

# CDA

Louvred Face Ceiling Diffuser

## 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°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 easily 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.

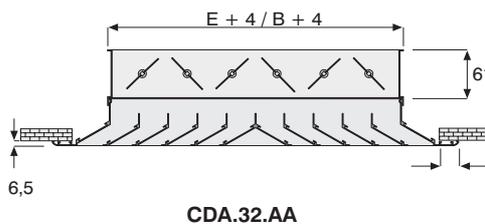
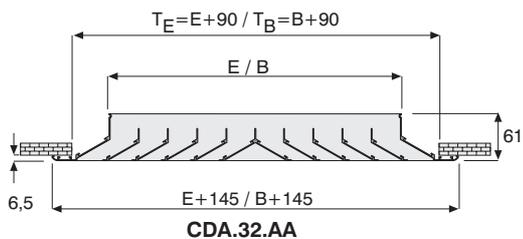
### Flap Damper With Rectifier

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

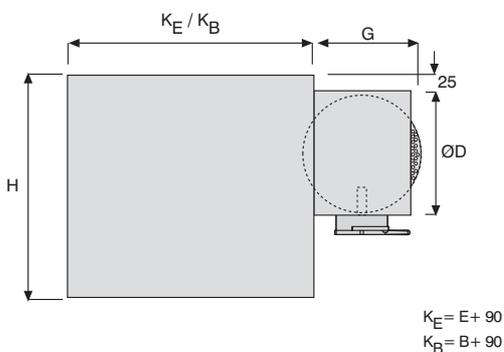


Standard Dimensions (mm)

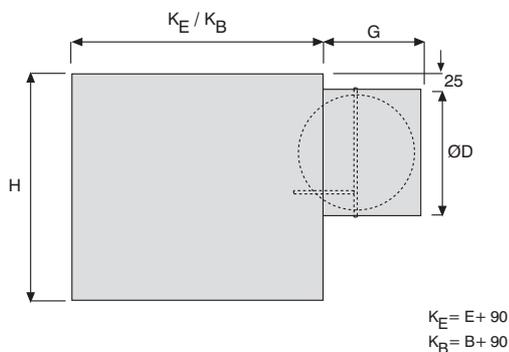
E	B	ØD	H	G
150	150	170	250	150
	225	244	350	175
	300	244	350	175
	375	295	450	225
	450	346	450	225
	525	346	450	225
225	600	346	450	225
	225	244	350	175
	300	295	400	225
	375	346	450	225
	450	396	500	250
	525	396	500	250

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
450	600	498	600	300
	450	498	600	300
	525	498	600	300
525	450	498	600	300
	600	498	600	300
600	600	498	600	300

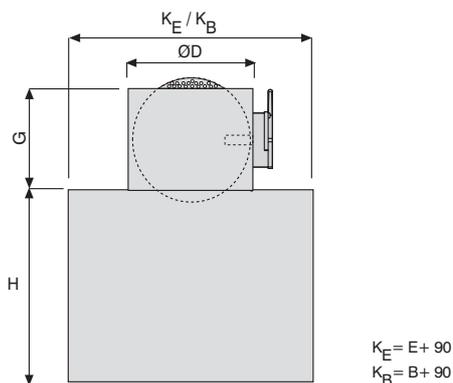
Externally Operated Side Inlet



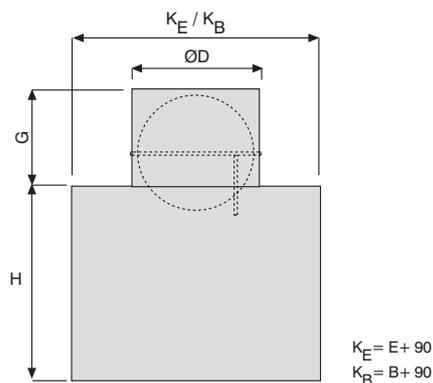
Internally Operated Side Inlet



Externally Operated Top Inlet

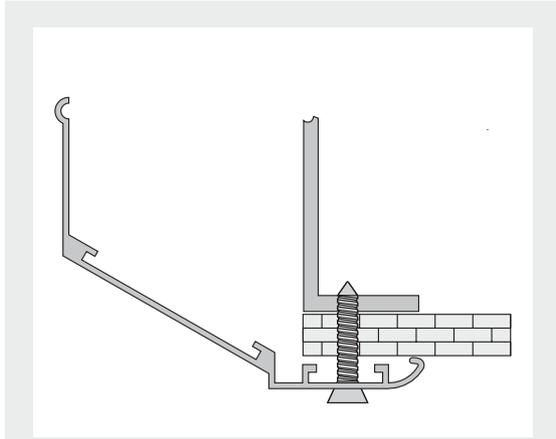


Internally Operated Top Inlet



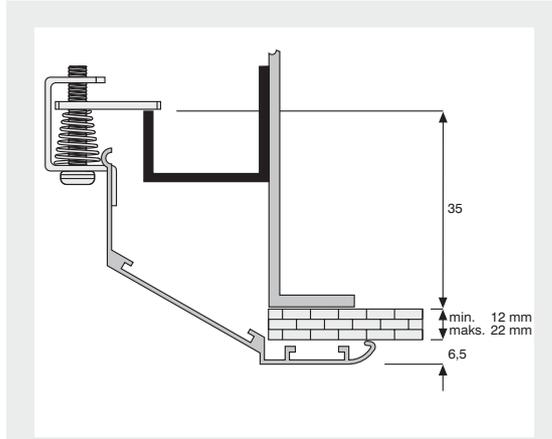
## Installation

### With Screws



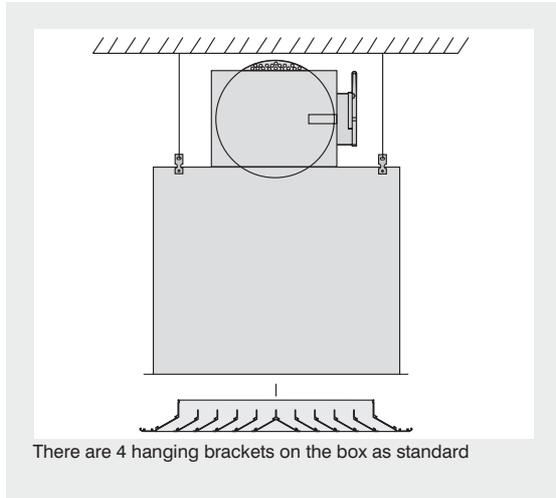
A set of  $\text{Ø } 4.2 \times 38$  mm self-drilling screws, painted the same, are given with the product

### Concealed Fixing



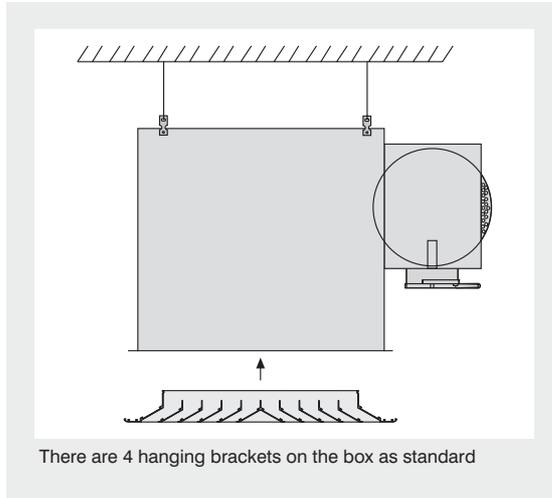
Suitable for ceiling thickness 12-22 mm. For other thicknesses, please contact us.

### Plenum box installation (top inlet)



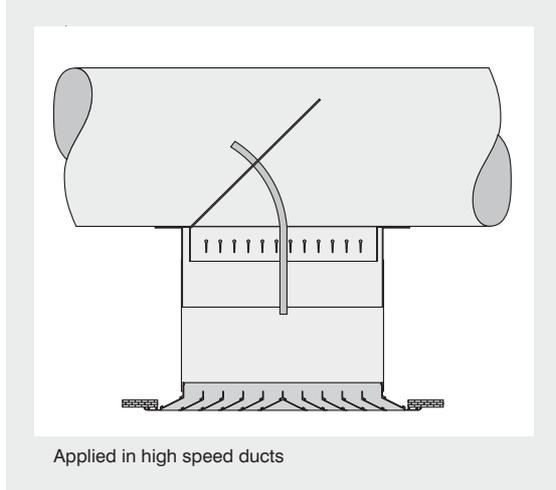
There are 4 hanging brackets on the box as standard

### Plenum Box installation (side inlet)



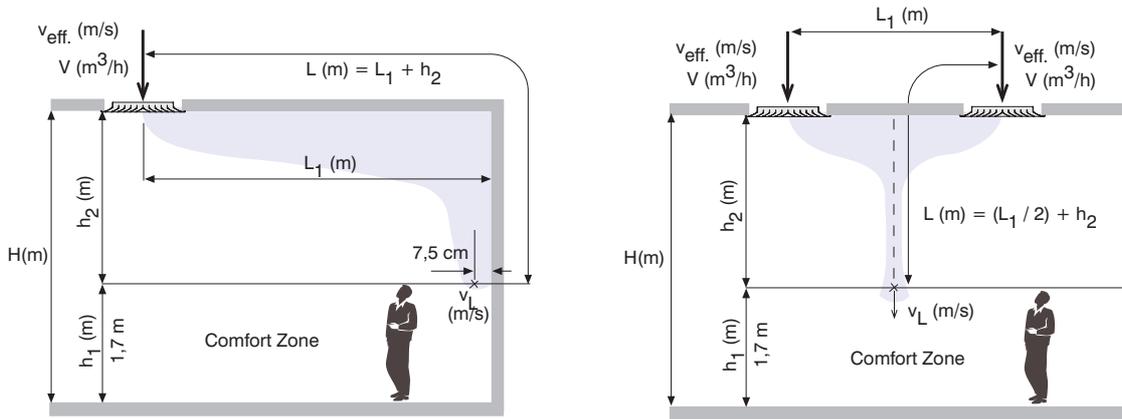
There are 4 hanging brackets on the box as standard

### Application of flap damper with rectifier



Applied in high speed ducts

## Nomenclature



$L_1$	Distance between diffuser centres or diffuser centre and wall. (m)
$h_1$	Comfort zone height (m)
$h_2$	Distance between a diffuser and comfort zone (m)
$v_{eff}$	Effective outlet velocity (m/s)
$v_L$	Velocity of core in comfort zone
$\Delta t_0$	Difference between supply air and room temperature ( $^{\circ}\text{C}$ )
$\Delta t_L$	Difference between core and comfort zone temperature ( $^{\circ}\text{C}$ )
$L$	Throw distance (m)
$V$	Air flow rate (m <sup>3</sup> /h)
$H$	Room height (m)
$S$	Sound power level dB(A)

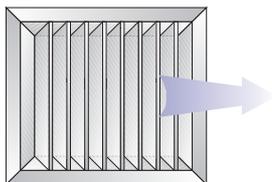
To achieve "Coanda effect", the outlet velocity must be greater than 2m/s. The general comfort conditions require that the sound power level is below 40 dB(A). The height of the comfort zone is taken as 1.70m above the floor. It is important that 0.25 m/s core velocity is not exceeded in this zone.

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

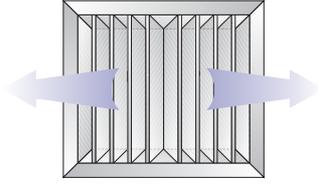
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Size E/B (mm)	Flow Rate V(m <sup>3</sup> /h)	Throw, L (m)		Pressure loss ΔP (Pa)	Sound power level S (dB(A))
		v <sub>L</sub> =0,25 m/s	v <sub>L</sub> =0,10 m/s		
150 x 150	120	1,50	2,50	9	<20
	160	2,00	3,50	15	<20
	200	2,20	4,50	23	25
	250	2,50	5,50	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

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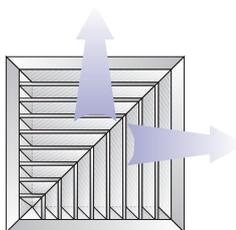


KESKLIMA

Size E/B (mm)	Flow Rate V(m <sup>3</sup> /h)	Throw, L (m)		Pressure loss ΔP (Pa)	Sound power level S (dB(A))
		v <sub>L</sub> =0,25 m/s	v <sub>L</sub> =0,10 m/s		
<b>150 x 150</b>	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
<b>225 x 225</b>	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
<b>300 x 300</b>	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
<b>375 x 375</b>	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
<b>450 x 450</b>	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
<b>525 x 525</b>	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
<b>600 x 600</b>	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

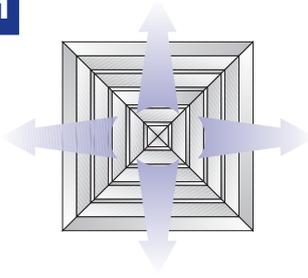
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KESKLIMA

Size E/B (mm)	Flow Rate V(m <sup>3</sup> /h)	Throw, L (m)		Pressure loss ΔP (Pa)	Sound power level S (dB(A))
		v <sub>L</sub> =0,25 m/s	v <sub>L</sub> =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

41



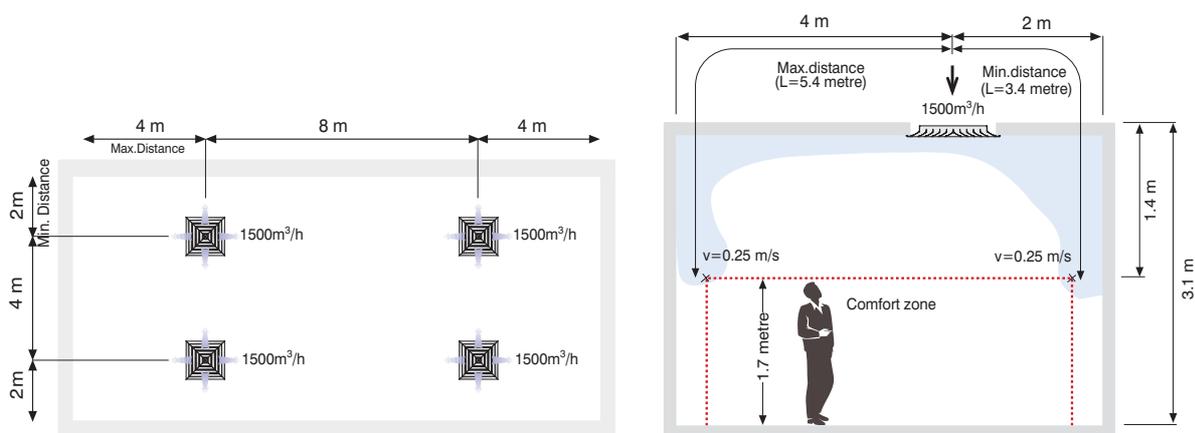
KESKLIMA

Size E/B (mm)	Flow Rate V(m <sup>3</sup> /h)	Throw, L (m)		Pressure loss ΔP (Pa)	Sound power level S (dB(A))
		v <sub>L</sub> =0,25 m/s	v <sub>L</sub> =0,10 m/s		
<b>150 x 150</b>	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
<b>225 x 225</b>	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
<b>300 x 300</b>	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
<b>375 x 375</b>	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
<b>450 x 450</b>	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
<b>525 x 525</b>	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
<b>600 x 600</b>	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 m<sup>3</sup>/h, is to be supplied into a room with dimensions 16 x 8 m, and a height of 3.10 m. The supply air is 8°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.

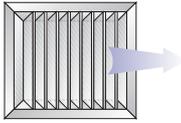


Solution:

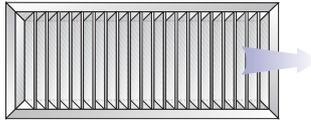
- 1) Diffusers are placed on the ceiling plan symmetrically.
- 2) Air flow rate per diffuser is calculated as  $6000 / 4 = 1500 \text{ m}^3/\text{h}$ .
- 3) Calculation of path length to the comfort zone:
  - Minimum distance:  $L = 2.0 + 1.40 = 3.40 \text{ m}$
  - Maximum distance:  $L = 4.0 + 1.40 = 5.40 \text{ m}$ .
- 4) From the table on page 9, the most suitable size is found as 375x375 mm; for 1500 m<sup>3</sup>/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

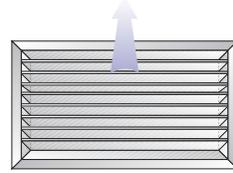
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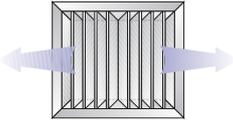
12



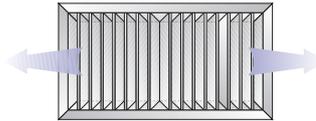
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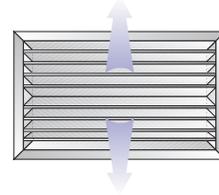
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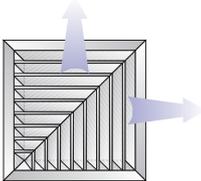
22



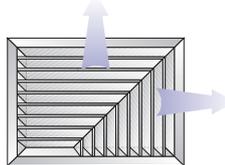
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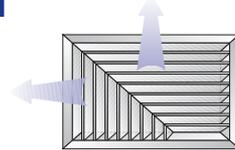
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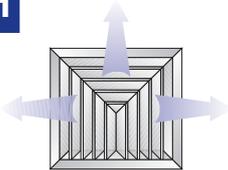
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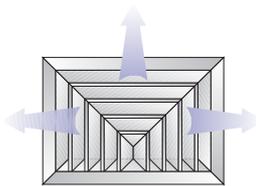
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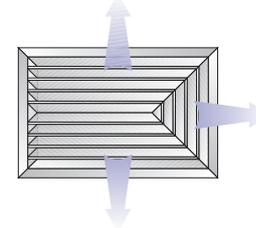
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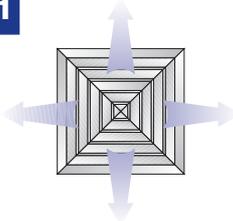
32



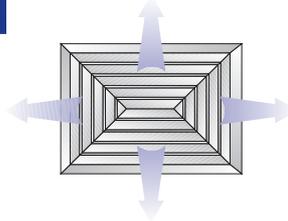
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Note: The views shown are face views, and throw directions are as seen from below. For blocks 25 and 26 care should be taken when ordering.

## 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  $\mu$ . 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

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

## Plenum Box Order Code

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

C

CDA

Louvered Face  
Ceiling Diffuser

**KES KLİMA**

INDUSTRIAL AND TRADE CO.

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06370 Östim/ANKARA  
Phone: +90.312.385 76 57  
Fax : +90.312.354 12 31  
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TÜV Rheinland Group



DIN EN ISO 9001:2000  
Zertifikat: 01 100 042854