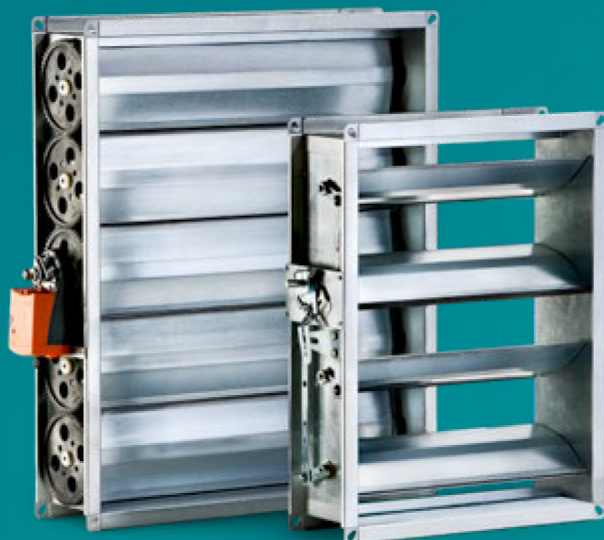

dampers (multi-leaf, certified)



Air regulation

In every air-conditioning and ventilation system, a large number of air flows must be monitored, controlled, and regulated.

The air regulation product group offers various dampers and control components in different material combinations and designs for these tasks.

Multi-leaf dampers (certified)	260
Positive pressure dampers	272
Industrial design multi-leaf dampers	276

Multi-leaf dampers

PRODUCT DESCRIPTION

Multi-leaf dampers are used for pressure and volume adjustment in ventilation systems. Alternatively, they can be used to close off an air duct, for example, to prevent the ingress of cold air when the system is shut down.

When the damper is closed, all multi-leaf dampers guarantee a leakage rate of class 2 (B) according to DIN EN 1751 when properly used and installed.

All types of multi-leaf dampers meet the requirements for casing leakage class B according to EN 1751. Multi-leaf dampers with a leakage class 4 (D) (when the damper is closed) as per DIN EN 1751 are available for special applications with stricter airtightness requirements. The requirements of DIN 1946-4 are thus also met. The operating temperature limits depend on the type of multi-leaf damper selected. The dampers can be adjusted using manual adjusters or motorised actuators.

Standards and guidelines

DIN EN 1751

Ventilation of buildings, aerodynamic testing of damper and shut-off elements

DIN EN 16798 part 3

Ventilation of non-residential buildings

DIN 1946 sheet 4

Ventilation systems in hospitals

VDI 3803

Structural and technical principles – Central air-conditioning systems

VDI 6022

Hygiene requirements for ventilation and air-conditioning systems and units ¹

VDI 2081

Air-conditioning – Noise generation and noise reduction

ATEX Directive

Directive 94/9/EC Article 8(1)b)ii)

RoHS Directive

2002/95/EC and 76/769/EEC

¹ for Austria and Switzerland OENORM H 6020-1 and H 6021 SWKI 2003-5

Declaration of conformity

The following types of multi-leaf dampers are VDI 6022 certified
JK-A-SA 120 T4
JK-A-SS 180 T4
JK-G-SS 180 T4

The following types of multi-leaf dampers are ATEX certified
JK-G-SS 180
JK-G-SS 180 T4

ILH reg. no.: HKP 02/19 – 10
HKP 02/19 – 11
HKP 02/19 – 12

Reg. no.: IBExU06ATEXB016 X
marking: Ex II 2/2 GD IIC T X
marking: Ex II 2/2 GD IIC T X
marking: Ex II 2G/2 GD IIC T X

All types mentioned in the documentation comply with the RoHS Directives.



Multi-leaf dampers

DESIGN DETAILS

Multi-leaf dampers with gear drive

Flow-optimised damper blades are arranged in a casing frame with a duct connection flange. The opposing blades are connected to each other by internal or external gearwheels. Gearwheels and sliding bearings are made of a special plastic. The drive axis for the manual adjuster or motorised drive is positioned approximately half way up.

For heights over 1,100 mm, the drive is located in the upper third, as additional connecting rods are required. The overall depth of the casing (T) is 120 mm or 180 mm, depending on the type. Depending on the airtightness requirements, rubber lip seals or liners are used. The possible material types can be found in the overview of the different types.

Multi-leaf dampers with linkage

In this design, internal or external gearwheels are replaced by external, counter-rotating metal linkages. Sliding bearings made of special plastic are used in the standard design.

Sliding bearings made of sintered bronze are used on linkage dampers for high temperature applications or with ATEX certification.

For operating temperature limits see the “Type overview” table

DIMENSIONS

The dimensions for the one-piece maximum widths and heights depend on the type (see “Type overview”).

Larger dimensions can be achieved by lining up the dampers or stacking them. It is recommended to arrange them on a common counter frame.

CALCULATION AND DESIGN

Multi-leaf dampers are calculated and designed taking into account the intended use and the requirements for airtightness on the basis of the following diagrams and design notes.

DESIGN VIA VOLUWIN® SOFTWARE*

Easy selection of type according to material, function, and requirements

Pressure drop, flow noise, ability to withstand pressure, actuator torque

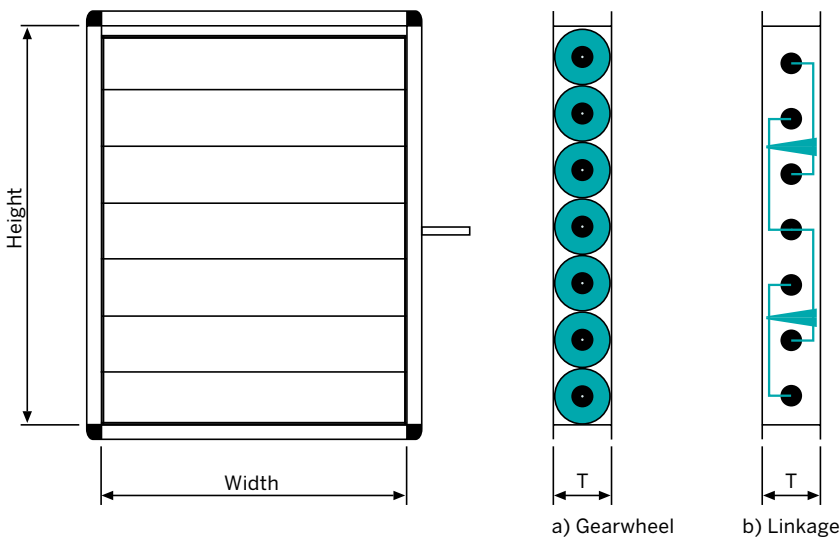
Simulation of any damper positions

Automatic assignment of suitable actuators

Tender specification texts, prices, ordering

* Free download at www.berlinerluft.de

MAIN DIMENSIONS AND DRIVE VARIANTS



Overview of types

CONSTRUCTION SIZES AND DAMPER ACTUATORS (OPTIONAL)

Multi-leaf damper	Position of gearwheels/ linkage ¹	Material pairing frame/damper blade ²	Installed depth in mm ³	Airtightness class/ temperature resistance ⁴	Flange width in mm ⁵	Dimensions – drive axis in mm	Max. width (one-piece) in mm ⁶	Max. height (one-piece) in mm ⁶	Adjustment device attached (optional) Selection see ^{7,8}	Operating voltage in V ⁹	Torque in Nm ¹⁰	Drive versions ¹¹								
JK	A	SS	120	4	5	15 × 15	1200	1205	HV	M	230 24	5 10 15 20 30 40	F ¹¹	SR						
		SS	180			15 × 15	2000	2490												
		AA	120			10 × 10	1500	1405												
		EE	180			15 × 15	2000	2490												
	I	SS	120			15 × 15	1200	1205												
		SS	180			15 × 15	2000	2490												
		SA	120			10 × 10	1500	1405												
		AA	120			10 × 10	1500	1405												
		EE	180			15 × 15	2000	2490												
	A	SS	180	T4		15 × 15	2000	2490												
		SA	120			10 × 10	1500	1405												
		AA	120			10 × 10	1500	1405												
		EE	180			15 × 15	2000	2490												
		G ⁴	SS			180	T4	DN 14							2000	2490				
	SS		180	DN 14		2000		2490												
	SS		180	ATEX		DN 14		2000							2490					
	SS		180	HT		DN 14		2000							2490					
	HT without motor, temperature up to 200 °C																			

- 1 |

A: External gearwheels
I: Internal gearwheels
G: External linkage
- 2 |

S: Steel
A: Aluminium
E: Stainless steel
- 3 |

component depth 120 mm ➔ blade width 100 mm
component depth 180 mm ➔ blade width 165 mm
- 4 |

airtightness class/temperature resistance
without specification – standard – DK 2 as per DIN EN 1751
with specification T4 – airtight – DK 4 as per DIN EN 1751
with specification HT – increased temperature resistance up to 200 °C
- 5 |

flange width 20 mm or 30 mm
for types JK-A 180 flange width only 30 mm
- 6 |

max. width/height (informative)
- 7 |

manual adjuster with locking device (alternative)
- 8 |

motor actuator
- 9 |

alternatively 24 V or 230 V
- 10 |

required torque see type-specific diagrams
- 11 |

F: Spring return actuator (max. 30 Nm, SR only available with 24 V)

SR: continuously adjustable
for “open/close” mechanics, no specification

OPERATING TEMPERATURES

JK with gear drive
-20 °C/+80 °C

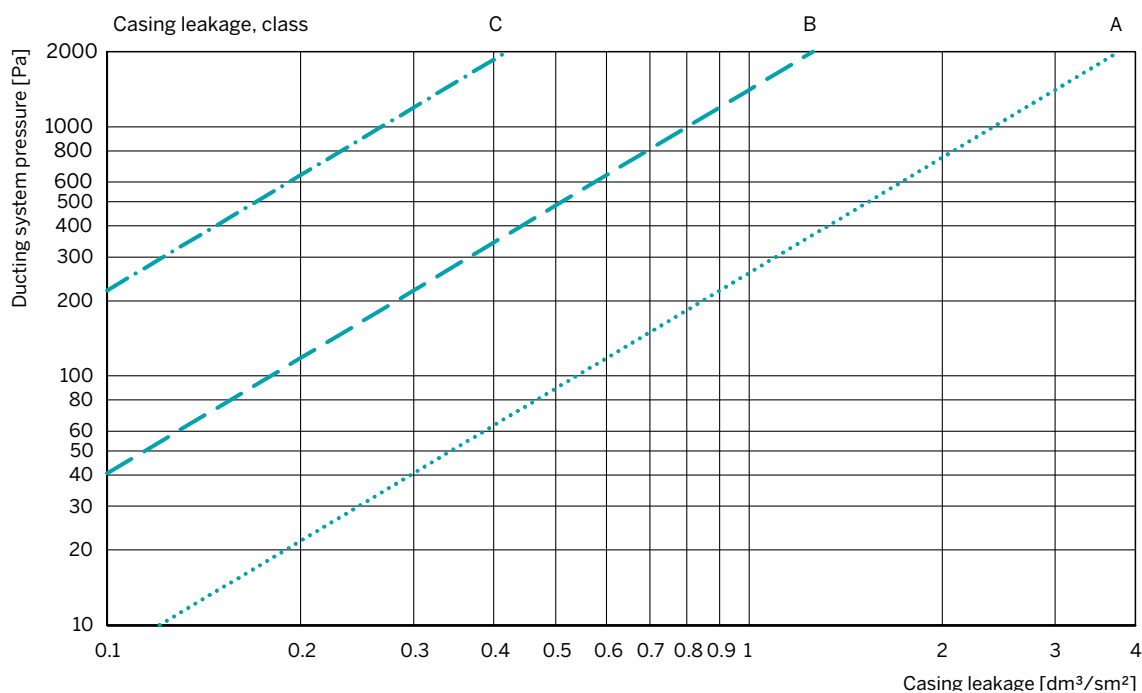
JK with linkage drive
-40 °C/+80 °C

JK with linkage drive, type HT
-40 °C/+200 °C

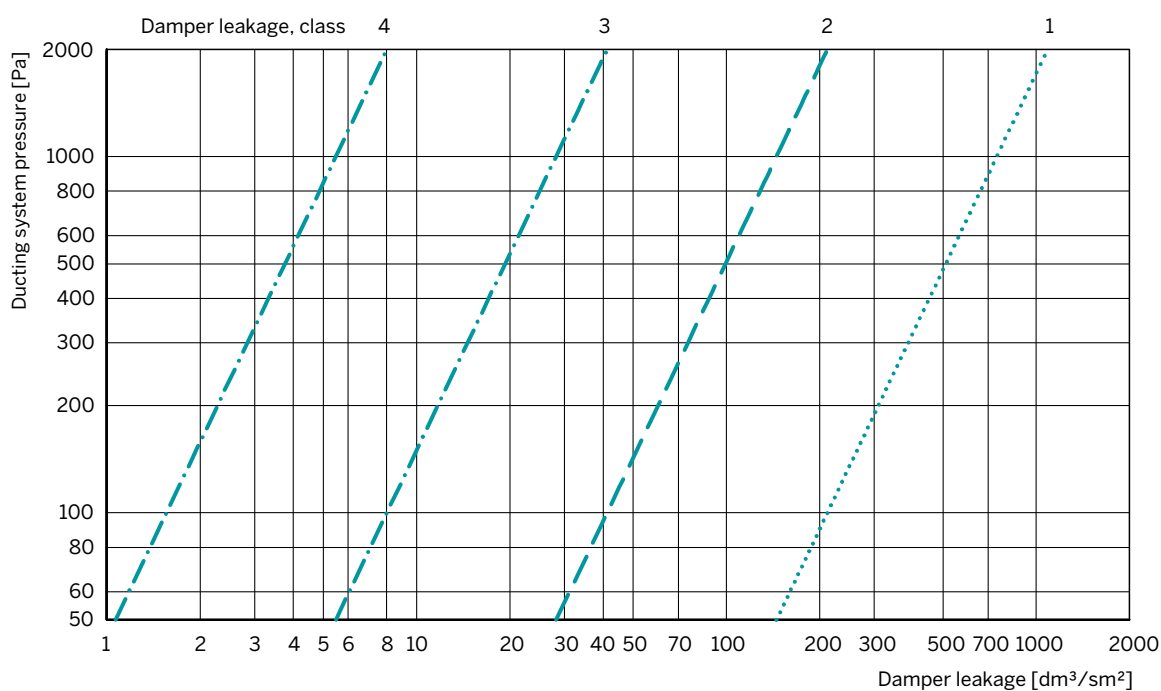
Airtightness requirements

as per DIN EN 1751 and DIN 1946 part 4

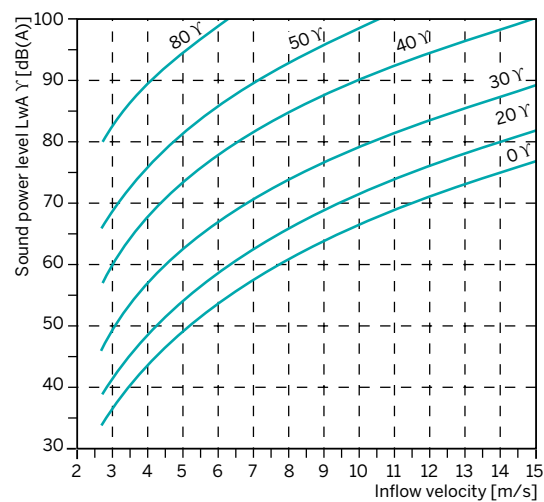
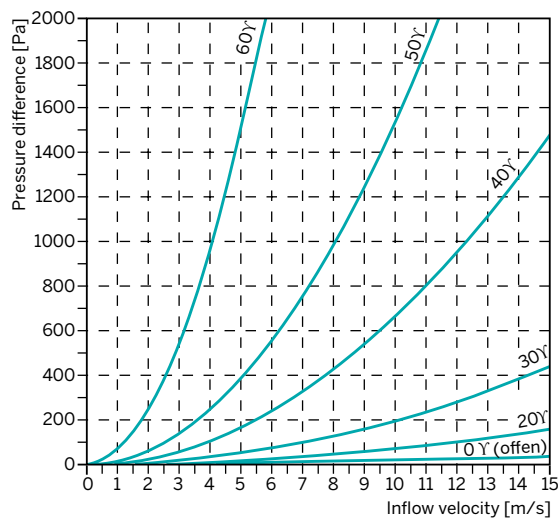
CASING LEAKAGE



DAMPER LEAKAGE



PRESSURE DROP AND FLOW NOISE¹



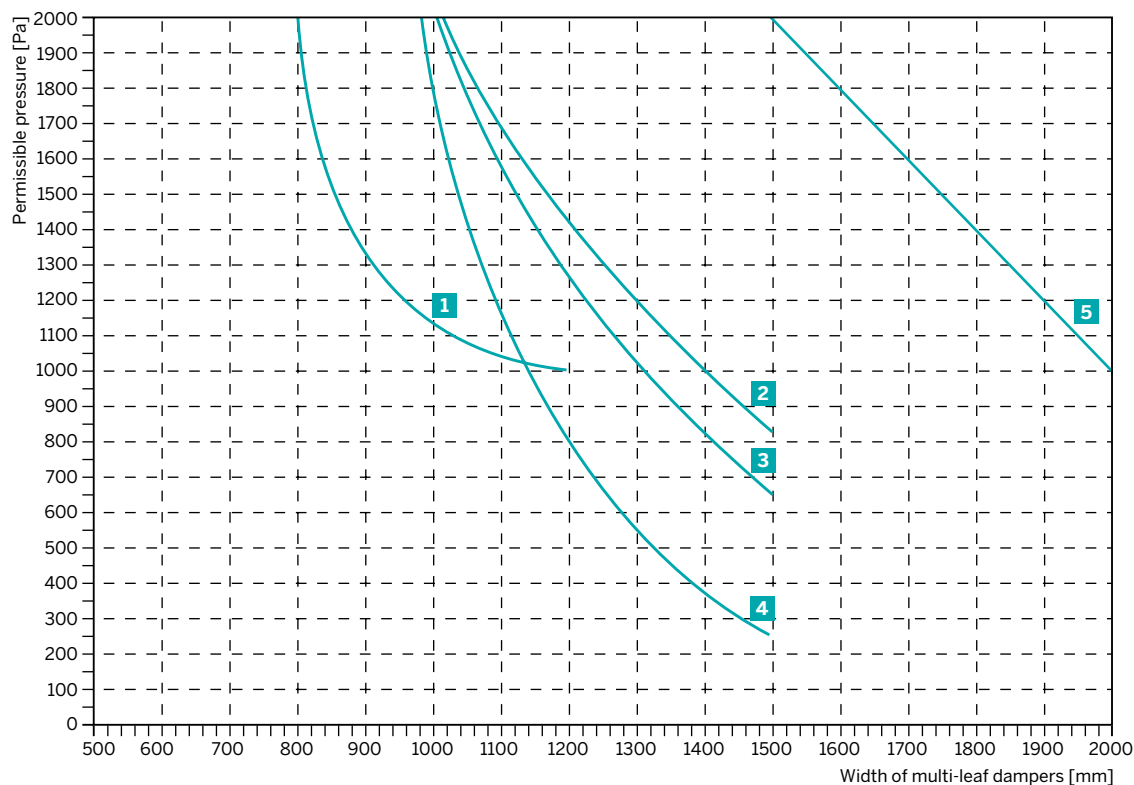
¹ Approximate values valid for nominal dimensions, diagrams in accordance with VDI 2081, unfavourable installation conditions tend to increase the pressure drop and the flow noise.

Correction: $LwA = LwA^\circ + K$

W x H [m²]	0.04	0.06	0.1	0.2	0.4	0.6	1	2	4	8
K [db]	-14	-12	-10	-7	-4	-2	0	3	6	9

Maximum permissible pressure load

as a function of damper width



- 1 | JK-A-SS 120
JK-I-SS 120
- 2 | JK-A-AA 120
- 3 | JK-I-SA 120
JK-I-AA 120

- 4 | JK-A-SA 120 T4
JK-A-AA 120 T4
- 5 | JK-A-SS 180 T4
JK-A-EE 180 T4
JK-G-SS 180 T4

The following applies to JK-A-SS 180, JK-A-EE 180, JK-I-SS 180, JK-I-EE 180, JK-G-SS 180, JK-G-SS 180HT:

p_{max} = 2,000 Pa up to a width of 2,000 mm
JK with $p_{max} > 2,000$ Pa

MULTI-LEAF DAMPERS FOR USE IN AREAS SUBJECT TO EXPLOSION HAZARDS

The JK-G multi-leaf damper series may be used in areas subject to explosion hazards and for conveying explosive air (containing gas and dust). The special user instructions to be observed can be found in approval no. IBExU06ATEXB016 X, which is provided by the supplier.

Note: In explosion-proof zones, only actuators with ATEX approval may be used.

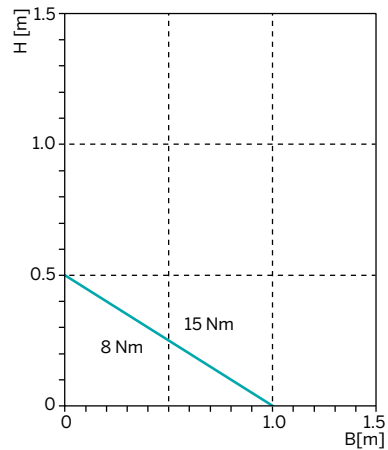
MAINTENANCE

Multi-leaf dampers are maintenance-free. Dust and dirt deposits on the dampers and gearwheels can be removed without chemical additives. Treatment of the side seals, bearings or other parts with oil, grease or a chemical cleaning agent is not permitted.

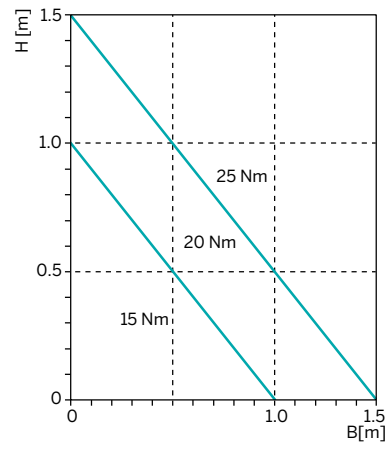
Required torque

(actuation force diagrams)

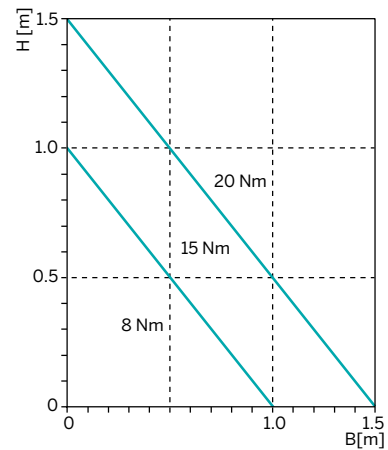
JK-I-SS 120



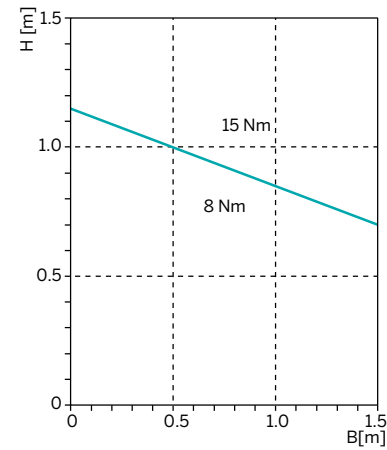
JK-A-SA 120 T4 | JK-A-AA 120 T4



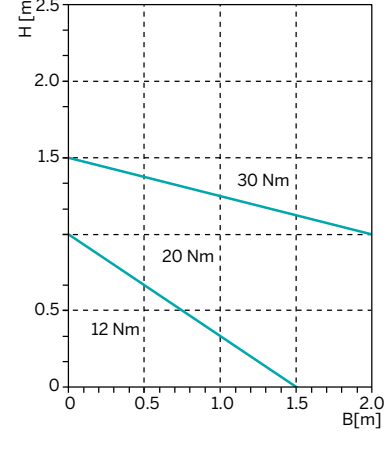
JK-I-SA 120 | JK-I-AA 120



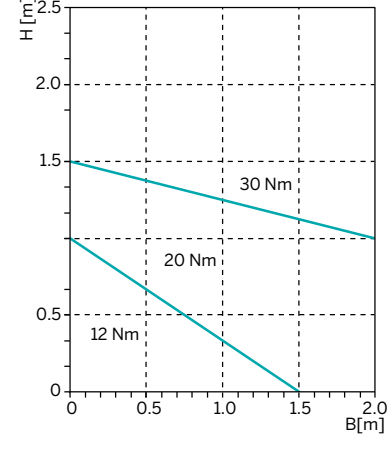
JK-A-AA 120 | JK-A-SS 120



JK-I-SS 180 | JK-I-EE 180



JK-A-SS 180 T4 | JK-A-SS 180 | JK-A-EE 180 | JK-A-EE 180 T4 | JK-G ALL TYPES



Drives – damper adjusters – accessories

All dampers are equipped with a drive axis without additional specification. Various drive systems can be connected to this axis, depending on the requirements. The required actuating forces can be taken from the diagrams.

Manual adjustment:	manual adjuster – HV
Electrical adjustment:	motor actuator (see table)
Optional:	pneumatic actuators hydraulic actuators

ELECTRIC ACTUATORS

	Actuation torque Nm	Type for 24 V voltage Volt-Nm	Type for 230 V voltage Volt-Nm
Motor actuator open/closed	5	M 24-5	M 230-5
	10	M 24-40	M 230-10
	20	M 24-20	M 230-20
	40	M 24-40	M 230-40
Motor actuator continuously adjustable	5	M 24-5 SR	M 230-5 SR
	10	M 24-10 SR	M 230-10 SR
	20	M 24-20 SR	M 230-20 SR
	40	M 24-40 SR	M 230-40 SR
Motor actuator, open/closed with spring return	4	MF 24-4	MF 230-4
	15	MF 24-15	MF 230-15
	30	MF-24-30	MF 230-30
Motor actuator, continuously adjustable with spring return	4	MF 24-4 SR	
	15	MF 24-15 SR	
	30	MF 24-30 SR	

Mechanical accessories

Accessories mounted if required	Kz
Hand lever with locking device	HVA
Bracket for actuator	KSA
Connector for rows	KVA
Connecting lever, ball joint	VKA

Accessories unmounted if required	Kz
Hand lever with locking device	HV
Damper connector in the width (drive lever)	KV1
Damper connector in the width (driving lever)	KV2
Drive axis, not fixed	A
Bracket for actuator	KS
Connecting lever, ball joint	VK
Ball joint	KG

ASSEMBLY INFORMATION

Multi-leaf dampers must be mounted without the casing bracing to the assemblies which are to be connected. If this is not observed, increased actuating forces occur which can lead to the destruction of individual components (e.g. gear breakage, destruction of the side seal on T4 dampers).

Multi-leaf dampers must be checked after assembly and before installation of the actuators to ensure that the damper blades move freely.

Multi-leaf dampers

TYPE CODES

JK – A – SA 120 T4 – 30 – 1000 x 1210 – HV

Adjustment

- HV – manual adjuster
- M.... Motor actuator

Width x height

Connection flange 30 (20)

Hygienic design, increased DK T4, ATEX

Installed depth 120 mm (180 mm)

Material design:

- Galvanised steel frame
- Aluminium blade

Damper adjustment:

- A – external gearwheel
- I – internal gearwheel
- G – linkage

Component designation

- JK – multi-leaf damper

Tender specification texts

Due to the variety of applications and types, the tender specification text for the respective application is shown in the table below, with the most important details as an example. Tender specification texts specifically relating to the type can be found in the multi-leaf damper design program, VOLUWIN®.

	Gearwheel damper	Linkage damper
Material type	Galvanised steel, aluminium, stainless steel, 1.4301	Galvanised steel
Function of the blades	Opposed, adjustable using internal (external) gearwheels made of special plastic	Opposed, adjustable using external linkage
Installed depth	120 mm (or 180 mm), depending on type	180 mm
Connection flange	20 mm (30 mm) duct section on both sides	30 mm duct section on both sides
Accessories	See selection list	See selection list
Actuator	SR electric actuator – continuously adjustable (or open/close adjustment, spring return)	SR electric actuator – continuously adjustable (or open/close adjustment, spring return)
Operating voltage	220 V (24 V), actuating force Nm	220 V (24 V), actuating force Nm
Operating temperature	-20 °C/+80 °C	-40 °C/+80 °C; (-40 °C/+200 °C)
Airtightness class	DK 2 as per DIN EN 1751 (airtight as per DIN 1946-4; DIN EN 1751 class 4)	DK 2 as per DIN EN 1751 (airtight as per DIN 1946-4; DIN EN 1751 class 4)
Dimensions W x H	800 x 1000 mm	1000 x 1210 mm
Type	JK - I (A) - SS 120	JK - G - SS 180
Manufacturer	BerlinerLuft. Technik GmbH	BerlinerLuft. Technik GmbH

Positive pressure dampers



Positive pressure dampers

PRODUCT DESCRIPTION

Application

Positive pressure dampers (ÜDK) can be used wherever it is necessary to prevent an uncontrolled ingress or return flow of air. In many cases, these dampers are a cost-effective alternative to conventional pressure dampers.

Design details

The positive pressure damper consists of a frame construction in which several aluminium blades are able to swivel on their horizontal axes. The frames are designed either to be surface-mounted or installed between elements.

Functional principle

The blades can move freely in the outlet direction, thereby enabling the air flow to pass through without any significant resistance. When the system is running, the blades are supported by the air flow and therefore remain in the OPEN position. If positive pressure occurs on the locking side, the blades are pushed against a stop. This mutual overlap of the blades and the stop results in the blades being sealed. The positive pressure damper therefore acts as a self-actuating valve.

MATERIALS

Frames: galvanised sheet steel or aluminium

Blades: aluminium (extruded section)

Blade mounting: plastic

Stop seal: foam

DESIGNS

Series U ÜDK/U - Sv

ÜDK/U - Sv1

ÜDK/U - Sv2

ÜDK/U - Alu

ÜDK/U - Alu1

ÜDK/U - Alu2

Series L ÜDK/L - Sv

ÜDK/L - Sv1

ÜDK/L - Sv2

ÜDK/L - Alu

ÜDK/L - Alu1

ÜDK/L - Alu2

The design printed in bold is manufactured as the standard version.

KEY

L1 L-shaped frame for outlet, air direction L1

L2 L-shaped frame for inlet, air direction L2

Sv Galvanised steel non-perforated frame

Sv1 Galvanised steel frame with 4x corner holes

Sv2 Galvanised steel frame perforated to requirements

Alu Aluminium non-perforated frame

Alu1 Aluminium frame with 4x corner holes

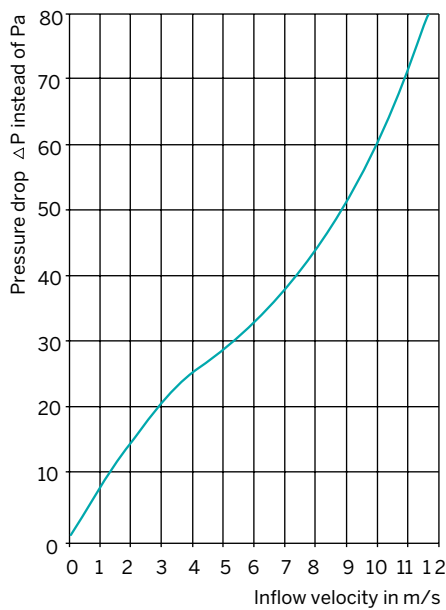
Alu2 Aluminium frame perforated to requirements



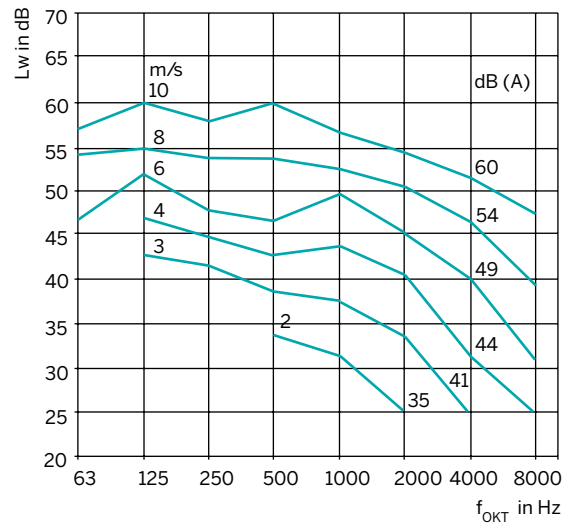
Positive pressure dampers

PERFORMANCE DATA

Pressure drop



Sound power level



Recommended inflow velocity (in relation to a × b)	3.0 m/s
Load-bearing capacity in case of blocking	1.2 kPa
Temperature resistance	-20 °C to + 80 °C
Opening angle (max.)	84°
Opening from	10 Pa
Installed depth	120 mm

AVAILABLE SIZES

Series U
for installation between ducting components
width from 200 mm to 1,600 mm
height from 160 mm to 2,000 mm

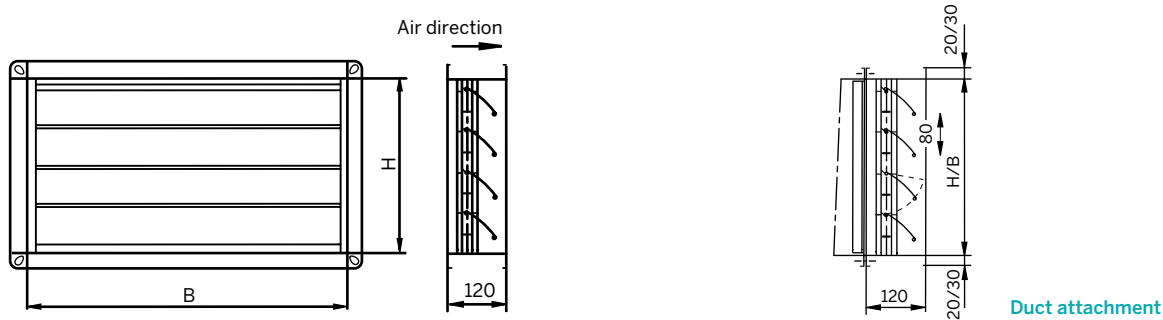
Series L
for wall/duct installation
width from 250 mm to 1,600 mm
height from 160 mm to 2,000 mm

For a width > 1,200
a crossbar is installed.

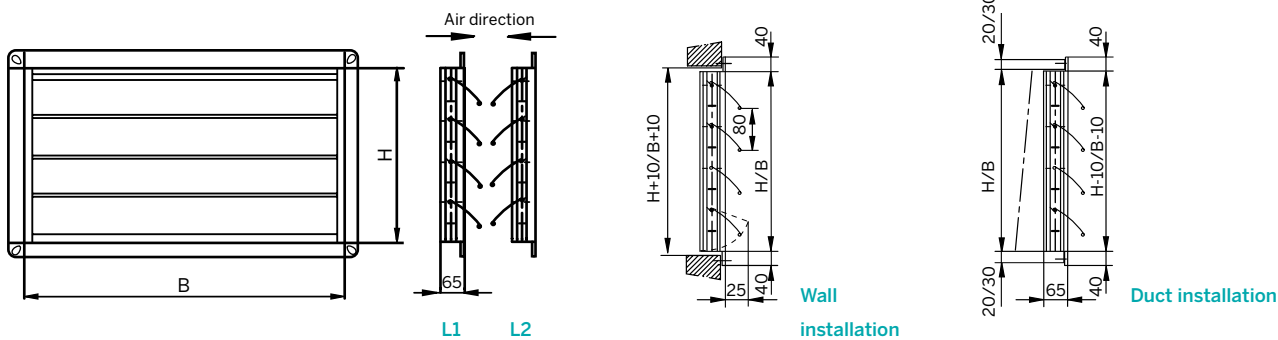
A mounting frame (ER) with or without masonry anchors suitable for Series L can be included upon request.

INSTALLED DIMENSIONs

Series U



Series L



TYPE CODES

ÜDK/U – 400 x 400 – Sv

ÜDK	Material (frame) galvanised steel or aluminium
/U	Nominal dimensions width x height
400 x 400	Design
Sv	Component designation

TENDER SPECIFICATION TEXT

Positive pressure damper (ÜDK) for installation in inlets or outlets of HVAC systems for protection against uncontrolled ingress or return flow of air; the blades open automatically when the HVAC system is running and close automatically when the HVAC system is not in operation; suitable for instal-

lation between duct components (Series U); suitable for wall/ duct installation (Series L).

Manufacturer:
BerlinerLuft. Technik GmbH

Industrial design multi-leaf dampers



Multi-leaf dampers

Industrial design

PRODUCT DESCRIPTION

Welded JK-PL multi-leaf dampers are used for process air technology in industrial plants with higher demands.

The multi-leaf dampers are used:

For pressure and flow rate control

For shut-off

To distribute air flows

As a robust, welded construction

The components consist of a sturdy, torsion-free, connection-compatible frame. Depending on the dimensions and function, the sturdy, hollow body blades are mounted according to requirements and, if necessary, divided for bypass functions so that they can be adjusted interchangeably by means of linkages.

General standards and guidelines for the throttle, shut-off and multi-leaf dampers

DIN EN 1751 (06/14)

Aerodynamic testing of damper and valves

DIN 13779

Ventilation for non-residential buildings

DIN 25496

Ventilating components in nuclear facilities

ATEX

Directive 2014/34/EU

RoHS

Directive 2011/65/EU (RoHS 2)

KTA 3601

Ventilation systems in nuclear power plants

Declaration of conformity

Preliminary testing documents with implemented seismic calculations must be prepared for use in earthquake areas.

MATERIALS

Sheet steel: S235 JRG 2

Boiler plate: 16M03

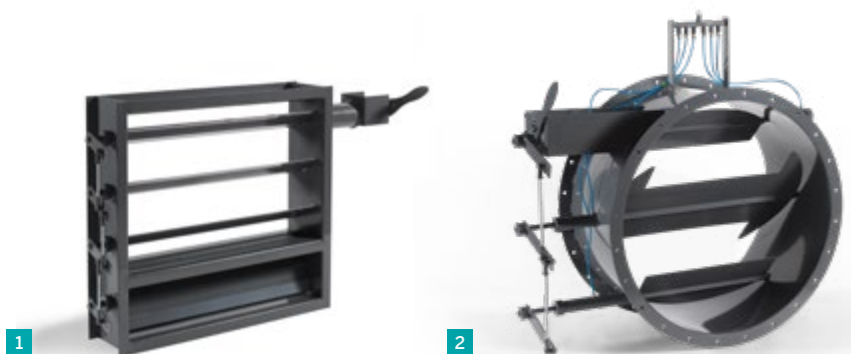
Stainless steel: 1.4301; 1.4571

AIRTIGHTNESS (LEAKAGE)

The casing leakage corresponds to class D as per DIN EN 1751.

1 | Multi-leaf damper, welded,
with manual adjuster

2 | Round multi-leaf damper, welded,
with electric actuator



Multi-leaf dampers

Industrial design

DUCT CONNECTIONS

The standard construction of the welded multi-leaf damper includes a module edge on the casing with a connection width of 40 mm and is perforated as per DIN 24193/1. Reinforced frames can be used for extreme conditions (e.g. seismic type).

ADJUSTABILITY OF THE DRIVES

The blades of the multi-leaf dampers are coupled via external linkages and have an axis that is compatible with any given actuator.

The choice of actuators depends on the requirements. Recommended drives can be:

Manual adjustment

Electric drive

Pneumatic drive

Hydraulic drive

SURFACE FINISH

The surface treatment is carried out according to the customer's order. For operating temperatures of up to +80 °C, a temporary surface protection (primer of up to max. 60 µm) can be applied to the components. For higher temperatures, no additional surface protection is applied.

Components made of stainless steel are spray-pickled and passivated.

MAXIMUM OPERATING TEMPERATURES¹

Sheet steel:	S235 JRG 2	t max. = 250 °C
Boiler plate:	15 Mo3	t max. = 530 °C
Stainless steel:	1.4301	t max. = 500 °C
Stainless steel:	1.4571	t max. = 500 °C

¹ the t-max. figures are limit values for short-time operation.
No continuous load.

Note: Depending on the degree of stress and the medium, the use of the dampers may have to be discussed with the material manufacturer or an information centre for steel.

CONSTRUCTION SIZES

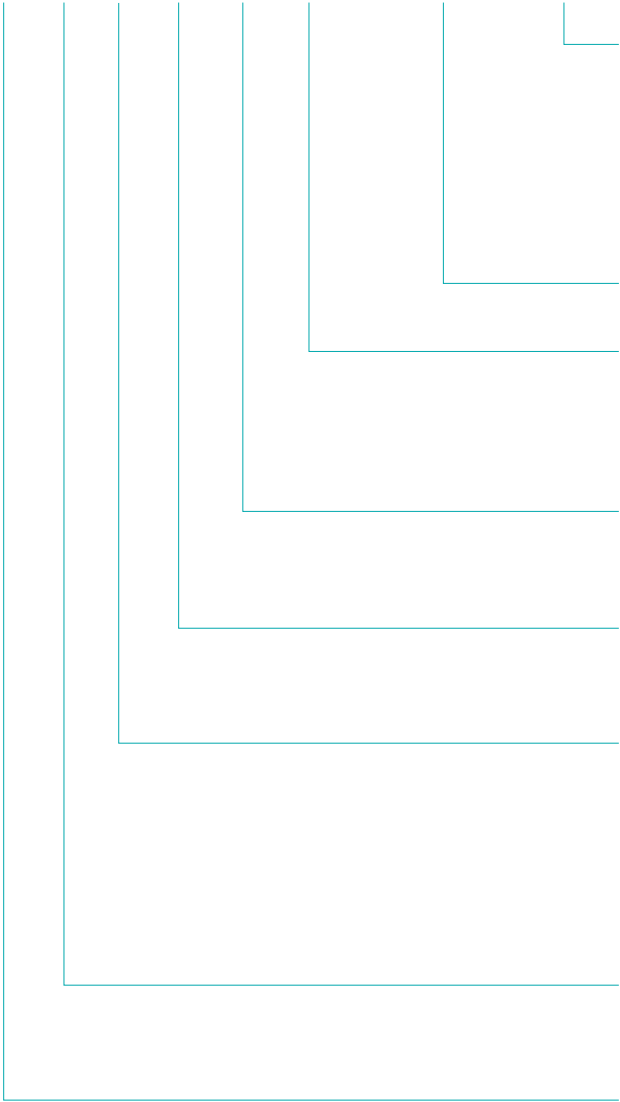
The design of the JK-PL series can be adapted to all industrial requirements. Depending on the pressure load and width, centre bars are used individually to prevent deflection of the sturdy, hollow body blades.



- 1 | Welded V2A multi-leaf damper 1 with Halar inner coating sealed as per EN 1751 class 2 closed
- 2 | Welded V2A multi-leaf damper 1 with Halar inner coating sealed as per EN 1751 class 2 open

TYPE CODES

JK – PL – S – 220 – 0 – M40 – 1000 x 1210 – HV



Adjustment	
HV	– manual adjuster
M	– electric drive
P	– pneumatic drive
H	– hydraulic drive
Width x height	
Connection flange	
M 40	– modular edging
SP	– special section on request
Airtightness class	
0	– without classification
Installed depth	
280 mm	– standard version
Material	
S	– black sheet steel
MO	– 15Mo3 - boiler plate
V2A	– stainless steel 1.4301
V4A	– stainless steel 1.5471
Construction	
PL	– for process air
Component designation	
JK	– multi-leaf damper

Tender specification text

Due to the variety of applications, the tender specification text for the given application is shown in the table together with the most important information. Tender specification texts relating to specific requirements can be found in the VOLUWIN® multi-leaf damper design program. Download at www.berlinerluft.de

	Standard design	Custom design
Function of the blades	Arranged in the same direction as before, adjustable via external linkage	As before
Installed depth	280 mm	According to requirement
Connection flange	Module edging 40 mm with corner hole	According to requirement
Actuator	Electrical – continuously adjustable (or open/close adjustment spring return)	Manual adjuster – pneumatic drive, hydraulic drive
Operating voltage	220 V (24 V), actuating force Nm	According to requirement
Operating temperature	–40 °C/ + 250 °C	According to requirements (see material selection)
Material	Sheet steel S 235 JRG 2	Boiler plate 16 M03; V2A; V4A
Airtightness class	Part 2 as per DIN EN 1751	T4 as per DIN EN 1751
Dimensions W x H	1000 x 1600 mm	According to requirement
Type	JK - PL	JK - PL
Manufacturer	BerlinerLuft. Technik GmbH	BerlinerLuft. Technik GmbH