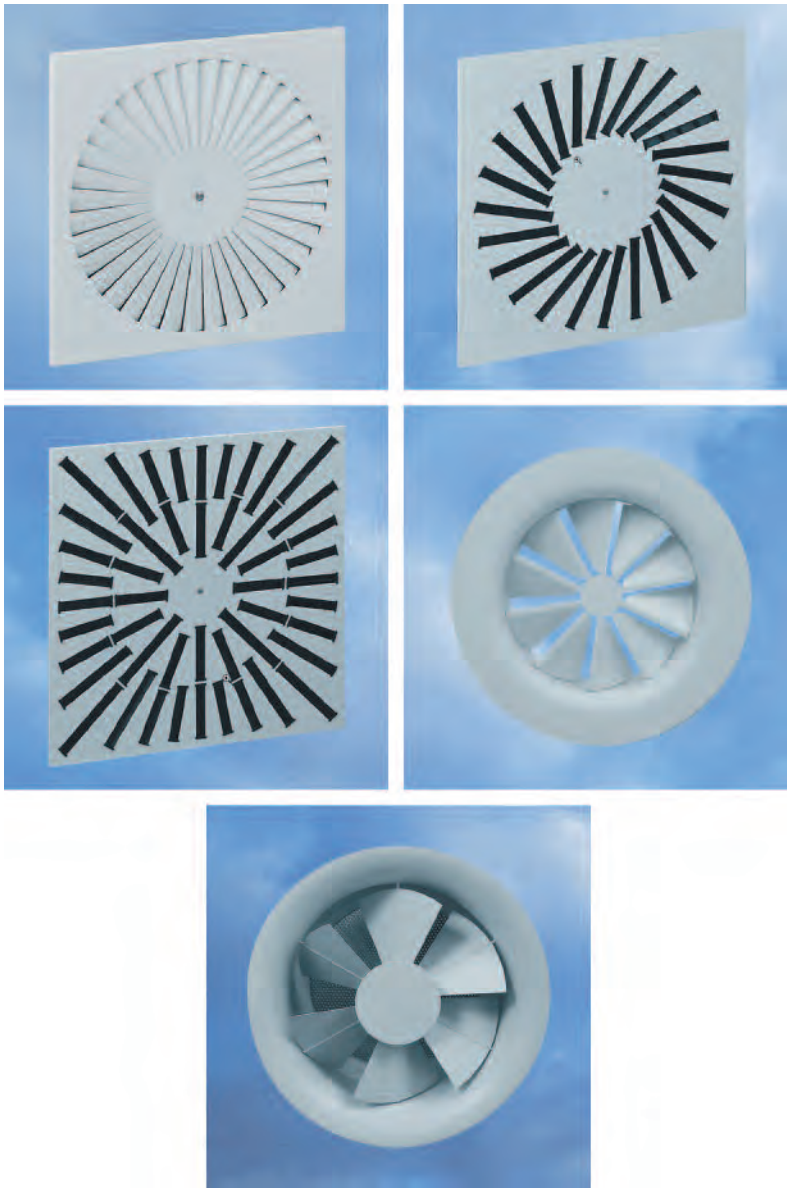
Fixed Adjustable or Variable Air Pattern Ceiling Swirl Diffusers

Models OD-4, OD-7, OD-8 OD-9 and OD-11

Features

- Fixed Air Pattern Swirl
- Adjustable Air Pattern Swirl
- Variable Air Pattern Swirl
- Ceiling or Duct Mounted
- Circular or Square Ceiling Panels
- Purpose Designed Plenum Boxes



Air Diffusion

Grilles Diffusers Louvres Chilled Beams

Ruskin Air Management Limited
www.ruskinuk.co.uk

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Introduction

Swirl diffusers are designed to create a rotary swirling motion to the supply air discharge, which rapidly induces the room air to quickly decrease the velocity and temperature difference of the supply air.

Within the **AIR DIFFUSION** range of swirl diffusers are fixed air pattern, adjustable air pattern and variable air pattern swirl diffusers. The fixed air pattern swirl diffusers have a horizontal discharge and are suitable for minimum mounting heights of 2.6 meters to a maximum of 4 meters at a temperature difference of ±10°K. Adjustable air pattern diffusers are used for the same mounting heights and temperature differences but can be adjusted for horizontal or vertical discharge. Whilst the variable air pattern swirl diffusers have either a horizontal or vertical discharge and are suitable for mounting heights up to 15 meters at a temperature difference of ± 10°K.

In addition the variable air pattern swirl diffusers may be fitted with electric motors for remote operation of the inner vanes, which adjusts the air discharge from horizontal to vertical and vice versa. Alternatively, simple manually adjusted vanes are also available.

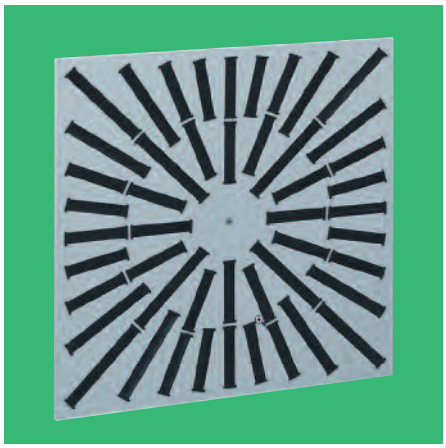
The range consists of two styles of fixed air pattern swirl diffusers models OD-4, OD-7 with two adjustable air pattern models OD-8 and OD-9 with each model type available with either a circular or square ceiling panel format. The model OD-11 variable air pattern swirl diffusers are only supplied in a circular casing format.

Purpose designed and individually selected plenum boxes are available to ensure the performance and characteristics of the diffuser.

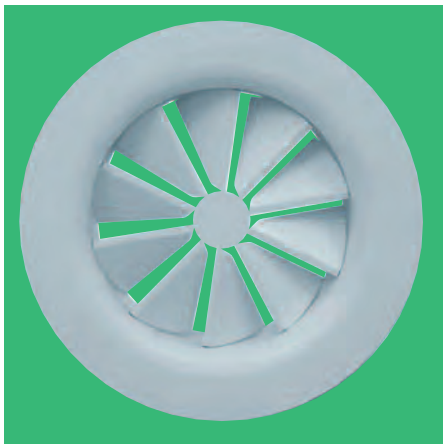
As standard all models are finished to polyester powder white RAL9010 (30% gloss), alternatively other special finishes are available on request.

Model OD-4

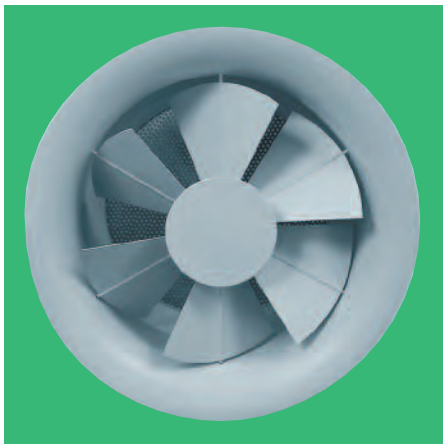
Model OD-8



Model OD-9



Model OD-7



Model OD-11

Model OD-4 Fixed Horizontal Air Pattern Ceiling Swirl Diffuser

Model OD-4

Description
The model OD-4 is a fixed air pattern swirl diffuser giving a horizontal discharge with a set of pre-formed close pitch vanes and being available in either a square or circular ceiling panel format. An additional anti smudge diffuser ring may be fitted to minimise the collection of dust particles on the diffuser face. Typical applications include all general offices and reception areas.

Specification

Material and Construction
Manufactured on CNC press from sheet steel.

Installation Methods
Three alternative installation methods are available as follows:

Single central countersunk screw hole in circular or square ceiling panel diffusers.

Four corner countersunk screw hole positions on square ceiling panel.

Plenum box supplied with diffuser.

When using a diffuser and plenum box combination, the diffuser is normally fixed to the plenum box by a single central fixing.

Alternatively single fixing bars or angles for duct fixing are by others.

Accessories
Purpose designed plenum box, with spigot damper if required.

Anti smudge ring. Fig.1.

Size Range
Model OD-4 ceiling swirl diffuser in square or circular ceiling panels
Size 400
Size 500
Size 600
Size 625
Size 600D
Size 625D
Size 675D

Model Types

Model OD-4/K1 – circular swirl diffuser in square ceiling panel with single central countersunk screw hole fixing position.

Model OD-4/K4 – circular swirl diffuser in square ceiling panel with four countersunk screw hole fixing positions (one in each corner of ceiling panel).

Model OD-4/R1 – circular swirl diffuser in circular ceiling panel with single central countersunk screw hole fixing position.

Model OD-4/K0 – as K1 but with anti smudge ring.

Model OD-4/R0 – as R1 but with anti smudge ring.

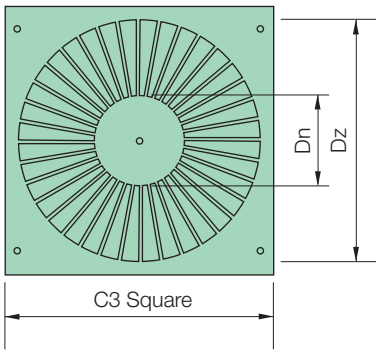
Finish
White polyester powder coat to RAL9010 (30% gloss).

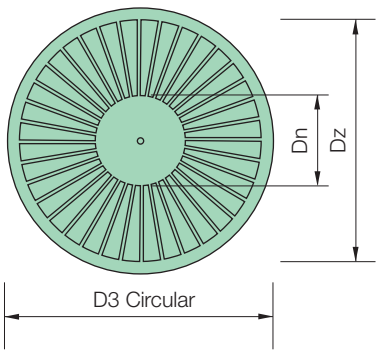
Other colours are also available on request.

Fig.1 Accessories

Diffuser face with anti smudge ring
The diffuser anti smudge ring is an additional element preventing the discharged air to flow over the diffuser face itself. The advantage of such construction is that dust particles do not gather on the diffuser plate.

Model Types and Dimensions



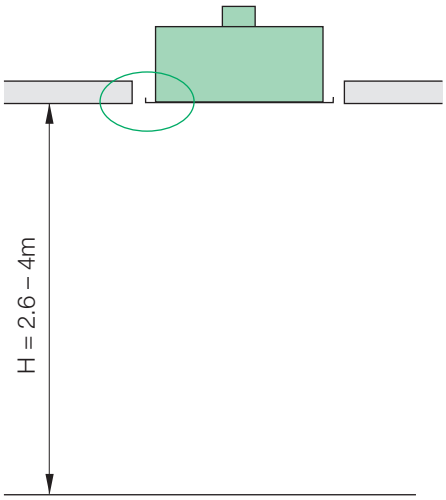


Size	Dn	Dz	C3	D3 (dia)	A_{ef} (m^2)
400	130	350	398	400	0.0138
500	130	350	498	500	0.0138
600	130	350	598	600	0.0138
625	130	350	623	625	0.0138
600D	200	540	598	600	0.367
625D	200	540	623	625	0.367
675D	200	540	673	675	0.367

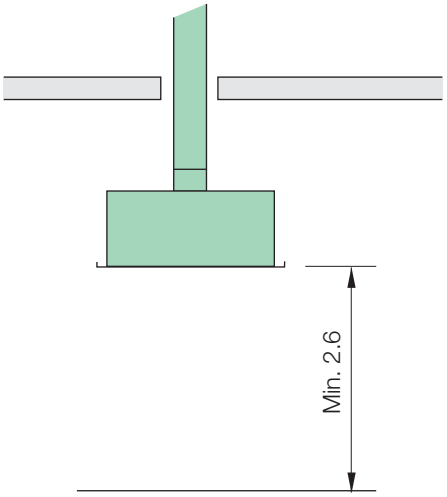
A_{ef} - effective discharge area (m^2)

Installation Guide

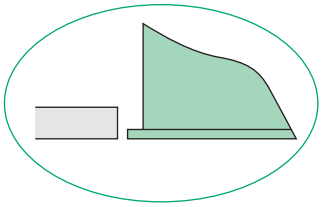
Flush with ceiling



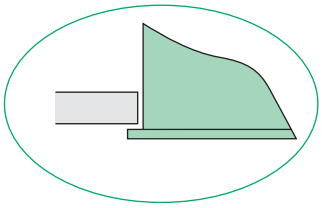
With extended duct below the ceiling



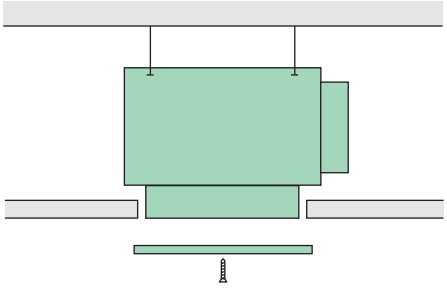
Flush mounting



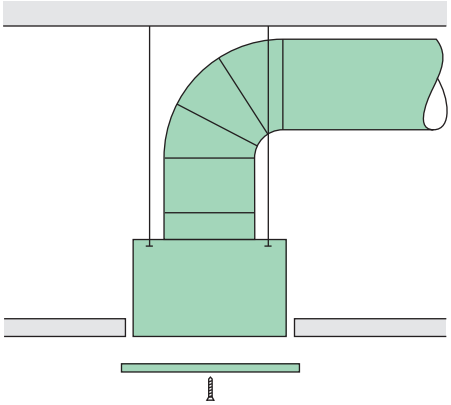
Surface mounting



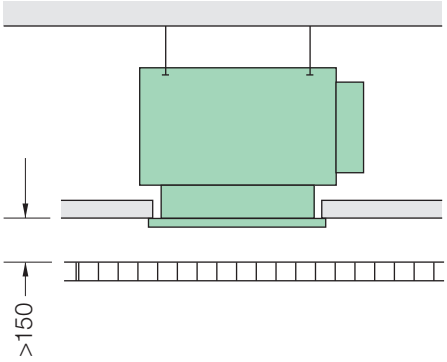
Plenum box with side entry



Plenum box with top entry



Above open grid ceiling



Single central fixing position shown

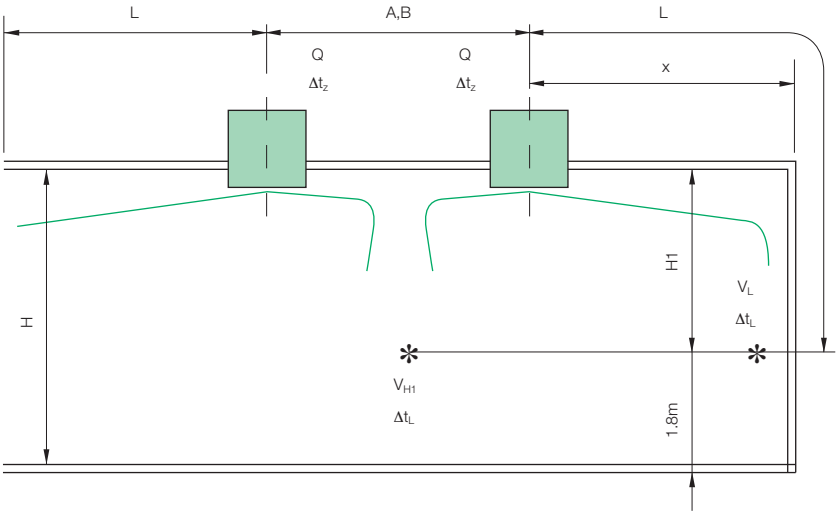
Ordering Information

Example

Model Type	Fixing Location, Type and Accessories	Finish	Size
OD-4	K1	83	500
OD-4 – fixed pattern swirl diffuser in either square or circular ceiling panel with pre-formed close pitch vanes.	**K1** – Square diffuser – single central fixing position **K4** – Square diffuser – four fixing positions **R1** – Circular diffuser – single central fixing position **K0** – Square diffuser with anti smudge ring – single central fixing position **R0** – Circular diffuser with anti smudge ring – single central fixing position.	**83** - White RAL9010 Polyester Powder (30% Gloss). Alternative colours within the RAL colour range, also available. (Subject to the relevant quantity surcharge).	400 500 600 625 600D 625D 675D

Important Note: If the overall size is critical then it must be clearly stated on the order.
All orders must be addressed to AIR DIFFUSION, Ruskin Air Management Limited.

Performance Data

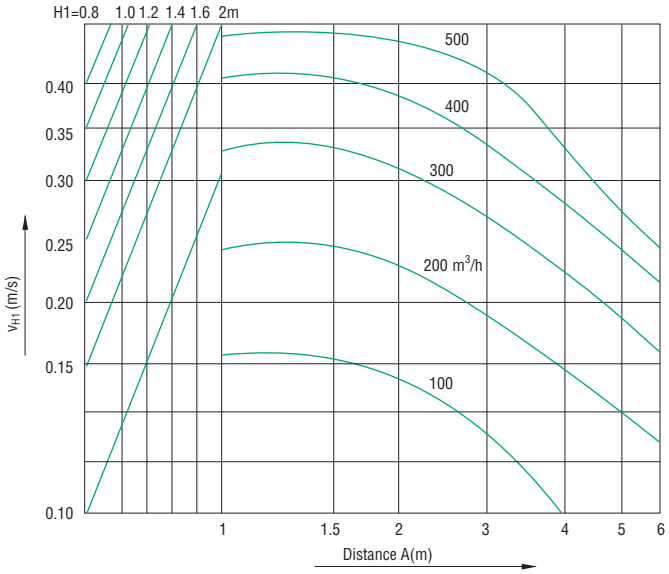


Q (m³/h)	Air flow
x (m)	Horizonal distance to the wall
H (m)	Room height
H1 (m)	Distance from ceiling to occupied zone
L (m)	Throw distance (L=H1 + x)
V_L(m/s)	Air velocity at the throw distance L
Δt_z(K)	Temperate difference between the supply and room air
Δt_L(K)	Difference between the core and room air temperature
Δp_t(Pa)	Pressure drop
L_{WA}(db(A))	Sound power level
V_{H1}(m/s)	Air velocity at the H1 distance
A, B (m)	Distance between diffusers by length and by width

Air velocity at the throw distances (for OD-4 without diffusion ring and with ceiling effect)

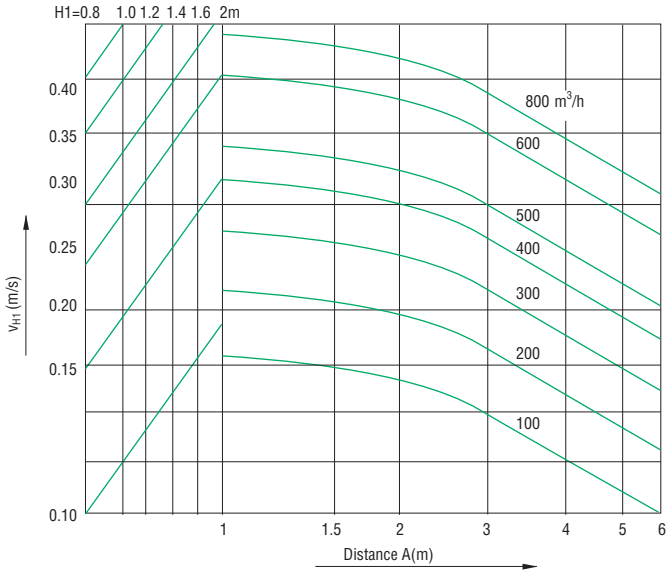
OD-4 size 400, 500, 600, 625

B = 2.5 ...3.5m



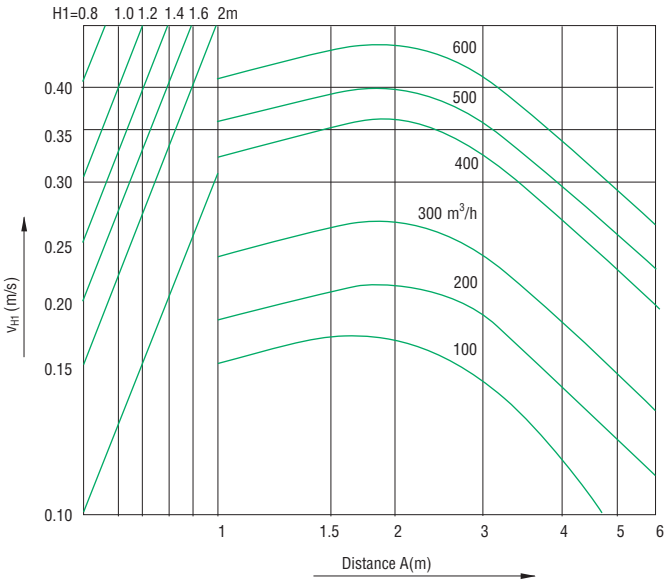
OD-4 size 600D, 625D, 675D

B = 2.5 ...3.5m



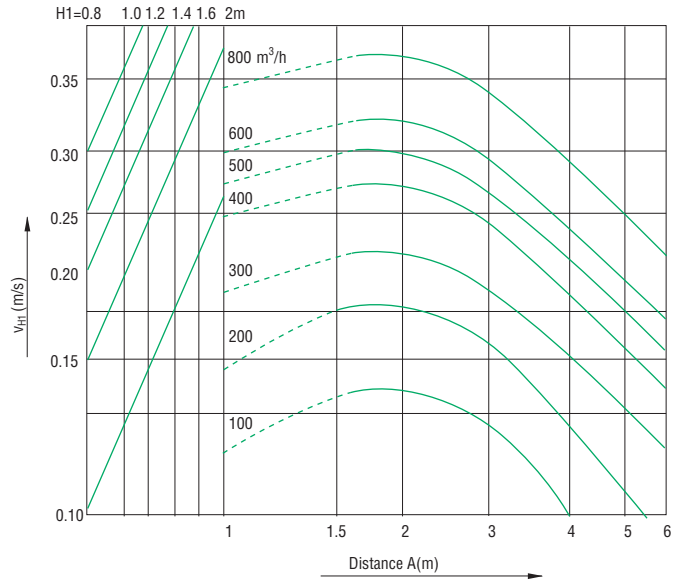
OD-4 size 400, 500, 600, 625

B > 4m



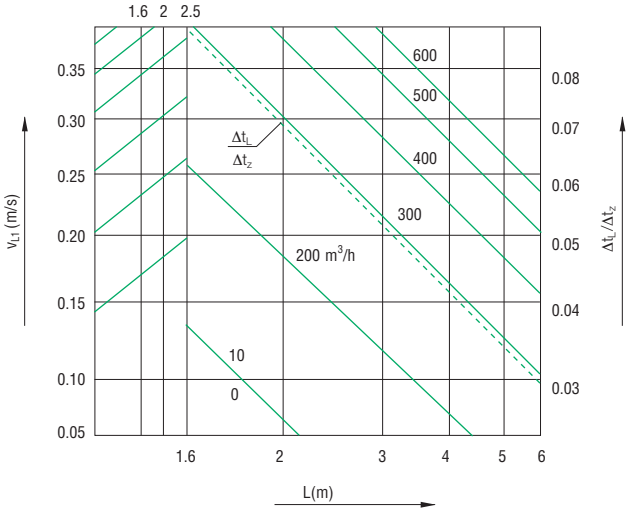
OD-4 size 600D, 625D, 675D

B>4m

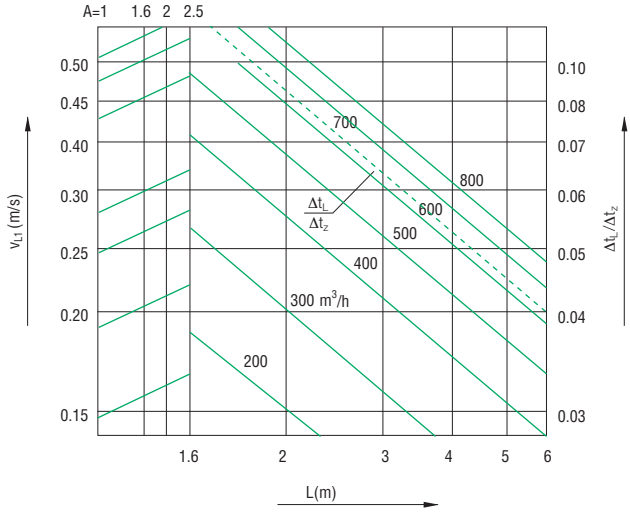


Performance Data Continued

OD-4 size 400, 500, 600, 625

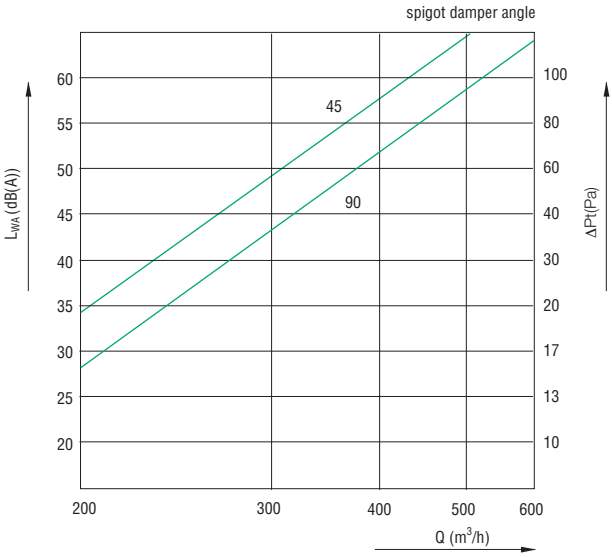


OD-4 size 600D, 625D, 67D

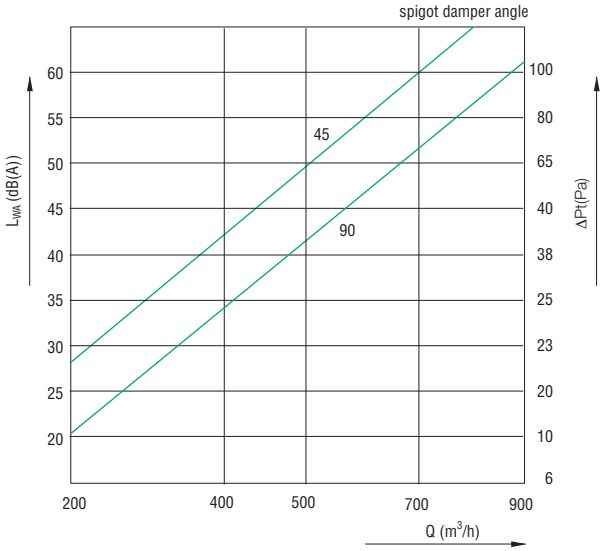


Pressure drop and sound power level (with plenum box having equalising grid).
Spigot damper angle 90° - opened, 45° - half opened.

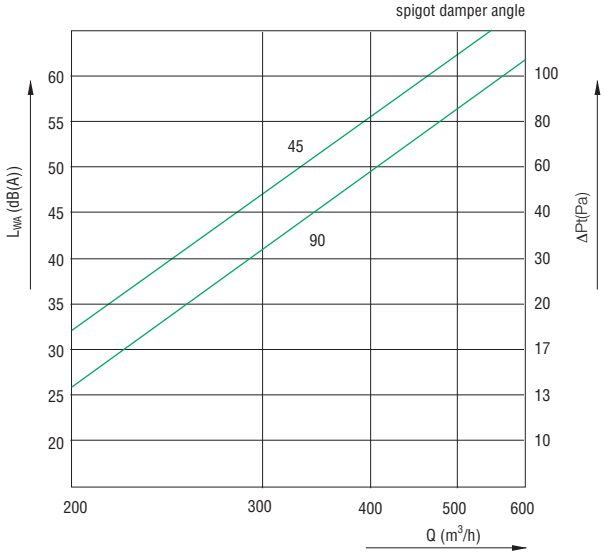
OD-4/S size 400, 500, 600, 625 (Side Entry)



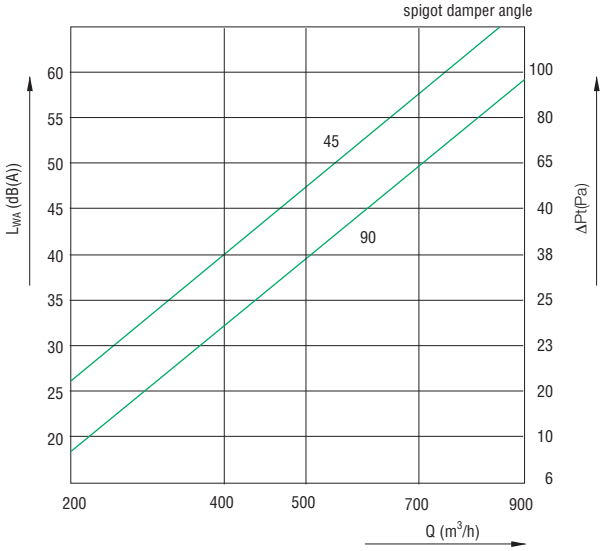
OD-4/S size 600D, 625D, 675D (Side Entry)



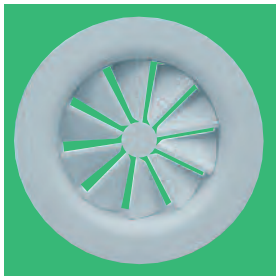
OD-4/V size 400, 500, 600, 625 (Top Entry)



OD-4/V size 600D, 625D, 675D (Top Entry)



Model OD-7 Fixed Horizontal Air Pattern Ceiling Swirl Diffuser



Model OD-7

Description
The Model OD-7 is a fixed air pattern swirl diffuser giving a horizontal discharge with a set of angled inner vanes. Available in 3 different styles from either a circular face set into a square ceiling panel, circular with flush flange or circular with deeper flange format. Typical applications include all offices, shops and other all-purpose areas, with ceiling heights up to 4 metres.

Specification
Material
Components constructed from steel.

Accessories
Crossbar fixing.
Slip spigot connection.
Purpose designed plenum box, with spigot damper if required.

Finish
White polyester powder coat to RAL9010 (30% gloss)

Other colours are also available on request.

Size Range
Model OD-7/RB, model OD-7/RC and model OD-7/KB.
Size 100
Size 125
Size 160
Size 180
Size 200
Size 250
Size 315
Size 355
Size 400

(The model OD-7/KB is available in all sizes to suit a nominal 600x600mm ceiling grid).

Installation Methods
Three alternative installation methods are available as follows:

Duct fixing using single central countersunk screw hole onto crossbar supplied loose with diffuser (for fixing by others).

Duct connection using separate slip spigot connection supplied with diffuser.

Plenum box supplied with diffuser.

(When using a diffuser and plenum box combination, the diffuser is normally fixed to the plenum box by a single central fixing.)

The diffuser may also be supplied plain with no fixings for installation by others.

All installation methods require diffuser or plenum box / diffuser combination to be supported independently.

Model Types and Dimensions

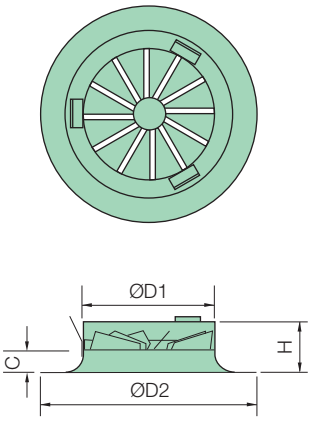
Model OD-7/RB circular swirl diffuser having circular face with flush outer flange.

Model OD-7/KB circular swirl diffuser having square ceiling panel.

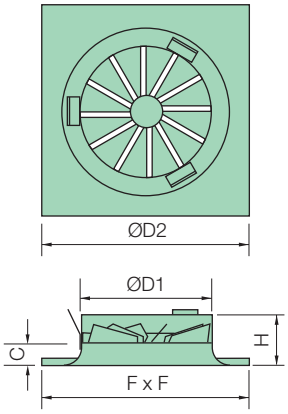
Model OD-7/RC circular swirl diffuser having circular face with deeper outer flange.

Each model type may be supplied with the different installation methods, (specify as required).

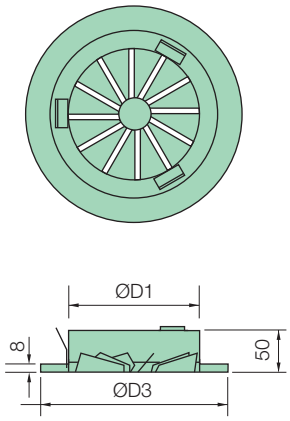
OD-7/RB



OD-7/KB



OD-7/RC

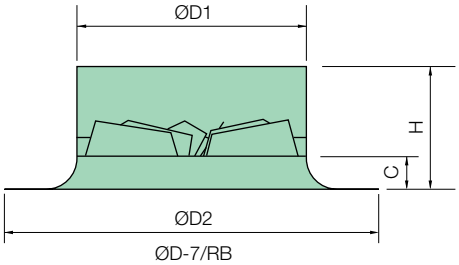


Size	ØD1	ØD2	ØD3	F	H	C	A_{ef} (m^2)
***100**	98	150	-	195	65	17	0.0033
125	123	200	158	245	65	17	0.0049
160	158	250	197	295	65	20	0.0081
***180**	178	250	-	295	65	20	0.0104
200	198	300	241	345	65	15	0.0127
250	248	350	295	395	65	15	0.200
315	313	450	364	495	88	35	0.0317
***355**	353	500	-	595	88	35	0.0481
***400**	398	500	-	595	125	45	0.0620

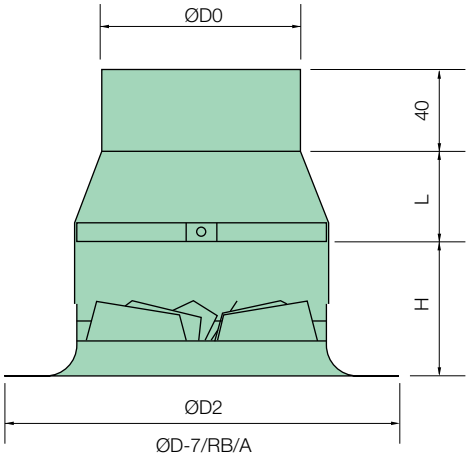
*Model OD-7/RC not available in these sizes.

A_{ef} (m^2) - effective discharge area (m^2)

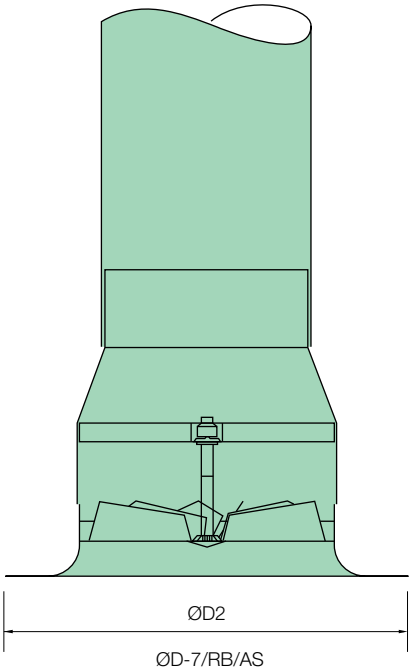
Installation Guide



ØD-7/RB
(Diffuser only)



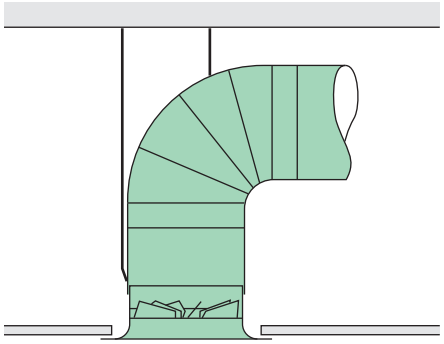
ØD-7/RB/A
Slip spigot connection (A)



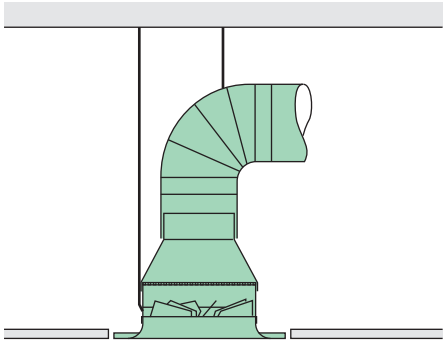
ØD-7/RB/AS

Slip spigot connection with
cross bar fixing (AS)

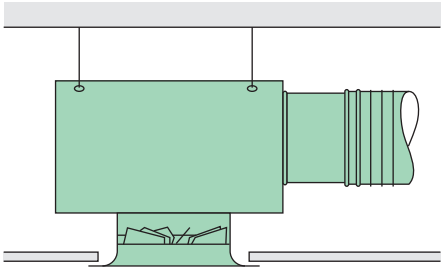
Size	ØD1	ØD0	L	H
100	97	78	20	65
125	122	98	35	65
160	157	123	40	65
180	177	158	25	65
200	197	178	25	65
250	247	198	50	65
315	312	248	65	88
355	352	248	65	88
400	397	313	65	125



Suspension brackets (0)



Installation with spigot
(Spigot and diffusers are connected)



Installation with plenum box
(Spigot and plenum box are connected)

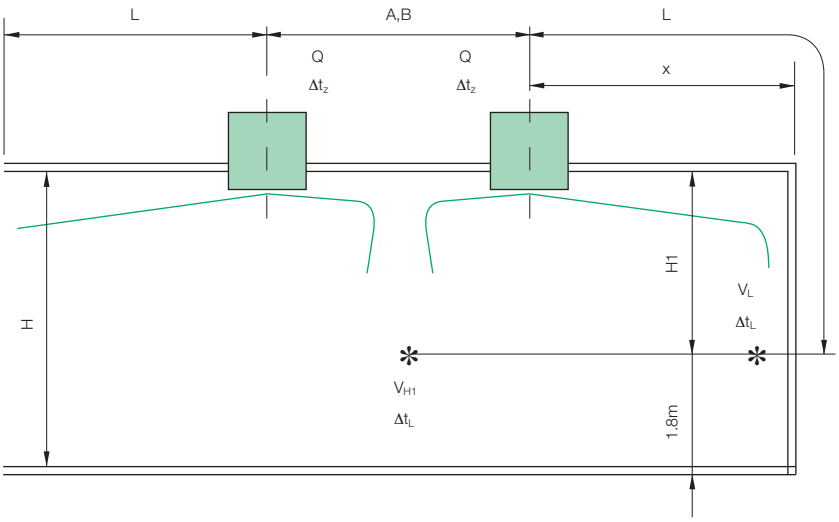
Ordering Information

Example

Model Type	Installation Method	Finish	Size
OD-7/RB	AS	83	315
Model OD-7/RB circular swirl diffuser having circular face with flush outer flange. **Model OD-7/KB** circular swirl diffuser having square ceiling panel. **Model OD-7/RC** circular swirl diffuser having circular face with deeper outer flange.	**A** – Slip spigot connection. **S** – Crossbar fixing (crossbar supplied loose for fixing by others) **AS** – Slip spigot with cross bar fixing.	**83** - White RAL9010 polyester powder (30% gloss). Alternative colours within the RAL colour range, also available. (Subject to the relevant quantity surcharge).	**100** **125** **160** **180** **200** **250** **315** **355** **400**

Important Note: If the overall size is critical then it must be clearly stated on the order.
All orders must be addressed to AIR DIFFUSION, Ruskin Air Management Limited.

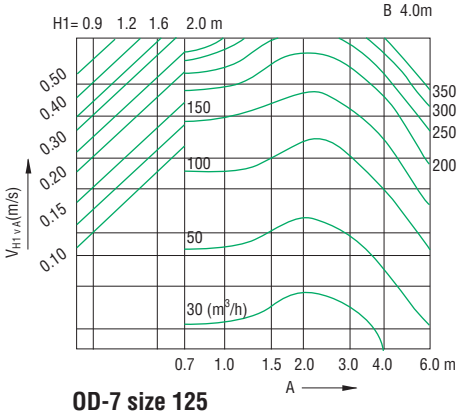
Performance Data

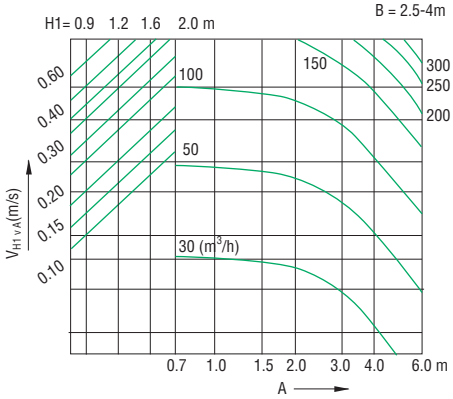


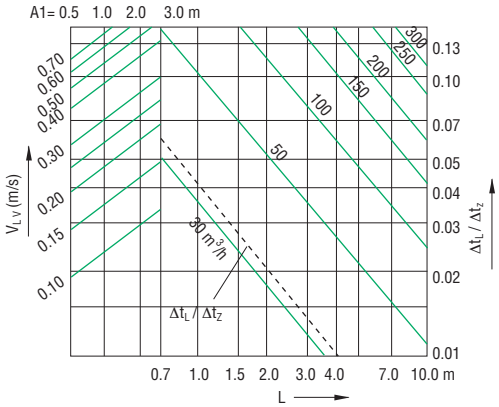
Q (m³/h)	Air flow
x (m)	Horizonal distance to the wall
H (m)	Room height
H1 (m)	Distance from ceiling to occupied zone
L (m)	Throw distance (L=H1 + x)
V_L(m/s)	Air velocity at the throw distance L
Δt_z(K)	Temperate difference between the supply and room air
Δt_L(K)	Difference between the core and room air temperature
Δp_t(Pa)	Pressure drop
L_{WA}(db(A))	Sound power level
V_{H1}(m/s)	Air velocity at the H1 distance
A, B (m)	Distance between diffusers by length and by width

Air velocity of the throw distance (with ceiling effect)

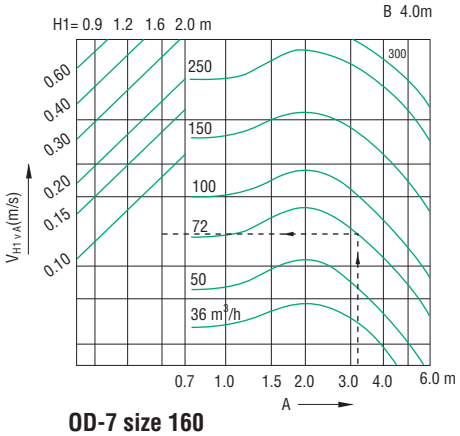
OD-7 size 100

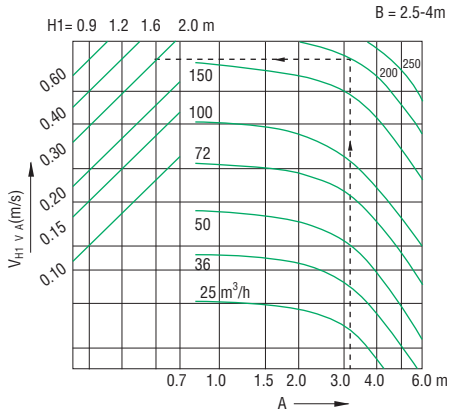


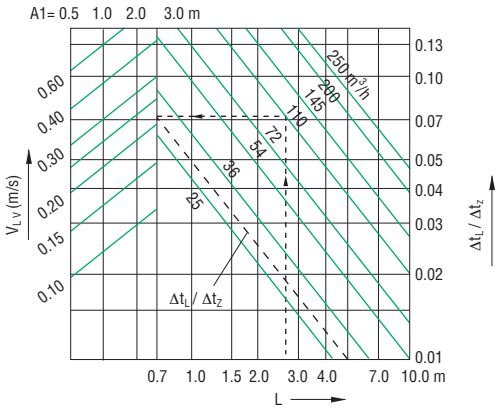




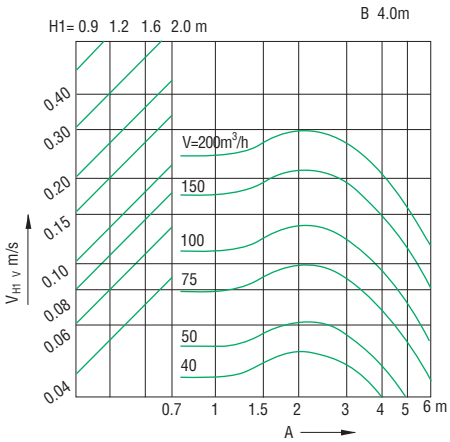
OD-7 size 125

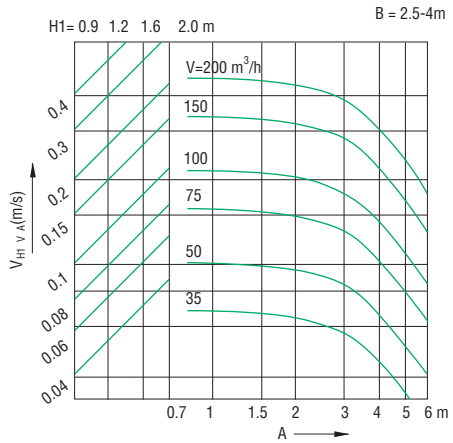


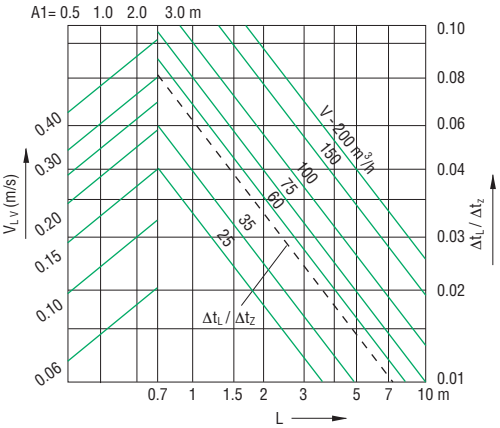




OD-7 size 160



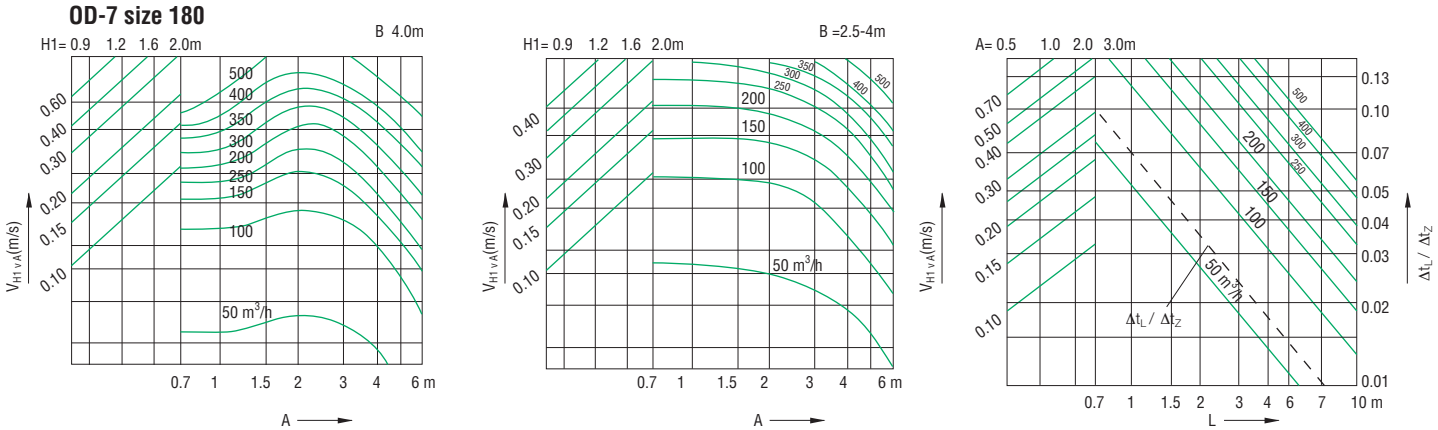




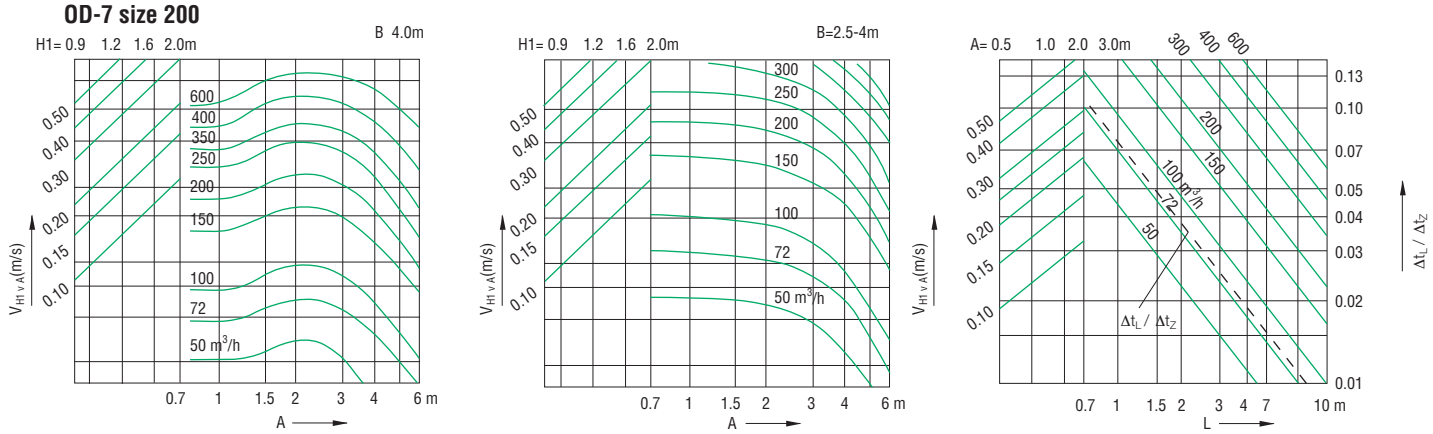
Performance Data Continued

Air velocity of the throw distance (with ceiling effect)

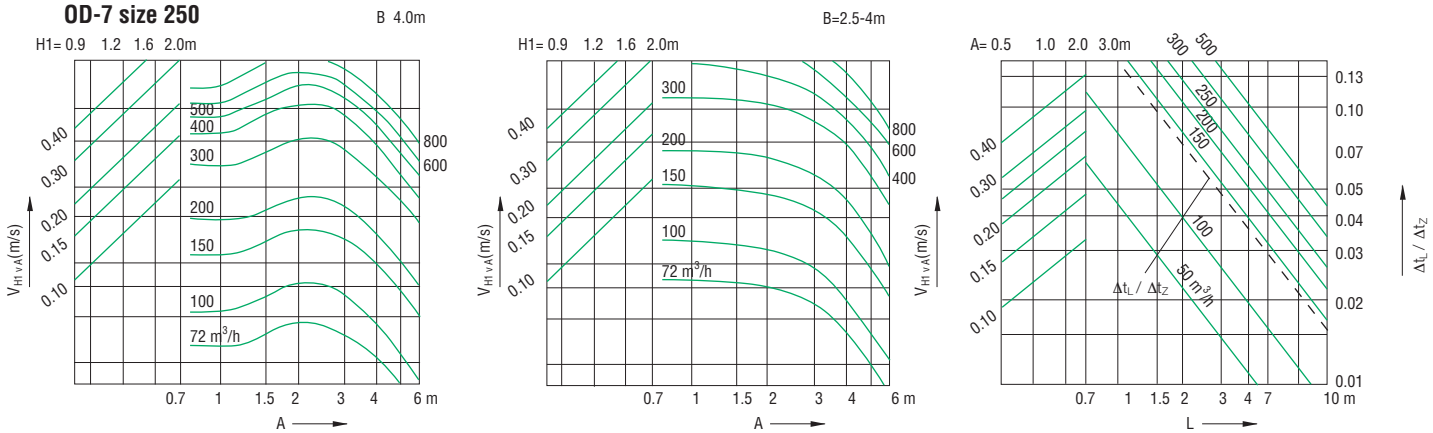
OD-7 size 180



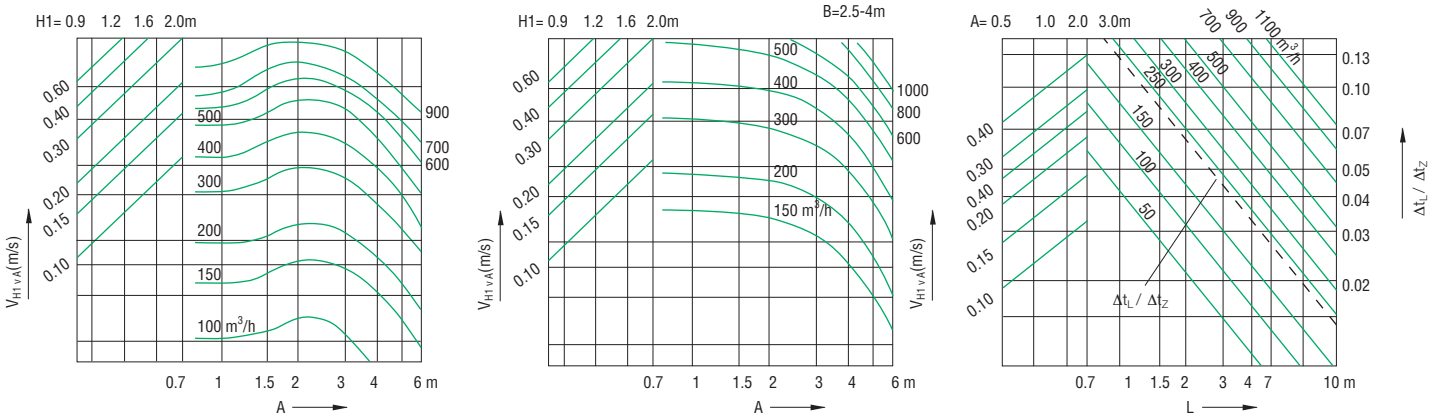
OD-7 size 200



OD-7 size 250

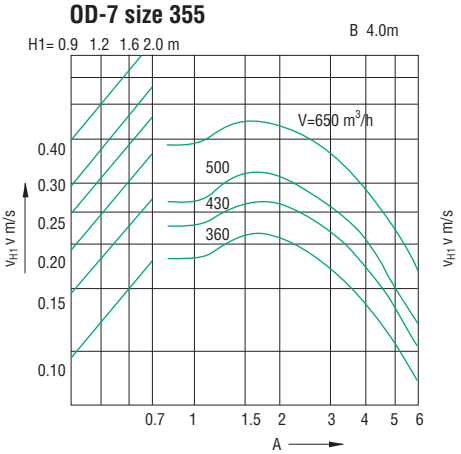


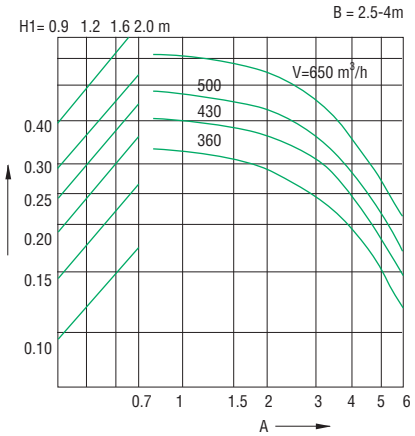
OD-7 size 315

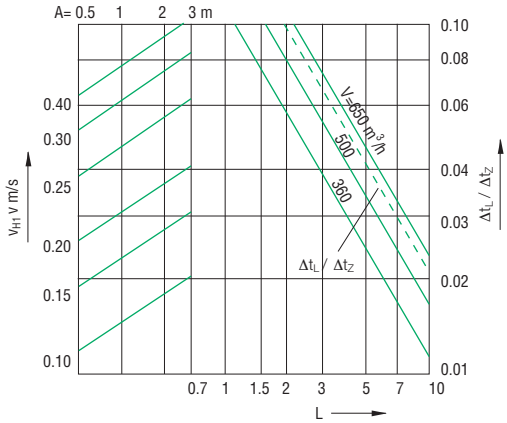


Performance Data Continued

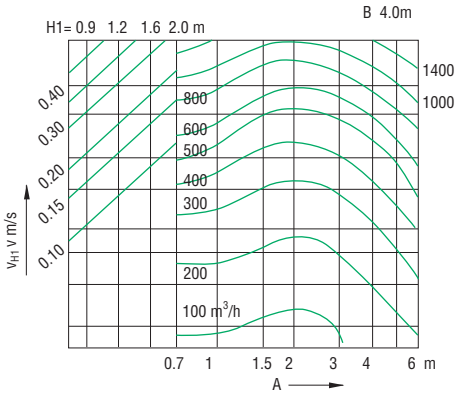
OD-7 size 355

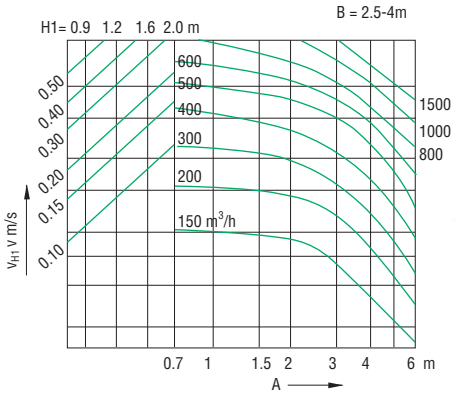


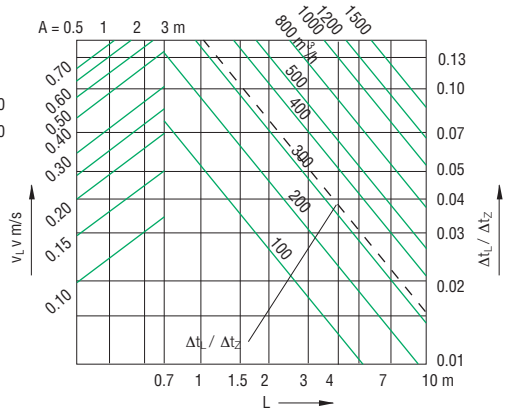




OD-7 size 400



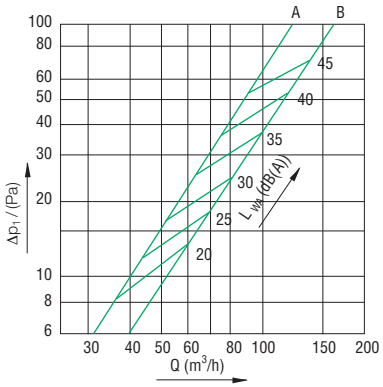




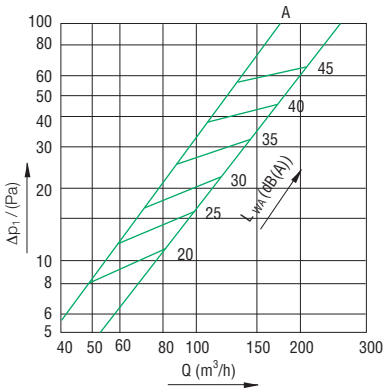
Pressure drop and sound power level

The diagram values apply to OD-7 with plenum box, at 100% open regulation blade. For intermediate diffuser sizes, select the parameters from the diagram for the model of the nearest smaller size (**exception:** for size 100 select the parameters from the diagram for size 125). Line A is for OD-7/RC, Line B is for OD-7/RB and OD-7/KB.

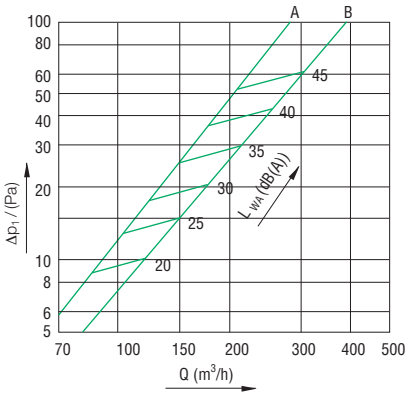
OD-7 size125



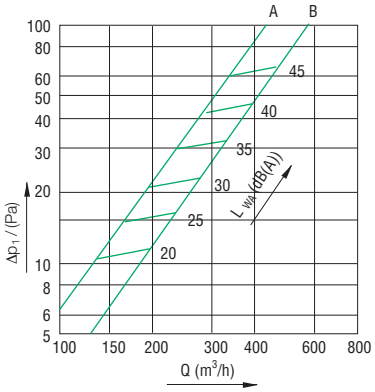
OD-7 size 160



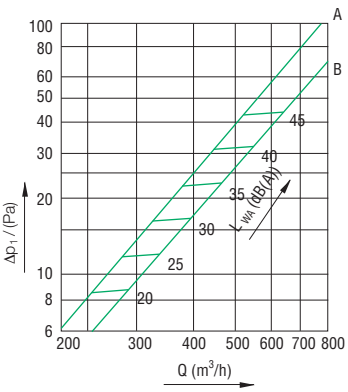
OD-7 size 200



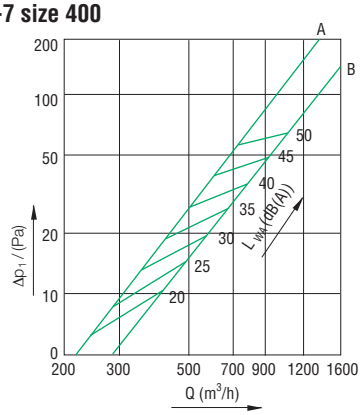
OD-7 size 250



OD-7 size 315



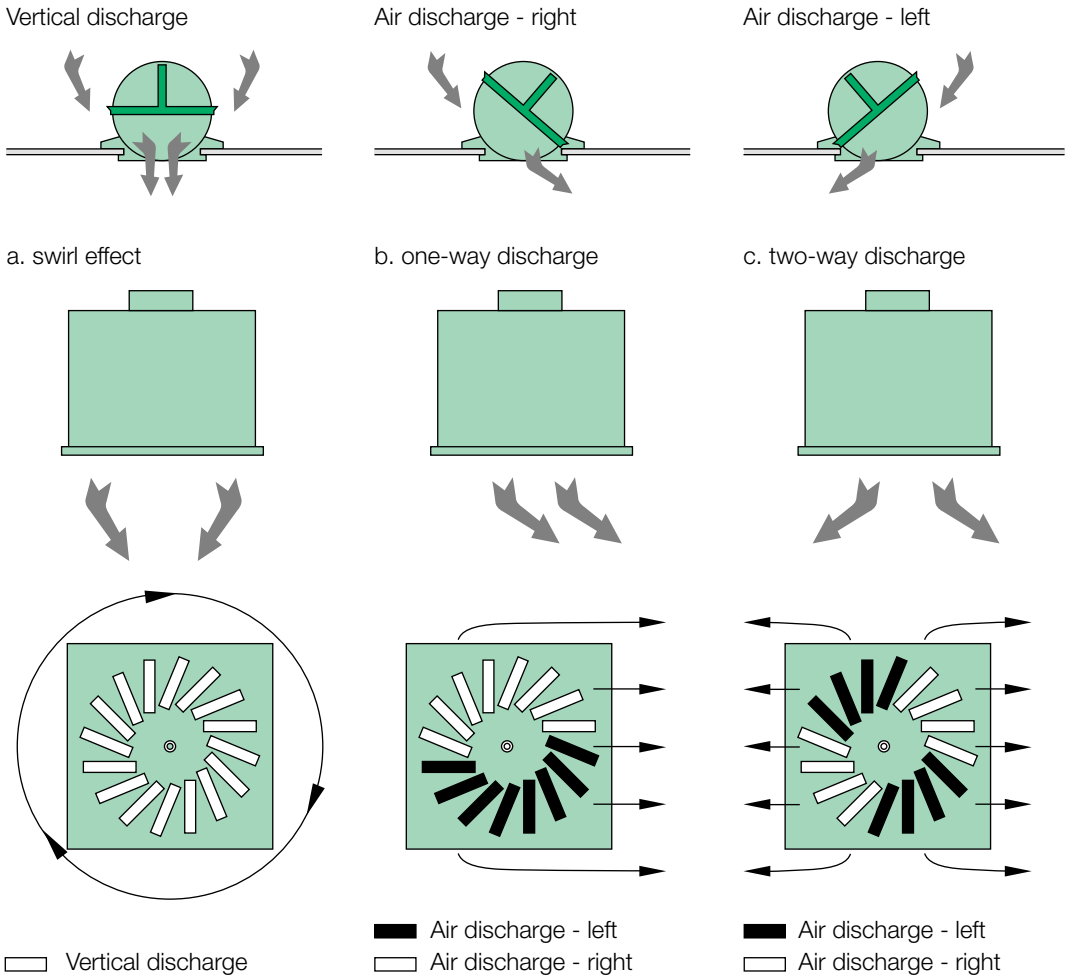
OD-7 size 400



Model OD-8 Horizontal or Vertical Air Pattern Ceiling Swirl Diffuser

Model OD-8

Description
The model OD-8 is an adjustable horizontal or vertical air pattern swirl diffuser, having a series of slots in a curved radial format, within a circular or square ceiling panel. Contained in the slots are nylon deflectors, which allows the direction of the supply air to be altered from left to right whilst also being capable of adjustment to provide a vertical discharge. For extract use the nylon deflectors are omitted. Typical applications include most general offices, shops or other commercial areas.



Specification
Material
External components constructed from steel with internal deflectors from nylon. Stainless steel also available, please state type of finish required, either polished or brushed, and grade of material.

Installation Methods
Four alternative diffuser installation methods are available as follows:

Single central countersunk screw hole in circular or square ceiling panel diffusers.

Four corner position countersunk screw holes on square and circular ceiling panel diffusers.

Five countersunk screw hole positions for sizes 800/72 and 825/72, four on edges and one central.

The diffuser may also be supplied plain with no fixings for installation by others.

Alternatively single fixing bars or angles for duct fixing are by others.

Plenum box supplied with diffuser.

When using a diffuser and plenum box combination, the diffuser is normally fixed to the plenum box by a single central fixing.

All installation methods require diffuser or plenum box / diffuser combination to be supported independently.

Accessories
Purpose designed plenum box, with spigot damper if required.
Filter media can be provided on extract units.

Finish
White polyester powder coat to RAL9010 (30% gloss) to all external surfaces, with black nylon internal deflectors, as standard. (White deflectors available as an option).

Other colours within the RAL range are also available on request.

Size Range
Model OD-8/K1,
Model OD-8/K4,
Model OD-8/R1 and
Model OD-8/K4
Size 300/8
Size 400/16
Size 500/16
Size 600/16
Size 625/16
Size 500/24
Size 600/24
Size 625/24
Size 600/48
Size 625/54
Size 800/72
Size 825/72

(The model OD-8/K is available in all sizes to suit a nominal 600 x 600mm ceiling grid).

Model Types and Dimensions

Model OD-8/K1 – swirl diffuser with radial pattern slots having adjustable internal deflectors, within a square ceiling panel and a single central fixing position.

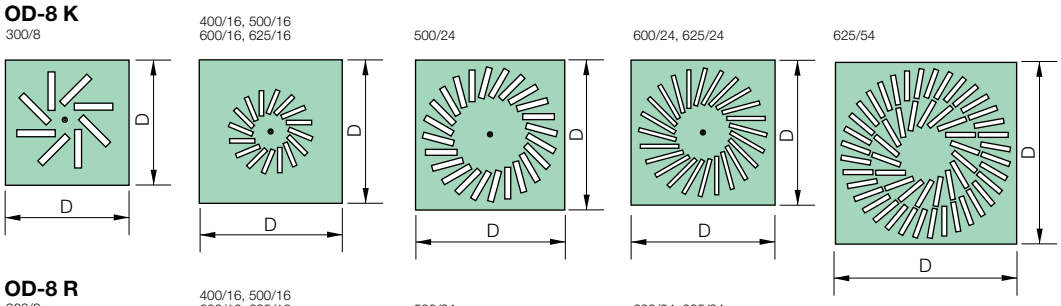
Model OD-8/K4 – swirl diffusers with radial pattern slots having adjustable internal deflectors, within a square ceiling panel and four fixing positions (one in each corner of ceiling plate).

Model OD-8/R1 – swirl diffuser with radial pattern slots having adjustable internal deflectors, within a circular ceiling panel and a single central fixing position.

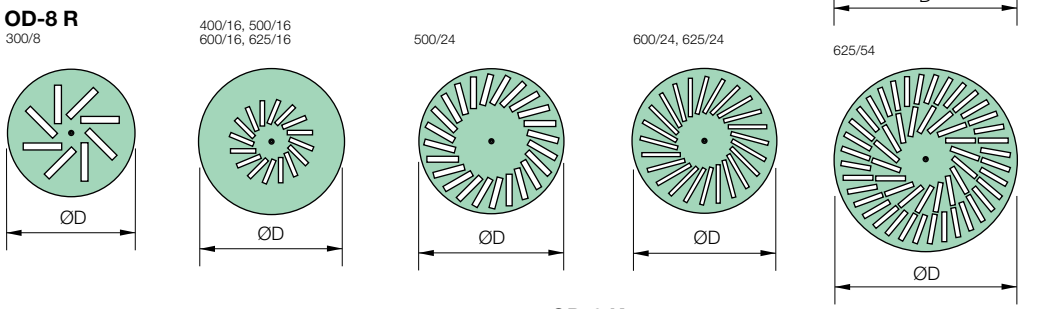
Model OD-8/R4 – swirl diffusers with radial pattern slots having adjustable internal deflectors, within a circular ceiling panel and five fixing positions (four along the edge and one central in the ceiling plate, sizes 800/72 and 825/72 only).

Each model type may be supplied with the different installation methods, (specify separately as required).

OD-8 K



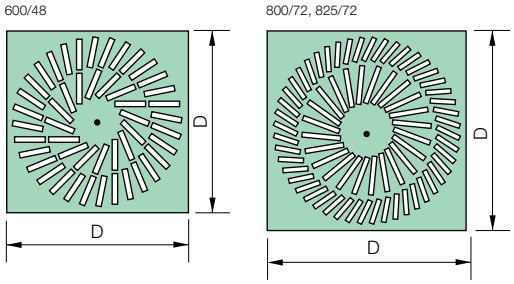
OD-8 R



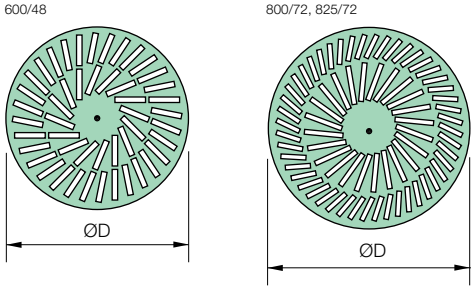
Size	ØD	D	A_{ef} (m²)
300/8	300	298	0.009464
400/16	400	398	0.018928
500/16	500	498	
600/16	600	598	
625/16	625	623	
500/24	500	498	0.028392
600/24	600	598	0.044928
625/24	625	623	
600/48	600	598	0.056784
625/54	625	623	0.063882
800/72	800	798	0.101712
825/72	825	823	

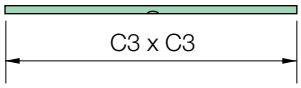
A_{ef} (m²) - effective discharge area (m²)

OD-8 K



OD-8 R





Size	C3
300/8 K	298
400/16 K	398
500/16 K	498
600/16 K	598
625/16 K	623
500/24 K	498
600/24 K	598
625/24 K	623
600/48 K	598
625/54 K	623
800/72 K	798
825/72 K	823

Size	ØD3
300/8 R	300
400/16 R	400
500/16 R	500
600/16 R	600
625/16 R	625
500/24 R	500
600/24 R	600
625/24 R	625
600/48 R	600
625/54 R	625
800/72 R	800
825/72 R	825

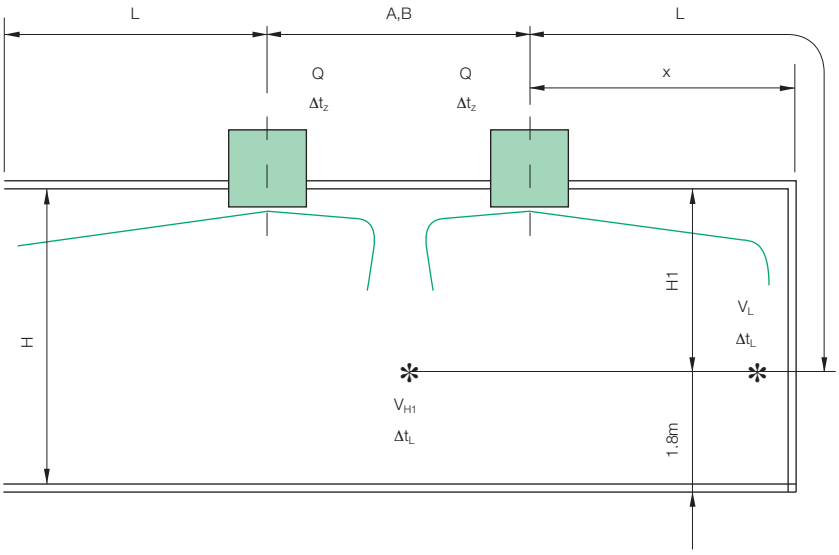
Ordering Information

Example

Model Type OD-8	Fixing Location K1	Function	Finish 83	Size 600/24
Model OD-8 – swirl diffuser with curved radial pattern slots having adjustable internal deflectors, within a square or circular ceiling panel.	**K1** – Square diffuser – single central fixing position **K4** – Square diffuser – four fixing positions **R1** – Circular diffuser – single central fixing position **R4** – Circular diffuser – five fixing positions (sizes 800/72 and 825/72 only) (Please state separately if no fixings are required.)	**Z** – Supply **A** – Extract (Internal deflectors omitted on extract)	**83** – White RAL9010 polyester powder (30% gloss)	300/8 400/16 500/16 600/16 625/16 500/24 600/24 625/24 600/48 625/54 800/72 825/72

Important Note: If the overall size is critical then it must be clearly stated on the order.
All orders must be addressed to AIR DIFFUSION, Ruskin Air Management Limited.

Performance Data



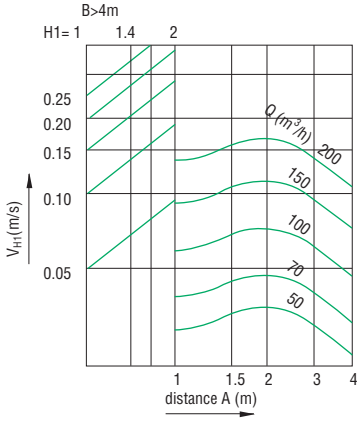
Q (m³/h)	Air flow
x (m)	Horizonal distance to the wall
H (m)	Room height
H1 (m)	Distance from ceiling to occupied zone
L (m)	Throw distance GL=H1 + x)
V_L(m/s)	Air velocity at the throw distance L
Δt_z(K)	Temperate difference between the supply and room air
Δt_L(K)	Difference between the core and room air temperature
Δp_t(Pa)	Pressure drop
L_{WA}(db(A))	Sound power level
V_{H1}(m/s)	Air velocity at the H1 distance
A, B (m)	Distance between diffusers by length and by width

Continued on next page

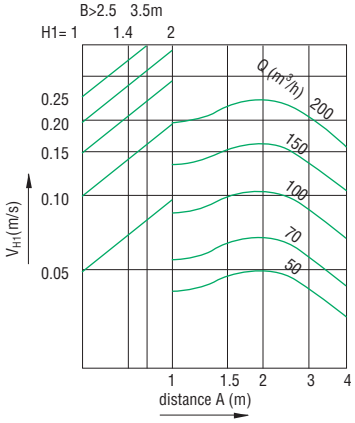
Performance Data Continued

Air velocity at the throw distances and temperature quotient (with ceiling effect)

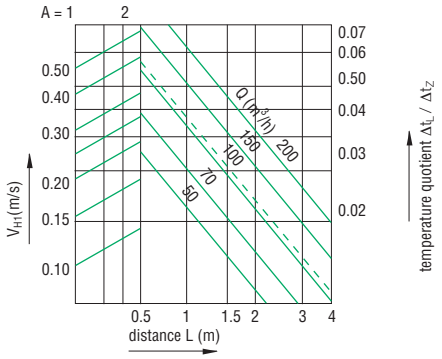
OD-8 size 300/8



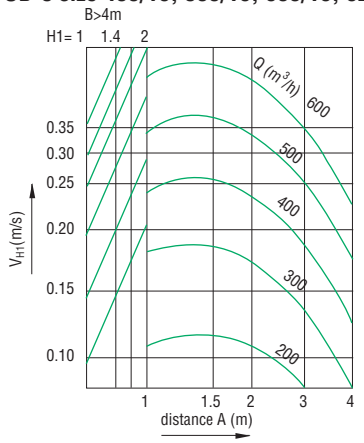
OD-8 size 300/8



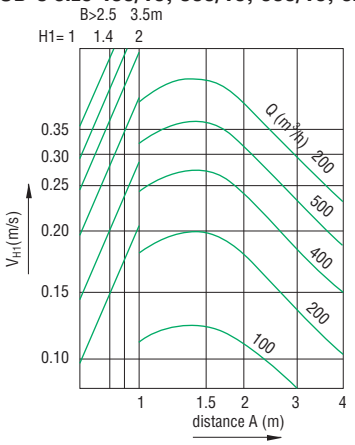
OD-8 size 300/8



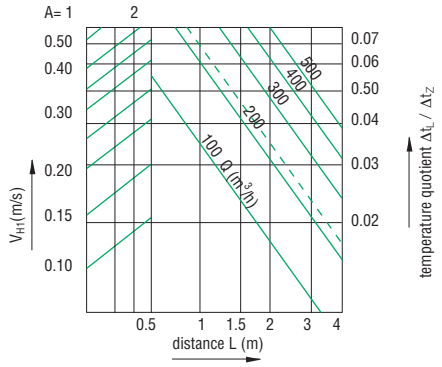
OD-8 size 400/16, 500/16, 600/16, 625/16



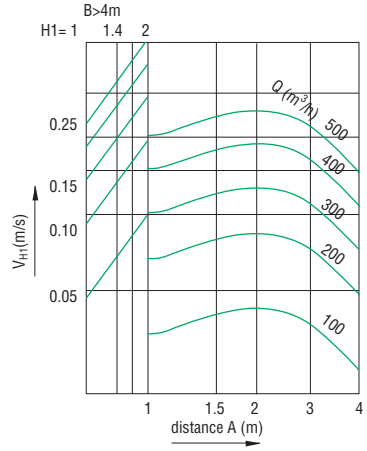
OD-8 size 400/16, 500/16, 600/16, 625/16



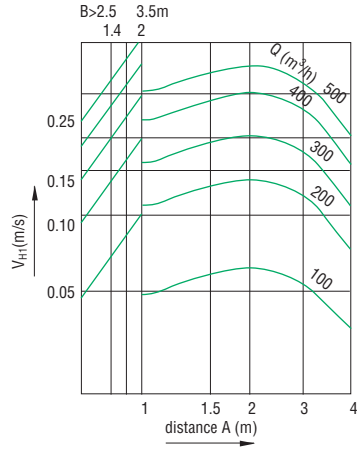
OD-8 size 400/16, 500/16, 600/16, 625/16



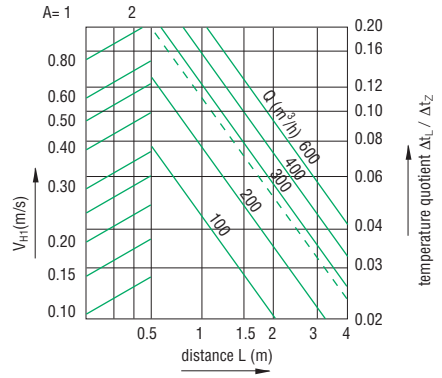
OD-8 size 500/24



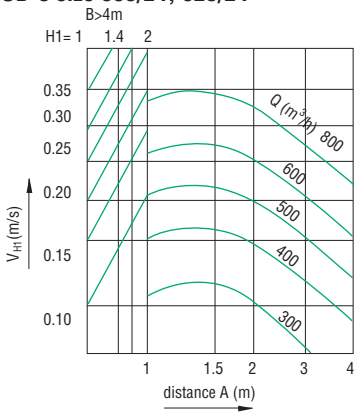
OD-8 size 500/24



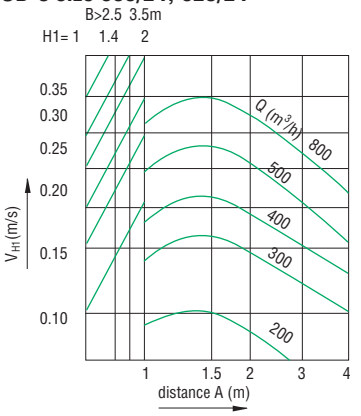
OD-8 size 500/24



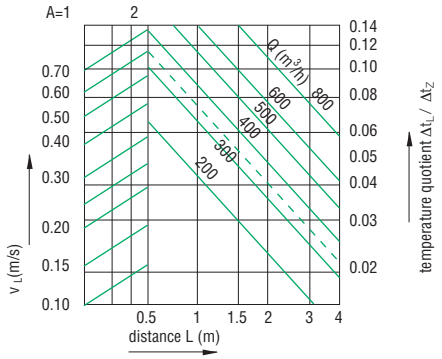
OD-8 size 600/24, 625/24



OD-8 size 600/24, 625/24



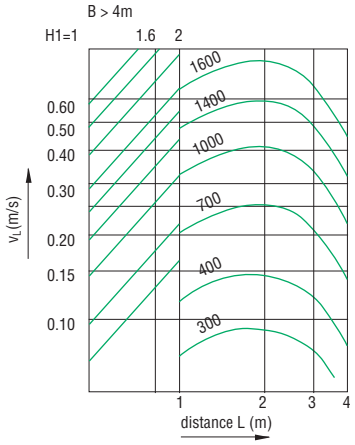
OD-8 size 600/24, 625/24



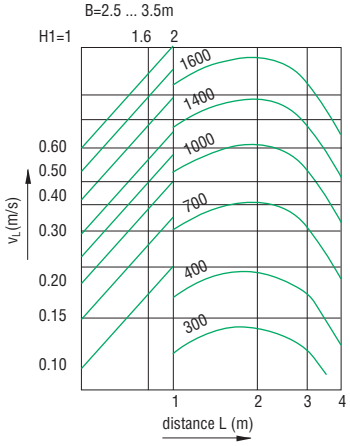
Performance Data Continued

Air velocity at the throw distance and temperature quotient (with ceiling effect)

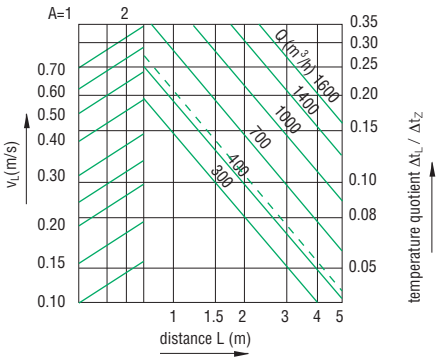
OD-8 size 600/48



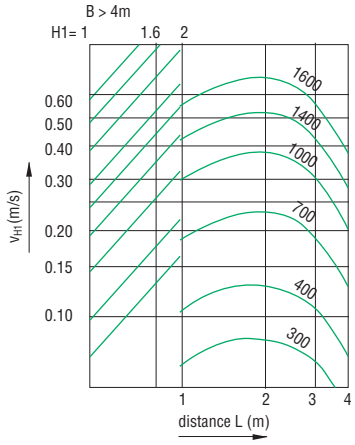
OD-8 size 600/48



OD-8 size 600/48



OD-8 size 625/54



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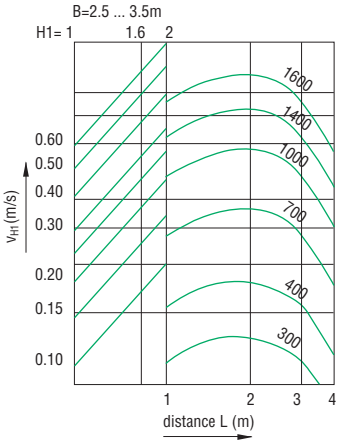
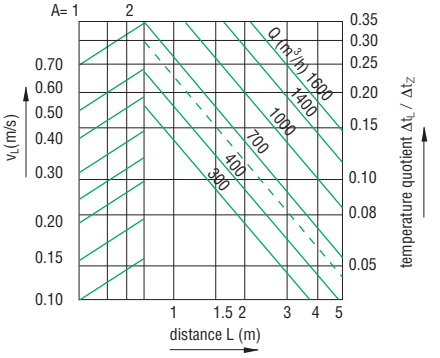
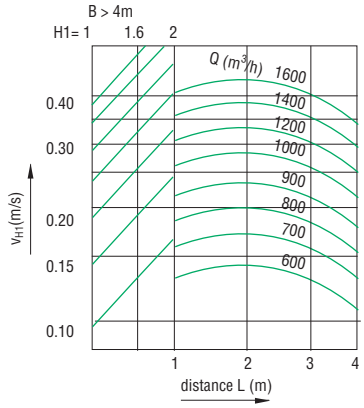


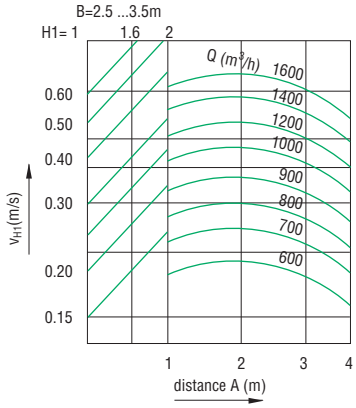
OD-8 size 625/54



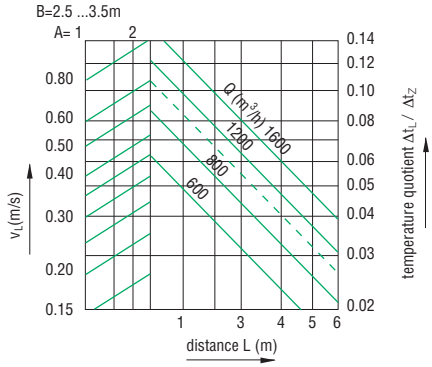
OD-8 size 800/72, 825/72



OD-8 size 800/72, 825/72



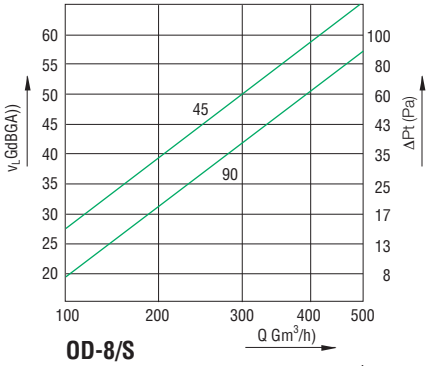
OD-8 size 800/72, 825/72



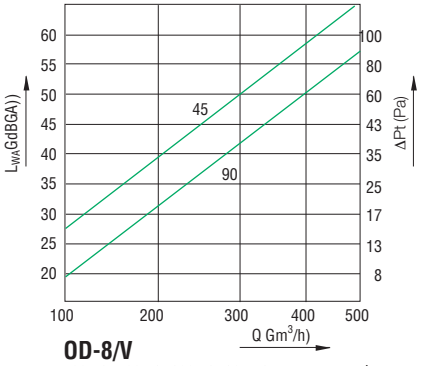
Performance Data Continued

Pressure drop and sound power level diagrams (spigot damper angle 90° - opened 45° - half opened). With plenum box having equalising grid.

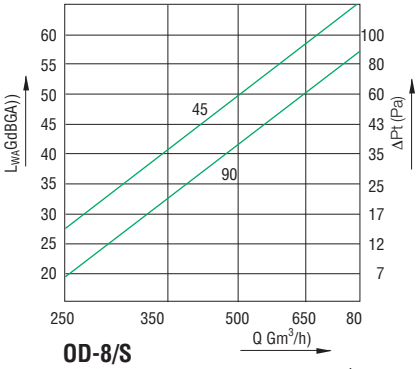
OD-8/V
300/8 top entry spigot SPG damper position



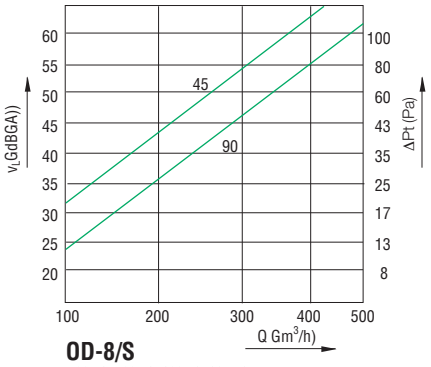
OD-8/V
400/16, 500/16, 600/16, 625/16 damper



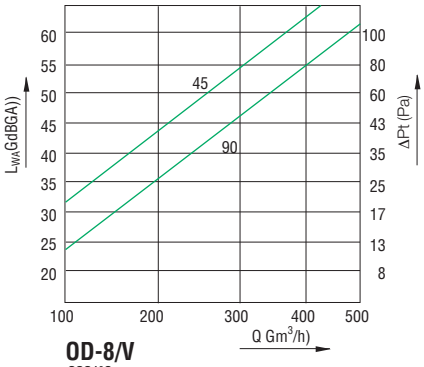
OD-8/V
500/24 damper



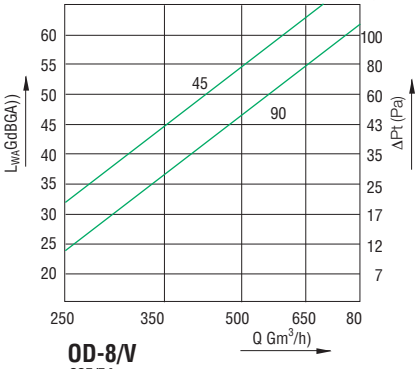
OD-8/S
400/16, 500/16. 600/16, 625/16 side entry spigot damper



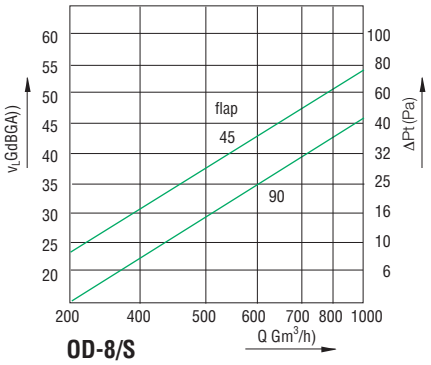
OD-8/V
400/16, 500/16, 600/16, 625/16 damper



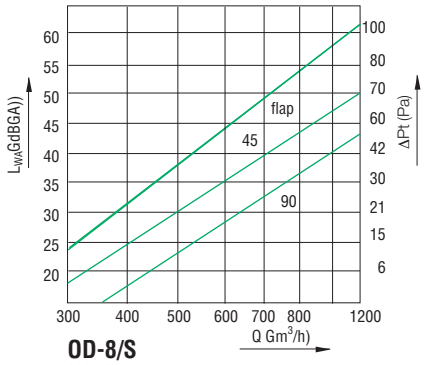
OD-8/S
500/24 damper



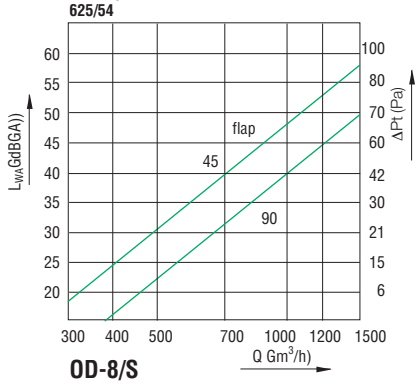
OD-8/S
400/16, 500/16. 600/16, 625/16 side entry spigot



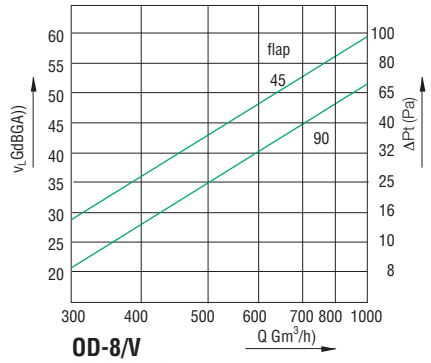
OD-8/V
600/48



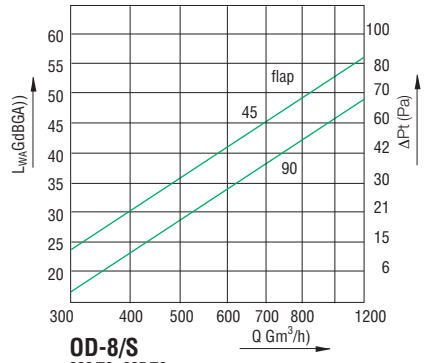
OD-8/V
625/54



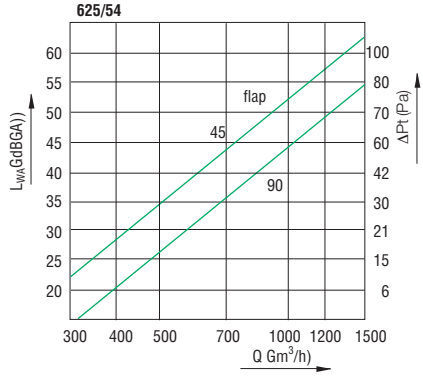
OD-8/S
600/24, 625/24 side entry spigot



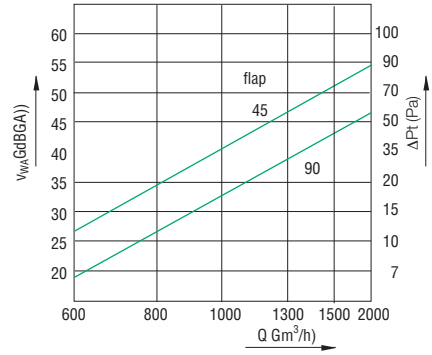
OD-8/S
600/48



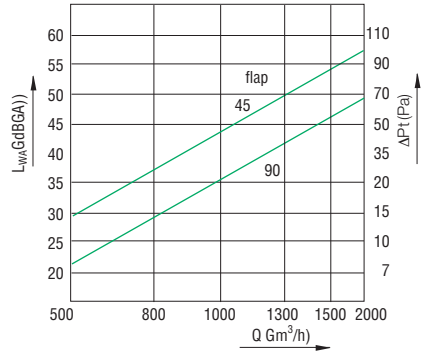
OD-8/S
625/54



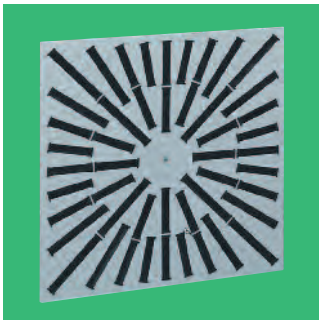
OD-8/V
800/72, 825/72 top entry spigot



OD-8/S
800/72, 825/72

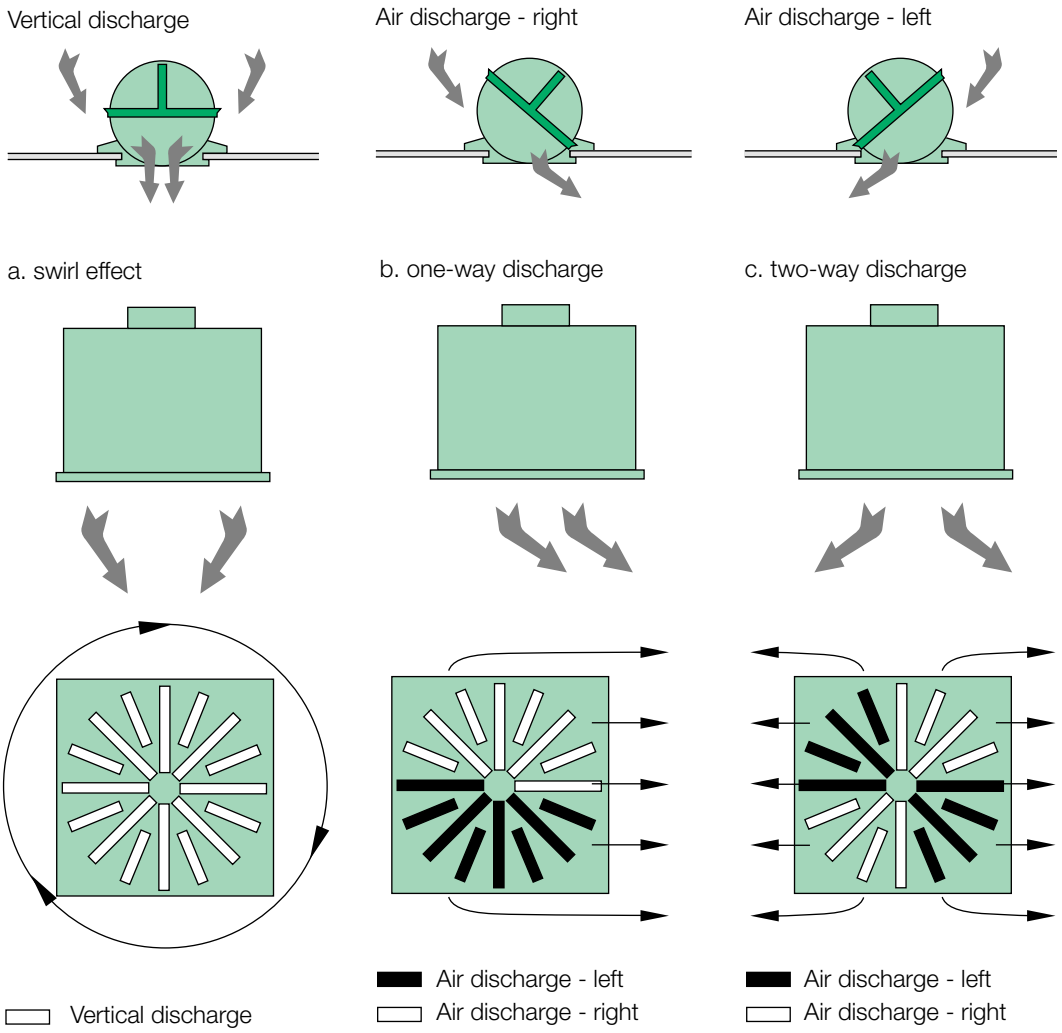


Model OD-9 Horizontal or Vertical Air Pattern Ceiling Swirl Diffuser



Model OD-9

Description
The model OD-9 is an adjustable horizontal or vertical air pattern swirl diffuser having a series of slots in a straight radial format, within a circular or square ceiling panel. Contained in the slots are nylon deflectors, which allows the direction of the supply air to be altered from left to right whilst also being capable of adjustment to provide a vertical discharge. For extract use the nylon deflectors are omitted. Typical applications include most general offices, shops or other commercial areas.



Specification
Material
External components constructed from steel with internal deflectors from nylon. Stainless steel also available, please state type of finish required, either polished or brushed, and grade of material.

Installation Methods
Four alternative diffuser installation methods are available as follows:

Single central countersunk screw hole in circular or square ceiling panel diffusers.

Four corner position countersunk screw holes on square and circular ceiling panel diffusers.

Five position countersunk screw holes for sizes 800/72 and 825/72, four on edges and one central.

(Note: Fixing using four countersunk screw holes is recommended for sizes 600, 625 and 800).

The diffuser may also be supplied plain with no fixings for installation by others.

Alternatively single fixing bars or angles for duct fixing are by others.

Plenum box supplied with diffuser.

When using a diffuser and plenum box combination, the diffuser is normally fixed to the plenum box by a single central fixing.

All installation methods require diffuser or plenum box / diffuser combination to be supported independently.

Accessories
Purpose designed plenum box, with spigot damper if required.
Filter media can be provided on extract units.

Finish
White polyester powder coat to RAL9010 (30% gloss) to all external surfaces, with black nylon internal deflectors, as standard. (White deflectors available as an option).

Other colours within the RAL range are also available on request.

Size Range
Models OD-9/KR, OD-9/KK and OD-9/RR
Size 310
Size 400
Size 500
Size 600
Size 625
Size 800

Model Types and Dimensions

Model OD-9/KR1 – swirl diffuser with radial pattern standard slots having adjustable internal deflectors, within a square ceiling panel and a single central fixing position.

Model OD-9/KR4 – swirl diffusers with radial pattern standard slots having adjustable internal deflectors, within a square ceiling panel and four fixing positions (one in each corner of ceiling plate).

Model OD-9/KK1 – swirl diffuser with radial pattern extended slots having adjustable internal deflectors, within a square ceiling panel and a single central fixing position.

Model OD-9/KK4 – swirl diffusers with radial pattern extended slots having adjustable internal deflectors, within a square ceiling panel and four fixing positions (one in each corner of ceiling plate).

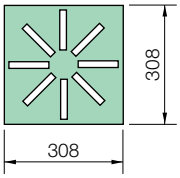
Model OD-9/RR1 – swirl diffuser with radial pattern slots having adjustable internal deflectors, within a circular ceiling panel and a single central fixing position.

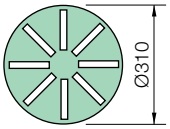
Model OD-9/RR4 – swirl diffusers with radial pattern slots having adjustable internal deflectors, within a circular ceiling panel and five fixing positions (four along the edge and one central in the ceiling panel, sizes 800/72 and 825/72 only).

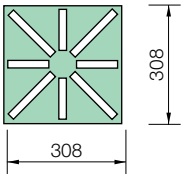
Each model type may be supplied with the different installation methods, (specify separately as required).

OD-9/KR **OD-9/RR** **OD-9/KK**

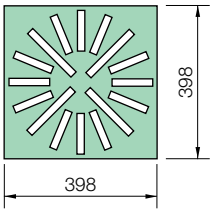
Size 310

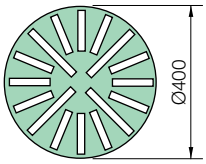


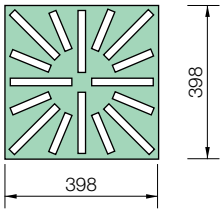




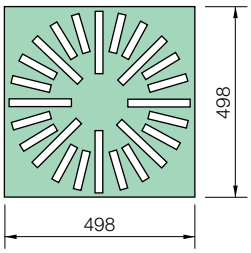
Size 400

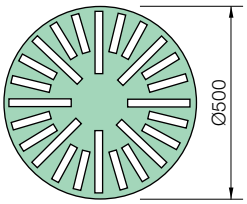


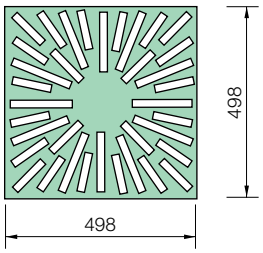




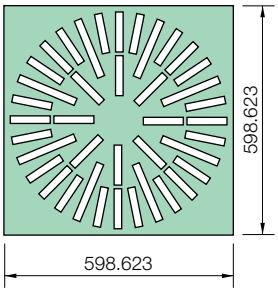
Size 500

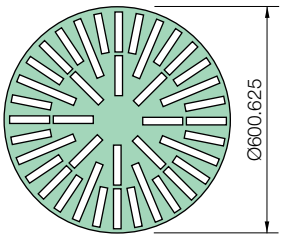


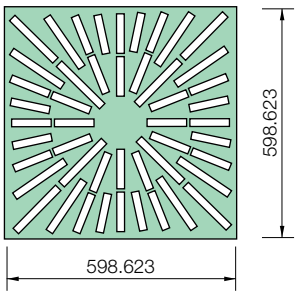




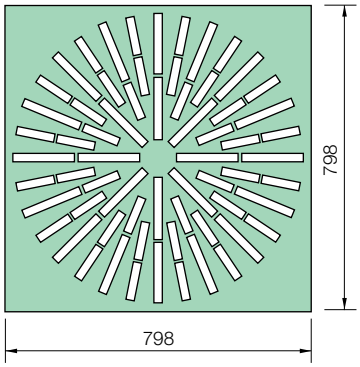
Size 600.625

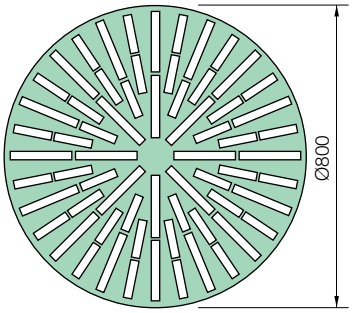


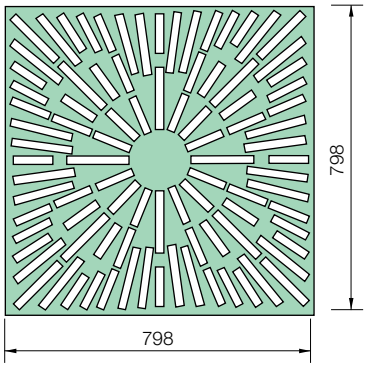




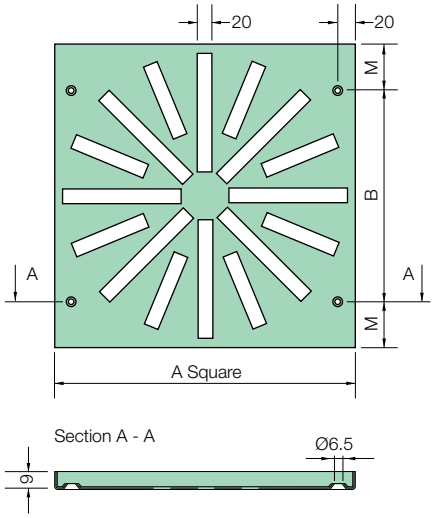
Size 800



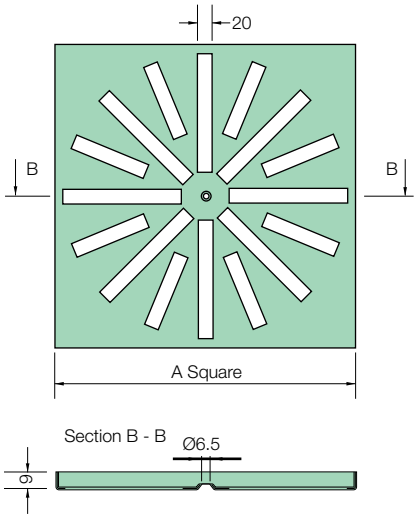




Model Types and Dimensions Continued



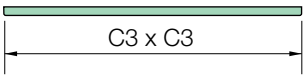
Fastening with four screws

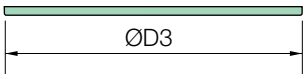


Central fastening

Size	A	M	B	A_{ef}/K	A_{ef}/R
310	308	59	190	0.0192	0.0120
400	398	64	270	0.0248	0.0248
500	498	64	370	0.0517	0.0392
600	598	69	460	0.0718	0.0565
625	623	81.5	460	0.0718	0.0565
800	798	124	550	0.1359	0.0938

A_{ef} - effective discharge area (m^2)





Size	C3
310 KR, KK	308
400 KR, KK	398
500 KR, KK	498
600, 625 KR KK	598, 623
800 KR, KK	798

Size	ØD3
310 RR	310
400 RR	400
500 RR	500
600, 625 RR	600, 625
800 RR	800

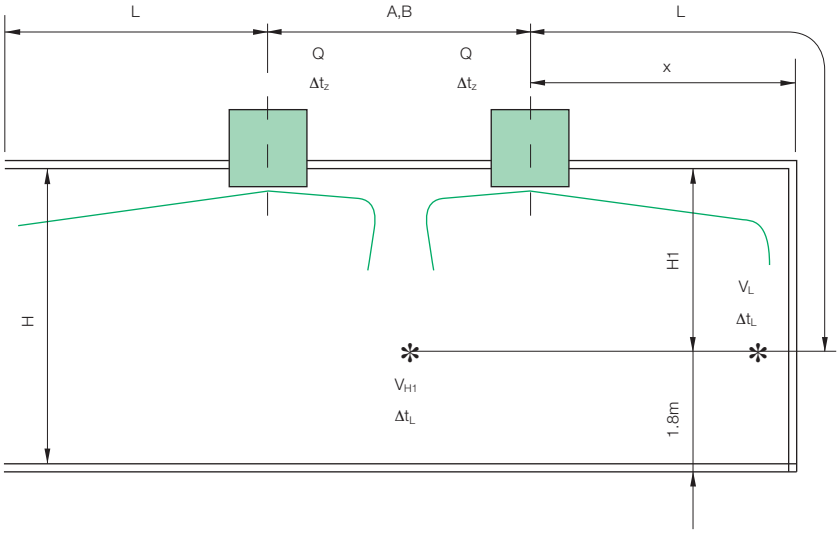
Ordering Information

Example

Model Type	Fixing Location & Slot Arrangement	Function	Finish	Size
OD-9	KK1	83	600	
Model OD-9 – swirl diffuser with radial pattern slots having adjustable internal deflectors, within a square or circular ceiling panel.	**KR1** – Square diffuser – single central fixing position **KR4** – Square diffuser – four fixing positions **KK1** - Square diffuser – single central fixing position **KK4** - Square diffuser – four fixing positions **RR1** – Circular diffuser – single central fixing position **RR4** – Circular diffuser – five fixing positions (sizes 800/72 and 825/72 only) (Note: Fixing using four countersunk screw holes is recommended for sizes 600, 625 & 800). See separate illustration to view arrangement of slots. (Please state separately if no fixings are required.)	**Z** – Supply **A** – Extract (Internal deflectors omitted on extract)	**83** – White RAL9010 polyester powder (30% gloss) Alternative colours within the RAL colour range, also available. (Subject to the relevant quantity surcharge).	310 400 500 600 625 800

Important Note: If the overall size is critical then it must be clearly stated on the order.
All orders must be addressed to AIR DIFFUSION, Ruskin Air Management Limited.

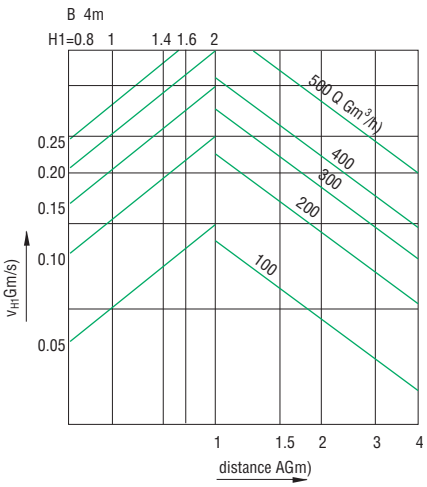
Performance Data



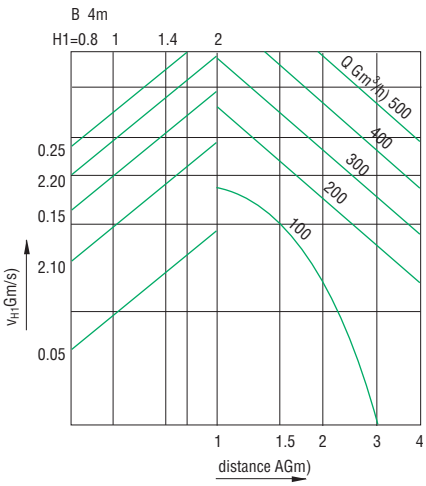
Q (m³/h)	Air flow
x (m)	Horizonal distance to the wall
H (m)	Room height
H1 (m)	Distance from ceiling to occupied zone
L (m)	Throw distance GL=H1 + x)
V_L(m/s)	Air velocity at the throw distance L
Δt_z(K)	Temperate difference between the supply and room air
Δt_L(K)	Difference between the core and room air temperature
Δp_t(Pa)	Pressure drop
L_{WA}(db(A))	Sound power level
V_{H1}(m/s)	Air velocity at the H1 distance
A, B (m)	Distance between diffusers by length and by width

Air velocity at the throw distance and temperature quotient (with ceiling effect).

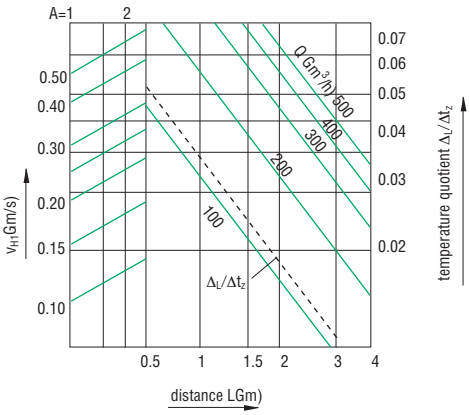
OD-9/KK size 310



OD-9/KR, RR size 310



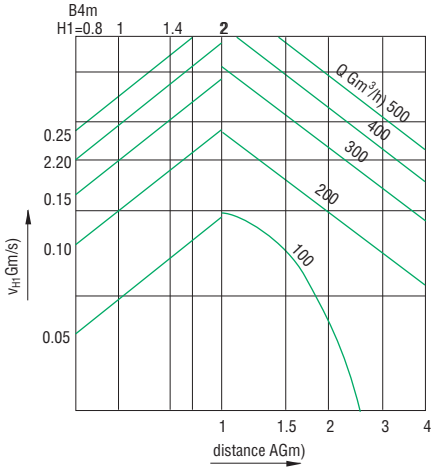
OD-9/KK size 310



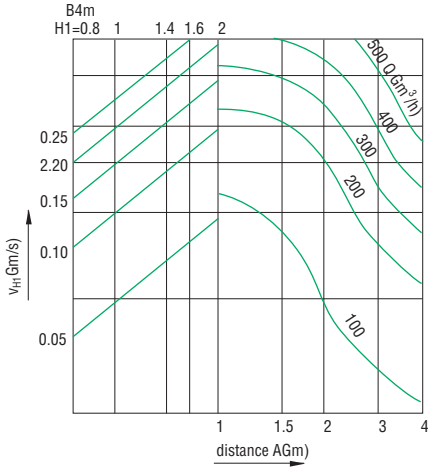
Performance Data Continued

Air velocity at the throw distances and temperature quotient (with ceiling effect).

OD-9/KR, RR size 310



OD-9/KR, RR size 310



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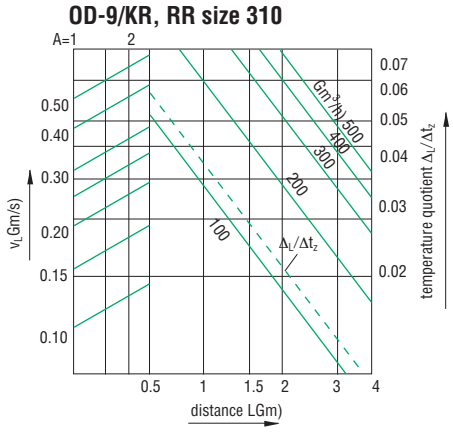
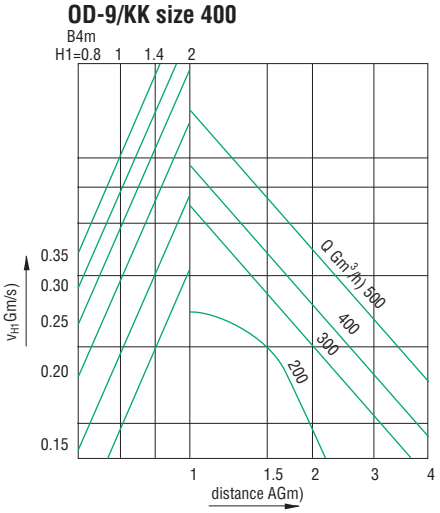


OD-9/KK size 400



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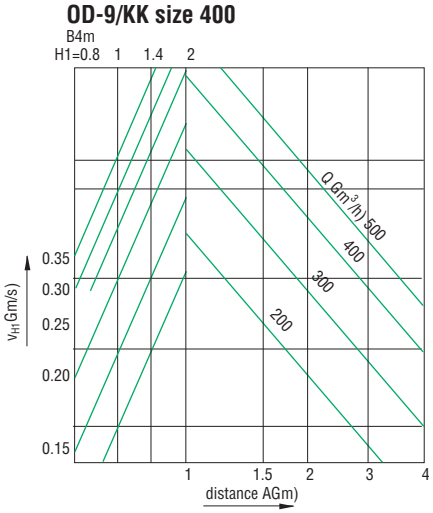
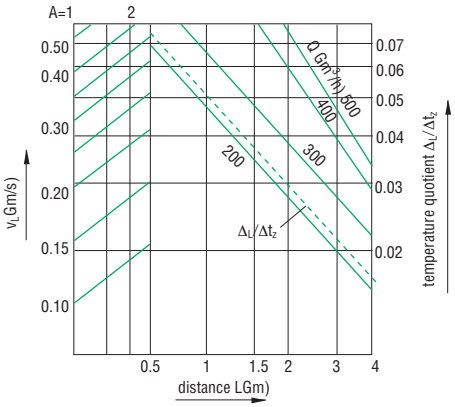
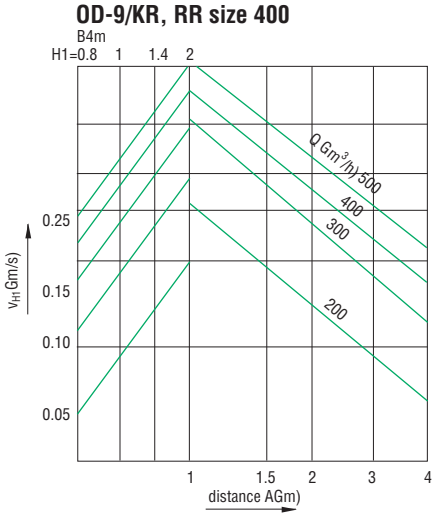


OD-9/KK size 400



OD-9/KR, RR size 400



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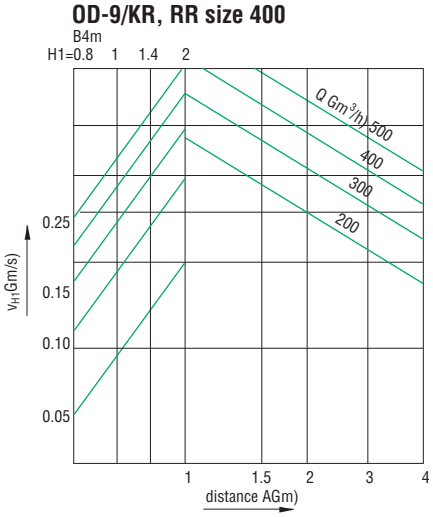

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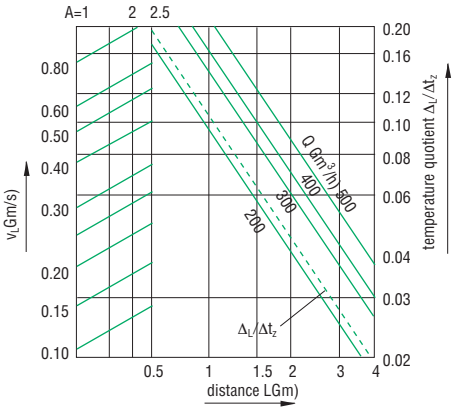
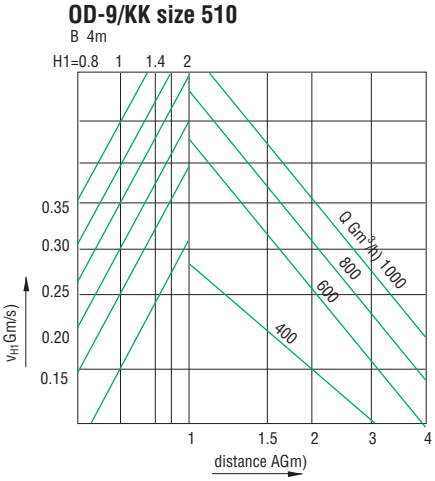


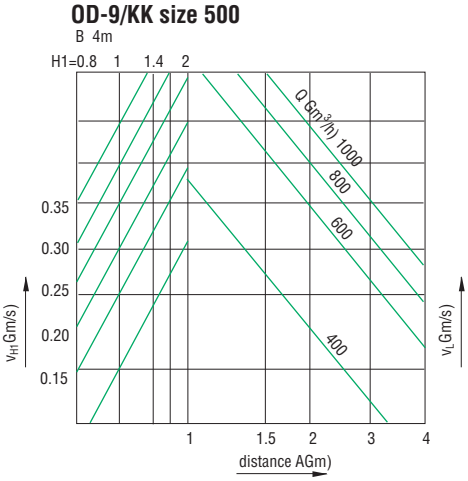
Performance Data Continued

Air velocity at the throw distances and temperature quotient (with ceiling effect).

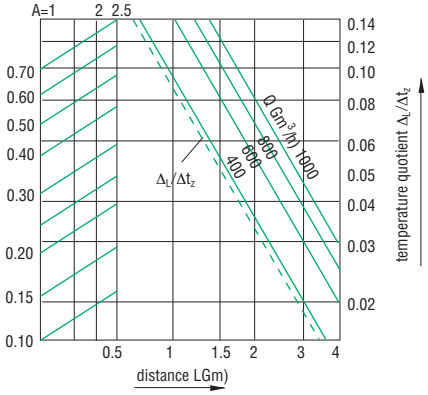
OD-9/KK size 510



OD-9/KK size 500



OD-9/KK size 500



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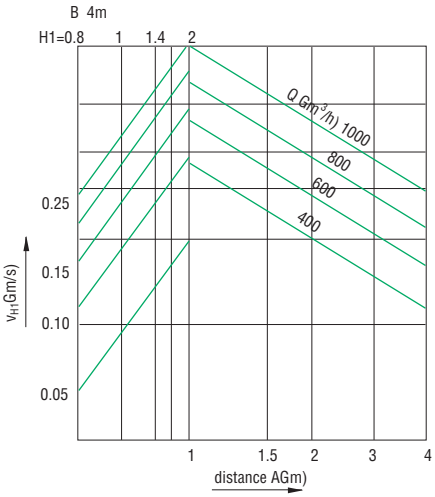
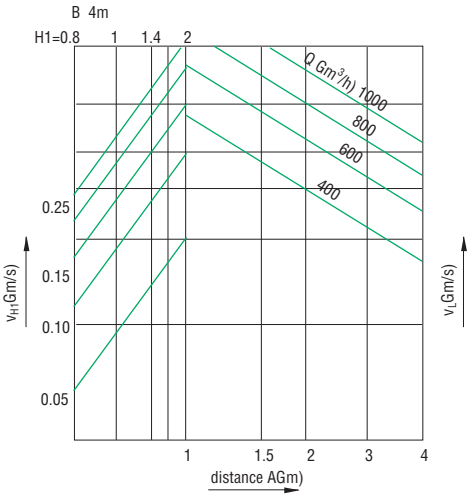
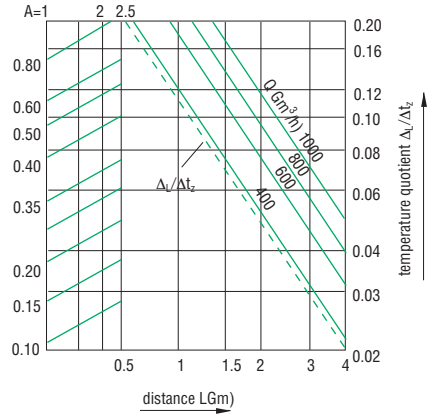


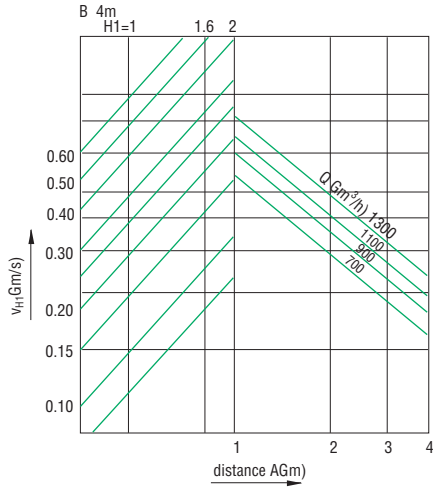
OD-9/KR, RR size 500



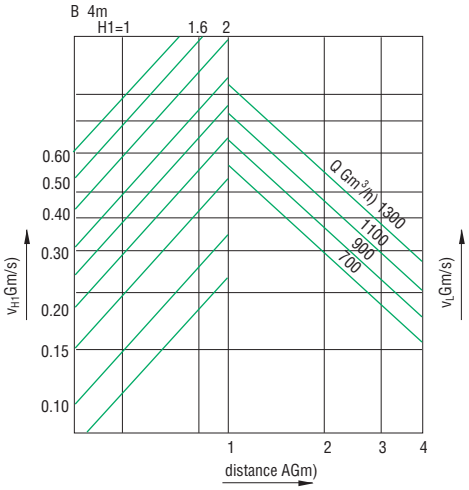
OD-9/KR, RR size 500



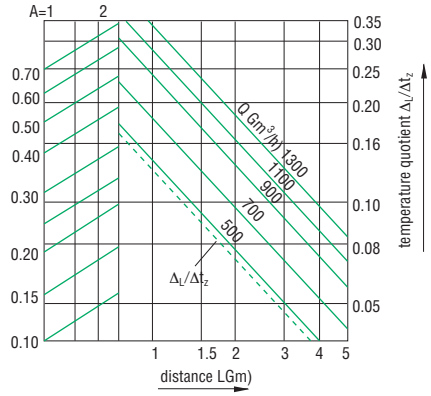
OD-9/KK, size 600



OD-9/KK, size 600



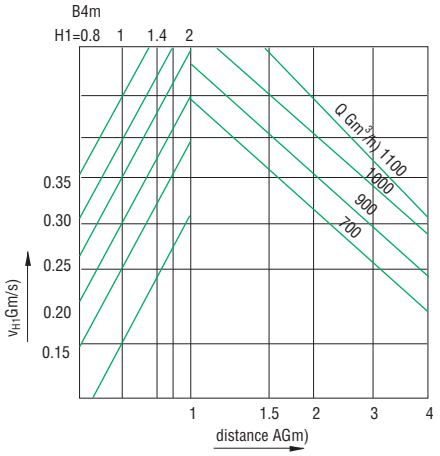
OD-9/KK, size 600



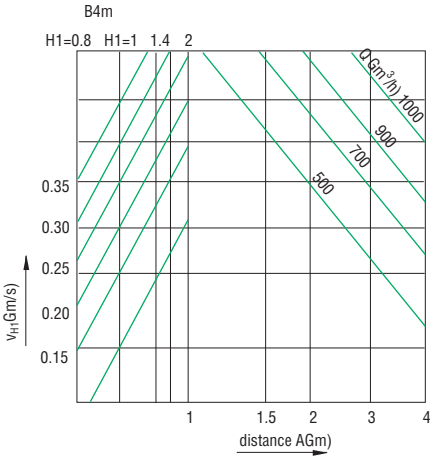
Performance Data Continued

Air velocity at the throw distances and temperature quotient (with ceiling effect).

OD-9/KR, RR size 600



OD-9/KR, RR size 600



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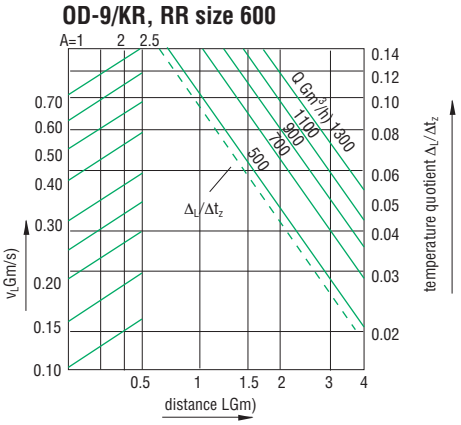
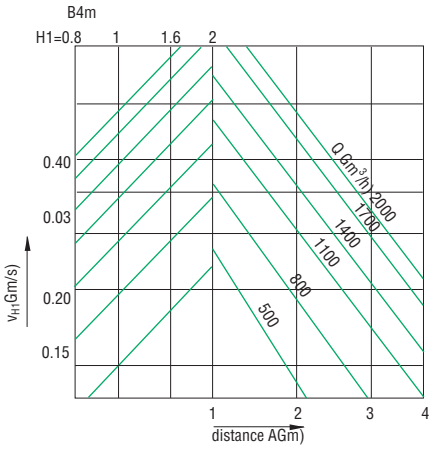
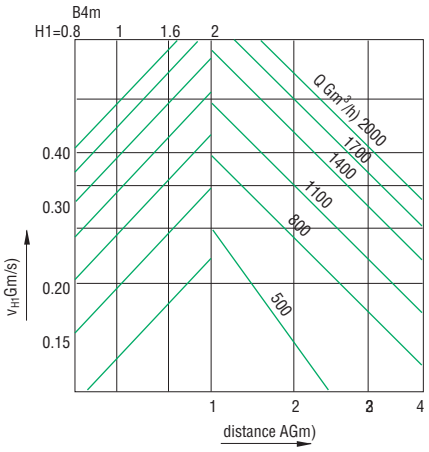


OD-9/KR, RR size 500



OD-9/KK size 800



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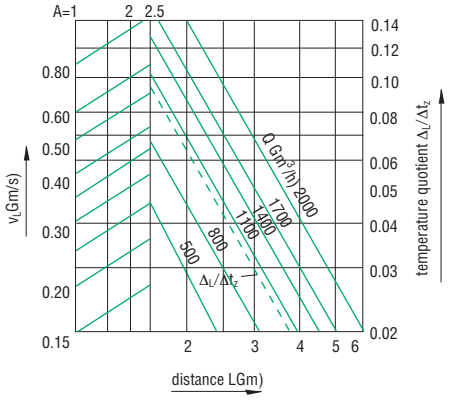
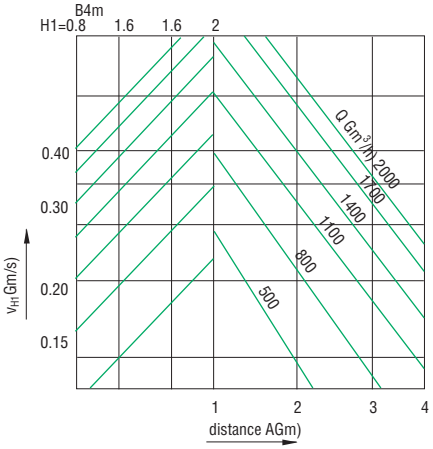
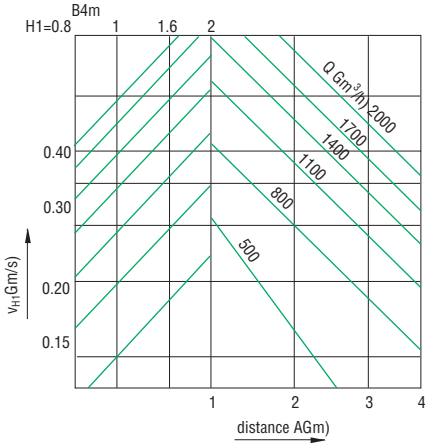


OD-9/KR, RR size 800



OD-9/KR, RR size 800



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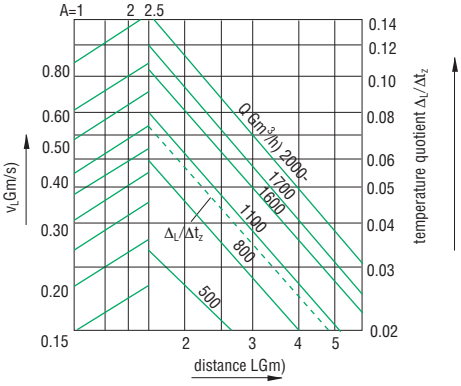
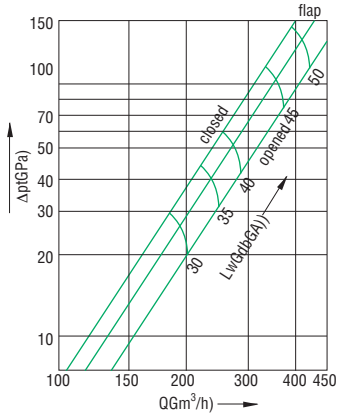


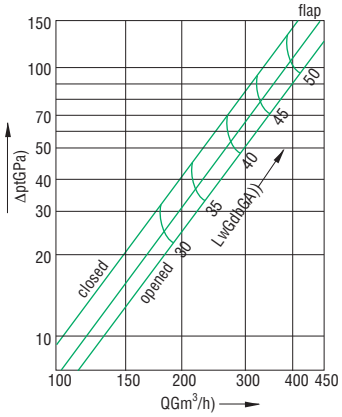
Performance Data Continued

Pressure drop and sound power level
Spigot damper angle: 90° - opened, 45° - half opened.

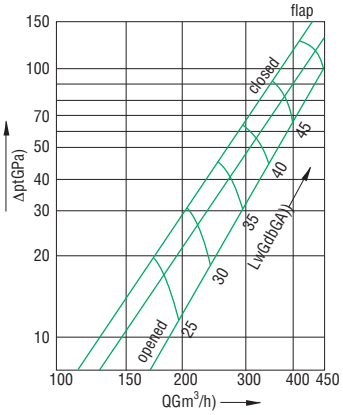
OD-9/K size 310



OD-9/K size 310



OD-9/K size 400



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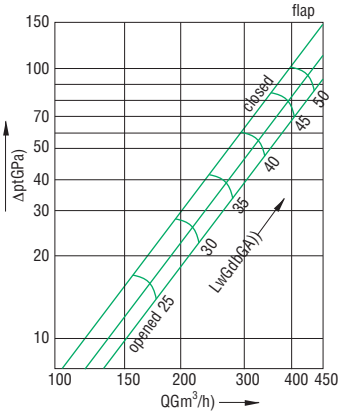
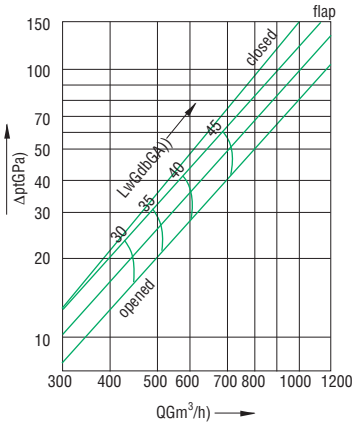


OD-9/K size 500



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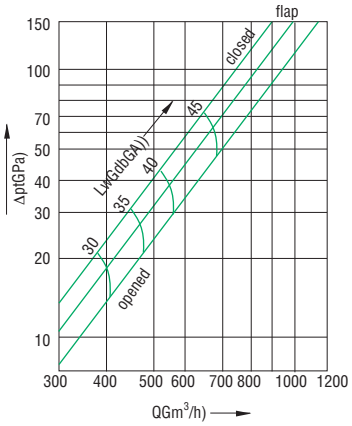
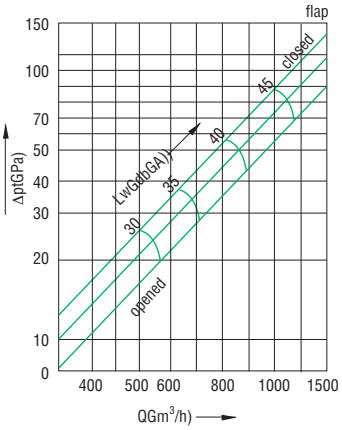
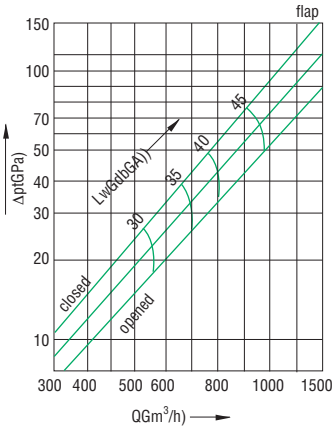


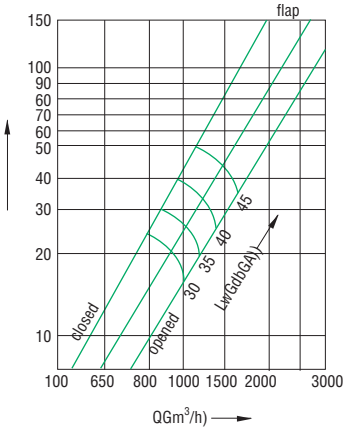
OD-9/K size 600.625



OD-9/K size 600, 625



OD-9/K size 800



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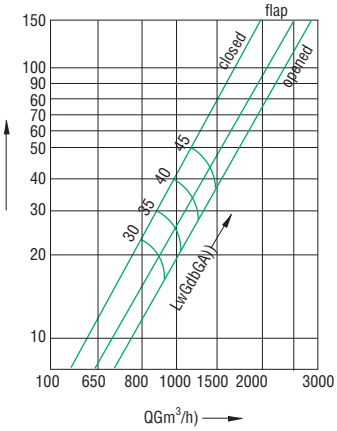
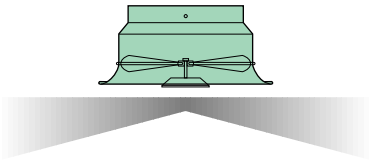


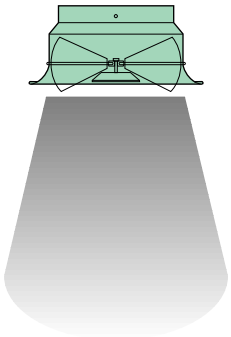
Model OD-11 Variable Air Pattern Ceiling Swirl Diffuser

Model OD-11

Discharge type by cooling



Discharge type by heating



Description
The Model OD-11 is a variable air pattern swirl diffuser having a set of movable inner vanes to alter the angle of discharge from horizontal to vertical, which is imperative to ensure optimum heating and cooling function. By regulating the inner vanes, varying throw discharges can be achieved from fully horizontal to vertical projection, which is important in the heating mode. To accomplish this adjustment two types of control are offered, manual or electric motor operation. Supplied with a circular outer tube casing having a flush flange and a set of movable inner vanes. Typical applications include shopping malls, exhibition halls and other large open spaces with mounting heights of between 3 m to 12m, where large air volumes and temperature differentials are required.

Specification
Material
Outer tube casing constructed from aluminium sheet with other components from sheet steel.

Installation Methods
Two alternative installation methods are available as follows:
Direct Spigot Connection to duct.
Plenum box supplied with diffuser.

(When using a diffuser and plenum box combination, the diffuser is normally fixed to the plenum box through the spigot)

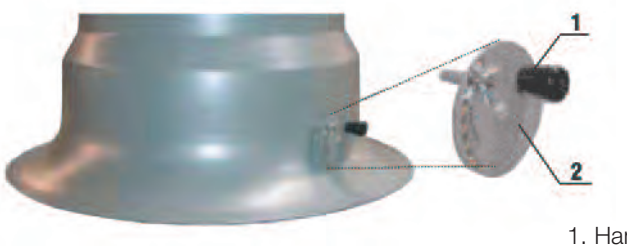
All installation methods require diffuser or plenum box / diffuser combination to be supported independently.

Finish
White polyester powder coat to RAL9010 (30% gloss)

Other colours are also available on request.

Size Range
Model OD-11
Size 125
Size 160
Size 200
Size 250
Size 315
Size 400
Size 500
Size 630

Accessories
Perforated diffusion plate
Manual operating handle
Electric motor operation
Purpose designed plenum box, with spigot damper if required.



Manual handle (RR)

1. Handle
2. Fixing screw

Model Types and Dimensions

Model OD-11 / R – circular variable swirl diffuser with individual manual adjustment of the inner vane assembly.

Model OD-11V/ / RR – circular variable swirl diffuser with manual handle adjustment for ganged operation of the inner vane assembly.

Model OD-11V/ / B1 – circular variable swirl diffuser with electric motor adjustment for ganged operation of the inner vane assembly (LM 24 motor).

Model OD-11V/ / B2 – circular variable swirl diffuser with electric motor adjustment for ganged operation of the inner vane assembly (LM 230 motor.

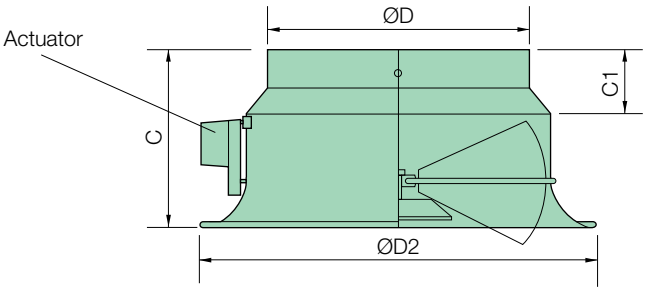
Model OD-11V/ / B3 – circular variable swirl diffuser with electric motor adjustment for ganged operation of the inner vane assembly (LM 24-SR motor).

Additional motor types B4 to B10 also available, see ordering information for type and voltage.

(Note: Motor types B4 to B10 are as shown with the exception of size 630 where an NM type motor is used and size 800 where an AM type motor is used).

Each model may be fitted with a perforated diffusion plate.

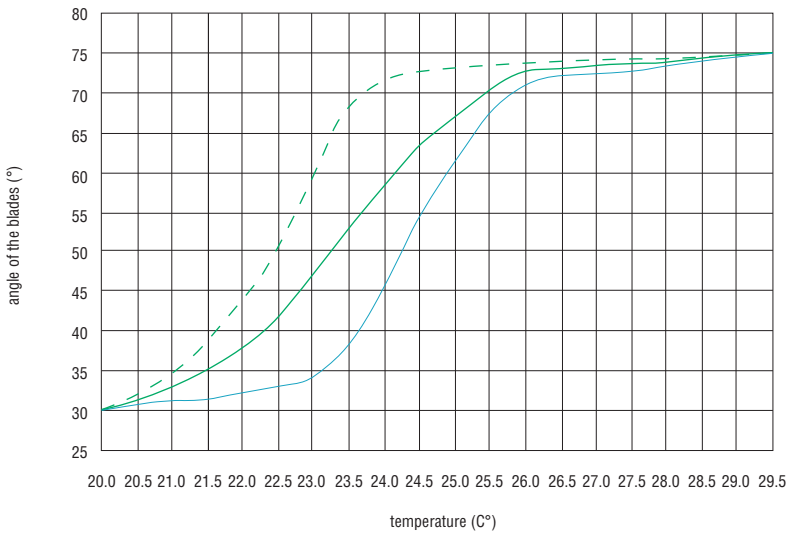
Dimensions



Size	ØD	ØD2	C	C1	A_{ef}/m^2
125	125	205	130	40	0.012
160	160	250	155	40	0.020
200	200	310	174	40	0.030
250	250	400	200	40	0.048
315	315	480	240	40	0.077
400	400	615	265	55	0.125
500	500	790	320	60	0.195
630	630	940	380	80	0.310
800	800	1142	555	75	0.503

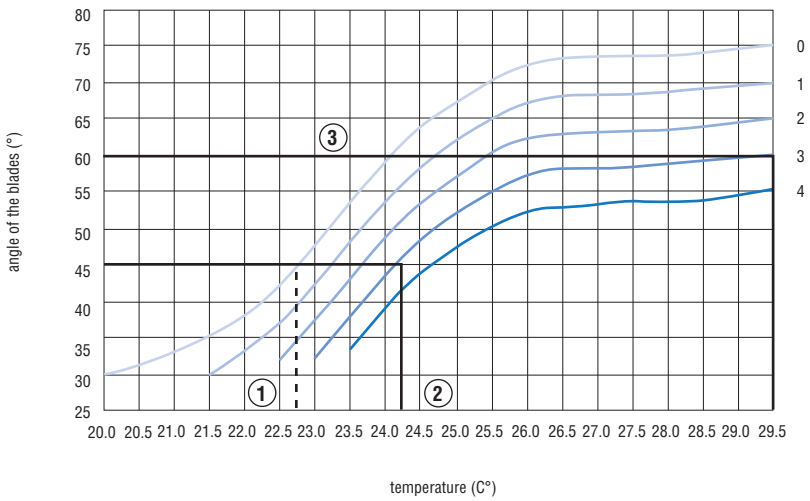
A_{ef} - effective discharge area (m^2)

Mode OD-11V/TR Variable Swirl Diffuser



decrease of temperature — increase of temperature

mean value



Nr. of spacers added	0	1	2	3	4
Final blade angle	75°	70°	65°	60°	55°

Variable diffuser with the thermostat regulation OD-11V/TR

Operation:
The OD-11V/TR diffuser has centrally adjustable blades which can be adjusted automatically with the thermostat regulation. The thermostat perceives temperature of the supply air and automatically adjusts the blades angle. No additional power supply and controls are required, so no additional wiring installation is needed. Blade angle according to the supply air temperature is shown in the chart below.
The behaviour of the thermostatic head in both cooling and heating mode is shown in the chart. After the temperature is stabilized, angle of the blades is adjusted to the medium value in about 15 minutes.

Size:
OD-11V/TR diffuser can be made in sizes 200, 250, 315, 400, 500, 630 and 800 (sizes 125 and 160 are not available).

Performance Data
As per model OD-11V

Regulation of the initial and final blade angle:
OD-11V/TR allows the regulation of the initial and final blade angle. During the selection of appropriate diffuser for certain room conditions with the Klima ADE software package, exact angles are calculated according to the installation height of the diffuser, supplied air quantity and the temperature difference between supplied and room temperature. Calculation is based on air flow speed of 0.2 m/s in the living area.

Initial blade angle is preadjusted with the special nut in the range between 30 and 50˚. Automatic opening of the blades is initiated, when the temperature reaches limit value, shown in the chart according to the preadjusted angle and number of used spacers. When initial angle of 45˚ is preadjusted without additional spacers and final angle is 75˚, blade opening temperature is between 22.5 and 23˚C (designation 1 in diagram).

Final blade angle is adjusted by adding spacers below thermostatic head. Default preassembled spacer allow complete opening of the blades until 75˚. By each added spacer, final angle is reduced for 5˚.

Adding of spacers also change the thermostatic head characteristics (average values according to the number of added spacers are shown in the chart).

Ordering Information

Example

Model Type	Perforated Diffusion Plate	Control Type & Accessories	Finish	Size
OD-11V	P	RR	83	400

Model OD-11 circular variable swirl diffuser with individual manual adjustment of the inner vanes.

Model OD-11V circular variable swirl diffuser with manual or motorised adjustment of the inner vanes assembly ganged together.

O – no plate
P – perforated diffusion plate

R – individual manual control
RR – manual handle fitted on outside of diffuser casing
B1 – electric control LM 24
B2 – electric control LM 230
B3 – electric control LM 24-SR
B4 – electric control NM24
B5 – electric control NM230
B6 – electric control NM24 SR
B7 – electric control AM24
B8 – electric control AM230
B9 – electric control AM24 SR
B10 – electric control AM230 SR

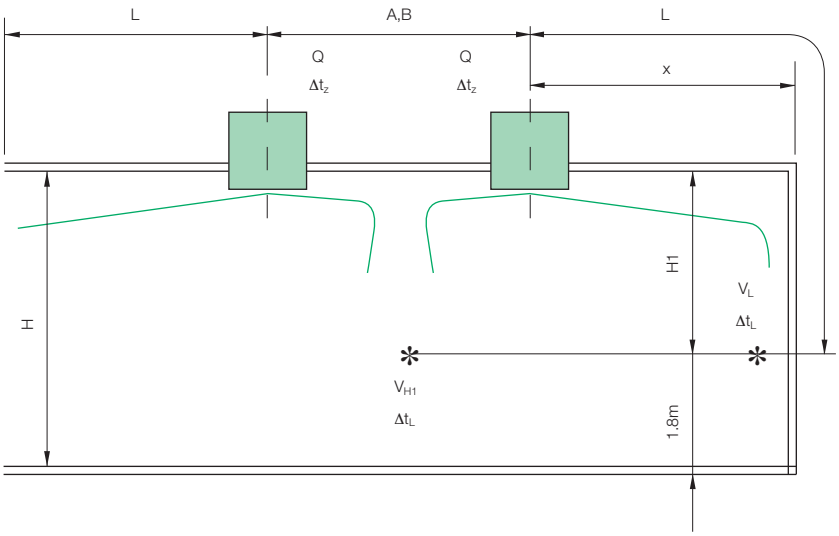
83 – White RAL9010 polyester powder (30% gloss)

Alternative colours within the RAL colour range, also available. (Subject to the relevant quantity surcharge)

125
160
200
250
315
400
500
630
800

Important Note: If the overall size is critical then it must be clearly stated on the order. All orders must be addressed to AIR DIFFUSION, Ruskin Air Management Limited.

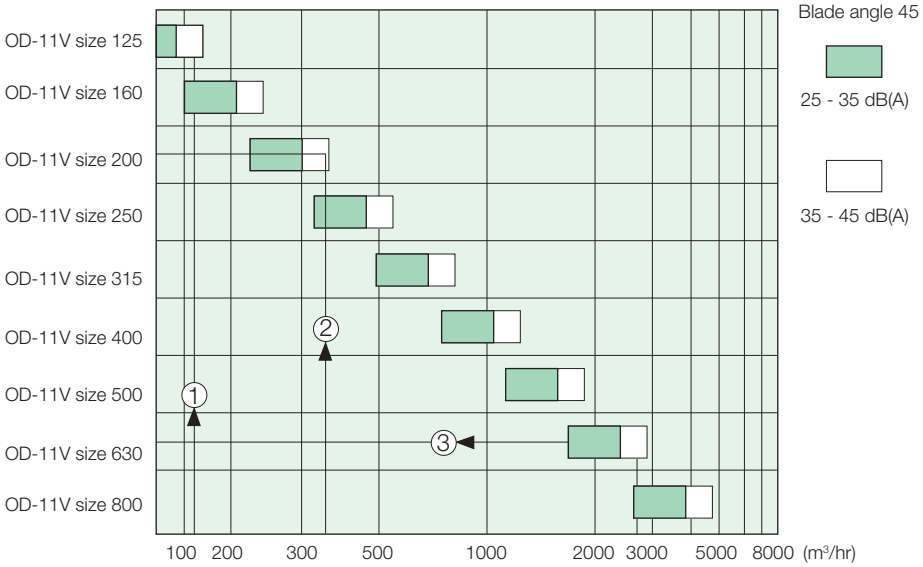
Performance Data



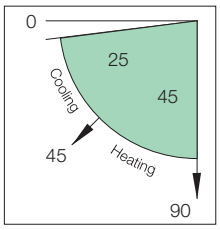
Q (m³/h)	Air flow
x (m)	Horizonal distance to the wall
H (m)	Room height
H1 (m)	Distance from ceiling to occupied zone
L (m)	Throw distance GL=H1 + x)
V_L(m/s)	Air velocity at the throw distance L
Δt_z(K)	Temperate difference between the supply and room air
Δt_L(K)	Difference between the core and room air temperature
Δp_t(Pa)	Pressure drop
L_{WA}(db(A))	Sound power level
V_{H1}(m/s)	Air velocity at the H1 distance
A, B (m)	Distance between diffusers by length and by width

Performance Data Continued

Diagram for fast selection



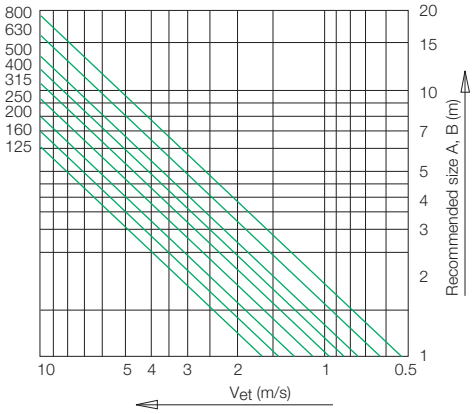
Examples for selection 1, 2 and 3: see the following pages



Corrections

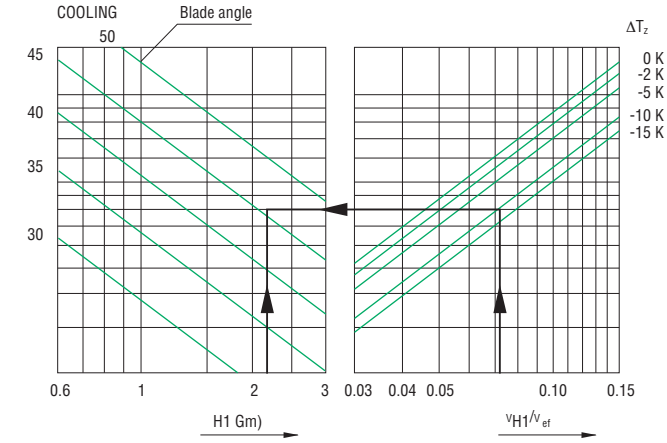
In the case of the diffuser installation in the ceiling, the velocity Vh at the level A/2+H is to be multiplied with a factor of 1.4 (due to the Coanda effect). The above applies to the cases of heating and cooling operation with blade opening angles less than 30°.

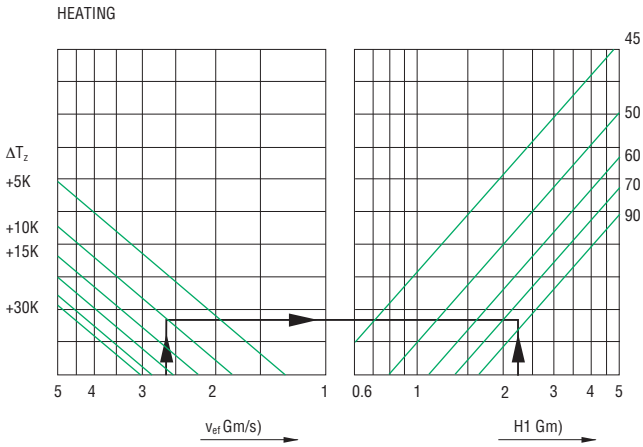
Diffuser size as a function of distance between units and effective velocity



Blade opening angle during heating and cooling operation

OD-11V size 125





Example 1 (cooling)

Q = 120m³/h
H = 4m
H1 = H-1, 8 = 4-1, 8 = 2.2m
V_{H1} = 0.2m/s
ΔT_z = -10 K
Recommended sizeH 125

V_{ef} = Q/A_{ef} x 3600 = 120/0.012 x 3600
V_{ef} = 2.7 m/s
V_{H1}/V_{ef} = 0.2/2.7 = 0.074
Blade angleH 46

Example 1 (heating)

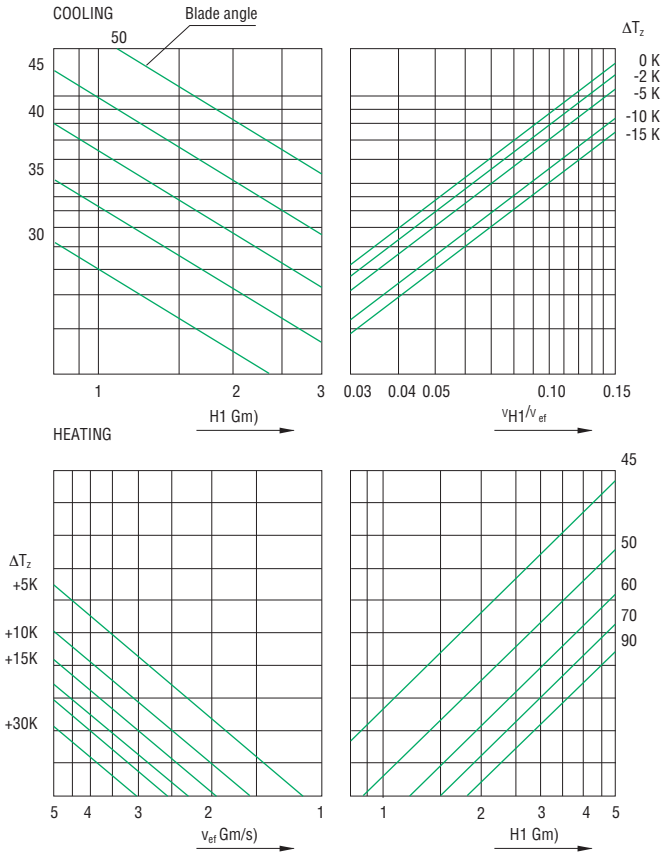
Q = 120m³/h
H = 4m Æ H1 = 2.2m
V_{H1} = 0.2m/s
ΔT_z = +10 K
Recommended sizeH 125

V_{ef} = 2.7m/s
Blade angleH 80

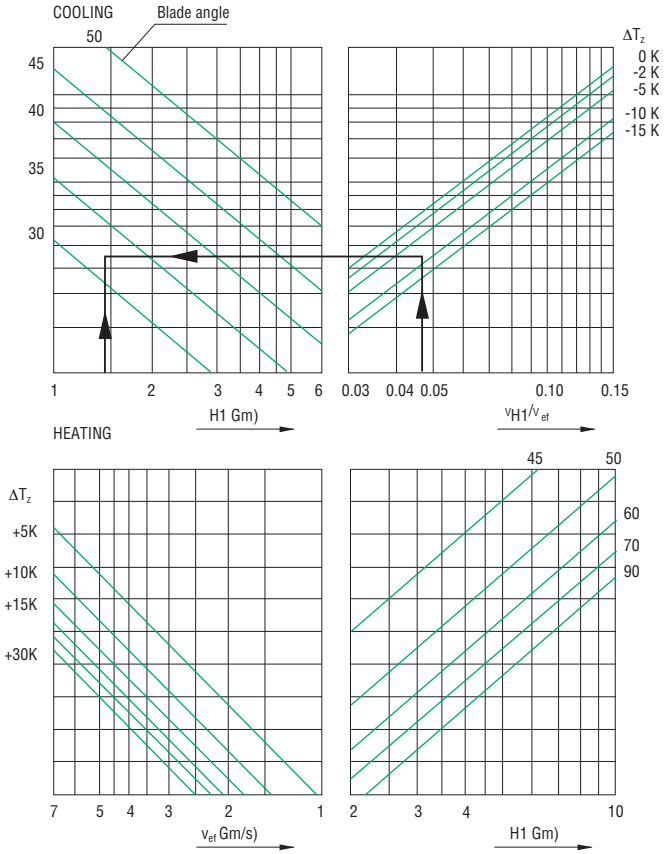
Performance Data Continued

Blade opening angle during heating and cooling operation

OD-11V size 160



OD-11V size 200



Example 2 (cooling)

Q = 350m³/h
H1 = 1.4m
$\mathbf{V_{H1}}$ = 0.15m/s
$\Delta\mathbf{T_z}$ = -8 K
Recommended sizeHH 200

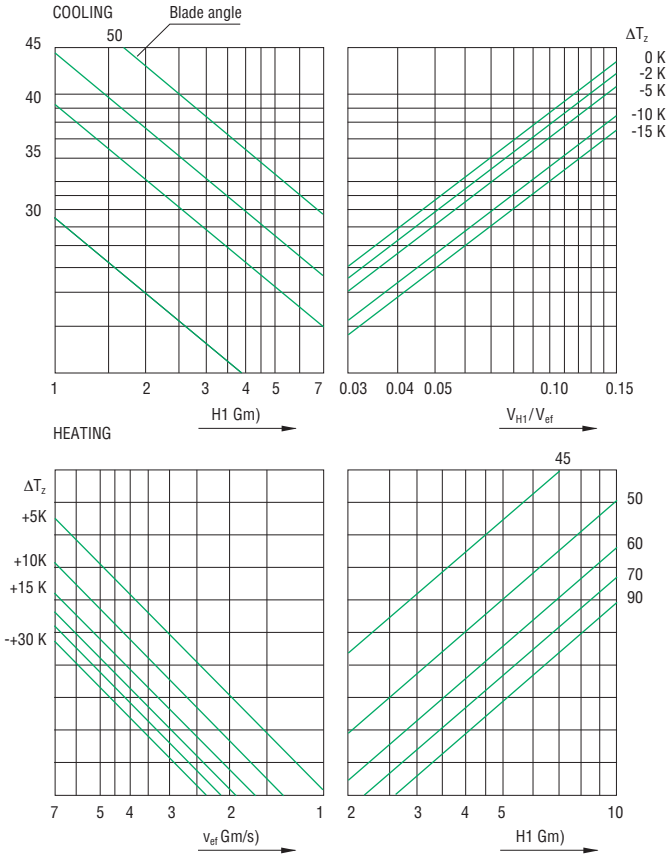
$\mathbf{V_{ef}}$ = Q/A_{ef} x 3600 = 350/0.031 x 3600
$\mathbf{V_{ef}}$ = 3.13m/s
$\mathbf{V_{H1}/V_{ef}}$ = 0.15/3, 24 = 0.046
Blade angleH 32

Blade angleH 32 Æ Coanda effect)
H1 = 1.4 x 1.4 = 1.96m
H = H1 + 1.8 = 1.96 + 1.8 = 3.67m
or
H = 1.4 Æ V_{H1} = 0.15 x 1.4 = 0.25m/s

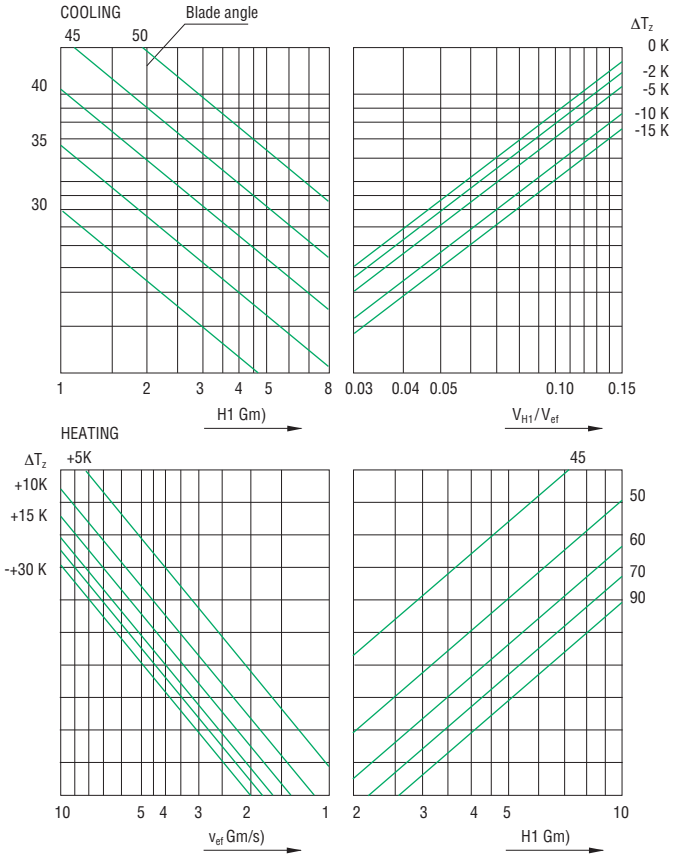
Performance Data Continued

Blade opening angle during heating and cooling operation

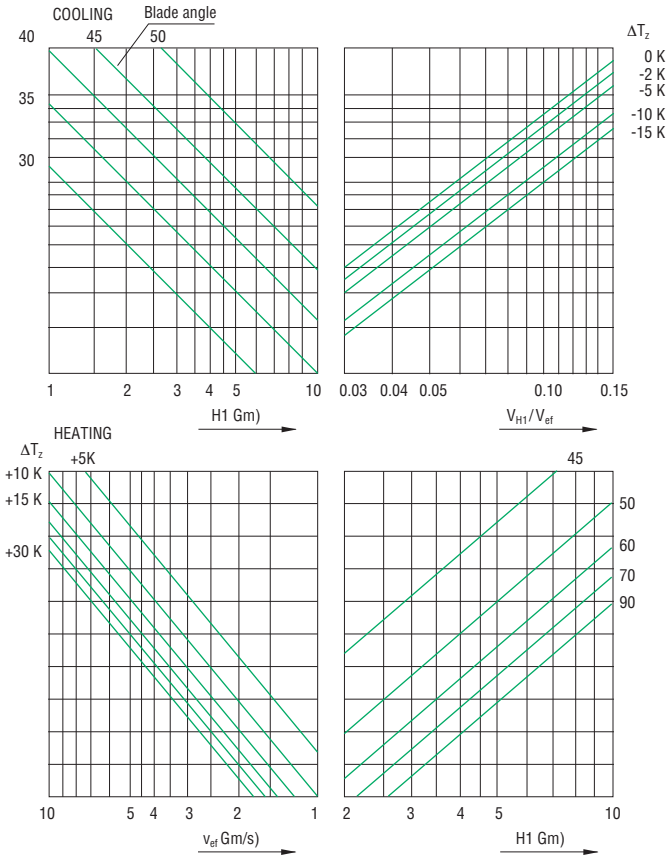
OD-11V size 250



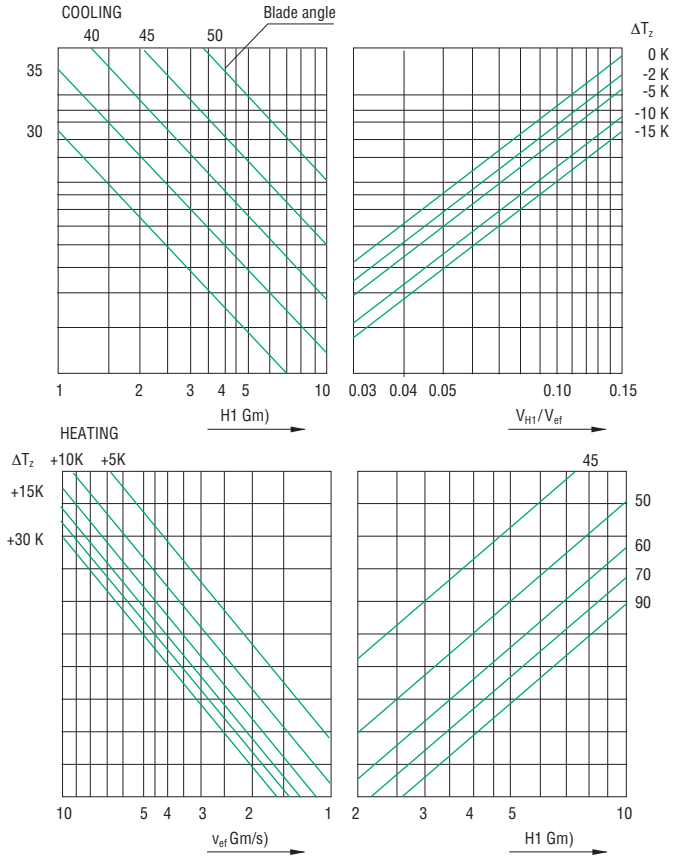
OD-11V size 315



OD-11V size 400



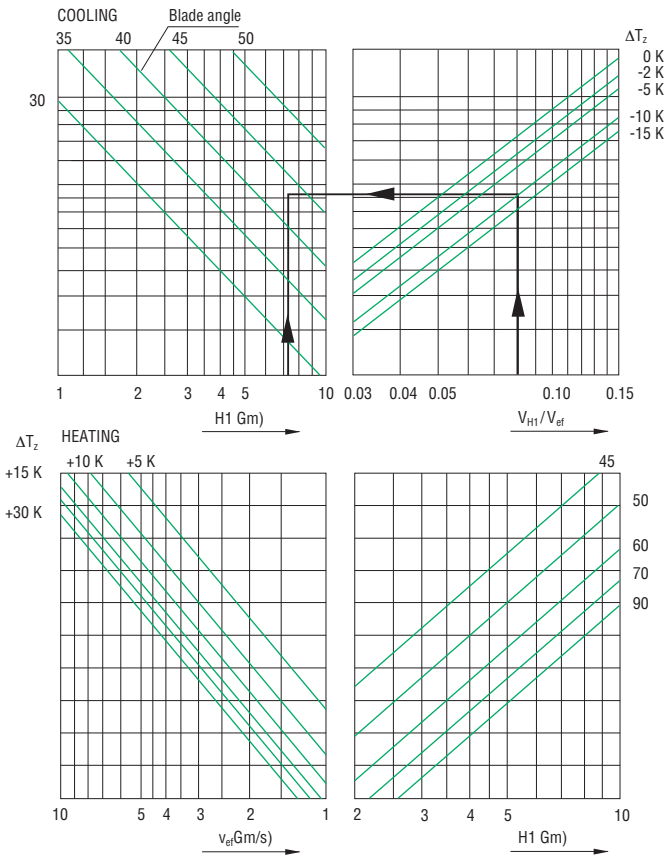
OD-11V size 500



Performance Data Continued

Blade opening angle during heating and cooling operation

OD-11V size 630

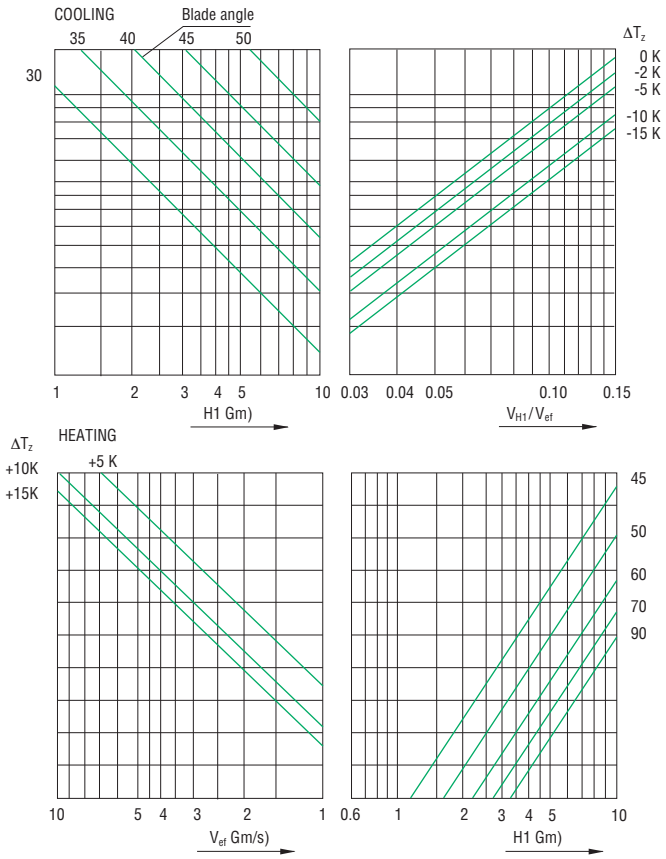


Example 3 (cooling)

Q = 2700m³/h
V_{H1} = 0.2m/s
ΔT_z = -10 K
H1 = 9mÆ H1=9-1.8 = 7.2m
Recommended sizeH 630

V_{ef} = Q/A_{ef} x 3600 = 2700/0.32 x 3600
V_{ef} = 2.3m/s
V_{H1}/V_{ef} = 0.2/2.3 = 0.08
Blade angleH 43

OD-11V size 800

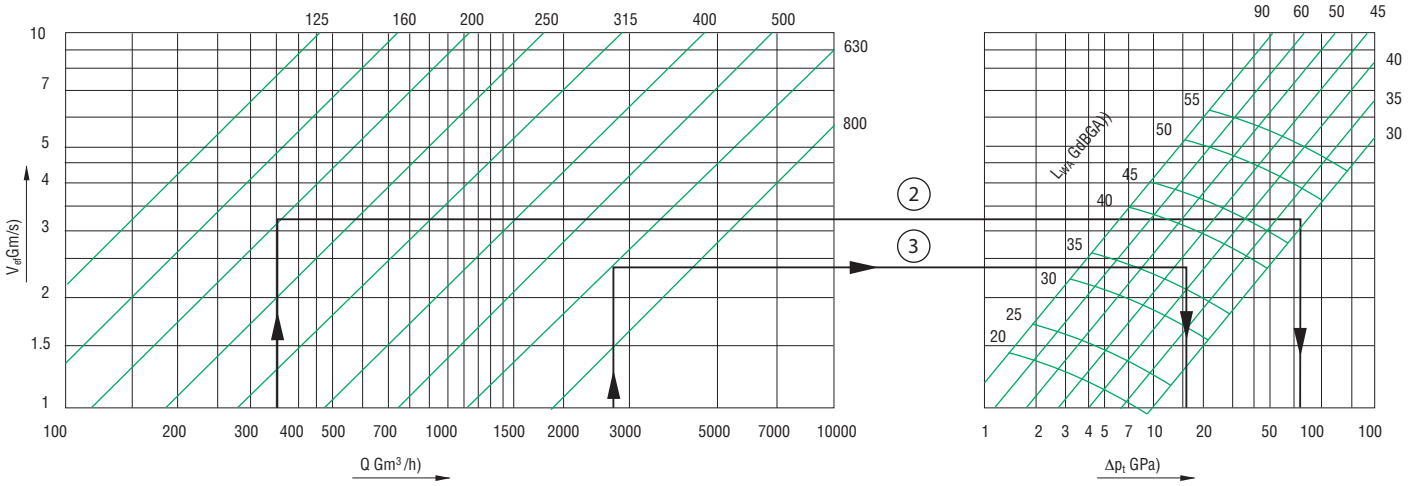


Performance Data Continued

Pressure drops and sound power level (for version with dispersing plate)

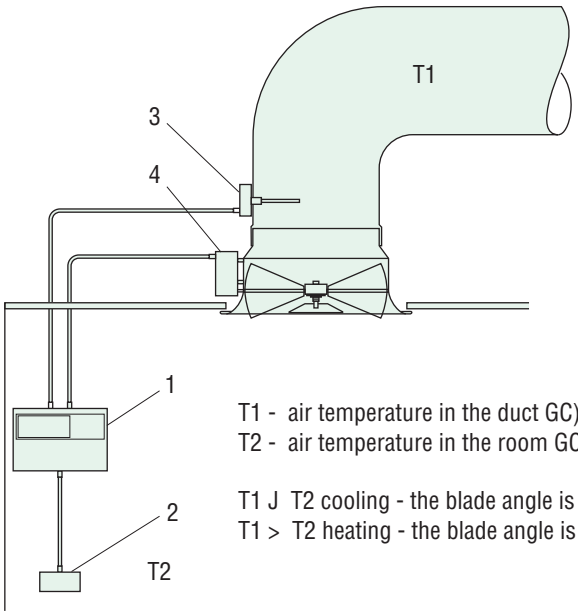
OD-11V Size 125 - 800

PRESSURE DROPS AND SOUND POWER LEVEL



Example 2 (cooling)
Q = 350m³/h
L_{WA} = 48 dBGA)
Δp = 77Pa
Blade angleH 32

Example 3 (cooling)
Q = 2700m³/h
L_{WA} = 37 dBGA)
Δp = 16Pa
Blade angleH 43



T1 - air temperature in the duct GC)
T2 - air temperature in the room GC)

T1 J T2 cooling - the blade angle is towards 0
T1 > T2 heating - the blade angle is towards 90

OD-11V with the ADT-1 thermostat with analogue output

Description
The ADT-1 differential thermostat with continuous analogue output is a controller that based on the duct air temperature and room temperature signals automatically adjusts the angle of OD-11V blades as required. One ADT-1 can operate up to 10 OD-11 units.
Operation
The controller compares the selected temperature curve, which is set according to the OD-11V position, desired mode of operation, etc, with data received from temperature sensors located in the air supply duct and in the room. taking into account the desired temperature difference, the controller generates a continuous analogue 0-10V DC output signal, which is then transmitted to the OD-11V electric motor drive. comparing the temperature, the controller automatically recognises the heating or cooling mode and sets the OD-11V accordingly. In the case the duct air temperature is higher than the room temperature, the controller switches the DC-V11 to the heating mode, ie. to the vertical supply of warm air into the room. In the case the duct air temperature is lower than the room temperature, the controller automatically infers that the system in the room cooling mode and accordingly generates a signal to set the OD-11V to the cooling mode.
Advantage
Applying ADT-1, the need for manual switching of a large number of OD-11V units to the proper operational mode is avoided, since the controller switches the units automatically. In this way, the efficiency of room air conditioning is enhanced as well.

ADT-1 differential thermostat

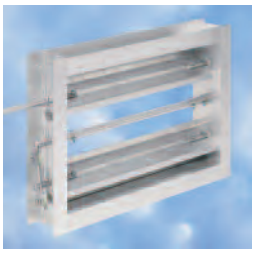
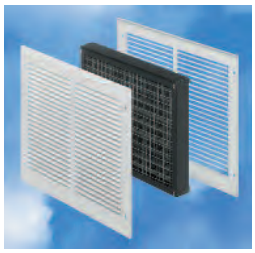
1. controller
2. room temperature sensor
3. duct temperature sensor
4. Belimo LM24-SR
   For the size 630, appropriate motor type is NM
   For the size 800, appropriate motor type is AM

Product Range

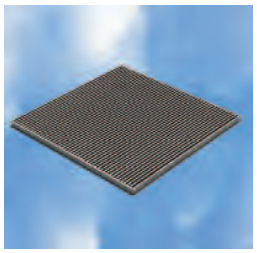
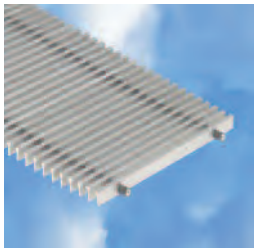
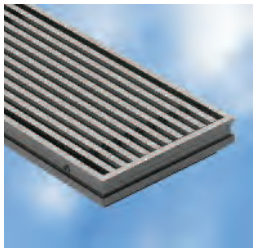
Linear Grilles

External Louvres

Miscellaneous

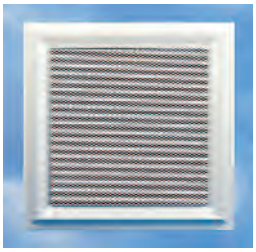



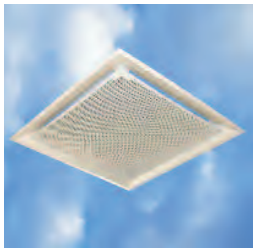
Floor Grilles

Swirl, Displacement and High Induction Diffusers

Perforated and Louvre Face Ceiling Diffusers





Slot and Fixed Blade Diffusers

Grilles

Cylinder and Jet Nozzle Diffusers

Circular Diffusers and Air Valves

- Swirl, Displacement and High Induction Diffusers
- Perforated and Louvre Face Ceiling Diffusers
- Slot and Fixed Blade Linear Diffusers
- Cylinder and Jet Nozzle Diffusers
- Circular Diffusers and Air Valves
- Floor Grilles
- Linear Bar Grilles
- Grilles
- External Louvres
- Miscellaneous

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