C 01.01
EN.00

CAA

Circular **Diffuser**

KES KLIMA
AIR CONTROL SYSTEMS

Description

The CAA type diffusers are designed for ceiling applications. They can be used for supply or extract air, together with the accessories required for various demands.

Properties

The CAA type diffusers have fixed and curved blades. For supply air purposes, they are characteristically suitable for horizontal air throws. Where "Coanda effect" is required, they should be installed close to the ceiling. These diffusers are recommended for use with ceiling heights up to 4 m., with a supply air temperature difference of (+/-) 10^{O}C. The diffuser is made of a frame and a central blade block. The blade block is fixed to the frame by the aid of spring pins and can easly be removed / installed.

The standard sizes start from 150 mm diameter, and go up to 500 mm with increments of 50 mm.

Materials

The frame and the blades are manufactured from ETIAL-5 norm aluminium sheets.

Surface Treatment

The surfaces of the diffusers are first cleaned, then treated with chromating process; after which, are painted electrostatically, with 20% gloss RAL 9010 (white) as standard. Other colours are also available upon request.

Accessories

Double Flap Damper

Depending on application characteristics, a double-flap damper can be installed on the back side of the diffuser. This damper is a separate item which can be operated from the face of the diffuser.These dampers are formed from steel sheets. To prevent reflection, they are painted RAL 9005 (matt black) as standard.

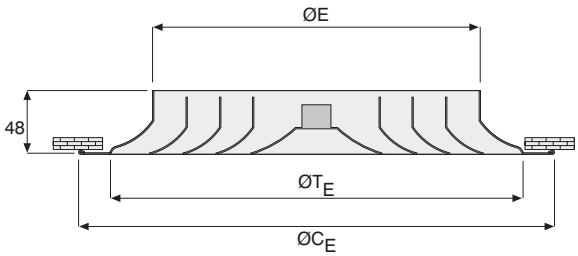
Flap Damper with Rectifier

This type of damper is used in high velocity ducts. The rectifier is made of ETIAL-60 norm aluminium profiles and the flap damper part is formed from steel sheets. To prevent reflection, they are painted RAL 9005 (matt black) as standard.

Plenum Box

The plenum box is used to achieve optimum throw characteristics. It has the inlet either at the top or at one side. Depending on request, a damper can be installed at the inlet, which can be operated internally or externally (has to be specified with the order). The plenum boxes are made from 0.6 mm thick galvanized steel sheets and have 4 hanging brackets on their body. Optionally, a 6 mm thick acoustic foam can be laid inside the plenum box.

Dimensions



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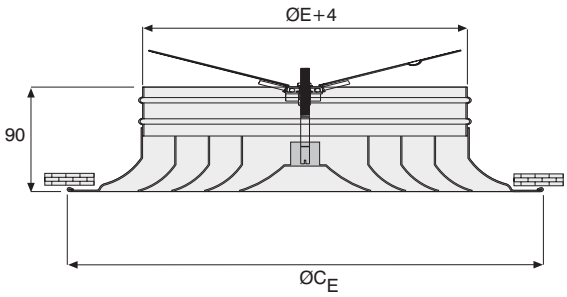

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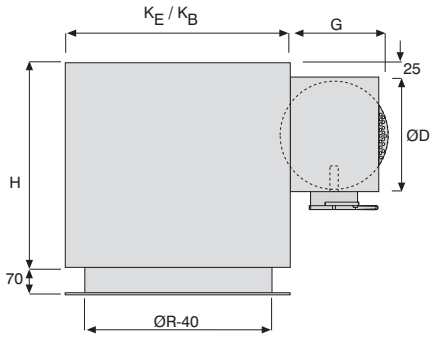
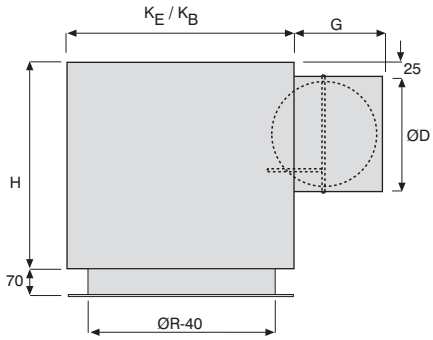
Size (mm)	ØE	ØT$_E$	ØC$_E$	K$_E$ / K$_B$	H	ØD	G
150	146	207	257	300	250	142	150
200	196	270	310	350	250	193	150
250	246	320	361	400	350	244	175
300	300	367	412	450	350	244	175
350	350	425	463	500	400	305	200
400	400	470	513	550	400	305	200
450	450	520	564	600	450	346	225
500	500	570	615	650	450	346	225

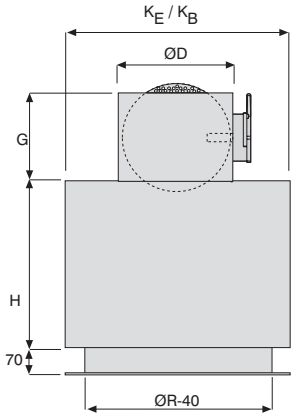
Externally Operated, Side inlet



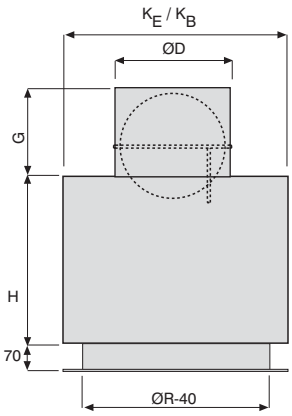
Internally Operated, Side inlet



Externally Operated, Top inlet

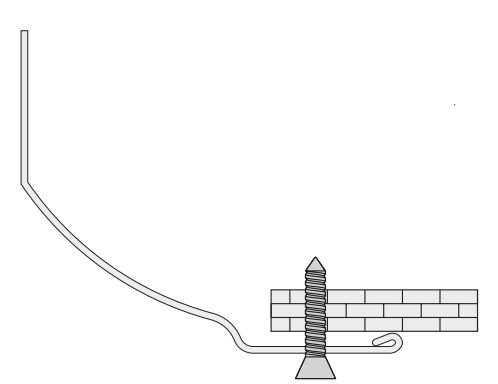


Internally Operated, Top inlet



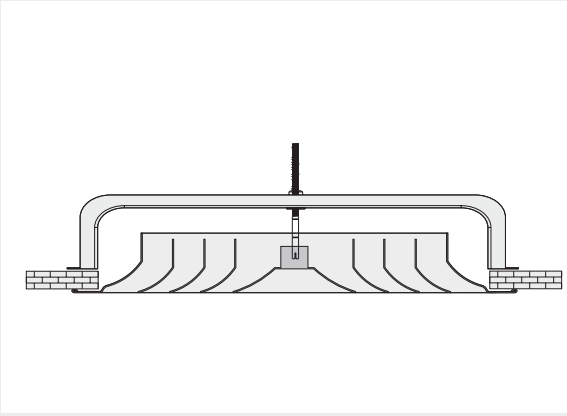
Installation

Fixing with screws



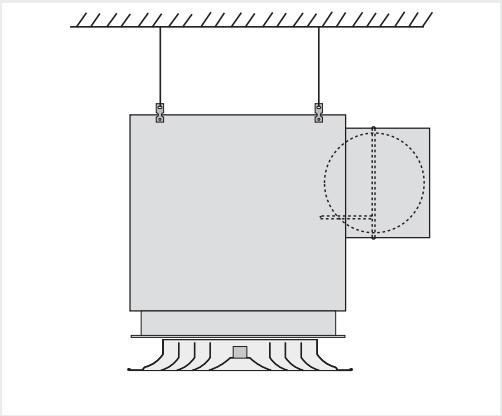
A set of Ø4.2 x 38 mm self-drilling screws, painted the same, are given with the product

Fixing with a bridge



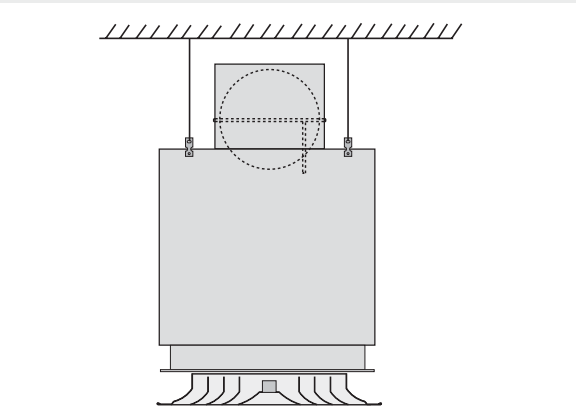
This is fixing type is possible without any accessories

Plenum Box Installation (Side inlet)



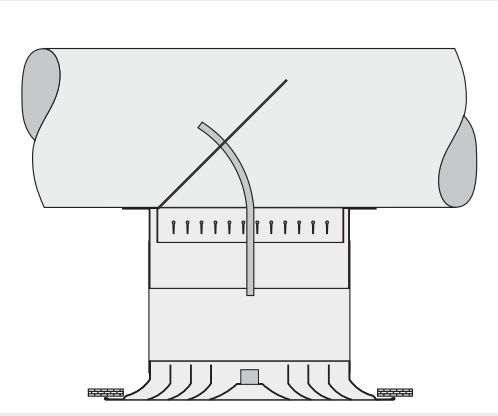
There are 4 hanging brackets on the box as standard

Plenum Box Installation (Top inlet)



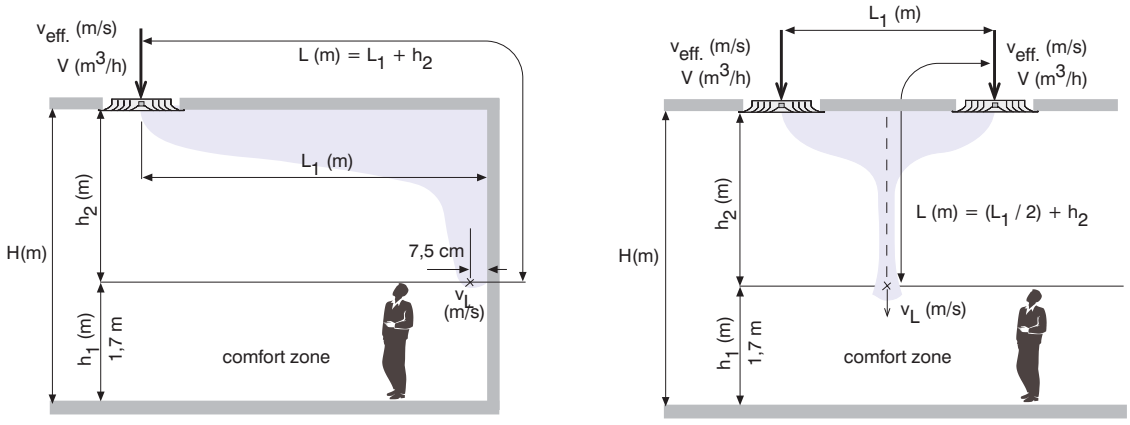
There are 4 hanging brackets on the box as standard

Application of Flap Damper with Rectifier



Applied in high-speed ducts

Nomenclature



L_1	Distance between diffuser centres or diffuser centre and wall. (m)
h1	Comfort zone height (m)
h2	Distance between a diffuser and comfort zone (m)
$v_{eff.}$	Effective outlet velocity (m/s)
v_L	Velocity of core in comfort zone
Δt_0	Difference between supply air and room temperature (^oC)
Δt_L	Difference between core and comfort zone temperature (^oC)
L	Throw distance (m)
V	Air flow rate (m^3/h)

	Sound Power	Pressure Loss
Supply , With Damper	+3 dB (A)	x 1,0
Extract	+3 dB (A)	x 1,1
Extract , With Damper	+13 dB (A)	x 1,15

The data in tables are given for supply diffusers without dampers.For the cases indicated in the table beside, apply the relevant correction factors

Technical Data

Size ØE (mm)	Flow Rate V (m^3/h)	Throw Length L (m)		Pressure Loss ΔP (Pa)	Sound Power level S (dB(A))
		v_L=0,25 m/s	v_L=0,10 m/s		
150	90	0,85	1,90	7	<20
	110	1,00	2,20	9	<20
	140	1,25	2,75	15	<20
	180	1,55	3,35	23	23
	215	1,80	3,90	36	30
200	125	0,95	2,00	3	<20
	140	1,05	2,20	4	<20
	200	1,35	2,90	8	<20
	250	1,65	3,60	12	20
	360	2,25	4,80	25	31
250	200	1,15	2,45	3	<20
	300	1,70	3,45	6	<20
	400	2,05	4,30	11	25
	500	2,50	5,25	18	32
	600	2,90	6,10	25	37
300	300	1,50	3,20	3	<20
	450	2,05	4,35	6	20
	600	2,60	5,50	11	28
	800	3,30	7,05	20	37
	1000	3,80	8,50	32	45
350	450	1,90	4,00	3	<20
	700	2,65	5,55	8	27
	950	3,40	7,20	14	35
	1200	4,10	8,55	23	43
	1450	4,75	10,00	34	49
400	540	1,90	4,00	3	<20
	900	2,90	6,25	7	28
	1260	3,90	8,35	14	39
	1620	4,85	10,45	23	46
	1980	5,75	12,40	35	>50
450	800	2,35	4,95	3	20
	1150	3,20	6,85	7	30
	1500	3,95	8,40	12	38
	1850	4,80	10,20	18	45
	2200	5,55	12,00	26	>50
500	900	2,45	5,20	3	<20
	1300	3,30	7,05	6	30
	1700	4,20	8,90	10	38
	2100	5,00	10,60	15	45
	2500	5,75	12,10	21	50

Technical Data

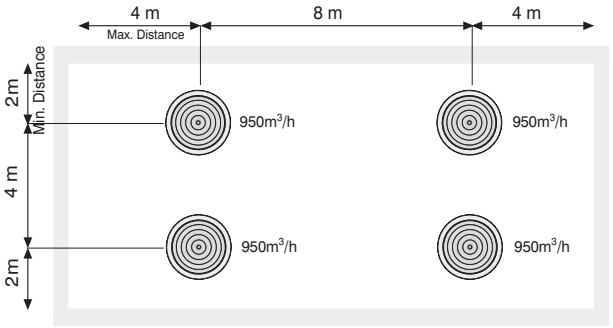
Temperature gradients along the throw path are read from the table below, depending on the Δt_o , Δt_L and throw length values. The temperature of the core at L metres from the diffuser, differs from the room temperature by the value read from the tables. The difference is plus in heating and minus in cooling. The less the difference, the better the comfort conditions.

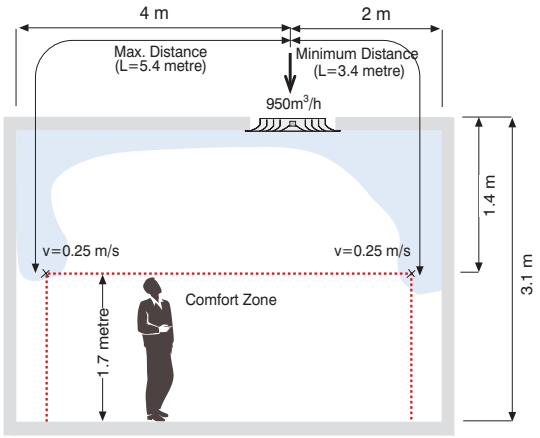
Temperature Gradients along the throw path Δt_L (°C) Values

Size ØE (mm)	Throw (L) m	Δt_o (°C)					
		4	6	8	10	12	14
150	2	0,25	0,37	0,50	0,62	0,74	0,87
	2,5	0,19	0,28	0,38	0,47	0,56	0,66
	3	0,15	0,23	0,30	0,38	0,46	0,53
	4	0,11	0,16	0,22	0,27	0,32	0,38
	5	0,08	0,12	0,16	0,20	0,24	0,28
200	2	0,36	0,54	0,72	0,90	1,08	1,26
	3	0,28	0,41	0,55	0,69	0,83	0,97
	4	0,16	0,23	0,31	0,39	0,47	0,55
	5	0,12	0,18	0,24	0,30	0,36	0,42
	7	0,08	0,12	0,16	0,20	0,24	0,28
250	2	0,48	0,72	0,96	1,20	1,44	1,68
	3	0,30	0,44	0,59	0,74	0,89	1,04
	4	0,21	0,31	0,42	0,52	0,62	0,73
	5	0,16	0,24	0,32	0,40	0,48	0,56
	7	0,10	0,16	0,21	0,26	0,31	0,36
	9	0,08	0,12	0,16	0,20	0,24	0,28
300	3	0,38	0,56	0,75	0,94	1,13	1,32
	4	0,26	0,40	0,53	0,66	0,79	0,92
	5	0,20	0,31	0,41	0,51	0,61	0,71
	6	0,16	0,25	0,33	0,41	0,49	0,57
	7	0,14	0,20	0,27	0,34	0,41	0,48
	8	0,12	0,17	0,23	0,29	0,35	0,41
	9	0,10	0,15	0,20	0,25	0,30	0,35
350	3	0,46	0,69	0,92	1,15	1,38	1,61
	5	0,25	0,38	0,50	0,63	0,76	0,88
	6	0,20	0,29	0,39	0,49	0,59	0,69
	7	0,16	0,25	0,33	0,41	0,49	0,57
	8	0,14	0,21	0,28	0,35	0,42	0,49
	9	0,12	0,18	0,24	0,30	0,36	0,42
	10	0,11	0,16	0,22	0,27	0,32	0,38
400	3	0,56	0,83	1,11	1,39	1,67	1,95
	4	0,39	0,59	0,78	0,98	1,18	1,37
	5	0,30	0,45	0,60	0,75	0,90	1,05
	6	0,24	0,36	0,48	0,60	0,72	0,84
	7	0,20	0,29	0,39	0,49	0,59	0,69
	9	0,15	0,22	0,30	0,37	0,44	0,52
	11	0,12	0,17	0,23	0,29	0,35	0,41
450	3	0,66	1,00	1,33	1,66	1,99	2,32
	4	0,47	0,70	0,94	1,17	1,40	1,64
	5	0,36	0,53	0,71	0,89	1,07	1,25
	6	0,29	0,43	0,58	0,72	0,86	1,00
	8	0,20	0,30	0,40	0,50	0,60	0,70
	10	0,16	0,23	0,31	0,39	0,47	0,55
	12	0,12	0,19	0,25	0,31	0,37	0,43
500	3	0,75	1,12	1,50	1,87	2,24	2,62
	4	0,53	0,79	1,06	1,32	1,58	1,85
	5	0,40	0,60	0,80	1,00	1,20	1,40
	6	0,32	0,49	0,65	0,81	0,97	1,13
	8	0,23	0,34	0,46	0,57	0,68	0,80
	10	0,18	0,26	0,35	0,44	0,53	0,62
	12	0,14	0,21	0,28	0,35	0,42	0,49

Example

Air at 3800 m3/h, is to be supplied into a room with dimensions 16 x 8m, and a height of 3.10 m .The supply air is 8^{O}C below room temperature and 4 diffusers will be used. Determine diffuser spacings so that the core velocity in comfort zone is below 0.25 m/s





Solution:

1) Diffusers are placed on the ceiling plan symmetrically.

2) Air flow rate per diffuser is calculated as

   3800 / 4 = 950 m3/h.

3) Calculation of path length to the comfort zone:

   Minimum distance: L= 2.0 + 1.40 = 3.40 m

   Maximum distance: L= 4.0 + 1.40 = 5.40 m.

4) From the table on page 6, the most suitable size is found as

   350 mm; for 950 m3/h and 3.40 m throw.

5) From the same table, pressure loss is read as 14 Pa and

   sound power level as 35 dB(A).

6) From the table on page 7; for 350 mm size, Δt_o=8^{O}C, and

   3.40 m throw, Δt_L is found as 0.84^{O}C.

Specification Text

Air diffuser for ceiling installation. The diffuser will be manufactured from ETIAL-5 norm aluminium sheets, and chromated. After chromating, will be painted to ordered request with electrostatic powder paint and a minimum thickness of 60 μ. The diffuser will be made of a frame and a central blade block. The blade block will be fixed to the frame by the aid of spring pins and will be easy to be removed / installed.Optionally, a double-flap damper will be installed on the back side of the diffuser. This damper will be a separate item which will be formed from steel sheets and be operated from the face of the diffuser. To prevent reflection, they will be painted RAL 9005 (matt black).The plenum box will be manufactured from 0.6 mm galvanized steel sheets by seams. There will be 4 hanging brackets on the box. Optionally, the entry spigot will be equipped with a volume control damper, operated externally or internally, depending on request. Also, optionally, 6-mm thick acoustic foam (according to BS 476 Part 6 & 7 Class0) will be installed inside the plenum box.

Order Code

Model	CAA	.00	.AA	.10	-300	-9010
Frame	**35** mm				ØE (mm) Refer to page 3	Indicate RAL Colour Code
Accessories			**AA**..Without Accesories **KA**..With Double - Flap Damper			
Installation Type		**00**...Without Screw Holes **10**...With Screw **40**...With Bridge			**Standard Demensions**	**Colour Code**

Plenum Box Order Code

Model	PLB	.10	.S	B	.1	1	-450 x 350 x 244 x 1
Installation Type		**10**...With Screw **40**...With Bridge					
Box Inlet			**S** ....Side **T**.....Top				
Spigot Damper				**A** ....Without Damper **B** ....Externally Operated **C** ....Internally Operated			
Perforated Rectifier plate					**0**.....Without Plate **1**.....With Plate		
Insulation						**0**.....Without Insulation **1**.....With acoustic Insulation	
							Please indicate if special dimensions are requested K_E/K_B x H x ØD (mm) x s (number of inlet spigots) **Box Dimensions**

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C

CAA

Circular Diffuser

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EN.00

BAA

Grilles

KES KLIMA
AIR CONTROL SYSTEMS

Description

The BAA type grilles are designed for duct or wall applications. They can be used for supply or extract air.

Properties

The BAA type grilles have adjustable blades. For supply air purposes, they are characteristically suitable for horizontal air throws. Where "Coanda effect" is required, they should be installed close to the ceiling. The blades are easily and individually adjustable from the front of the grille.The blades can be single or double rows, depending on the request.

Materials

The frame and the blades are manufactured from ETIAL-60 norm aluminium extruded profile.

Surface Treatment

The surfaces of the grilles are first cleaned, then treated with chromating process; after which, are painted electrostatically, with 20% gloss RAL 9010 (white) as standard. Other colours are also available upon request.

Accessories

Damper with opposed blades

Depending on application characteristics, an opposed blade damper can be installed on the back side of the grille. This damper is a separate item which can be operated by its special tool from the face of the grille. Opposed blade dampers are manufactured from ETIAL-60 norm aluminium extruded profiles. To prevent reflection, they are painted RAL 9005 (matt black) as standard.

Damper with parallel blades

Depending on application characteristics, a parallel blade damper can be installed on the back side of the grille. This damper is a separate item which can be operated by its special tool from the face of the grille. It can also be manufactured as fixed to the grille frame. Parallel blade dampers are manufactured from ETIAL-60 norm aluminium extruded profiles. To prevent reflection, they are painted RAL 9005 (matt black) as standard, if manufactured separately. If manufactured as a unit with the grille, then they are painted the same colour with the grille.

Plenum Box

The plenum box is used to achieve optimum throw characteristics. It has the inlet either at the top or at one side. Depending on request, a damper can be installed at the inlet, which can be operated internally or externally (has to be specified with the order). The plenum boxes are made from 0.6 mm thick galvanized steel sheets and have 4 hanging brackets on their body. Optionally, a 6 mm thick acoustic foam can be laid inside the plenum box.

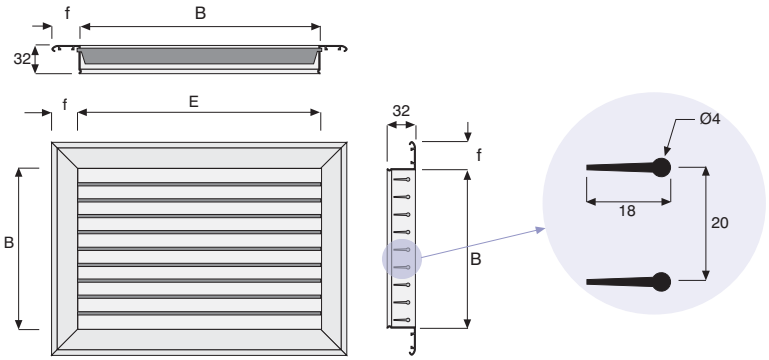
Second row of blades

A second row of blades can be installed behind the front main row, and on a separate frame. These blades are also made from ETIAL-60 norm extruded aluminium profile and are painted the same colour with the grille. The second row option is advised to be used for supply air.

Installation subframe

On customer request, an installation subframe is given with the grille for easy installation. This subframe is made of galvanized steel sheet and is painted the same colour with the grille.

Dimensions



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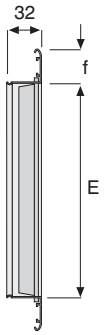
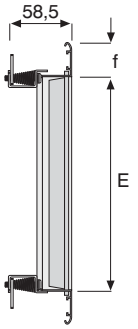
Visible screw fixing



Concealed fixing



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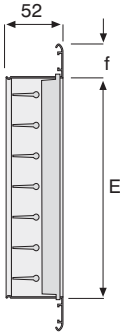
Vidalı



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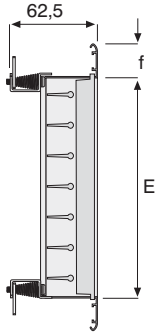

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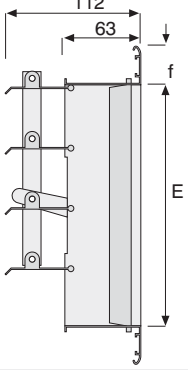
Visible screw fixing



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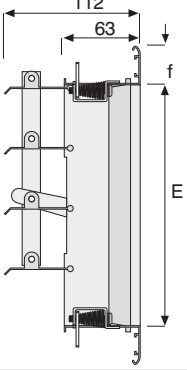

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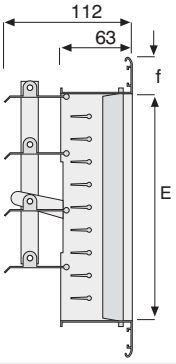
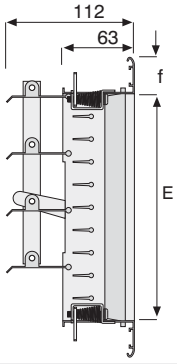
Vidalı

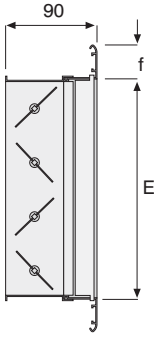


Concealed fixing

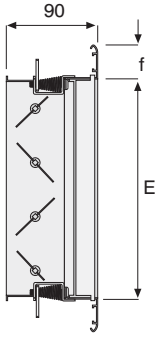


BAA.xx.ZA.xx

Visible screw fixing

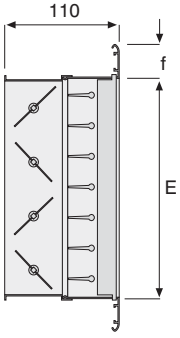


Concealed fixing

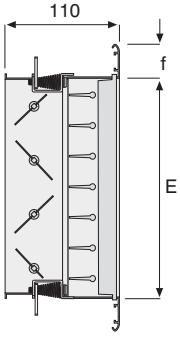


BAA.xx.ZD.xx

Vidalı



Concealed fixing



* **E** is the horizontal dimension. **E** and **B** are internal frame dimensions. **f** is the frame flange width.

Dimensions

Standard Dimensions

Double-Row Grilles Net Area ($A_{eff.}$) chart (cm^2)

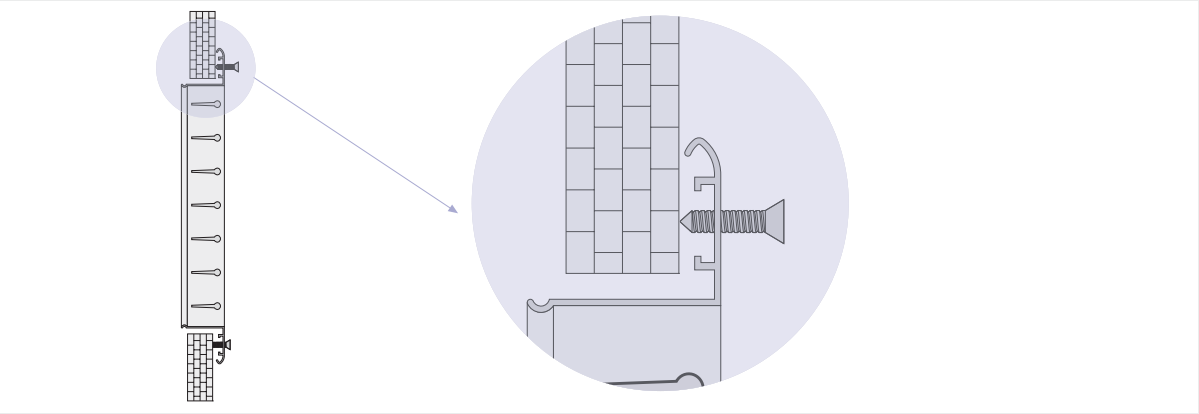
E (mm) \ B (mm)	100	200	300	400	500	600	700	800	900	1000
100	64									
200	128	256								
300	192	384	576							
400	256	512	768	1024						
500	320	640	960	1280	1600					
600	384	768	1152	1536	1920	2304				
700	448	896	1344	1792	2240	2688	3136			
800	512	1024	1536	2048	2560	3072	3584	4096		
900	576	1152	1728	2304	2880	3456	4032	4608	5184	
1000	640	1280	1920	2560	3200	3840	4480	5120	5760	6400
1100	704	1408	2112	2816	3520	4224	4928	5632	6336	7040
1200	768	1536	2304	3072	3840	4608	5376	6144	6912	7680

Single-Row Grilles Net Area ($A_{eff.}$) chart (cm^2)

E (mm) \ B (mm)	100	200	300	400	500	600	700	800	900	1000
100	80									
200	160	320								
300	240	480	720							
400	320	640	960	1280						
500	400	800	1200	1600	2000					
600	480	960	1440	1920	2400	2880				
700	560	1120	1680	2240	2800	3360	3920			
800	640	1280	1920	2560	3200	3840	4480	5120		
900	720	1440	2160	2880	3600	4320	5040	5760	6480	
1000	800	1600	2400	3200	4000	4800	5600	6400	7200	8000
1100	880	1760	2640	3520	4400	5280	6160	7040	7920	8800
1200	960	1920	2880	3840	4800	5760	6720	7680	8640	9600

Installation

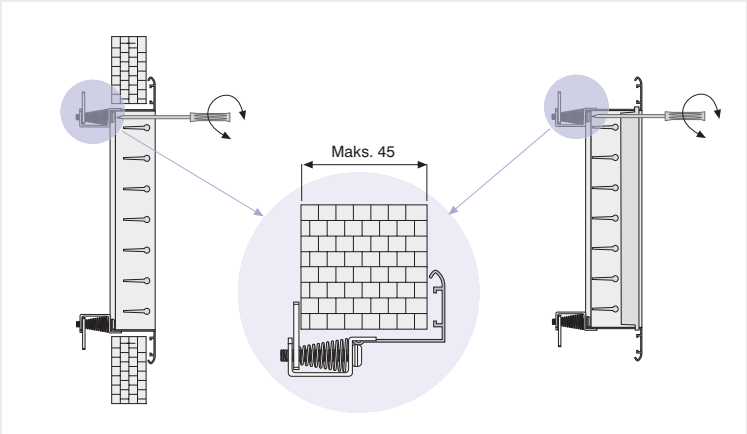
Fixing with screws, in the wall



A set of Ø 4.2 x 38 mm screws, painted the same colour, are given with the product.

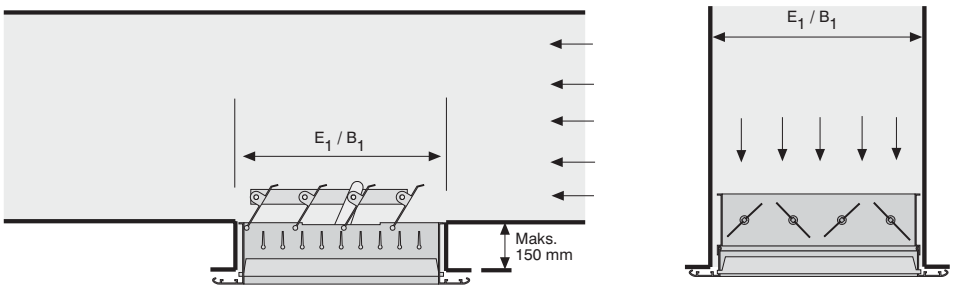
Concealed fixing

Concealed fixing can be applied to duct, wall or plenum box installations. No holes are present on the face of the grille flange. The fixing machanism can be accessed easily at the front, by a screw driver. It is advised that the special installation subframes are used for this type of fixing.



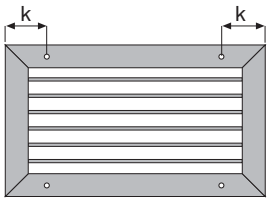
Installation

Duct Installation

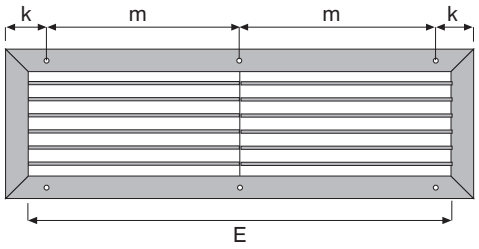


E_1 = E + 20 **B_1** = B + 15

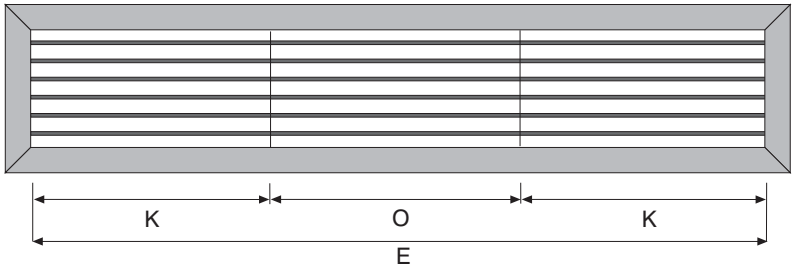
Dimensions for installation holes



k=50 mm, E < 800 mm



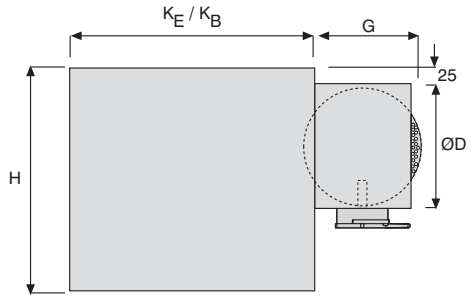
E > 800 mm
k=50 mm
m=(E - 32)/ 2 mm



E = (2 * K) + (n * O)
n = Number of divisions
between two edge sections
K = 600 mm

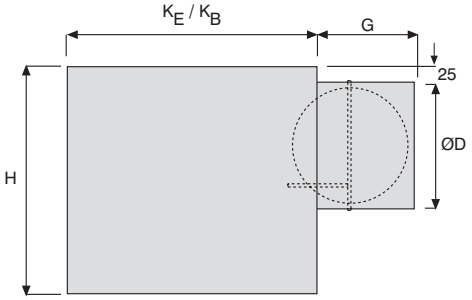
Plenum Box

Externally Operated Side Inlet



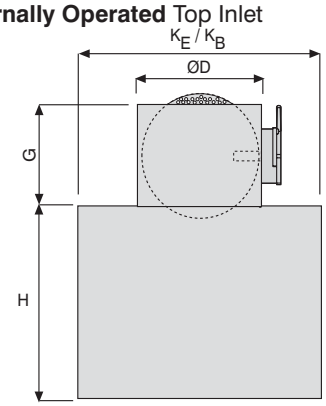
K_E= E+ 15
K_B= B+ 15

Internally Operated Side Inlet



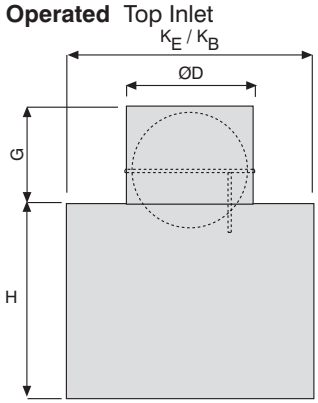
K_E= E+ 15
K_B= B+ 15

Externally Operated Top Inlet



K_E= E+ 15
K_B= B+ 15

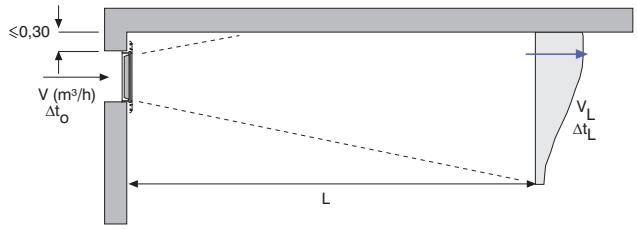
Internally Operated Top Inlet



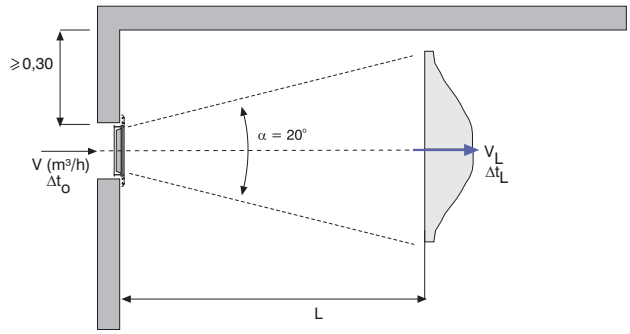
K_E= E+ 15
K_B= B+ 15

Nomenclature

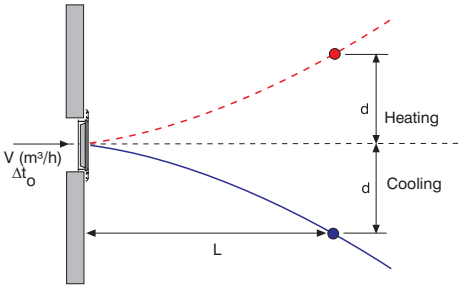
With ceiling effect



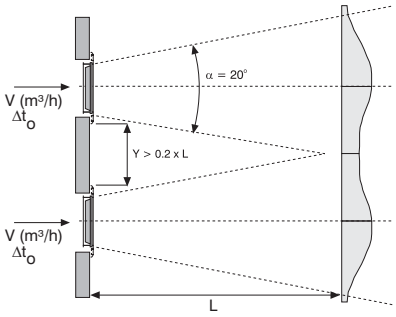
Without ceiling effect



Heating & Cooling air throw



Positioning grilles side by side



$A_{eff.}$	Effective area (cm^2)
$v_{eff.}$	Effective distance velocity (m/s)
v_L	Velocity at distance L
Y	Spacing between grilles (m)
d	Vertical deflection of air (m)
V_T	Total air flow rate (m^3/h)
Δt_L	Difference between core and room temperature at distance L (^oC)
Δt_o	Difference between supply air and room air temperatures (^oC)
L	Throw length (m)
α	Air discharge angle (^{o})

Technical Data

NOTE:
This chart is valid for the condition that the top of the grille is closer than 300 mm to the ceiling For farther locations, throw length must be multiplied by 0.7. Pressure loss and sound power level values are valid for 100% open damper position. Refer to table below, for different blade angle settings.

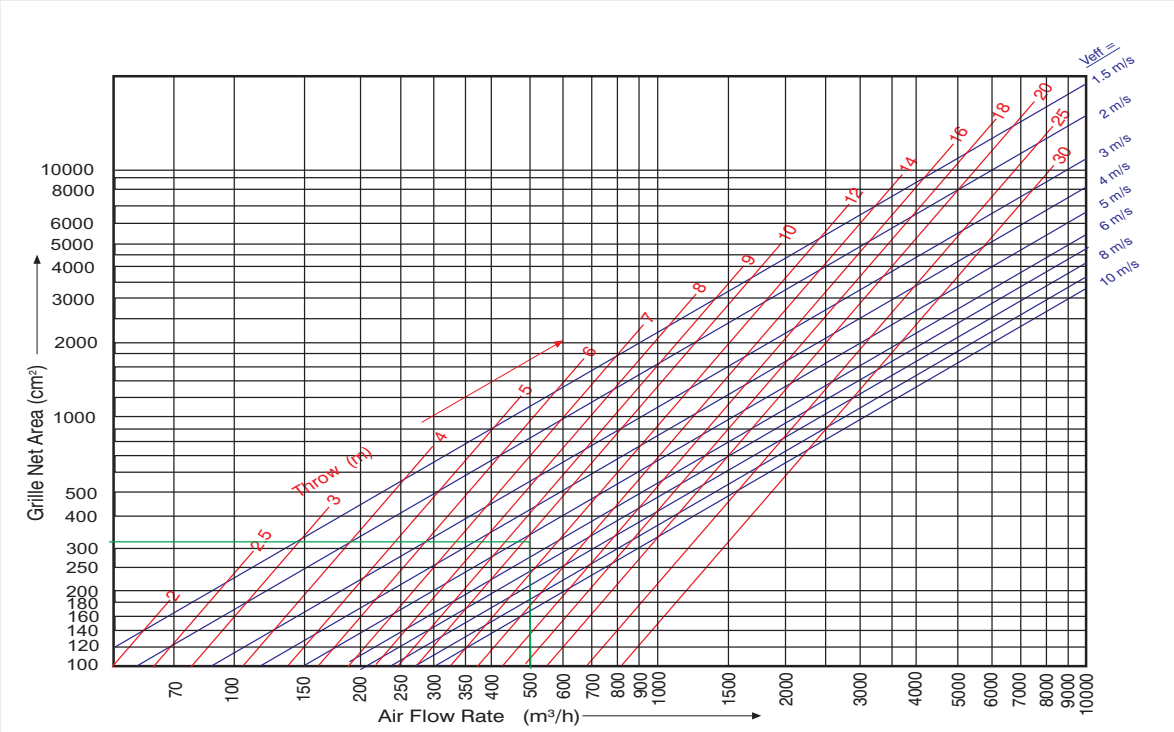


Table of coefficients for various blade angles

Horizontal blades (°)	0°	0°	0°	45°	90°	45°	90°
Vertical blades (°)	0°	45°	90°	0°	0°	45°	90°
Throw length(m)	x 1,0	x 0,7	x 0,5	x 0,7	x 0,5	x 0,5	x 0,25
Pressure loss (Pa)	x 1,0	x 1,1	0 1,2	x 1,1	x 1,2	x 1,1	x 1,5
Sound power level dB (A)	-	+ 1	+ 3	+ 1	+ 3	+ 1	+ 6

Supply Air

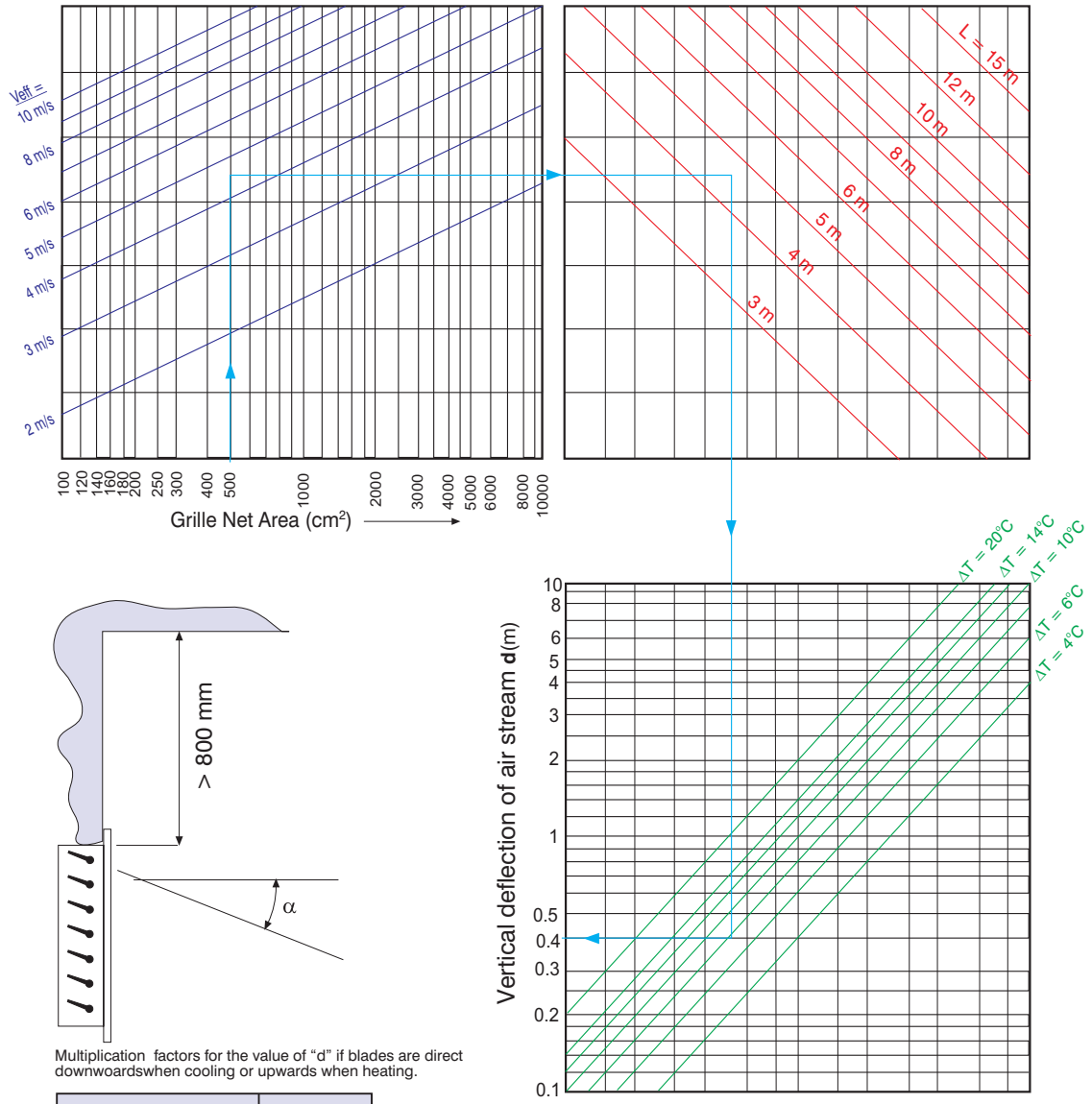
$V_{eff.}$ (m/s)	Pressure loss (Pa)	Sound power level dB(A)
2	3	<20
3	7	20
4	13	28
5	20	35
6	29	40
7	37	43
8	44	47
9	60	50
10	80	55

Extract Air

$V_{eff.}$ (m/s)	Pressure loss (Pa)	Sound power level dB(A)
2	1	<20
3	3	20
4	5	23
5	8	33
6	12	38
7	17	42
8	21	45
9	30	48
10	36	51

Technical Data

NOTE:
This chart is valid for the condition that the top of the grille is located farther than 300 mm to the ceiling. Deflection (d) is upwards for heating and downwards for cooling. Refer to table given , for coefficients of different blade angles.

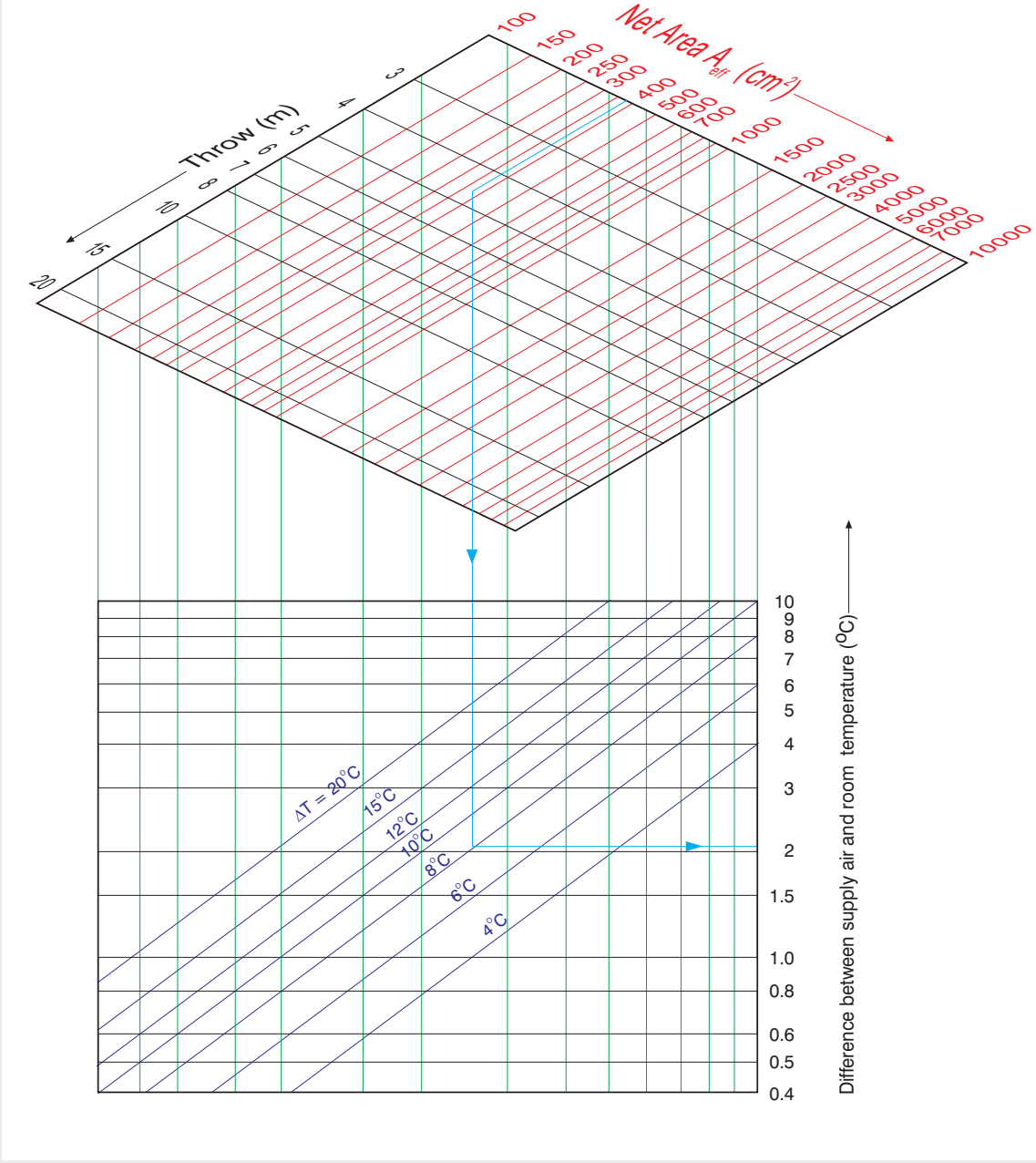


Multiplication factors for the value of "d" if blades are direct downwoardswhen cooling or upwards when heating.

Blade angle the Horizontal(α)	Coefficient
0	1,00
10	1,16
20	1,36
30	1,59
40	1,85
45	2,00

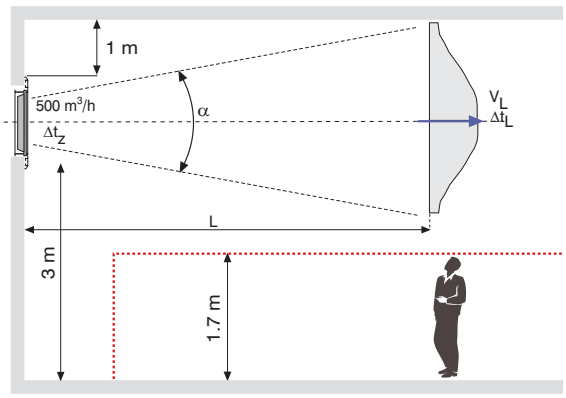
Technical Data

NOTE:
This chart is valid for the condition that the top of the grille is closer than 300 mm ceiling. For farther locations, the temperature gradient value must be multiplied by 0.7



Example:

Air at 500 m3/h from each of the double-row grilles on a wall, are to be supplied into a room. The grilles are 1m below the ceiling and 3m above the floor. The required throw is 5m. The first row of blades are to remain horizontal, while the back row blades are to be set at 45^{o}. Supplied air temperature is 8^{o}C below room temperature. 300 x 200 mm grilles are intended to be used, check if they are suitable for the purpose.



Solution:

1) From the table on page 9, the coefficient for given blade angles is found to be 0.7
2) Throw length for lookup on the graph is calculated as 5 / 0.7 = 7.14m
3) Due to being without ceiling effect, throw length for lookup on the graph is calculated as 7.14 / 0.7 =10.2m
4) From the graph on page 9, net grille area is read as 320 cm^{2} for a throw of 10.2 m and flow rate of 500 m3/h.
5) From the table on page 4, the net area for 300x200mm grille is read as 384 cm^{2}.
6) From the graph on page 9, throw is read as 9.5m for a flow rate of 500m^{3}/h and net grille area of 384 cm2. The outlet velocity is read as 4.5 m/s.
7) Applying coefficients to find true throw, we find 9.5 x 0.7 x 0.7 = 4.65m.
8) From the graph on page 10; we read the vertical deflection of air to be 0.4m, for 500 m^{3}/h flow rate, 4.5 m/s outlet velocity, 4.65 m throw and 8^{o}C temperature difference. Since it is above the comfort zone, the case is acceptable.
9) From the graph on page 11, the temperature gradient is read as 2.1^{o}C for 4.65m throw, 384 cm^{2} net area and 8^{o}C temperature difference.
10) From the tables on page 9, for 4.5 m/s outlet velocity, the pressure loss is read as 16.5 Pa and sound power level as 31 dB(A)
11) Applying corrections for blade angles, the values become 16.5 x 1.1 = 18 Pa and 31 + 1 = 32 dB(A).

Specification Text

Air grille for wall or duct installation. The grille will be manufactured from ETIAL-60 norm aluminium profiles, and chromated; then will be painted to ordered request with electrostatic powder paint and a minimum thickness of 60μ. The grille will be composed of two parts, the frame and the blades. The blades will be easily adjustable from the face of the grille. Optionally, opposed or parallel blade dampers will be installed at the back of the grille. The dampers will be manufactured from ETIAL-60 norm aluminium profile, and painted. The dampers will be adjusted from the front of the grille by its special tool (opposed blades) or by a small lever arm (parallel blades). Optionally, the installation subframe will be given with the product. The plenum box will be manufactured from 0.6 mm galvanized steel sheets by seams. There will be 4 hanging brackets on the box. Optionally, the entry spigot will be equipped with a volume control damper, operated externally or internally, depending on request. Also, optionally, 6-mm thick acoustic foam (according to BS 476 Part 6 & 7 Class 0) will be installed inside the plenum box.

Order Code

Model	BAA.32.AA.1	1	-300 x 200	-9010
Frame	22 mm 32 mm			
Accessories	**AA**..Single Row Blades **AD**..Double Row Blades **PA**..Single Row and Parallel Blade Damper **PD**..Double Row and Parallel Blade Damper **ZA**..Single Row and Opposed Blade Damper **ZD**..Double Row and Opposed Blade Damper			
Installation	**0**.....Without Screw Holes **1**.....With Screw Holes **3**.....Concealed Fixing			
Installation Accessories	**0**.....Without installation subframe **1**.....With installation subframe		E x B (mm) Refer to page 3 **Standard Dimensions**	Indicate RAL Colour Code **Colour Code**

Plenum Box Order Code

Model	PLA.10.S	B.1	1	-320 x 220 x 300 x 193 x 1
Installation	**10**...With Screws **30**...Concealed Fixing			
Box Inlet	**S** ....Side Inlet **T**.....Top Inlet			
Spigot Damper	**A** ....Without Damper **B** ....Externally operated **C** ....Internally Operated			
Perforated Rectifier Plate	**0**.....Without Plate **1**.....With Plate			
Insulation	**0**.....Without Insulation **1**.....With Accoustic Insulation			Please indicate if special dimensions are requested K_E x K_B x H x ØD (mm) x s (no.of inlet spigots) **Plenum Box Dimensions**

B.01.01.EN.00

B BAA Grilles

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www.kesklima.com

D 01.01
EN.00

DAA

Air Damper

KES KLİMA
AIR CONTROL SYSTEMS

Description

The DAA type air dampers are designed for regulating air flow in rectangular ducts.

Properties

DAA type dampers are used in rectangular ducts. The blades are placed with a pitch of 100 mm and are aerodynamically shaped for little resistance. The blades have rubber gaskets on the edges for less leakage. The blades have opposed motions, being connected to each other by plastic gears.The damper body is self-flanged and contains the bracket for either the manual adjusting arm or a servomotor. The manual adjusting arm has blade position indicator scale. The damper can also be manufactured with parallel operated blades.

Materials

The body is manufactured from 1.2 mm thick galvanized steel sheets. The blades are made from ETIAL-60 norm aluminium profiles. The gears are from wear-resistant plastic, and the gaskets are made of rubber.

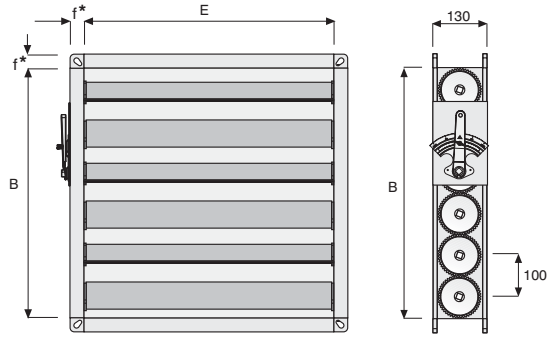
Accessories

Servomotor

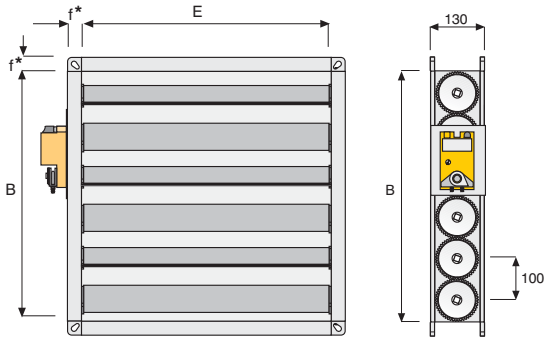
BELIMO maintenance-free servomotors are optionally installed on the damper bodies.

Dimensions

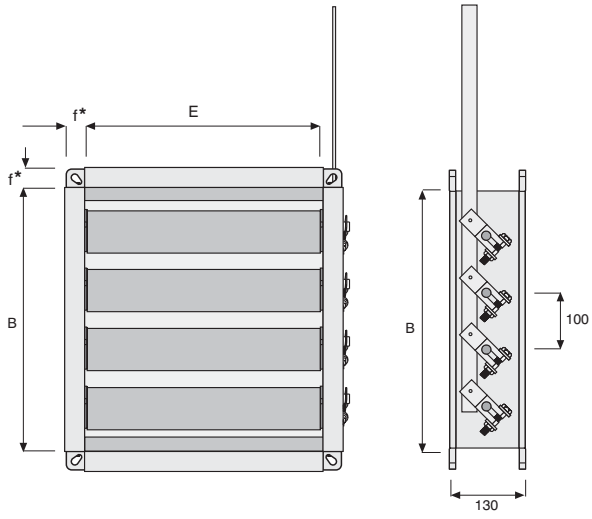
Geared Mechanism (manual)



Geared Mechanism (Servomotor)



Parallel Blades



Standard Dimensions

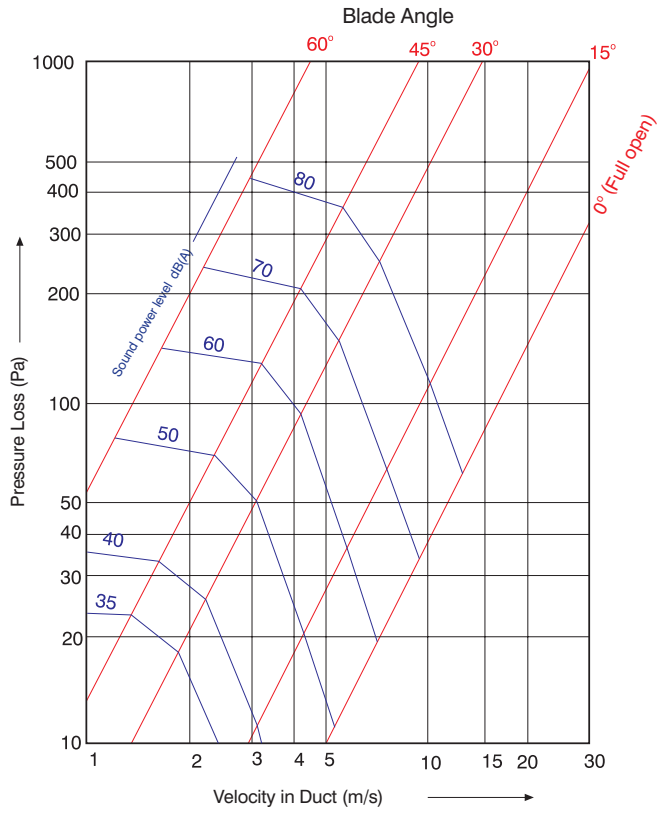
E (mm)	**B** (mm)
200	200
300	300
400	400
500	500
600	600
700	700
800	800
900	900
1000	1000
1100	1100
1200	1200
1300	1300
1400	1400
1500	1500
1600	1600
1700	1700
1800	1800
1900	1900
2000	2000

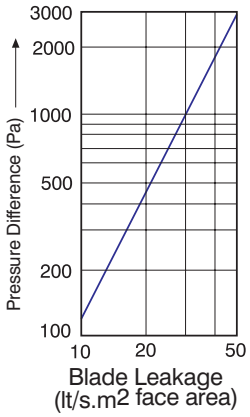
Flange

f (mm)
30
35

* In cases when E or B exceeds 1000 mm, 35 mm flange is used.

Technical Data





Specification Text

Rectangular duct type air damper. The body will be manufactured from galvanized steel sheets, and the blades from ETIAL-60 norm aluminium profiles. Adjustments will be made by a control arm, fixed on the damper body and having a blade positioning scale; or, optionally, with a servomotor. The blades will be aerodynamically shaped, have rubber gaskets on the edges and rotate in opposite directions with each other.The blades will be interconnected by a series of wear-resistant plastic gears positioned with 100 mm pitch. The damper body will have flanges on the body, compatible with 30 and 35 mm standard duct flanges.

Order Code

Model	DAA	.30	.AA	.00	-	300 x 300
Flange		**30** mm **35** mm				E x B (mm) Refer to page 3
Accessories			**AZ** ..Manual, opposed blade damper **AP** ..Manual, parallel blade damper **MZ**..With servomotor, opposed blade damper **MP** .With servomotor, parallel blade damper			**Standard Dimensions**

D.01.01.EN.00

D DAA Air Damper

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TÜV Rheinland Group
TÜV CERT
DIN EN ISO 9001:2000
Zertifikat: 01 100 042854

C 03.01
EN.00

CCA

Disc **Valve**

KES KLIMA
AIR CONTROL SYSTEMS

Description

The CCA type diffusers are designed for ceiling or wall applications of extract air.

Properties

The CCA type diffusers have an adjustable disc within the circular frame, and are suitable for extract air. The air flow is adjusted by turning the disc. The disc can easily be removed from the frame. They are produced in neck sizes suitable for standard flexible ducts.

Materials

The frame and the disc are formed from 0.7 mm thick steel sheets.

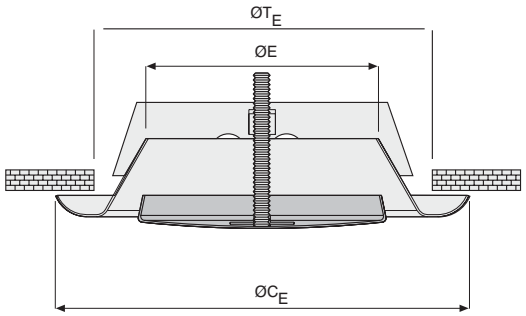
Surface Treatment

The surfaces are first cleaned, then painted electrostatically, with 20% gloss RAL 9010 (white) as standard.Other colours are also available upon request.

Dimensions

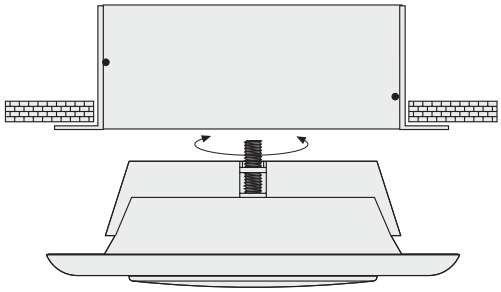
Standard Dimensions

Size (mm)	ØE	$ØC_E$	$ØT_E$
100	95	185	120
120	116	205	140
160	153	245	185
200	193	285	220



CCA.00

Installation



The product is manufactured for spring mechanism fixing.For other types of installations , please contact us.

Technical Data

ØE (mm) 100		
Flow Rate (m^3/h)	ΔP (Pa)	S dB(A)
35	10	<20
75	40	20
110	90	30
145	140	40
180		
220		
290		
360		
435		
500		

ØE (mm) 120		
Flow Rate (m^3/h)	ΔP (Pa)	S dB(A)
35	5	<20
75	30	<20
110	70	25
145	130	30
180	170	36
220		
290		
360		
435		
500		

ØE (mm) 160		
Flow Rate (m^3/h)	ΔP (Pa)	S dB(A)
35		
75	15	<20
110	35	20
145	55	25
180	95	30
220	130	35
290		
360		
435		
500		

ØE (mm) 200		
Flow Rate (m^3/h)	ΔP (Pa)	S dB(A)
35		
75		
110		
145	6	<20
180	12	<20
220	20	<20
290	30	28
360	55	34
435	70	36
500	90	40

Specification Text

Disk valve for ceiling or wall installation. The disk valve will be manufactured from 0.7 mm steel sheets, and cleaned. After cleaning, it will be painted to ordered request with electrostatic powder paint with a minimum thickness of 60 μ.The disk valve will be made of a frame and a disc. The disc will be used for adjusting the air flow by rotating,and will be able to close the inlet fully.The neck size of the disk valve will be compatible with standard flexible duct sizes.

Order Code

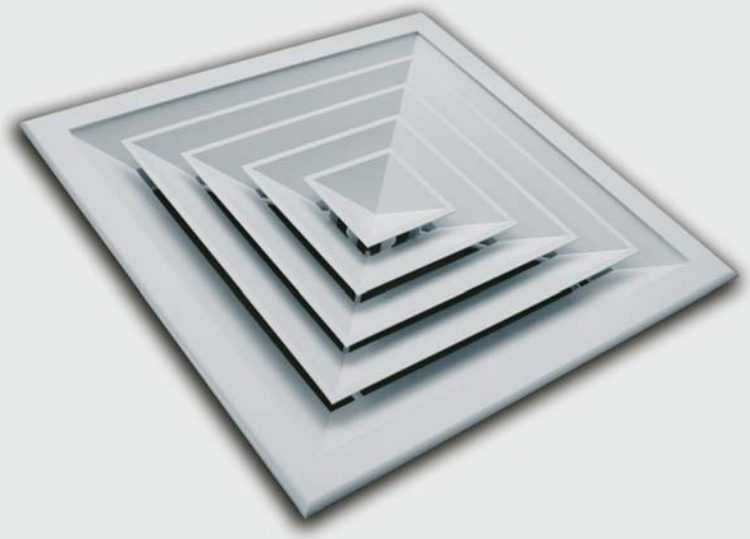
Model	CCA	.00	.AA	.50	-120	-9010
					ØE (mm) Refer to page 2	indicate RAL colour code
Installation Type	**50**...Spring Mechanism				**Standard Dimensions**	**Colour code**

C.03.01.EN.00

C CCA Disc Valve

KES KLiMA
INDUSTRIAL AND TRADE CO.
Uzay Çağı Caddesi No:10
06370 Ostim/ANKARA
Phone:+90.312.385 76 57
Fax :+90.312.354 12 31
www.kesklima.com

C 04.01
EN.00



CDA

Louvred Face **Ceiling Diffuser**

KES KLİMA
AIR CONTROL SYSTEMS

Description

The CDA type diffusers are designed for ceiling applications. They can be used for supply or extract air, together with the accessories required for various demands.

Properties

The CDA type diffusers have fixed and straight blades. For supply air purposes, they are characteristically suitable for horizontal air throws. Where "Coanda effect" is required, they should be installed close to the ceiling. These diffusers are recommended for use with ceiling heights up to 4 m., with a supply air temperature difference of (+/-) 10^{o}C.The diffuser is made of a frame and a central blade block. The blade block is fixed to the frame by the aid of spring pins and can easly be removed / installed. The standard sizes start from 150 x 150 mm, and go up to 600 x 600 mm with increments of 75 mm. One, two, three and four way throwing types are available.

Materials

The frame and the blades are manufactured from ETIAL-60 norm aluminium profiles.

Surface Treatment

The surfaces of the diffusers are first cleaned, then treated with chromating process; after which, are painted electrostatically, with 20% gloss RAL 9010 (white) as standard. Other colours are also available upon request.

Accessories

Damper With Opposed Blades

Depending on application characteristics, an opposed blade damper can be installed on the back side of the diffuser. This damper is a separate item which can be operated by its special tool from the face of the diffuser. Opposed blade dampers are manufactured from ETIAL-60 norm aluminium extruded profiles. To prevent reflection, they are painted RAL 9005 (matt black) as standard.

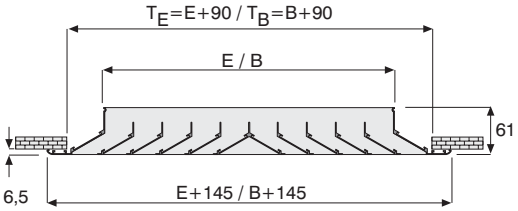
Flap Damper With Rectifier

This type of damper is used in high velocity ducts. The rectifier is made of ETIAL-60 norm aluminium profiles and the flap damper part is formed from steel sheets. To prevent reflection, they are painted RAL 9005 (matt black) as standard

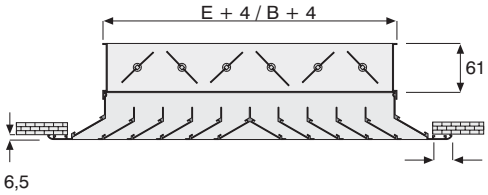
Plenum Box

The plenum box is used to achieve optimum throw characteristics. It has the inlet either at the top or at one side. Depending on request, a damper can be installed at the inlet, which can be operated internally or externally (has to be specified with the order).The plenum boxes are made from 0.6 mm thick galvanized steel sheets and have 4 hanging brackets on their body.Optionally, a 6 mm thick acoustic foam can be laid inside the plenum box.

Dimensions



CDA.32.AA



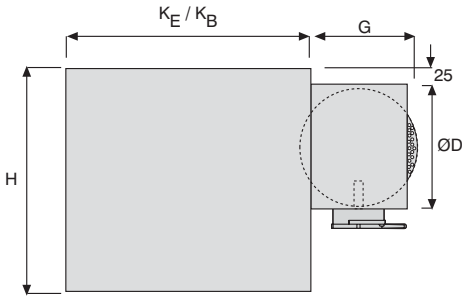
CDA.32.AA

Standard Dimensions (mm)

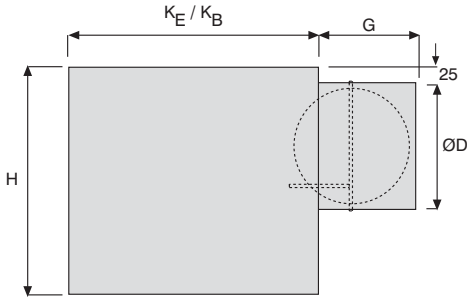
E	B	ØD	H	G
150	150	170	250	150
	225	244	350	175
	300	244	350	175
	375	295	450	225
	450	346	450	225
	525	346	450	225
	600	346	450	225
225	225	244	350	175
	300	295	400	225
	375	346	450	225
	450	396	500	250
	525	396	500	250
	600	447	550	275

E	B	ØD	H	G
300	300	295	450	225
	375	346	450	225
	450	447	550	275
	525	447	550	275
	600	498	600	300
375	375	396	500	250
	450	447	550	275
	525	498	600	300
	600	498	600	300
450	450	498	600	300
	525	498	600	300
	600	498	600	300
525	525	498	600	300
	600	498	600	300
600	600	498	600	300

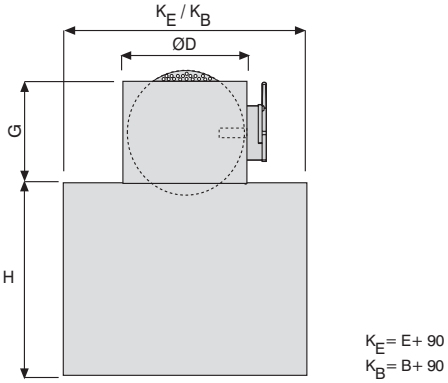
Externally Operated Side Inlet



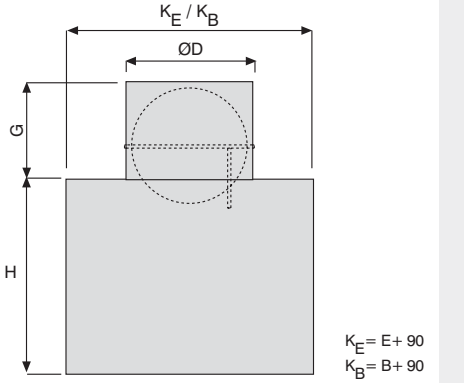
Internally Operated Side Inlet



Externally Operated Top Inlet

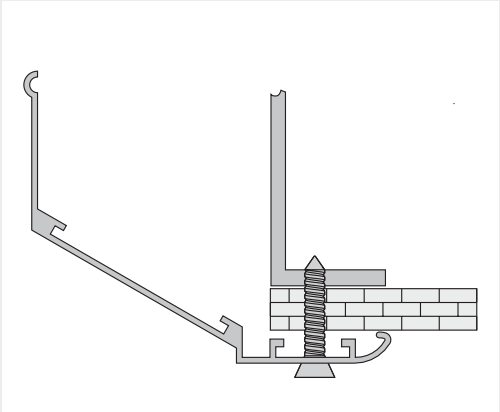


Internally Operated Top Inlet



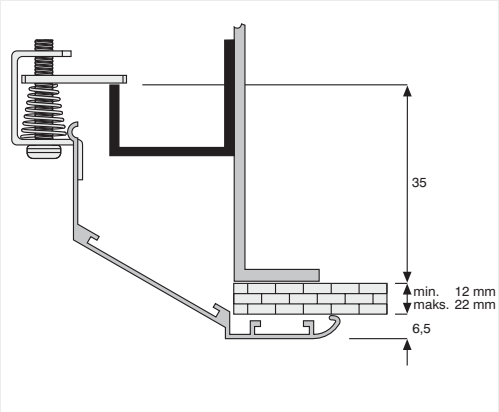
Installation

With Screws



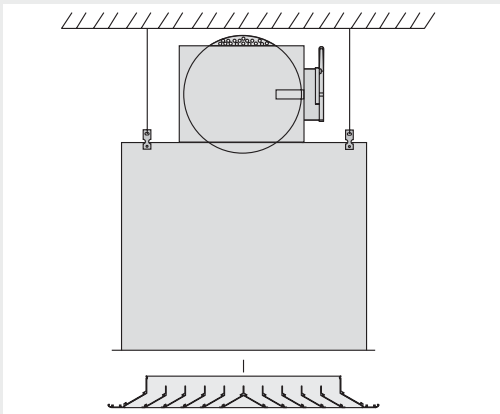
A set of Ø 4.2 x 38 mm self-drilling screws, painted the same, are given with the product

Concealed Fixing



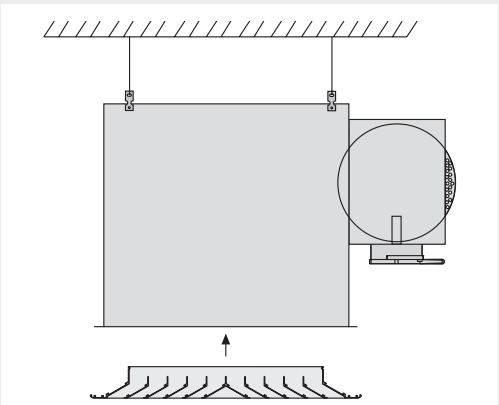
Suitable for ceiling thickness 12-22 mm. For other thicknesses, please contact us.

Plenum box installation (top inlet)



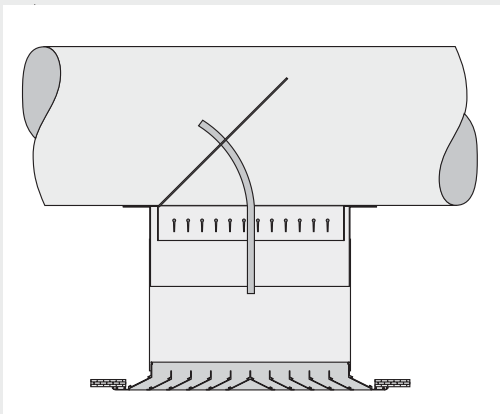
There are 4 hanging brackets on the box as standard

Plenum Box installation (side inlet)



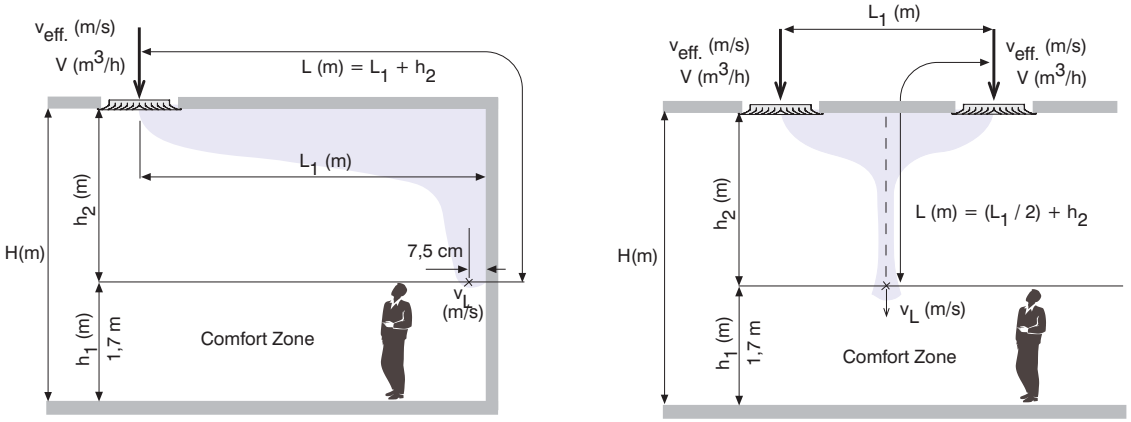
There are 4 hanging brackets on the box as standard

Application of flap damper with rectifier



Applied in high speed ducts

Nomenclature



L_1	Distance between diffuser centres or diffuser centre and wall. (m)
h1	Comfort zone height (m)
h2	Distance between a diffuser and comfort zone (m)
v_{eff}	Effective outlet velocity (m/s)
v_L	Velocity of core in comfort zone
Δt_0	Difference between supply air and room temperature (^oC)
Δt_L	Difference between core and comfort zone temperature (^oC)
L	Throw distance (m)
V	Air flow rate (m3/h)
H	Room height (m)
S	Sound power level dB(A)

To achieve "Coanda effect", the outlet velocity must be greater than 2m/s. The general comfort conditions require that the sound power level is below 40 dB(A). The height of the comfort zone is taken as 1.70m above the floor. It is important that 0.25 m/s core velocity is not exceeded in this zone.

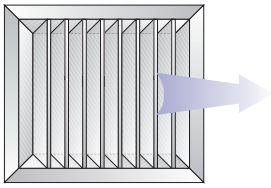
Note: The tables are given for 4 types of blade blocks (11,21,24,41). For other types of blocks listed on page 11, please contact us.

	Sound power level	pressure drop
Supply air, with damper	+3 dB (A)	x 1,0
Extract air	+3 dB (A)	x 1,1
Extract air with damper	+13 dB (A)	x 1,15

The data given in the tables are valid for supply air, without dampers. For other conditions, the correction factors in the table (left) have to be applied

Technical Data

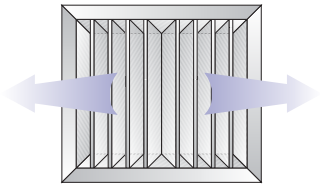
11



Size E/B (mm)	Flow Rate V(m^3/h)	Throw, L (m)		Pressure loss ΔP (Pa)	Sound power level S (dB(A))
		v_L=0,25 m/s	v_L=0,10 m/s		
150 x 150	120	1,50	2,50	9	<20
	160	2,00	3,50	15	<20
	200	2,20	4,50	23	25
	250	2,50	5,50	33	29
	280	3,00	6,00	43	33
225 x 225	280	2,00	4,00	9	<20
	370	2,50	5,50	15	25
	460	3,50	6,50	23	30
	550	4,00	8,00	33	34
	640	4,50	9,00	43	37
300 x 300	490	2,50	5,50	9	<20
	650	3,50	6,50	15	28
	810	4,50	8,50	23	33
	970	5,00	10,50	33	37
	1130	6,50	12,00	43	40
375 x 375	760	3,50	6,50	9	<20
	1010	4,50	8,50	15	30
	1270	5,50	11,00	23	35
	1520	6,50	13,50	33	39
	1770	7,50	15,00	43	42
450 x 450	1100	3,50	7,00	9	<20
	1460	5,50	10,00	15	30
	1820	6,50	13,00	23	40
	2190	7,50	16,00	33	40
	2550	9,00	18,00	43	45
525 x 525	1490	4,00	8,00	9	25
	1980	5,50	10,00	15	35
	2480	6,50	13,00	23	40
	2980	7,00	14,00	33	45
	3470	9,50	18,50	43	45
600 x 600	1950	4,50	8,50	9	25
	2590	6,00	11,00	15	35
	3240	7,00	14,00	23	40
	3890	8,50	17,00	33	45
	4540	10,00	19,00	43	50

Technical Data

21

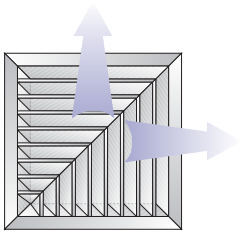


KESKLIMA

Size E/B (mm)	Flow Rate V(m^3/h)	Throw, L (m)		Pressure loss ΔP (Pa)	Sound power level S (dB(A))
		v_L=0,25 m/s	v_L=0,10 m/s		
150 x 150	120	1,00	2,00	9	<20
	160	1,20	2,50	15	<20
	200	1,50	3,00	23	25
	250	2,00	3,50	33	29
	280	2,20	4,50	43	32
225 x 225	280	1,50	2,50	9	<20
	370	2,00	3,50	15	25
	460	2,50	5,00	23	30
	550	2,70	5,50	33	34
	640	3,00	6,00	43	37
300 x 300	490	2,00	3,50	9	<20
	650	2,50	5,00	15	28
	810	3,00	6,00	23	32
	970	3,50	7,50	33	37
	1130	4,50	8,50	43	40
375 x 375	760	2,50	4,50	9	<20
	1010	3,00	6,00	15	30
	1270	4,00	7,50	23	35
	1520	5,00	9,50	33	39
	1770	5,50	11,00	43	42
450 x 450	1100	2,50	6,00	9	26
	1460	3,50	7,50	15	32
	1820	4,50	9,00	23	37
	2190	5,50	11,00	33	40
	2550	6,50	13,00	43	44
525 x 525	1490	3,00	6,50	9	30
	1980	4,00	8,00	15	35
	2480	5,00	10,00	23	40
	2980	6,50	13,00	33	45
	3470	7,50	15,00	43	45
600 x 600	1950	3,50	7,00	9	30
	2590	4,50	8,50	15	35
	3240	5,50	10,50	23	40
	3890	6,50	13,00	33	45
	4540	7,00	15,00	43	45

Technical Data

24

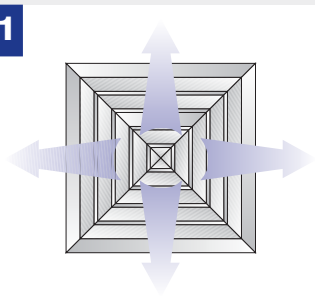


KESKLIMA

Size E/B (mm)	Flow Rate V(m^3/h)	Throw, L (m)		Pressure loss ΔP (Pa)	Sound power level S (dB(A))
		v_L=0,25 m/s	v_L=0,10 m/s		
150 x 150	120	1,00	2,00	9	<20
	160	1,10	2,50	15	<20
	200	1,50	3,00	23	20
	250	2,00	3,50	33	24
	280	2,00	4,50	43	28
225 x 225	280	1,50	2,50	9	<20
	370	2,00	3,50	15	20
	460	2,50	5,00	23	25
	550	2,70	5,50	33	29
	640	3,00	6,00	43	32
300 x 300	490	2,00	3,50	9	<20
	650	2,50	5,00	15	23
	810	3,00	6,00	23	28
	970	3,50	7,50	33	32
	1130	4,50	8,50	43	35
375 x 375	760	2,50	4,50	9	<20
	1010	3,00	6,00	15	25
	1270	4,00	7,50	23	30
	1520	5,00	9,50	33	34
	1770	5,50	11,00	43	37
450 x 450	1100	2,50	6,00	9	21
	1460	3,50	7,50	15	27
	1820	4,50	9,00	23	32
	2190	5,50	11,00	33	35
	2550	6,50	13,00	43	39
525 x 525	1490	3,00	6,50	9	25
	1980	4,00	8,00	15	30
	2480	5,00	10,00	23	35
	2980	6,00	12,00	33	40
	3470	7,00	14,00	43	40
600 x 600	1950	3,00	7,00	9	25
	2590	4,00	9,00	15	30
	3240	5,00	11,00	23	35
	3890	6,00	13,00	33	40
	4540	7,00	15,00	43	40

Technical Data

41



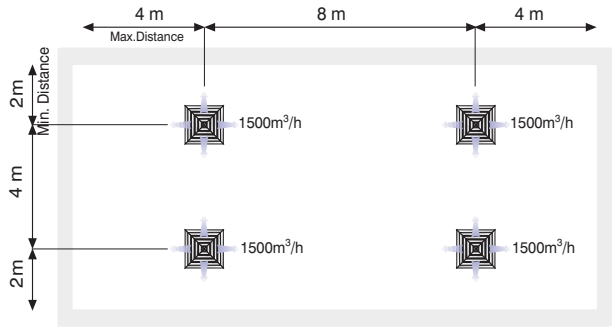
KESKLIMA

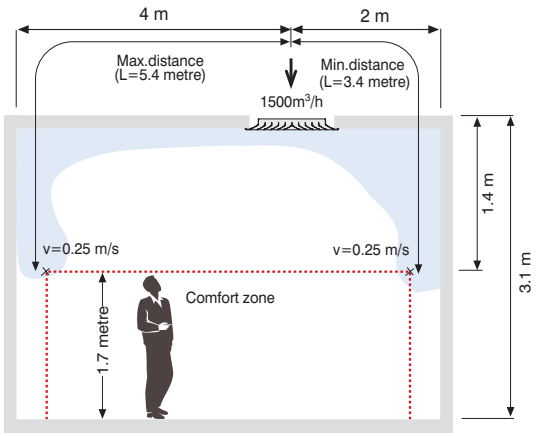
Size E/B (mm)	Flow Rate V(m^3/h)	Throw, L (m)		Pressure loss ΔP (Pa)	Sound power level S (dB(A))
		v_L=0,25 m/s	v_L=0,10 m/s		
150 x 150	120	1,00	1,50	9	<20
	160	1,10	2,00	15	<20
	200	1,50	2,50	23	<20
	250	1,70	3,00	33	<20
	280	2,00	3,50	43	19
225 x 225	280	1,00	2,00	9	<20
	370	1,50	2,50	15	<20
	460	2,00	3,50	23	<20
	550	2,10	4,00	33	23
	640	2,20	4,50	43	27
300 x 300	490	1,50	2,50	9	<20
	650	2,00	3,50	15	20
	810	2,20	4,50	23	25
	970	2,50	5,00	33	29
	1130	3,00	6,00	43	32
375 x 375	760	2,00	3,50	9	<20
	1010	2,20	4,50	15	24
	1270	2,50	5,50	23	29
	1520	3,50	6,50	33	33
	1770	4,00	7,50	43	37
450 x 450	1100	2,00	4,00	9	22
	1460	2,50	5,00	15	28
	1820	3,50	6,50	23	33
	2190	4,00	8,00	33	36
	2550	4,50	9,00	43	40
525 x 525	1490	2,50	5,00	9	25
	1980	3,00	6,00	15	30
	2480	4,00	8,00	23	35
	2980	4,50	9,00	33	40
	3470	5,00	10,50	43	45
600 x 600	1950	2,50	5,50	9	30
	2590	3,50	7,00	15	35
	3240	4,50	8,50	23	40
	3890	5,00	10,50	33	45
	4540	6,00	12,00	43	45

Example:

Air at 6000 m3/h, is to be supplied into a room with dimensions 16 x 8m, and a height of 3.10 m .The supply air is 8^{O}C below room temperature and 4 units of 4-way diffusers will be used.

Determine diffuser spacings so that the core velocity in comfort zone is below 0.25 m/s.





Solution:

1) Diffusers are placed on the ceiling plan symmetrically.

2) Air flow rate per diffuser is calculated as 6000 / 4 = 1500 m3/h.

3) Calculation of path length to the comfort zone:

Minimum distance: L= 2.0 + 1.40 = 3.40 m

Maximum distance: L= 4.0 + 1.40 = 5.40 m.

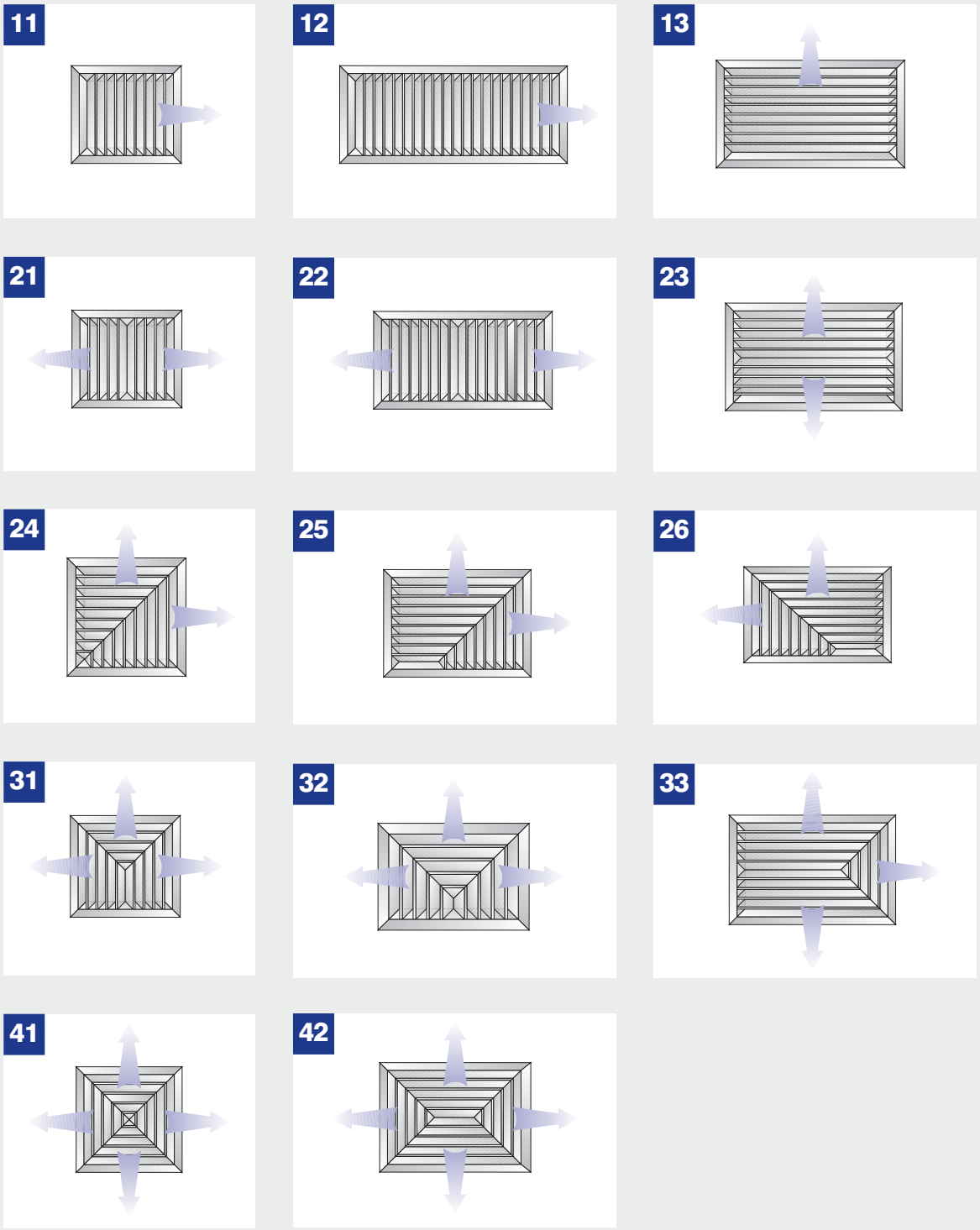
4) From the table on page 9, the most suitable size is found as

375x375 mm; for 1500 m3/h and 3.40 m throw.

5) From the same table with interpolation, pressure loss is read

as 32 Pa and sound power level as 33 dB(A).

Blade Block Codes



Note: The views shown are face views, and throw directions are as seen from below. For blocks 25 and 26 care should be taken when ordering.

Specification Text

Air diffuser for ceiling installation. The diffuser will be manufactured from ETIAL-60 norm aluminium profiles, and chromated. After chromating, will be painted to ordered request with electrostatic powder paint and a minimum thickness of 60 μ.The diffuser will be made of a frame and a central blade block. The blade block will be fixed to the frame by the aid of spring pins and will be easy to be removed / installed.Optionally, a damper will be installed on the back side of the diffuser. This damper will be a separate item which will be formed from ETIAL-60 norm aluminium profiles and be operated from the face of the diffuser. To prevent reflection, the damper will be painted RAL 9005 (matt black).The plenum box will be manufactured from 0.6 mm galvanized steel sheets by seams. There will be 4 hanging brackets on the box. Optionally, the entry spigot will be equipped with a volume control damper, operated externally or internally, depending on request. Also, optionally, 6-mm thick acoustic foam (according to BS 476 Part 6 & 7 Class 0) will be installed inside the plenum box.

Order Code

Model	CDA	.32	.AA	.1	1	-375 x 375	- 41	- 9010
Frame		32 mm						
Accessories			**AA**..Without accessories **ZA**..Opposed blade damper					
Installation				**0**.....Without screw holes **1**.....With screw holes **3**.....Concealed fixing				
Installation accessories					**0**.....Without installlation bridge **1**.....With installation bridge			
						E x B (mm) Refer to page 3 **Standard Dimensions**	Refer to page 11 11, 12, 13, 21, 22, 23, 24, 25, 26, 31, 32, 33, 41, 42 **block code**	indicate RAL colour code **Colour Code**

Plenum Box Order Code

Model	PLA	.10	.S	B	.1	1	-465 x 465 x 500 x 396 x 1
Installation		**10**...With Screws **30**...Concealed Fixing					
Box Inlet			**S** ....Side Inlet **T**.....Top Inlet				
spigot Damper				**A** ....Without Damper **B** ....Externally Operated **C** ....Internally Operated			
Perforated Rectifier Plate					**0**.....Without Plate **1**.....With Plate		
Insulation						**0**.....Without Insulation **1**.....With Acoustic Insulation	
							Please indicate if special dimensions are requested K_E x K_B x H x ØD (mm) x s (no. of inlet spigots) **Plenum Box Dimensions**

C.04.01.EN.00

C CDA Louvered Face Ceiling Diffuser

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