air Transfer Grille.





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Installation Methods for the Air Transfer Grille FGS

Tab. 1: Permitted installation methods for the air transfer grille FGS

		Fire Resistivity, Radiation					
Wall Construction /Thickness		Rigid /100 mm	Flexible /125 mm	Rigid Flexible /100 mm /125 mm		Rigid /100 mm	Flexible /125 mm
Installation Height (H), Ground to FGS bottom edge		-0,2 m 0,5 m		0,5 m 2,8 m		2,8 m 4 m	
Installation	Wet	EI 90, EW 120	-	EI 60, EW 90	EI 90, EW 90	-	EI 30, EW 90
Method	Soft Crossing	EI 90, EW 120	-	EI 60, EW 90	EI 60, EW 90	-	EI 30, EW 90







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Opening Preparation for the Rigid Wall



Legend

1	Concrete/masonry/cellular concrete
---	------------------------------------

Tab. 2: Minimum thickness of rigid wall according 1363-1

Minimum	<i>s</i> (mm)				
Fire Resistivity	Concrete/Masonry	Cellular Concrete			
30					
60	100 ± 10	100 ± 10			
90					





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Opening Preparation for the Flexible Wall

Walls



Legend

1	2 layers of plasterboard fireproof plate type F, EN 520 (thickness see Tab. 3)
2	Vertical CW - profiles (profile width s_{cw} based on fire resistivity, see Tab. 3)
3	Horizontal CW - profiles (profile width S_{cw} based on fire resistivity, see Tab. 3); must be firmly embedded into the vertical profiles
4	Mineral wool; thickness/cubic density see Tab. 3

Tab. 3: Minimum thickness of standardized flexible wall and layers according to EN 1363-1

Minimum	Minimum Minimum			Thickness of	Insulation	
Fire	S	s _{cw}	Allowed Metal	Plasterboards	Thickness	Cubic Density
Resistivity	(mm)			(mm)		(kg/m³)
30						
60	125	75	В, С	12,5	40 50	80 115
90						





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1 Wet Installation

Using Plaster/Mortar/Concrete Filling

- 1. The supporting construction opening must be prepared in a way described in the section "Opening Preparation" with the dimensions of L_1 and H_1 (as per Fig. 1 or Fig. 2). Opening surfaces must be even and cleaned off. The flexible wall opening must be reinforced as per the standards for plasterboard walls.
- 2. Create 2 mounds from the desired filling (2) on the bottom edge of the opening. At the mounds top create a surface at the desired height for placing the FGS with the help of spirit-level.
- 3. Insert the mounting frame (1) into the opening so that the flange on the side fitted with white board is flush with the wall surface. This side will be the inspection side (5).
- 4. Fix the frame in position with screws (3) through the openings in the frame. Make sure there is no skewing and the diagonals are the same length and there is no torsion deforming the frame.
- 5. Connect the wires to the connector (see section "Electrical Connections") on the mounting frame if the FGS is fitted with actuator or position switches in case of manual FGS. Only ZV type of FGS doesn't need cable connection. For DV9-T-ST mount the communication unit next to the opening.
- 6. For FGS with widths greater than 500 mm, it is recommended to use/create a support inside the frame to avoid any damage, bend to the frame from the weight of the filling.
- 7. Fill in the area between the wall and the installation frame with plaster or mortar or concrete filling (2), while making sure the internal surface of the mounting frame is clean from filling. If needed use wooden boards to create formwork on the inspection side.
- First let the plaster or mortar or concrete filling harden and then perform the next steps!
- 8. After the filling hardens, remove the installation frame support and framework.
- 9. If needed, uncover and clean the internal surfaces of the installation frame after installation.
- 10. Insert the closed FGS body into the installation frame, while joining the connectors and fix both the upper and lower side of the FGS with screws DIN 7504M-SR 4.2 × 25 (6; screws are included in the packaging - the amount depends on nominal dimensions of the FGS)
- 11. Check the FGS functionality, following the instruction from section "FGS Functionality Check"





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Legend

1	FGS frame (included in the package)
2	Plaster/mortar/concrete filling
3	Screw, e.g. 5 × 100 (fabory 29385.050.100)
4	Screw, e.g. DIN 7982 C-H 4.2 × 13
5	Flange of the frame that must be aligned with the wall surface
6	Screw DIN 7504M-SR 4.2 \times 25 - fix after inserting the FGS body into the frame





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Installation into a Soft Crossing

- 1. The supporting construction opening must be prepared in a way described in the section "Opening Preparation" with the dimensions of L_1 and H_1 (as per Fig. 1 or Fig. 2). Opening surfaces must be even and cleaned off. The flexible wall opening must be reinforced as per the standards for plasterboard walls.
- 2. Prepare mineral wool installation segments thickness 50 mm (2).
- 3. Apply the suitable fire resistive coating (4) onto the FGS installation frame and the mineral wool segments.
- 4. Apply fire resistive coating (4) to the opening edges.
- 5. Insert the bottom wool segment and place the FGS installation frame onto the bottom segment.
- 6. Connect the wires to the connector (see section "Electrical Connections") on the mounting frame if the FGS is fitted with actuator or position switches in case of manual FGS. Only ZV type of FGS doesn't need cable connection.

For DV9-T-ST mount the communication unit next to the opening.

- 7. Insert the remaining wool segments between FGS installation frame and the opening.
- 8. Align flush the FGS installation frame flange on the side fitted with white board with the wall surface. This side will be the inspection side (6).
- Fix the FGS installation frame in position with screws (3) through the openings in the frame.
 Make sure there is no skewing and the diagonals are the same length and there is no torsion deforming the frame.
- 10. Apply the same fire resistive coating, at least 2 mm thick layer and 100 mm wide, on the opening filling and wall edges evenly from both sides.
- 11. Before the glue dries, remove the unwanted remnants of the mastic from the FGS installation frame internal surfaces. If needed clean the FGS installation frame.
- 12. Insert the closed FGS body into the installation frame, while joining the connectors and fix both the upper and lower side of the FGS with screws DIN 7504M-SR 4.2 × 25 (6; screws are included in the packaging - the amount depends on nominal dimensions of the FGS).
- 13. Check the FGS functionality, following the instruction from section "FGS Functionality Check".





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Legend

1	FGS frame (included in the package)
2	Mineral wool segment (150 kg/m ³ , Isover FireProtect [®] 150, TECH Slab HT 6.2)
3	Screw 5 × 100 (e.g. fabory 29385.050.100)
4	Layer of fire-resistant mastic at least 2 mm thick (Isover Protect BSF)
5	Screw 4.2 × 13 – e.g. DIN 7982 C-H
6	Flange of the frame that must be aligned with the wall surface
7	Screw DIN 7504M-SR 4.2 \times 25 - fix after inserting the FGS body into the frame

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Electrical Connections

IMPORTANT: Danger of electric shock!

Switch off the power supply before working on any electrical equipment. Only qualified electricians are allowed to work on the electrical system.

Tab. 4: Electric parameters of the microswitches and actuators based on the type of activation

Activation Type Electric Equipment		Power Supply	Electric Parameters		
ZV	None	-	-		
DV/1	Microswitch (Closed)	AC 125/250 V	5A		
	Microswitch (Open)	-	-		
	Microswitch (Closed)	AC 125/250 V	5A		
DVI-Z	Microswitch (Open)	AC 125/250 V	5A		
DV7-T		AC 230 V, 50/60 Hz			
DV9-T	Actuator Belimo		Tab. 5		
DV9-T-ST]				

Tab. 5: Electric parameters of Belimo actuators for FGS based on the type of activation mechanism

Type/Power Consumtion		<i>L</i> (mm)							
		200	300	400	500	600	700	800	
	200								
	300								
	400			DV7-T/6					
	500			DV9-T/4	VA				
H (mm)	600			DV9-T-S	r/11 va				
()	700								
	800								
	900								
	1000					DV7-T/10 VA,	DV9-T/6 VA, D\	/9-T-ST/11 VA	





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Legend (Fig. 5 up to Fig. 8)

DV1						
1	yellow-green wire					
2	black wire	closed position				
3	blue wire					
4	grey wire					
DV1-2	2					
1	yellow-green wire					
2	black wire	clor	and position			
3	blue wire	CIUS	sed position			
4	grey wire					
5	black wire					
6	blue wire open position					
7	7 grey wire					
DV7-T	-	DVS	DV9-T			
1	yellow-green wire					
2	brown wire (230 V AC)	2	red wire (+)			
3	blue wire	3	black wire (-)			
4	violet wire (S1) *					
5	red wire (S2) *					
6	white wie (S3) *					
7	orange wire (S4) *					
8	pink wire (S5) *					
9	grey wire (S6) *					
DV9-T	T-ST					
Actua	tor BFL24-T: connect as ver	sion D	V9-T			







Fig. 6: Manual activation type FGS with micro-switches for open and closed indication (DV1-2)





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Fig. 7: DV7-T connection scheme; actuator Belimo BLF230-T and BFN230-T

NOTES:

- Caution! Main power supply voltage! <u>A</u>
- A device that disconnects the pole conductors (minimum contact gap 3 mm) is required for isolation from the power supply.
- Paralell connection of several actuators possible.
- \cdot Power consumption must be observed! igt A



Fig. 8: DV9-T connection scheme; actuator Belimo BLF24-T and BFN24-T NOTES:

- Supply via safety isolation transformer.
- Paralell connection of several actuators possible.
- \cdot Power consumption must be observed! $igt \Delta$

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Fig. 9: DV9-T-ST connection scheme; actuator Belimo BLF24-T and BFN24-T through supply and communication unit BKN230-24

NOTES:

- 1) Jumper factory-fitted. Can be removed if necessary to be replaced by a thermoalectric trip (the safety function will be triggered if terminals 1 and 2 are not linked).
- 2) Jumper only used for commissioning purposes and without BKS24-..!
- 3) 2-wire conductor to BKS24-..



Fig. 10: Connector on the installation frame





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Operation Manual

After installation, the functionality of the FGS must be checked and set into the open operating position.

Manually operated FGS

Twist the blades into the horizontal position (in the direction indicated by the arrow - Fig. 11), force against the spring and fix the first blade with the help of a bend hard wire or a bend wrench from the top side with the thermal fusible link (Fig. 12).

Spring Return Actuator operated FGS

By connecting a power source according to the relevant scheme displayed in Fig. 7 up to Fig. 9, activate the actuator and the blades will open. For an actuator with the BKN230-24 unit - by connecting a power source to the unit BKN230-24, activate the actuator and the blades will open. In the need of thermal fuse access the front panel made of calcium silicate board can be removed by removal of three screws that hold it in place, pulling the bottom out and pushing downwards.





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Fig. 12: Fix the first blade on the top side with the thermal fusible link

NOTE: pull the thermal fusible link in the direction indicated by the arrow and hang on sheet metal hook



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Fig. 13: Activate the mechanism NOTE: push the thermal fusible link in the direction indicated by the arrow





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FGS Functionality Check

Manually Operated FGS

- 1. In the open position, all blades must be fully open. If fitted with end position switches the appropriate signalling circuit must switch on.
- 2. Close the FGS:
 - Lever up the upper blade with your fingers and release the thermal fusible link by pushing with a screwdriver in the direction indicated by the arrow (Fig. 13). Remove the screwdriver and release your fingers from the blade.
 - The blades must come up to the fully closed position and remain there. After reaching the end position of the blades, the appropriate signaling circuit must switch on.
- 3. Open the FGS:
 - After checking the signaling and the blade closure, set the FGS into open position.
 - Twist the blades into the horizontal position (in the direction indicated by the arrow Fig. 11), force against the spring and fix the first blade from the top side with the thermal fusible link (Fig. 12).

Spring Return Actuator Operated FGS

- 1. After connecting the supply connectors (Fig. 7 up to Fig. 9), the FGS opens. The blades must come to the fully open position and must remain there.
- 2. After reaching the end position of the blade, the appropriate signalling circuit must be switched on.
- 3. Close the FGS:
 - Remove the mesh and the front panel.
 - Push the test button on the thermal fuse until the blades are in closed position.
 DO NOT COME IN CONTACT WITH THE BLADES DURING THEIR MOVEMENT TO AVOID RISK OF INJURY!
- 4. Open the FGS:
 - After checking the signaling and the blade closure, set the FGS into open position.
 - By connecting a power source according to the relevant scheme displayed in Fig. 7 up to Fig. 9, activate the actuator and the blades will open. For an actuator with the BKN230-24 unit by connecting a power source to the unit BKN230-24, activate the actuator and the blades will open.





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FGS Inspection

The FGS manual or actuator mechanism keeps the dampers on stand-by during their entire life cycle in accordance with this manual issued by the manufacturer. It is not permitted to alter the FGS in any way nor perform any changes to its structure without the manufacturer's consent.

The operator performs regular checks of the FGS as per country established regulations, standards or at least once every 12 months. The check needs to be performed by an employee who has been trained for this purpose by the manufacturer following the "FGS Functionality Check" procedure. The current FGS condition determined during the inspection needs to be entered into the operating logbook along with the date of the inspection, the legible name, surname and signature of the employee who performed the inspection. The Operating Journal includes a copy of the employee's authorization. If any discrepancies are discovered, these need to be entered in the Operating Journal along with a proposal for their removal. The Operating Journal can be found from page 20 up to 22 of this manual. Immediately after the installation and activation of the FGS, it needs to be checked under the identical conditions as apply to the above mentioned 12-month inspections. The visual check ensures that visible damages on the inspected damper parts is seen. On its external side, the damper housing and the activation mechanism are checked. Through the removal of mesh a visual check of the FGS blades are to be checked. The FGS's internal casing, thermal fuse, sealing's, foaming substance, the blades condition and accuracy of its closure during its leaning against the backstop in the closed position must all be checked. There must not be any foreign objects or a layer of impurities present on the FGS.

Recommended Course of Action and Inspection Log as per EN 15 650:

- 1. FGS identification
- 2. Date of inspection
- 3. Checking of the electric connection of the activation mechanism (where applicable)
- 4. Checking of the FGS for cleanliness and possible need for cleaning (where needed)
- 5. Checking of the blades and sealing condition, possible correction and logging (where needed)
- 6. Checking of the proper fire FGS closure details can be found in the previous paragraphs
- 7. Checking of the FGS functionality opening and closing using the control system, physical examination of the FGS's behaviour, possible correction and logging (where needed)
- 8. Checking of the end switches functionality in the open and closed position, possible correction and logging (where needed)
- 9. Check whether the FGS remains in its standard operating position open.
- 10. The FGS is usually part of a system. In that case the whole system needs to be checked as described in its operation and requirements published by the builder of the system.





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Warranty Conditions

For the warranty conditions, please contact our Systemair colleagues in your respective country. Before installing the FGS, its functionality must be tested as per chapter "FGS Functionality Check" **DO NOT INSTALL A NON-FUNCTIONING FGS!**

Changes to the functionality of the FGS, caused by transport or installation, aren't reclaimable after installation (deformations, damages, mechanical damage of the sealing material, foreign objects which can constrain the blades movement, improper handling of the activating mechanism, etc.).

Operating Conditions

FGS air transfer grille can be defined as fire shutter for overpressure ventilation without duct system in the place where it's needed to create an opening in borders of a fire area or compartment. In case of fire, the air transfer grille functions as a fire safety element and by closing, it prevents fire and smoke from expanding to the next compartment zone during the maximum performance time.

They are intended:

- · for installation in places which are protected against weather disruptions.
- for ventilation distributing air without any mechanical or chemical contamination.
- for maximum air flow velocity 12 m/s.
- for storage temperature minimum -20 °C and maximum 50 °C.

In a standard design all manually and actuator operated Air Transfer Grilles are equipped with a thermal fuse which, after reaching or exceeding 74 °C (manually operated, ± 2 °C) or 74 °C (actuator operated, ± 2 °C), activates the spring which closes the damper blade.

From the noise perspective all FGS air transfer grilles are passive. Increased noise can only be heard when the dampers is being closed or opened in case of an inspection or fire.





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Operating Journal

Activation of the FGS Air Transfer Grille					
Mark the Applied Installat	ion Method with a Cross:	(1) Ξ_ Wet	Soft		
Date	Description of the Discovered Defeo Following Inspection after the Elimi	cts and the Date of the nation of Deficiencies.	Inspection Technician's Signature		
Periodic Inspections of the	e FGS Air Transfer Grille - at Least On	ce Every 12 Months			
Date	Description of the Discovered Defect Following Inspection after the Elimi	cts and the Date of the nation of Deficiencies.	Inspection Technician's Signature		

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Periodic Inspections of the FGS Air Transfer Grille - at Least Once Every 12 Months					
Date	Description of the Discovered Defects and the Date of the Following Inspection after the Elimination of Deficiencies.	Inspection Technician's Signature			





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Slovak Technical approval		FGS Air Transfer Grille Identification	
Nr: SK01-ZSV-0364 Notiffied Body No. 1396		Building	
IMOS-Systemair Hlavná 371, 900 43 Kalinkovo, Slovakia ETAG 026 Part 4, EN 13501-2			
Fire Resistant Reactive Air Transfer Grille - Typ	oe MMS	Placement	
Reaction to fire: Classes E or F according to EN 13501-1	Pass		
Resistance to fire: - maintenance of the cross section (under E) - integrity E resistivity depending on installation method and situation	Pass	Room No.	
 Insulation I Cold smoke leakage Sa Mechanical stability (under E) Cross section (under E) 		Position No.	
Air Permeability According to EN 13141-1	Pass	Identification	
Content and/or Release of dangerous substances: No dangerous substances	Pass		
Response delay (response time): - closure time	Pass	Signalization	
Operational reliability: - motorized cycle 6.000 cycles - manual cycle 250 cycles	Pass		
Aspects of durability and serviceability: Class Z2 according to EOTA TR 024:2009	Pass		

Warranty Service

Date of Warranty Repair Notification	Date of Warranty Repair Finalization	Description of Warranty Repair Performed	Representative of the Manufacturer (Stamp, Signature)

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