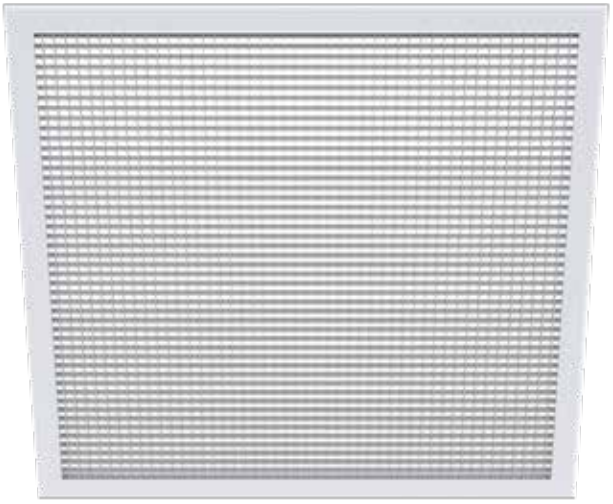
DOĞU
İKLİMLENDİRME | HVAC SYSTEMS



DMP
Egg Crate Grille

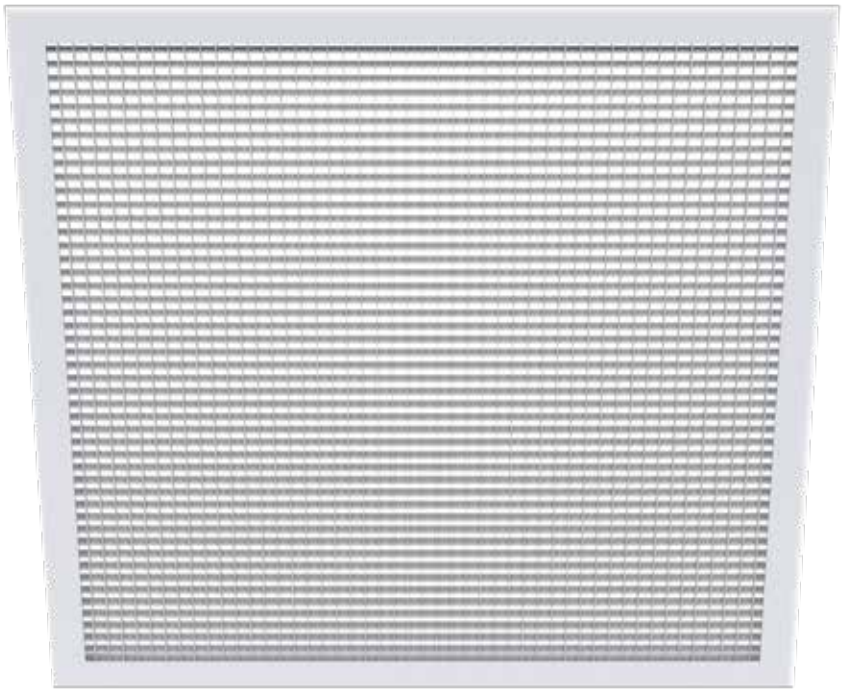
FOUR SEASONS®

Venues Breathe with DOGU HVAC Systems!

DOGU HVAC founded in 1999, and ever since has been manufacturing Energy-and Cost-Efficient products as Air Handling Units, Air Distribution & Management & Movement Systems [HVAC Components] and constantly enhancing to provide an integrated solution for well-being. DOGU HVAC's core business products which are subsumed under four major groups as Air Handling Units, Heat/Energy Recovery Units, Air Distribution & Management Products and Kitchen Ventilation Equipment are all produced under the compliance with EU standarts. Particularly AHU and HRU-ER units are entitled under the "FOUR SEASONS" brand name for domestic and foreign markets. DOGU HVAC's, headquarter in Izmir/Turkey, operates in a large-sized plant spread over two factories, in total area of 45.000 sqm in which 25.000 sqm indoor space that enables DOGU HVAC manufactures 140 various type of products. Additionally, DOGU HVAC has a powerful sales network with three sales offices located in Istanbul, Ankara and Antalya in Turkey as well as authorized dealers in many other countries for sales and after sales operations. DOGU HVAC has been exporting to more than 50 countries.

Thanks to our "Customer Satisfaction","Zero-Defect Policy" motto and reinforced by complete certified products, more than 250 employees. DOGU HVAC R&D center developed exclusive products, such as Double Skin Make-Up Kitchen Hood, Recirculated Laminar Airflow Unit, Single Piece Square Ceiling Diffuser and Ecology Units, for the first time have brought to the sector. DOGU HVAC R&D has the ability to make customized production which can meet the requirement of the customers by means of special software such as "ANSYS FLUENT". DOGU HVAC guaranteed its quality of management by having advantages of ISO 9001, ISO 14001, ISO 18001 certifications. Air Handling Units have EUROVENT, TUV Hygiene [in accordance with DIN1946-4, VDI 6022-1, DIN EN 13053 standarts], CE, TSEK, GOST-R certifications; Fire Dampers have EN 1366-2 and EN 13501-3 CE certifications; Smoke Control Dampers have EN 1366-10 and 12101-8 CE certifications; Kitchen Ventilation Products have TSE, CE and GOST-R quality certifications.

- DMP – Egg Crate Grille is a suction grille with egg crate mesh structure.
- It has a low pressure drop value since its effective area is higher than other grilles. For this reason, it can be used as a suction grille in ventilation systems.



MATERIAL

- The frame is made of aluminum 6063 extrusion profile.
- Egg crates manufactured from aluminum 1050 sheet metal.

SURFACE COATING

- RAL 9010 or RAL 9016 electrostatic powder paint as standard.
- Optional
  -Different RAL color codes
  -Unpainted manufacturing

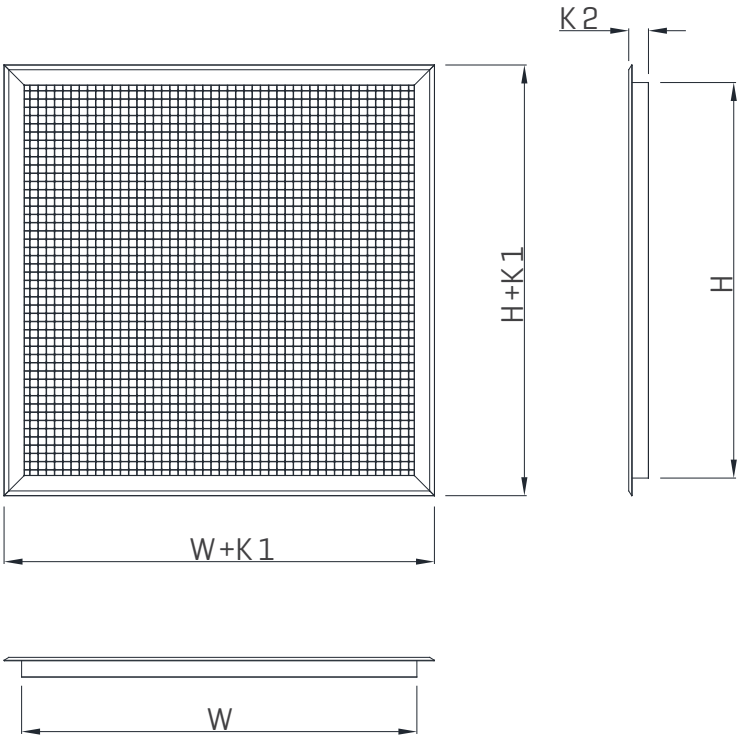
INSTALLATION OPTIONS

- Screw System
- Suspended Ceiling
- Clip-In Ceiling
- With Latch
- Long Clip
- Subframe Short Clip
- With Damper

ACCESSORIES

- Optional
  - ZKD - Opposed Blade Air Adjustment Damper (Production from aluminum 6063 extrusion profile)
  - Fiber Filter
  - Polyurethane Filter
  - Neck Reducer

STANDARD DIMENSIONS



	K1 (mm)	K2 (mm)
22 mm Frame	35.6	30
31 mm Frame	54	30
Clip-In Frame	59.2	30

W (mm) (Width)	50 - 100 - 200 - 400 - 500 - 600 - 700 - 800 - 900 - 1000 - 1100 1200 - 1300 - 1400 - 1500 - 1600 - 1800 - 2000
H (mm) (Height)	50 - 100 - 200 - 400 - 600 - 800 - 1000

PERFORMANCE DATA

Table 1. Effective Area

Effective Areas (m²)		H Height (mm)																		
		50	100	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
W Width (mm)	50	0.0022	0.0045	0.0091	0.0114	0.0137	0.0160	0.0183	0.0206	0.0229	0.0252	0.0275	0.0298	0.0321	0.0344	0.0367	0.0390	0.0413	0.0436	0.0459
	100	0.0045	0.0091	0.0183	0.0229	0.0275	0.0321	0.0367	0.0413	0.0459	0.0505	0.0551	0.0597	0.0643	0.0689	0.0735	0.0781	0.0827	0.0873	0.0919
	200	0.0091	0.0183	0.0367	0.0459	0.0551	0.0643	0.0735	0.0827	0.0919	0.1011	0.1103	0.1194	0.1286	0.1378	0.1470	0.1562	0.1654	0.1746	0.1838
	250	0.0114	0.0229	0.0459	0.0574	0.0689	0.0804	0.0919	0.1034	0.1149	0.1263	0.1378	0.1493	0.1608	0.1723	0.1838	0.1953	0.2068	0.2183	0.2298
	300	0.0137	0.0275	0.0551	0.0689	0.0827	0.0965	0.1103	0.1240	0.1378	0.1516	0.1654	0.1792	0.1930	0.2068	0.2206	0.2343	0.2481	0.2619	0.2757
	350	0.0160	0.0321	0.0643	0.0804	0.0965	0.1126	0.1286	0.1447	0.1608	0.1769	0.1930	0.2091	0.2252	0.2412	0.2573	0.2734	0.2895	0.3056	0.3217
	400	0.0183	0.0367	0.0735	0.0919	0.1103	0.1286	0.1470	0.1654	0.1838	0.2022	0.2206	0.2389	0.2573	0.2757	0.2941	0.3125	0.3309	0.3492	0.3676
	450	0.0206	0.0413	0.0827	0.1034	0.1240	0.1447	0.1654	0.1861	0.2068	0.2275	0.2481	0.2688	0.2895	0.3102	0.3309	0.3515	0.3722	0.3929	0.4136
	500	0.0229	0.0459	0.0919	0.1149	0.1378	0.1608	0.1838	0.2068	0.2298	0.2527	0.2757	0.2987	0.3217	0.3447	0.3676	0.3906	0.4136	0.4366	0.4596
	550	0.0252	0.0505	0.1011	0.1263	0.1516	0.1769	0.2022	0.2275	0.2527	0.2780	0.3033	0.3286	0.3538	0.3791	0.4044	0.4297	0.4550	0.4802	0.5055
	600	0.0275	0.0551	0.1103	0.1378	0.1654	0.1930	0.2206	0.2481	0.2757	0.3033	0.3309	0.3584	0.3860	0.4136	0.4412	0.4687	0.4963	0.5239	0.5515
	650	0.0298	0.0597	0.1194	0.1493	0.1792	0.2091	0.2389	0.2688	0.2987	0.3286	0.3584	0.3883	0.4182	0.4481	0.4779	0.5078	0.5377	0.5676	0.5974
	700	0.0321	0.0643	0.1286	0.1608	0.1930	0.2252	0.2573	0.2895	0.3217	0.3538	0.3860	0.4182	0.4504	0.4825	0.5147	0.5469	0.5790	0.6112	0.6434
	750	0.0344	0.0689	0.1378	0.1723	0.2068	0.2412	0.2757	0.3102	0.3447	0.3791	0.4136	0.4481	0.4825	0.5170	0.5515	0.5859	0.6204	0.6549	0.6894
	800	0.0367	0.0735	0.1470	0.1838	0.2206	0.2573	0.2941	0.3309	0.3676	0.4044	0.4412	0.4779	0.5147	0.5515	0.5882	0.6250	0.6618	0.6985	0.7353
	850	0.0390	0.0781	0.1562	0.1953	0.2343	0.2734	0.3125	0.3515	0.3906	0.4297	0.4687	0.5078	0.5469	0.5859	0.6250	0.6641	0.7031	0.7422	0.7813
	900	0.0413	0.0827	0.1654	0.2068	0.2481	0.2895	0.3309	0.3722	0.4136	0.4550	0.4963	0.5377	0.5790	0.6204	0.6618	0.7031	0.7445	0.7859	0.8272
	950	0.0436	0.0873	0.1746	0.2183	0.2619	0.3056	0.3492	0.3929	0.4366	0.4802	0.5239	0.5676	0.6112	0.6549	0.6985	0.7422	0.7859	0.8295	0.8732
	1000	0.0459	0.0919	0.1838	0.2298	0.2757	0.3217	0.3676	0.4136	0.4596	0.5055	0.5515	0.5974	0.6434	0.6894	0.7353	0.7813	0.8272	0.8732	0.9192
	1100	0.0505	0.1011	0.2022	0.2527	0.3033	0.3538	0.4044	0.4550	0.5055	0.5561	0.6066	0.6572	0.7077	0.7583	0.8088	0.8594	0.9100	0.9605	1.0111
	1200	0.0551	0.1103	0.2206	0.2757	0.3309	0.3860	0.4412	0.4963	0.5515	0.6066	0.6618	0.7169	0.7721	0.8272	0.8824	0.9375	0.9927	1.0478	1.1030
	1500	0.0689	0.1378	0.2757	0.3447	0.4136	0.4825	0.5515	0.6204	0.6894	0.7583	0.8272	0.8962	0.9651	1.0341	1.1030	1.1719	1.2409	1.3098	1.3788
	1750	0.0804	0.1608	0.3217	0.4021	0.4825	0.5630	0.6434	0.7238	0.8043	0.8847	0.9651	1.0455	1.1260	1.2064	1.2868	1.3673	1.4477	1.5281	1.6086
	2000	0.0919	0.1838	0.3676	0.4596	0.5515	0.6434	0.7353	0.8272	0.9192	1.0111	1.1030	1.1949	1.2868	1.3788	1.4707	1.5626	1.6545	1.7464	1.8384

Table 2. Performance Data

		Effective Speed (m / s)														
Flow Rate (m^3 / h)		0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0	7.0	8.0	9.0	10.0
50	Effective Area [m^2]	0.0278	0.0139	0.0093	0.0069	0.0056	0.0046	0.004	0.0035	0.0031	0.0028	0.0023				
	Pressure Drop [Pa]	<1	1	2	4	6	9	12	15	19	24	34				
	Throw Distance [m]	1	2	2	3	3	3	4	4	4	5	5				
	Sound Power Level [dB(A)]	<15	<15	<15	<15	<15	<15	<15	<15	17	20	25				
100	Effective Area [m^2]	0.0556	0.0278	0.0185	0.0139	0.0111	0.0093	0.0079	0.0069	0.0062	0.0056	0.0046	0.004	0.0035	0.0031	0.0028
	Pressure Drop [Pa]	<1	1	2	4	6	9	12	15	19	24	34	46	61	77	95
	Throw Distance [m]	1	2	3	3	4	4	5	5	5	6	6	7	8	8	9
	Sound Power Level [dB(A)]	<15	<15	<15	<15	<15	<15	<15	17	20	23	27	31	35	38	41
200	Effective Area [m^2]	0.1111	0.0556	0.037	0.0278	0.0222	0.0185	0.0159	0.0139	0.0123	0.0111	0.0093	0.0079	0.0069	0.0062	0.0056
	Pressure Drop [Pa]	<1	1	2	4	6	8	11	15	19	23	34	46	60	76	94
	Throw Distance [m]	2	3	3	4	5	5	6	6	7	7	8	9	10	11	11
	Sound Power Level [dB(A)]	<15	<15	<15	<15	<15	<15	16	20	23	26	30	34	38	41	44
300	Effective Area [m^2]	0.1667	0.0833	0.0556	0.0417	0.0333	0.0278	0.0238	0.0208	0.0185	0.0167	0.0139	0.0119	0.0104	0.0093	0.0083
	Pressure Drop [Pa]	<1	1	2	4	6	8	11	15	19	23	34	46	60	76	94
	Throw Distance [m]	2	3	4	5	5	6	7	7	8	8	9	10	11	12	13
	Sound Power Level [dB(A)]	<15	<15	<15	<15	<15	<15	18	21	25	27	32	36	40	43	45
400	Effective Area [m^2]	0.2222	0.1111	0.0741	0.0556	0.0444	0.037	0.0317	0.0278	0.0247	0.0222	0.0185	0.0159	0.0139	0.0123	0.0111
	Pressure Drop [Pa]	<1	1	2	4	6	8	11	15	19	23	33	46	60	75	93
	Throw Distance [m]	2	3	4	5	6	6	7	8	8	9	10	11	12	13	14
	Sound Power Level [dB(A)]	<15	<15	<15	<15	<15	15	19	23	26	29	33	37	41	44	47
500	Effective Area [m^2]	0.2778	0.1389	0.0926	0.0694	0.0556	0.0463	0.0397	0.0347	0.0309	0.0278	0.0231	0.0198	0.0174	0.0154	
	Pressure Drop [Pa]	<1	1	2	4	6	8	11	15	19	23	33	45	59	75	
	Throw Distance [m]	2	3	4	5	6	7	8	8	9	10	11	12	13	14	
	Sound Power Level [dB(A)]	<15	<15	<15	<15	<15	16	20	24	27	29	34	38	42	45	
600	Effective Area [m^2]	0.3333	0.1667	0.1111	0.0833	0.0667	0.0556	0.0476	0.0417	0.037	0.0333	0.0278	0.0238	0.0208		
	Pressure Drop [Pa]	<1	1	2	4	6	8	11	15	19	23	33	45	59		
	Throw Distance [m]	2	4	5	6	7	7	8	9	10	10.4	12	13	14		
	Sound Power Level [dB(A)]	<15	<15	<15	<15	<15	17	21	24	27	30	35	39	42		
700	Effective Area [m^2]	0.3889	0.1944	0.1296	0.0972	0.0778	0.0648	0.0556	0.0486	0.0432	0.0389	0.0324	0.0278	0.0243		
	Pressure Drop [Pa]	<1	1	2	4	6	8	11	15	19	23	33	45	59		
	Throw Distance [m]	2	4	5	6	7	8	9	9	10	10.9	12	14	15		
	Sound Power Level [dB(A)]	<15	<15	<15	<15	<15	17	21	25	28	31	36	40	43		
800	Effective Area [m^2]	0.4444	0.2222	0.1481	0.1111	0.0889	0.0741	0.0635	0.0556	0.0494	0.0444	0.037	0.0317			
	Pressure Drop [Pa]	<1	1	2	4	6	8	11	15	19	23	33	45			
	Throw Distance [m]	3	4	5	6	7	8	9	10	11	11.4	13	14			
	Sound Power Level [dB(A)]	<15	<15	<15	<15	<15	18	22	26	29	31	36	40			
900	Effective Area [m^2]	0.5	0.25	0.1667	0.125	0.1	0.0833	0.0714	0.0625	0.0556	0.05	0.0417	0.0357			
	Pressure Drop [Pa]	<1	1	2	4	6	8	11	15	19	23	33	45			
	Throw Distance [m]	3	4	5	7	8	9	9	10	11	11.9	13	15			
	Sound Power Level [dB(A)]	<15	<15	<15	<15	<15	19	23	26	29	32	37	41			
1000	Effective Area [m^2]	0.5556	0.2778	0.1852	0.1389	0.1111	0.0926	0.0794	0.0694	0.0617	0.0556	0.0463				
	Pressure Drop [Pa]	<1	1	2	4	6	8	11	15	19	23	33				
	Throw Distance [m]	3	4	6	7	8	9	10	11	12	12.3	14				
	Sound Power Level [dB(A)]	<15	<15	<15	<15	<15	19	23	27	30	32	37				
1250	Effective Area [m^2]	0.6944	0.3472	0.2315	0.1736	0.1389	0.1157	0.0992	0.0868	0.0772	0.0694	0.0579				
	Pressure Drop [Pa]	<1	1	2	4	6	8	11	15	19	23	33				
	Throw Distance [m]	3	5	6	7	8	9	11	11	12	13.2	15				
	Sound Power Level [dB(A)]	<15	<15	<15	<15	15	20	24	27	31	33	38				
1500	Effective Area [m^2]	0.8333	0.4167	0.2778	0.2083	0.1667	0.1389	0.119	0.1042	0.0926	0.0833					
	Pressure Drop [Pa]	<1	1	2	4	6	8	11	15	18	23					
	Throw Distance [m]	3	5	6	8	9	10	11	12	13.1	14.1					
	Sound Power Level [dB(A)]	<15	<15	<15	<15	16	21	25	28	31	34					
1750	Effective Area [m^2]	0.9722	0.4861	0.3241	0.2431	0.1944	0.162	0.1389	0.1215	0.108	0.0972					
	Pressure Drop [Pa]	<1	1	2	4	6	8	11	15	18	23					
	Throw Distance [m]	3	5	7	8	9	11	12	13	14	15					
	Sound Power Level [dB(A)]	<15	<15	<15	<15	16	21	25	29	32	35					
2000	Effective Area [m^2]		0.5556	0.3704	0.2778	0.2222	0.1852	0.1587	0.1389	0.1235						
	Pressure Drop [Pa]		1	2	4	6	8	11	15	18						
	Throw Distance [m]		5	7	8	10	11	12	13	15						
	Sound Power Level [dB(A)]		<15	<15	<15	17	22	26	29	32						
2500	Effective Area [m^2]		0.6944	0.463	0.3472	0.2778	0.2315	0.1984	0.1736							
	Pressure Drop [Pa]		1	2	4	6	8	11	14							
	Throw Distance [m]		6	8	9	11	12	13	14							
	Sound Power Level [dB(A)]		<15	<15	<15	18	23	27	30							
3000	Effective Area [m^2]		0.8333	0.5556	0.4167	0.3333	0.2778	0.2381								
	Pressure Drop [Pa]		1	2	4	6	8	11								
	Throw Distance [m]		6	8	10	11	13	14								
	Sound Power Level [dB(A)]		<15	<15	<15	19	24	28								
4000	Effective Area [m^2]			0.7407	0.5556	0.4444	0.3704									
	Pressure Drop [Pa]			2	4	6	8									
	Throw Distance [m]			9	11	12	14									
	Sound Power Level [dB(A)]			<15	<15	20	25									

Note: The data are obtained when the temperature difference between the air distribution equipment and the ambient air is T=8 K.

Throw distance is the distance between the point where the air leaving the distribution equipment reaches to velocity of 0.25 m/s, and the air distribution equipment.

Table 3. Throw Distance Correction

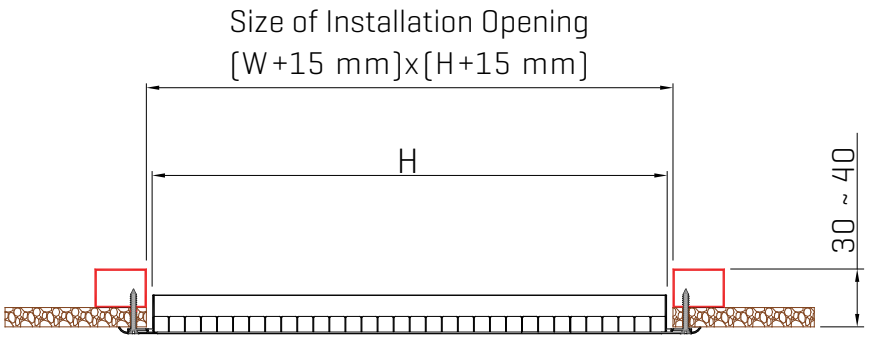
Heating Mode (ΔT)	4	6	8	10	12
Throw Distance Factor	1.07	1.02	1	0.90	0.83
Cooling Mode (ΔT)	4	6	8	10	12
Throw Distance Factor	1.31	1.36	1.42	1.48	1.54

Table 4. Damper Pressure Correction

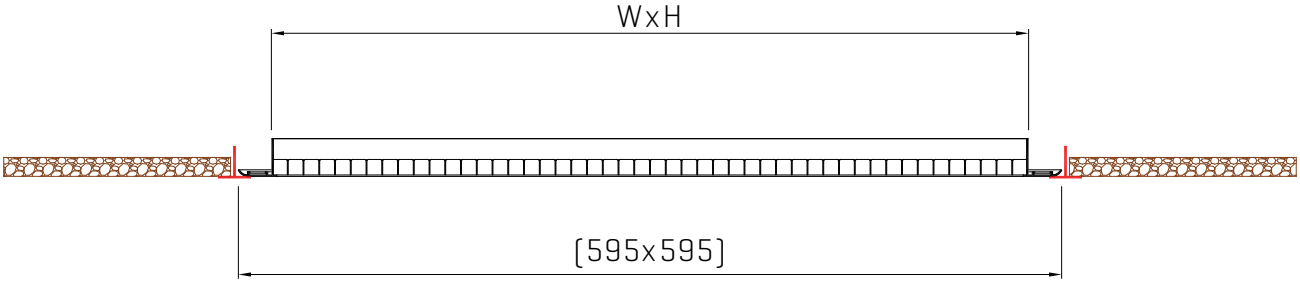
Damper Location	Pressure Drop Factor	Sound Production (dB(A))
Opened	1.1	+1
25% Closed	1.14	+4
50% Closed	2.48	+14
75% Closed	5.11	+29

INSTALLATION

1. SCREW SYSTEM



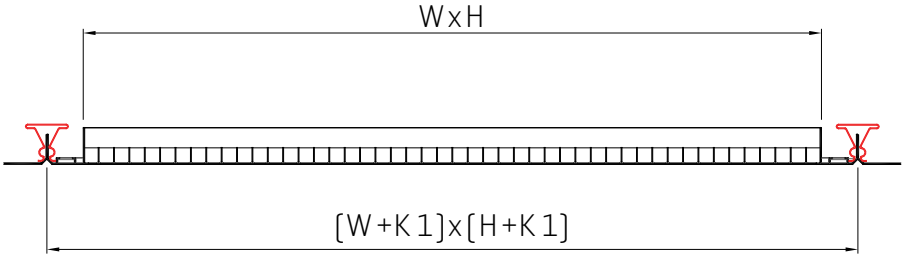
2. SUSPENDED CEILING



W and H sizes that can be selected according to the frame sizes specified in the product selection are shown in the table on the right.

	W (mm)	H (mm)
22 mm Frame	559	559
32 mm Frame	541	541

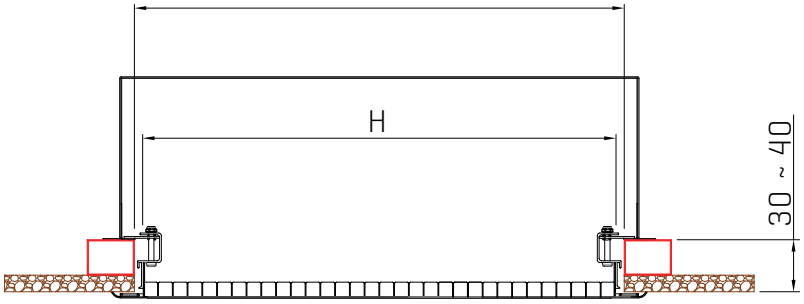
3. CLIP-IN CEILING



Clip-In Frame K1 = 59 mm	W (mm)	H (mm)
600x600	541	541
300x300	241	241

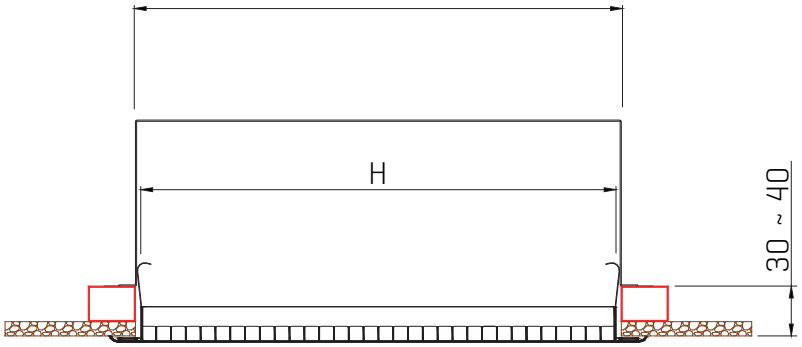
4. WITH LATCH

Size of Installation Opening
If H≤300 (W+30 mm)x(H+15 mm)
If H>300 (W+30 mm)x(H+15 mm)



5. LONG CLIPS

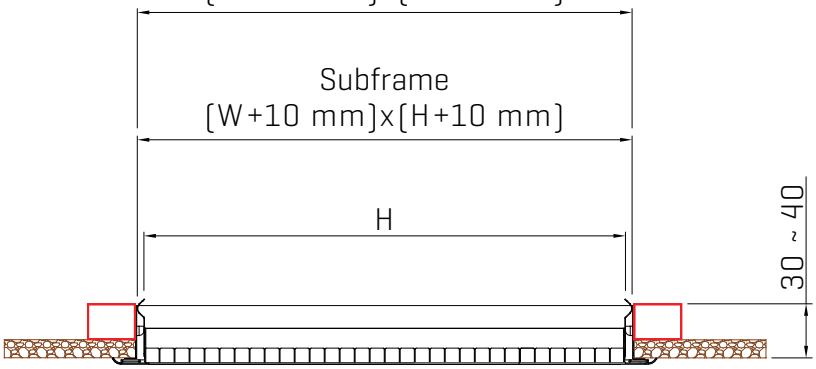
Size of Installation Opening
(W+15 mm)x(H+15 mm)



6. SUBFRAME SHORT CLIP

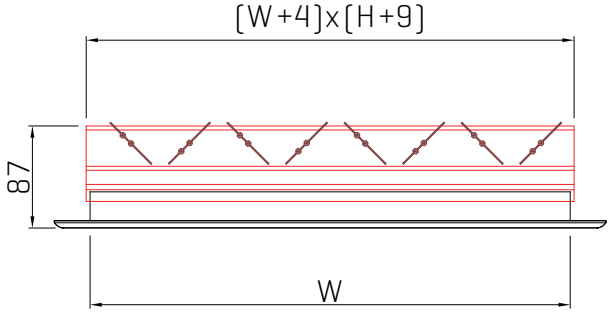
Size of Installation Opening
(W+15 mm)x(H+15 mm)

Subframe
(W+10 mm)x(H+10 mm)



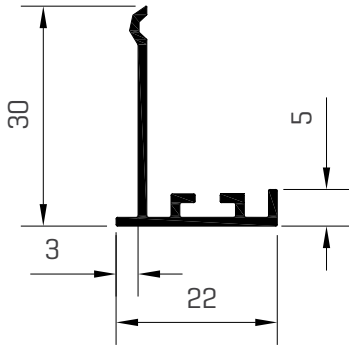
7. WITH DAMPER

(W+4)x(H+9)

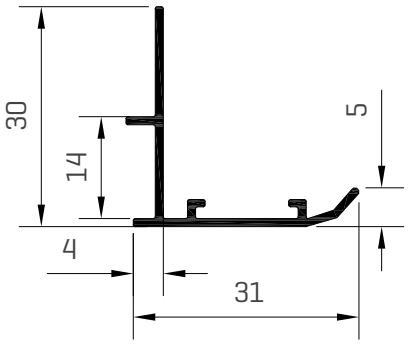


FRAME TYPES

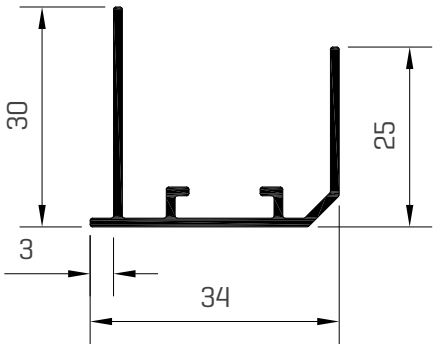
22 mm Frame



31 mm Frame



Clip-In Frame



MAXIMUM MODULE SIZE

The standard size of a single piece product is in the limits of 50x50 to 2000x1000. If the order is placed over standard sizes, the grilles will be produced more than once in full pieces.

PRODUCT SELECTION

Example: The air flow distributed in the space has been determined as 3000 m³/h. 3 Egg Crate Grille will be used for air extract. Make your product selection.

Solution: Flow rate for a grille, 3000/3 = 1000 m³/h

From the Performance Data Table (Table 2), the effective area corresponding to the appropriate pressure drop and flow rate values are selected.

For example, in 0.1389 m² effective area, the effective speed is 2 m/s, pressure loss is 4 Pa, and sound power level is less than 15 dB(A).

The appropriate grille size can be selected from the effective area table as 500 mm x 300 mm corresponding to 0.1389 m² value.

Opposed Blade Damper Condition

The pressure drop and sound power level changes in the damper product. Damper Correction Table (Table 4) should be used.

For example, the pressure multiplier for the damper product in the 50% closed position of the damper is 2.48 corresponding to the table and the sound generation to be added is +14 dB(A).

Total static pressure drop: 4x2.48=9.9 Pa

Total sound power level is less than 29 dB(A).

PRODUCT ORDER CODES

You can place your orders according to the following coding format.

DMP.< A > . < B > . < C > . < D > . < E > . < F > . < G >. < H >

A	Raw Material Type	
	ALM	Aluminum
B	**Case Type**	
	04	22 mm
	05	31 mm
	09	Clip-In Ceiling
	00	Without Frame
C	**Damper**	
	ZD	Opposed Blade Damper
	DZ	Without Damper
D	**Installation Type**	
	VD	Screw System
	KR	Suspended Ceiling
	KL	Clip-In Ceiling
	MD	Without Mounting Hole
	MN	With Latch
	UK	Long Clips
	KO	Subframe Short Clip
	KK	Short Clip without Subframe
E	**Accessories**	
	00	Without Accessories
	EF	Fiber Filter
	PF	Polyurethane Filter
	BD	Neck Reducer
F	**Horizontal Dimension (W) (mm)**	
	0000	You can view it from standard dimensions.
G	**Vertical Dimension (H) (mm)**	
	0000	You can view it from standard dimensions.
H	**Paint**	
	00	Unpainted
	S1	Standard Painted - RAL 9010
	S2	Standard Painted - RAL 9016
	XX	Special Painted

Sample Coding; DMP.ALM.24.ZD.KR.00.0500.0500.S1

NOTES

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