

LOUVERS.



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سافيد
SAFID



SAND TRAP LOUVERS





STL - 100

Sand Trap Louvers are generally used as prefilter for fresh air intake of Air Handling Units (AHU), Package Air Conditioning Units (PACU), Roof Top Fresh Air Units (RTFAU) for Air Conditioning Systems and for Fresh Air Intake in manufacturing plants. These louvers are able to separate sand and large dust particles even in case of high dust concentrations. The vertically arranged blade sections and holes for sand drainage ensure that the sand trap louver is self cleaning and maintenance free. It is designed to separate large particles of sand and dust from airstream at low velocities, thus avoiding excessive dust loading of conventional filters. It is not intended as a substitute for conventional filters.

Construction Standards

Frame:
Gauge 16 (1.5mm thk.) from formed galvanized steel sheet.

Blades:
Gauge 18 (1.2mm thick) formed galvanized steel sheet.

Screen:
Galvanized steel bird screen 12 x 12 x 1mm fixed behind the blades. Please note that Pressure Drop Data is obtained from AMCA Test without bird screen. Pressure drop of bird screen is additive and to be calculated separately.

Minimum Size:
150 x 150mm (6in x 6in) - Neck Size.

Maximum Size:
2500 x 1200mm as single section (Neck Size).
2500 x 2500mm will be single module with 2 sections vertical blades and with sand chute between.

Consult SAFID for multiple section assembly details.

STL - 110

General construction as type STL - 100 but frame and blades are built from mill finish aluminum sheet.

STL - 120

General construction as type STL - 100 but frame and blades are built from extruded aluminum profiles.

STL - 130

General construction as type STL - 100 but frame and blades are built from stainless steel sheet Grade 304.

Optional: Frame and blades from stainless steel Grade 316 or 316L.

Additional Options

- *Code Z: Painted to RAL (epoxy coated).
- *Code I: Insect screen in galvanized steel 1 x 1 x 0.4mm.
- *Code T: Bird screen in stainless steel 5 x 5 x 0.7mm.

Catalog ID: STL - 100 April 28, 2018

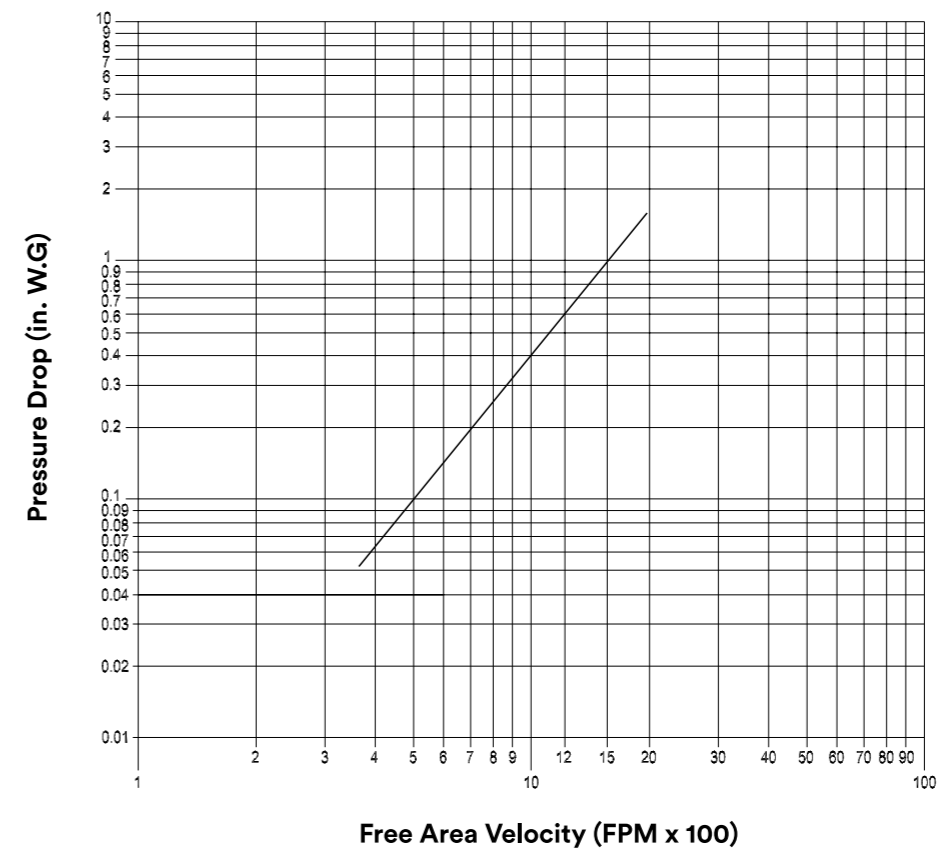


SAFID certifies that the Sand Trap Louver shown herein is licensed to bear the AMCA Seal for Model STL - 100. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance Ratings and Wind Driven Sand Rejection.
Test Information
Tested for air performance Figure 5.5 and Sand Rejection Figure 5.12 in accordance with ANSI / AMCA Standard 500-L-12.

STL SERIES [STL - 100, STL - 110, STL - 120, STL - 130]

Pressure Drop

Intake Air Performance



STL SERIES [STL - 100, STL - 110, STL - 120, STL - 130]

Free Area Chart (Sq. Ft.)

Outer Frame Size (W1 Inches)

Outer Frame Size (H1 Inches)

	16	24	28	36	40	48	52	60	64	68	76	84	88	92	100	104
16	0.31	0.47	0.62	0.78	0.94	1.09	1.25	1.40	1.56	1.72	1.87	2.03	2.19	2.34	2.50	2.65
24	0.53	0.79	1.05	1.32	1.58	1.85	2.11	2.37	2.64	2.90	3.16	3.43	3.69	3.96	4.22	4.48
28	0.64	0.95	1.27	1.59	1.91	2.22	2.54	2.86	3.18	3.49	3.81	4.13	4.45	4.76	5.08	5.40
36	0.85	1.28	1.70	2.13	2.55	2.98	3.40	3.83	4.25	4.68	5.10	5.53	5.95	6.38	6.80	7.23
40	0.96	1.44	1.92	2.39	2.87	3.35	3.83	4.31	4.79	5.27	5.75	6.23	6.71	7.18	7.66	8.14
48	1.17	1.76	2.35	2.93	3.52	4.13	4.69	5.28	5.87	6.45	7.04	7.63	8.21	8.80	9.39	9.97
52	1.28	1.92	2.56	3.20	3.84	4.48	5.12	5.76	6.40	7.05	7.69	8.33	8.97	9.61	10.25	10.89
60	1.39	2.08	2.78	3.47	4.17	4.86	5.55	6.25	6.94	7.64	8.33	9.03	9.72	10.41	11.11	11.80
64	1.50	2.24	2.99	3.74	4.49	5.24	5.98	6.73	7.48	8.23	8.98	9.73	10.47	11.22	11.97	12.72
68	1.60	2.41	3.21	4.01	4.81	5.61	6.42	7.22	8.02	8.82	9.62	10.42	11.23	12.03	12.83	13.63
76	1.82	2.73	3.64	4.55	5.46	6.37	7.28	8.19	9.10	10.01	10.91	11.82	12.73	13.64	14.55	15.46
84	2.03	3.05	4.07	5.09	6.10	7.12	8.14	9.15	10.17	11.19	12.21	13.22	14.24	15.26	16.28	17.29
88	2.14	3.21	4.28	5.36	6.43	7.50	8.57	9.64	10.71	11.78	12.85	13.92	14.99	16.07	17.14	18.21
92	2.25	3.37	4.50	5.62	6.75	7.87	9.00	10.12	11.25	12.37	13.50	14.62	15.75	16.87	18.00	19.12
100	2.46	3.70	4.93	6.16	7.39	8.63	9.86	11.09	12.32	13.56	14.79	16.02	17.25	18.49	19.72	20.95
104	2.57	3.86	5.15	6.43	7.72	9.00	10.29	11.58	12.86	14.15	15.44	16.72	18.01	19.29	20.58	21.87

NOTE

See Table 1 on page 13 for the equivalent neck size (W x H).



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Test Information
 Tested for air performance Figure 5.5 and Sand Rejection Figure 5.12 in accordance with ANSI / AMCA Standard 500-L-12.

Catalog ID: STL - 100 April 28, 2018

STL SERIES [STL - 100, STL - 110, STL - 120, STL - 130]

Sand Filtration Performance Data

Wind Driven Sand at 22 m/s.

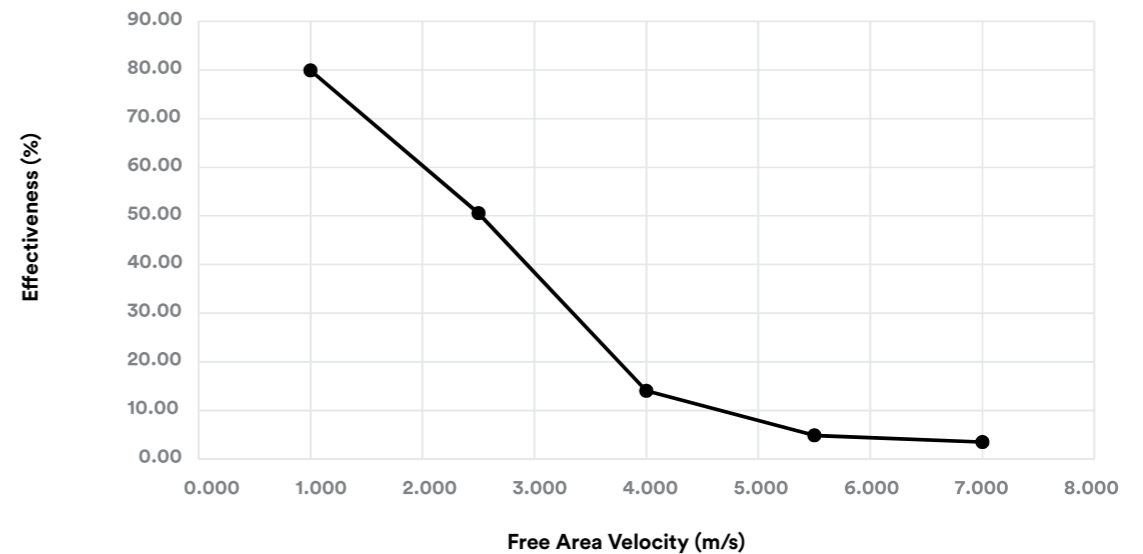
Simulated wind velocity in accordance with ANSI/AMCA Standard 500-L.

Tested for Sand Rejection Effectiveness as per ANSI/AMCA Standard 500-L.

AMCA Test Figure 5.12

Sand Rejection Effectiveness of Louver

Sand Particles Grade in Microns (µm)	Free Area Velocity (m/s)	Sand Rejection Louver Effectiveness (%)	Penetration Class
76 - 699	1.000	79.65	C
	2.500	50.57	D
	4.000	14.02	D
	5.500	4.87	D
	7.000	3.48	D



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Test Information
 Tested for air performance Figure 5.5 and Sand Rejection Figure 5.12 in accordance with ANSI / AMCA Standard 500-L-12.

Catalog ID: STL - 100 April 28, 2018

STL SERIES [STL - 100, STL - 110, STL - 120, STL - 130]

Sand Filtration Performance Data

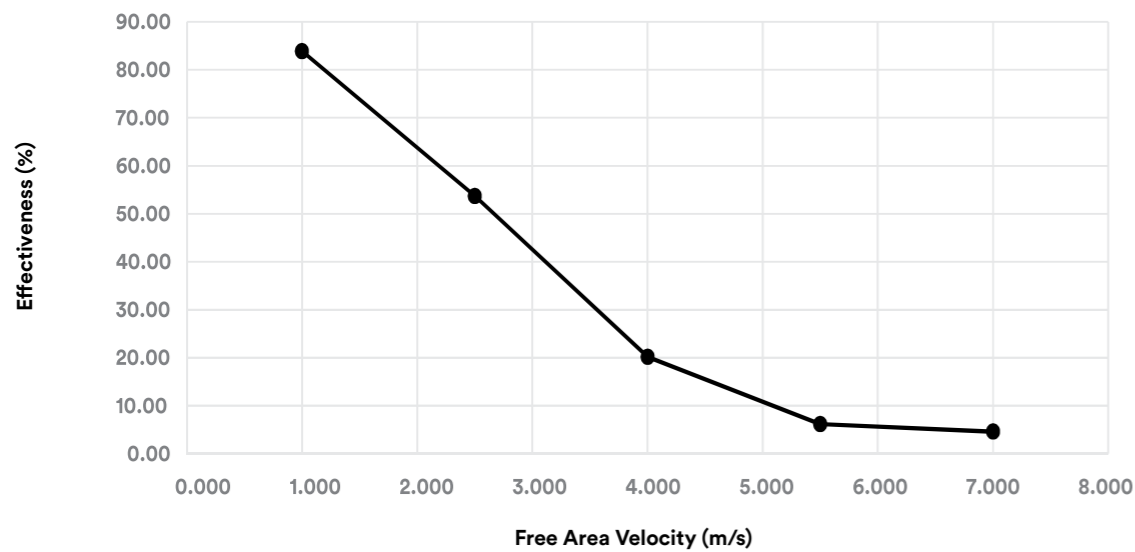
Wind Driven Sand at 11 m/s.

Simulated wind velocity in accordance with ANSI/AMCA Standard 500-L.
Tested for Sand Rejection Effectiveness as per ANSI/AMCA Standard 500-L.

AMCA Test Figure 5.12

Sand Rejection Effectiveness of Louver

Sand Particles Grade in Microns (µm)	Free Area Velocity (m/s)	Sand Rejection Louver Effectiveness (%)	Penetration Class
76 - 699	1.000	83.91	B
	2.500	53.72	D
	4.000	20.17	D
	5.500	6.17	D
	7.000	4.59	D



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Test Information
Tested for air performance Figure 5.5 and Sand Rejection Figure 5.12 in accordance with ANSI / AMCA Standard 500-L-12.

Catalog ID: STL - 100 April 28, 2018

STL SERIES [STL - 100, STL - 110, STL - 120, STL - 130]

Sand Filtration Performance Data

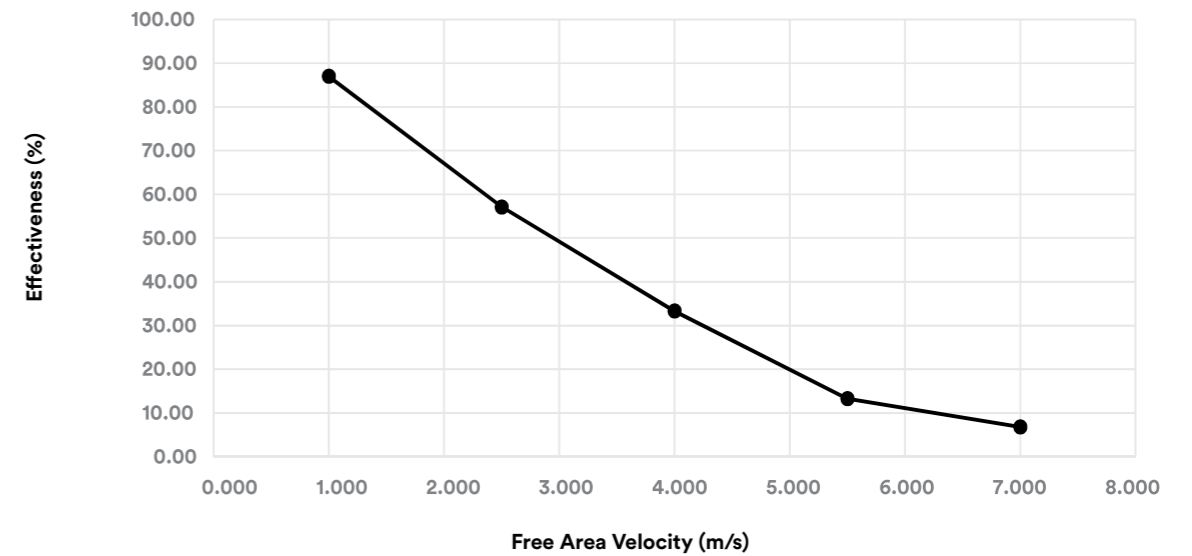
Wind Driven Sand at 7 m/s.

Simulated wind velocity in accordance with ANSI/AMCA Standard 500-L.
Tested for Sand Rejection Effectiveness as per ANSI/AMCA Standard 500-L.

AMCA Test Figure 5.12

Sand Rejection Effectiveness of Louver

Sand Particles Grade in Microns (µm)	Free Area Velocity (m/s)	Sand Rejection Louver Effectiveness (%)	Penetration Class
76-699	1.000	86.96	B
	2.500	57.10	D
	4.000	33.31	D
	5.500	13.20	D
	7.000	6.76	D



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Test Information
Tested for air performance Figure 5.5 and Sand Rejection Figure 5.12 in accordance with ANSI / AMCA Standard 500-L-12.

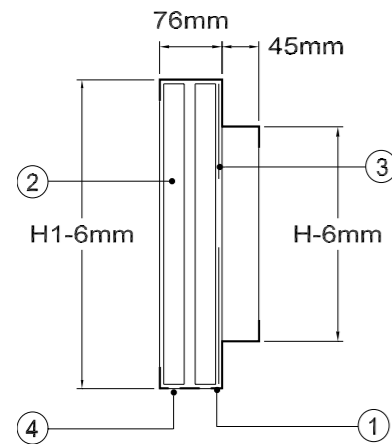
Catalog ID: STL - 100 April 28, 2018

STL SERIES [STL - 100, STL - 110, STL - 120, STL - 130]

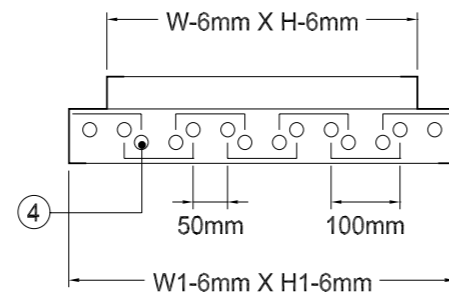
Construction - Dimension and Details

- 1 - Casing
- 2 - Blade
- 3 - Bird Screen (optional)
- 4 - Drain Hole

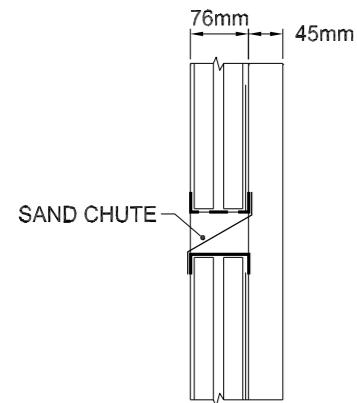
Vertical Section



Horizontal Section

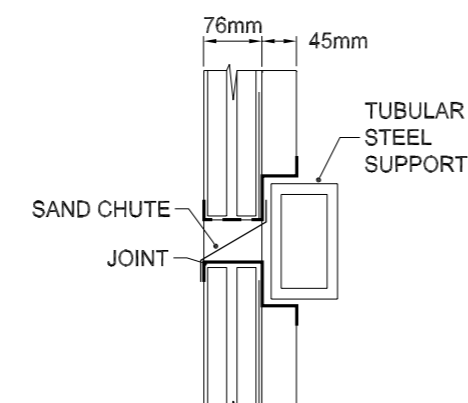


Single Module with Sand Chute



Single Module with 2 sections on vertical blades with Sand Chute from height (H) of 1300mm up to 2500mm.

Multiple Module with Sand Chute



Consult SAFID for Multiple Module assembly details.

STL SERIES [STL - 100, STL - 110, STL - 120, STL - 130]

Table 1

Outer Frame Size (in.)	Neck Size (mm)
W1 x H1	W x H
16 x 16	300 x 300
20 x 20	400 x 400
24 x 24	500 x 500
28 x 28	600 x 600
32 x 32	700 x 700
36 x 36	800 x 800
40 x 40	900 x 900
44 x 44	1000 x 1000
48 x 48	1100 x 1100
52 x 52	1200 x 1200
56 x 56	1300 x 1300
60 x 60	1400 x 1400
64 x 64	1500 x 1500
68 x 68	1600 x 1600
72 x 72	1700 x 1700
76 x 76	1800 x 1800
80 x 80	1900 x 1900
84 x 84	2000 x 2000
88 x 88	2100 x 2100
92 x 92	2200 x 2200
96 x 96	2300 x 2300
100 x 100	2400 x 2400
104 x 104	2500 x 2500

Selection Example

For normal operation condition the sand trap louvers should be selected for a maximum free area velocity of 600 feet per minute (FPM).

Example:

Given:
Airflow: 2658 CFM
Assumed free area velocity: 600 FPM

Calculate for free area, neck size and pressure drop.

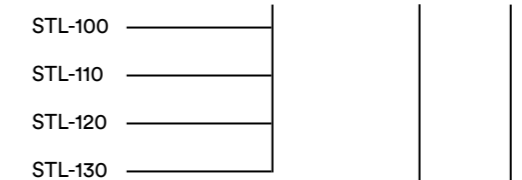
1. Free Area = 2658 CFM / 600 FPM = 4.43 ft².
2. From Free Area Chart the outer frame size is 48in x 48in (W1 x H1).
3. From Table 1 neck size is 1100mm x 1100mm (W x H).
4. Pressure drop = 0.151 in. W.G. (38Pa).

Note:

For optional screens the pressure drop is additive and to be calculated separately.

Order Example

Product Code: STL-100 - a - aaa x aaa



With Optional Extras:

- Z = Painted to RAL (epoxy coated)
- I = Insect Screen in galvanized
- T = Bird Screen in stainless steel

Sizes

Ordering:

Make : SAFID
Type : STL-100 - 500 x 500
Qty. : 1

STATIONARY LOUVERS



SSL - 100

Stationary Louver is a weather louver designed to provide air intake and air exhaust openings in building exterior walls to protect against direct ingress of rain. The blades are positioned on 98mm minimum centers up to 120mm maximum centers at 45 degree slope and has a high free area to provide minimum resistance to airflow.

Construction Standards

Frame:
Gauge 16 (1.5mm thick) formed galvanized steel sheet.

Blades:
Gauge 18 (1.2mm thick) formed galvanized steel sheet.

Screen:
Galvanized steel bird screen 12 x 12 x 1mm fixed behind the blades . Please note that Pressure Drop Data is obtained from AMCA Test without bird screen. Pressure drop of bird screen is additive and to be caculated separately.

Minimum Size:
200mm x 200mm (8in x 8in) - Neck Size.

Maximum Size:
1250W x 2500H as single section (Neck Size).
2500W x 2500H will be single module with 2 sections on horizontal blades.

Consult SAFID for multiple section assembly details.

SSL - 110
General construction as type SSL - 100 but frame and blades are built from mill finish aluminum sheet.

SSL - 120
General construction as type SSL - 100 but frame and blades are built from stainless steel Grade 304.

Optional: Frame and blades from stainless steel Grade 316 or 316L.

Additional Options

- *Code Z: Painted to RAL (epoxy coated).
- *Code I: Insect screen in galvanized steel 1 x 1 x 0.4mm.
- *Code T: Bird screen in stainless steel 5 x 5 x 0.7mm.

Catalog ID: SSL - 100 March 25, 2015



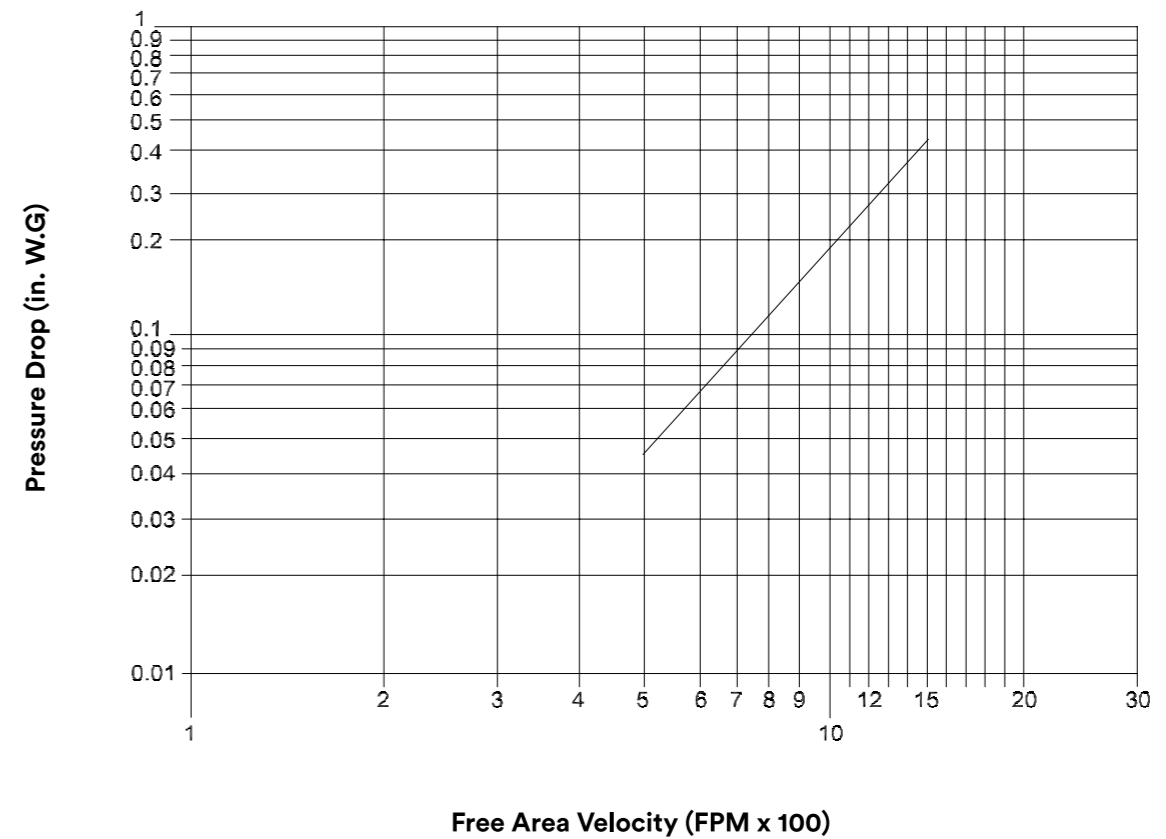
SAFID certifies that the Stationary Louver shown herein is licensed to bear the AMCA Seal for Model SSL - 100. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to Air Performance Ratings.
Test Information: Tested for air performance in accordance with ANSI / AMCA Standard 500-L-12 (Pressure Drop), Figure 5.5.

SSL SERIES [SSL - 100, SSL - 110, SSL - 120]

Air Performance

Pressure Drop

Exhaust Air Performance



Data are corrected to standard air density.
Test size: 48in. x 48 in.



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Test Information: Tested for air performance in accordance with ANSI / AMCA Standard 500-L-12 (Pressure Drop), Figure 5.5.

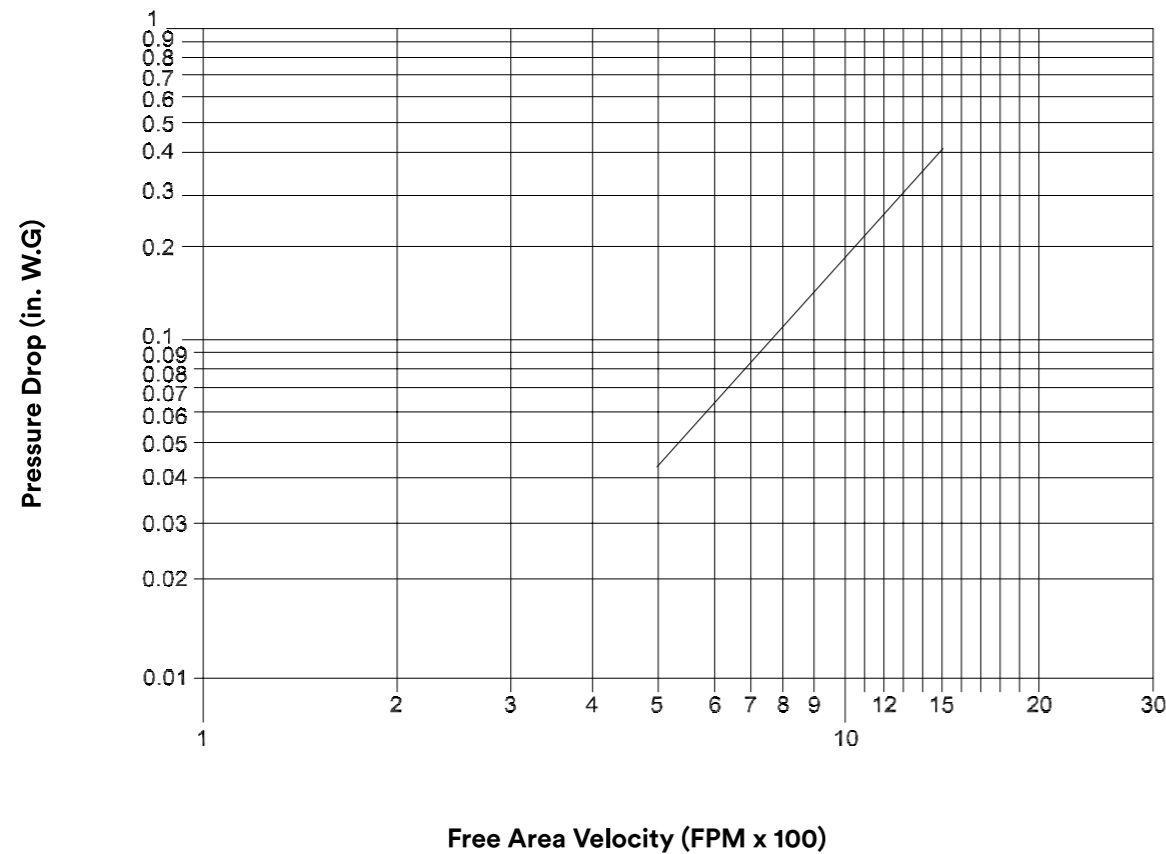
Catalog ID: SSL - 100 January 26, 2014

SSL SERIES [SSL - 100, SSL - 110, SSL - 120]

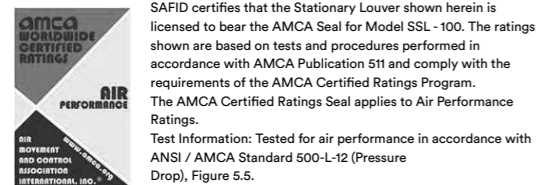
Air Performance

Pressure Drop

Exhaust Air Performance



Data are corrected to standard air density.
Test size: 48in. x 48 in.



Catalog ID: SSL - 100 January 26, 2014

SSL SERIES [SSL - 100, SSL - 110, SSL - 120]

Air Performance

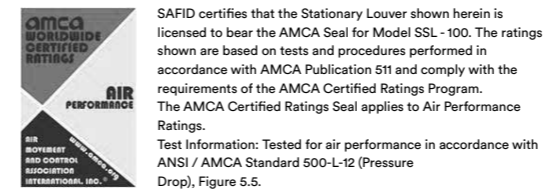
Free Area Chart (Square Feet)

Outer Frame Size (W1 Inches)

Outer Frame Size (H1 Inches)	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100	104
12	0.06	0.10	0.15	0.19	0.24	0.29	0.33	0.38	0.42	0.47	0.52	0.54	0.58	0.63	0.67	0.72	0.76	0.81	0.85	0.90	0.94	0.99	1.03	1.08
16	0.14	0.23	0.33	0.43	0.53	0.63	0.72	0.82	0.92	1.02	1.12	1.16	1.26	1.36	1.46	1.56	1.65	1.75	1.85	1.95	2.05	2.14	2.24	2.34
20	0.21	0.36	0.51	0.66	0.81	0.96	1.11	1.26	1.41	1.56	1.71	1.78	1.93	2.08	2.23	2.38	2.53	2.68	2.82	2.97	3.12	3.27	3.42	3.57
24	0.28	0.49	0.69	0.89	1.10	1.30	1.51	1.71	1.91	2.12	2.32	2.42	2.62	2.81	3.01	3.21	3.40	3.61	3.80	3.99	4.20	4.45	4.65	4.86
28	0.36	0.61	0.87	1.13	1.38	1.63	1.87	2.12	2.38	2.63	2.91	3.07	3.32	3.56	3.81	4.06	4.32	4.56	4.81	5.06	5.32	5.58	5.84	6.09
32	0.46	0.75	1.05	1.37	1.67	1.97	2.27	2.57	2.87	3.18	3.77	3.71	4.01	4.32	4.62	4.92	5.22	5.53	5.83	6.14	6.44	6.80	7.15	7.50
36	0.53	0.89	1.25	1.60	1.96	2.31	2.67	3.03	3.38	3.74	4.37	4.35	4.70	5.06	5.41	5.77	6.12	6.48	6.84	7.19	7.55	7.90	8.25	8.60
40	0.61	1.08	1.51	1.94	2.37	2.80	3.24	3.67	4.10	4.53	4.98	5.29	5.72	6.15	6.58	7.01	7.44	7.87	8.30	8.73	9.17	9.61	10.05	10.49
44	0.68	1.20	1.69	2.17	2.66	3.14	3.63	4.11	4.60	5.08	5.55	5.93	6.41	6.90	7.38	7.87	8.35	8.84	9.31	9.80	10.28	10.76	11.24	11.72
48	0.76	1.45	1.87	2.41	2.95	3.49	4.03	4.56	5.10	5.91	6.18	6.58	7.10	7.64	8.18	8.72	9.26	9.80	10.33	10.86	11.40	11.94	12.48	13.02
52	0.83	1.47	2.07	2.65	3.24	3.83	4.41	5.01	5.60	6.19	6.76	7.21	7.80	8.40	8.99	9.57	10.16	10.75	11.35	11.93	12.52	13.11	13.70	14.29
56	0.91	1.60	2.25	2.88	3.53	4.18	4.81	5.46	6.09	6.74	7.44	7.86	8.50	9.15	9.78	10.43	11.06	11.71	12.36	12.99	13.64	14.28	14.92	15.58
60	0.99	1.73	2.43	3.12	3.82	4.51	5.20	5.90	6.60	7.29	8.05	8.50	9.20	9.89	10.59	11.28	11.98	12.67	13.37	14.06	14.76	15.45	16.14	16.83
64	1.06	1.86	2.62	3.36	4.11	4.85	5.60	6.35	7.09	7.75	8.60	9.15	9.89	10.65	11.39	12.14	12.88	13.63	14.38	15.12	15.88	16.61	17.14	17.77
68	1.20	2.00	2.80	3.60	4.40	5.20	6.00	6.80	7.60	8.40	9.20	9.80	10.59	11.39	12.19	12.99	13.79	14.59	15.39	16.19	16.99	17.79	18.59	19.39
72	1.28	2.13	2.98	3.83	4.68	5.54	6.39	7.24	8.09	8.94	9.79	10.44	11.29	12.14	12.99	13.84	14.69	15.54	16.39	17.24	18.09	18.94	19.79	20.64
76	1.35	2.26	3.16	4.07	4.97	5.88	6.78	7.69	8.59	9.50	10.55	11.09	11.99	12.90	13.80	14.69	15.50	16.30	17.10	17.90	18.70	19.50	20.30	21.10
80	1.43	2.39	3.35	4.31	5.26	6.22	7.18	8.14	9.10	10.06	11.02	11.72	12.68	13.64	14.60	15.56	16.52	17.48	18.44	19.40	20.36	21.32	22.28	23.24
84	1.52	2.53	3.53	4.54	5.55	6.57	7.58	8.58	9.59	10.60	11.61	12.37	13.38	14.39	15.40	16.41	17.42	18.43	19.44	20.45	21.46	22.47	23.48	24.49
88	1.56	2.68	3.64	4.71	5.79	6.86	7.93	9.00	10.07	11.14	12.21	12.73	13.80	14.87	15.94	17.01	18.08	19.15	20.22	21.29	22.36	23.43	24.50	25.57
92	1.62	2.79	3.79	4.91	6.03	7.14	8.25	9.36	10.47	11.58	12.69	13.26	14.37	15.48	16.59	17.70	18.81	19.92	21.03	22.14	23.25	24.36	25.47	26.58
96	1.71	2.94	4.16	5.17	6.34	7.51	8.68	9.85	11.02	12.19	13.36	13.96	15.13	16.30	17.47	18.64	19.81	20.98	22.15	23.32	24.49	25.66	26.83	28.00
100	1.77	3.03	4.30	5.34	6.55	7.76	8.98	10.19	11.40	12.61	13.82	14.41	15.63	16.84	18.05	19.26	20.47	21.68	22.89	24.10	25.31	26.52	27.73	28.94
104	1.86	3.19	4.52	5.62	6.90	8.17	9.44	10.71	11.98	13.25	14.52	15.17	16.45	17.73	19.00	20.27	21.54	22.81	24.08	25.35	26.62	27.89	29.16	30.43

NOTE

See Table 1 on page 22 for the equivalent neck size (W x H).



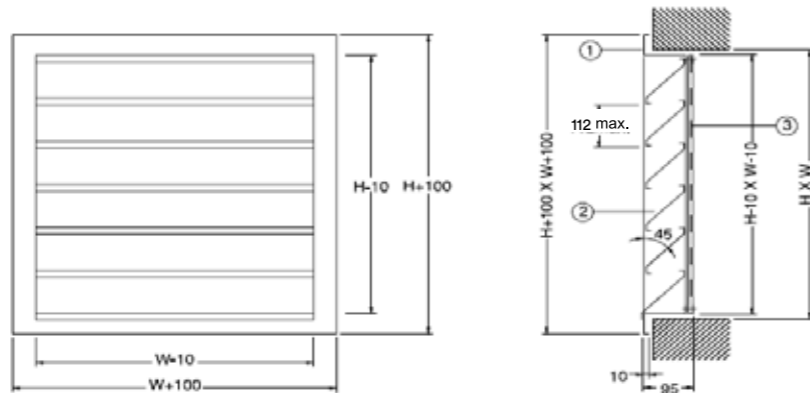
Catalog ID: SSL - 100 January 26, 2014

SSL SERIES [SSL - 100, SSL - 110, SSL - 120]

Construction - Dimension and Details

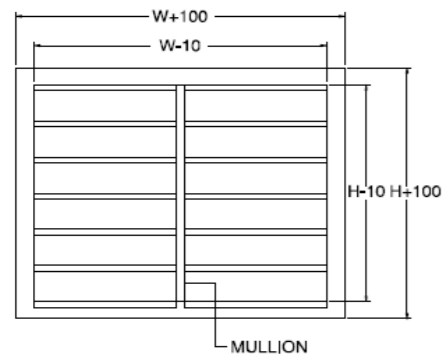
- 1 - Casing
- 2 - Blade
- 3 - Bird Screen (optional)

SSL - 100, SSL - 110, SSL - 12 (Single Section)



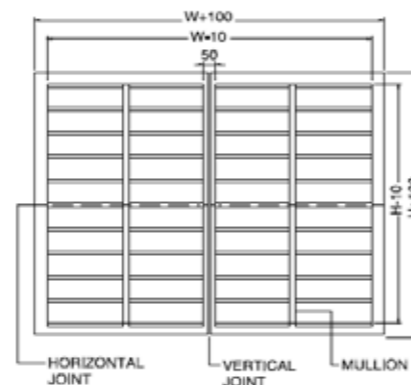
The maximum size for single section is up to 1250mm wide (W) and up to 2500mm height (H).

Single Module with Mullion



Single module with 2 sections on horizontal blades and with mullion from size above 1250mm up to 2500mm maximum width (W). The maximum Single Module is 2500 W x 2500 H.

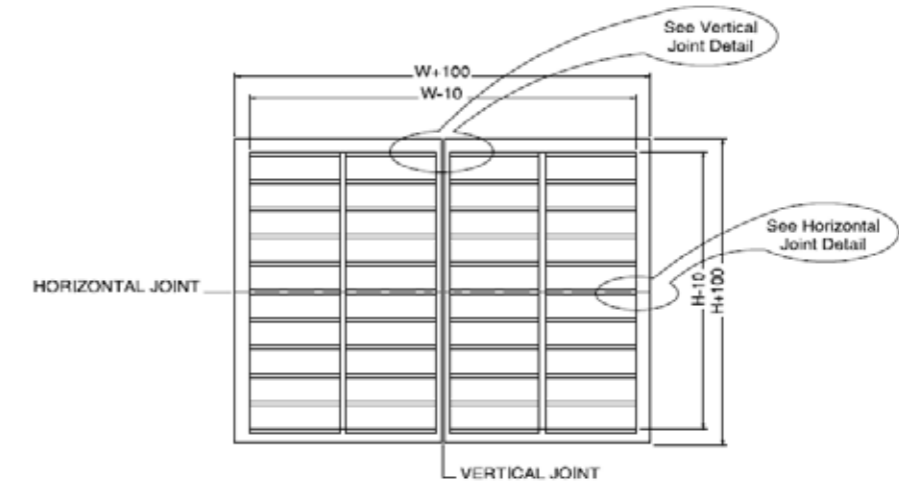
Multiple Module (Segmented)



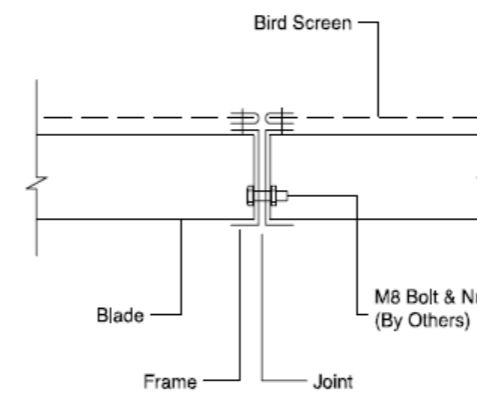
Segmented for size above 2500 W and 2500 H.

SSL SERIES [SSL - 100, SSL - 110, SSL - 120]

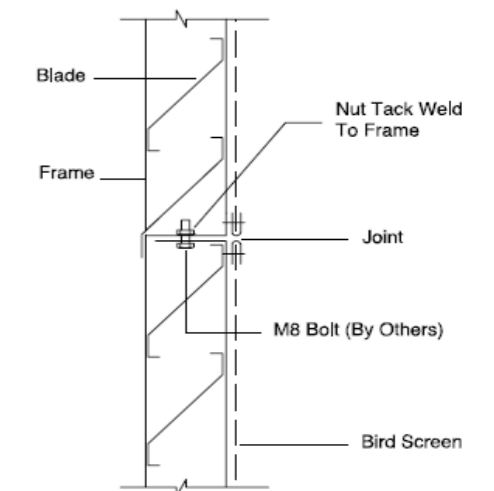
Multiple Module (Segmented) - Assembly Details



Vertical Joint Detail



Horizontal Joint Detail



SSL SERIES [SSL - 100, SSL - 110, SSL - 120]

Table 1

Outer Frame Size (in.)	Neck Size (mm)
W1 x H1	W x H
12 x 12	200 x 200
16 x 16	300 x 300
20 x 20	400 x 400
24 x 24	500 x 500
28 x 28	600 x 600
32 x 32	700 x 700
36 x 36	800 x 800
40 x 40	900 x 900
44 x 44	1000 x 1000
48 x 48	1100 x 1100
52 x 52	1200 x 1200
56 x 56	1300 x 1300
60 x 60	1400 x 1400
64 x 64	1500 x 1500
68 x 68	1600 x 1600
72 x 72	1700 x 1700
76 x 76	1800 x 1800
80 x 80	1900 x 1900
84 x 84	2000 x 2000
88 x 88	2100 x 2100
92 x 92	2200 x 2200
96 x 96	2300 x 2300
100 x 100	2400 x 2400
104 x 104	2500 x 2500

Calculate for free area, neck size and pressure drop.

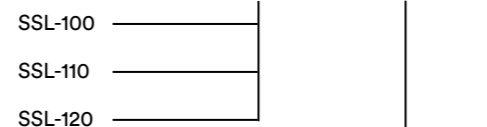
- Free Area = 4000 CFM / 800 FPM = 5 square feet (ft²).
- From Free Area Chart the outer frame size can be 48in. x 44in., or 64in. x 36in. (W1xH1).
- From Table 1 neck size is 1100mm x 1000mm, or 1500mm x 800mm (WxH).
- The pressure drop for Exhaust Air Louver from Exhaust Air Performance Graph at 800 feet per minute (FPM) is 0.12 in. W.G. (30Pa).
- The pressure drop for Fresh Air Intake Louver from Intake Air Performance Graph at 800 feet per minute (FPM) is 0.105 in. W.G. (26Pa).

NOTE

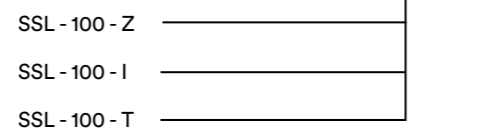
For optional screens the pressure drop is additive and to be calculated separately.

Order Example

Product Code: SSL-100 - a - aaa x aaa



With Optional Extras:



Sizes _____

Standard

Make : SAFID

Type : SSL - 100 - 500 x 500

With Optional Extras

Make : SAFID

Type : SSL - 100 - Z - 500 x 500

Selection Example

Selection Procedure of Stationary Louver

Example:

With Given Air Volume:

Select Exhaust Air Louver or Fresh Air Intake Louver with a given air volume of 4000 cubic feet per minute (CFM) and 800 feet per minute (FPM) free area velocity.

Catalog ID: SSL - 100 January 26, 2014

SSL - 200

SSL SERIES EXTRUDED ALUMINUM



Description

SAFID Extruded Aluminum Stationary Louvers is designed to provide air intake and air exhaust openings in building exterior walls to protect against the direct ingress of rain. The blades are positioned on 104mm minimum centers up to 118mm maximum centers at 45 degree and has a high free area to provide minimum resistance to airflow.

Construction Standards

Frame:

Extruded aluminum profile 2mm thick.

Blades:

Extruded aluminum profile 1.8mm thick.

Standard Finish:

Mill aluminum finish.

Screen:

Expanded aluminum birdscreen.

Minimum Size:

300 x 300 mm

Maximum Size:

1200Wx2000H

Larger sizes will be in multiple sections.

For details of multiple sections consult SAFID.

Additional Options

*Code A: Anodized aluminum in silver.

*Code P: Polyester powder coated.

*Code Z: Painted to RAL (epoxy coated).

*Code I: Expanded aluminum insect screen.

*Code T: Bird screen in stainless steel, 5 x 5 x 0.7mm.

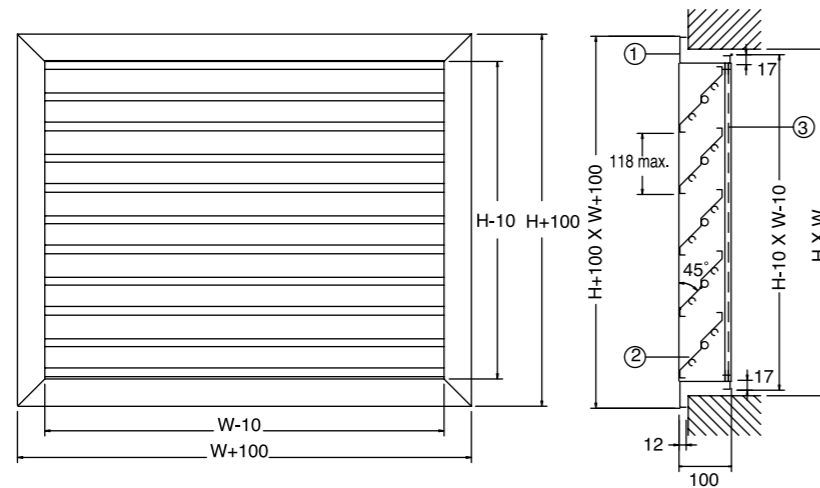
SSL - 210

General construction as type SSL - 200 but with drainable frame and blades. Drain gutter in each blades and downspouts in vertical frames allows water to drain from louver to minimize water cascade from blade to blade.

SSL SERIES [SSL - 200, SSL - 210]

SSL - 200 (Single Section)

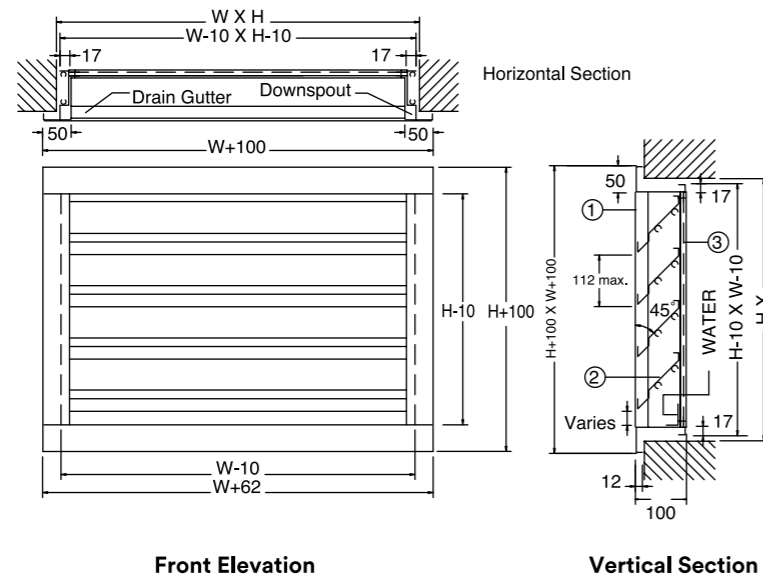
- 1 - Frame 2 - Blades 3 - Bird Screen



SSL - 210 (Single Section)

Legend:

- 1 - Drainable Frame 2 - Drainable Blades 3 - Bird Screen



SSL SERIES [SSL - 200, SSL - 210]

Technical Data SSL - 200

Louver Selection and Application:

Application of stationary louver involves selecting velocity through free area that gives an acceptable pressure drop for intake and exhaust application.

Louver Free Area Chart:

H (m)	Width (meters)																					
	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2	2.1	2.2		
0.3	0.013	0.018	0.024	0.029	0.035	0.040	0.046	0.051	0.057	0.062	0.064	0.070	0.075	0.081	0.087	0.092	0.098	0.103	0.109	0.114		
0.4	0.022	0.032	0.042	0.052	0.062	0.072	0.082	0.091	0.101	0.111	0.115	0.124	0.134	0.144	0.154	0.164	0.174	0.184	0.193	0.203		
0.5	0.030	0.044	0.057	0.071	0.084	0.098	0.111	0.125	0.138	0.152	0.156	0.170	0.183	0.196	0.210	0.223	0.237	0.250	0.264	0.277		
0.6	0.039	0.056	0.073	0.090	0.107	0.124	0.141	0.158	0.175	0.192	0.198	0.215	0.232	0.249	0.266	0.283	0.300	0.317	0.334	0.352		
0.7	0.047	0.067	0.088	0.109	0.129	0.150	0.171	0.191	0.212	0.233	0.240	0.260	0.281	0.302	0.322	0.343	0.364	0.384	0.405	0.426		
0.8	0.055	0.079	0.103	0.128	0.152	0.176	0.201	0.225	0.249	0.273	0.282	0.306	0.330	0.355	0.379	0.403	0.427	0.452	0.476	0.500		
0.9	0.063	0.091	0.119	0.147	0.175	0.203	0.230	0.258	0.286	0.314	0.324	0.352	0.379	0.407	0.435	0.463	0.49	0.519	0.547	0.575		
1	0.082	0.119	0.155	0.191	0.228	0.264	0.300	0.337	0.373	0.409	0.422	0.458	0.495	0.531	0.567	0.604	0.640	0.676	0.713	0.749		
1.1	0.091	0.132	0.172	0.213	0.253	0.293	0.334	0.374	0.415	0.455	0.469	0.509	0.549	0.590	0.630	0.671	0.711	0.751	0.792	0.832		
1.2	0.099	0.143	0.187	0.231	0.275	0.319	0.363	0.407	0.451	0.495	0.510	0.554	0.598	0.642	0.686	0.730	0.774	0.818	0.862	0.906		
1.3	0.107	0.155	0.203	0.250	0.298	0.345	0.393	0.440	0.488	0.536	0.552	0.599	0.647	0.694	0.742	0.789	0.837	0.885	0.932	0.980		
1.4	0.116	0.167	0.218	0.269	0.320	0.371	0.422	0.474	0.525	0.576	0.593	0.644	0.695	0.747	0.798	0.849	0.900	0.951	1.002	1.053		
1.5	0.124	0.178	0.233	0.288	0.343	0.397	0.452	0.507	0.562	0.616	0.635	0.690	0.744	0.799	0.854	0.909	0.963	1.018	1.073	1.127		
1.6	0.132	0.190	0.248	0.307	0.365	0.423	0.482	0.540	0.598	0.657	0.677	0.735	0.793	0.852	0.910	0.968	1.027	1.085	1.143	1.202		
1.7	0.140	0.202	0.264	0.326	0.388	0.450	0.512	0.574	0.635	0.697	0.718	0.780	0.842	0.904	0.966	1.028	1.090	1.152	1.214	1.276		
1.8	0.148	0.214	0.279	0.345	0.410	0.476	0.541	0.607	0.672	0.738	0.760	0.826	0.891	0.957	1.022	1.088	1.153	1.219	1.284	1.350		
1.9	0.156	0.225	0.295	0.364	0.433	0.502	0.571	0.640	0.709	0.778	0.802	0.871	0.940	1.009	1.079	1.14	1.217	1.286	1.355	1.424		
2	0.164	0.237	0.310	0.383	0.455	0.528	0.601	0.674	0.746	0.819	0.844	0.917	0.989	1.062	1.135	1.208	1.280	1.355	1.426	1.499		

Selection Procedure of Stationary Louver

Example:

With given air volume:

Select Fresh Air Intake Louver with a given air volume of 1.0m³/s and 3.5m/s free area velocity.

A - Determine Louver Free Area:

Dividing the given air volume (1.5m³/s) by free area velocity (3.5m/s, do not exceed to 4.2m/s for fresh air intake application), the free area will be:

$$\text{Louver Free Area} = \frac{1.5\text{m}^3/\text{s}}{3.5\text{m/s}} = 0.429 \text{ m}^2$$

B - Select a suitable louver from Free Area Chart

The following suitable louvers from Free Area Chart are:

1. 1m Wide x 1.3m High
2. 1.2m Wide x 1.1m High
3. 1.4m Wide x 1m High

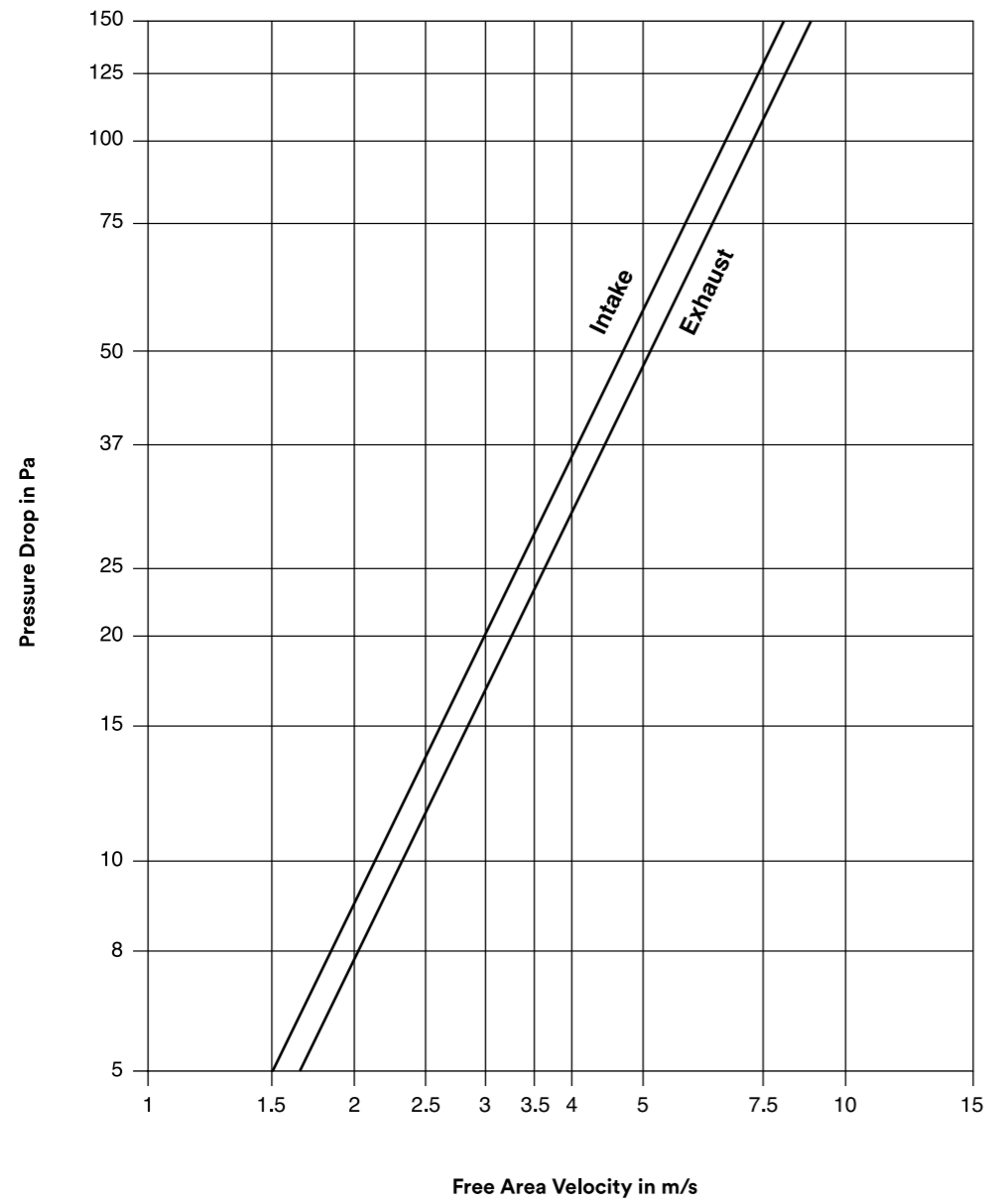
C - Check the pressure drop of the selected louver on the Pressure Drop Chart:

The pressure drop across the selected size of louver is 25 Pa.

SSL SERIES [SSL - 200, SSL - 210]

Technical Data SSL - 200

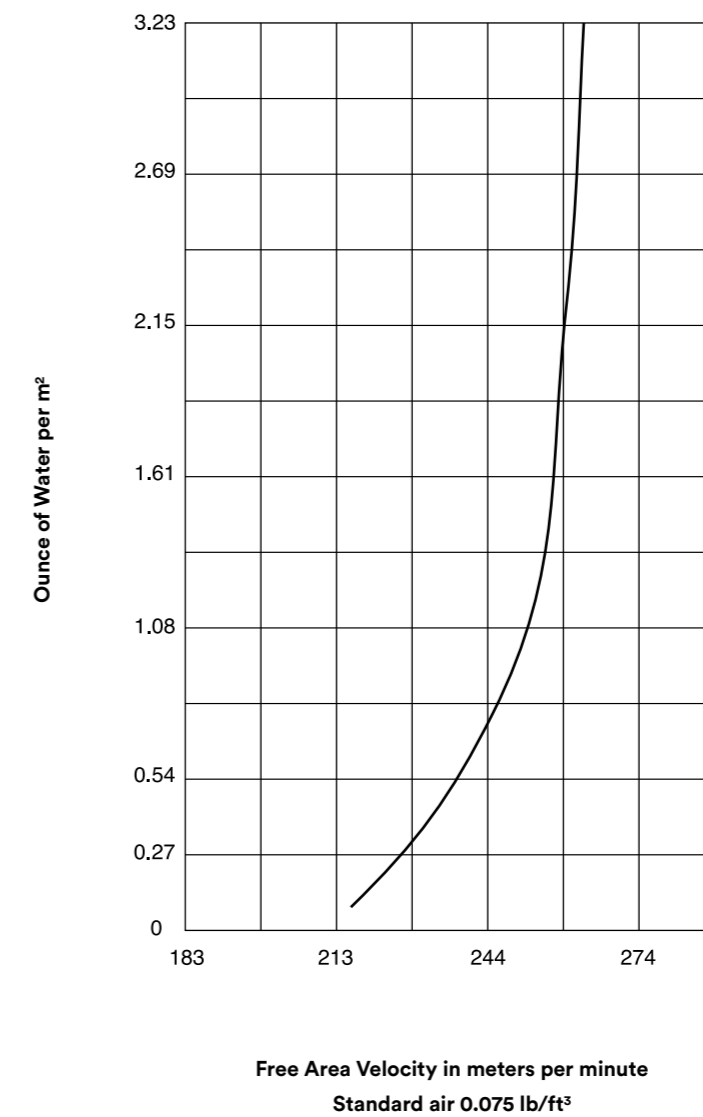
Airflow Resistance



SSL SERIES [SSL - 200, SSL - 210]

Technical Data SSL - 200

Water Penetration



SSL SERIES [SSL - 200, SSL - 210]

Technical Data SSL - 210

Louver Selection and Application:

Application of stationary louver involves selecting velocity through free area that gives an acceptable pressure drop for intake and exhaust application.

Louver Free Area Chart:

H (m)	Width (meters)																			
	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2	2.1	2.2
0.3	0.018	0.027	0.035	0.043	0.051	0.059	0.067	0.075	0.083	0.092	0.094	0.102	0.110	0.118	0.126	0.134	0.142	0.151	0.159	0.167
0.4	0.029	0.042	0.055	0.068	0.080	0.093	0.106	0.119	0.132	0.145	0.148	0.161	0.174	0.187	0.199	0.212	0.225	0.238	0.251	0.264
0.5	0.040	0.058	0.076	0.094	0.111	0.129	0.147	0.165	0.183	0.201	0.205	0.223	0.241	0.259	0.276	0.294	0.312	0.330	0.348	0.365
0.6	0.051	0.074	0.097	0.120	0.143	0.165	0.188	0.211	0.234	0.257	0.262	0.285	0.308	0.331	0.354	0.376	0.399	0.422	0.445	0.468
0.7	0.063	0.091	0.118	0.146	0.174	0.202	0.229	0.257	0.285	0.313	0.320	0.348	0.375	0.403	0.431	0.459	0.486	0.514	0.542	0.570
0.8	0.074	0.107	0.140	0.172	0.205	0.238	0.271	0.303	0.336	0.369	0.377	0.410	0.443	0.476	0.508	0.541	0.574	0.607	0.639	0.672
0.9	0.085	0.123	0.161	0.199	0.236	0.274	0.312	0.350	0.387	0.425	0.435	0.473	0.510	0.548	0.586	0.624	0.661	0.699	0.737	0.775
1	0.097	0.139	0.182	0.225	0.268	0.310	0.353	0.396	0.438	0.481	0.492	0.535	0.578	0.620	0.663	0.706	0.749	0.791	0.834	0.877
1.1	0.108	0.156	0.203	0.251	0.299	0.346	0.394	0.442	0.490	0.537	0.550	0.598	0.645	0.693	0.741	0.788	0.836	0.884	0.932	0.979
1.2	0.119	0.172	0.225	0.277	0.330	0.383	0.435	0.488	0.541	0.594	0.607	0.660	0.713	0.765	0.818	0.871	0.924	0.976	1.029	1.082
1.3	0.130	0.188	0.246	0.304	0.361	0.419	0.477	0.534	0.592	0.650	0.665	0.723	0.780	0.838	0.896	0.953	1.011	1.069	1.126	1.184
1.4	0.142	0.204	0.267	0.330	0.393	0.455	0.518	0.581	0.643	0.706	0.722	0.785	0.848	0.910	0.973	1.036	1.099	1.161	1.224	1.287
1.5	0.153	0.221	0.288	0.356	0.424	0.491	0.559	0.627	0.695	0.762	0.780	0.848	0.915	0.983	1.05	1.118	1.186	1.254	1.321	1.389
1.6	0.164	0.237	0.310	0.382	0.455	0.528	0.600	0.673	0.746	0.818	0.837	0.910	0.983	1.055	1.128	1.201	1.273	1.346	1.419	1.491
1.7	0.175	0.253	0.331	0.408	0.486	0.563	0.641	0.719	0.796	0.874	0.894	0.972	1.049	1.127	1.204	1.282	1.360	1.437	1.515	1.592
1.8	0.186	0.269	0.352	0.434	0.517	0.599	0.682	0.764	0.847	0.929	0.951	1.033	1.116	1.198	1.281	1.363	1.446	1.528	1.611	1.693
1.9	0.198	0.285	0.373	0.460	0.547	0.635	0.722	0.810	0.897	0.985	1.007	1.095	1.182	1.270	1.357	1.445	1.532	1.620	1.707	1.794
2	0.209	0.301	0.394	0.486	0.578	0.671	0.763	0.855	0.948	1.040	1.064	1.157	1.249	1.341	1.434	1.526	1.618	1.711	1.803	1.896

Selection Procedure of Stationary Louver

Example:

With given air volume:

Select Fresh Air Intake Louver with a given air volume of 1.5m³/s and 3.5m/s free area velocity.

A - Determine Louver Free Area:

Dividing the given air volume (1.5m³/s) by free area velocity (3.5m/s, do not exceed to 4.2m/s for fresh air intake application), the free area will be:

$$\text{Louver Free Area} = \frac{1.5\text{m}^3/\text{s}}{3.5\text{m/s}} = 0.429\text{ m}^2$$

B - Select a suitable louver from Free Area Chart

The following suitable louvers from Free Area Chart are:

- 1.1m Wide x 1.0m High
2. 1.3m Wide x 0.9m High
3. 1.5m Wide x 0.8m High

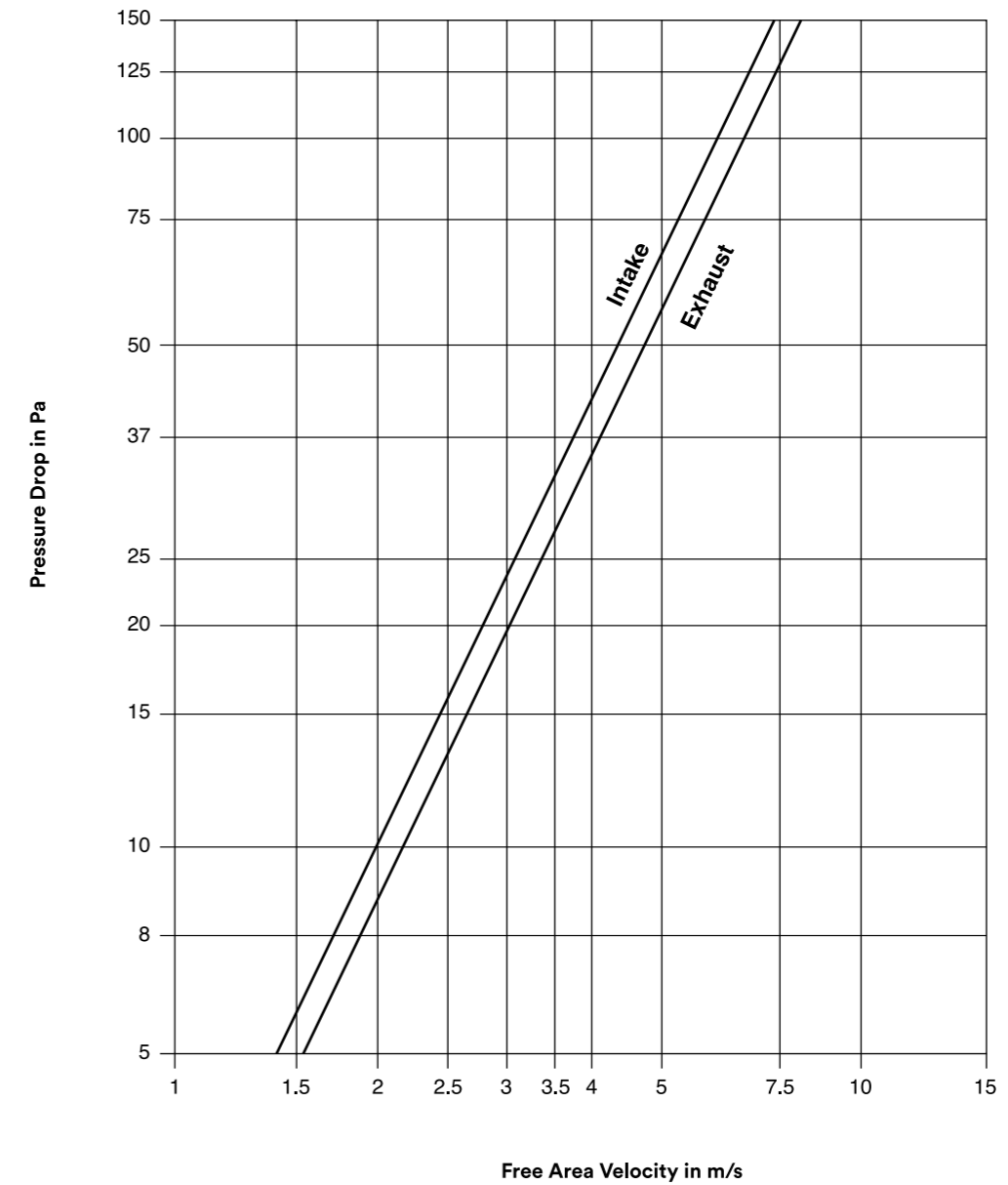
C - Check the pressure drop of the selected louver on the Pressure Drop Chart:

The pressure drop across the selected size of louver is 34 Pa.

SSL SERIES [SSL - 200, SSL - 210]

Technical Data SSL - 210

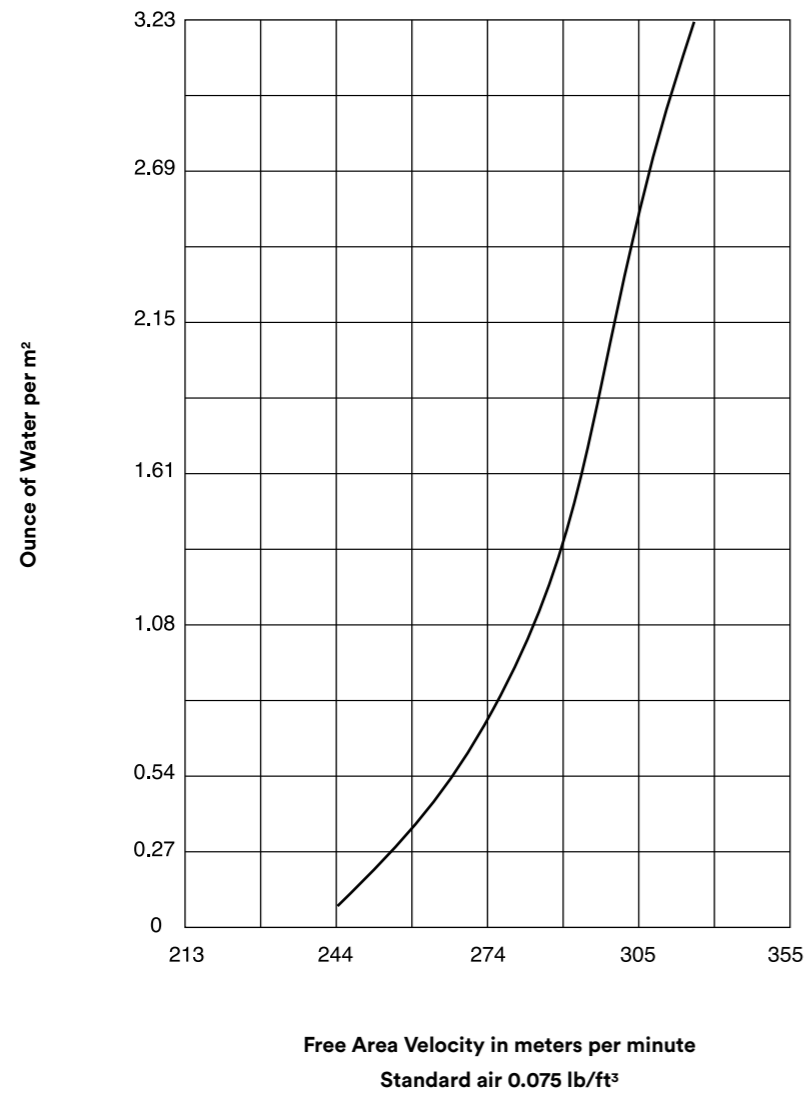
Airflow Resistance



SSL SERIES [SSL - 200, SSL - 210]

Technical Data SSL - 210

Water Penetration





سافيد
SAFID

ACOUSTIC LOUVERS

**Introduction**

There are many applications in the industry where large quantities of air must be drawn from the atmosphere. The equipment handling the air is frequently noisy and it is necessary to provide some attenuation between the air moving device and the exterior. We have already seen that this can be done with cylindrical or rectangular sound attenuators. However, in certain conditions it is more appropriate to use an acoustic louver which is a combination of a normal louver, as associated with air inlets to buildings, and attenuator.

They are frequently installed in the facades of buildings where they are architecturally acceptable and yet provide an adequate amount of attenuation to prevent creating unacceptably high noise levels outside. Effectively, an acoustic louver is a very short attenuator with a very large cross-sectional area, so it is appropriate where length is restricted but face area is not.

Description

Acoustic louvers provide a positive solution where acoustic performance is required from a weather louver. The acoustic performance for an acoustic louver is usually measured in terms of transmission loss. This enables a direct comparison to be made between the performance of the louver and a solid wall which it probably replaces. Acoustic louvers as well as attenuators are frequently used in mechanical equipment rooms where a requirement for ventilation exists.

They are available in either steel or aluminum construction with standard and high acoustic performance options. A non-acoustic version having a complementary appearance is available and a variety of colored finishes may be specified.



Description

Type SALS acoustic louvers provide a positive solution where acoustic performance is required from a weather louver. They are available in either steel or aluminum construction with 'single' or 'double bank' acoustic performance options. A non-acoustic version having a complementary appearance is available. A variety of coloured finishes may be specified.

Construction

Steel Construction

Casings are manufactured from galvanized sheet metal channels Ga.16 minimum. Galvanized louver blades are of aerodynamic section and are set at approx. 40° on 150mm pitches. Bird screens from 12x12x1mm galvanized wire mesh are fitted as standard to all types, except Type SALN when fitted with blanking plate.

Acoustic louver blades contain infill which complies with Class O Building Regulations. The infill has a glass cloth facing and is contained behind perforated metal; this dual protection prevents damage and fibre erosion up to 30 m/s airway velocity.

Aluminum Construction

Construction is generally as for steel types described above except that the casing and louver blades are made from mill finish aluminum alloy, type 1050-H14.

Alternative Construction

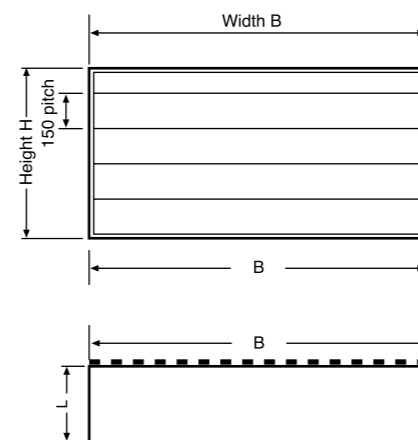
SALD

Type SALD; double bank acoustic louver comprising of two SALS type mounted back to back.

SALN

Type SALN; non-acoustic version with complementary appearance. Can be supplied with rear blanking plate to prevent air passage.

Dimensions

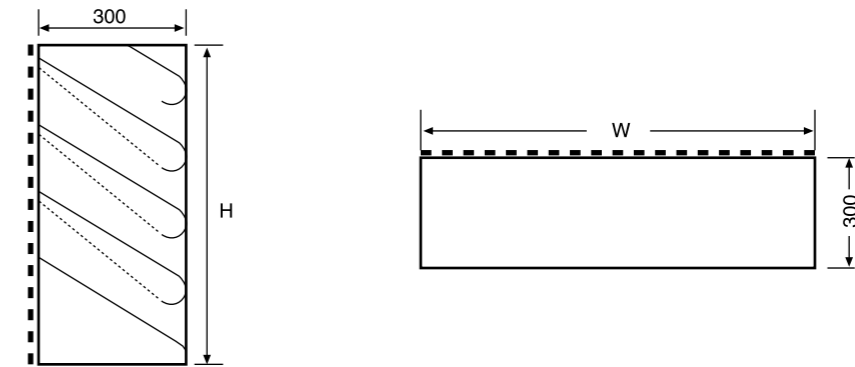


Dimensions in mm	Standard Sizes
W	300 to 1800 (in increments of 150)
H	450 to 2400 (in increments of 150)

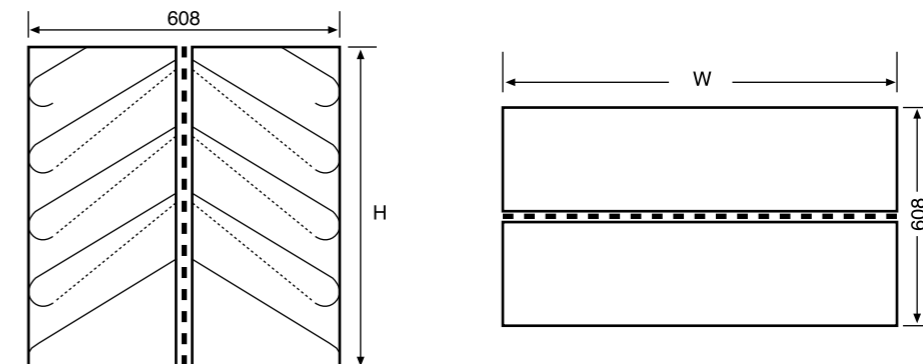
SALS [SALS, SALD, SALN]

Dimensions

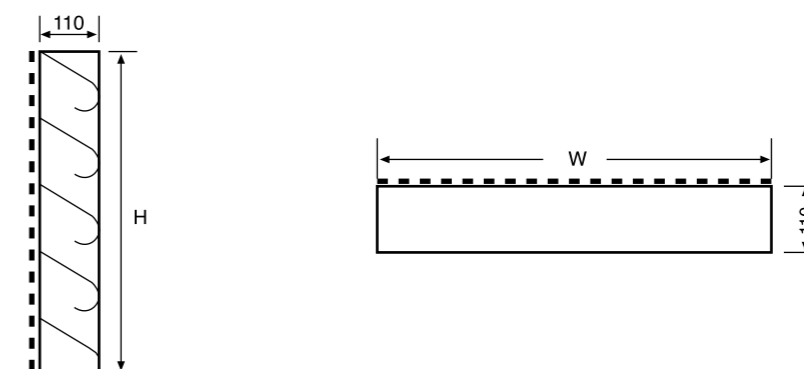
SALS



SALD



SALN



SALS [SALS, SALD, SALN]

Sectionalized Construction

Acoustic louvers are normally supplied in sections when either of the following dimensions is exceeded:

B = 1800 mm H = 2400 mm

Where louvers are in sections in both width and height, a 50x50x3 galvanized vertical box section frame is supplied to couple together adjacent sections. The weight of the upper section is borne by the coupling frame and not by the lower louver. Coupling frames are concealed behind a cover plate of material and finish to complement the louver.

The combinations illustrated on this page are available in louver Types SALS, SALD and SALN.

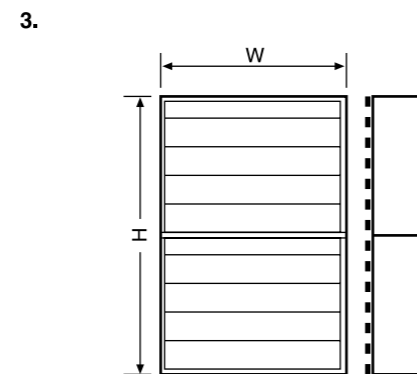
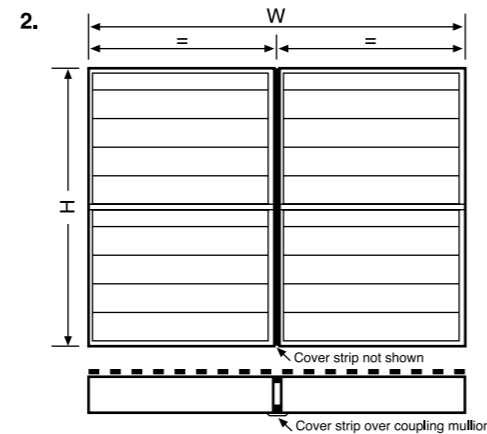
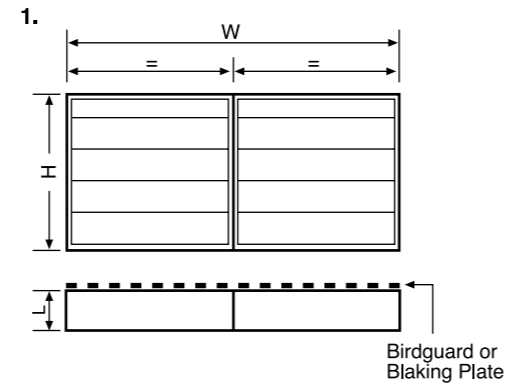
1. Split on width only.
2. Split on width and height.
3. Split on height only.

The assembly of sectionalised louvers is on site, by others. SAFID will provide full details of louver configuration and assembly.

Optional Features

Louvers can be supplied with matching sheet metal architrave or rolled metal angle picture frame. These would be supplied loose and undrilled for site fixing by others.

Dimensions



Installation

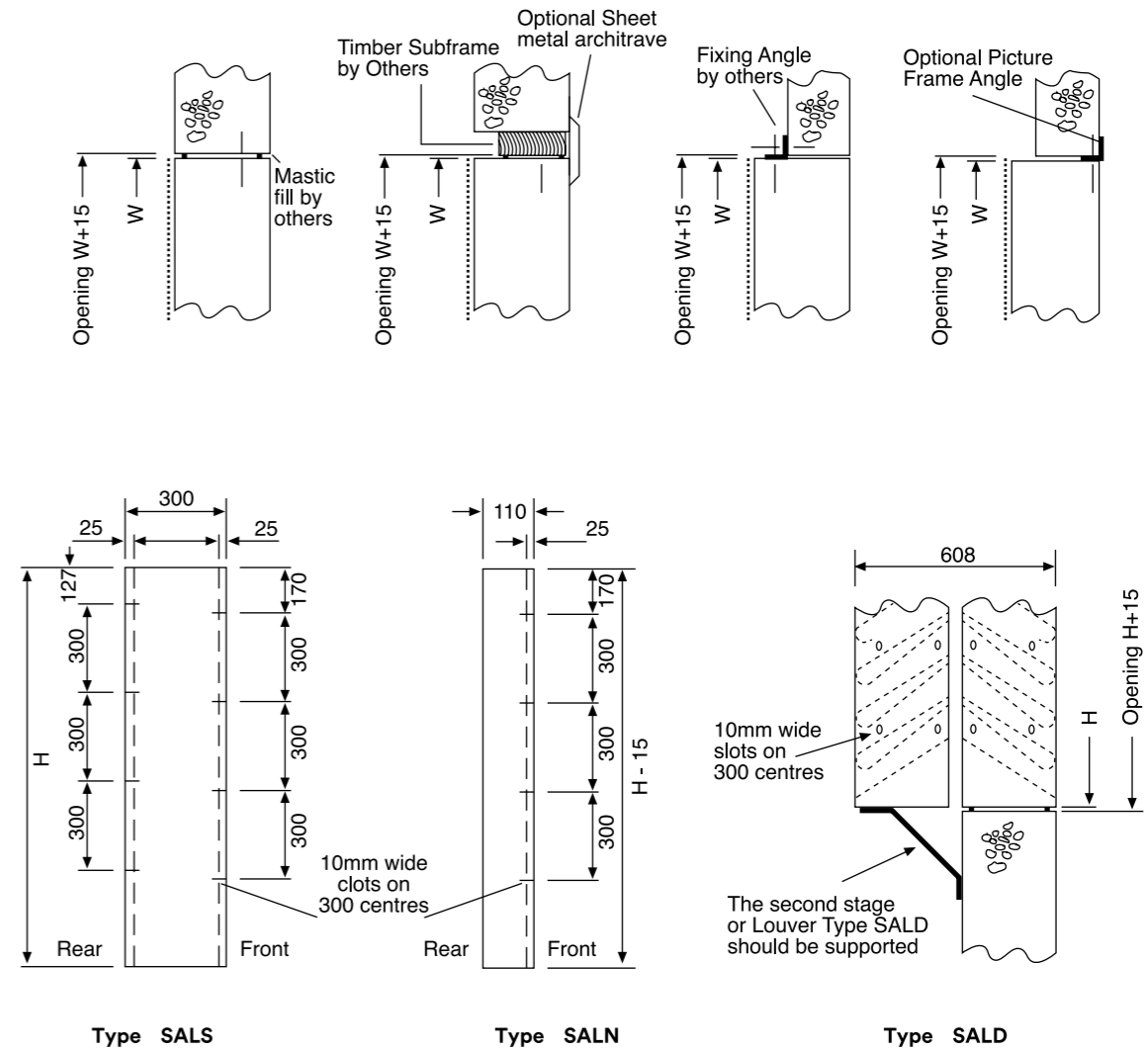
Types SALS, SALD, SALN

The vertical casing sides of the acoustic louvers are pre-slotted to facilitate fixing using a variety of acceptable methods. Where supplied, architraves and picture frames are supplied loose and undrilled.

On multisection units incorporating hollow section coupling frames, the frames are supplied drilled for easier site assembly. During fixing, the louvers should be set square and true in opening then wedged before fixing. Air gaps should be filled with a flexible mastic.

Installation and fixing items are not normally supplied; however, screws would be provided for use with our standard vertical box sections frames, where supplied.

Installation Details



Louver Selection

The acoustic performance needed to meet a particular design noise requirement can be calculated from other technical sources. Table 1 indicates the acoustic performance available from standard and high performance acoustic louvers.

From Table 2, select a louver size at a face velocity that gives an acceptable pressure loss. Check that louver self-noise will not infringe upon the design noise criterion by reference to the Self Noise Index, SNI.

The SNI gives an approximation of regenerated noise from the louver due to air velocity. This is expressed as an NC value at 1 meter, 3 meters and 10 meters from the louver face. The louver selected should have an SNI at least 5 NC below the design noise criterion.

Nomenclature

L in mm : Length (in direction of airflow)

W in mm: Width

H in mm: Height

V in l/s: Volume Flow Rate

V_f in m/s: Face Velocity based on $V \div (W \times H \times 1000)$

Δp in Pa: Pressure Loss

f_m in Hz: Octave Center Frequency

SRI in dB: Sound Reduction Index

SNI: Self Noise Index (equivalent to NC sound pressure level curve at free field distance shown)

Example

a) SRI Required @ f_m

63	125	250	500	1k	2k	4k	8k	Hz
3	5	7	11	14	16	10	8	dB

b) Design Noise Criteria: = NC50 at 3 meters from opening.

c) Volume Flow Rate: V = 12000 l/s.

d) Maximum Required Pressure Loss: Δp=50Pa.

e) Maximum required height, H = 1200mm. Maximum Required Height:

1) From Table 1, a standard performance Type SALS louver would meet the required acoustic performance.

2) From Table 2, the maximum permissible face velocity, for Δp = 50 Pa, is 2.8 m/s.

3) From Table 2, the maximum permissible face velocity, v_t for an SNI of 50 minus 5 at 3m, is 4.9 m/s.

$$\begin{aligned} \text{Required louver area (m}^2\text{)} &= V \div (v_t \times 1000) \\ &= 12000 \div (2.8 \times 1000) \\ &= 4.290 \end{aligned}$$

$$\begin{aligned} \text{Width (W required)} &= 4.290 \div H \text{ (in meters)} \\ &= 4.290 \div 1.2 \\ &= 3.575 \text{ meters} \\ &= 3575 \text{ mm} \end{aligned}$$

Louver Selection:
Type SALS; W x H, 3575 x 1200
(Specify materials and finish)

Acoustic Performance

Acoustic louver performance has been derived from tests based on BS 2750. The test work was carried out using a reverberant room technique. Measurements with and without the test piece were compared to produce the 'Sound Reduction Index' (also known as 'Transmission Loss') of both the 'single bank' performance SALS acoustic louver and the 'double bank' performance version SALD.

The term 'Noise Reduction' is sometimes encountered. This refers to free field measurements taken in close proximity to the louver face rather than in the reverberant receiving room described in BS 2750. This method tends to improve upon the Sound Reduction Index figures by 6 dB.

However, for most applications the 'Sound Reduction Index' data is the more appropriate, since for all practical purposes it may be used in the same way as the static insertion loss of a duct attenuator.

The aerodynamic profile of the acoustic louver blade ensures low pressure loss similar to conventional non-acoustic weather louvers of higher free area. The percentage free area varies with louver height, with the smaller louvers most affected by the restriction of the top and bottom dummy sections.

Weights

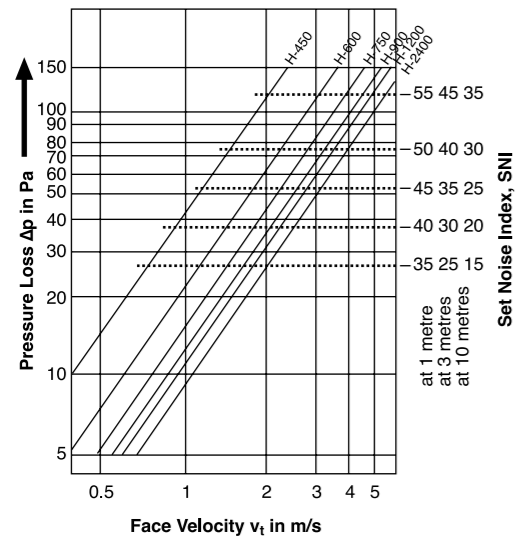
Louver Type	Approximate Weights
SALSS	48kg/m ² face area
SALSA	35kg/m ² face area
SALD	as SALSS or SALSA x 2
SALN	as SALSS or SALSA x 0.5

Table 1: Sound Reduction Index (SRI in dB)

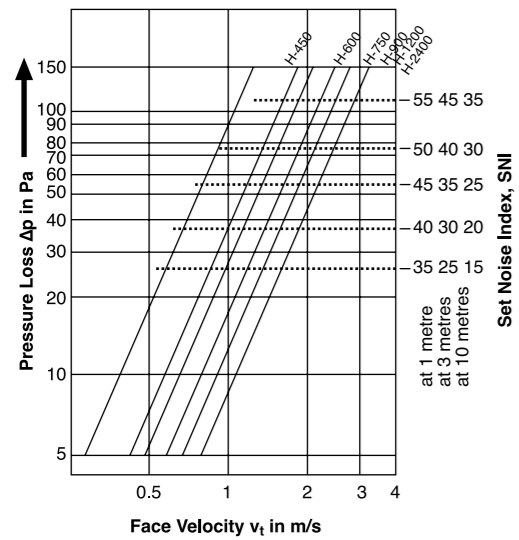
Louver Type	Octave Center Frequency f _m in Hz							
	63	125	250	500	1k	2k	4k	8k
SALS	5	5	7	11	15	18	13	13
SALD	8	9	12	19	28	30	23	22

Pressure Loss and Regenerated Noise

Table 2:
Type SALS (ducted from atmosphere)



Type SALD (ducted from atmosphere)



Order Details

Specifications

Type SALS acoustic louver constructed from either galvanized sheet steel or natural mill aluminum with finish as specified. 1.5 mm thick channel casing incorporates aerodynamic acoustic blades containing erosion protected Class O infill covered by perforated sheet metal. Casing sides are pre-slotted for fixing into a prepared opening.

Ordering

Product Code: SAL D A 4000 1800

Type

Type Suffix:
 S - Single Bank
 D - Double Bank
 N - Non Acoustic

Material:
 S - Galvanized Steel
 A - Natural Aluminum

W (width, mm)

H (height, mm)

