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.

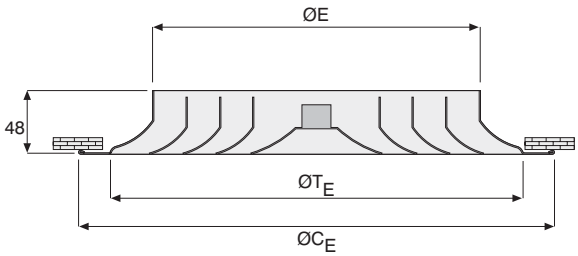
Flap Damper with Rectifier

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.

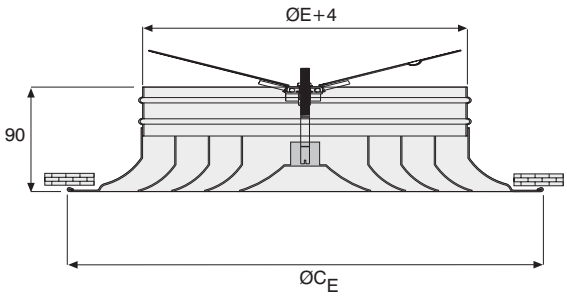
Plenum Box

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



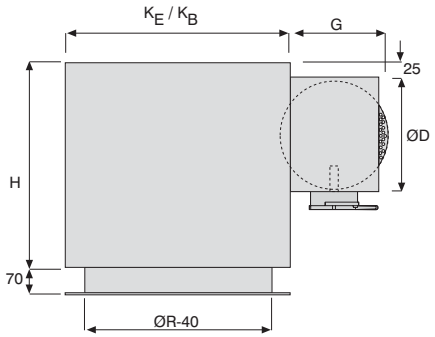
CAA.35.AA



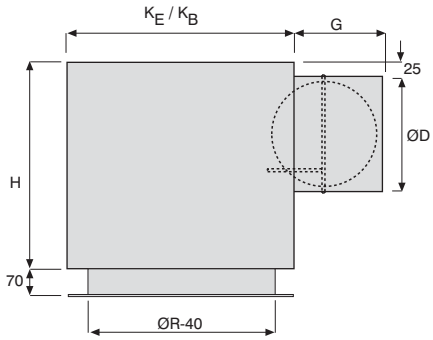
CAA.35.KA

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

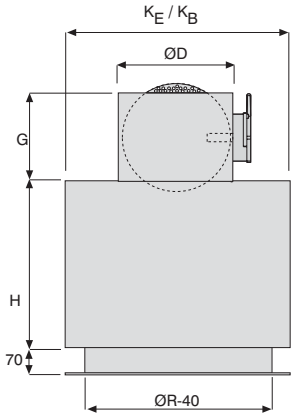
Externally Operated, Side inlet



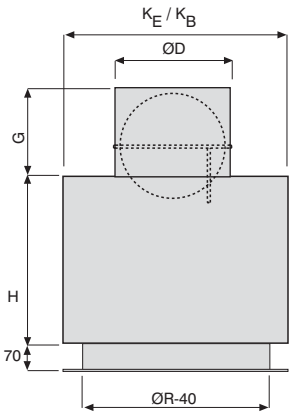
Internally Operated, Side inlet



Externally Operated, Top inlet

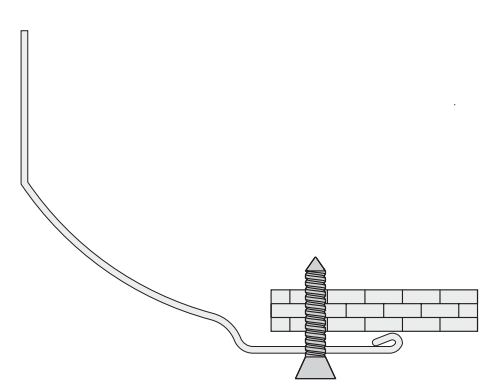


Internally Operated, Top inlet



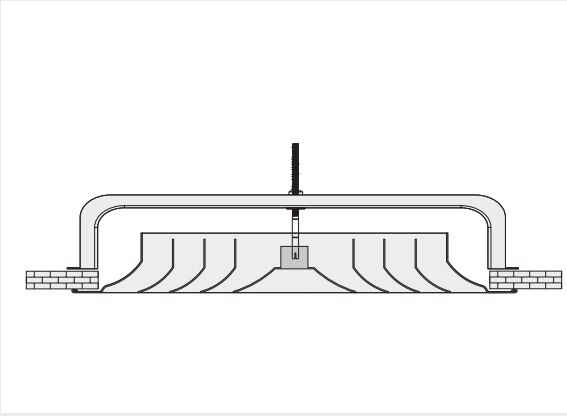
Installation

Fixing with screws



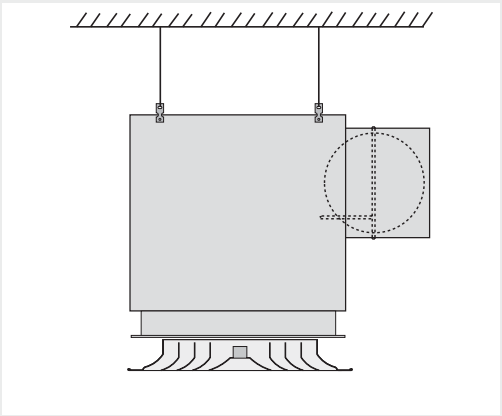
A set of Ø4.2 x 38 mm self-drilling screws, painted the same, are given with the product

Fixing with a bridge



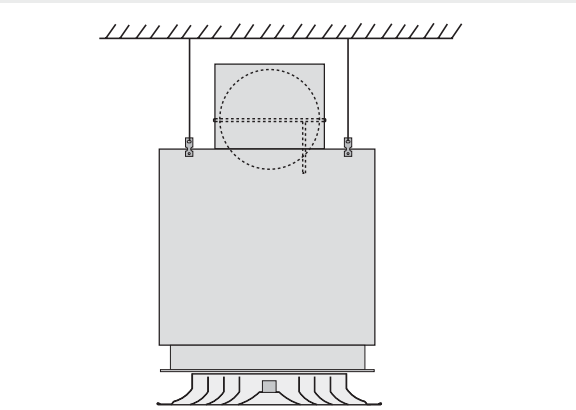
This is fixing type is possible without any accessories

Plenum Box Installation (Side inlet)



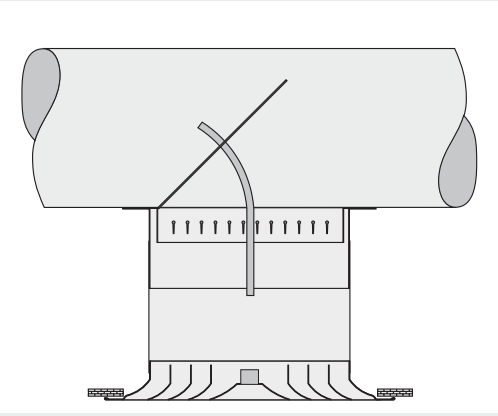
There are 4 hanging brackets on the box as standard

Plenum Box Installation (Top inlet)



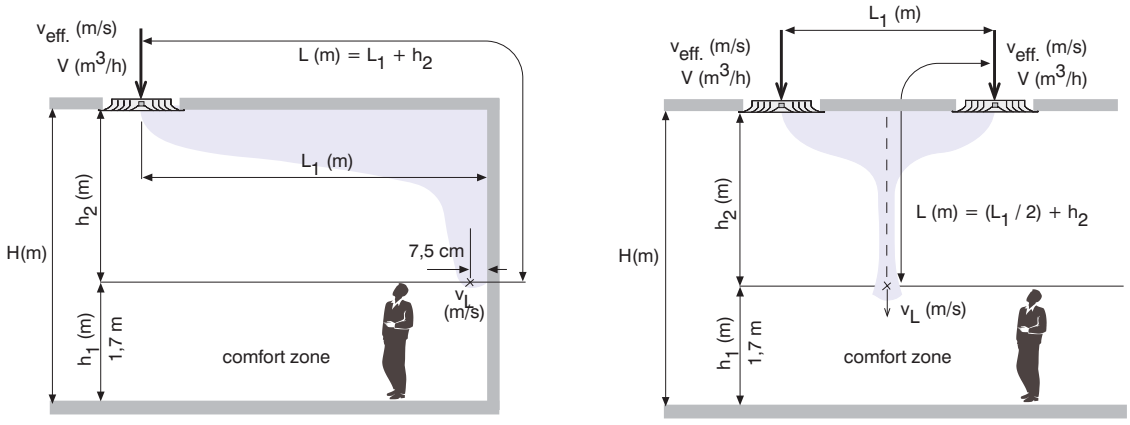
There are 4 hanging brackets on the box as standard

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

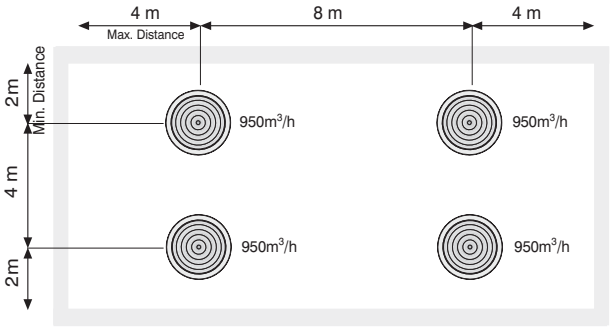
Temperature gradients along the throw path are read from the table below, depending on the Δt_o , Δt_L and throw length values. The temperature of the core at L metres from the diffuser, differs from the room temperature by the value read from the tables. The difference is plus in heating and minus in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

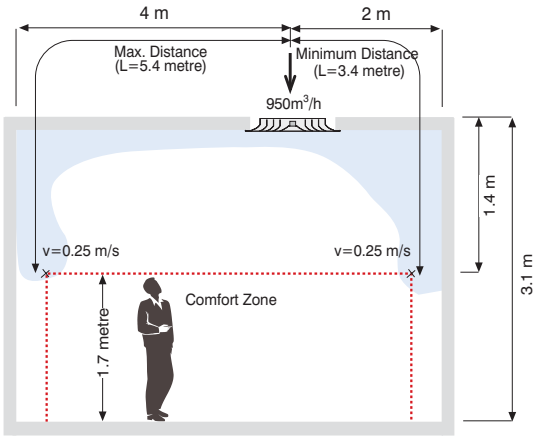
Temperature Gradients along the throw path Δt_L (°C) Values

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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Circular Diffuser

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