



Opposed blades

Multileaf dampers

JZ-HL



For low-leakage shut-off in ventilation and air conditioning systems

Rectangular multileaf dampers for volume flow and pressure control as well as for low-leakage shut-off of ducts and openings in walls and ceiling slabs

- Maximum dimensions 2000 × 1995 mm
- Closed blade air leakage to EN 1751, classes 1 – 2, depending on size
- Casing air leakage to EN 1751, class C
- Aerofoil opposed action blades
- Blades interconnected by external linkage
- Available in standard sizes and many intermediate sizes

Optional equipment and accessories

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

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General information

Application

- Multileaf dampers as a control element in the volume flow rate and differential pressure control in ventilation and air conditioning systems
- For low-leakage shut-off of ducts and openings in walls and ceiling slabs
- 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

Classification

Air leakage with closed multileaf damper according to EN 1751: Test pressure up to 2000 Pa

- Up to B = 599 mm, class 1
- From B = 600 mm, class 2

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

Construction

Duct connection

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

Bearings

- Plastic bearings, operating temperature 0 – 100 °C
- M: Brass bearings, operating temperature 0 – 100 °C
- E: Stainless steel bearings, operating temperature 0 – 100 °C

Blades

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

- V: Reinforced blades available as 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 welded casing (P1: casing with screws), material thickness 1.25 mm
- Blades, material thickness 1 mm
- Flanges on both sides, suitable for duct connection, either flange holes or corner holes
- External linkage, robust and durable, consisting of the coupling rod and horizontal arms
- Blade shafts, Ø12 mm, with notch to indicate the damper blade position (not for ZS99)
- With drive spindle as an attachment: For the position of the spindle, see 'Dimensions and weight'
- With actuator as an attachment: The actuator is always attached to the second blade from the top
- Travel stop (angle section) ensures tight closure of the top and bottom blades
- Blade tip seals
- The construction and selection of materials comply with the criteria stipulated in European 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
- Blade shafts, drive arm and external linkage made of galvanised steel
- Blade tip seals made of PP/PTV plastic
- P1: Powder-coated, RAL CLASSIC colour
- PS: Powder-coated, DB colour

Standards and guidelines

- Casing air leakage to EN 1751, class C
- Meets the general requirements of DIN 1946, part 4, with regard to the acceptable air leakage with closed multileaf damper (from B = 600 mm)

Maintenance

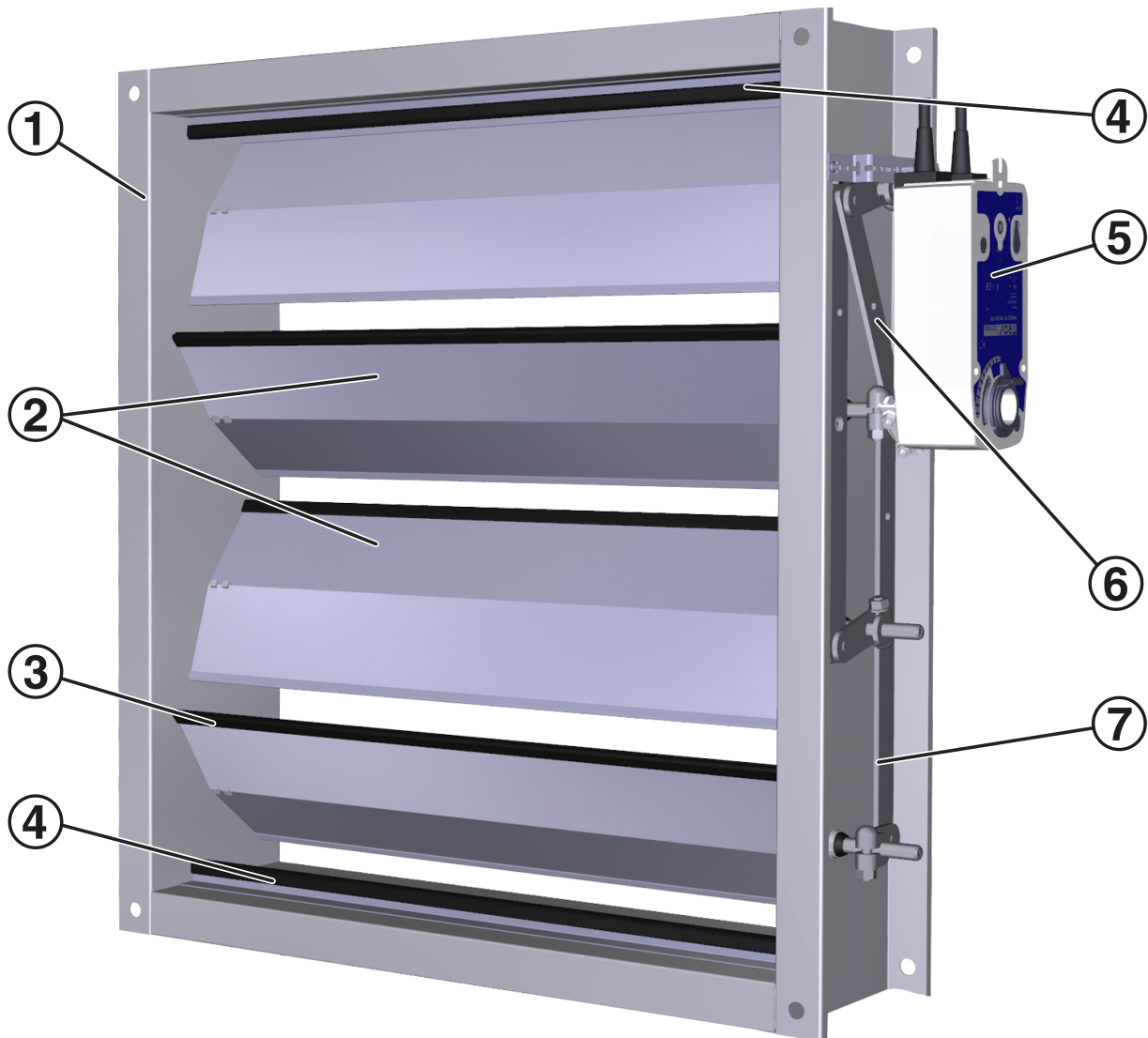
- Maintenance-free, as construction and materials are not subject to wear
- Contamination should be removed, as it may lead to corrosion and to increased closed blade air leakage

Function

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-HL



- ① Casing
- ② Opposed blades
- ③ Blade tip seal
- ④ Travel stop (angle section with seal)
- ⑤ Actuator
- ⑥ Transverse link
- ⑦ External linkage

Technical data

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 independent of the direction of the airflow. This closing force must be countered, or overcome. The blade angle α with the largest torque dependently of among other things, on the fan characteristics.

Nominal sizes	200 × 180 – 2000 × 1995 mm
Operating temperature	0 – 100 °C

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 [m²]

H	B									
	200	400	600	800	1000	1200	1400	1600	1800	2000
180 – 344	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27	0.3
345 – 509	0.06	0.11	0.17	0.23	0.28	0.34	0.4	0.45	0.51	0.57
510 – 674	0.08	0.17	0.25	0.33	0.42	0.5	0.58	0.67	0.75	0.83
675 – 839	0.11	0.22	0.33	0.44	0.55	0.66	0.77	0.88	0.99	1.1
840 – 1004	0.14	0.27	0.41	0.55	0.69	0.82	0.96	1.1	1.23	1.37
1005 – 1169	0.16	0.33	0.49	0.66	0.82	0.98	1.15	1.31	1.47	1.64
1170 – 1334	0.19	0.38	0.57	0.76	0.95	1.14	1.33	1.52	1.72	1.91
1335 – 1499	0.22	0.43	0.65	0.87	1.09	1.3	1.52	1.74	1.96	2.17
1500 – 1664	0.24	0.49	0.73	0.98	1.22	1.47	1.71	1.95	2.2	2.44
1665 – 1829	0.27	0.54	0.81	1.08	1.36	1.63	1.9	2.17	2.44	2.71
1830 – 1994	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 permissible static differential pressure [$\Delta p_{max,t}$] 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 (-MV, -E-V)	3500	3000	2700	2500	2300	2100	2000

Sound power level for a closed multileaf damper L_{WA} [dB(A)]

Δp_t	Area $B \times H$ [m ²]							
	0.14	0.2	0.4	0.6	0.8	1.2	2	4
100	43	45	48	50	51	53	55	58
200	51	53	56	58	59	61	63	66
500	62	63	66	68	69	>70	>70	>70
1000	69	>70	>70	>70	>70	>70	>70	>70
1500	>70	>70	>70	>70	>70	>70	>70	>70
2000	>70	>70	>70	>70	>70	>70	>70	>70

Quick sizing

Quick sizing tables provide a good overview of the sound power levels and differential pressures that can be expected. Approximate intermediate values can be interpolated. Precise intermediate values and spectral data can be calculated with our Easy Product Finder design program.

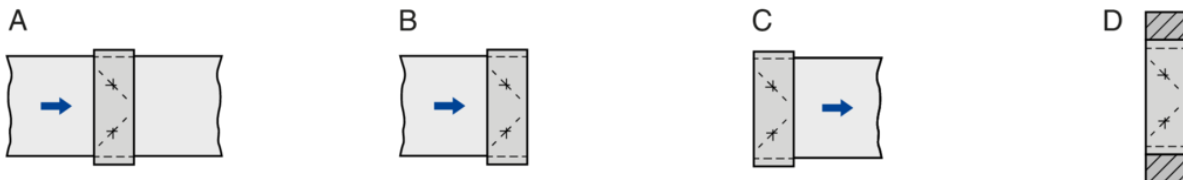
The sound power levels L_{WA} apply to multileaf dampers with a cross-sectional area ($B \times H$) of 1 m².

The differential pressures apply to multileaf dampers installed in ducts (installation type A).

JZ-LL, JZ-LL-A2, JZ-HL, 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	7.5	22	34	250	63
1	<5	<30	<5	<30	8	26	85	53	1000	83
2	<5	<30	<5	<30	30	46	345	73	>2000	>90
4	<5	41	10	44	120	65	1385	>90	>2000	>90
6	<5	52	24	56	270	77	>2000	>90	>2000	>90
8	10	60	42	64	480	85	>2000	>90	>2000	>90

Installation type



A = Ducts on both sides

B = Air discharge

C = Air intake

D = Air transfer

Specification text

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

Rectangular multileaf dampers for volume flow and pressure control as well as for low-leakage shut-off of 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. Closed multileaf damper air leakage according to EN 1751, class 2 ($B \leq 600$ mm, class 1) Casing leakage according 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
- Blade shafts, drive arm and external linkage made of galvanised steel
- Blade tip seals made of PP/PTV plastic
- 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 0 – 100 °C
- M: Brass bearings, operating temperature 0 – 100 °C
- E: Stainless steel bearings, operating temperature 0 – 100 °C

Blades

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

- V: Reinforced blades available as from width 800 mm

Technical data

Nominal sizes: 200 × 180 mm – 2000 × 1995 mm

- Operating temperature: 0 to 100 °C

Sizing data

- q_v (m³/h)
- Δp_t [Pa]

Air-regenerated noise

- L_{PA} [dB(A)]

Order code

JZ-HL-G-M-V-L/1000 × 1005/ER/Z64/NC/P1 - RAL 9010

1	2	3	4	5	6	7	8	9	10
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1 Type

JZ-HL Low-leakage multileaf damper, closed blade air leakage to EN 1751, classes 1 – 2

2 Duct connection

No entry: corner holes on both sides,

G Flange holes on both sides (no corner holes)

3 Bearings

No entry: plastic bearings

M Brass bearings

E Stainless steel bearings

4 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

5 Operating side

No entry: right

L left

6 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

Order example: JZ-HL-G-M-V-L/1200×675/ER/ZF06/NC**Duct connection****Bearings****Construction of blades****Operating side****Nominal size****Installation subframe****Attachments****Damper blade position****User interface****7 Installation subframe**

No entry: without installation subframe

ER With installation subframe (duct connection G only)

8 Attachments

No entry: without attachment

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

9 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)

10 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

Flange holes on both sides

Brass bearings

Reinforced blades

Left side

1200 × 675 mm

With

Spring return actuator, 20 Nm, 24 V AC/DC

Power off to CLOSE

Standard construction

Dimensions

Standard sizes

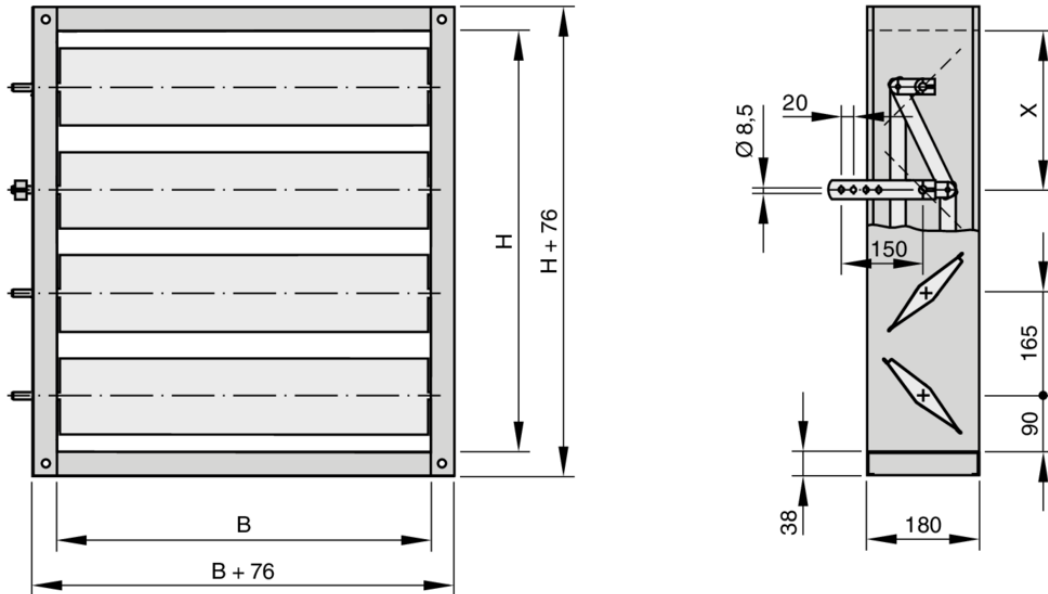


Illustration shows operating side on the left

JZ, JZ-HL, standard sizes

H	No. of blades	Spindle position	
		X	Damper blade
180	1	90	1
345	2	90	1
510	3	90	1
675	4	255	2
840	5	420	3
1005	6	420	3
1170	7	585	4
1335	8	585	4
1500	9	750	5
1665	10	750	5
1830	11	915	6
1995	12	915	6

Intermediate sizes

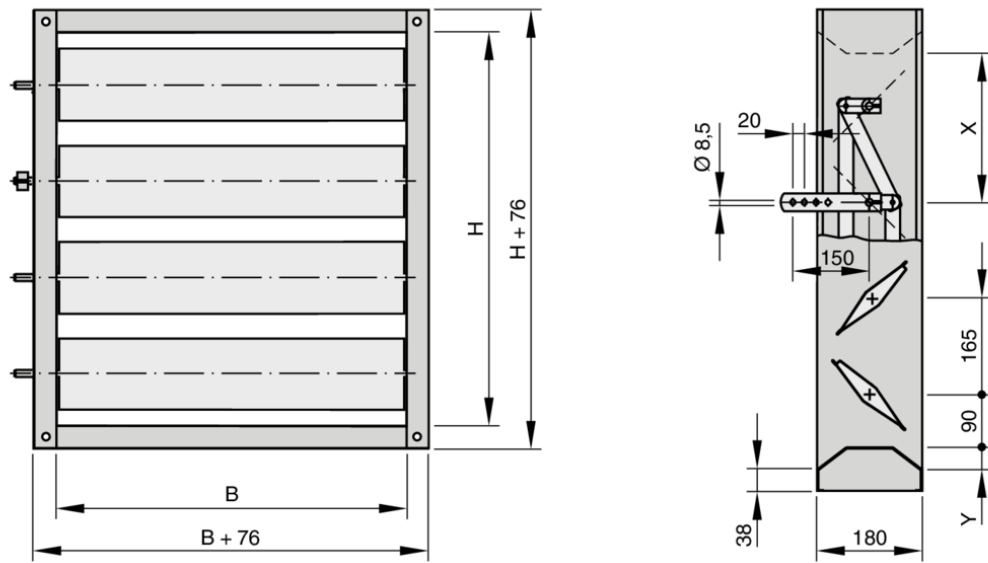


Illustration shows operating side on the left

JZ, JZ-HL, intermediate sizes

H	No. of blades	Spindle position		Y
		X	Damper blade	
183 – 343	1	90	1	1.5 – 81.5
348 – 508	2	90	1	1.5 – 81.5
513 – 673	3	90	1	1.5 – 81.5
678 – 838	4	255	2	1.5 – 81.5
843 – 1003	5	420	3	1.5 – 81.5
1008 – 1168	6	420	3	1.5 – 81.5
1173 – 1333	7	585	4	1.5 – 81.5
1338 – 1498	8	585	4	1.5 – 81.5
1503 – 1663	9	750	5	1.5 – 81.5
1668 – 1828	10	750	5	1.5 – 81.5
1833 – 1993	11	915	6	1.5 – 81.5

JZ, JZ-LL, JZ-HL, weight

H	B			
	200	400	600	800
180	4	6	8	9
345	6	8	10	12
510	7	10	13	16
675	10	13	16	20
840	11	15	19	23
1005	11	17	22	27
1170	13	19	25	31
1335	15	22	28	35
1500	16	23	30	37
1665	17	25	33	41
1830	18	27	35	44
1995	19	29	38	47

Attachments

Quadrant stays and limit switches

Order code detail	Description	Limit switch	Function
Z04	Hold open device	–	
Z05	Hold open device	1	Damper blade position CLOSED
Z06	Hold open device	1	Damper blade position OPEN
Z07	Hold open device	2	Damper blade positions CLOSED and OPEN

Open/close actuators

Order code detail	Description	Function	Supply voltage	Torque	Auxiliary switch
Z12	SM230A	1-wire-control 2-wire-control (3-point)	100 – 240 V AC	20 Nm	–
Z13	GM230A	1-wire-control –2-wire-control (OPEN-CLOSE)	100 – 240 V AC	40 Nm	–
Z14	SM24A	1-wire-control 2-wire-control (3-point)	24 V AC/DC	20 Nm	–
Z15	GM24A	1-wire-control –2-wire-control (OPEN-CLOSE)	24 V AC/DC	40 Nm	–
Z16	SM230A	1-wire-control 2-wire-control (3-point)	100 – 240 V AC	20 Nm	S2A
Z17	GM230A	1-wire-control 2-wire-control (3-point)	100 – 240 V AC	40 Nm	S2A
Z18	SM24A	1-wire-control 2-wire-control (3-point)	24 V AC/DC	20 Nm	S2A
Z19	GM24A	1-wire-control 2-wire-control (3-point)	24 V AC/DC	40 Nm	S2A
Z43	NM230A	1-wire-control 2-wire-control (3-point)	100 – 240 V AC	10 Nm	–
Z45	NM24A	1-wire-control 2-wire-control (3-point)	24 V AC/DC	10 Nm	–
Z47	NM230A	1-wire-control 2-wire-control (3-point)	100 – 240 V AC	10 Nm	S2A
Z49	NM24A	1-wire-control 2-wire-control (3-point)	24 V AC/DC	10 Nm	S2A

Minimum torque of multileaf damper has to be considered when selecting the actuator.

Open/close actuators, fast-running

Order code detail	Description	Function	Supply voltage	Torque	Auxiliary switch
ZS21	SMQ24A	1-wire-control	24 V AC/DC	16 Nm	–
ZS22	SMQ24A	1-wire-control	24 V AC/DC	16 Nm	S2A

Only for nominal sizes with a minimum torque not exceeding 16 Nm.

Open/close actuators, spring return

Order code detail	Description	Function	Supply voltage	Torque	Auxiliary switch
ZF01	NF24A	Supply voltage on/off	24 V AC/DC	10 Nm	–
ZF02	NFA	Supply voltage on/off	24 – 240 V AC 24 – 125 V DC	10 Nm	–
ZF03	NF24A-S2	Supply voltage on/off	24 V AC/DC	10 Nm	integrated
ZF04	NFA-S2	Supply voltage on/off	24 – 240 V AC 24 – 125 V DC	10 Nm	integrated
ZF06	SF24A	Supply voltage on/off	24 V AC/DC	20 Nm	–
ZF07	SFA	Supply voltage on/off	24 – 240 V AC 24 – 125 V DC	20 Nm	–
ZF08	SF24A-S2	Supply voltage on/off	24 V AC/DC	20 Nm	integrated
ZF09	SFA-S2	Supply voltage on/off	24 – 240 V AC 24 – 125 V DC	20 Nm	integrated
ZF11	EF24A	Supply voltage on/off	24 V AC/DC	30 Nm	–
ZF12	EF230A	Supply voltage on/off	100 – 240 V AC	30 Nm	–
ZF13	EF24A-S2	Supply voltage on/off	24 V AC/DC	30 Nm	integrated
ZF14	EF230A-S2	Supply voltage on/off	100 – 240 V AC	30 Nm	integrated

Minimum torque of multileaf damper has to be considered when selecting the actuator.

Modulating actuators

Order code detail	Description	Function	Supply voltage	Torque	Auxiliary switch
Z20	SM24A-SR	2 – 10 V DC	24 V AC/DC	20 Nm	–
Z21	GM24A-SR	2 – 10 V DC	24 V AC/DC	40 Nm	–
Z51	NM24A-SR	2 – 10 V DC	24 V AC/DC	10 Nm	–

Minimum torque of multileaf damper has to be considered when selecting the actuator.

Modulating actuators, spring return

Order code detail	Description	Function	Supply voltage	Torque	Auxiliary switch
ZF05	NF24A-SR	2 – 10 V DC	24 V AC/DC	10 Nm	–
ZF10	SF24A-SR	2 – 10 V DC	24 V AC/DC	20 Nm	–
ZF15	EF24A-SR	2 – 10 V DC	24 V AC/DC	30 Nm	–

Minimum torque of multileaf damper has to be considered when selecting the actuator.

Double acting pneumatic actuators, including explosion-proof actuators

Order code detail		Description	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
(1)	(2)						
Z60	Z60 EX	DR030	–	1.2 – 6 bar	35 Nm	–	
Z61	Z61 EX	DR030	power off to close/open	1.2 – 6 bar	35 Nm	–	24 V DC
Z62	Z62 EX	DR030	power off to close/open	1.2 – 6 bar	35 Nm	–	230 V AC
Z63	Z63 EX	DR030	–	1.2 – 6 bar	35 Nm	2	
Z64	Z64 EX	DR030	power off to close/open	1.2 – 6 bar	35 Nm	2	24 V DC
Z65	Z65 EX	DR030	power off to close/open	1.2 – 6 bar	35 Nm	2	230 V AC
Z66	Z66 EX	DR060	–	1.2 – 6 bar	70 Nm	–	
Z67	Z67 EX	DR060	power off to close/open	1.2 – 6 bar	70 Nm	–	24 V DC
Z68	Z68 EX	DR060	power off to close/open	1.2 – 6 bar	70 Nm	–	230 V AC
Z69	Z69 EX	DR060	–	1.2 – 6 bar	70 Nm	2	
Z70	Z70 EX	DR060	power off to close/open	1.2 – 6 bar	70 Nm	2	24 V DC
Z71	Z71 EX	DR060	power off to close/open	1.2 – 6 bar	70 Nm	2	230 V AC

(1) Standard

(2) Explosion-proof (only with brass or stainless steel bearings)

Minimum torque, which depends on the nominal size of multileaf damper, and the operating pressure have to be considered when selecting the actuator.

Single acting pneumatic actuators, including explosion-proof actuators

Order code detail		Description	Damper blade safety function	Operating pressure	Torque at 6 bar	Limit switch	Solenoid valve
(1)	(2)						
Z72	Z72 EX	SC060 SO060	pressure off to close/open	6 bar	30 Nm	–	–
Z73	Z73 EX	SC060 SO060	power off and pressure off to close/open	6 bar	30 Nm	–	24 V DC
Z74	Z74 EX	SC060 SO060	power off and pressure off to close/open	6 bar	30 Nm	–	230 V AC
Z75	Z75 EX	SC060 SO060	pressure off to close/open	6 bar	30 Nm	2	–
Z76	Z76 EX	SC060 SO060	power off and pressure off to close/open	6 bar	30 Nm	2	24 V DC
Z77	Z77 EX	SC060 SO060	power off and pressure off to close/open	6 bar	30 Nm	2	230 V AC

(1) Standard

(2) Explosion-proof (only with brass or stainless steel bearings)

Explosion-proof open/close actuators, spring return actuators

Order code detail	Description	Function	Supply voltage	Torque	Auxiliary switch
Z1EX	ExMax15-SF	2-wire-control (3-point)	24 – 240 V AC/DC	15 Nm	integrated



Order code detail	Description	Function	Supply voltage	Torque	Auxiliary switch
Z3EX	ExMax30-SF	2-wire-control (3-point)	24 – 240 V AC/DC	30 Nm	integrated

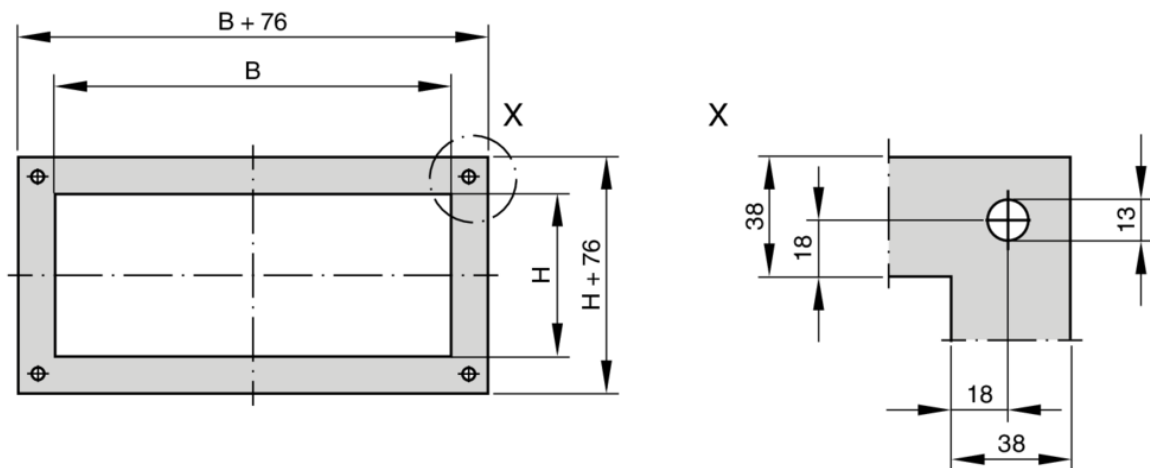
Only with brass or stainless steel bearings

Z1EX: Only for nominal sizes with a minimum torque up to 15 Nm.

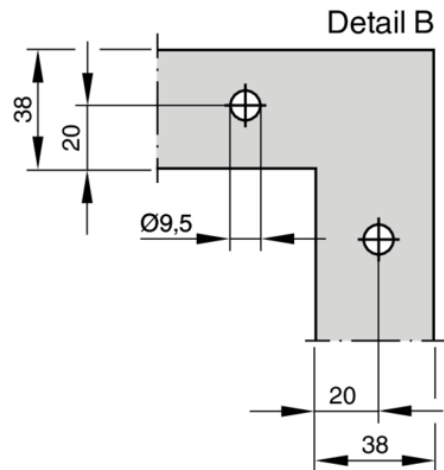
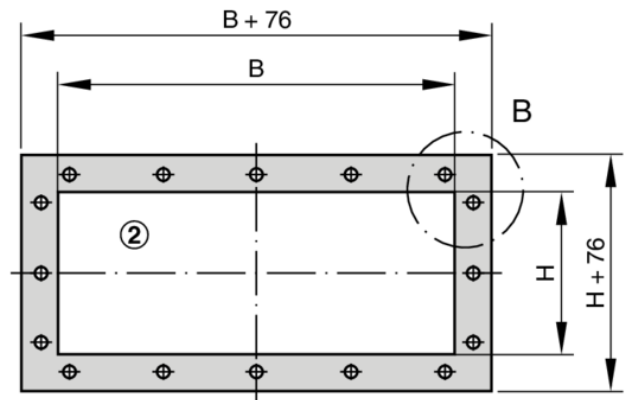
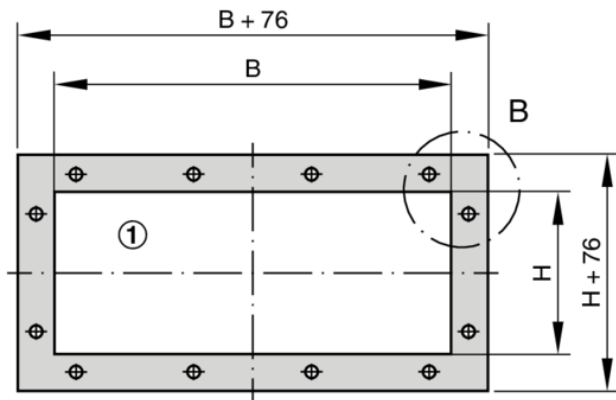
Product details

- Constructions with flange holes (-G) do not have corner holes
- Drive spindles (special accessory) upon request

Multileaf dampers made of steel or stainless steel, corner holes



Multileaf dampers made of steel or stainless steel, flange holes



- ① Even number of holes (hole pitch = 250 mm)
- ② Uneven number of holes (hole pitch = 250 mm)



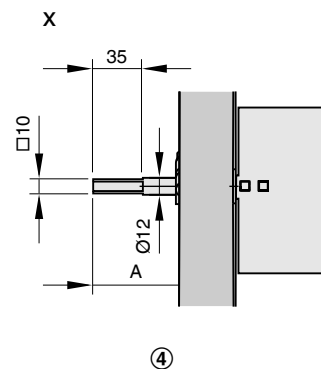
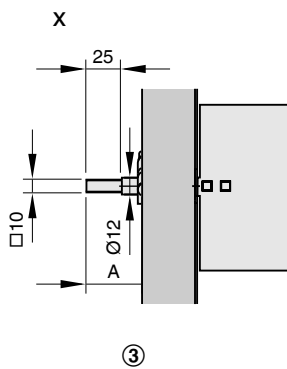
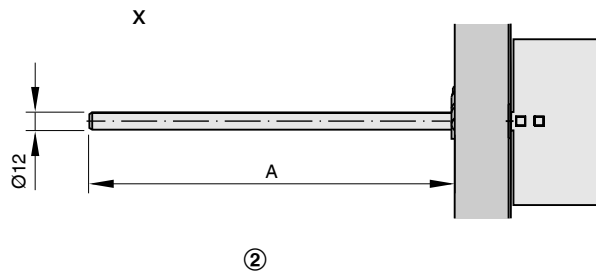
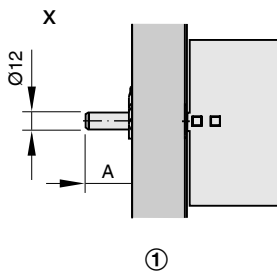
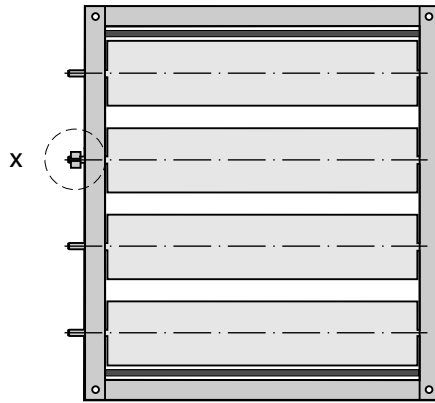
Steel or stainless steel multileaf dampers, width, no. of flange holes per side

B	Number of holes n
200 – 287	1
288 – 537	2
538 – 787	3
788 – 1037	4
1038 – 1287	5
1288 – 1537	6
1538 – 1787	7
1788 – 2000	8

Steel or stainless steel multileaf dampers, height, no. of flange holes per side

H	Number of holes n
180 – 211	1
212 – 461	2
462 – 711	3
712 – 961	4
962 – 1211	5
1212 – 1461	6
1462 – 1711	7
1712 – 1961	8
1962 – 1995	9

JZ-LL, JZ-HL, JZ-LL-A2, drive spindles



- ① Standard shaft
- ② ZS99 – extended spindle
- ③ ZS991 – square shaft 10 mm
- ④ ZS992 – square shaft 10 mm

Shaft end projection A [mm]

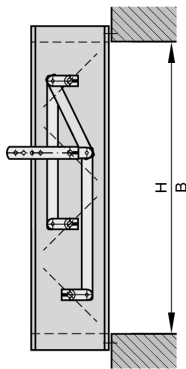
Drive shaft	JZ-LL	JZ-LL-A2	JZ-HL
Standard spindle	30	26	30
ZS99 – extended spindle	250	180	250
ZS991 – square shaft 10 mm	37	37	37
ZS992 – square shaft 10 mm	70	–	60

Installation details

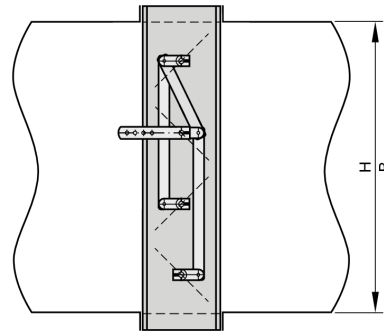
Installation and commissioning

- Only with horizontal blades
- With or without installation subframe
- Torsion-free installation
- For widths exceeding 2000 mm or heights exceeding 1995 mm, install two multileaf dampers side by side or one above the other
- Only for installation in internal spaces

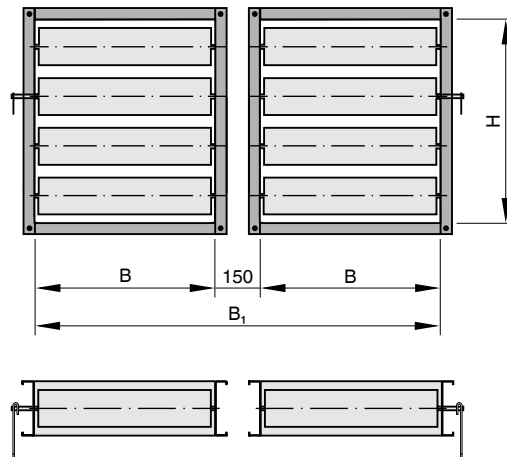
Wall installation without installation subframe



Duct installation



Width subdivided

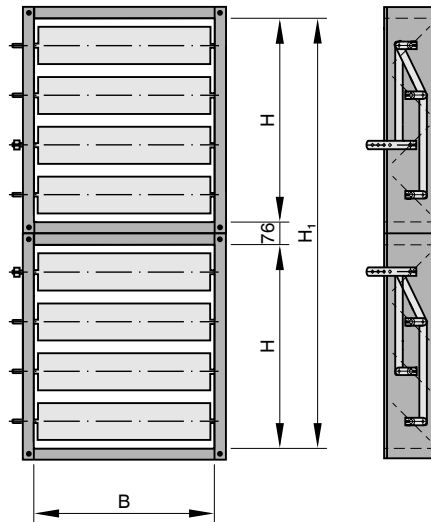


$$B_1 = 2 B + 150$$

Width subdivided, width [mm]

B ₁	B
2550	1200
2950	1400
3350	1600
3750	1800
4150	2000

Height subdivided



$$H_1 = 2 H + 76$$

Explanation

B [mm]; [in]
Duct width

H [mm]; [in]
Duct height

Lengths

All lengths are given in millimetres [mm] unless stated otherwise

n []
Number of flange screw holes

m [kg]
Weight

L_{WA} [dB(A)]
A-weighted sound power level of air-regenerated noise for the multileaf damper

α [kPa]
Damper blade position, 0°: OPEN, 90°: CLOSED

A [m²]
Upstream cross section

v [m/s]
Airflow velocity based on the upstream cross section (B × H)

q_v [m³/h]; [l/s]
Volume flow rate

Δp_t [Pa]
Differential pressure

Δp_{max t} [Pa]
Maximum differential pressure