

Adjustable Curved Vane Diffusers

ACDH Vanes are parallel to the width dimension

ACDV Vanes are parallel to the height dimension



Adjustable Curved Vane Diffusers

ACDH / ACDV

Introduction

The Waterloo ACD diffusers are ideally suited to commercial and industrial projects requiring relatively low cost but versatile air outlets. Available with 1, 2, 3 or 4 way patterns with individually adjustable vanes, the diffusers can be manufactured to any increment between the minimum and maximum sizes to suit ceiling or duct integration requirements.

As the air pattern is easily adjustable from the face it is recommended that ACD diffusers are not located in low or easily accessible ceiling locations.

Product Description

ACDH Vanes are parallel to the width dimension
ACDV Vanes are parallel to the height dimension
OBSS Allen key operated opposed blade damper through face of diffuser

Features

- 1, 2, 3 and 4 way patterns
- Variable size range
- Adjustable air patterns
- Vertical or horizontal diffusers

Finishes

PPG9010 (RAL 9010 Gloss - 80% Gloss White)

PPM9010 (RAL 9010 Matt - 20% Gloss White)

PPM9006 (RAL 9006 Matt - 30% Gloss Silver)

Other colours available on request

Weights

Approx 9kg/m² face area

OBSS/ED 9.5kg/m² face area

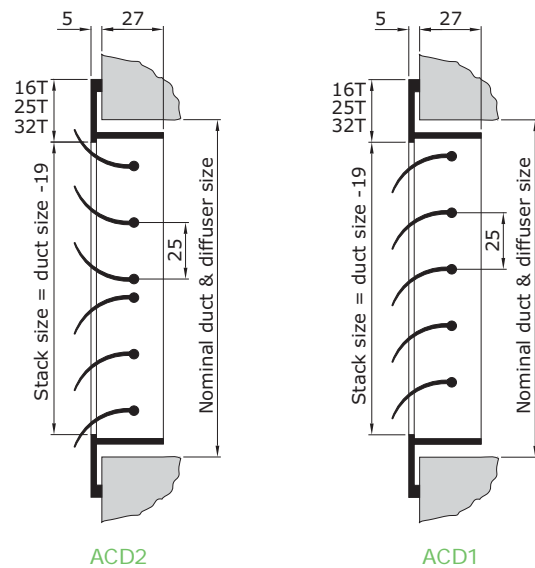
Sizes

Standard sizes Minimum size - 150 x 150mm

Maximum size - 600 x 600mm

Special sizes Minimum size - 150 x 100mm

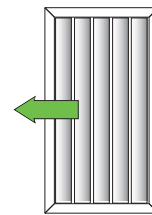
(ACD1 & 2 only) Maximum size - 1500 x 1500mm



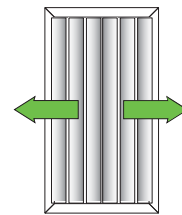
ACD2

ACD1

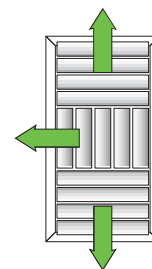
Patterns



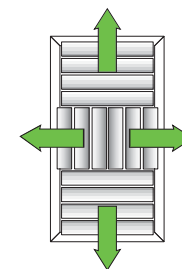
ACD1



ACD2



ACD3



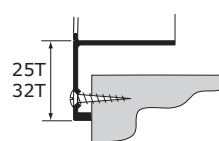
ACD4

ORDER EXAMPLE

ACDH/4/300/300/25T/SF/PPG9010/OBSS

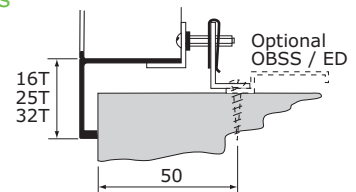
Type _____
 Air pattern _____
 Duct width _____
 Duct height _____
 Border type _____
 Fixing _____
 Finish _____
 Damper _____

Border and fixing options



SF

Screw fixing through flange
 (available on 25T & 32T only)



CRB

Concealed rear bracket
 (Bracket can be reversed to
 reduce overall depth)

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ACDH / ACDV

Selection Criteria

Performance data is based on diffusers mounted in a ceiling with air at 11 °C cooling differential.

l/s tabulated is the total discharged by the diffuser. For a 2 way pattern one half of the tabulated l/s is discharged in each direction and for a 3 way one third in each direction. The 4 way pattern discharges one third at the tabulated l/s through each end section (XI) & one sixth through each centre section (Xs).

Noise level is based on diffuser sound power level (L_w) re 10^{-12} W level less 8dB room absorption.

Terminal Velocity V_t (m/s)	0.3	0.4	0.5
Correction factor for Throw	1.3	1	0.8

Selection Example ACD 600 x 400

Total air flow rate 400 l/s

ACD1

Velocity 2.8 m/s

Throw 3.8m

Pressure Loss 4.4 Pa

41dBA level

ACD2

Velocity 2.8 m/s

Throw 2.7m

Pressure Loss 5.4 Pa

41dBA level

ACD3

Velocity 2.8 m/s

Throw 2.4m

Pressure Loss 6.5 Pa

41dBA level

ACD4

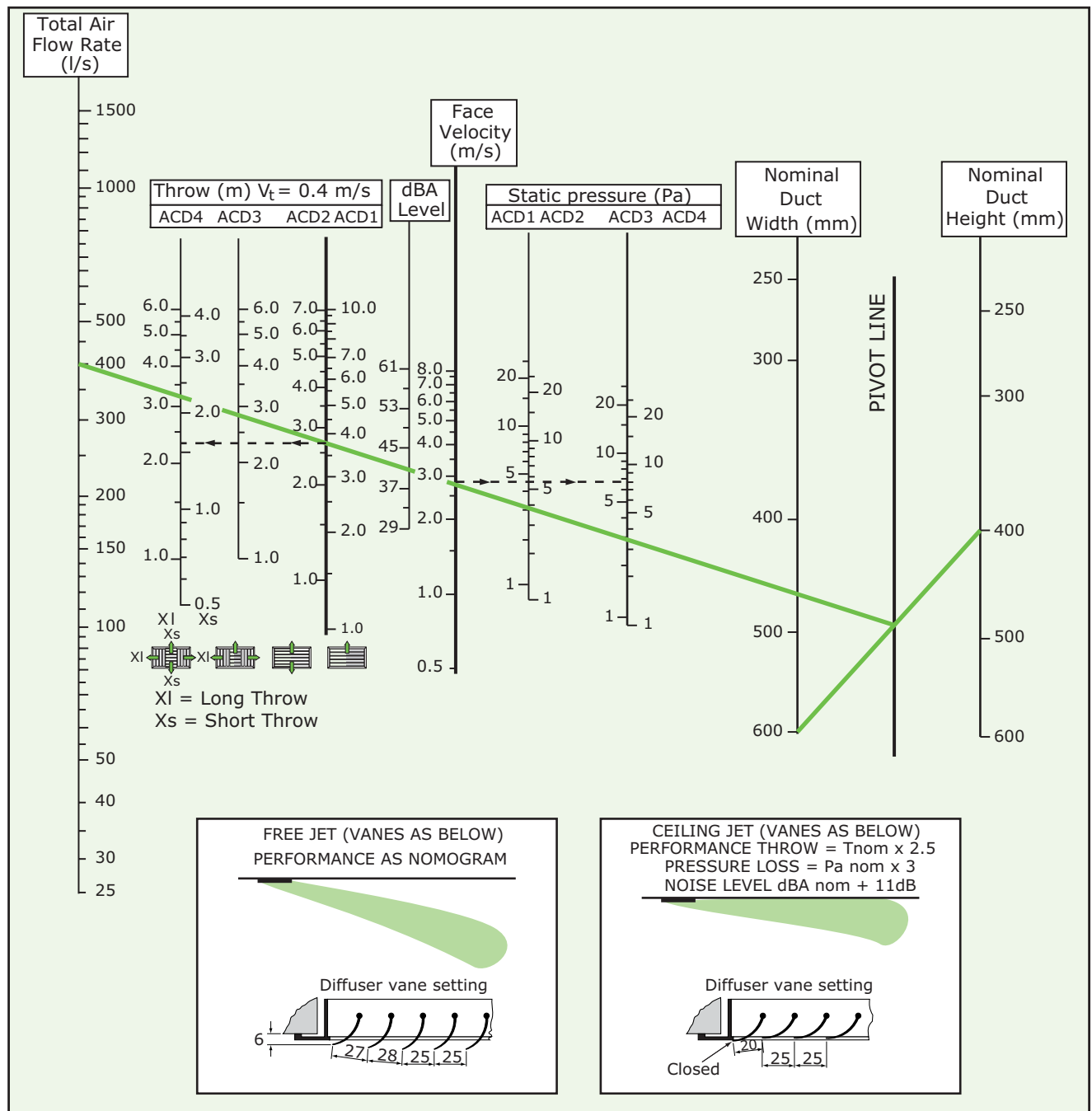
Velocity 2.8 m/s

Throw 2.4m (XI) 1.6m (Xs)

Pressure Loss 7.6 Pa

41dBA level

Performance graph



Plenum Boxes

Introduction

Our High- / Low- Line plenum boxes are designed to guarantee a good distribution of the air prior to diffusion through the terminals. Available with Side or Top Entry connections to customer-specific diameter/shape, these can be fitted with Spigot Flap Dampers, cord- / quadrant-operated, as well as 6mm acoustic lining (optional) reaction to fire class C-s3-d0 to EN 13501-1: 2007 to avoid noise generation. Also available with rivet fix (hem fix as standard).

Product Description

PBHL	High-Line Plenum box to suit CS / LCS / DSL / HF Linear Slot Diffusers
PBLL	Low-Line Plenum box to suit CS / LCS / DSL / HF Linear Slot Diffusers
PBHLB	High-Line Plenum box to suit CSB Barrel Slot Diffusers
PBLLB	Low-Line Plenum box to suit CSB Barrel Slot Diffusers
PBHLH	High-Line Plenum box to suit FCD Fan Coil Diffusers
PBLLH	Low-Line Plenum box to suit FCD Fan Coil Diffusers
SE	Side Entry spigot
TE	Top Entry spigot
CC	Circular Connection
RC	Rectangular Connection
FO	Flat Oval Connection
FDC	Cord-operated Flap Damper (optional)
FDQ	Quadrant-operated Flap Damper (optional)
LINED	6mm acoustic lining (optional) reaction to fire class C-s3-d0 to EN 13501-1: 2007
BFL	Internal perforated plate for Supply air diffusers (optional)
BLACK	Plenum painted black to prevent through vision (optional)

Features

- Galvanised steel, stitch fixed
- Available in High-Line or Low-Line to accommodate larger spigot sizes
- 1 to 4 connections – Circular, Rectangular or Flat Oval (reduced plenum height)
- Side or Top Entry spigots with optional airflow control damper
- Slotted holes on top plate for easy drop rod installation

Finish

Galvanised sheet steel

Dimensions

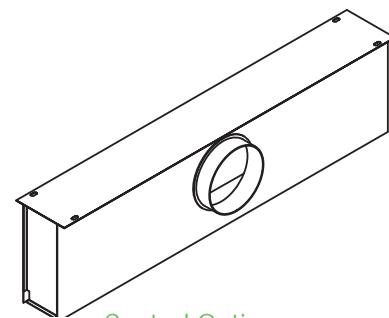
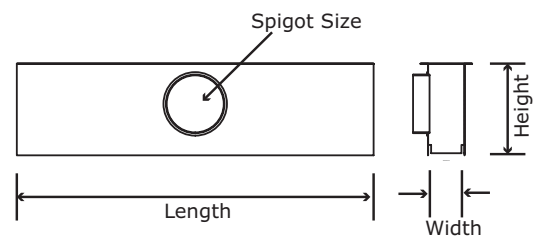
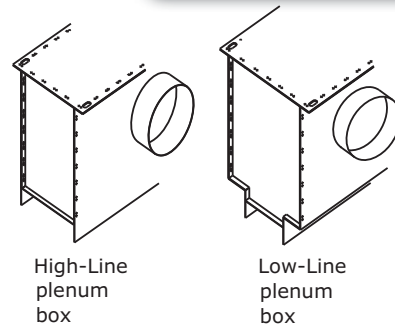
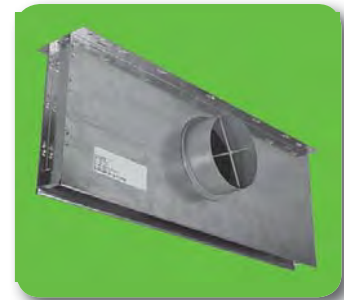
Length	PBHLH / Fan Coil Diffuser length PBHL, PBHLB / Linear Slot diffuser length
Width	PBHLH / Fan Coil Diffuser width PBHL, PBHLB / Number of slots
Height	SE – Spigot diameter or height + 100mm as standard TE – as specified by customer (200mm minimum recommended)

Order

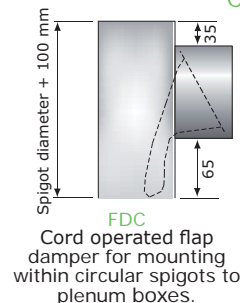
When ordering plenum boxes please specify length, width & height, spigot size and position (Top or Side Entry) and control options. Please note that the plenum height should in general be 100mm greater than the spigot diameter (Side Entry applications).

ORDER EXAMPLE

Type	PBHL/HF/2/1200/250/250/SE/147/2CC/OBSS/LINED
Diffuser type	
Number of slots	
Plenum box Length	
Plenum box Width	
Plenum box Height	
Entry position	
Spigot Size	
Spigot Number / Shape	
Option	
Option	



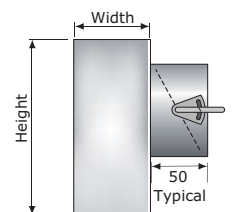
Control Options



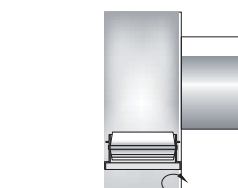
FDC
Cord operated flap damper for mounting within circular spigots to plenum boxes.



OBCO
Cord operated opposed blade damper for installation within square or rectangular plenum spigots.



FDQ
Flap damper with external quadrant control for mounting within circular spigots to plenum boxes.



OBSS / ED
Standard opposed blade damper for diffuser or duct mounting.

Plenum Boxes

Selection Criteria (Using the Nomogram)

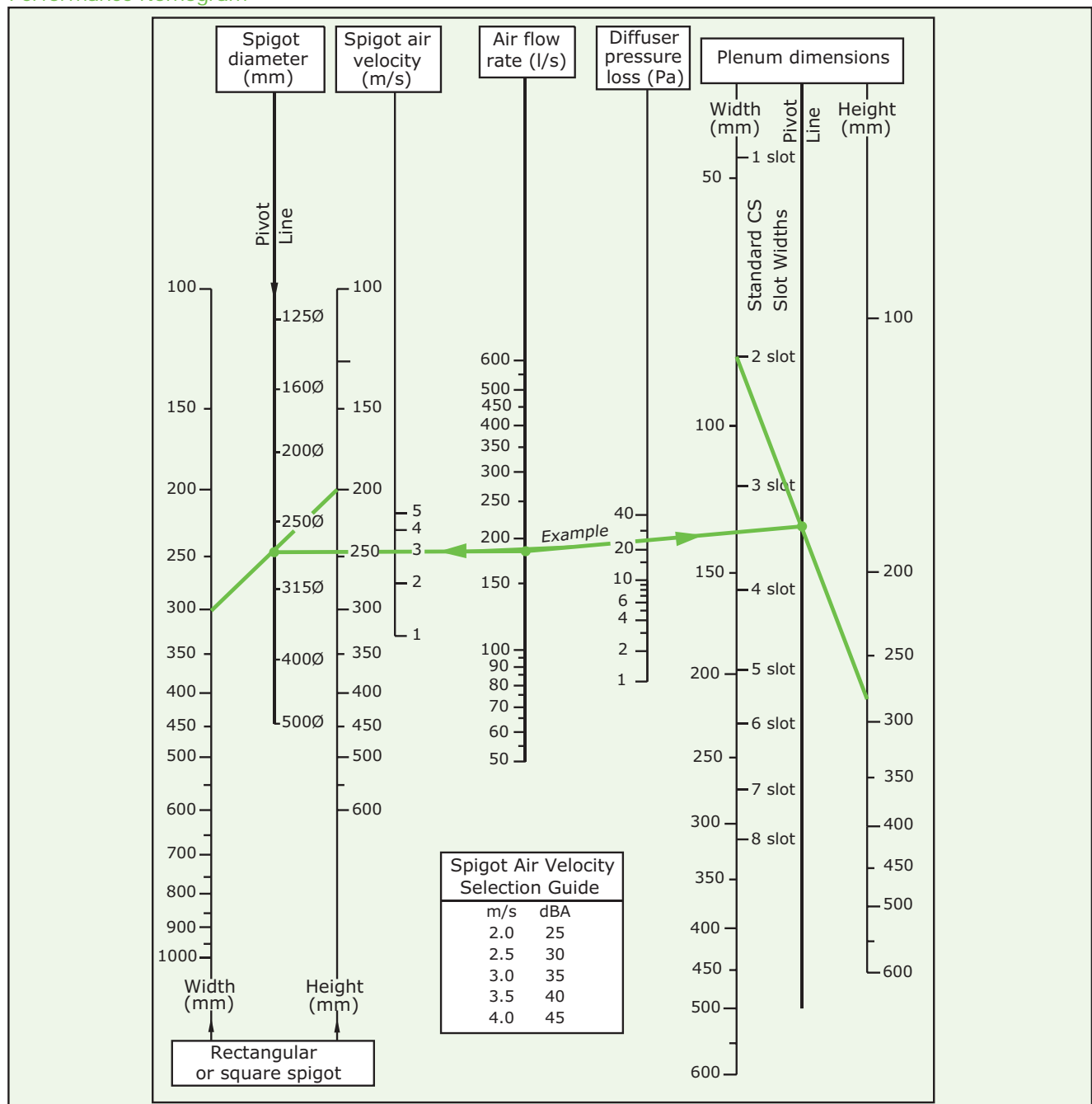
By way of example, referring to the data in the CS section, consider a diffuser handling 180 l/s total with a pressure drop of 25Pa. Projecting from this volume through the diffuser pressure loss, then pivot on the plenum dimensions to suit the diffuser 2 slot width, which gives a minimum plenum height of approx 280mm. Draw a line from the air flow selection point through the required spigot air velocity and read off the nearest standard spigot size. In this example the spigot diameter exceeds the selected plenum height, so the height now becomes $315 + 100 = 415\text{mm}$.

Alternatively, to maintain the original height, select a suitably sized rectangular spigot (300 x 200 in the example) or use multiple circular spigots.

Recommended max air volume for 3 m/s, 35 dBA based on recommended spigot sizes

Diameter	97	122	157	197	247	312	397
l/s	22	35	58	92	144	229	370

Performance Nomogram



Installation

The plenum boxes and neck reducers are supported by four drop rods through a locating hole positioned near each corner.

Note: Actual spigot diameter is nominal - 3mm (i.e. 200mm is 197mm actual).

Note: Plenum length is determined by linear diffuser selection.

Note: The connection between the diffuser and plenum is adequately sealed for most installations, although secondary additional sealing may be required at the discretion of the installers, if the leakage rate required is particularly low.

Diffusers

Control Options - Grille Mounted OBSS Opposed Blade Damper (Volume Control Damper)

Introduction

Waterloo OB Opposed Blade Dampers are manufactured to suit virtually the whole of our square / rectangular Air Terminal range and can be fitted to the neck of the terminals or inside plenum box.

They are adjustable from the front of the Grille or Diffuser with a screwdriver as standard, but are also available with cord- or lever-operation.

Manufactured with linked aluminium extruded blades, in sizes to suit any Waterloo Grille or Diffuser, they are useful for fine airflow regulation and can be adjusted from fully open to closed low-leakage position.

Product Description

- OBSS** Opposed Blade Damper, Screwdriver operated
OBCO Opposed Blade Damper, Cord operated
OBSL Opposed Blade Damper, Short Lever operated
OBLL Opposed Blade Damper, Long Lever operated
BLACK Painted black to prevent through vision

Features

- Linked aluminium extrusions for limited extra weight
- Large choice of adjustments to suit any configuration
- Can be fitted to virtually any Waterloo Grille or Diffuser

Finishes

Extruded aluminium blades

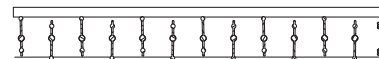
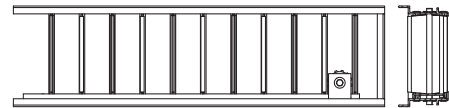
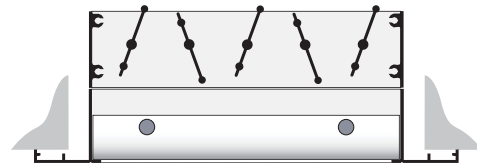
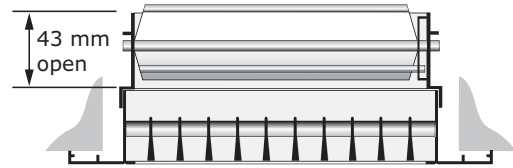
Sizes

Minimum Size - 100 x 75

Minimum Size for Plasterline - 100 x 50

Maximum Size - single section 800x600mm

Multiple sections will be banked to accommodate larger terminal sizes.



ORDER EXAMPLE

OBSS/Black/600/200/For ALN

Damper type _____
Options _____
Terminal Length _____
Terminal Width _____
Terminal type _____

ED Equalising Dampers (Directional Blades Incapable of Shut Off)

Introduction

Waterloo ED Equalising Dampers are manufactured to suit virtually the whole of our square / rectangular Air Terminal range and can be fitted to the neck of the terminals or inside plenum box.

They are individually adjustable to control air direction and may be used for localised blanking.

Manufactured with aluminium extruded blades, in sizes to suit any Waterloo Grille or Diffuser, they can be adjusted manually by removing the Grille or Diffuser core.

Product Description

- ED** Equalising deflector
BLACK Painted black to prevent through vision

Features

- Aluminium extrusions for limited extra weight
- Individually adjustable for fine airflow regulation
- Can be fitted to virtually any Waterloo Grille or Diffuser

Finishes

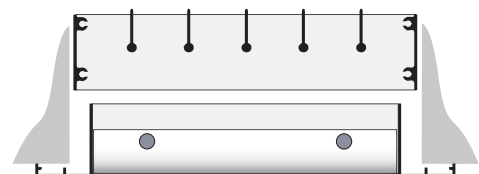
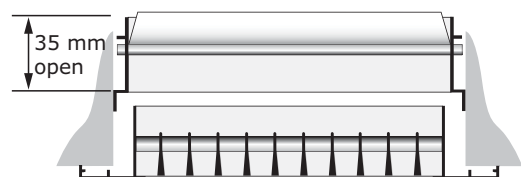
Extruded aluminium blades

Sizes

Minimum Size - 100 x 50

Maximum Size - single section 800x600mm

Multiple sections will be banked to accommodate larger terminal sizes.



ORDER EXAMPLE

ED/Black/600/200/For A CSF

Damper type _____
Options _____
Terminal Length _____
Terminal Width _____
Terminal type _____

Waterloo Product Range

GRILLES

A complete range of products suitable for all wall, ceiling and floor applications. Most grilles are made from aluminium and have a range of fixed or moveable blades designed to give performance whilst remaining aesthetically pleasing to the eye. Grilles are made to customer specified sizes and colours (PPM/G); standard colour PPM9010 (20% Gloss White). The range is complemented by the Aircell range of polymer Grilles.



DIFFUSERS

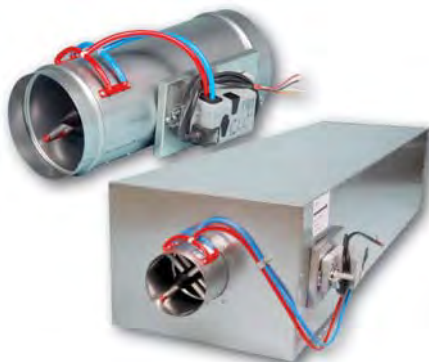
Designed to be installed in various ceiling systems, we have a complete range to suit both performance and aesthetic requirements. Most diffusers are made from aluminium and can be ordered with or without plenum boxes for easy duct work. Diffusers can be ordered in customer specified colours (PPM/G); standard colour is PPM 9010 (20% Gloss White). This range is complemented by the Aircell range of polymer Diffusers.



ACTIVE AND PASSIVE CHILLED BEAMS

The finest quality range of high output active beams, used for ventilated heating and cooling applications. These units have 4 pipe coils to allow heating and cooling circuits to run simultaneously, giving constant and responsive control. The design allows a large optimum capacity and also allows the customer to specify the nozzle type and pitch for individual circumstances.

Active beams are made from steel to a large range of customer specified sizes and as such are suitable for various different ceiling systems. Standard finish is PPM 9010, however other (PPM/G) colours are available on request.



AIR VOLUME CONTROL DAMPERS

Pressure independent Variable Air Volume and Constant Air Volume dampers made from zintec plate. Most volume dampers are regulated with an electronic motor and sensors and are calibrated to customer specifications before delivery.

The Constant Air Volume damper requires no power source as it is controlled via a mechanical device and calibrated before delivery. All volume dampers can be ordered with a single or double (insulation) skin.



EXTERNAL LOUVRES

A quality range of products for external wall applications. Made from aluminium, with birdscreen or insect screen options. All louvres are made to customer specified sizes and (PPM/G) colours; standard colour is PPM 9006.



DISPLACEMENT

A full range of recessed, semi-recessed, floor, wall and corner units providing high ventilation efficiency and excellent comfort. The very low pressure involved also offer quiet installations. Displacement units are available as wall or floor mounted, or indeed integrated within the architectural design.



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EMS 590755

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