



**NON-RETURN DAMPER,
VARIANT UL-1**



BEARINGS



BORDER

TYPE UL

FOR INSTALLATION INTO WALLS OR RECTANGULAR DUCTS

Non-return dampers prevent unwanted airflows against the intended airflow direction when the system is not in operation

- Maximum differential pressure: 100 Pa
- Angle section border to be installed in wall openings
- Available in standard sizes and many intermediate sizes
- Non-return damper with formed aluminium blades for normal requirements; blades are fitted with seals for sound attenuation

Optional equipment and accessories

- Installation subframe
- Powder coating (RAL or DB)

Application

Application

- Type UL non-return dampers for installation into internal walls and rectangular ducts
- Prevention of unwanted airflows against the intended airflow direction when the system is not in operation
- Blades close automatically when the system is shut down
- Maximum differential pressure: 100 Pa

Special characteristics

- Any intermediate sizes within the standard size range are available
- operating temperature: $-20 - 80$ °C
- Maximum differential pressure: 100 Pa
- Non-return dampers are opened and closed by the airflow; no actuator is required
- Non-return damper with formed aluminium blades for normal requirements; blades are fitted with seals for sound attenuation

Nominal sizes

- B: 200, 400, 600, 800, 1000, 1200, 1400, 1600 mm (intermediate sizes: 201 – 1599 mm in increments of 1 mm)
- H: 215, 315, 415, 515, 615, 715, 815, 1015, 1215, 1415, 1615 mm (intermediate sizes: 216 – 1614 mm, in increments of 1 mm)
- Any combination of B × H

Description



Variants

- UL-1: Non-return damper for airflows directed towards the installation side
- UL-2: Non-return damper for airflows directed towards the rear side (suction)

Parts and characteristics

- Border
- Blades with low-friction bearings
- Blade restrictors
- Blade tip seals
- Bottom travel stop (angle section)
- Visible mullion from B = 997 mm

Accessories

- Installation subframe: Installation subframe for the fast and simple installation of mechanically self-powered dampers

Construction features

- Border, material thickness 1.75 mm
- Blades, material thickness 1.0 mm
- Additional side bar with fixing holes to accommodate the blade shafts and integral blade restrictors (pins)
- Blade restrictors prevent the blades from opening beyond a certain angle
- Border fixing holes

Materials and surfaces

- Border, mullion and travel stop (angle section) made of galvanised sheet steel
- Blades made of formed aluminium
- Blade shafts made of brass
- Side bar made of PVC plastic
- Blade tip seals made of foamed polyester
- Blade restrictors made of plastic
- P1: Powder-coated, RAL CLASSIC colour
- PS: Powder-coated, DB colour

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

TECHNICAL INFORMATION

FUNCTION, TECHNICAL DATA, QUICK SIZING, SPECIFICATION TEXT, ORDER CODE, RELATED PRODUCTS



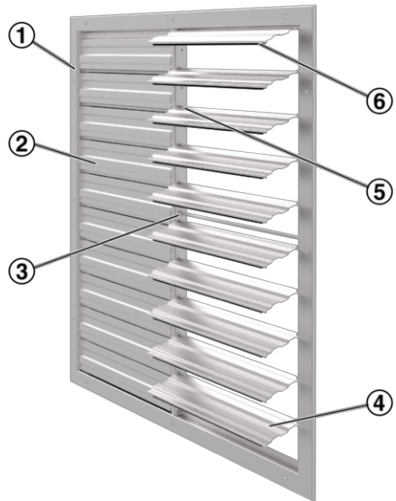
Functional description

Non-return dampers open and close automatically.

When the system is in operation, the blades open when air flows.

When the system is shut down, the blades close due to their weight. They safely prevent air from flowing against the intended airflow direction.

Schematic illustration of UL-1



- ① Border
- ② Blades (closed)
- ③ Mullion from B = 997 mm
- ④ Blades (open)
- ⑤ Blade restrictor
- ⑥ Seal

Schematic illustration of UL-2



- ① Border
- ② Blades (closed)
- ③ Mullion from B = 997 mm
- ④ Blades (open)
- ⑤ Blade restrictor
- ⑥ Seal

Nominal sizes	200 × 215 to 1600 × 1615 mm
Volume flow rate range	110 – 6460 l/s or 396 – 23256 m³/h at 2.5 m/s
Total differential pressure	25 Pa at 2.5 m/s
Maximum differential pressure in closing direction	100 Pa
Operating temperature	–20 to 80 °C

Quick sizing tables provide a good overview of the volume flow rates with an airflow velocity of 2.5 m/s. Intermediate values can be interpolated.

Sizing example

Given data

$V = 2000 \text{ l/s}$ (7200 m³/h)

$v = 2.5 \text{ m/s}$

Fresh air

Maximum width: 1000 mm

Quick sizing

UL-2/1000×815

Calculation procedure

$A = 1.000 \times 0.815 = 0.815 \text{ m}^2$

$v = V/A = 2000/0.815 (/1000) = 2.5 \text{ m/s}$

$\Delta p_t = 30 \text{ Pa}$

UL, KUL: Width 200 – 600 mm, volume flow rate at 2.5 m/s

H	B [mm]									
	200		300		400		500		600	
mm	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h
215	110	396	160	576	215	774	270	972	325	1170
315	160	576	235	846	315	1134	395	1422	475	1710
415	210	756	310	1116	415	1494	520	1872	625	2250
515	260	936	385	1386	515	1854	645	2322	775	2790
615	310	1116	460	1656	615	2214	770	2772	925	3330
715	360	1296	535	1926	715	2574	895	3222	1070	3852
815	410	1476	610	2196	815	2934	1020	3672	1220	4392
1015	510	1836	760	2736	1020	3672	1270	4572	1520	5472
1215	610	2196	910	3276	1220	4392	1520	5472	1820	6552
1415	710	2556	1060	3816	1420	5112	1770	6372	2120	7632
1615	810	2916	1210	4356	1620	5832	2020	7272	2420	8712

UL, KUL: Width 800 – 1600 mm, volume flow rate at 2.5 m/s

H	B [mm]									
	800		1000		1200		1400		1600	
mm	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h
215	430	1548	540	1944	645	2322	755	2718	860	3096
315	630	2268	790	2844	945	3402	1100	3960	1260	4536
415	830	2988	1040	3744	1250	4500	1450	5220	1660	5976
515	1030	3708	1290	4644	1550	5580	1800	6480	2060	7416
615	1230	4428	1540	5544	1850	6660	2150	7740	2460	8856
715	1430	5148	1790	6444	2150	7740	2500	9000	2860	10296
815	1630	5868	2040	7344	2450	8820	2850	10260	3260	11736
1015	2030	7308	2540	9144	3050	10980	3550	12780	4060	14616
1215	2430	8748	3040	10944	3650	13140	4250	15300	4860	17496
1415	2830	10188	3540	12744	4250	15300	4950	17820	5660	20376
1615	3230	11628	4040	14544	4850	17460	5650	20340	6460	23256

Differential pressure

v	UL-1	UL-2
	Δp_t	
m/s	Pa	
0.5	10	12
1	16	18
2	20	24
3	25	30
4	30	40
5	40	55
6	45	65

Rectangular non-return dampers to prevent air from flowing against the intended airflow direction; for installation into internal walls and into rectangular ducts.

Ready-to-install component which consists of a border, blades with low-friction bearings, and travel stop and sealing parts.

Special characteristics

- Any intermediate sizes within the standard size range are available
- operating temperature: $-20 - 80$ °C
- Maximum differential pressure: 100 Pa
- Non-return dampers are opened and closed by the airflow; no actuator is required
- Non-return damper with formed aluminium blades for normal requirements; blades are fitted with seals for sound attenuation

Materials and surfaces

- Border, mullion and travel stop (angle section) made of galvanised sheet steel
- Blades made of formed aluminium
- Blade shafts made of brass
- Side bar made of PVC plastic
- Blade tip seals made of foamed polyester
- Blade restrictors made of plastic
- P1: Powder-coated, RAL CLASSIC colour
- PS: Powder-coated, DB colour

Technical data

- Nominal sizes: 200×215 to 1600×1615 mm
- Volume flow rate range: 110 – 6460 l/s or 396 – 23256 m³/h at 2.5 m/s
- Total differential pressure: 25 Pa at 2.5 m/s
- Maximum differential pressure in closing direction: 100 Pa
- Operating temperature: -20 to 80 °C

Sizing data

- V _____ [m³/h]
- Δp_{st} _____ [Pa]

Air-regenerated noise

- L_{WA} _____ [dB(A)]

Order example: UL-2/600x1615/ER

Direction of airflow	Towards the rear
Nominal size	600 × 1615 mm
Installation subframe	With
Surface	Standard construction

UL – 1 / 800x515 / ER / P1 – RAL ...



1 Type

UL Non-return damper

2 Airflow direction

- 1 Airflow directed towards the installation side
- 2 Airflow directed towards the rear side (suction)

3 Nominal size [mm]

B x H

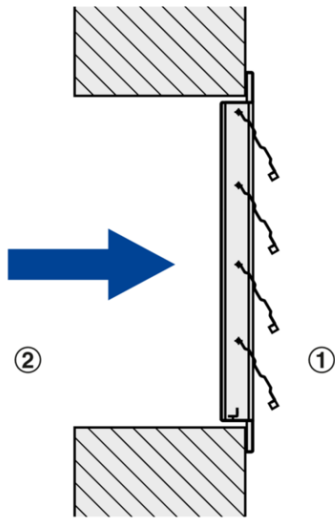
4 Installation subframe

- No entry: none
- ER With

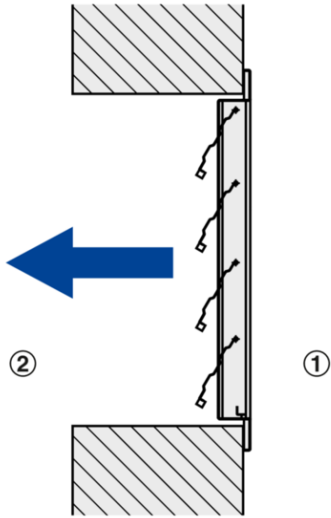
5 Surface

- No entry: standard construction
- P1 Powder-coated, RAL CLASSIC colour
- PS Powder-coated, DB colour

Gloss level
RAL 9010 50 %
RAL 9006 30 %
All other RAL colours 70 %



① Installation side ② Rear side



① Installation side ② Rear side

Accessories
[Type Installation subframe](#)

Dimensions and weight, Product details



- B: 200 – 1600 mm, intermediate sizes 201 – 1599 in increments of 1 mm
- H: 215 – 1615 mm, intermediate sizes 216 – 1614 mm in increments of 1 mm
- The weight for the next larger size applies

Flow cross section to calculate the airflow velocity

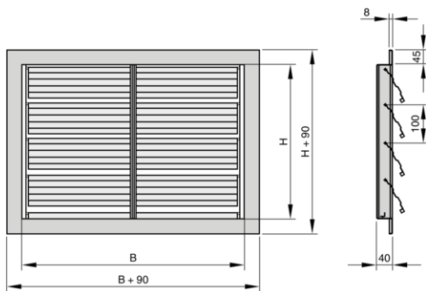
- $A = B \times H$

Unit of measure for B and H: m

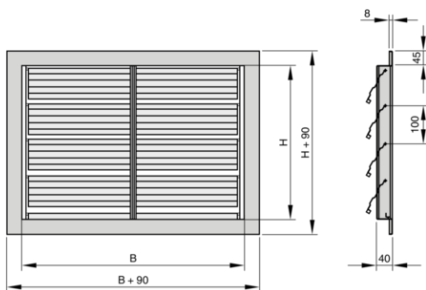
UL, weights

H	B [mm]									
	200	300	400	500	600	800	1000	1200	1400	1600
mm	kg									
215	3	3	3	4	4	5	6	7	8	9
315	3	3	4	4	5	6	7	8	9	10
415	3	4	4	5	5	6	7	8	9	10
515	4	4	5	5	6	7	8	9	10	11
615	4	5	5	6	7	8	9	10	11	12
715	5	5	6	7	8	9	10	11	12	13
815	5	6	7	8	9	10	11	12	13	14
1015	7	8	9	10	11	12	13	14	15	16
1215	9	10	11	12	13	14	15	16	17	18
1415	11	12	13	14	15	16	17	18	19	20
1615	13	14	15	16	17	18	19	20	21	22

UL-1



UL-2



UL: Standard sizes, width, no. of flange holes

Width		No. of holes	
B	n	T ₁	T ₂
mm		mm	
200	1	–	100
300	1	–	150
400	2	303	48.5
500	2	403	48.5
600	3	252	48.5
800	3	352	48.5
1000	3	452	48.5
1200	3	552	48.5
1400	3	652	48.5
1600	4	501	48.5

UL: Standard sizes, height, no. of flange holes

Height		No. of holes	
H	n	T ₃	T ₄
mm		mm	
215	1	–	107.5
315	1	–	157.5
415	1	–	207.5
515	1	–	257.5
615	2	320	147.5
715	2	420	147.5
815	3	260	147.5
1015	3	360	147.5
1215	3	460	147.5
1415	3	560	147.5
1615	4	440	147.5

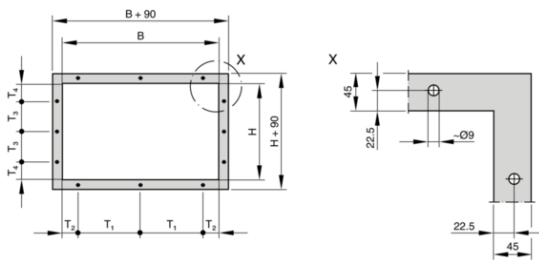
UL: Intermediate sizes, width, no. of flange holes

Width	No. of holes		
B	n	T ₁	T ₂
mm		mm	
201 – 396	1	–	B/2
397 – 596	2	B – 97	48.5
597 – 1596	3	(B – 97)/2	48.5
1597 – 1599	4	(B – 97)/3	48.5

UL: Intermediate sizes, height, no. of flange holes

Height	No. of holes		
H	n	T ₃	T ₄
mm		mm	
216 – 614	1	–	H/2
616 – 814	2	H – 295	147.5
816 – 1614	3	(H – 295)/2	147.5

Border fixing holes – UL



Installation details, Basic information and nomenclature

Installation and commissioning

- Horizontal airflow: Vertical installation
- Vertical airflow: Installation into ceilings, upward airflow; horizontal installation
- Straight upstream section required (at least B + H) on the positive pressure side of fans
- Ensure a gradual start-up of fans to avoid a sudden pressure increase
- Only for installation in internal spaces

Installation into an internal wall, without installation subframe

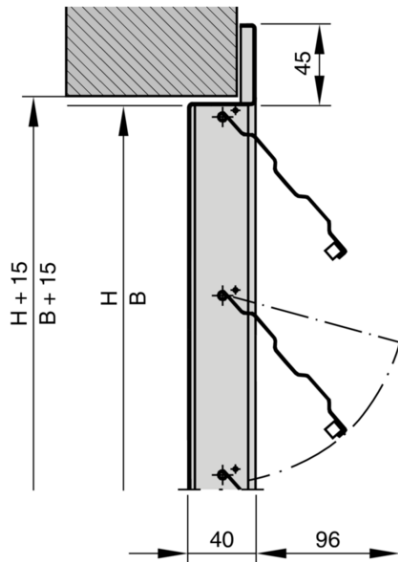
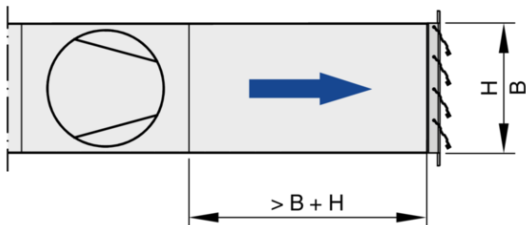


Illustration shows variant UL-1

Installation on the discharge side of a fan



The airflow downstream of a fan is characterised by strong turbulence, and the velocity profile is not uniform. As a consequence, the blades of the non-return dampers are not uniformly subject to the airflow, and this may result in individual blades becoming subject to forces that might lead to mechanical damage.

Safe operation requires a straight upstream section of at least $B + H$.

Nomenclature

L_{WA} [dB(A)]

A-weighted sound power level of air-regenerated noise for the mechanically self-powered damper

A [m²]

Upstream cross section

v [m/s]

Airflow velocity based on the upstream cross section

V [m³/h] and [l/s]

Volume flow rate

Δp_{st} [Pa]

Static differential pressure

Δp_t [Pa]

Total differential pressure

All sound power levels are based on 1 pW.

Principal dimensions

B [mm]

Duct width

H [mm]

Duct height

n []

Number of flange screw holes

m [kg]

Weight

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