Multi-Leaf Damper

JK

Leakage air flow with control damper closed according to DIN EN 1751, up to class 4

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Multi-leaf damper JK

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Multi-leaf damper JK

Description

Application range

Multi-leaf dampers type JK are used in air-conditioning and ventilation systems as control, throttle or shut-off dampers to control pressure and volumetric flow.

The **flow-favouring aluminium blades** are adjusted **together, rotating in opposite directions**, via external plastic gear wheels. The external arrangement of the gears has the benefit that in comparison to internally arranged wheels exposed to the air flow, they do not become soiled so quickly. A cover plate protects the gear wheels from outside dirt and reduces the personal accident danger during assembly or maintenance.

The multi-leaf dampers type JK are suitable for a maximum pressure of up to 1000 Pa. The multi-leaf damper type JK allows **airtight sealing to DIN EN 1751 up to class 4**. Housing leakage according to DIN EN 1751, class B, at a duct pressure of up to 1000 Pa.

The multi-leaf damper JK has been successfully tested by TÜV Süd according to the following rules:

- **VDI 6022, Sheet 1: Hygienic requirements of ventilation and air-conditioning systems**
- **VDI 6022, Sheet 2: Hygienic requirements of ventilation and air-conditioning systems - Measurement methods and investigations during hygienic controls and hygienic inspections.**
- **DIN 1946, Sheet 2: Air-conditioning technology - Health requirements**

For maintenance, service, retrofitting, etc., inspection openings in sufficient number and size must be provided on site.

Temperature resistance

JK-LP:	temperature-resistant to a max. of +80°C
JK-LU:	temperature-resistant to a max. of +80°C
Gear wheels:	temperature-resistant to a max. of +80°C
with electric actuator:	-20°C < permissible ambient temperature < +50°C
with pneumatic servo cylinder:	- 5°C < permissible ambient temperature < +60°C

Chemical resistance

The resistance of the seals to chemical stress is as follows:

concentrated acid:	- not resistant
dilute acid	- limited resistance
bases	- resistant
mineral oils	- not resistant
vegetable oils	- resistant

Adjustment

The multi-leaf dampers type JK can be adjusted either manually, electrically or pneumatically.

Installation information

The multi-leaf dampers must not be tilted during installation. This could lead to problems with the adjusting mechanism or cause leakage.

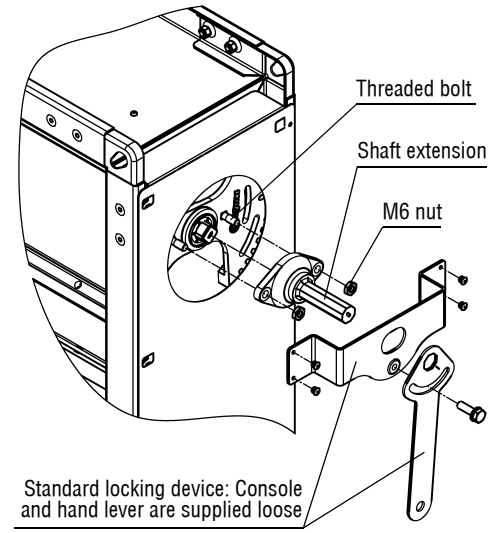
From size 1588 x 1588, the multi-leaf dampers type JK may only be assembled with horizontal leaf axis.

It is recommended mounting the multi-leaf dampers while closed. To screw the multi-leaf damper to the duct, the cover plate on the drive side can be simply dismounted by loosening the Parker screw. After the multi-leaf damper has been screwed back on, the cover plate must be reattached. To do this, the plate is attached to the housing by means of the lugs, screwed down and the lugs on the screw side are folded down.

Please note!

The order number is always written on the topside on the multi-leaf damper.

Mounting instructions



1. Push shaft extension on to threaded bolt and fasten it with M6 nuts.
2. Fasten the console to the frame.
3. Place the hand lever on the shaft extension and fasten it.

The hand lever or actuator must be fitted on the same side as the gear wheel. If there is an odd number of blades, the actuating lever / actuator must be mounted on the central blade. If there is an even number of blades it must be mounted on one of the two central blades.

To fit the hand lever / actuator, the shaft extension must be inserted. If an actuator is mounted (on site), the console for manual adjustment must not be fastened.

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Construction

- locking device
  - Galvanised sheet steel
  - loose
- Seals
  - Special rubber
- Hollow-body blades
  - Aluminium profile, flow-favouring and torsion-resistant
  - Block adjustment in opposite directions
- Bearing
  - Plastic bearing (JK-LP)
  - Sintered bearing (JK-LU)
- Frame
  - Profiled sheet steel galvanised 1.5 mm, dimensionally stable
  - Depth of the frame = 180 mm
  - with profiled connection frame
  - with frame bores (at an extra charge): on one side (-RB1)
  - with frame bores (at an extra charge): on two sides (-RB2)
- Gear wheels
  - Plastic, externally fitted

Model

JK-LP	-	with plastic bearing
JK-LU	-	with sintered bearing
JK-...-R	-	Operating side on the right
JK-...-L	-	Operating side on the left

Accessories

- Add-on parts
  - Installation frame 35/35/4 with riveted wall anchors (-ER2)
  - Flat-steel counter frame 33/5 (-FG1)
  - Angular steel counter frame 30/30/3 (-WG1)
  - Locking device (-M001) mounted to the multi-leaf damper.
- Shaft design (at an extra charge) (-W02/-W03)
  - including bearing block
- Electric actuator, 2/3-point
  - 5 Nm, 24 V AC/DC (E001) / 230 V AC (E002)
  - 10 Nm, 24 V AC/DC (E003) / 230 V AC (E004)
  - 20 Nm, 24 V AC/DC (E005) / 230 V AC (E006)
  - 40 Nm, 24 V AC/DC (E007) / 230 V AC (E008)
- Electric actuator with spring return 2/3-point
  - 4 Nm, 24 V AC/DC (E021) / 230 V AC (E020), currentless OPEN
  - 4 Nm, 24 V AC/DC (E021) / 230 V AC (E020), currentless CLOSED
  - 10 Nm, 24 V AC/DC (E027) / 230 V AC (E029), currentless OPEN
  - 10 Nm, 24 V AC/DC (E027) / 230 V AC (E029), currentless CLOSED
  - 20 Nm, 24 V AC/DC (E025) / 230 V AC (E024), currentless OPEN
  - 20 Nm, 24 V AC/DC (E025) / 230 V AC (E024), currentless CLOSED
- Electric actuator 0-10 V (continuous)
  - 5 Nm, 24 V AC/DC (E012) / 230 V AC (E016)
  - 10 Nm, 24 V AC/DC (E013) / 230 V AC (E017)
  - 20 Nm, 24 V AC/DC (E014) / 230 V AC (E018)
  - 40 Nm, 24 V AC/DC (E015)
- Electric actuator with spring return, 0-10 V (continuous)
  - 4 Nm, 24 V AC/DC (E023)
  - 10 Nm, 24 V AC/DC (E028)
  - 20 Nm, 24 V AC/DC (E026)
- Electric actuator with integrated limit switch
- limit switch
  - "CLOSED" (-ESZ)
  - "OPEN" (-ESA)
  - 2 limit switches, "CLOSED" and "OPEN" (-ES2)
- Pneumatic servo cylinder
  - Piston force 295 N (supply) / 247 N (return), 6 bar, double-acting (P001)
  - Piston force 753 N (supply) / 633 N (return), 6 bar, double-acting (P002)
  - including bearing block

Note:
The gear wheels consists of the plastic PA6. The plastic PA 6 has the property of changing its dimensions as a function of the relative humidity. The gear wheels have been pre-conditioned for a standard climate of 23°C and a relative humidity of 50%.
If the gear wheels are exposed permanently to a relative humidity of more than 60% over a longer period, the damper may run sluggishly. At a permanent relative humidity of under 40%, the gear wheels shrink, and the gear play may become too large.
If the multi-leaf dampers are to be used in rooms in which the relative humidity is permanently <40% / >60%, we recommend using stainless steel gear wheels made of V2A (1.4301) instead of the plastic ones. Extra charge upon request.

Attention!
When using linkage adjustment (only available upon request) instead of adjustment by means of external gear wheels, the force required for adjustment is twice as high as with gear wheel adjustment.

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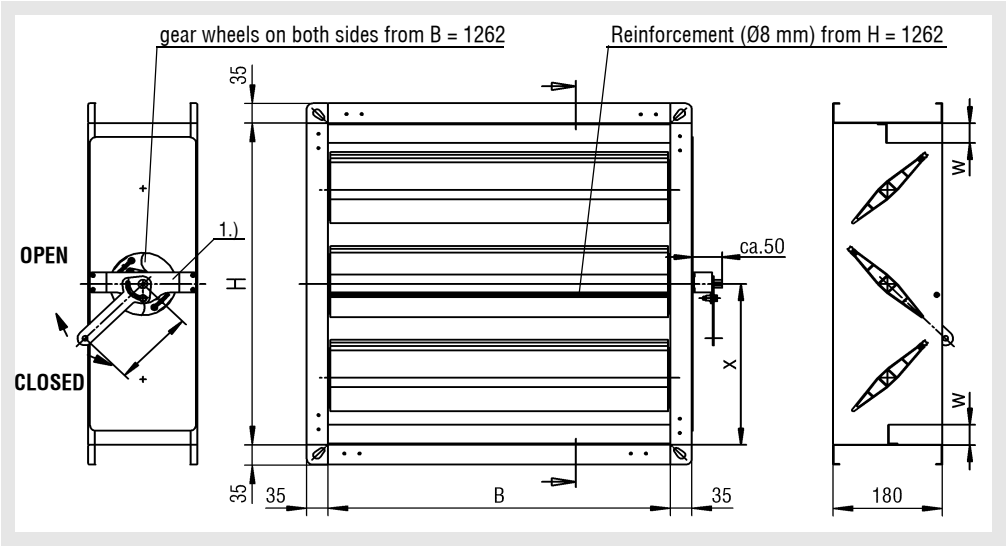
Models and dimensions

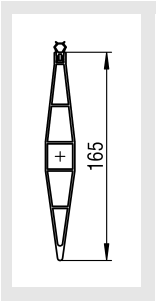
Dimensions

JK-LP (with plastic bearing)
JK-LU (with sintered bearing)

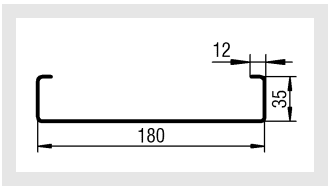


1.) Locking device (console and adjusting lever) supplied loose as standard.

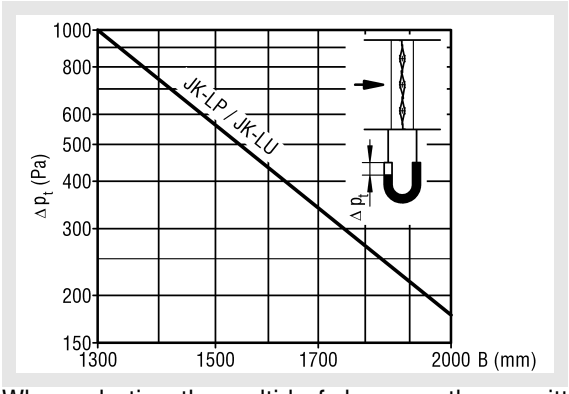
Blade profile



Frame profile



Selection diagram



When selecting the multi-leaf dampers, the permitted width must be selected according to the total pressure loss (see selection table above).
Max. differential pressure 1000 Pa.

Available sizes

B	H	Number of blades	w	x
201	**201**	1	18	100
225	**225**	1	30	113
252	**252**	1	45	126
318	-	-	-	-
357	**357**	2	15	262
400	**400**	2	35	284
449	**449**	2	60	308
503	**503**	2	94	335
565	**565**	3	35	283
634	**634**	3	70	317
711	**711**	4	25	439
797	**797**	4	65	315
894	**894**	5	30	447
1003	**1003**	5	85	502
1125	**1125**	6	65	479
1262	**1262**	7	45	631
1416	**1416**	8	40	624
1588	**1588**	9	45	794
1781	**1781**	10	55	807
1998	**1998**	11	80	999

All combined lengths and widths available!

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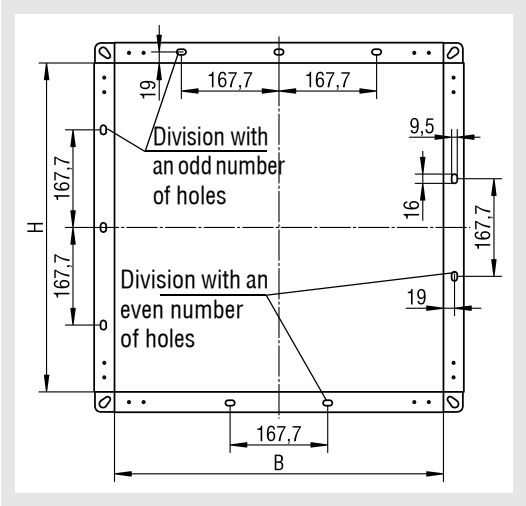
Frame bore (-RB1/ -RB2)



The number of holes does not include the 4 corner holes.

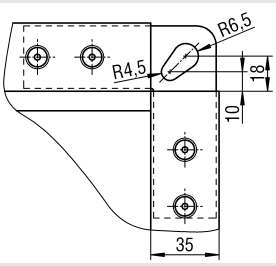
Number of holes

B	H	Number of holes
201	201	0
225	225	0
252	252	0
318	-	0
357	357	1
400	400	1
449	449	1
503	503	1
565	565	2
634	634	2
711	711	3
797	797	3
894	894	4
1003	1003	4
1125	1125	5
1262	1262	6
1416	1416	7
1588	1588	8
1781	1781	9
1998	1998	10

All combined lengths and heights available.

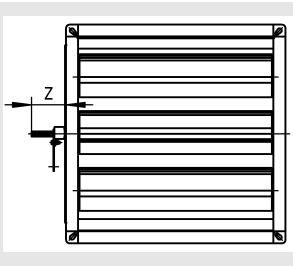
Corner angle

As standard, multi-leaf dampers are supplied with corner angles. The special form of the corner holes allows them to be connected to the connection systems available on the market (e.g. Metu system M 2/M 3)

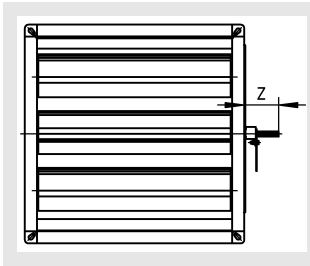


Shaft design (-W02/-W03)

Operating side left

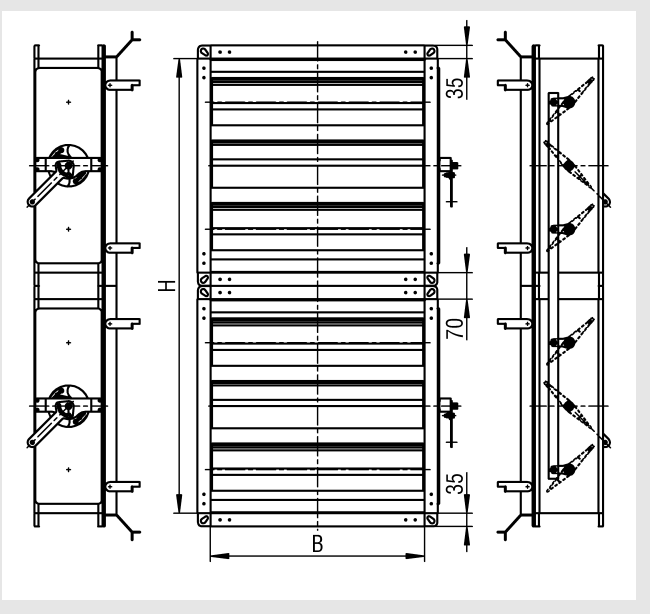


Operating side right



Projection length z = max. 150 mm (at an extra charge).

Multi-leaf damper divided horizontally



The above illustration shows the division of multi-leaf dampers greater than 1998 mm in height.
The blades in the two sections are joined by a coupling rod.
The primed mounting frame 35/35/4 is only available in primed design.

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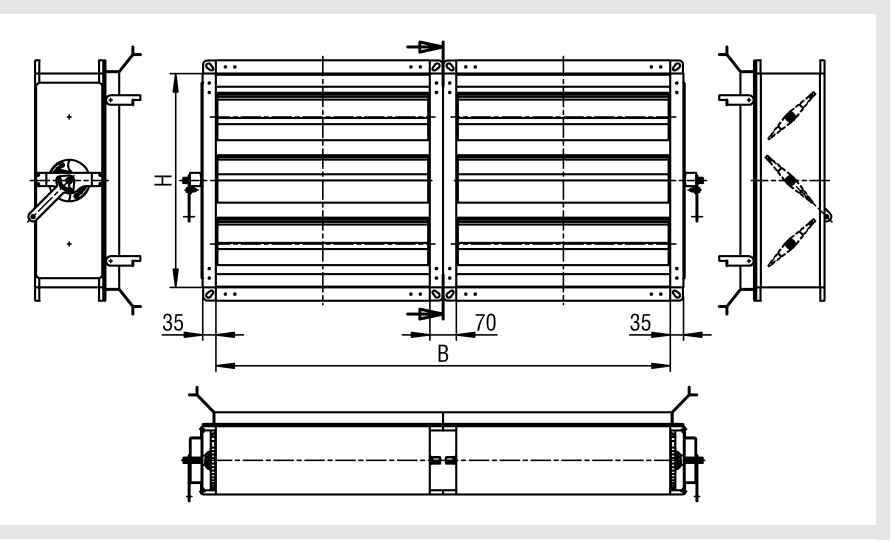
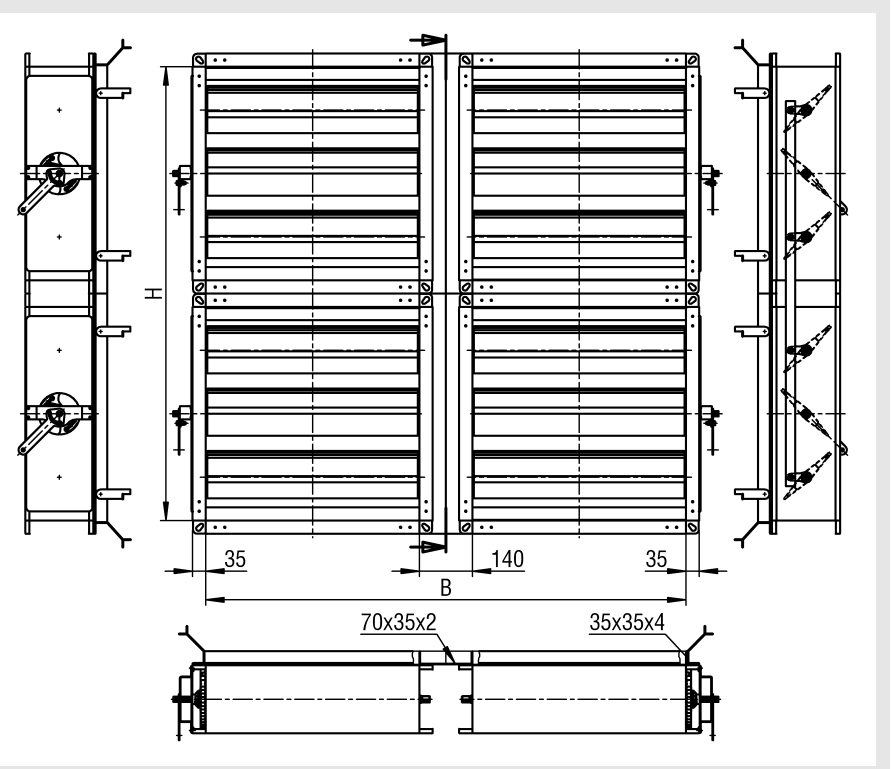
Multi-leaf damper divided vertically



The figure opposite shows the division of multi-leaf dampers greater than 1998 mm in width.
It is not possible to join the two sections.
Operating side 1 x "on the left" and 1 x "on the right".
All frames are supplied in primed design.

Vertically and horizontally divided multi-leaf dampers



The figure opposite shows the division of multi-leaf dampers greater than 1998 mm in height and width.
The blades in the two sections on top of each other are joined by a coupling rod.
It is not possible to join the horizontally adjacent sections.
All frames are supplied in primed design.

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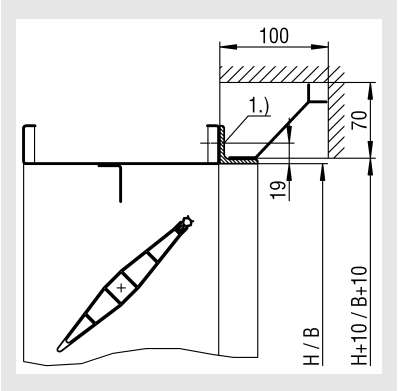
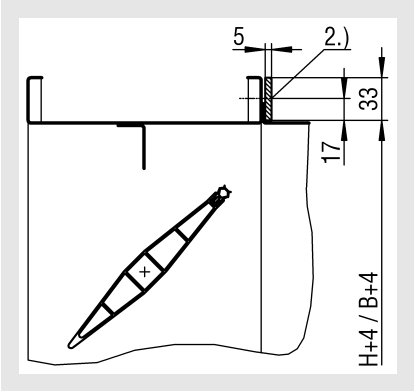
Dimensions of accessories

Assembly detail

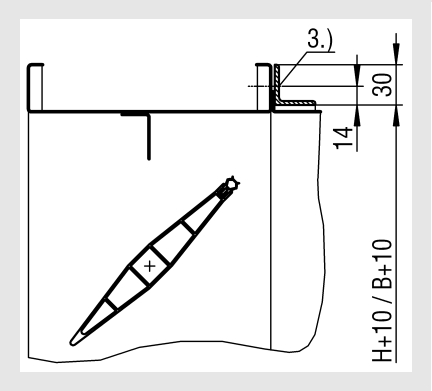
Installation frame (-ER2)



Flat-steel counter frame (-FG1)



Angular steel counter frame (-WG1)

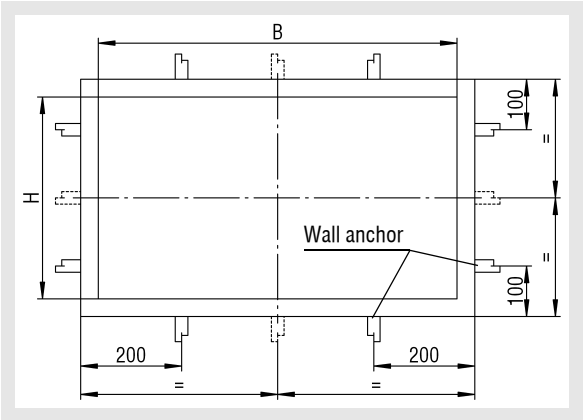


Multi-leaf dampers can be additionally fitted with:

1.) Installation frame 35/35/4 with riveted wall anchors (-ER2)
2.) Flat-steel counter frame 33/5 (-FG1)
3.) Angular steel counter frame 30/30/3 (-WG1)

undrilled or drilled.
All frames are supplied in primed design.

Installation frame (-ER2)



Wall anchor arrangement

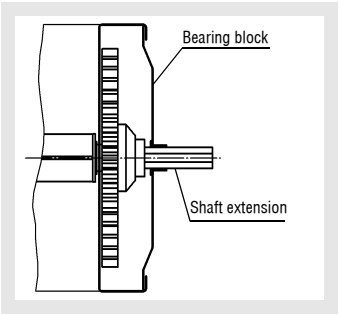
Height (mm):

H ≤ 1003 → 2 wall anchors per side
H > 1003 → 3 wall anchors per side

Width (mm):

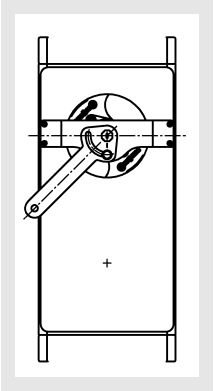
B ≤ 797 → no wall anchors
797 < B ≤ 1003 → 2 wall anchors per side
B > 1003 → 3 wall anchors per side

Bearing block



A bearing block is mounted ex-works for shaft design (W02/W03).
When a servo cylinder is mounted in factory, the bearing block is mounted as well as standard. The bearing block must be installed as well when a pneumatic servo cylinder is mounted on site, otherwise the adjusting mechanism could be damaged by the thrust.

locking device



The manual adjusting device is supplied loose as standard (-E000).
In the model with the locking device (-M001), the manual adjusting device (hand lever and console) is delivered mounted ex works. The blades can be adjusted continuously by means of the manual adjusting device.

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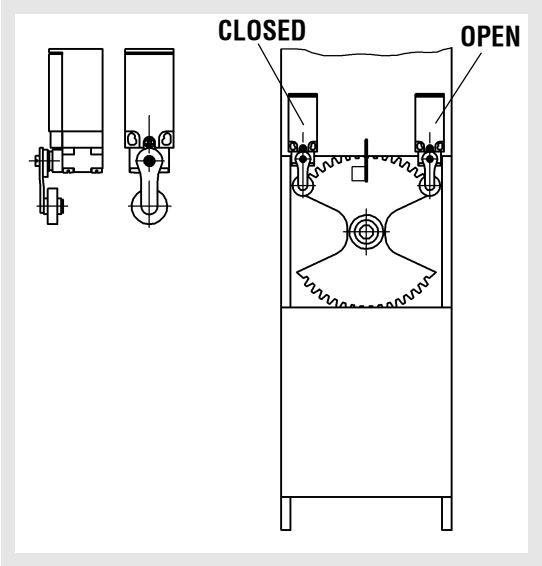
limit switch



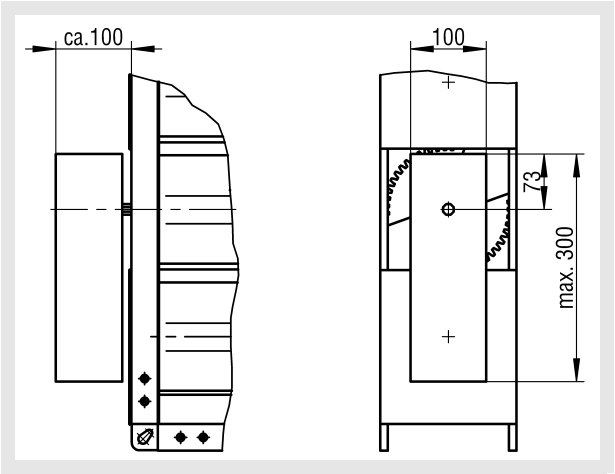
Electric limit switches can be installed to indicate position or to perform switching functions

Installation options:

- Damper position "CLOSED" 1 limit switch (-ESZ)
- Damper position "OPEN" 1 limit switch (-ESA)
- with 2 limit switches, "CLOSED" and "OPEN" (-ES2)

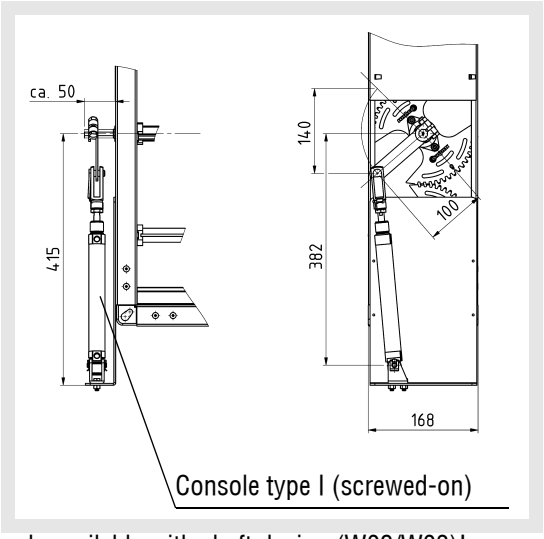
If an electric actuator or pneumatic servo cylinder is used, the limit switches can also be installed as shown in the figure.

Actuator is fitted outside (-AU) (standard)



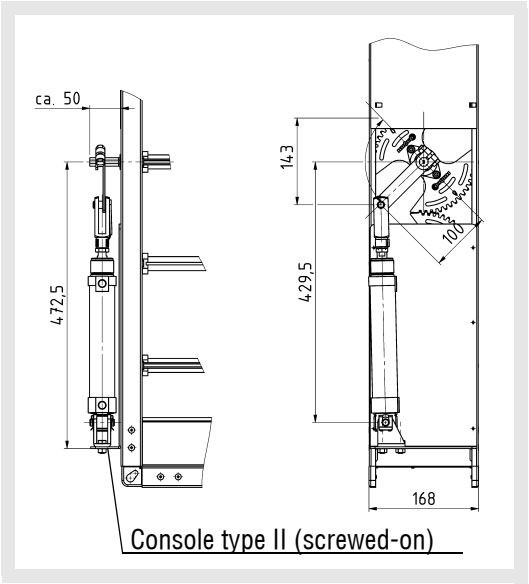
Integrated limit switches
The electric actuators are available with integrated / mounted limit switches.

with pneumatic servo cylinder
H = 201-565 or H = 200-600



only available with shaft design (W02/W03)!

H = 634-1998 or H = 800-2000



only available with shaft design (W02/W03)!

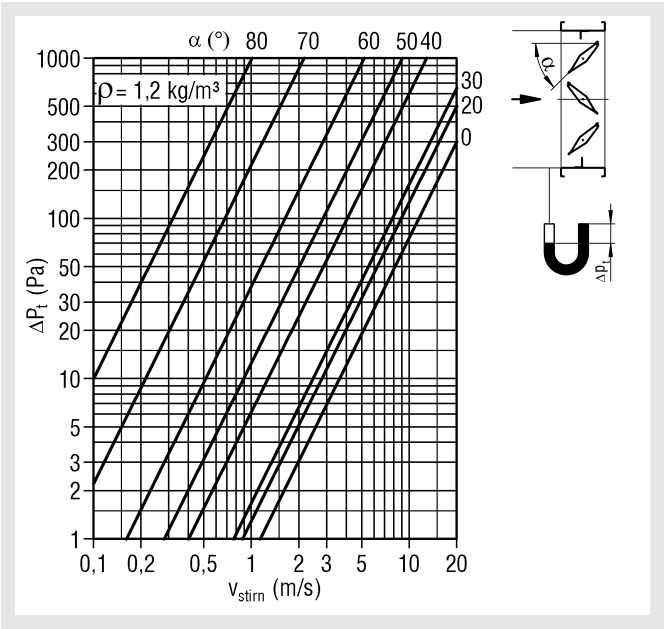
Multi-leaf damper JK

Technical data

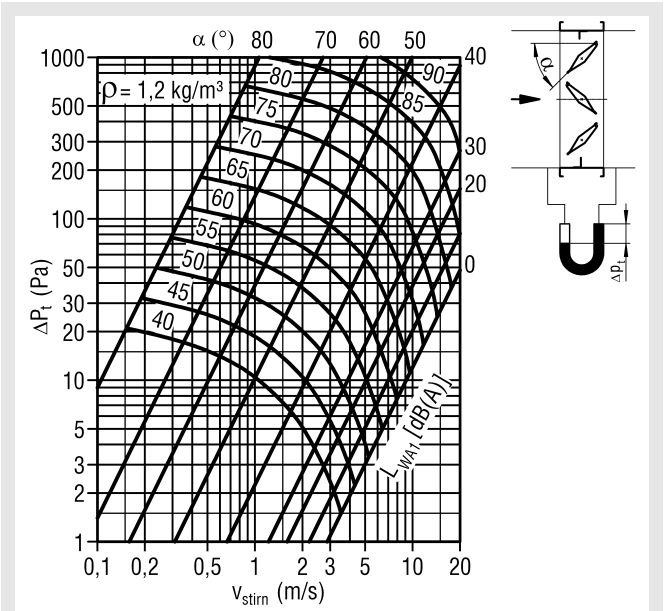
Pressure loss and noise level

Pressure loss

Open connection



Duct connection



(as a function of the blade position α)

Correction factor (for flow generated noise)

A_{stirn} (m^2)	0,04	0,06	0,08	0,10	0,12	0,16	0,2	0,25	0,3	0,4	0,5	0,6	0,8	1
KF [-]	-14	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0

$$L_{WA} = L_{WA1} + KF$$

Damper leaf leakage, classification to DIN EN 1751

H dimension in mm	Test pressure in				
	100	250	500	750	1000
200 - 599	Class 3	Class 3	Class 3	Class 3	Class 3
600 - 999	Class 4	Class 4	Class 4	Class 4	Class 3
1000 - 1499	Class 4	Class 4	Class 4	Class 4	Class 3
1500 - 2000	Class 4	Class 4	Class 4	Class 4	Class 4
H 600 - 1499, class 4 at 1000 Pa available at an extra charge					

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Selection actuator / servo cylinder

JK-LP / JK-LU (with electric actuator)

	0-10 V		2/3-point		Spring return "OPEN" and "CLOSED"		Spring return 0-10 V
	24 V AC	230 V AC	24 V AC	230 V AC	24 V AC	230 V AC	24 V AC
4 Nm	-	-	-	-	E021	E020	E023
5 Nm	E012	E016	E001	E002	-	-	-
10 Nm	E013	E017	E003	E004	E027	E029	E028
20 Nm	E014	E018	E005	E006	E025	E024	E026
40 Nm	E015	-	E007	E008	-	-	-

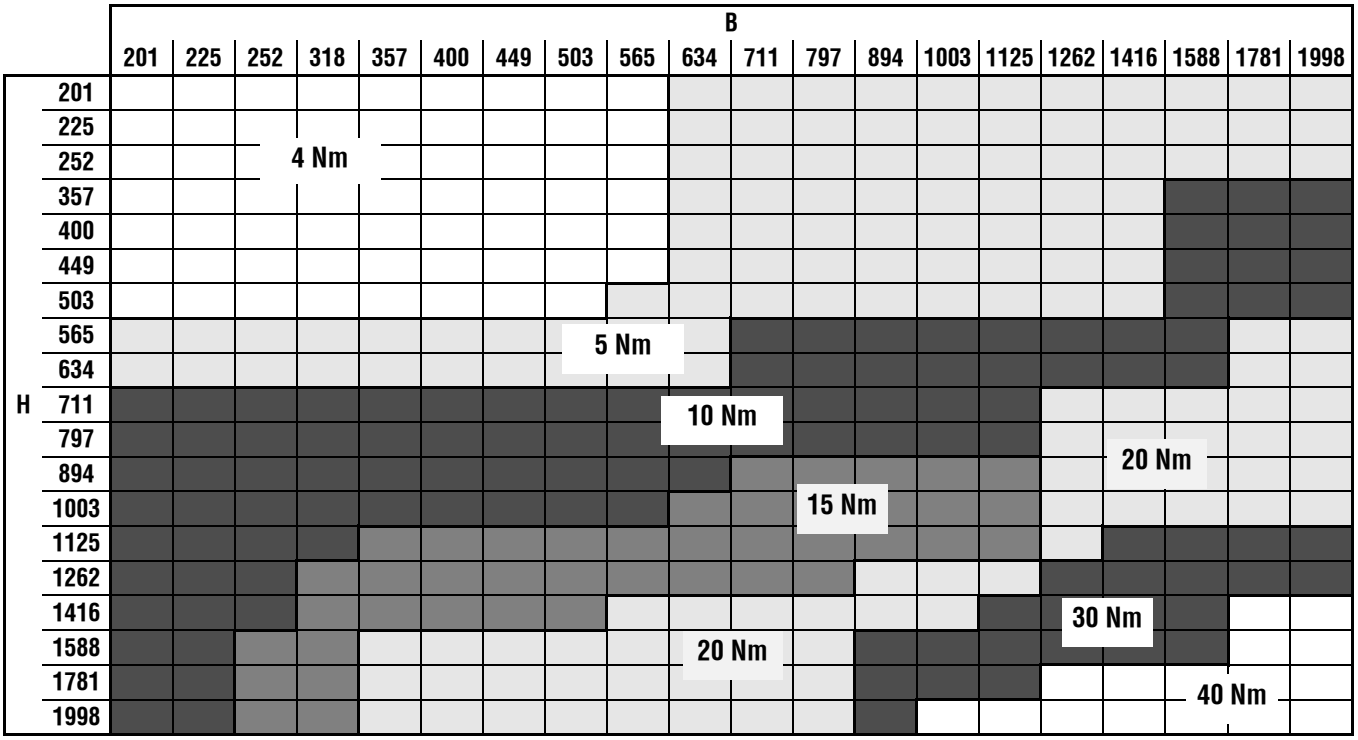
JK-LP/JK-LU with pneumatic servo cylinder

pneumatic servo cylinder	Damper size WxH (mm)
P001	201x 201 to 634x 400
P002	711x 201 to 1998 x 1998

The actuators E001 - E008 and E012 - E015 can be fitted with a limit switch "OPEN" or "CLOSED" or with two limit switches "CLOSED" and "OPEN".
The actuators with spring return E024 - E029 can be fitted with two limit switches "CLOSED" and "OPEN".

Additional spring return actuators have to be mounted if the assembly of spring return actuators requires a torque of more than 20 Nm.
When a pneumatic servo cylinder is mounted in factory, a bearing block is mounted on the multi-leaf damper as well by default.

Selection



The electric actuator or pneumatic cylinder can also be installed at a later stage.

When a thrust actuator or servo cylinder is mounted on site, it is recommended also ordering the bearing block, in order to ensure better absorption of the thrust.

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Model
Electric actuators

	2/3-point							
	E001	**E003**	**E005**	**E007**	**E002**	**E004**	**E006**	**E008**
Torque min. (Nm)	5	10	20	40	5	10	20	40
Operating voltage	24 V AC / 24 V DC				230 V AC			
Frequency	50 / 60 Hz				50 / 60 Hz			
Dimensioning in VA	2	3,5	4	6	4	5,5	6	9
Protection class	III				II			
Protection type	IP54				IP54			
Optional auxiliary switch	-	2			-	2		
Ambient temperature	-30° C..... +50° C							
Max. sound power level in dB(A)	35	35	45	45	35	35	45	45

	0-10V						
	E012	**E013**	**E014**	**E015**	**E016**	**E017**	**E018**
Torque min. (Nm)	5	10	20	40	5	10	20
Operating voltage	24 V AC / 24 V DC				230 V AC		
Frequency	50 / 60 Hz				50 / 60 Hz		
Dimensioning in VA	2	4	4	6,5	4	6,5	6
Protection class	III				II		
Protection type	IP54				IP54		
Optional auxiliary switch	2				2		
Ambient temperature	-30° C..... +50° C						
Max. sound power level in dB(A)	35	35	45	45	35	35	45

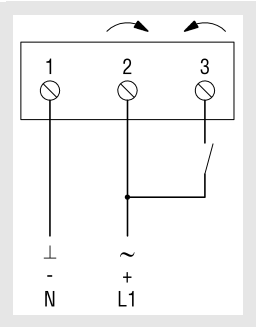
	Spring return "OPEN" and "CLOSED"						Spring return 0-10V		
	E021	**E027**	**E025**	**E020**	**E029**	**E024**	**E023**	**E028**	**E026**
Torque min. (Nm)	4	10	20	4	10	20	4	10	20
Operating voltage	24 V AC/DC			230 V AC			24 V AC/DC		
Frequency	50 / 60 Hz			50 / 60 Hz			50 / 60 Hz		
Dimensioning in VA	7	8,5	7,5	7	9,5	18	5	5,5	7
Protection class	III			II			III		
Protection type	IP54			IP54			IP54		
Optional auxiliary switch	2			2			-	2	
Ambient temperature	-30° C..... +50° C								
Max. sound power level in dB(A)	50*	45*	45*	50*	45*	45*	30*	40*	40*

*Spring return actuator 62 dB (A)

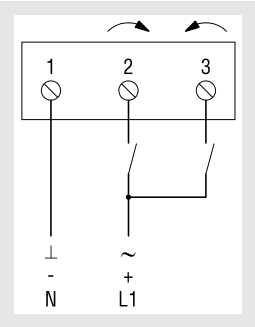
Multi-leaf damper JK

Electric terminals 24 V AC/DC, 230 V AC

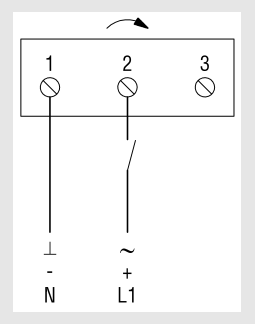
Two-point



Three-point

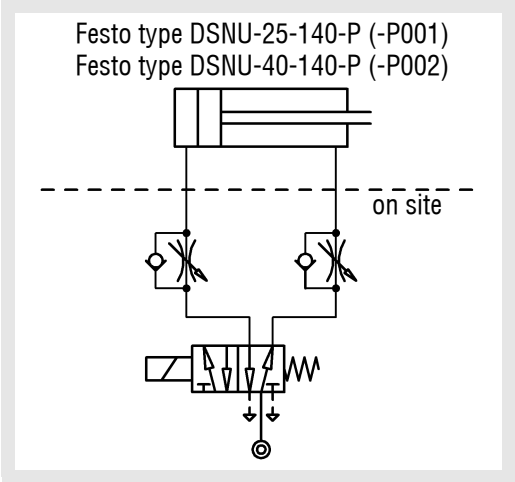


Electric terminals 24 V AC/DC, 230 V AC
Two-point



E27 and E29 actuators have OPEN - CLOSED control.
Three-point actuators on request

Connection diagram
Pneumatic servo cylinder



Legend

Δp_t	(Pa)	=	Pressure loss
v_{stirn}	(m/s)	=	Intake velocity, blower stream velocity, outflow velocity, relative to B x H
α	(°)	=	Blade position
L_{WA}	[dB(A)]	=	A-weighted sound power level [$L_{WA} = L_{WA1} + KF$]
L_{WA1}	[dB(A)]	=	A-weighted sound power level relative to 1 m^2
ρ	(kg/m^3)	=	Density
KF	(-)	=	Correction factor
A_{stirn}	(m^2)	=	Face area
H	(mm)	=	Height
B	(mm)	=	Width
V_{leck}	(m^3/h)	=	Leak air volume
V_{leck}	[l/s]	=	Leak air volume
F	(m^2)	=	Leaf area

Multi-leaf damper JK

Order details

01	02	03	04	05	06	07	08
Type	model	Width	Height	Material	Shaft design	Operating side	Actuator
Example							
JK	-LP	-0400	-0201	-SV	-W01	-R	-E000

09	10	11	12	13
Actuator position	Damper position	Mounting frame	Frame bores	External limit switches
-AU	-NA	-ER2	-RB1	-ESA

Example
JK-LP-0400-0201-SV-W01-R-E000-AU-NA-ER2-RB1-ESA
Multi-leaf damper, rectangular design, airtight | with sintered bearing | width 400 mm | height 201 mm | galvanised sheet steel | with shaft design 50 mm | operating side on the right | without actuator, with loose locking device | fitted outside | no spring return actuator | with installation frame, with wall anchors | with frame bores on one side | with external limit switch, position "OPEN"

ORDER DETAILS

01 - Type

JK = Multi-leaf damper, rectangular design, airtight

02 - Model

LP = with plastic bearing
LU = with sintered bearing

03 - Width

0201 - 0225 - 0252 - 0318 - 0357 - 0400 - 0449 - 0503 - 0565 - 0634 - 0711 - 0797 - 0894 - 1003 - 1125 - 1262 - 1416 - 1588 - 1781 - 1998 in mm, always four digits

04 - Height

0201 - 0225 - 0252 - 0357 - 0400 - 0449 - 0503 - 0565 - 0634 - 0711 - 0797 - 0894 - 1003 - 1125 - 1262 - 1416 - 1588 - 1781 - 1998 in mm, always four digits

05 - Material

SV = Galvanised sheet steel (standard)

06 - Shaft design

W01 = Length 50 mm (standard)
W02 = Length 100 mm
W03 = Length 150 mm

07 - Operating side

R = right (standard)
L = left

08 - Actuator

E000 = without actuator, with loose locking device (standard)
M001 = without actuator, with mounted locking device

Actuator, 2/3-point

E001 = 5 Nm, 24 V AC/DC
E002 = 5 Nm, 230 V AC
E003 = 10 Nm, 24 V AC/DC
E004 = 10 Nm, 230 V AC
E005 = 20 Nm, 24 V AC/DC
E006 = 20 Nm, 230 V AC
E007 = 40 Nm, 24 V AC/DC
E008 = 40 Nm, 230 V AC

Actuator with spring return, 2/3-point

E021 = 4 Nm, 24 V AC/DC
E020 = 4 Nm, 230 V AC
E027 = 10 Nm, 24 V AC/DC
E029 = 10 Nm, 230 V AC
E025 = 20 Nm, 24 V AC/DC
E024 = 20 Nm, 230 V AC

Actuator, 0-10 V (continuous)

E012 = 5 Nm, 24 V AC/DC
E016 = 5 Nm, 230 V AC
E013 = 10 Nm, 24 V AC/DC
E017 = 10 Nm, 230 V AC
E014 = 20 Nm, 24 V AC/DC
E018 = 20 Nm, 230 V AC
E015 = 40 Nm, 24 V AC/DC

Multi-leaf damper JK

Actuator with spring return, 0-10 V (continuous)

E023 = 4 Nm, 24 V AC/DC
E028 = 10 Nm, 24 V AC/DC
E026 = 20 Nm, 24 V AC/DC

Pneumatic servo cylinder

P001 = with pneumatic servo cylinder, 295 N
P002 = with pneumatic servo cylinder, 753 N

Further actuators and servo cylinders upon request!!!

09 - Actuator position

AU = fitted outside (standard)

Locking device/servo cylinder only outside possible!!!

10 - Damper position

NA = no spring return actuator (standard)
NO = currentless OPEN - normally open
NC = currentless CLOSED - normally closed
(only for drives with spring return)

11 - Installation frame

ER0 = without installation frame
ER2 = with mounting frame and wall anchors
FG1 = with flat-steel counter frame
WG1 = with angular steel counter frame

12 - Frame bores

RB0 = without frame bores (standard)
RB1 = with bores on one side
RB2 = with bores on both sides

Number of holes according to table!!!

13 - External limit switches

ES0 = without limit switch (standard)
ESA = one limit switch, positon "OPEN"
ESZ = one limit switch, positon "CLOSED"
ES2 = two limit switches

Please note!
Accessories and actuators must be ordered separately!!!

Multi-leaf damper JK

Specification texts

Multi-leaf damper, consisting of dimensionally stable profiled frame made of 1.5 mm galvanised sheet steel, frame depth 180 mm with profiled connection frame (4-screw duct connection), with joint flow-favouring hollow-body blades adjustable in opposite directions made of torsion-resistant aluminium profile. Sealing airtight to DIN EN 1751 up to class 4. Housing leakage according to DIN EN 1751, class B, at a duct pressure of up to 1000 Pa.
The blades are adjusted by means of external plastic gear wheels arranged on one side.

- with plastic bearing, temperature-resistant up to +80°C.
  Manually adjustable. Locking device (hand lever and console) supplied loose.
  Product: SCHAKO **type JK-LP**

- With sintered bearing, temperature resistant up to +80°C.
  Manually adjustable. Locking device (hand lever and console) supplied loose.
  TÜV inspected according to **VDI 6022 Sheets 1+2,** as well as **DIN 1946 Sheet 2.**
  Product: SCHAKO **type JK-LU**

- with frame bore
  - on one side (RB1)
  - on two sides (-RB2)

Accessories:

- Add-on parts
  - Installation frame (-ER2), 35/35/4 with riveted wall anchors
  - Flat-steel counter frame (-FG1), 33/5
  - Angular steel counter frame (-WG1), 30/30/3
  - Locking device (-M001), console and hand lever mounted ex works to the multi-leaf damper.
  - Shaft design (W01= 50 mm, W02= 100 mm, W03= 150 mm)

- with electric actuator
  - 5 Nm, 24 V AC/DC (-E001) / 230 V AC (-E002)
  - 10 Nm, 24 V AC/DC (-E003) / 230 V AC (-E004)
  - 20 Nm, 24 V AC/DC (-E005) / 230 V AC (-E006)
  - 40 Nm, 24 V AC/DC (-E007) / 230 V AC (-E008)
  - 5 Nm, 0 - 10 V DC 24 V AC/DC (-E012) / 230 V AC (-E016)
  - 10 Nm, 0 - 10 V DC 24 V AC/DC (-E013) / 230 V AC (-E017)
  - 20 Nm, 0 - 10 V DC 24 V AC/DC (-E014) / 230 V AC (-E018)
  - 40 Nm, 0 - 10 V DC 24 V AC/DC (-E015)
  - Spring return actuator 4 Nm, 24 V AC/DC (-E021, -E023)
  - Spring return actuator 10 Nm, 24 V AC/DC (-E027, -E028)
  - Spring return actuator 20 Nm, 24 V AC/DC (-E025, -E026)
  - Spring return actuator 4 Nm, 230 V AC (-E020)
  - Spring return actuator 10 Nm, 230 V AC (-E029)
  - Spring return actuator 20 Nm, 230 V AC (-E024)

- limit switch
  - "CLOSED" (-ESZ)
  - "OPEN" (-ESA)
  - with 2 limit switches, "CLOSED" and "OPEN" (-ES2)

- with pneumatic servo cylinder
  - Piston force 295 N (supply) / 247 N (return), 6 bar, double-acting (-P001)
  - Piston force 753 N (supply) / 633 N (return), 6 bar, double-acting (-P002)
  - including bearing block