TROX® TECHNIK
The art of handling air

MULTILEAF DAMPER, VARIANT JZ-P-A2

Multileaf damper with actuator

PARALLEL BLADES

Parallel blades

OPPOSED BLADES

Opposed blades

JZ

FOR SHUTTING OFF THE AIRFLOW IN AIR CONDITIONING SYSTEMS

Rectangular multileaf dampers for volume flow and pressure control as well as for shutting off ducts and openings in walls and ceiling slabs

- Maximum dimensions 2000 × 1995 mm
- Casing air leakage to EN 1751, class C
- Aerofoil parallel or opposed action blades
- Blades interconnected by external linkage (for parallel or opposed blade action)
- Available in standard sizes and many intermediate sizes
- Can be combined with external weather louvres

Optional equipment and accessories

- Actuators: Open/close actuators, modulating actuators
- Explosion-proof construction with pneumatic actuator or spring return actuator
- Powder-coated construction

Allgemeine Informationen

Application

- Multileaf dampers as a control element in the volume flow rate and differential pressure control in ventilation and air conditioning systems
- For shutting off ducts and openings in walls and ceiling slabs
- Parallel action blades are preferably used for opening/closing
- Due to their characteristics, opposed action blades are preferable for variable operation
- Steel and stainless steel variants with brass or stainless steel bearings are suitable for use in potentially explosive atmospheres (ATEX)

Special characteristics

- Aerofoil blades
- Low-maintenance, robust construction
- No parts with silicone
- Available in standard sizes and many intermediate sizes

Nominal sizes

- B: 200 – 2000 mm, in increments of 1 mm
- Width subdivided (BM): 2001 – 4150 mm, in increments of 1 mm
- H: 180, 345, 510, 675, 840, 1005, 1170, 1335, 1500, 1665, 1830, 1995 mm (intermediate sizes 183 – 1995 in increments of 1 mm, except for standard size H - 1 mm, H + 1 mm, H + 2 mm)
- Height subdivided (HM): 1999 – 4066 mm, in increments of 1 mm
- Any combination of B × H

Variants

- JZ-S: Multileaf damper with opposed blade action, made of galvanised sheet steel
- JZ-P: Multileaf damper with parallel blade action, made of galvanised sheet steel
- JZ-S-A2: Multileaf damper with opposed blade action, made of stainless steel
- JZ-P-A2: Multileaf damper with parallel blade action, made of stainless steel

Construction

Duct connection

- Corner holes on both sides
- G: Flange holes on both sides

Bearings

- Plastic bearings, operating temperature -20 – 100 °C
- M: Brass bearings, operating temperature -20 – 150 °C
- E: Stainless steel bearings, operating temperature -20 – 150 °C

Blades

Only for steel or stainless steel multileaf dampers with brass or stainless steel bearings (JZ-...-M, JZ-...-E)

- V: Reinforced blades available from width 800 mm

Parts and characteristics

- Ready-to-install shut-off damper
- Blades with external linkage
- Drive arm

Attachments

- Quadrant stays and limit switches for the infinite adjustment of the multileaf dampers and for capturing the end positions
- Open/close actuators for opening and closing multileaf dampers
- Modulating actuators for variable damper blade positions
- Pneumatic actuators for opening and closing multileaf dampers
- Explosion-proof actuators for opening and closing multileaf dampers

Accessories

- Installation subframes for the fast and simple installation of multileaf dampers

Construction features

- Rectangular casing, welded (P1: casing with screws), material thickness galvanised steel 1.25 mm, stainless steel A2 = 1.2 mm
- Blades, material thickness 1 mm
- Flanges on both sides, suitable for duct connections, either corner holes or flange holes
- External linkage, robust and durable, consisting of the coupling rod and horizontal arms
- Damper blade shafts, Ø12 mm, with notch to indicate the damper blade position (not for ZS99)
- With spindle as an attachment: For the position of the spindle, see "Dimensions and weights"
- With actuator as an attachment: The actuator is always attached to the second blade from the top
- Construction and the selection of materials comply with the criteria stipulated in EU directives, referred to as ATEX (for use in potentially explosive atmospheres) for variants with brass or stainless steel bearings (-M, -E)

Material and surfaces

- Casing and blades made of galvanised sheet steel or stainless steel
- Blade shafts, drive arms and external linkages made of galvanised steel or stainless steel
- Plastic, brass or stainless steel bearings
- P1: powder-coated, RAL CLASSIC colour
- PS: powder-coated, DB colour

Standards and guidelines

- Casing air leakage to EN 1751, class C

Maintenance

- Maintenance-free, given that construction and the materials used are not subject to wear
- Contamination should be removed as it may lead to corrosion and to increased air leakage in closed multileaf dampers

TECHNICAL INFORMATION

Function, Technical data, Quick sizing, Specification text, Order code

Multileaf dampers with external linkage can have parallel action blades or opposed action blades. An external linkage transfers the synchronous rotational movement from the drive arm to the individual blades. Even very large multileaf dampers can be safely opened and closed with this type of linkage. Opposed action blades close at various speeds as the linkage includes a transverse link. This facilitates the closing process and reduces the air leakage in closed multileaf dampers.

Schematic illustration of JZ-S

① Casing

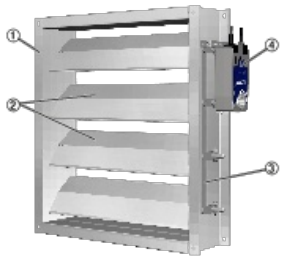
② Opposed blades

③ External linkage

④ Actuator

⑤ Transverse link

Schematic illustration of JZ-P



① Casing

② Parallel blades

③ External linkage

④ Actuator

The torques for operating multileaf dampers must be dimensioned in such a way that the damper can be safely opened and closed. For closure, the torque must suffice to ensure complete shut-off by the blades. Opening is initiated without the impact of aerodynamic forces. When air flows through the damper, the aerodynamic forces of the airflow create a closing force (torque) on the blades; this happens independently of the direction of the airflow. This closing force must be countered, or overcome. The blade angle α with the largest torque depends, among other things, on the fan characteristics.

Nominal sizes	200 × 180 – 2000 × 1995 mm
Operating temperature	-20 to 100 °C

JZ-*, JZ-*-A2, minimum torques [Nm]

H	B									
	200	400	600	800	1000	1200	1400	1600	1800	2000
180 – 1995	10	10	10	10	10	10	10	10	10	10

Steel and stainless steel multileaf dampers, free cross-sectional area [m^2]

H	B									
	200	400	600	800	1000	1200	1400	1600	1800	2000
180	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27	0.3
345	0.06	0.11	0.17	0.23	0.28	0.34	0.4	0.45	0.51	0.57
510	0.08	0.17	0.25	0.33	0.42	0.5	0.58	0.67	0.75	0.83
675	0.11	0.22	0.33	0.44	0.55	0.66	0.77	0.88	0.99	1.1
840	0.14	0.27	0.41	0.55	0.69	0.82	0.96	1.1	1.23	1.37
1005	0.16	0.33	0.49	0.66	0.82	0.98	1.15	1.31	1.47	1.64
1170	0.19	0.38	0.57	0.76	0.95	1.14	1.33	1.52	1.72	1.91
1335	0.22	0.43	0.65	0.87	1.09	1.3	1.52	1.74	1.96	2.17
1500	0.24	0.49	0.73	0.98	1.22	1.47	1.71	1.95	2.2	2.44
1665	0.27	0.54	0.81	1.08	1.36	1.63	1.9	2.17	2.44	2.71
1830	0.3	0.6	0.89	1.19	1.49	1.79	2.08	2.38	2.68	2.98
1995	0.32	0.65	0.97	1.3	1.62	1.95	2.27	2.6	2.92	3.25

Intermediate sizes: Interpolate values between widths.

Maximum permitted differential pressure $\Delta p_{max\ t}$ [Pa] in the case of closed multileaf damper

Construction	B						
	800	1000	1200	1400	1600	1800	2000
Standard construction	2500	2000	1650	1400	1250	1100	1000
Brass bearings (-M)	3000	2500	2200	1950	1750	1600	1500
Stainless steel bearings (-E)	3000	2500	2200	1950	1750	1600	1500
Reinforced blades (-M-V, -E-V)	3500	3000	2700	2500	2300	2100	2000

JZ-S, JZ-S-A2, sound power level L_{WA} [dB (A)] in the case of closed multileaf damper

Δp_t [Pa]	Area B × H [m²]							
	0.14	0.2	0.4	0.6	0.8	1.2	2	4
100	57	58	61	63	64	66	68	71
200	63	65	68	69	71	72	75	77
500	71	72	76	78	79	81	83	84
1000	78	80	82	84	85	88	90	>90
1500	81	83	86	88	89	>90	>90	>90
2000	84	85	89	>90	>90	>90	>90	>90

JZ-P, JZ-P-A2, sound power level L_{WA} [Pa] in the case of closed multileaf damper

Δp_t [Pa]	Area B × H [m²]							
	0.14	0.2	0.4	0.6	0.8	1.2	2	4
100	57	58	61	63	64	64	68	71
200	63	65	68	69	71	71	75	78
500	71	72	76	78	79	79	85	87
1000	78	80	82	84	85	85	89	>90
1500	81	82	86	88	89	89	>90	>90
2000	84	86	89	>90	90	>90	>90	>90

Quick sizing tables provide a good overview of the expected sound power levels and differential pressures. Approximate intermediate values can be interpolated. Precise intermediate values and spectral data can be calculated with our Easy Product Finder design program. The LWA sound power levels apply to multileaf dampers with a cross-sectional area (B × H) of 1 m². The differential pressures apply to multileaf dampers installed in ducts (installation type A).

JZ-S, JZ-S-A2, differential pressure and sound power level

v [m/s]	Damper blade position α									
	OPEN		20°		40°		60°		80°	
	Δp_t [Pa]	L_{WA} [dB(A)]	Δp_t [Pa]	L_{WA} [dB(A)]	Δp_t [Pa]	L_{WA} [dB(A)]	Δp_t [Pa]	L_{WA} [dB(A)]	Δp_t [Pa]	L_{WA} [dB(A)]
0.5	<5	<30	<5	<30	<5	<30	22	44	255	67
1	<5	<30	<5	<30	8	38	85	59	1010	82
2	<5	31	<5	35	28	53	335	74	>2000	>90
4	<5	46	10	50	110	68	1395	89	>2000	>90
6	<5	55	22	59	250	77	>2000	>90	>2000	>90
8	8	61	40	65	440	83	>2000	>90	>2000	>90

JZ-P, JZ-P-A2, differential pressure and sound power level

v [m/s]	Damper blade position α									
	OPEN		20°		40°		60°		80°	
	Δp_t [Pa]	L_{WA} [dB(A)]	Δp_t [Pa]	L_{WA} [dB(A)]	Δp_t [Pa]	L_{WA} [dB(A)]	Δp_t [Pa]	L_{WA} [dB(A)]	Δp_t [Pa]	L_{WA} [dB(A)]
0.5	<5	<30	<5	<30	<5	<30	<5	<30	12	42
1	<5	<30	<5	<30	<5	<30	12	40	45	60
2	<5	<30	<5	30	10	41	45	57	185	77
4	<5	41	6	48	40	58	170	75	750	>90
6	<5	51	14	58	85	69	385	85	1685	>90
8	<5	58	25	65	150	76	685	>90	>2000	>90

Rectangular multileaf dampers for volume flow and pressure control as well as for shutting off ducts and openings in walls and ceiling slabs. Ready-to-operate unit which consists of the casing, aerofoil blades and the blade mechanism. Flanges on both sides, suitable for duct connection. The blade position is indicated externally by a notch in the blade shaft extension. Casing air leakage to EN 1751, class C.

Special characteristics

- Aerofoil blades
- Low-maintenance, robust construction
- No parts with silicone
- Available in standard sizes and many intermediate sizes

Material and surfaces

- Casing and blades made of galvanised sheet steel or stainless steel
- Blade shafts, drive arms and external linkages made of galvanised steel or stainless steel

- Plastic, brass or stainless steel bearings
- P1: powder-coated, RAL CLASSIC colour
- PS: powder-coated, DB colour

Construction

Duct connection

- Corner holes on both sides
- G: Flange holes on both sides

Bearings

- Plastic bearings, operating temperature -20 – 100 °C
- M: Brass bearings, operating temperature -20 – 150 °C
- E: Stainless steel bearings, operating temperature -20 – 150 °C

Blades

Only for steel or stainless steel multileaf dampers with brass or stainless steel bearings (JZ-...-M, JZ-...-E)

- V: Reinforced blades available from width 800 mm

Technical data

- Nominal sizes: 200 × 180 mm – 2000 × 1995 mm
- Operating temperature: -20 to 100 °C

Sizing data

- q_v (m^3/h)
- Δp_t [Pa]

Air-regenerated noise

- L_{PA} [dB(A)]

Life cycle assessment
A life cycle assessment is available for the product series in form of an Environmental Product Declaration (EPD) that has been checked and published by a programme holder.

JZ	–	P	–	A2	–	G	–	M	–		–	L	/	1000 × 1005	/	ER	/	Z64	/	NC	/	P1 - RAL 9010
|		|		|		|		|		|		|		|		|		|		|
1		2		3		4		5		6		7		8		9		10		11		12

1 Type

JZ Multileaf damper

2 Function
S Opposed (standard)
P Parallel

3 Material
No entry: galvanised steel
A2 Stainless steel

4 Duct connection
No entry: corner holes on both sides,
G Flange holes on both sides (no corner holes)

5 Bearings
No entry: plastic bearings
M Brass bearings
E Stainless steel bearings

6 Construction of blades
Only for steel or stainless steel multileaf dampers with brass or stainless steel bearings
V Reinforced blades, available from width 800 mm

7 Operating side
No entry: right
L left

8 Nominal size [mm]
Specify size width × height

Galvanised steel variants are available with the width or height subdivided
Width > 2000: width subdivided
Height > 1995: height subdivided

9 Installation subframe
No entry: without installation subframe
ER With installation subframe (duct connection G only)

10 Attachments
No entry: without attachments
Z04 – Z07 Hold open device
Z12 – Z51 Actuators
ZF01 – ZF15 Spring return actuators
Z60 – Z77 Pneumatic actuators

Explosion-proof actuators
Z1EX, Z3EX Electrical
Z60EX – Z77EX Pneumatic

11 Damper blade safety function
Only with spring return actuators or pneumatic actuators
NO pressure off/power off to OPEN (Normally Open)
NC pressure off/power off to CLOSE (Normally Closed)

12 Surface
No entry: standard construction
P1 powder-coated, specify RAL CLASSIC colour

Gloss level
RAL 9010 GU 50
RAL 9006 GU 30
All other RAL colours GU 70

Order example: JZ–S–G–M–V–L/800×510/ER/Z43

Function	Opposed
Material	Galvanised steel
Duct connection	Flange holes on both sides
Bearings	Brass bearings
Construction of blades	Reinforced blades
Operating side	Left
Nominal size	800 × 510 mm
Installation subframe	With
Attachments	Actuator, 10 Nm, 230 V AC, 3-point
User interface	Standard construction

Variants

Multileaf damper, variant JZ-S

Multileaf damper with quadrant stay

Multileaf damper, variant JZ-P

Multileaf damper with installation subframe and actuator

Multileaf damper, variant JZ-S-A2

Multileaf damper with actuator

Multileaf damper, variant JZ-P-A2

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