



**ACOUSTIC LOUVRE,  
VARIANT NL-A**

## NL

### WITH SOUND REDUCTION CHARACTERISTICS

Acoustic louvres as a protection of air conditioning systems against the direct ingress of rain, leaves and birds into fresh air and exhaust air openings

- Maximum width of 1800 mm, maximum height of 2250 mm
- Low differential pressure due to aerofoil blades
- Low air-regenerated noise
- All aerodynamic data is measured in aerodynamics and acoustics laboratories
- Absorption material faced with glass fibre fabric and retained by perforated sheet metal
- Double bank of louvre blades for demanding acoustic requirements
- Non-active section, without acoustic function, for a uniform appearance
- Multi-section constructions for large dimensions

Optional equipment and accessories

- Powder-coated

## Application



### Application

- Acoustic louvres of Type NL for the fresh air and exhaust air openings of air conditioning systems
- Protection against the direct ingress of rain as well as against leaves and birds
- Recommended face velocity for fresh air openings: 2 – 2.5 m/s max.
- Weather and noise protection with a compact-depth unit

### Special characteristics

- Two construction depths for normal and demanding acoustic requirements
- Aerofoil blades
- Absorption material retained by perforated sheet metal

### Nominal sizes

- B: 300, 450, 600, 750, 900, 1050, 1200, 1350, 1500, 1650, 1800 mm

- Width subdivided: 1950, 2100, 2250, 2400, 2550, 2700, 2850, 3000, 3150, 3300, 3450, 3600 mm
- H: 450, 600, 750, 900, 1050, 1200, 1350, 1500, 1650, 1800, 1950, 2100, 2250 mm
- Height subdivided: 2400, 2550, 2700, 2850, 3000, 3150, 3300, 3450, 3600, 3750, 3900, 4050, 4200, 4350, 4500 mm
- Any combination of B × H
- Other dimensions upon request

## Description

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### Variants

- NL: Acoustic louvre
- NL-H: Double bank for demanding acoustic requirements
- NL-D: Non-active section for a uniform appearance

### Construction

- S: Galvanised sheet steel
- A: Aluminium

### Parts and characteristics

- Casing
- Sound absorbing blades (NL, NL-D)
- Bird mesh (NL, NL-D)
- Blades (NL-D)
- Rear blanking plate (NL-D)

### Construction features

- Aerofoil blades, 150 mm blade pitch
- Casing with fixing holes for wall installation
- Absorption material faced with glass fibre fabric and retained by perforated sheet metal (NL, NL-H)
- Bird mesh 12 × 12 × 1 mm (NL, NL-H)

### Materials and surfaces

- Casing and blades made of galvanised sheet steel (S) or aluminium (A)
- Perforated sheet metal to retain absorption material is made of galvanised sheet steel (NL, NL-H)
- Bird mesh made of galvanised steel (NL, NL-H)
- Absorption material is mineral wool (NL, NL-H)

### Mineral wool

- To EN 13501, fire rating class A1, non-combustible
- RAL quality mark RAL-GZ 388
- Biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EG
- Faced with glass fibre fabric as a protection against erosion through airflow velocities of up to 20 m/s
- Inert to fungal and bacterial growth

### Standards and guidelines

- Insertion loss and sound power level of air-regenerated noise tested to ISO 7235
- Sound reduction index determined according to EN ISO 10140-2 und EN ISO 717-1

### Maintenance

- Maintenance-free as construction and materials are not subject to wear

## TECHNICAL INFORMATION

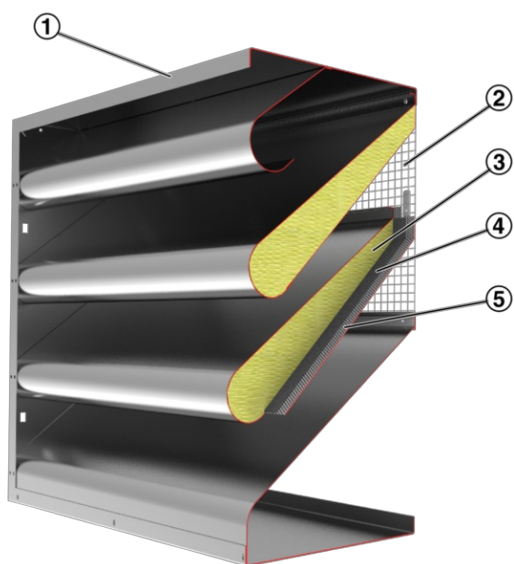
### Functional description

External weather louvres are externally mounted air transfer devices for the fresh air and exhaust air of air conditioning systems. They are installed in external walls and façades. Their narrowly arranged blades give good protection against the direct ingress of rain as well as against leaves and birds.

Under certain unfavourable conditions, such as heavy rain, and depending on the airflow velocity it might happen that slight quantities of water enter together with the air.

This is why the airflow velocity in fresh air openings should not exceed 2 – 2.5 m/s.

### Schematic illustration of NL



- ① Casing
- ② Bird mesh
- ③ Absorption material
- ④ Glass fibre fabric
- ⑤ Perforated sheet metal

<b>Nominal sizes</b>	300 × 450 to 1800 × 2250 mm
<b>Width subdivided</b>	Up to 3600 mm
<b>Height subdivided</b>	Up to 4500 mm
<b>Volume flow rate range (undivided construction)</b>	120 – 9360 l/s or 432 – 33696 m <sup>3</sup> /h at max. 2.5 m/s

#### Insertion loss

Variant	Centre frequency fm [Hz]							
	63	125	250	500	1000	2000	4000	8000
Variant	D <sub>e</sub>							
	dB							
<b>NL</b>	3	4	7	8	13	15	13	15
<b>NL-H</b>	3	6	9	16	21	24	24	30

#### Sound reduction index

Variant	Centre frequency fm [Hz]							R <sub>w</sub>
	63	125	250	500	1000	2000	4000	
Variant	R							
	dB							
<b>NL</b>	–	6	6	9	13	14	–	12
<b>NL-H</b>	–	7	9	16	25	27	–	21

Quick sizing tables provide a good overview of the volume flow rates with an airflow velocity of 2.5 m/s. Values for intermediate widths can be interpolated. Precise intermediate values and volume flow rates for other airflow velocities can be calculated with our Easy Product Finder design programme.

The sound power levels L<sub>WA</sub> apply to external weather louvres with a flow cross section of 1 m<sup>2</sup>.

**NL, width 300 – 1050 mm, volume flow rate at max. 2.5 m/s**

Height	Width [mm]											
	300		450		600		750		900		1050	
mm	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h
450	120	432	180	648	240	864	300	1080	360	1296	420	1512
600	240	864	360	1296	480	1728	600	2160	720	2592	840	3024
750	360	1296	540	1944	720	2592	900	3240	1080	3888	1260	4536
900	480	1728	720	2592	960	3456	1200	4320	1440	5184	1680	6048
1050	600	2160	900	3240	1200	4320	1500	5400	1800	6480	2100	7560
1200	720	2592	1080	3888	1440	5184	1800	6480	2160	7776	2520	9072
1350	840	3024	1260	4536	1680	6048	2100	7560	2520	9072	2940	10584
1500	960	3456	1440	5184	1920	6912	2400	8640	2880	10368	3360	12096
1650	1080	3888	1620	5832	2160	7776	2700	9720	3240	11664	3780	13608
1800	1200	4320	1800	6480	2400	8640	3000	10800	3600	12960	4200	15120
1950	1320	4752	1980	7128	2640	9504	3300	11880	3960	14256	4620	16632
2100	1440	5184	2160	7776	2880	10368	3600	12960	4320	15552	5040	18144
2250	1560	5616	2340	8424	3120	11232	3900	14040	4680	16848	5460	19656

NL, width 1200 – 1800 mm, volume flow rate at max. 2.5 m/s

Height	Width [mm]									
	1200		1350		1500		1650		1800	
mm	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h	l/s	m³/h
450	480	1728	540	1944	600	2160	660	2376	720	2592
600	960	3456	1080	3888	1200	4320	1320	4752	1440	5184
750	1440	5184	1620	5832	1800	6480	1980	7128	2160	7776
900	1920	6912	2160	7776	2400	8640	2640	9504	2880	10368
1050	2400	8640	2700	9720	3000	10800	3300	11880	3600	12960
1200	2880	10368	3240	11664	3600	12960	3960	14256	4320	15552
1350	3360	12096	3780	13608	4200	15120	4620	16632	5040	18144
1500	3840	13824	4320	15552	4800	17280	5280	19008	5760	20736
1650	4320	15552	4860	17496	5400	19440	5940	21384	6480	23328
1800	4800	17280	5400	19440	6000	21600	6600	23760	7200	25920
1950	5280	19008	5940	21384	6600	23760	7260	26136	7920	28512
2100	5760	20736	6480	23328	7200	25920	7920	28512	8640	31104
2250	6240	22464	7020	25272	7800	28080	8580	30888	9360	33696

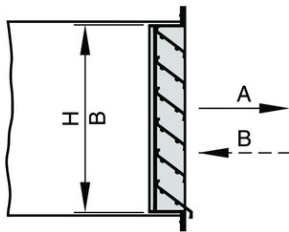
NL, differential pressure and sound power level

v	v <sub>t</sub>	Installation type							
		A		B		C		D	
v	v <sub>t</sub>	Δp <sub>t</sub>	L <sub>WA</sub>	Δp <sub>t</sub>	L <sub>WA</sub>	Δp <sub>t</sub>	L <sub>WA</sub>	Δp <sub>t</sub>	L <sub>WA</sub>
m/s		Pa	dB(A)	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)
1.5	0.2 – 0.4	2	<15	2	<15	2	<15	1	<15
2	0.2 – 0.6	4	<15	4	<15	4	<15	4	<15
4	0.4 – 1.2	18	32	14	28	18	29	14	27
6	0.7 – 1.7	40	44	30	40	40	41	28	39
8	0.9 – 2.3	70	52	50	48	65	49	50	47
10	1.1 – 2.9	110	58	80	54	105	55	75	53

**NL-H, Differential pressure and sound power level**

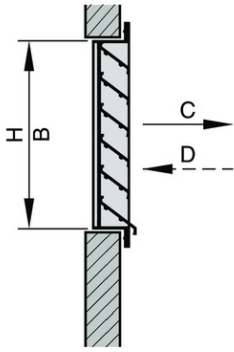
v	v <sub>t</sub>	Installation type							
		A		B		C		D	
v	v <sub>t</sub>	Δp <sub>t</sub>	L <sub>WA</sub>	Δp <sub>t</sub>	L <sub>WA</sub>	Δp <sub>t</sub>	L <sub>WA</sub>	Δp <sub>t</sub>	L <sub>WA</sub>
m/s		Pa	dB(A)	Pa	dB(A)	Pa	dB(A)	Pa	dB(A)
1	0.1 – 0.3	2	<15	2	<15	2	<15	2	<15
2	0.2 – 0.6	8	26	6	19	6	18	6	18
3	0.3 – 0.9	16	37	12	30	12	29	12	29
4	0.4 – 1.2	26	45	20	38	20	37	20	37
5	0.6 – 1.5	40	52	30	45	30	44	30	44
7	0.8 – 2.0	80	61	65	54	60	53	60	53

Installation into rectangular ducts (installation types A and B)



A Exhaust air  
B Fresh air

Plenum installation (installation types C and D)



C Exhaust air  
D Fresh air

Rectangular acoustic louvres as a protection of air conditioning systems against the direct ingress of rain, leaves and birds into fresh air and exhaust air openings.

Ready-to-install component which consists of a border, aerofoil rain defence blades, and a wire mesh at the rear.

Insertion loss measured according to ISO 7235, sound reduction index measured according to EN ISO 10140-2.

#### Special characteristics

- Two construction depths for normal and demanding acoustic requirements
- Aerofoil blades
- Absorption material retained by perforated sheet metal

#### Materials and surfaces

- Casing and blades made of galvanised sheet steel (S) or aluminium (A)
- Perforated sheet metal to retain absorption material is made of galvanised sheet steel (NL, NL-H)
- Bird mesh made of galvanised steel (NL, NL-H)
- Absorption material is mineral wool (NL, NL-H)

#### Mineral wool

- To EN 13501, fire rating class A1, non-combustible
- RAL quality mark RAL-GZ 388
- Biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EG
- Faced with glass fibre fabric as a protection against erosion through airflow velocities of up to 20 m/s
- Inert to fungal and bacterial growth

#### Construction

- S: Galvanised sheet steel
- A: Aluminium

#### Technical data

- Nominal sizes: 300 × 450 to 1800 × 2250 mm
- Width subdivided: up to 3600 mm
- Height subdivided: Up to 4500 mm
- Volume flow rate range (undivided construction): 120 – 9360 l/s or 432 – 33696 m<sup>3</sup>/h at 2.5 m/s
- Total differential pressure – exhaust air (single louvre): 30 – 100 Pa (depending on height) at 1.75 m/s
- Total differential pressure – fresh air (single louvre): 25 – 75 Pa (depending on height) at 1.75 m/s

#### Sizing data

- V \_\_\_\_\_ [m<sup>3</sup>/h]
- $\Delta p_t$  \_\_\_\_\_ [Pa]

#### Air-regenerated noise

- $L_{WA}$  \_\_\_\_\_ [dB(A)]

#### Weighted sound reduction index

- $R_w$  \_\_\_\_\_ [dB]

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design programme.



Order example: NL-H-S/1050x750

Acoustic performance	High
Material	Galvanised steel
Nominal size	1050x750 mm
Surface	Standard construction

**NL – H – A / 1800x2250 / P1 – RAL ...**



**1** Type

NL Acoustic louvre

**4** Nominal size [mm]

B x H

**2** Acoustic performance

No entry: standard requirement, single louvre  
H High, double bank  
D Non-active section

**5** Surface

No entry: standard construction  
P1 Powder-coated, RAL Classic colour

**3** Material

S Galvanised steel  
A Raw aluminium

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

## Variants, Dimensions and weight



NL

### Variant

- Acoustic louvre

### Parts and characteristics

- Casing
- Sound absorbing blades
- Bird mesh

### Construction features

- Aerofoil blades, 150 mm blade pitch
- Casing with fixing holes for wall installation
- Absorption material faced with glass fibre fabric and retained by perforated sheet metal
- Bird mesh 12 x 12 x 1 mm

### Materials and surfaces

- Casing and blades made of galvanised sheet steel (S) or aluminium (A)
- Perforated sheet metal to retain absorption material is made of galvanised sheet steel
- Bird mesh made of galvanised steel

- Absorption material is mineral wool

#### Mineral wool

- To EN 13501, fire rating class A1, non-combustible
- RAL quality mark RAL-GZ 388
- Biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EG
- Faced with glass fibre fabric as a protection against erosion through airflow velocities of up to 20 m/s
- Inert to fungal and bacterial growth

#### NL-H

##### Variant

- High performance acoustic louvre (double bank)

##### Parts and characteristics

- Casing
- Sound absorbing blades
- Bird mesh

##### Construction features

- Aerofoil blades, 150 mm blade pitch
- Casing with fixing holes for wall installation
- Absorption material faced with glass fibre fabric and retained by perforated sheet metal
- Bird mesh 12 × 12 × 1 mm

##### Materials and surfaces

- Casing and blades made of galvanised sheet steel (S) or aluminium (A)
- Perforated sheet metal to retain absorption material is made of galvanised sheet steel
- Bird mesh made of galvanised steel
- Absorption material is mineral wool

#### Mineral wool

- To EN 13501, fire rating class A1, non-combustible
- RAL quality mark RAL-GZ 388
- Biosoluble and hence hygienically safe according to the German TRGS 905 (Technical Rules for Hazardous Substances) and EU directive 97/69/EG
- Faced with glass fibre fabric as a protection against erosion through airflow velocities of up to 20 m/s
- Inert to fungal and bacterial growth

#### NL-D

##### Variant

- Non-active section for a uniform appearance

##### Parts and characteristics

- Casing
- Blades
- Rear blanking plate

##### Construction features

- Aerofoil blades, 150 mm blade pitch
- Casing with fixing holes for wall installation

##### Materials and surfaces

- Casing and blades made of galvanised sheet steel (S) or aluminium (A)

**Materials**

Part	Order code detail	Material	Notes
Casing and blades	S	Galvanised sheet steel	
	A	Aluminium	
Perforated sheet metal to retain absorption material	–	Galvanised sheet steel	Only NL, NL-H
Bird mesh	–	Galvanised steel	Only NL, NL-H
Absorption material	–	Mineral wool	Only NL, NL-H

**Surfaces**

Part	Order code detail	Surface	Notes
Casing and blades	–	Untreated	
	P1-RAL ...	Powder-coated, RAL colour ... CLASSIC	

**NL-S, Weight**

H	B [mm]										
	300	450	600	750	900	1050	1200	1350	1500	1650	1800
mm	kg										
450	7	10	13	16	19	23	26	29	32	36	39
600	9	13	17	22	26	30	35	39	43	48	52
750	11	16	22	27	32	38	43	49	54	59	65
900	13	19	26	32	39	45	52	58	65	71	78
1050	15	23	30	38	45	53	61	68	76	83	91
1200	17	26	35	43	52	61	69	78	86	95	104
1350	19	29	39	49	58	68	78	88	97	107	117
1500	22	32	43	54	65	76	86	97	108	119	130
1650	24	36	48	59	71	83	95	107	119	131	143
1800	26	39	52	65	78	91	104	117	130	143	156
1950	28	42	56	70	84	98	112	126	140	154	169
2100	30	45	61	76	91	106	121	136	151	166	181
2250	32	49	65	81	97	113	130	146	162	178	194

**NL-A, weight**

H	B [mm]										
	300	450	600	750	900	1050	1200	1350	1500	1650	1800
mm	kg										
450	5	7	10	12	14	17	19	21	24	26	28
600	6	10	13	16	19	22	25	28	32	35	38
750	8	12	16	20	24	28	32	35	39	43	47
900	10	14	19	24	28	33	38	43	47	52	57
1050	11	17	22	28	33	39	44	50	55	61	66
1200	13	19	25	32	38	44	50	57	63	69	76
1350	14	21	28	35	43	50	57	64	71	78	85
1500	16	24	32	39	47	55	63	71	79	87	95
1650	17	26	35	43	52	61	69	78	87	95	104
1800	19	28	38	47	57	66	76	85	95	104	113
1950	21	31	41	51	61	72	82	92	102	113	123
2100	22	33	44	55	66	77	88	99	110	121	132
2250	24	35	47	59	71	83	95	106	118	130	142

NL-H-S, weight

H	B [mm]										
	300	450	600	750	900	1050	1200	1350	1500	1650	1800
mm	kg										
450	13	19	26	32	39	45	52	58	65	71	78
600	17	26	35	43	52	61	69	78	86	95	104
750	22	32	43	54	65	76	86	97	108	119	130
900	26	39	52	65	78	91	104	117	130	143	156
1050	30	45	61	76	91	106	121	136	151	166	181
1200	35	52	69	86	104	121	138	156	173	190	207
1350	39	58	78	97	117	136	156	175	194	214	233
1500	43	65	86	108	130	151	173	194	216	238	259
1650	48	71	95	119	143	166	190	214	238	261	285
1800	52	78	104	130	156	181	207	233	259	285	311
1950	56	84	112	140	169	197	225	253	281	309	337
2100	61	91	121	151	181	212	242	272	302	333	363
2250	65	97	130	162	194	227	259	292	324	356	389

NL-H-A, weight

H	B [mm]										
	300	450	600	750	900	1050	1200	1350	1500	1650	1800
mm	kg										
450	10	14	19	24	28	33	38	43	47	52	57
600	13	19	25	32	38	44	50	57	63	69	76
750	16	24	32	39	47	55	63	71	79	87	95
900	19	28	38	47	57	66	76	85	95	104	113
1050	22	33	44	55	66	77	88	99	110	121	132
1200	25	38	50	63	76	88	101	113	126	139	151
1350	28	43	57	71	85	99	113	128	142	156	170
1500	32	47	63	79	95	110	126	142	158	173	189
1650	35	52	69	87	104	121	139	156	173	191	208
1800	38	57	76	95	113	132	151	170	189	208	227
1950	41	61	82	102	123	143	164	184	205	225	246
2100	44	66	88	110	132	154	176	199	221	243	265
2250	47	71	95	118	142	165	189	213	236	260	284

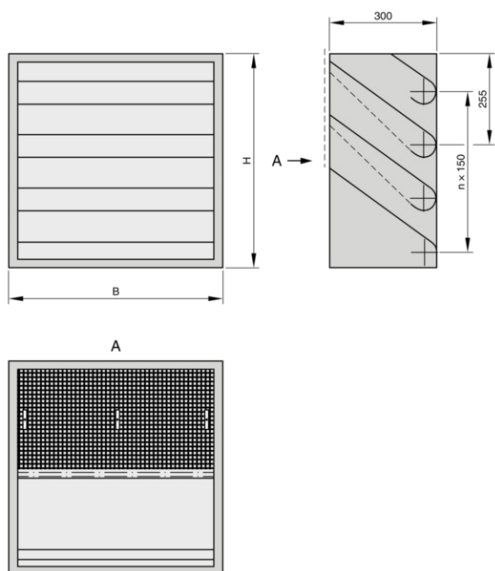
NL-D-S, weight

H	B [mm]										
	300	450	600	750	900	1050	1200	1350	1500	1650	1800
mm	kg										
450	3	5	7	8	10	11	13	15	16	18	19
600	4	7	9	11	13	15	17	19	22	24	26
750	5	8	11	14	16	19	22	24	27	30	32
900	7	10	13	16	19	23	26	29	32	36	39
1050	8	11	15	19	23	27	30	34	38	42	45
1200	9	13	17	22	26	30	35	39	43	48	52
1350	10	15	19	24	29	34	39	44	49	54	58
1500	11	16	22	27	32	38	43	49	54	59	65
1650	12	18	24	30	36	42	48	54	59	65	71
1800	13	19	26	32	39	45	52	58	65	71	78
1950	14	21	28	35	42	49	56	63	70	77	84
2100	15	23	30	38	45	53	61	68	76	83	91
2250	16	24	32	41	49	57	65	73	81	89	97

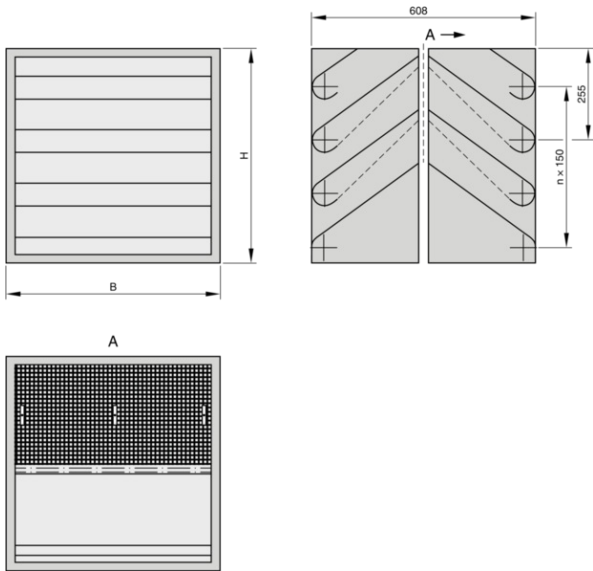
NL-D-A, weight

H	B [mm]										
	300	450	600	750	900	1050	1200	1350	1500	1650	1800
mm	kg										
450	2	4	5	6	7	8	10	11	12	13	14
600	3	5	6	8	10	11	13	14	16	17	19
750	4	6	8	10	12	14	16	18	20	22	24
900	5	7	10	12	14	17	19	21	24	26	28
1050	6	8	11	14	17	19	22	25	28	30	33
1200	6	10	13	16	19	22	25	28	32	35	38
1350	7	11	14	18	21	25	28	32	35	39	43
1500	8	12	16	20	24	28	32	35	39	43	47
1650	9	13	17	22	26	30	35	39	43	48	52
1800	10	14	19	24	28	33	38	43	47	52	57
1950	10	15	21	26	31	36	41	46	51	56	61
2100	11	17	22	28	33	39	44	50	55	61	66
2250	12	18	24	30	35	41	47	53	59	65	71

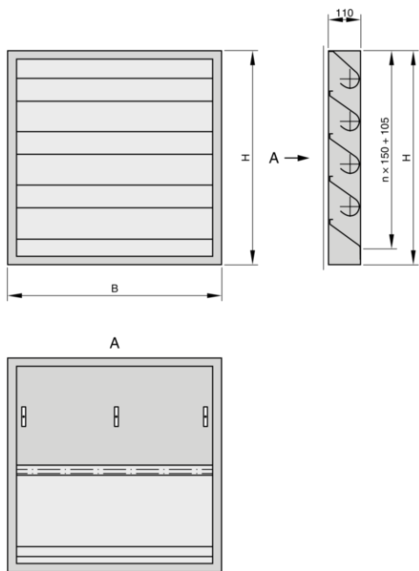
NL



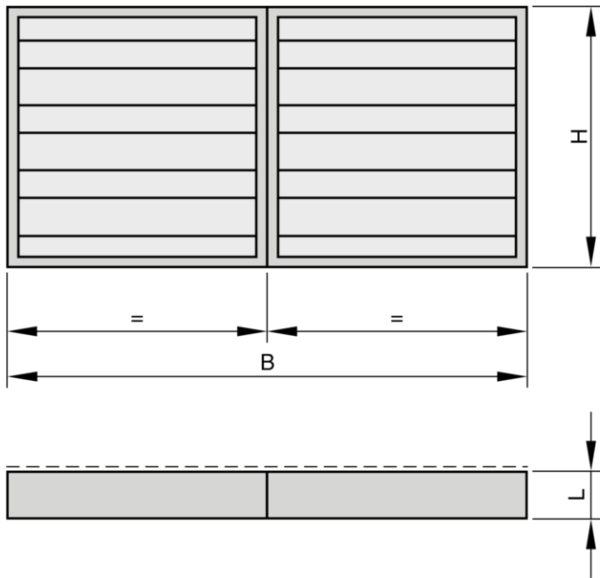
NL-H



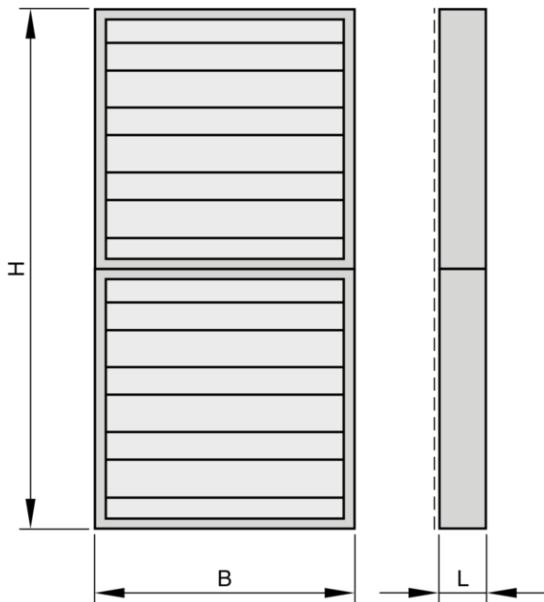
NL-D



NL width subdivided

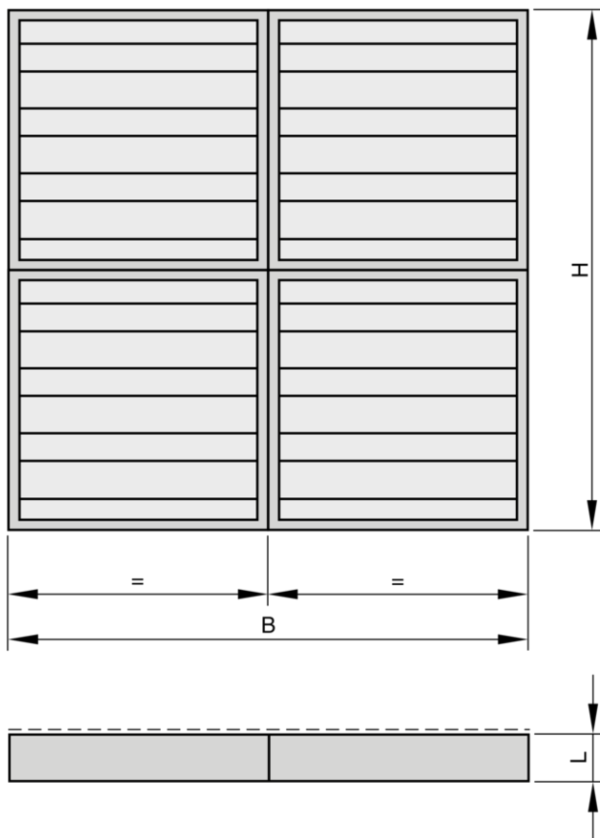


NL height subdivided



NL width and height subdivided





## Installation details, Basic information and nomenclature



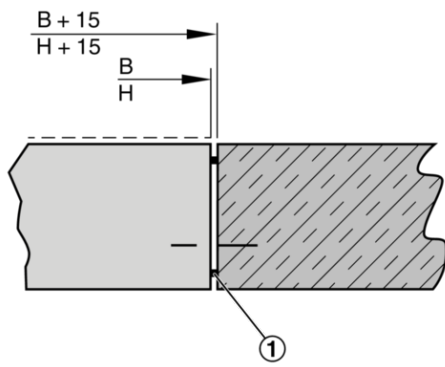
### Installation and commissioning

- Installation either without installation subframe or with timber subframe, fixing angles, or steel frame made of angle sections (to be provided by others)
- Install subdivided constructions either horizontally next to each other or vertically on top of each other
- Seal perimeter gap with mastic
- Fix cover strips

### Installation information

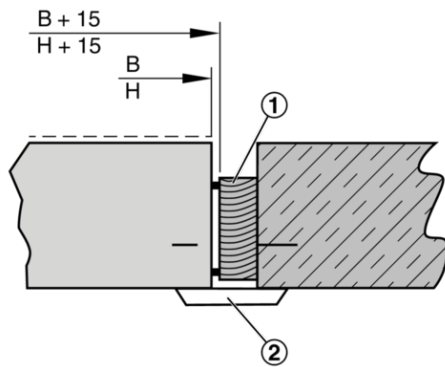
- Casing with slotted holes of 10 × 15 mm along the side panels

### Wall installation



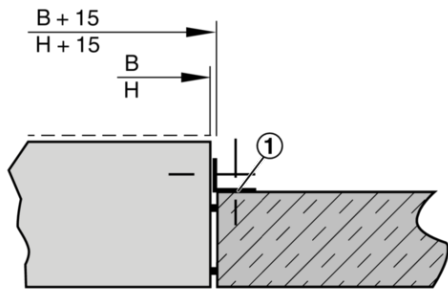
① Mastic, to be provided by others

Wall installation with a timber frame



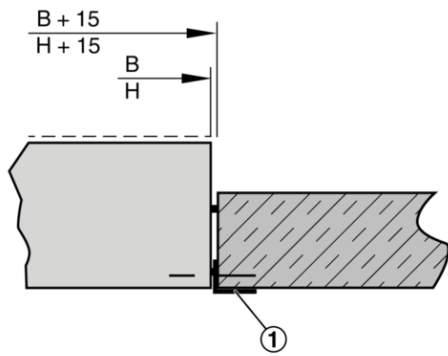
- ① Timber frame, to be provided by others
- ② Optional cover strip, to be performed by others

Wall installation with mounting brackets



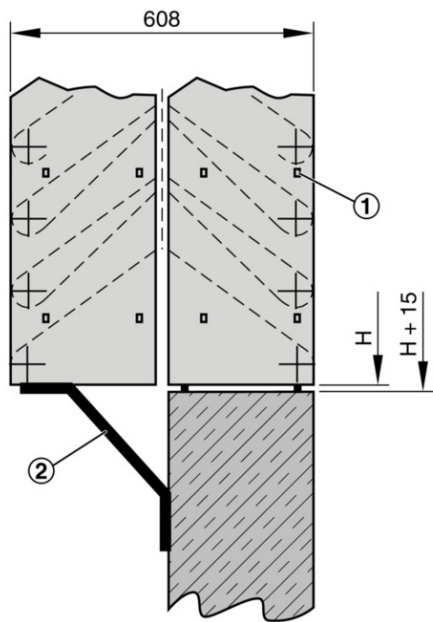
① Mounting brackets, to be provided by others

Wall installation with a steel frame made of angle sections



① Steel frame made of angle sections, to be provided by others

Wall installation of NL-H



- ① 10 mm wide slotted holes, 300 mm pitch (from centre line to centre line)
- ② Support for mesh at the rear, to be provided by others

**Nomenclature**

**$L_{WA}$  [dB(A)]**

A-weighted sound power level of air-regenerated noise for the louvre

**$A$  [m<sup>2</sup>]**

Upstream cross section

**$v$  [m/s]**

Airflow velocity based on the upstream cross section

**$v_t$  [m/s]**

Airflow velocity based on the upstream cross section (type NL)

**$V$  [m<sup>3</sup>/h] and [l/s]**

Volume flow rate

**$\Delta p_t$  [Pa]**

Total differential pressure

All sound power levels are based on 1 pW.

**$D_e$  [dB]**

Insertion loss

Measured with sound transmission from inside to outside

**$R$  [dB]**

Sound reduction index

**$R_w$  [dB]**

Weighted sound reduction index

Measured with sound transmission from inside to outside

**Principal dimensions**

**$B$  [mm]**

Duct width

**$B_1$  [mm]**

Duct width for subdivided louvres

**$H$  [mm]**

Duct height

**$H_1$  [mm]**

Duct height for subdivided louvres

**$n$  [ ]**

Number of flange screw holes

**$m$  [kg]**

Weight