

Tunnel dampers

Type JF



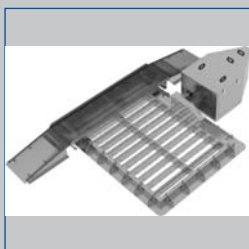
Tunnel damper with centre mullion (from B > 1000 mm)



Tunnel damper with linkage and opposed action blades



Damper for wall installation, with integral encased actuator



Damper for ceiling installation, with installation subframe, thermally insulated protective actuator enclosure, and bridge



For the ventilation of and smoke extract from underground transport systems

Tunnel dampers are safety components specially designed for underground transport systems and meet the requirements of the German Guideline for the Equipping and Operation of Roadway Tunnels (Richtlinie für die Ausstattung und den Betrieb von Straßentunneln, RABT) and of the Austrian Guidelines and Provisions for Road Traffic (Richtlinien und Vorschriften für das Straßenwesen, RVS)

- Certified construction and production according to ISO 9001
- Temperature resistance of 120 minutes at 400 °C
- Excellent low leakage performance even at high pressure
- Galvanised steel, powder-coated, or stainless steel construction
- Side seals made of sprung stainless steel compensate for the longitudinal expansion of the blades at high temperatures
- Parallel or opposed action blades
- Low pressure drop due to aerofoil blades
- With electric actuators encased in thermally insulated protective enclosures

Optional equipment and accessories

- Installation subframe for installation into intermediate concrete ceilings
- Support structure for installation of multiple dampers into walls

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Variants

Product examples

Tunnel damper Type JF-S



Tunnel damper Type JF-P



Description



Tunnel damper Type JF

Application

- TROX tunnel dampers of Type JF are specially designed safety components that meet the RABT and RVS requirements
- For opening and closing smoke extract ducts
- Used in ventilation and smoke extract systems in underground transport systems
- Can also be used as shut-off dampers for fans
- Installation usually either above the roadway in an intermediate concrete ceiling or in the ventilation plant room
- Bespoke solutions upon request

Classification

- Machinery Directive 2006/42/EG, Declaration of incorporation
- Test report no. 210004049 – MPA NRW (Germany)
- Stability report no. 7317/06 – Afiti Licof (Spain)
- Test report no. 2007-757.01 – MA 39 VFA (Austria)
- Test report no. 210005454 – MPA NRW (Germany)

Variants

- JF-S: Tunnel damper with opposed action blades
- JF-P: Tunnel damper with parallel action blades

Construction

- Galvanised sheet steel, flange holes on both sides, brass bearings, seals made of stainless steel
- A4: Stainless steel sheet, flange holes on both sides, stainless steel bearings, seals made of stainless steel

Nominal sizes

- B = 400 – 2,200 mm, in 100 mm increments as standard; H = 440 – 2,175 mm, in 195 mm increments as standard
- Available also in intermediate sizes (B and H) of 1 mm increments
- Sizes outside of the stated ranges are available upon request
- For larger sizes several dampers can be combined and fitted on a support structure

Optional equipment

- Installation subframe
- Baffle plates
- Walk-on grilles as bridges
- Support structure

Accessories

- Actuator
- Thermally insulated enclosure
- Quadrant stay with position indicator

Special characteristics

- Excellent low leakage performance of 0.1 m³/s per m² at a differential pressure of 3000 Pa
- For high operating pressure of up to 5000 Pa
- Low pressure drop
- Maximum corrosion and temperature resistance
- Excellent fire resistance of 120 minutes at 400 °C
- Remote control with actuator

Parts and characteristics

- Electric open/close actuator or spring return actuator including limit switches
- Thermally insulated protective enclosure for the actuator, made of galvanised sheet steel or stainless steel sheet and faced rockwool mats
- Aerofoil blades with side seals and longitudinal tip seals

Construction features

- TROX tunnel dampers of Type JF-S/P-TD consist basically of a casing, movable blades and linkage
- Casing made from four C-sections of sheet steel, welded at the joints
- From B > 1000 mm the blades are divided by a centre mullion
- The H sides are fitted with special side seals made of stainless steel
- Blades are double skin steel sections, screwed together, with longitudinal blade tip seals made of stainless steel, for opposed or parallel action
- Remote control with an actuator which may require a thermally insulated protective enclosure (depending on application)
- Enclosure can be fitted with baffle plates in order to reduce the aerodynamic drag in the smoke extract duct

Materials and surfaces

Stainless steel construction:

- KM: (only with stainless steel construction) All gaps, threads, and joints of corrosion-resistant steel are treated with a varnish for corrosion protection and preservation.
- Frame and blades: Stainless steel sheet, AISI 316Ti (1.4571)
- Shafts: Stainless steel, Ø 20 mm, AISI 316Ti (1.4571), surface treated with Kolsterising process
- Bearings: AISI 316Ti (1.4571)
- Linkage: AISI 316Ti (1.4571)
- Longitudinal blade tip seals: Stainless steel sheet, AISI 316Ti (1.4571)
- Side seals: Stainless steel sheet, AISI 316Ti (1.4571)
- Connecting elements: A4

Galvanised construction:

- Frame and blades: Galvanised sheet steel, DX51D+Z150-200NAC to EN 10327
- Shafts: Stainless steel, Ø 20 mm, AISI 303 (1.4305)
- Bearings: Brass CuZn40Pb2 (CW617N)
- Linkage: Stainless steel, AISI 304 (1.4301)
- Longitudinal blade tip seals: Stainless steel sheet, AISI 301 (1.4310)
- Side seals: Stainless steel sheet, AISI 301 (1.4310)
- Connecting elements: Galvanised

P1 Powder-coated construction:

- Frame and blades: Galvanised sheet steel, DX51D+Z150-200NAC to EN 10327
- Shafts: Stainless steel, Ø 20 mm, AISI 303 (1.4305)
- Bearings: Brass CuZn40Pb2 (CW617N)
- Linkage: Stainless steel, AISI 304 (1.4301)
- Longitudinal blade tip seals: Stainless steel sheet, AISI 316Ti (1.4571)
- Side seals: Stainless steel sheet, AISI 316Ti (1.4571)
- Powder coating: RAL (coating thickness 60 µm)

Installation and commissioning

- Tunnel dampers are installed in underground transport systems such as road tunnels or underground railway stations
- Use in ventilation and smoke extract systems in underground transport systems, installation into intermediate concrete ceilings above the roadway
- Use as fan shut-off dampers, in underground and multi-storey car parks or in ventilation plant rooms
- Simplified installation with installation subframe
- Horizontal or vertical installation
- Torsion-free installation
- Exact horizontal or vertical installation is a must
- For larger areas several dampers can be combined and fitted on a support structure

Environmental conditions, exposure to cleaning substances, etc.:

- Normal environmental conditions are harsh, with extreme temperature and humidity changes as well as pressure waves and vibrations caused by vehicles
- Exposure to large amounts of dirt and dust, e.g. by water jets with a pressure of 6 to 7 bar, sometimes with additives such as cleaning agents, rotating cleaning brushes of cleaning vehicles, exhaust fumes from gas and diesel engines, de-icing salts such as sodium chloride or calcium chloride
- In the event of a fire, the conditions are different but no less harsh: hot fire gases, high temperatures, longitudinal expansion due to high temperatures, firefighting water, and steam

Maintenance

- Low maintenance; operational reliability is ensured even after extended stand-by use; long service life
- Maintenance-free bearings
- Regular inspection is required in spite of robust construction and highly corrosion-resistant materials. Service as required, e.g. removing contamination that impairs the function or causes corrosion

Technical data

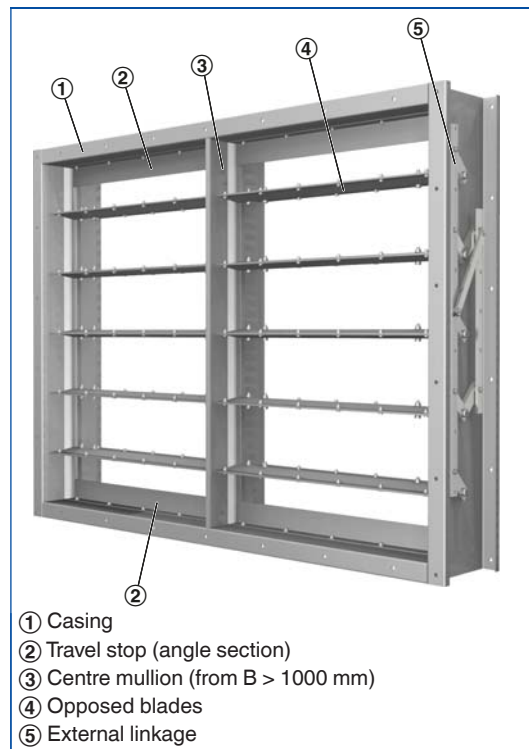
Nominal sizes	400 × 440 – 2200 × 2175 mm
Volume flow rate range	350 – 95,700 l/s or 1,260 – 344,520 m ³ /h
Differential pressure range	Bis 5000 Pa
Operating temperature	0 – 400 °C/120 mins
Leakage rate	0.1 m ³ /s per m ² at 3000 Pa

Function

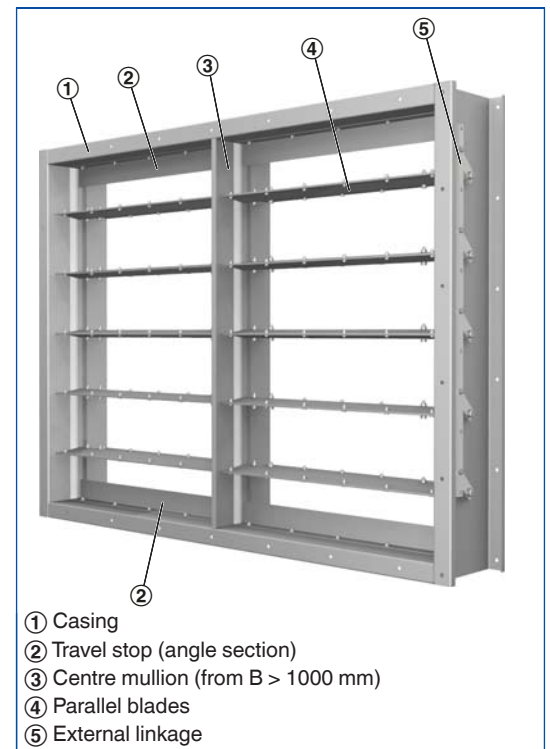
Functional description

When a fire is detected, two or three dampers near the fire site open automatically; the other dampers remain usually closed. At the same time, the exhaust fans are run at maximum speed to ensure efficient smoke exhaust. This enables people to leave the danger zone, and firefighters to fight the fire.

Schematic illustration of JF-S



Schematic illustration of JF-P



Order code

JF

JF – S – A4 / 1000x1000 / Z01 / NO							
1	2	3	6	7	8		

1 Type

JF Tunnel / industrial damper

2 Function

S Opposed
P Parallel

3 Material

No entry: galvanised steel
A4 Stainless steel 1.4571

4 Operating side

No entry: on the right
L Left side

5 Linkage-to-actuator connection

No entry: on the right
L Left side

6 Nominal size [mm]

B x H

7 Attachments

No entry: none
Z01 Belimo BE230-12 with Promat enclosure
Z02 Schischek InMax50-SF with Promat enclosure

8 Damper blade safety function

NO Power off to OPEN
NC Power off to CLOSE

9 Surface

No entry: standard construction
P1 Powder-coated, RAL CLASSIC colour (not with A4)
KM Anti-corrosive varnish (only with A4)
Gloss level
RAL 9010 50 %
RAL 9006 30 %
All other RAL colours 70 %

Order example

JF-P/1000x1000/Z01/NC/P1-RAL9006

Free area

H	B [mm]									
	400	600	800	1000	1200	1400	1600	1800	2000	2200
mm	m ²									
440	0.13	0.19	0.26	0.33	0.39	0.45	0.52	0.59	0.65	0.72
635	0.19	0.29	0.39	0.49	0.58	0.68	0.78	0.88	0.99	1.09
830	0.26	0.39	0.53	0.66	0.78	0.91	1.05	1.18	1.32	1.45
1025	0.32	0.49	0.66	0.83	0.98	1.14	1.31	1.48	1.67	1.82
1220	0.38	0.59	0.79	0.99	1.17	1.37	1.58	1.78	1.98	2.19
1415	0.45	0.69	0.92	1.16	1.37	1.61	1.84	2.08	2.32	2.55
1610	0.51	0.78	1.06	1.33	1.56	1.84	2.11	2.38	2.65	2.92
1805	0.58	0.88	1.19	1.49	1.76	2.07	2.37	2.68	2.98	3.29
2000	0.64	0.98	1.32	1.66	1.96	2.30	2.64	2.98	3.31	3.65

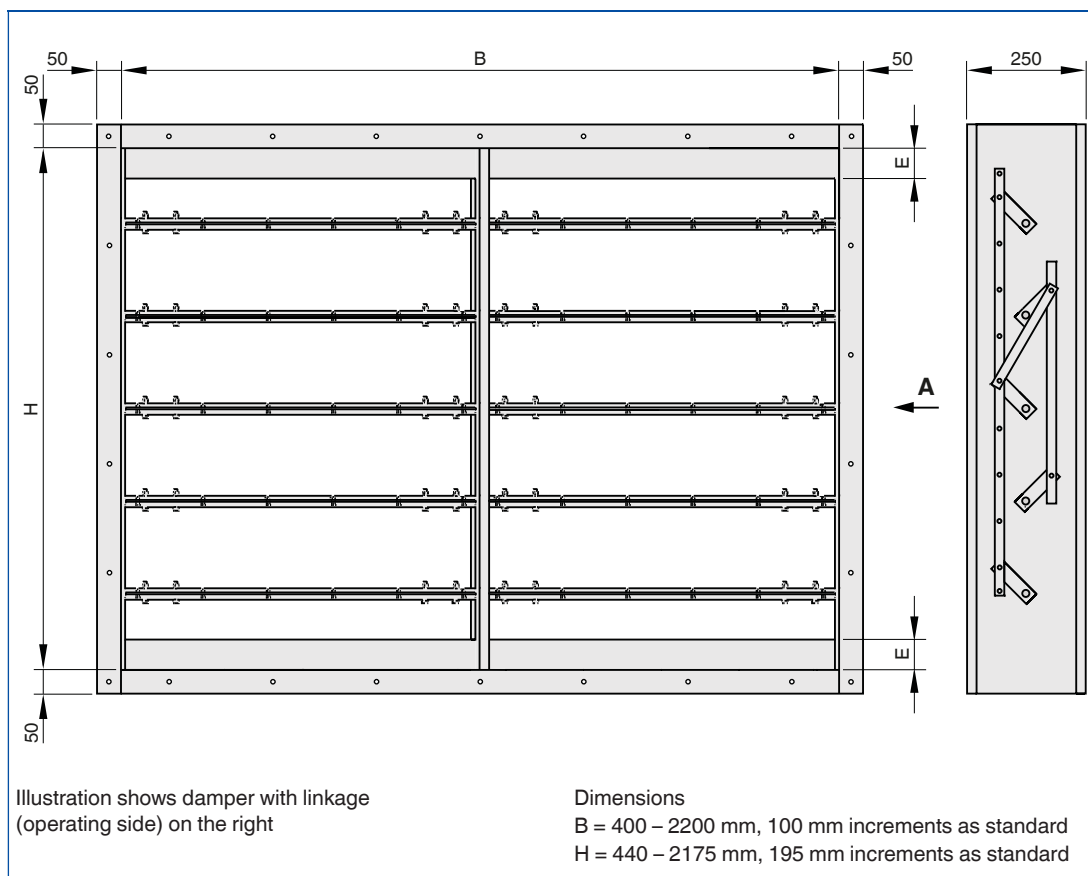
Aerodynamic data such as differential pressures and sound power levels are available upon request.

Dimensions



Tunnel damper Type JF-S

JF-S with opposed blades



Weight

H	B [mm]									
	400	600	800	1000	1200	1400	1600	1800	2000	2200
mm	kg									
440	26	31	36	40	46	51	57	62	68	73
635	32	38	44	50	59	66	72	79	86	92
830	38	46	53	61	73	81	89	97	104	112
1025	45	53	62	71	86	95	105	114	123	132
1220	51	61	71	81	100	110	121	131	142	152
1415	57	69	80	91	114	125	137	149	160	172
1610	64	76	88	101	127	140	153	166	179	192
1805	70	84	97	111	141	155	169	183	197	212
2000	77	91	106	121	154	169	185	201	216	219
2175	79	94	108	123	157	172	188	204	219	234

Standard sizes

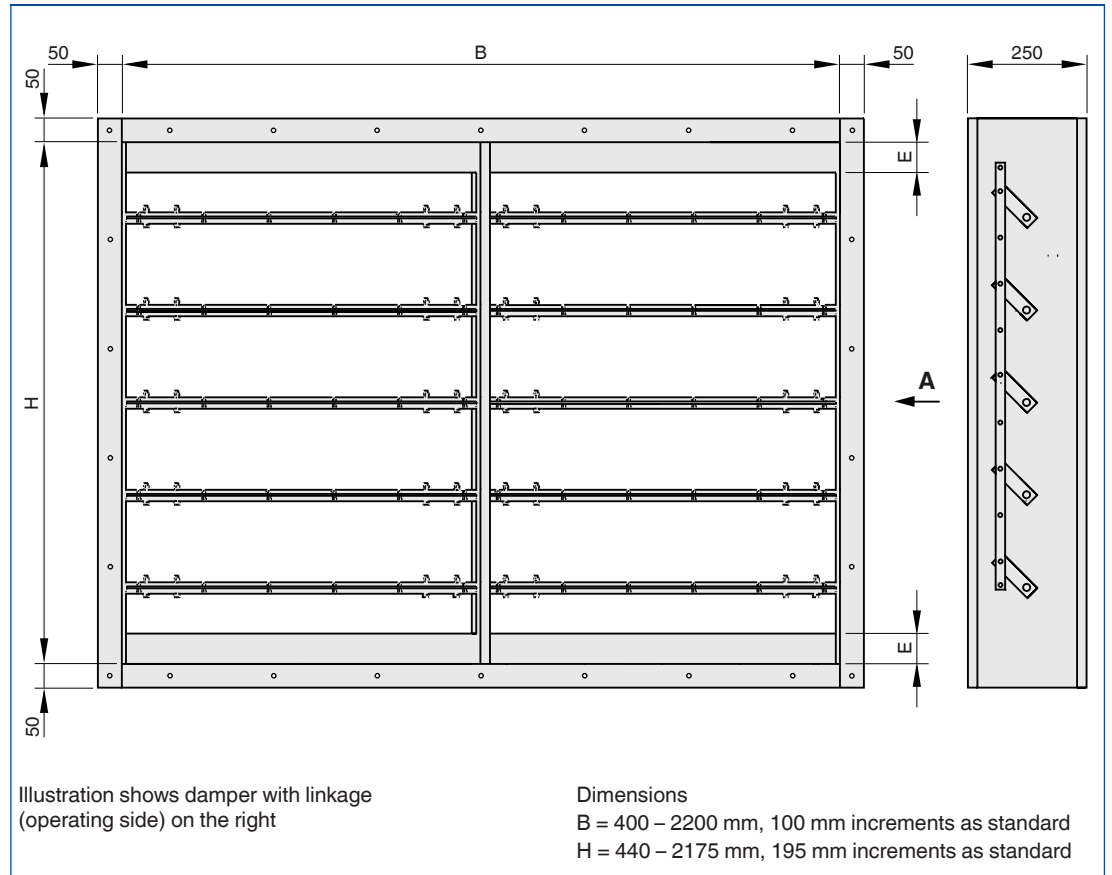
H	No. of blades	E
mm	-	mm
440	2	26.5
635	3	26.5
830	4	26.5
1025	5	26.5
1220	6	26.5
1415	7	26.5
1610	8	26.5
1805	9	26.5
2000	10	26.5

Dimensions



Tunnel damper Type JF-P

JF-P with parallel blades



Intermediate sizes

H	No. of blades	E
mm	–	mm
430 - 624	2	21.5 - 118.5
625 - 819	3	21.5 - 118.5
820 - 1014	4	21.5 - 118.5
1015 - 1209	5	21.5 - 118.5
1210 - 1404	6	21.5 - 118.5
1405 - 1599	7	21.5 - 118.5
1600 - 1794	8	21.5 - 118.5
1795 - 1989	9	21.5 - 118.5
1990 - 2175	10	21.5 - 118.5

Description

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design programme.

TROX tunnel dampers are specially designed safety components to control the volume flow rate of the extract air from tunnels; they meet the RABT and RVS requirements. Units consist basically of a casing, movable blades and linkage. Sprung steel side seals allow for the longitudinal expansion of the components at temperatures up to 400 °C for 120 minutes and ensure very low leakage rates even at high pressures.

Construction

- Galvanised sheet steel, flange holes on both sides, brass bearings, seals made of stainless steel
- A4: Stainless steel sheet, flange holes on both sides, stainless steel bearings, seals made of stainless steel

Special characteristics

- Excellent low leakage performance of 0.1 m³/s per m² at a differential pressure of 3000 Pa
- For high operating pressure of up to 5000 Pa
- Low pressure drop
- Maximum corrosion and temperature resistance
- Excellent fire resistance of 120 minutes at 400 °C
- Remote control with actuator

Technical data

- Nominal sizes: 400 × 440 – 2200 × 2175 mm
- Volume flow rate range: 350 to 95,700 l/s or 1,260 to 344,520 m³/h
- Differential pressure: up to 5000 Pa
- Operating temperature: 0 – 400 °C/120 mins
- Leakage rate: 0.1 m³/s per m² at 3000 Pa

Sizing data

- \dot{V} _____ [m³/h]
- Δp_{st} _____ [Pa]
- L_{WA} Air-regenerated noise _____ [dB(A)]

Order options

1 Type

JF Tunnel / industrial damper

2 Function

- S** Opposed
- P** Parallel

3 Material

- No entry: galvanised steel
- A4** Stainless steel 1.4571

4 Operating side

- No entry: on the right
- L** Left side

5 Linkage-to-actuator connection

- No entry: on the right
- L** Left side

6 Nominal size [mm]

B × H

7 Attachments

- No entry: none
- Z01** Belimo BE230-12 with Promat enclosure
- Z02** Schischek InMax50-SF with Promat enclosure

8 Damper blade safety function

- NO** Power off to OPEN
- NC** Power off to CLOSE

9 Surface

- No entry: standard construction
- P1** Powder-coated, RAL CLASSIC colour (not with A4)
- KM** Anti-corrosive varnish (only with A4)
- Gloss level
 - RAL 9010 50 %
 - RAL 9006 30 %
 - All other RAL colours 70 %
-

Tunnel dampers

Basic information and nomenclature



- Product selection

Tunnel dampers

Basic information and nomenclature

Product selection

	Tunnel dampers	
	JF-S	JF-P
Casing and blades		
Galvanised sheet steel	●	●
Galvanised sheet steel, powder-coated, RAL colour	●	●
Stainless steel 1.4571	●	●
Rotation		
Parallel		●
Opposed	●	
Dynamics		
External linkage	●	●
Nominal sizes		
Width	400 – 2200 mm	400 – 2200 mm
Increments	1 mm	1 mm
Width subdivided	●	●
Height	440 – 2175 mm	440 – 2175 mm
Increments	1 mm	1 mm
Height subdivided	●	●
Casing		
Depth	250 mm	250 mm
Areas of application		
Temperature resistance	400 °C for 120 mins	400 °C for 120 mins
Closed blade air leakage	0.1 m ³ /s per m ² at 3000 Pa	0.1 m ³ /s per m ² at 3000 Pa
Equipment and accessories		
Installation subframe for installation into intermediate concrete ceilings	●	●
Support structure for wall installation of subdivided construction	●	●
	Possible	
	Not possible	