



Blade mechanism with gears

# Multileaf dampers

## JZ-AL



### Multileaf dampers made of aluminium 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 1200 × 1000 mm
- Casing air leakage to EN 1751, class C
- Aerofoil opposed action blades
- Blades interconnected by gears

Optional equipment and accessories

- Actuators: Open/close actuators, modulating actuators
- Powder-coated construction
- Anodised 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 shutting off ducts and openings in walls and ceiling slabs
- Due to their characteristics, opposed action blades are preferable for variable operation
- Powder-coated construction

### Special features

- Aerofoil blades
- Low-maintenance, robust construction
- No parts with silicone

### Nominal sizes

- B: 200 – 1200 mm, in increments of 1 mm
- H: 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000 mm
- Any combination of B × H

### Parts and characteristics

- Ready-to-install shut-off damper
- Blades with gears
- Drive arm with drive shaft and bearing plate

### 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

### Accessories

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

### Construction features

- Rectangular casing, with screws, material thickness 1.5 mm
- Blades, material thickness 1.25 mm
- Flanges on both sides, suitable for duct connection, with corner holes
- Gears on both blade ends
- Damper blade shafts, Ø12 mm, with notch to indicate the damper blade position (not for ZS99)
- Bearings with ring seals
- With spindle as an attachment: For the position of the spindle, see 'Dimensions and weight'
- With actuator as an attachment: The actuator position at the first blade from the top (with up to 3 blades) or at the third blade from the top (with 4 or more blades)

### Materials and surfaces

- Casing and blades made of extruded aluminium sections
- Shafts, bearing plate and position indicator made of galvanised steel
- Special plastic anti-static gears
- P1: Powder-coated, RAL CLASSIC colour
- PS: Powder-coated, DB colour
- S3: With anodised finish, colour to EURAS standard E6-C-0

### Standards and guidelines

- Casing air leakage to EN 1751, class C

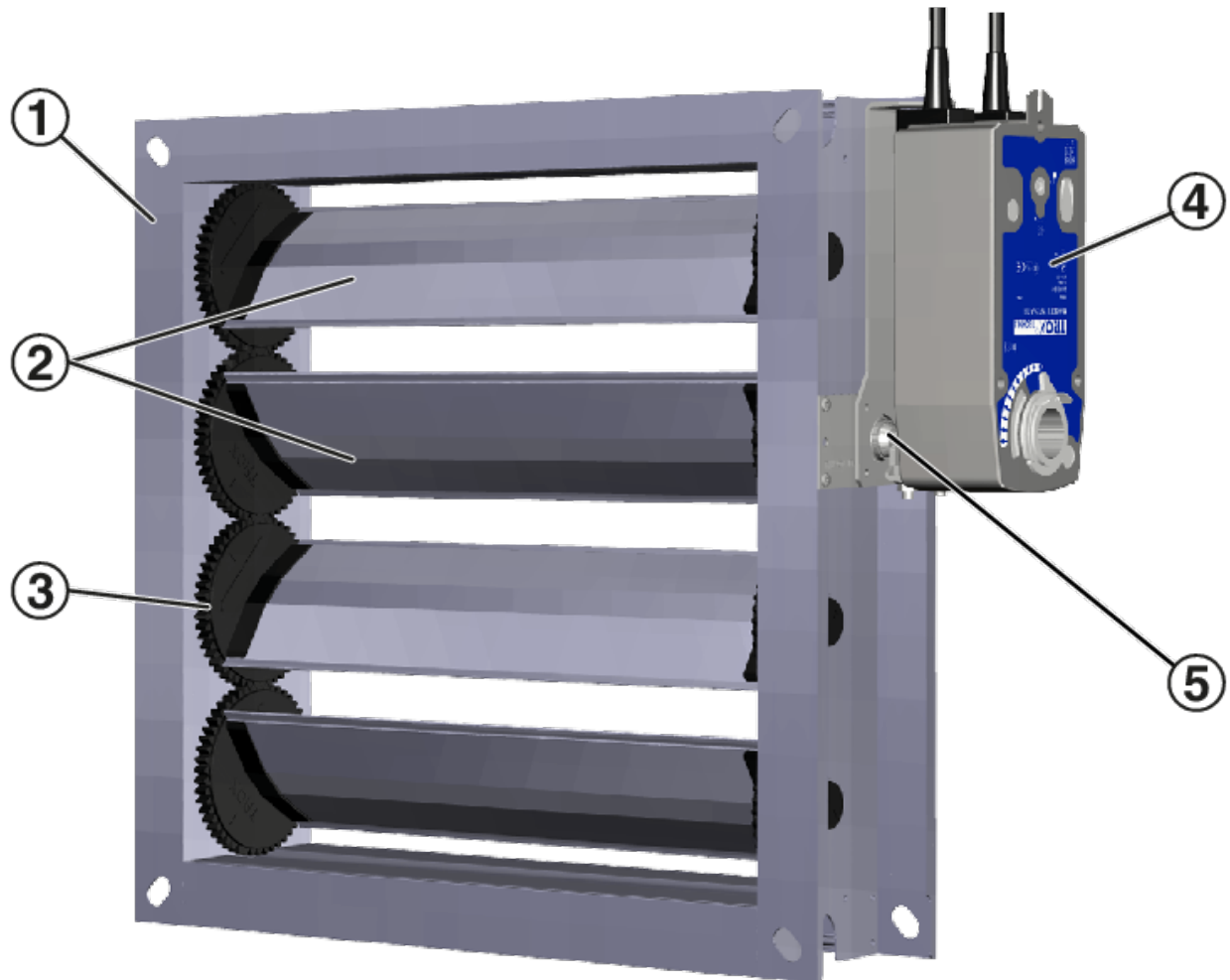
### Maintenance

- 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 gears can only have opposed action blades. The internal gears transfer the synchronous rotational movement from the drive arm to the individual blades.

### Schematic illustration of JZ-AL



- ① Casing
- ② Opposed blades
- ③ Gears
- ④ Actuator
- ⑤ Bearing plate and drive shaft

## 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  $\alpha$  with the largest torque depends, among other things, on the fan characteristics.

Nominal sizes	200 × 100 mm – 1200 × 1000 mm
Maximum permitted static differential pressure for a closed multileaf damper	2000 Pa
Operating temperature	0 to 60 °C

### Minimum torques [Nm]

H	B					
	200	400	600	800	1000	1200
100 – 650	5	5	5	5	5	5
700 – 1000	10	10	10	10	10	10

### Free cross-sectional area [m<sup>2</sup>]

H	B										
	200	300	400	500	600	700	800	900	1000	1100	1200
100, 150	0.014	0.022	0.03	0.038	0.047	0.055	0.063	0.071	0.079	0.087	0.095
200, 250	0.028	0.045	0.061	0.077	0.093	0.109	0.126	0.142	0.158	0.174	0.19
300, 350	0.043	0.067	0.091	0.115	0.14	0.164	0.188	0.213	0.237	0.261	0.286
400, 450	0.057	0.089	0.122	0.154	0.186	0.219	0.251	0.284	0.316	0.348	0.381
500, 550	0.071	0.111	0.152	0.192	0.233	0.273	0.314	0.354	0.395	0.435	0.476
600, 650	0.085	0.134	0.182	0.231	0.279	0.328	0.377	0.425	0.474	0.522	0.571
700, 750	0.099	0.156	0.213	0.269	0.326	0.383	0.439	0.496	0.553	0.61	0.666
800, 850	0.113	0.178	0.243	0.308	0.373	0.437	0.502	0.567	0.632	0.697	0.761
900, 950	0.128	0.2	0.273	0.346	0.419	0.492	0.565	0.638	0.711	0.784	0.857
1000	0.142	0.223	0.304	0.385	0.466	0.547	0.628	0.709	0.79	0.871	0.952

Intermediate sizes: Interpolate values between widths.

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

$\Delta p_i$ [Pa]	Area B × H [m <sup>2</sup> ]								
	0.04	0.09	0.16	0.25	0.36	0.64	0.81	1	1.2
100	42	45	48	50	51	54	55	56	56
200	49	53	55	57	59	>60	>60	>60	>60
500	59	>60	>60	>60	>60	>60	>60	>60	>60
1000	>60	>60	>60	>60	>60	>60	>60	>60	>60
1500	>60	>60	>60	>60	>60	>60	>60	>60	>60
2000	>60	>60	>60	>60	>60	>60	>60	>60	>60

## 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 × H) of 1 m<sup>2</sup>. The differential pressures apply to multileaf dampers installed in ducts (installation type A).

**Differential pressure and sound power level**

v [m/s]	Damper blade position $\alpha$									
	OPEN		20°		40°		60°		80°	
	$\Delta p_t$ [Pa]	$L_{WA}$ [dB(A)]	$\Delta p_t$ [Pa]	$L_{WA}$ [dB(A)]	$\Delta p_t$ [Pa]	$L_{WA}$ [dB(A)]	$\Delta p_t$ [Pa]	$L_{WA}$ [dB(A)]	$\Delta p_t$ [Pa]	$L_{WA}$ [dB(A)]
0.5	<5	<30	<5	<30	<5	<30	22	42	245	67
1	<5	<30	<5	<30	8	35	90	58	985	83
2	<5	<30	<5	<30	32	51	350	74	>2000	>90
4	<5	41	10	44	125	67	1390	90	>2000	>90
6	<5	52	24	56	275	76	>2000	>90	>2000	>90
8	10	60	42	64	490	83	>2000	>90	>2000	>90

## 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 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 features

- Aerofoil blades
- Low-maintenance, robust construction
- No parts with silicone

### Materials and surfaces

- Casing and blades made of extruded aluminium sections

- Shafts, bearing plate and position indicator made of galvanised steel
- Special plastic anti-static gears
- P1: Powder-coated, RAL CLASSIC colour
- PS: Powder-coated, DB colour
- S3: With anodised finish, colour to EURAS standard E6-C-0

### Technical data

- Nominal sizes: 200 × 100 mm – 1200 × 1000 mm
- Maximum permitted static differential pressure for a closed multileaf damper: 2000 Pa
- Operating temperature: 0 to 60 °C

### Sizing data

- $q_v$  (m<sup>3</sup>/h)
- $\Delta p_t$  [Pa]

Air-regenerated noise

- $L_{PA}$  [dB(A)]

## Order code

JZ-AL / 1100 × 950 / ER / Z64 / NC / P1 – RAL ...  
 |            |            |            |            |            |  
 1            2            3            4            5            6

**1 Type**

**JZ-AL** Multileaf damper made of aluminium

**2 Nominal size [mm]**

B × H

**3 Installation subframe**

No entry required: none

**ER** With

**4 Attachments**

No entry required: none

**Z04 – Z07** Hold open device

**Z12 – Z51** Actuators

**ZF01 – ZF15** Spring return actuators

**Z60 – Z77** pneumatic actuators

**5 Damper blade safety function**

Only for spring return actuators or pneumatic actuators

**NO** pressure off/power off to OPEN

**NC** pressure off/power off to CLOSE

**6 Surface**

No entry: standard construction

**P1** powder-coated, specify RAL CLASSIC colour

**S3** with anodised finish, E6-C-0, EURAS standard colour

Gloss level

RAL 9010 50 %

RAL 9006 30 %

All other RAL colours 70 %

**Order example: JZ-AL/600×850/ZF01/NO/P1–RAL7001**

**Nominal size**

600 × 850 mm

**Installation subframe**

None

**Attachments**

Spring return actuator, 10 Nm, 24 V AC/DC

**Damper blade position**

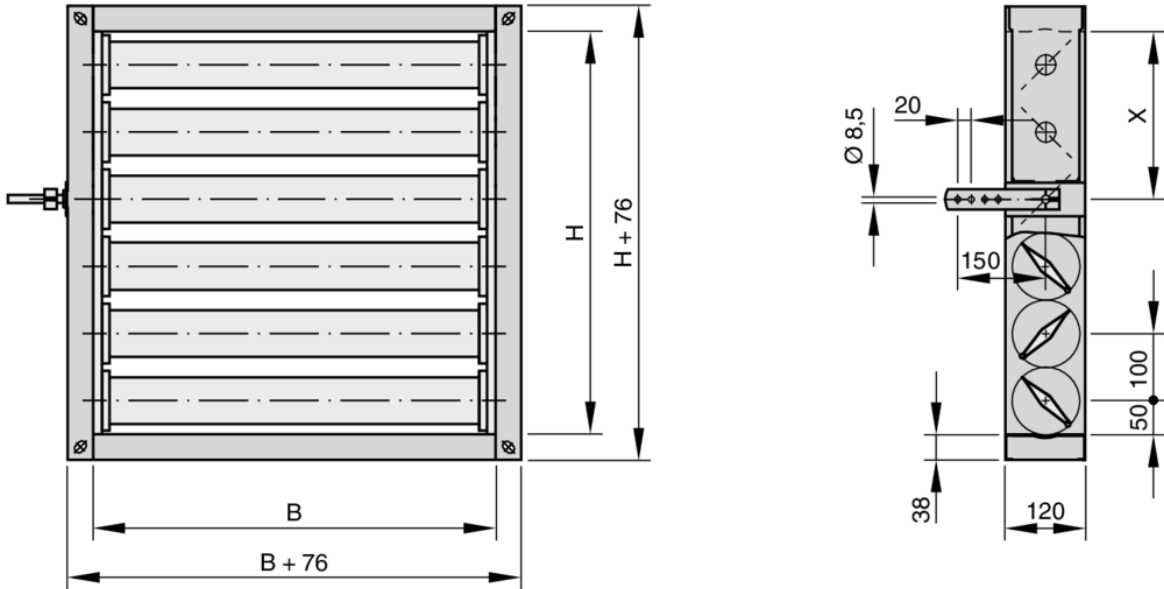
Power off to OPEN

**User interface**

Powder-coated, RAL 7001, silver

## Dimensions

**Standard sizes**

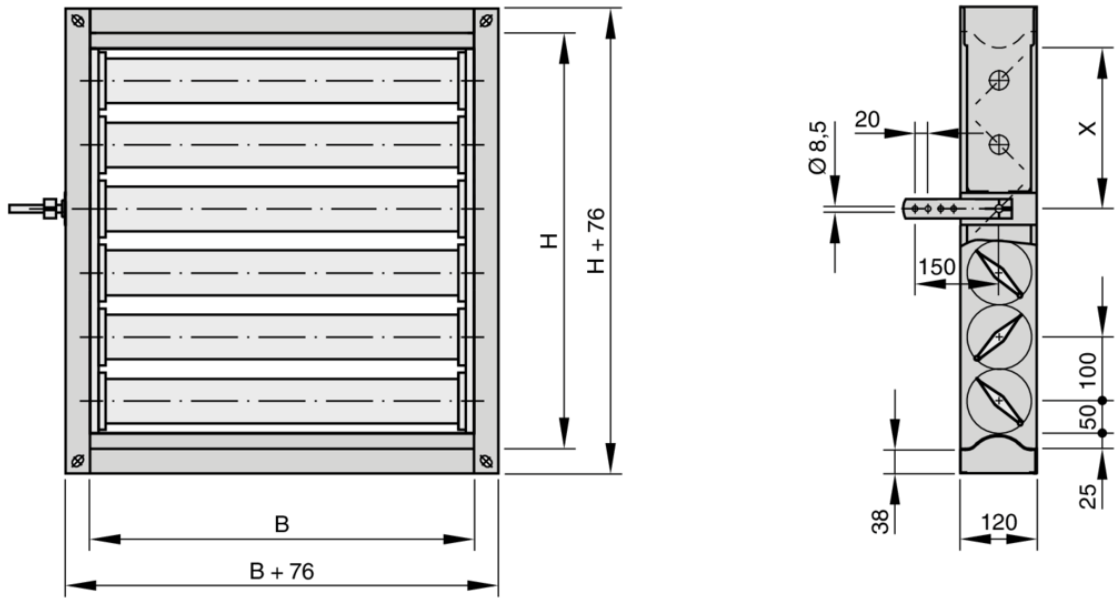


**JZ-AL, JZ-HL-AL, standard sizes**

H	No. of blades	Spindle position	
		X	Damper blade
100	1	50	1
200	2	50	1
300	3	50	1
400	4	250	3
500	5	250	3
600	6	250	3
700	7	250	3
800	8	250	3
900	9	250	3
1000	10	250	3



Intermediate sizes



JZ-AL, JZ-HL-AL, intermediate sizes

H	No. of blades	Spindle position	
		X	Damper blade
150	1	50	1
250	2	50	1
350	3	50	1
450	4	250	3
550	5	250	3
650	6	250	3
750	7	250	3
850	8	250	3
950	9	250	3

**Weights**

H	B											
	200	300	400	500	600	700	800	900	1000	1100	1200	
100	2	2	2	3	3	3	4	4	4	5	5	
200	2	2	3	3	3	4	4	5	5	5	6	
300	3	3	4	4	5	5	5	6	6	7	7	
400	4	4	5	5	6	6	7	7	8	8	9	
500	4	4	5	5	6	7	7	8	9	9	10	
600	5	5	6	7	7	8	9	9	10	11	11	
700	6	6	7	8	8	9	10	11	11	12	13	
800	6	7	8	9	9	10	11	12	13	13	14	
900	7	7	8	9	10	11	12	13	14	15	16	
1000	7	7	9	10	11	12	13	14	15	16	17	

**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	–
Z14	SM24A	1-wire-control 2-wire-control (3-point)	24 V AC/DC	20 Nm	–
Z16	SM230A	1-wire-control 2-wire-control (3-point)	100 – 240 V AC	20 Nm	S2A
Z18	SM24A	1-wire-control 2-wire-control (3-point)	24 V AC/DC	20 Nm	S2A
Z42	LM230A	1-wire-control 2-wire-control (3-point)	100 – 240 V AC	5 Nm	–
Z43	NM230A	1-wire-control 2-wire-control (3-point)	100 – 240 V AC	10 Nm	–
Z44	LM24A	1-wire-control 2-wire-control (3-point)	24 V AC/DC	5 Nm	–
Z45	NM24A	1-wire-control 2-wire-control (3-point)	24 V AC/DC	10 Nm	–
Z46	LM230A	1-wire-control 2-wire-control (3-point)	100 – 240 V AC	5 Nm	S2A
Z47	NM230A	1-wire-control 2-wire-control (3-point)	100 – 240 V AC	10 Nm	S2A
Z48	LM24A	1-wire-control 2-wire-control (3-point)	24 V AC/DC	5 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

## 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

## 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	–
Z50	LM24A-SR-F	2 – 10 V DC	24 V AC/DC	5 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	–

## Double acting pneumatic actuators

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

Z60 – Z65: At 1.2 bar operating pressure only up to height  $H \leq 650$  mm



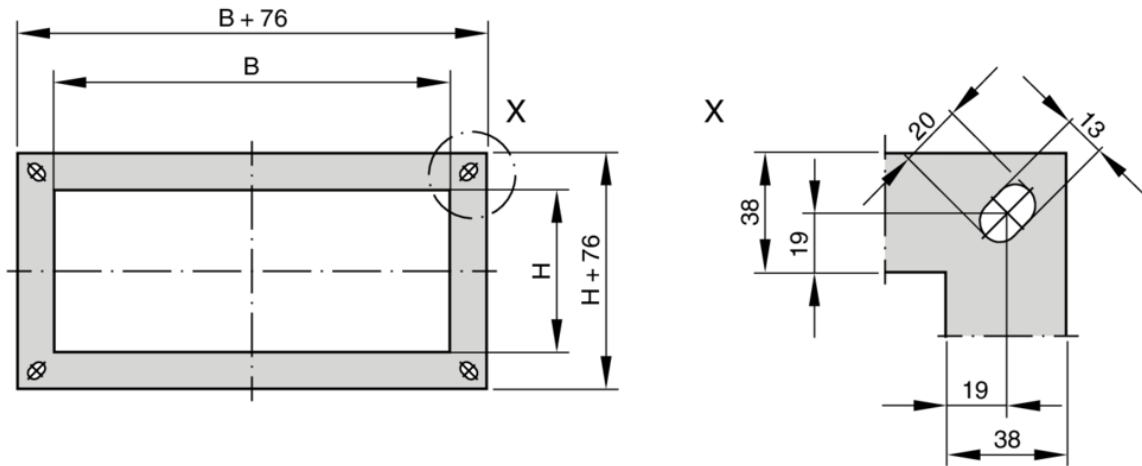
## Single acting pneumatic actuators

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

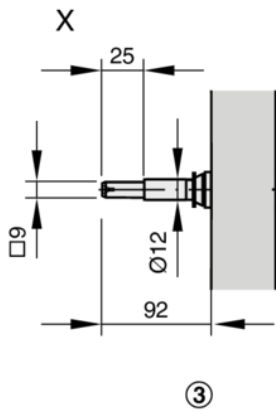
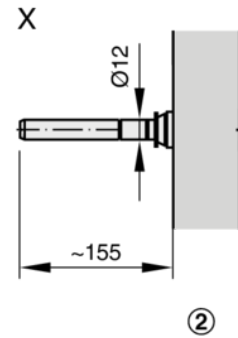
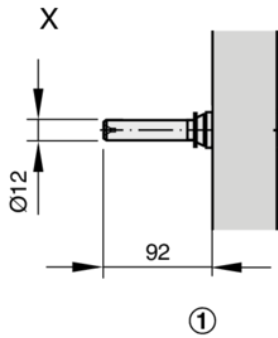
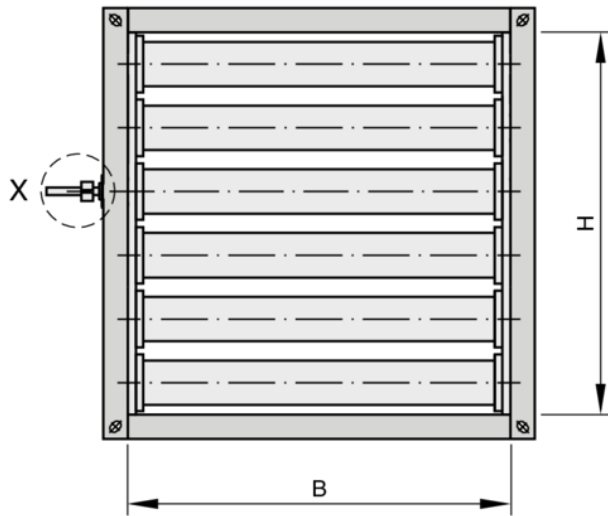
## Product details

- Drive shafts (special accessory) upon request

### Corner holes



Spindles



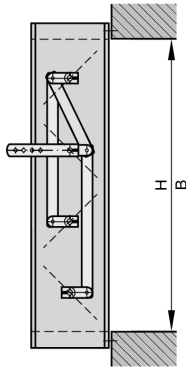
- ① Standard shaft
- ② ZS99 – extended drive shaft
- ③ ZS991 – square shaft

## Installation details

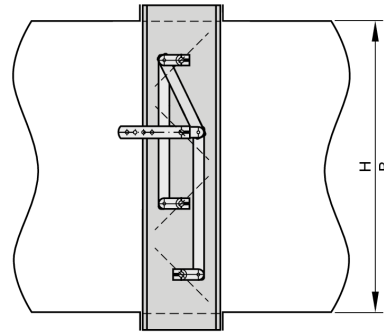
### Installation and commissioning

- With horizontal or vertical blades
- With or without installation subframe
- Torsion-free installation
- Only for installation in internal spaces

### Wall installation without installation subframe



### Duct installation



## Nomenclature

**B** [mm]

Duct width

**H** [mm]

Duct height

**Lengths**

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

**n** [ ]

Number of flange screw holes

**m** [kg]

Weight

**L<sub>WA</sub>** [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** [m<sup>2</sup>]

Upstream cross section

**v** [m/s]

Airflow velocity based on the upstream cross section (B × H)

**q<sub>v</sub>** [m<sup>3</sup>/h]; [l/s]

Volume flow rate

**Δp<sub>t</sub>** [Pa]

Differential pressure

**Δp<sub>max t</sub>** [Pa]

Maximum differential pressure