Multileaf Dampers

JK Multileaf Dampers

Steel, galvanised

JK multileaf dampers made of galvanised sheet steel are control and shut-off dampers for ventilation and air conditioning systems. With hollow blades profiled for optimum flow with linkage and galvanised actuator spindles in plastic or brass bushings; 180 mm or 120 long frame with canted connecting flanges. With adjusting lever, manual locking device or electrical actuators.

JK multileaf damper
with electrical actuator FM

Summary of types

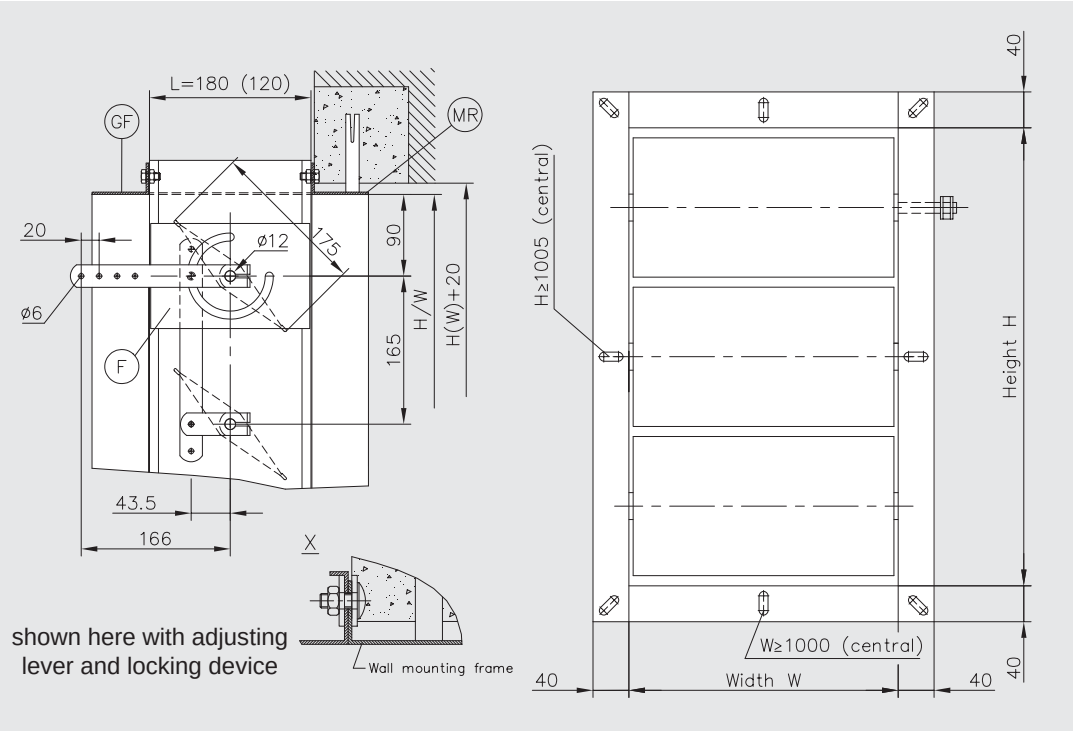
Blade coupling	Blade bearing	Length L 120 mm*)	Length L 180 mm
opposed with external linkage	plastic	**JK-N120G**	**JK-N180G**
	brass	**JK-M120G**	**JK-M180G**
parallel with external linkage	plastic	**JK-N120**	**JK-N180**
	brass	**JK-M120**	**JK-M180**
parallel with internal linkage	plastic	**JK-N120I**	**JK-N180I**
	brass	**JK-M120I**	**JK-M180I**

*) **Note:** **Blades are longer than the frame!**

Accessories

MR Wall mounting frame
made of galvanised sheet steel

GF Counter flange
made of galvanised sheet steel



shown here with adjusting lever and locking device

Sizes W x H

Width W [mm]	Height H [mm]
400	180
600	263
800	345
1000	428
1200	510
1400	675
1600	840
1800	1005
2000	1170
	1335
	1500
	1665
	1830
	1995

All W and H dimensions can be combined.

Intermediate dimensions in 1 mm steps are available for 180 mm lengths.

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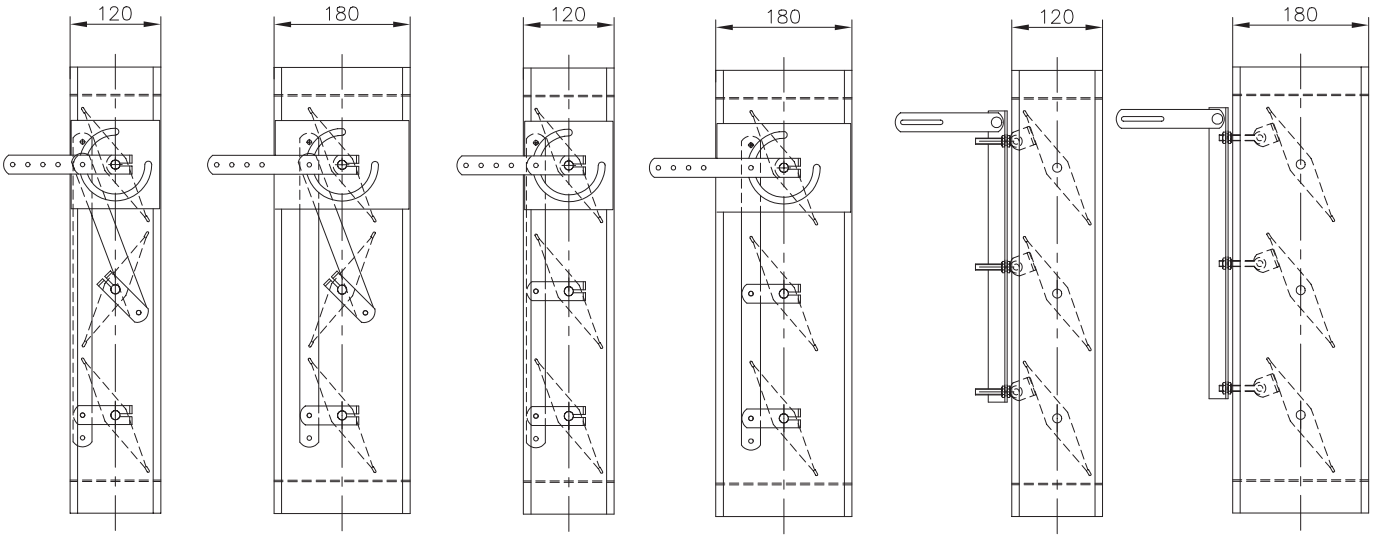
Actuators

Blade coupling - The actuator spindle is always on the uppermost blade -

In addition, the fifth blade with effect from H = 840 mm and the ninth blade with effect from H = 1500 mm are designed to include an actuator spindle. Adjusting devices can also be added by the customer on site!



opposed with external linkage*) | parallel with external linkage*) | parallel with internal linkage

*) On the operation side the blade setting is visible from the outside by way of notches in the spindle.

Electrical actuators

Multileaf dampers with externally located linkage are available with the following factory-installed electrical actuators:

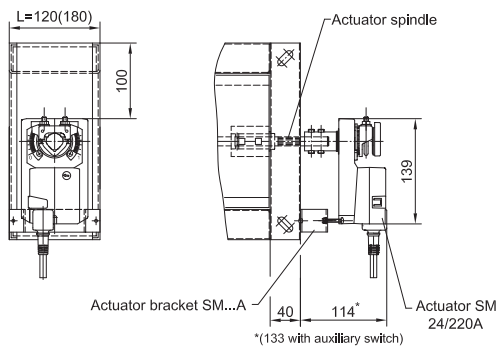
Electrical reversible actuators SM24A and SM220A, which open or close the multileaf dampers on 24V direct or alternating voltage or 230V alternating voltage at a driving torque of 20*) [Nm]. The current actuator setting is retained in the event of a power failure.

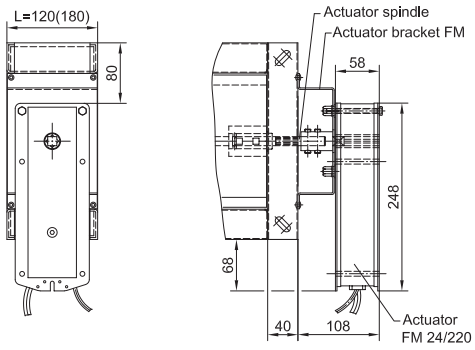
Further data ⇒ see page 8

Electrical spring return actuators FM24 and FM220, which open the multileaf dampers on 24V direct or alternating voltage or 230V alternating voltage at a driving torque of 18*) [Nm]. In the event of power failure the multileaf dampers close with a driving torque of 12*) [Nm].

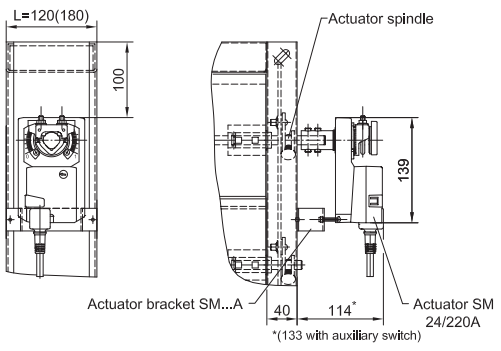
Further data ⇒ see page 8

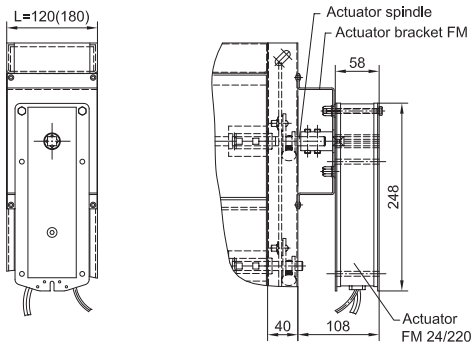
Actuator attachment for multileaf damper height H = 180 mm





Actuator attachment for multileaf damper height H > 180 mm





*) Required driving torques ⇒ see page 6; suitable actuators must be installed on site if these actuators are unable to provide the specified torque.

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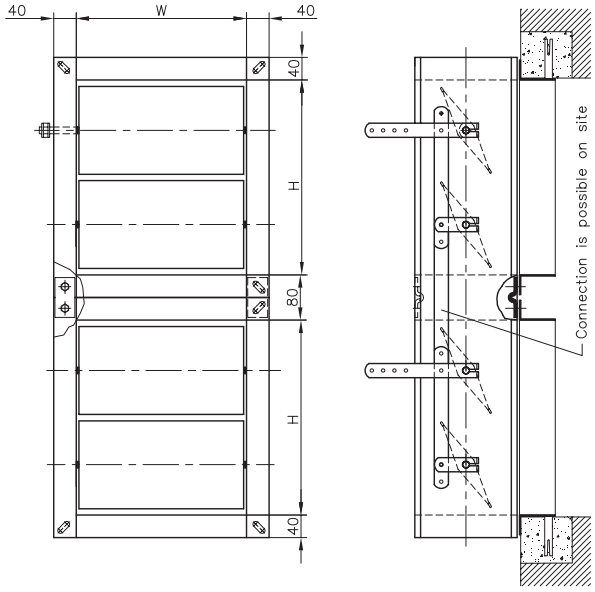
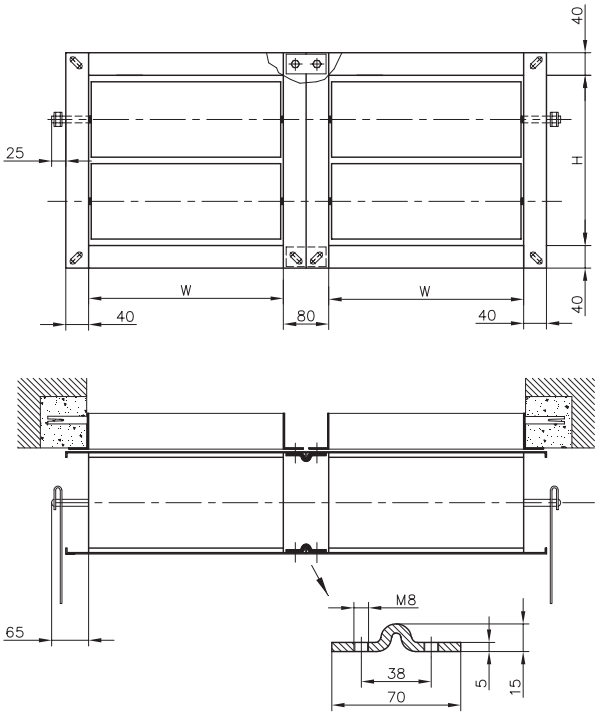
Installation, details, accessories

Vertical / horizontal assembly with straps

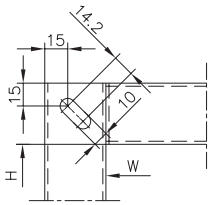




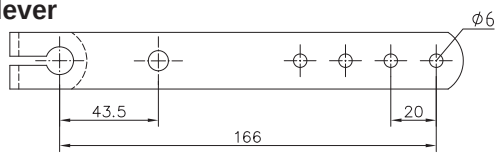
Recommendations:

- Use a separate actuator for each multileaf damper!
- Install multileaf dampers with horizontally arranged blades!

Corner drill hole in connecting frame



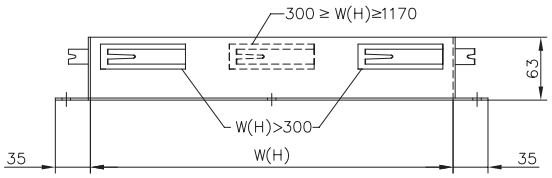
Adjusting lever



Accessories

MR Wall mounting frame made of galvanised sheet steel, punched, canted, corner welded with several wall clamps for cementing into wall.

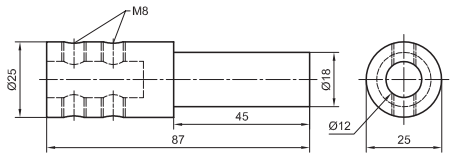
GF Counter flange made of galvanised sheet steel, punched, canted and corner welded.



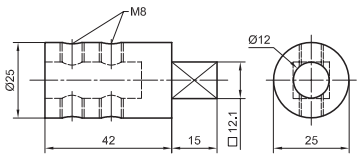
Counter flanges are without wall clamps!

Spindle extensions for customer-supplied actuators

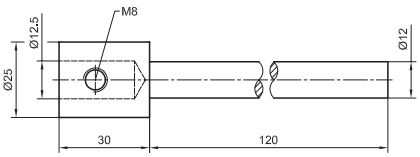
Extension for SM actuators



Extension for FM actuators



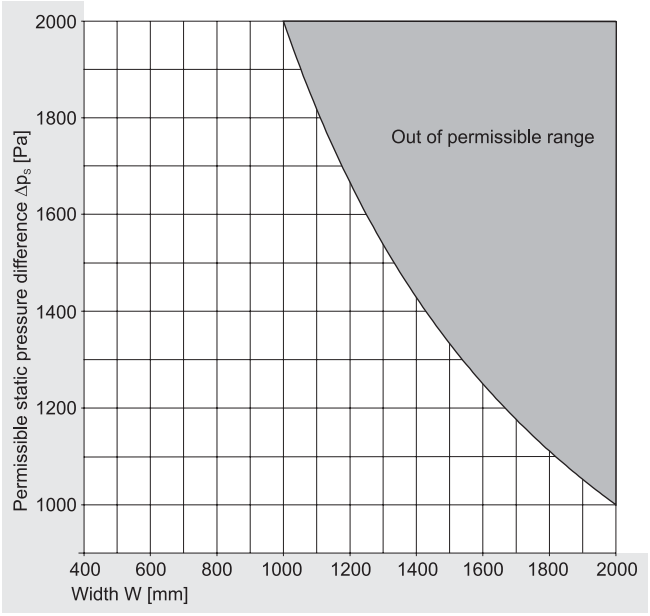
L150 extension for lever



JK Multileaf Dampers

Range of application, driving torques, leakage, pressure drop, sound power level

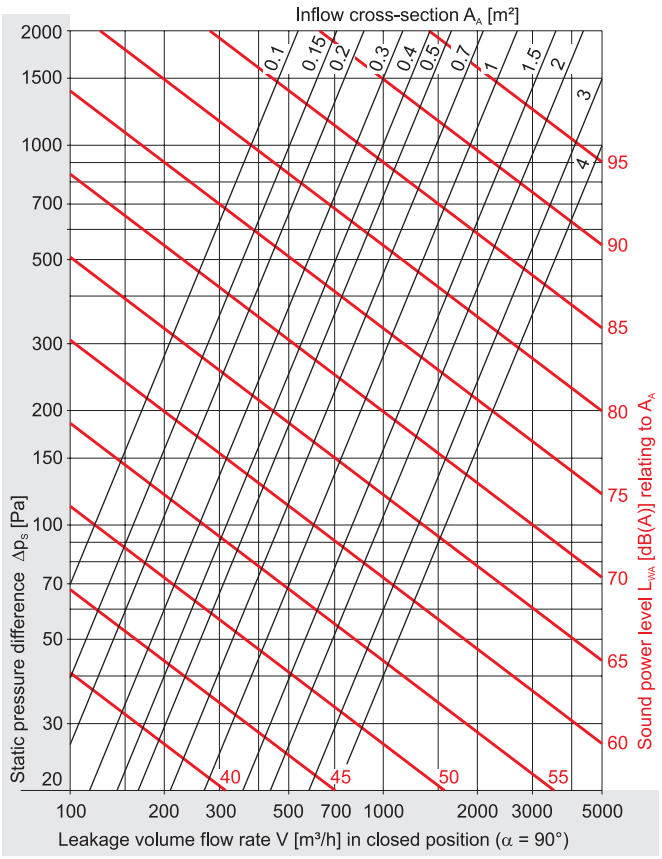
The **permissible pressure difference** depends on the width W and the leakage volume flow rate of the multileaf damper in closed position:

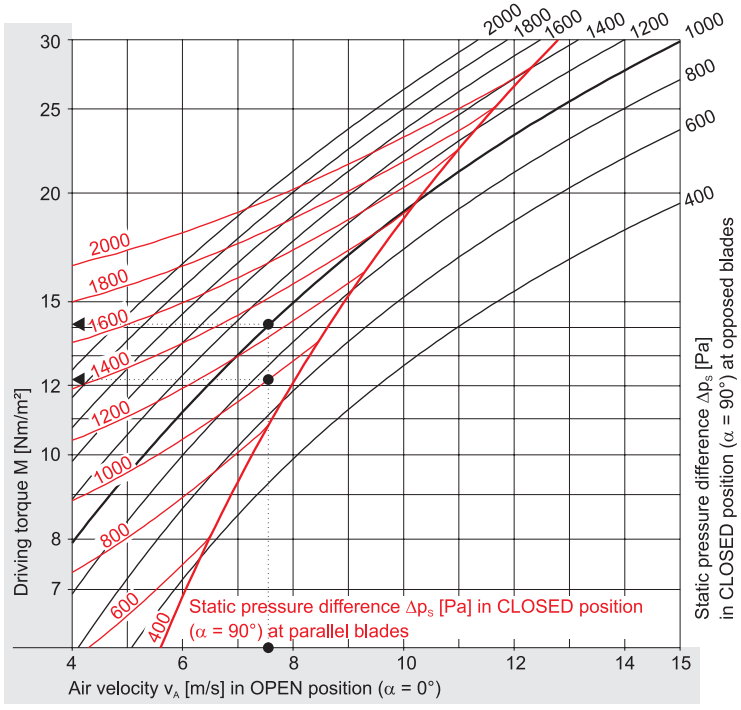


The **permissible temperature** depends on the bearing material:

JK-N: -20°C to +100°C

JK-M: -20°C to +110°C





- The driving torques required to close the multileaf dampers when air flow is present are generally significantly less (reference value: 50%) than those required to open the multileaf dampers!
- **The permissible driving torque per actuator spindle is limited to 35 [Nm].**

The **required driving torque** depends on the operating characteristics of the fan and duct network. The pressure may rise on increasing restriction of the volume flow rate by way of a shut-off damper; normally the volume flow rate reduces simultaneously and the flow velocity in the multileaf damper drops in relation to the inflow cross-section; however it rises in relation to the free cross-section. At the respective operating point to be set, a non-constant driving torque is required over the adjustment range from $0° \leq \alpha \leq 90°$ for the activation of the multileaf damper. An actuator must apply the maximum arising driving torque in order to allow unhindered travel across the entire adjustment angle range.

The driving torque which can be read in the nomogram opposite is required for multileaf dampers in ventilation systems with quadratic system operating characteristics and conventional fans. The basic variables are the maximum flow velocity in the fully open multileaf damper and the pressure difference present in the closed position.

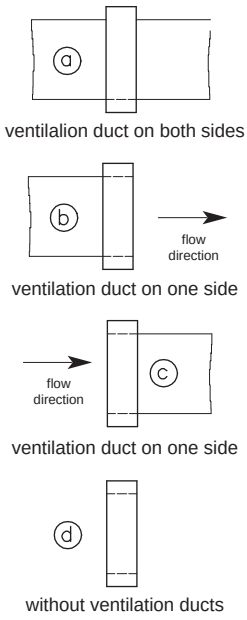
Example

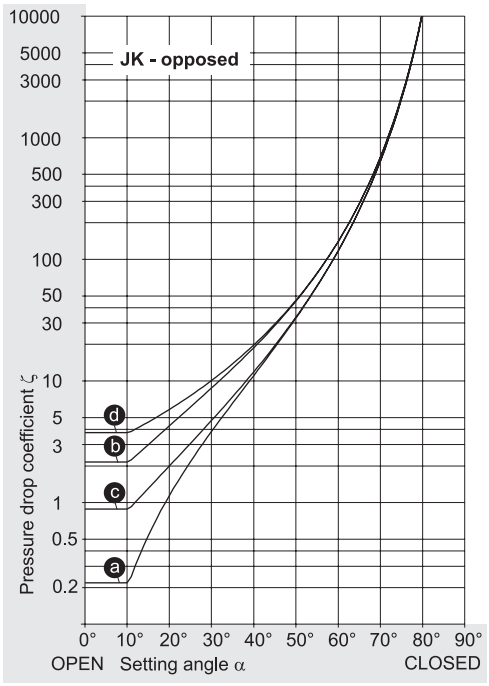
Flow velocity	v_A	=	7.5 [m/s]
Pressure difference	Δp_S	=	1000 [Pa]
Driving torque per m² inflow cross-section A_A			
• opposed	M	≈	14 [Nm/m²]
• parallel	M	≈	12 [Nm/m²]

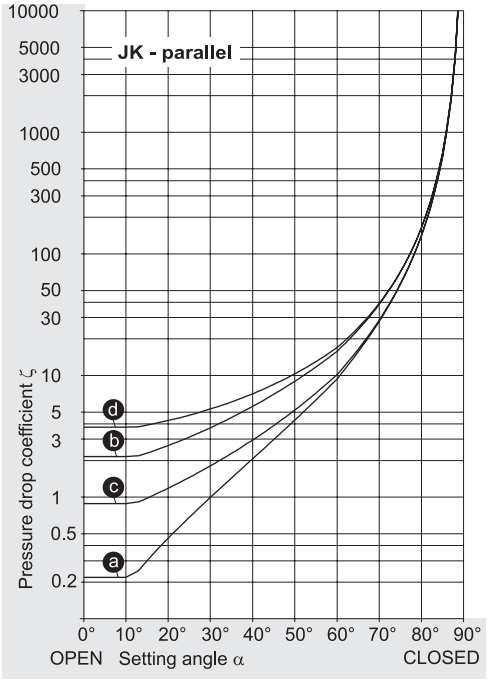
JK Multileaf Dampers

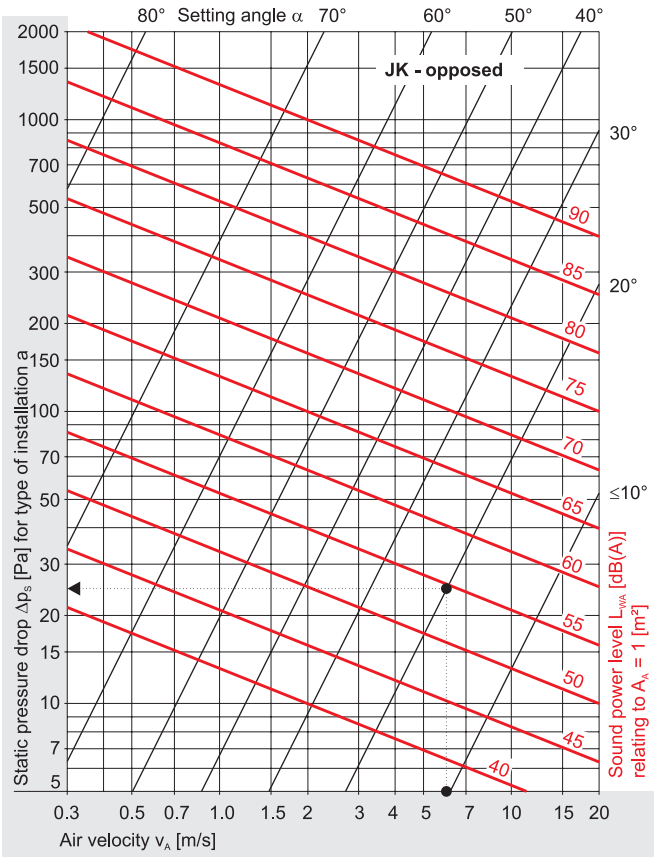
Pressure drop coefficients ζ, pressure drop, sound power level

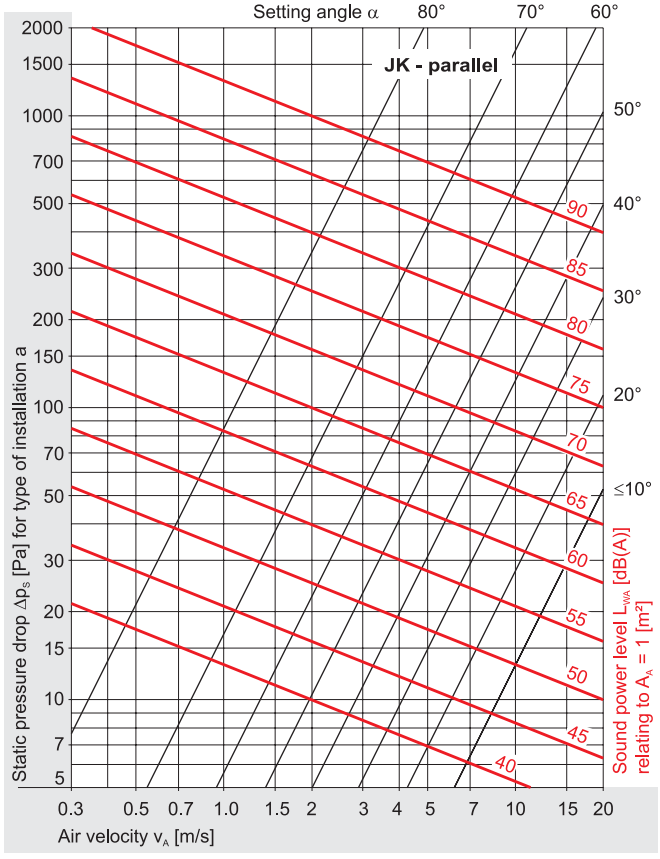
Pressure drop coefficients ζ for installation type:











Example (JK - opposed)

Setting angle	α	=	20 °	Pressure drop (type of installation a)	Δp_s	=	24 [Pa]
Air velocity	v_A	=	6 [m/s]	Sound power level	L_{WA}	=	55 [dB(A)]*)

*) Sound power levels are referenced to A_A = 1 [m²]; correction values for other inflow cross-sections ⇒ see page 8

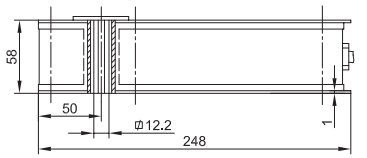
JK Multileaf Dampers

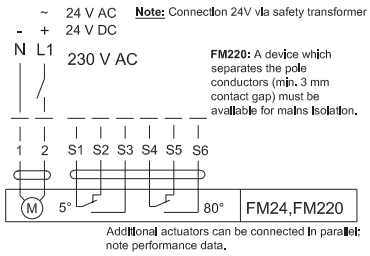
Electrical actuators, nomenclature

Technical data for factory installed actuators

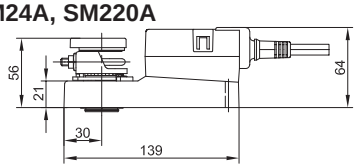
	SM24A	SM220A	FM24	FM220
Input voltage	24V AC / DC	100 to 240V AC	24V AC / DC	230V AC
tolerance range AC	± 20%	–15%, +10%	± 20%	±14%
tolerance range DC	± 20%		–10%, +20%	
Torque				
motor	≥20 Nm	≥20 Nm	≥18 Nm	≥18 Nm
spring return			≥12 Nm	≥12 Nm
Running time for 90°				
motor	150 s	150 s	140 s	140 s
spring return			~16 s	~16 s
Power input	4 VA	6 VA	10 VA	12.5 VA
Power consumption				
motoring	2 W	2.5 W	7 W	8 W
holding	0.2 W	0.6 W	2 W	3 W
Degree of protection	IP 54	IP 54	IP 54	IP 54
Connecting cable 0.75 mm²	approx. 1 m	approx. 1 m	approx. 1 m	approx. 1 m
motor	3 wire	3 wire	2 wire	2 wire
auxiliary switch			6 wire	6 wire
auxiliary switch S1A	3 wire	3 wire		
auxiliary switch S2A	6 wire	6 wire		
Ambient temperature	-30°C to + 50°C			

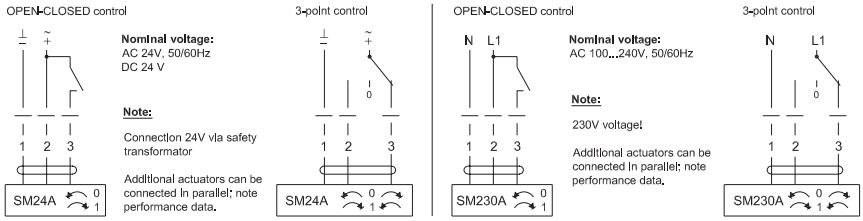
FM24, FM220 with integrated limit switches



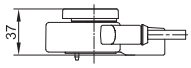


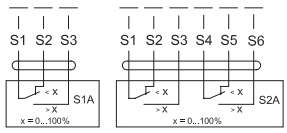
SM24A, SM220A





Auxiliary switches S1A, S2A





Nomenclature

A_A	[m²]	=	inflow cross-section $A_A = W \cdot H$
V	[m³/h]	=	volume flow rate, leakage volume flow rate
v_A	[m/s]	=	flow velocity relating to A_A (inflow velocity)
α		=	setting angle multileaf damper OPEN: $\alpha = 0°$ CLOSED: $\alpha = 90°$
ζ		=	pressure drop coefficient relating to A_A pressure drop $\Delta p_S = \zeta \cdot \rho/2 \cdot v_A^2$
ρ		=	medium density ($\rho_{dry\ air\ 20°C,\ 1\ bar} = 1.188$ [kg/m³])
Δp_S	[Pa]	=	static pressure drop, static pressure difference
L_{WA}	[dB(A)]	=	A-weighted sound power level
ΔL	[dB]	=	correction to L_{WA} relating to $A_A = 1$ [m²] $L_{WA} = L_{WA\text{-}1m^2} + \Delta L$ [dB]
M	[Nm/m²]	=	driving torque M_{total} [Nm] = M_{1m^2} [Nm/m²] · A_A [m²]

For other inflow cross-sections the following ΔL corrections must be added in the case of sound power levels relating to an inflow cross-section of $A_A = 1$ [m²]:

A_A [m²]	ΔL [dB]
0.10	-10
0.25	-6
0.40	-4
0.50	-3
0.60	-2
1.00	0
1.25	+1
1.60	+2
2.00	+3
2.50	+4
3.20	+5
4.00	+6

JK Multileaf Dampers

Order information

JK - __ - __ - __ - __ - __ - __ - __ - __

Multileaf damper with

plastic bushings	N
brass bushings	M
length 180 mm[1)]	180
length 120 mm	120

Size

nominal size[1)] W x H ..... x .....

⇒ see page 3

opposed linkage	G
parallel linkage	-
internal linkage[2)]	I

Accessories

1GF	with 1 counter flange
2GF	with 2 counter flanges

⇒ see page 5

MR	with wall mounting frame

⇒ see page 5

Adjusting devices[2)]

⇒ see page 4 and page 8

F	locking device

Actuators 20 [Nm][3)]

SM220A	100 to 240V AC
SM220A-S1A	100 to 240V AC and 1 auxiliary switch
SM220A-S2A	100 to 240V AC and 2 auxiliary switches
SM24A	24V AC / DC
SM24A-S1A	24V AC / DC and 1 auxiliary switch
SM24A-S2A	24V AC / DC and 2 auxiliary switches

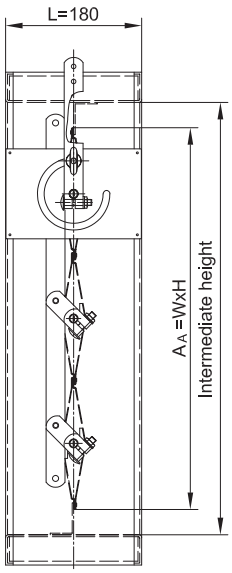
Spring return actuators 18 [Nm] / 12 [Nm][3)]

FM220	230V AC and integrated limit switches
FM24	24V AC/DC and integrated limit switches

Spindle extensions for customer-supplied actuators

SM	∅18 mm for SM actuators
FM	12 x 12 mm for FM actuators
L150	∅ 12 mm, 150 mm long for

[1)] **Intermediate dimensions** can be delivered for frames with a length of 180 mm. The blade spacing of 165 mm is retained and the remaining gaps between the upper / lower blades and the frame are filled with angle profiles.



Straps for combining two JK multileaf dampers must be ordered separately:

U-LU1	for widths < 1000 mm	same width arranged one upon the other!
U-LU2	for widths ≥ 1000 mm	
U-LN1	for heights < 1005 mm	same heigth arranged alongside!
U-LN2	for heights ≥ 1005 mm	

[2)] In this design the actuators are in the air flow! Factory installed adjusting devices are not available in this case.

[3)] Actuators with greater driving torques to be supplied by customer!

JK Multileaf Dampers

Specification text

Multileaf dampers made of galvanised sheet steel are control and shut-off dampers for ventilation and air conditioning systems. With hollow blades profiled for optimum flow, external opposed / external parallel / internal parallel **linkage, galvanised actuator spindles in** plastic / brass **bushings. All-around, canted frame with** 120 mm / 180 mm **length and with connecting flanges for installation between ducts, on walls or ceilings. With** adjusting lever and locking device / electrical actuator / electrical spring return actuator / with auxiliary switches. With wall mounting frame and counter flange / counter flanges. Also includes connecting straps required to install two multileaf dampers either one upon the other / alongside.

..... **pieces**

Volume flow rate: ..... **m³/h**

Manufacturer: **WILDEBOER®**

Type: **JK**

Dimension W x H ... x ... **mm**

Complete with fasteners **supply:** .....

install: .....

Delete text in non-bold type as required!