



NK

Multi-Leaf Damper

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FUNCTION AND USE

Application range

The multi-leaf damper NK is used in air-conditioning and ventilation systems as control, throttle or shut-off damper 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 gear wheels has the advantage that, in comparison to internally arranged wheels exposed to the air flow, they do not become dirty that 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 NK are suitable for a maximum pressure of up to 1000 Pa. The multi-leaf damper type NK allows **airtight sealing to DIN EN 1751 up to class 4**. Housing leakage according to DIN EN 1751, class C, at a duct pressure of up to 1000 Pa.

The multi-leaf damper NK has been successfully tested according to the following rules:

- **VDI 6022, Sheet 1:** **Hygienic requirements for ventilation and air-conditioning systems**
- **VDI 1946, Sheet 2:** **Air-conditioning technology - Health requirements**
- **DIN EN 1751:** **Housing leakage, class C, damper leakage, class 4, at a duct pressure of up to 1000 Pa.**

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

Temperature resistance

NK-SN:	temperature-resistant up to max. +70°C
NK-SL:	temperature-resistant up to max. +70°C
Gearwheels:	temperature-resistant up to max. +70°C
with actuator electric:	-20°C < allowed ambient temperature < +50°C

Chemical resistance

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

Concentrated acid	- not resistant
Diluted acid	- limited resistance
Bases	- resistant
Mineral oils	- not resistant
Vegetable oils	- resistant

Adjustment

The multi-leaf dampers type NK can be adjusted either manually or electrically.

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 1000 x 1000, the multi-leaf dampers type NK may only be assembled with horizontal leaf axis.

It is recommended mounting the multi-leaf dampers while closed. Brackets that are used to screw the multi-leaf damper to the duct can be inserted into the recesses in the cover plate.

Please note!

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

MODELS

NK-SN	not airtight model (standard)
NK-SL	airtight model

Damper position:

...-NA-...	no spring return actuator (standard)
...-NO-...	damper position currentless OPEN - normally open
...-NC-...	damper position currentless CLOSED - normally closed

(Version -NO/-NC only for drives with spring return)

PROCESSING

locking device

- Plastic
- Without actuator (-M001) (standard)

Seals

- Special rubber

Hollow-body blades

- Aluminium profile
- Flow-favouring and torsion-resistant
- Block adjustment in opposite directions

Storage

- Plastic bearing

Frame

- Profiled sheet steel galvanised 1.0 mm, dimensionally stable.
- Depth of the frame = 120 mm.
- Frame bore:
 - Without frame bore (-RB0) (standard)
 - With frame bore on two sides (-RB2) (at an extra charge)

Gear wheels

- Plastic
- Fitted outside
- Arranged on one side

ACCESSORIES

Electric actuator (2/3-point)

With positive locking 8 x 8 mm:

- 5 Nm, 24 V AC/DC (-E044) / 230 V AC (-E045)
- 10 Nm, 24 V AC/DC (-E047) / 230 V AC (-E048)

Electric actuator with spring return (2/3-point)

- 4 Nm, currentless OPEN:
 - 24 V AC/DC (-E021) / 230 V AC (-E020)
- 4 Nm, currentless CLOSED:
 - 24 V AC/DC (-E021) / 230 V AC (-E020)
- 10 Nm, currentless OPEN:
 - 24 V AC/DC (-E027) / 230 V AC (-E029)
- 10 Nm, currentless CLOSED:
 - 24 V AC/DC (-E027) / 230 V AC (-E029)

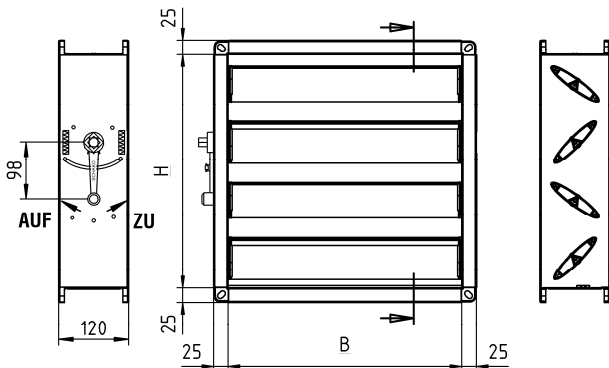
Electric actuator (0-10 V [continuous])

- 5 Nm:
 - 24 V AC/DC (-E046) / 230 V AC (-E016)
- 10 Nm:
 - 24 V AC/DC (-E049) / 230 V AC (-E017)

Electric actuator with spring return (0-10 V [continuous])

- 4 Nm, 24 V AC/DC (-E023)
- 10 Nm, 24 V AC/DC (-E028)

DIMENSIONS



Available sizes

B	H	Number of bores per side	Bore spacing	Division
-	100	0	-	-
200	200	0	-	-
250	-	0	-	-
300	300	0	-	-
400	400	1	-	Variant A
500	500	2	Variant D	Variant D
600	600	2	Variant C	Variant C
700	700	4	Variant B	Variant B
800	800	4	Variant C	Variant C
900	900	4	Variant B	Variant B
1000	1000	4	Variant C	Variant C

All combined lengths and widths available!

Example 1: B=500, H=200 →

Number of bores 2 arranged horizontally, 0

vertically

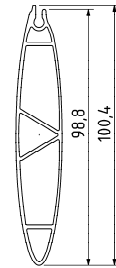
Example 2: B=600, H=900 →

Number of bores 2 arranged horizontally, 4

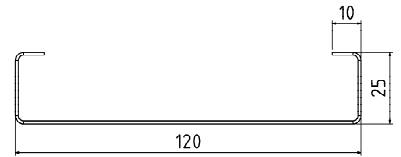
vertically

Construction subject to change
 No return possible

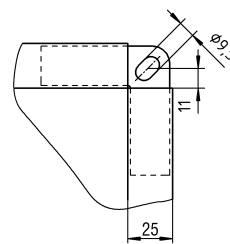
Blade profile



Frame profile

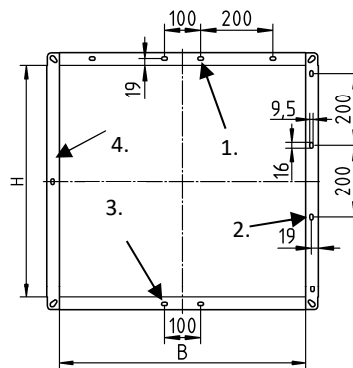


Corner angle



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)

Frame bore

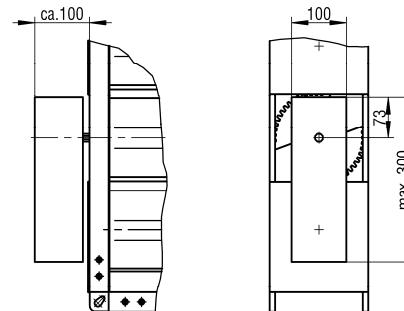


1. Division with a number of bores >1 (variant B)
2. Division with a number of bores >1 (variant C)
3. Division with a number of bores >1 (variant D)
4. Division with a number of bores =1 (variant A)

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

DIMENSIONS OF ACCESSORIES

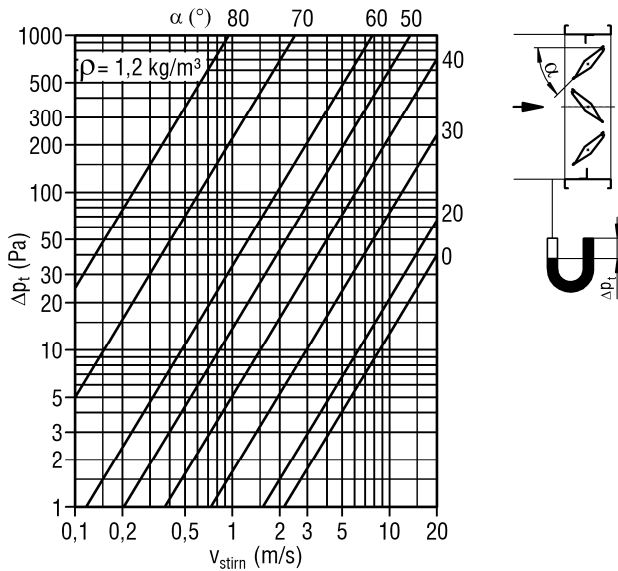
Actuator fitted outside (standard)



TECHNICAL DATA

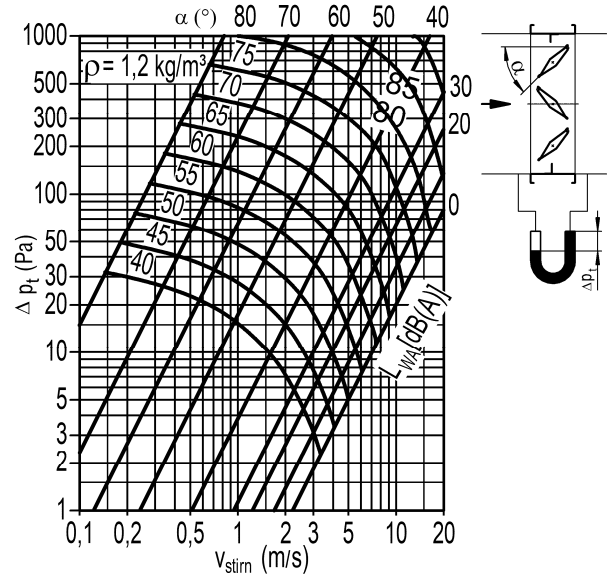
Pressure loss and noise level

Pressure loss - open connection



(as a function of the blade position α)

Pressure loss - duct connection



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

LWA = LWA1 + KF

Damper leaf leakage, classification to DIN EN 1751

H dimension in mm	Test pressure in				
	100	250	500	750	1000
100	Class 3	Class 3	Class 3	Class 3	Class 3
500	Class 4	Class 4	Class 4	Class 4	Class 4
1000	Class 4	Class 4	Class 4	Class 4	Class 4

All intermediate sizes 100<H<500: Damper leaf leakage category between class 3 and class 4
 All intermediate sizes 500<H<1000: Damper leaf leakage category class 4

SELECTION OF ACTUATORS

NK-SN / NK-SL (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	E046	E016	E044	E045	-	-	-
10 Nm	E049	E017	E047	E048	E027	E029	E028

The actuators can be fitted with a limit switch "OPEN" or "CLOSED" or with two limit switches "CLOSED" and "OPEN".

The actuators with spring return E027 - E029 can be fitted with two limit switches "CLOSED" and "OPEN".

Selection

H	B									
	200	300	400	500	600	700	800	900	1000	
200										
300										
400										
500				4/5 Nm						
600										
700										
800									10 Nm	
900										
1000										

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

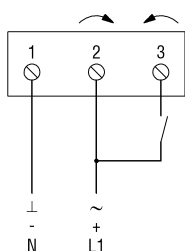
Version (electric actuators)

	2/3-point				0-10 V				Spring return "OPEN" and "CLOSED"				Spring return 0-10 V	
	E044	E047	E045	E048	E046	E049	E016	E017	E021	E027	E020	E029	E023	E028
Torque min. (Nm)	5	10	5	10	5	10	5	10	4	10	4	10	4	10
Operating voltage	24 V AC / 24 V DC		230 V AC		24 V AC / 24 V DC		230 V AC		24 V AC/DC		230 V AC		24 V AC/DC	
Frequency	50 / 60 Hz		50 / 60 Hz		50 / 60 Hz		50 / 60 Hz		50 / 60 Hz		50 / 60 Hz		50 / 60 Hz	
Dimensioning in VA	2	3.5	4	5.5	2	4	4	6.5	7	8.5	7	9.5	5	5.5
Protection class														
Degree of protection	IP54		IP54		IP54		IP54		IP54		IP54		IP54	
Optional auxiliary switch	-	2	-	2	2	2	2	2	-	2	-	2	-	2
ambient temperature	-30°C ... +50°C													
Sound power level max. in dB (A)	35	35	35	35	35	35	35	35	50*	45*	50*	45*	30*	40*

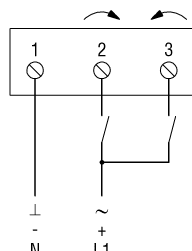
*Spring return actuator 62 dB (A)

Electric terminals 24 V AC / DC, 230 V AC

Two-point

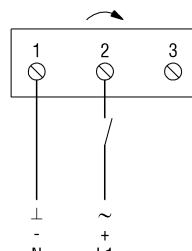


Three-point



Electric terminals 24 V AC / DC, 230 V AC

OPEN/CLOSED control



E027 and E029 actuators have
OPEN - CLOSED control.

LEGEND

Δp_t	(Pa)	=	Pressure loss
v_{stirn}	(m/s)	=	Intake velocity, blower stream 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

ORDER CODE

01	02	03	04	05	06	07	08
Type	Model	Width	Height	Material	Actuator	Damper position	Frame bores
Example							
NK	-SN	-0400	-0200	-SV	-E046	-NA	-RB0

Sample

NK-SN-400-200-SV-E046-NA-RB0

Multi-leaf damper, rectangular design, with plastic bearing, blade height 100 mm | not air-tight | width 400 mm | height 200 mm | galvanised sheet steel | with actuator, 0-10 V (continuous), 5 Nm, 24 V AC/DC | no spring return actuator | without frame bore

ORDER DETAILS

01 - Type

NK = Multi-leaf damper, rectangular design, with plastic bearing, blade height 100 mm

02 - Model

SN = not airtight (standard)
 SL = airtight

03 - Width

0200, 0250, 0300, 0400, 0500, 0600, 0700, 0800, 0900, 1000
 in mm, always four digits

04 - Height

0100, 0200, 0300, 0400, 0500, 0600, 0700, 0800, 0900, 1000
 in mm, always four digits

05 - Material

SV = Galvanised sheet steel (standard)

06 – Actuator

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

Actuator, 2/3-point

E044 = 5 Nm, 24 V AC/DC
 E045 = 5 Nm, 230 V AC
 E047 = 10 Nm, 24 V AC/DC
 E048 = 10 Nm, 230 V AC

Actuator with spring return, 2/3-point

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

Actuator, 0-10 V (continuous)

E046 = 5 Nm, 24 V AC/DC
 E016 = 5 Nm, 230 V AC
 E049 = 10 Nm, 24 V AC/DC
 E017 = 10 Nm, 230 V AC

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

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

Further drives upon request!!!

07 - Damper position

NA = no spring return actuator (standard)
 NO = currentless OPEN – normally open
 NC = currentless OPEN – normally closed (only for actuators with spring return)

08 - Frame bores

RB0 = without frame bores (standard)
 RB2 = frame bore on two sides

Please note!

Accessories must be ordered separately!!!

SPECIFICATION TEXT

Multi-leaf damper, consisting of dimensionally stable profiled frame made of 1.0 mm galvanised sheet steel, frame depth 120 mm, 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 C, at a duct pressure of up to 1000 Pa, with locking device.

The blades are adjusted by means of external plastic gear wheels arranged on one side.

- With plastic bearing, temperature-resistant up to +70 °C.
Product: SCHAKO type **NK-SN-...-SV-M001-...**
- With sintered bearing, temperature-resistant up to +70°C.

Tested according to VDI 6022 Sheets 1+2, as well as DIN 1946 Sheet 2.

Product: SCHAKO type **NK-SL-...-SV-M001-...**

- Damper position:
- No spring return actuator (-NA) (standard)
 - Damper position:
 - Currentless OPEN - normally open (-NO)
 - Currentless CLOSED - normally closed (-NC)
 - only for actuators with spring return
- Frame bore:
 - Without frame bore (-RB0)
 - With frame bore on two sides (-RB2)

Accessories:

- Electric actuator
 - 5 Nm, 24V AC/DC (-E044) / 230 V AC (-E045)
 - 10 Nm, 24V AC/DC (-E047) / 230 V AC (-E048)
 - 5 Nm, 0- 10 V DC 24 V AC/DC (-E046) / 230 V AC (-E016)
 - With 2 adjustable limit switches (-IS2)
 - 10 Nm, 0- 10 V DC 24 V AC/DC (-E049) / 230 V AC (-E017)
 - With 2 adjustable limit switches (-IS2)
- Spring return actuator 4 Nm, 24 V AC/DC (-E021)
- Spring return actuator 10 Nm, 24 V AC/DC (-E027)
 - With 2 adjustable limit switches "CLOSED/OPEN" (-IS2)
- Spring return actuator 4 Nm, 230 V AC (-E020)
- Spring return actuator 10 Nm, 230 V AC (-E029)
 - With 2 adjustable limit switches "CLOSED/OPEN" (-IS2)
- Spring return actuator 0-10 V, 4 Nm, 24 V AC/DC (-E023)
- Spring return actuator 0-10 V, 10 Nm, 24 V AC/DC (-E028)