

Adjustable Blade Grilles

1H Single set of horizontal blades

1V Single set of vertical blades

2H Double set of blades with front set horizontal

2V Double set of blades with front set vertical



Adjustable Blade Grilles

1H / 1V / 2H / 2V

Introduction

The Waterloo adjustable, single and double deflection, grilles are suitable for duct, ceiling and sidewall applications in most commercial projects. The grille vanes are individually adjustable to allow jet spread or deflection to be set within 45° of the duct axis.

Product Description

- 1H** Single set of horizontal blades
- 1V** Single set of vertical blades
- 2H** Double set of blades with front set horizontal
- 2V** Double set of blades with front set vertical
- OBSS** Allen key operated opposed blade damper
- ED** Equalising deflector
- DT-2M** Adjustable duct turn (Installed in duct)

Features

- Single or double deflection for complete air pattern control
- Teardrop blade for quiet operation but maximum induction

Finishes

PPG9010 (RAL 9010 Gloss - 80% Gloss White)

PPM9010 (RAL 9010 Matt - 20% Gloss White)

PPM9006 (RAL 9006 Matt - 30% Gloss Silver)

Other colours or anodised finish available on request

Weights

- 1H / 1V 8.5 kg/m² face area
- 2H / 2V 12.0 kg/m² face area
- OBSS / ED 9.5 kg/m² face area
- DT2M 9.0 kg/m² face area

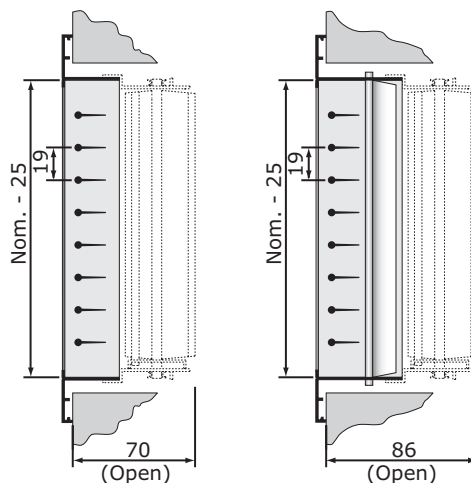
Sizes

Minimum Size - 75 x 75

Maximum Size - 1500 x 1200

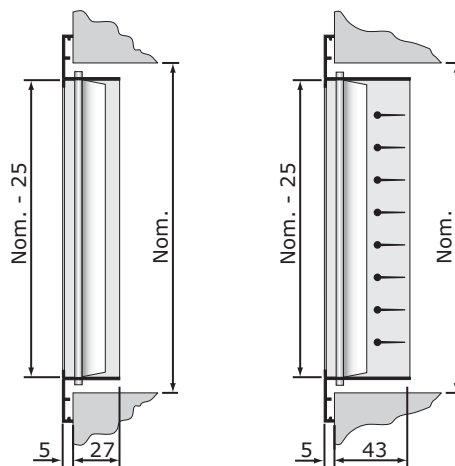
Fixing Options

- SF CF CRB VS AFVS
- PFVS RCHS AFHS AFCF RCCF
- BSSBD
- BSSBP (NOT for 2H or 2V)



1H + OBSS

2H + OBSS



1V

2V

ORDER EXAMPLE

1H/300/300/R25/SF/9010-Matt/OBSS

- Type _____
- Nominal Width _____
- Nominal Height _____
- Border _____
- Fixing _____
- Finish _____
- Options (Damper) _____

Free Area	
1H/1V	2H/2V
74%	66%

Adjustable Blade Grilles

1H / 1V / 2H / 2V

Selection Criteria

Performance data is based on grilles situated within 0.3m of ceiling with supply air at a 10°C cooling differential. Throw is the horizontal distance from the grille face to the point at which the velocity of the airstream has retarded to 0.4m/s.

For grilles situated 0.3m or more below ceiling level reduce throw by 1/3. dBA is based on a room absorption of 8 dB for sound power ref 10⁻¹² W.

Selection Example

2H/500/150/25T/SF

Air Volume 300 l/s

Grille @ 0° deflection

Throw 16m, Velocity 6.1m/s, dBA 31, P_s 10

Grille @ 45° deflection

Throw 8.5m, Velocity 6.1m/s, dBA 37, P_s 32

Grille with damper @ 0° deflection

Throw 16m, Velocity 6.1m/s, dBA 35, P_s 16

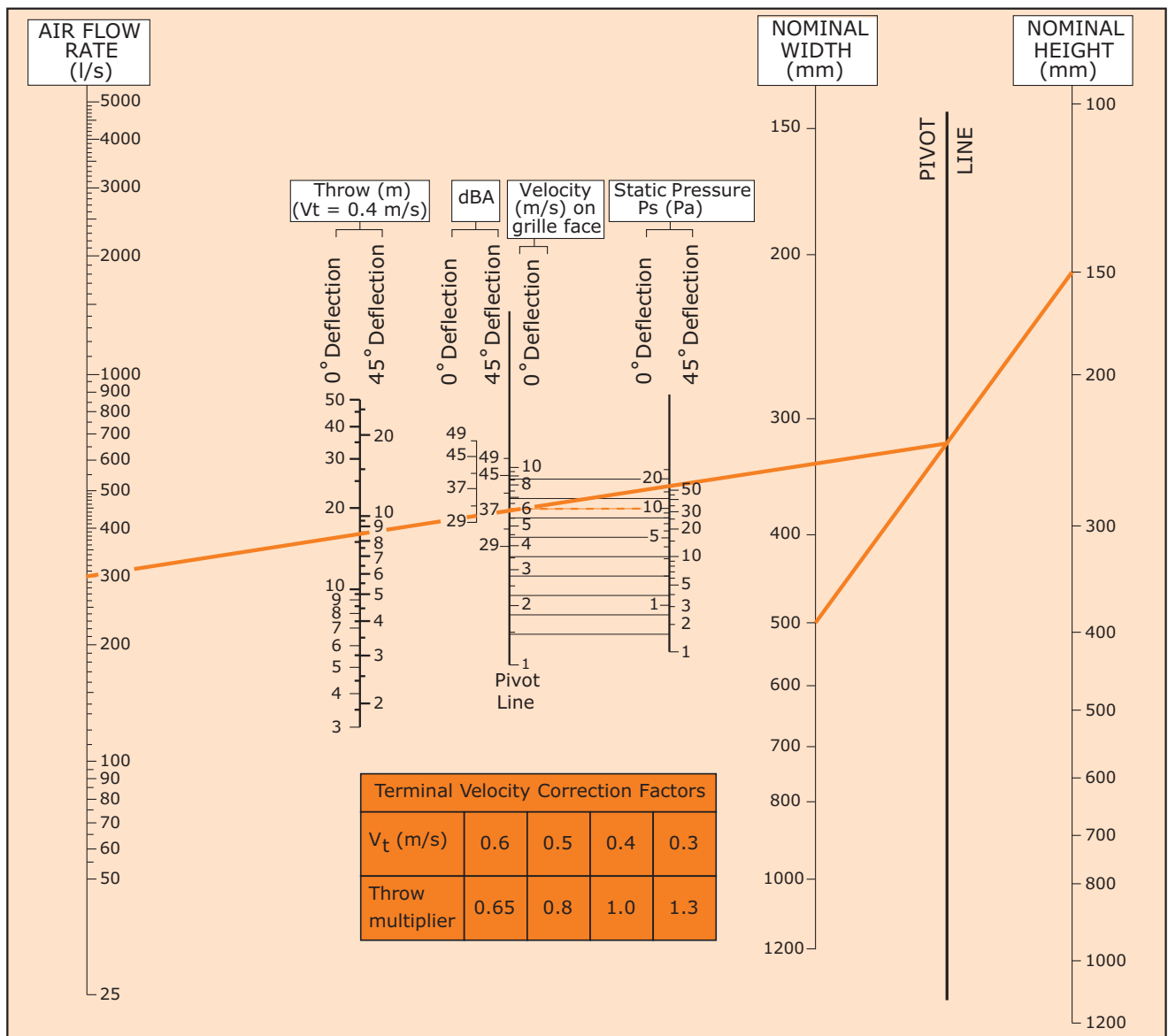
Grille with damper @ 45° deflection

Throw 8.5m, Velocity 6.1m/s, dBA 41, P_s 51

dBA and Static Pressure (P_s) Correction Factors for Grilles with an Open Damper

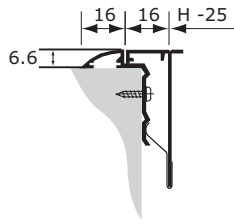
Grille Width	100+	125+	150+	200+	250+	300+	350+	450+	550+	600+	700+	850+	>1000
L _w Addition (C _L)	10	9	8	7	6	5	4	4	4	3	3	3	2
P _s Multiplier (C _P)	2.5	2.4	2.2	2.0	1.9	1.8	1.7	1.6	1.5	1.5	1.4	1.3	1.2

Performance Nomogram

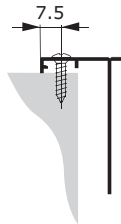


Controls and Fixing Options

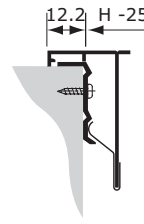
Fixing Options



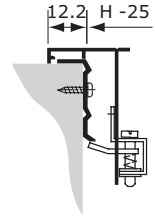
Frame: R16
Mounting: RCCF



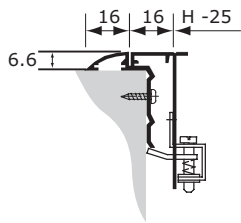
Frame: R25 / R32
Mounting: SF



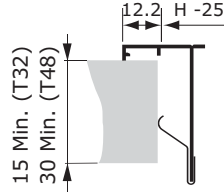
Frame: R25 / R32
Mounting: AFCF



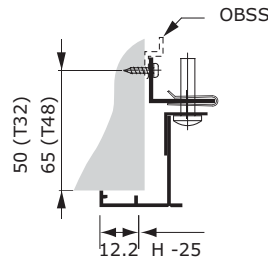
Frame: R25 / R32
Mounting: AFHS



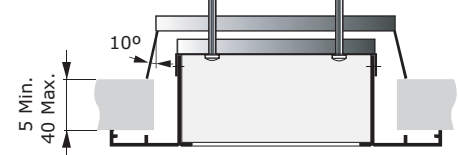
Frame: R16
Mounting: RCHS



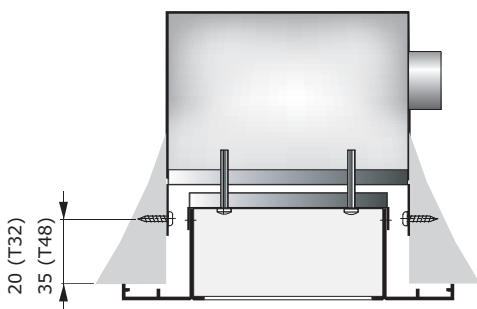
Frame: R16 / R25 / R32
Mounting: CF



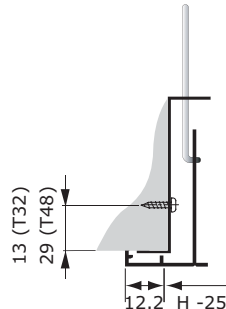
Frame: R16 / R25 / R32
Mounting: CRB



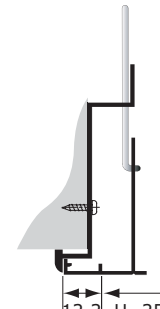
BSSBD (R16 / R25 / R32)
Duct / Plasterboard fixing



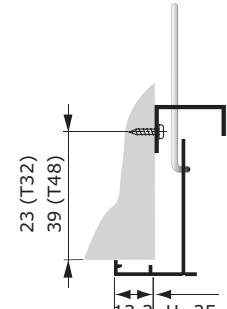
BSSBP (R16 / R25 / R32)
Plenum fixing (-15mm)



Frame: R25
Mounting: AFVS

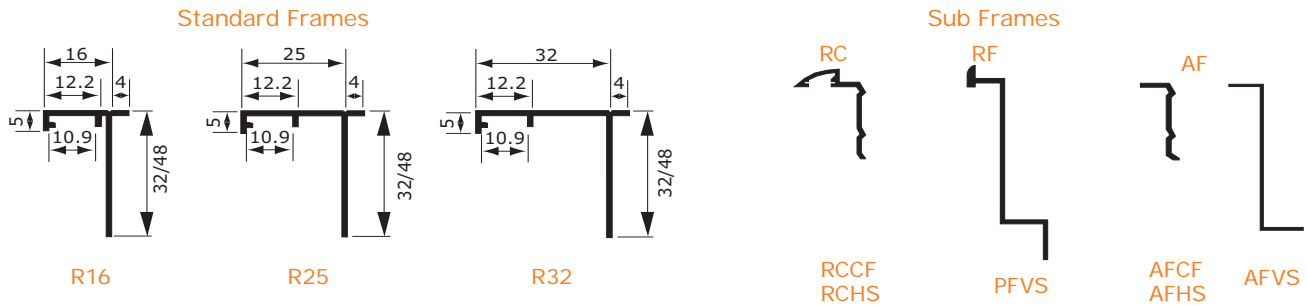


Frame: R25
Mounting: PFVS



Frame: R16 / R25 / R32
Mounting: VS

Standard Frames



Overall Grille Sizes
Grille with R16 = Nominal W/H + 7mm
Grille with R25 = Nominal W/H + 25mm
Grille with R32 = Nominal W/H + 39mm
Grille with RC = Nominal W/H + 39mm
Grille with PF = Nominal W/H + 21mm

Note:

AF and RC subframes can be made to a maximum size of 800mm in any direction in one piece. For sizes above that, we supply in parts for assembly on site by others.

DT-2M - Duct Fitted

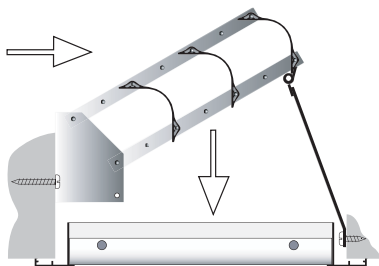
The hinged strip is used to calibrate the amount of air desired, by altering the angle of the blades and therefore altering the amount of disruption to the airflow.

Sizes for DT-2M

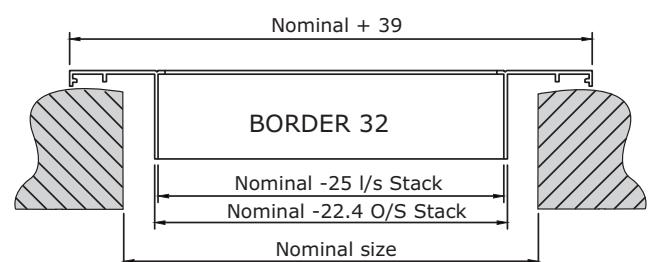
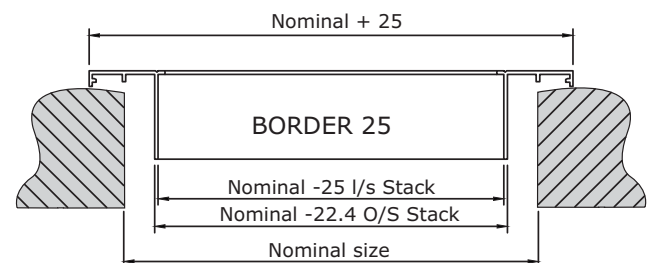
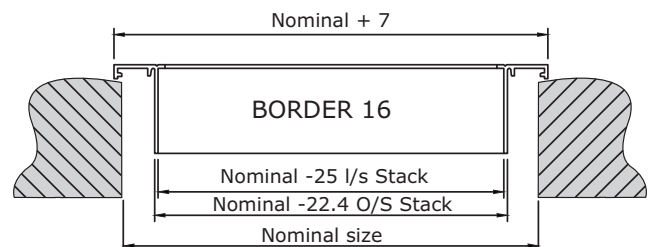
Width = 100 - 1225

Height = 75 - 425

Correction for Grille + Damper		
Supply 0° spread	dBA + 2	$P_s \times 1.3$
Supply 45° spread	dBA + 2	$P_s \times 1.1$
Exhaust	dBA + 2	$P_s \times 1.2$



Grille Nominal Sizes



Grille Fixing Selection

Types	SF	CF	CRB	VS	AFVS	PFVS	BSSB	AFCF	AFHS	RCCF	RCHS
1H / 2H / 1V / 2V	A/C	A	A/C	A/C	A/C	A/C	A/B/C	A	A/C	A	A/C
1KH / 2KH	A/C										
1KV / 2KV	A/C										
1HM / 2HM	A/C										
1VM / 2VM	A/C										
PER / 3HF	A/C	A		A/C	A/C	A/C		A		A	
GC5 / 3HG / 3HJ	A/C	A	A/C	A/C	A/C	A/C	A/B/C	A	A/C	A	A/C
ALF / 2ALF	A/C	A		A/C	A/C	A/C		A		A	
ALN / ALM / ALG / ALJ	A/C	A	A/C	A/C	A/C	A/C	A/B/C	A	A/C	A	A/C
ALG2 / ALJ2	A/C	A	A/C	A/C	A/C	A/C		A	A/C	A	A/C
ALM2 / ALN2	A/C	A	A/C	A/C	A/C	A/C		A	A/C	A	A/C
2ALM / 2ALJ / ALG10 / ALJ10	A/C	A		A/C	A/C	A/C		A		A	A/C
NSA / NSB / DVA / DVB	A/C										
DVC / NSC	A/C	A		A/C	A/C	A/C		A		A	
RTC / 2RTC	A/C										
BORDER STYLES	25T/32T	16T/25T/32T	16T/25T/32T	16T/25T/32T	25T/32T	25T	RTC/16T 25T/32T	25T/32T	25T/32T	16T/RTC-R16	16T/RTC-R16

A = SUITABLE FOR DUCTING AND WALL

B = SUITABLE FOR PLASTERBOARD

C = SUITABLE FOR CEILING

Removable Cores

Types	Removable	RCCF	RCHS	PFVS	AV	AFCF	AFHS	RTC	RCG - GC5	Special
1H/2H/1V/2V	Grille	B	B	B	N	N	N			
PER/GC5	Grille	B	B	B	N	N	N			
RCG - GC5	Core								B	
3HG/3HJ	Grille	B	B	B	N	N	N			
3HG/3HJ	Core							B		B
3HF/ALF	Grille	B		B	N	N				
3HF/3HJ	Core							B		B
ALN/ALM/ALG/ALJ	Grille	B	B	B	N	N	N			
ALN/ALM/ALG/ALJ	Core							B		B
APN/APM/APG/APJ	Core									
ALG10/ALJ10	Grille	B		B	N	N				
ALG10/ALJ10	Core							B		B
NSC/DVC	Grille	B		B	N	N				
RTC/2RTC	Grille	B								
RTC/2RTC	Core							B		

B = BEADED FRAME

N = NON BEADED FRAME

RTC = R5 OR R16 FRAME WITH CORE AND PACKERS

SPECIAL = PART 6200001 FRAME WITH CORE AND BRACKET INCORPORATING TERRY CLIP

Note: If OBSS or ED are selected access to the duct work will not be possible.

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
- OBL** 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

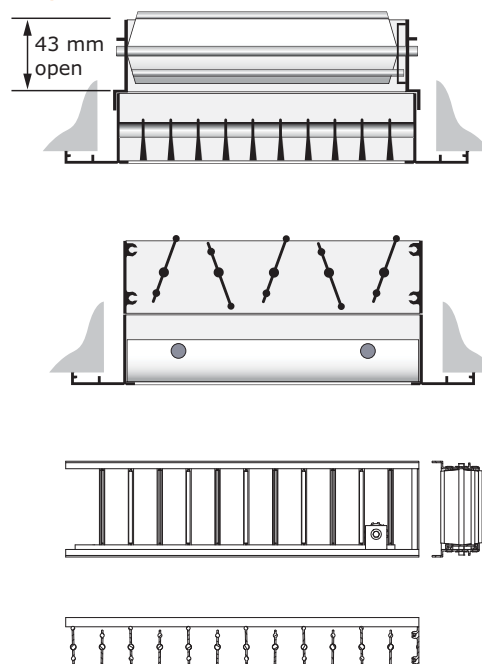
Sizes

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/300/300/Black/ To suit a 1H

Damper type |
Terminal length |
Terminal width |
Options |
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

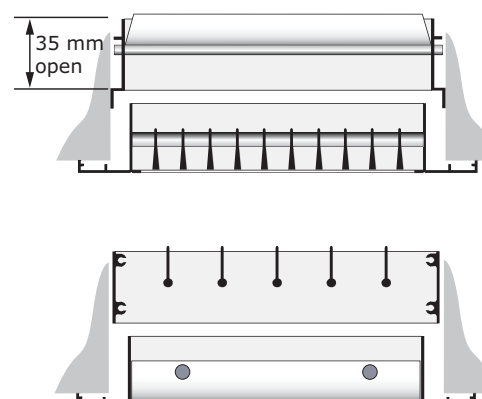
Extruded aluminium blades

Sizes

Minimum Size - 100 x 50

Maximum Size - single section 800x600mm

Multiple sections will be banked to accommodate larger terminal sizes.



ORDER EXAMPLE

ED/300/300/Black/ To suit a 1H

Damper type |
Terminal length |
Terminal width |
Options |
Terminal type |

Grille Plenum Boxes

Introduction

Correct selection and sizing of distribution plenum chambers is critical because grille air resistance is very low relative to the distribution ductwork resistance. It is therefore recommended that whenever possible grilles are served by low velocity stub ducts from branch ducting systems fitted with correct balancing controls. Where it is necessary to specify and use grille plenums a generous allowance for commissioned noise generation should be made.

Product Description

PBG	Individual grille plenum
PBG/LL	Low line grille plenum
NRG	Neck reducer
PBLG	Linear grille plenum
PBLG/LL	Low line linear grille plenum
PBSG	Security grille plenum

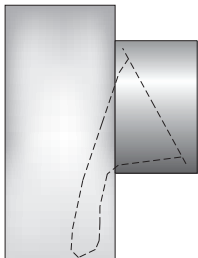
Spigot Options

SE	Side Entry
TE	Top Entry
1CC	1- Circular Connection
1RC	1- Rectangular/Square Connection
1FO	1- Flat Oval Connection

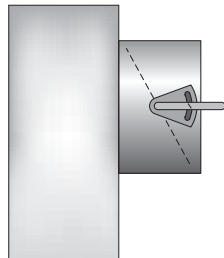
Features

- Plated steel with stitched seam joints.
- Standard circular connection diameters: 97, 122, 157, 197, 247, 312 and 397 Ø
- Available with circular, square, rectangular or flat oval spigots in either top or side entry applications
- Standard or Low-line configurations
- Optional 6mm internal thermal/acoustic lining

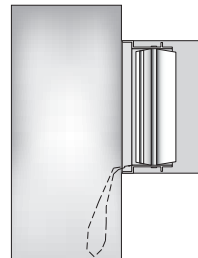
Control Options



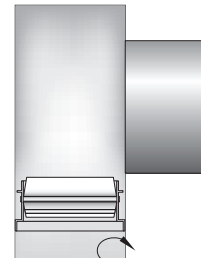
FDC
Cord operated flap damper for mounting within circular spigots to plenum chambers. The cord should be fed through the air terminal device ready for commissioning.



FDQ
Flap damper with external quadrant control for mounting within circular spigots to plenum chambers. The quadrant is accessible from outside the duct and the damper can be locked in any position.



OBBO
Cord operated opposed blade damper for installation within square or rectangular spigots to plenum chambers. The cord should be fed through the air terminal device ready for commissioning.



OBSS / ED
Standard opposed blade damper for diffuser or duct mounting. Adjustable by screwdriver inside the duct or through the face of the air terminal device. The ED is an individually adjustable blade device for equalising airflow across the diffuser.

Finish

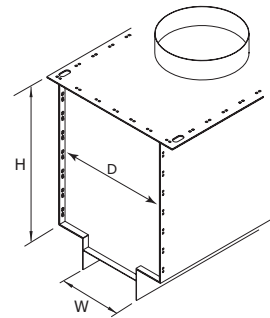
PBG/NRG	Galvanised sheet steel
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Dimensions

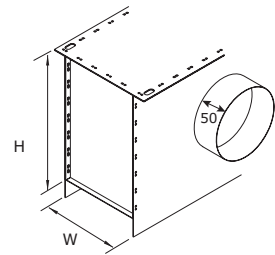
Length	Extract Grille length
Width	Extract Grille width
Height	SE – Spigot diameter or height + 100mm as standard TE – as specified by customer (200mm minimum recommended)

Order

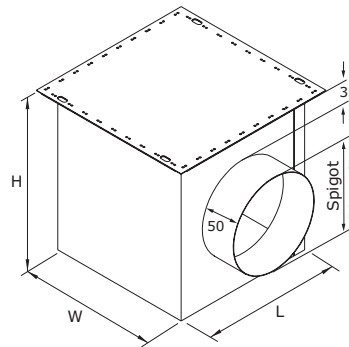
When ordering plenum chambers please specify length, width & height, spigot size and position (Top or Side Entry) and control options. Please note that the plenum height should in general be 100mm greater than the spigot diameter (Side Entry applications).



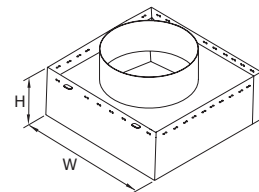
PBLG/LL - Top entry Low-line linear grille plenum box.



PBLG - Side entry Linear grille plenum box.



PBG - Side entry grille plenum box



NRG - Neck Reducer

Note: The connection between the grille 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.

PLENUM ORDER EXAMPLE

	PBG-1H/570/570/400/SE/1CC/157dia/Lined
Type	_____
Plenum box length	_____
Plenum box width	_____
Plenum box height	_____
Spigot position	_____
Spigot type	_____
Spigot size	_____
Acoustic lining	_____

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

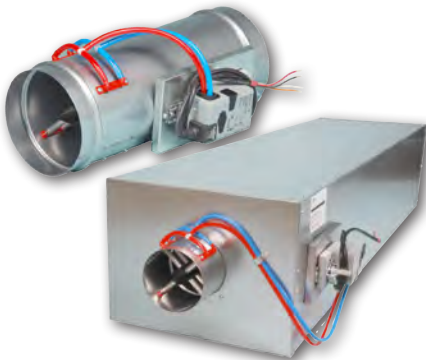
Designed to be installed in various ceiling systems, we have a complete range to suit both performance and aesthetical requirements. Most diffusers are made from aluminium and can be ordered with or without plenum boxes for easy duct work. Diffusers can be ordered in customer specified colours (PPM/G); 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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