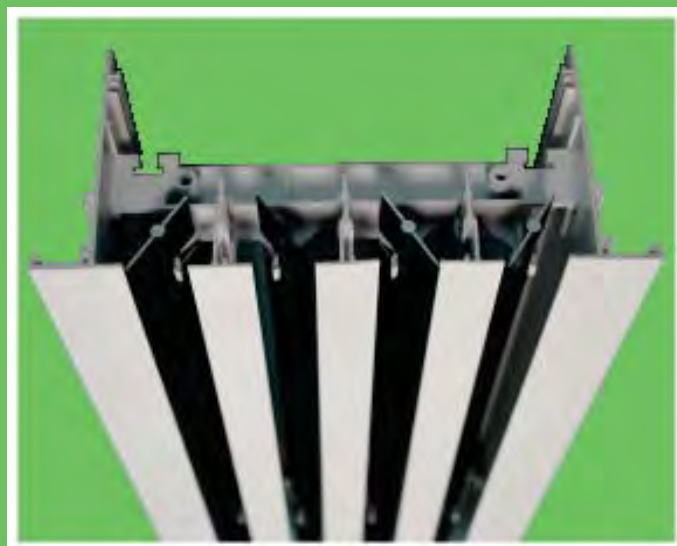


LCS Linear Slot Diffusers

LCS-F	28 mm flanged general purpose
LCS-P	18 mm flange for flush/recess mounting
LCS-J	25 mm flange for flush/recess mounting
LCS-TW	82.5 mm flange for flush/recess mounting
LCS-M	No flange
LCS-Plank	Plank replacement unit



Linear Slot Diffusers

LCS

Introduction

The LCS Linear Slot Diffuser has been developed to offer a cost effective alternative to the infinitely variable CS range of slot diffusers. Available in 2, 3 or 4 slots it comes complete with a black anodised aluminium pattern control element and will provide either a one or two way horizontal distribution. The LCS can be combined with the standard CS flange and plenum combinations.

Product Description

- LCS-F** 28 mm flanged general purpose
- LCS-P** 18 mm flange for flush/recess mounting
- LCS-J** 25 mm flange for flush/recess mounting
- LCS-TW** 82.5 mm flange for flush/recess mounting
- LCS-M** No flange
- LCS-Plank** Plank replacement unit
- Ends** End caps
- ED** Equalising deflector

Features

- Common plenum design with CS
- 2, 3 or 4 slot formats
- Easily adjustable air pattern
- Common external trim detail

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

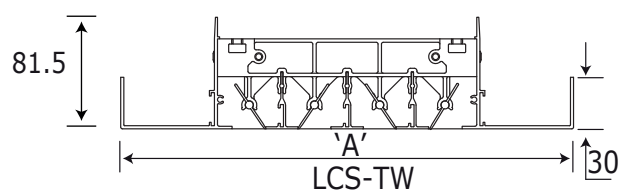
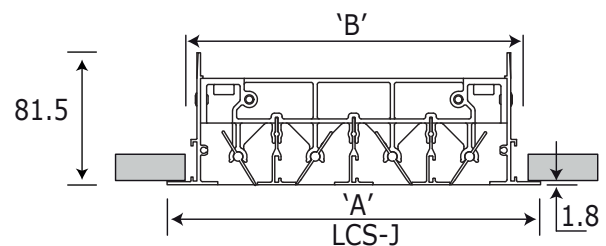
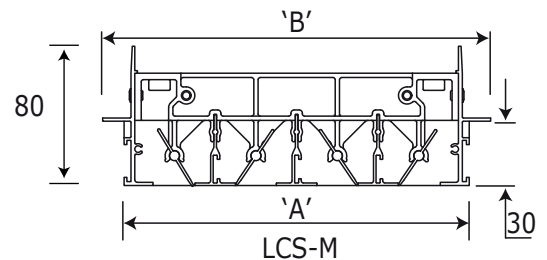
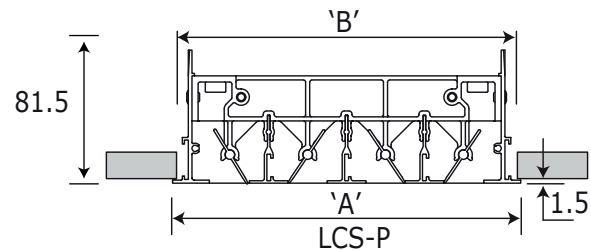
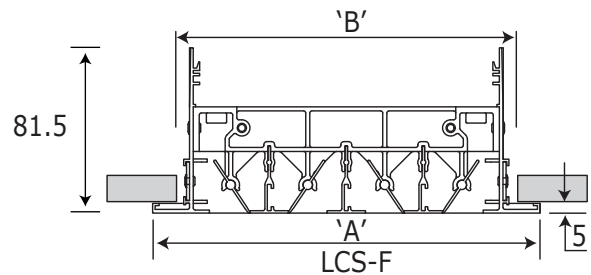
Sizes

Standard from 2, 3 or 4 slots wide, 1800mm long (excluding ends).

Continuous diffuser lengths are supplied in sections for butt jointing on site. (Alignment plates supplied)

Dimensions

Diffuser Type	Number of Slots		
LCS-F	2	3	4
O/A Flange Dim 'A'	114	152	190
Cutout Opening Size 'B'	95	133	171
LCS-J	2	3	4
O/A Flange Dim 'A'	108	146	184
Cutout Opening Size 'B'	89	127	165
LCS-M	2	3	4
O/A Flange Dim 'B'	105	143	181
Face Flange Dim 'A'	86	124	162
LCS-P	2	3	4
O/A Flange Dim 'A'	95	133	171
Flush Cutout Size 'B'	89	127	165
Recess Cutout Size 'B'	96	134	172
LCS-TW	2	3	4
O/A Flange Dim 'A'	223	261	299



ORDER EXAMPLE

LCS-F/1800/4SL/9010-Matt/2-ENDS

Type _____

Length _____

No of Slots _____

Finish _____

Ends caps _____

Linear Slot Diffusers

LCS

Selection Criteria

Ceiling height 2.75m, increase throw by 1m for each 1m increase in ceiling height. Horizontal diffusion is based on a cooling differential of 11°C. Vertical projection is based on a heating differential of 11°C.

Noise level is based on diffuser sound power level less 8dB room absorption.

V_r = mean room air velocity (m/s)

V_t = terminal velocity of supply air jet (m/s)

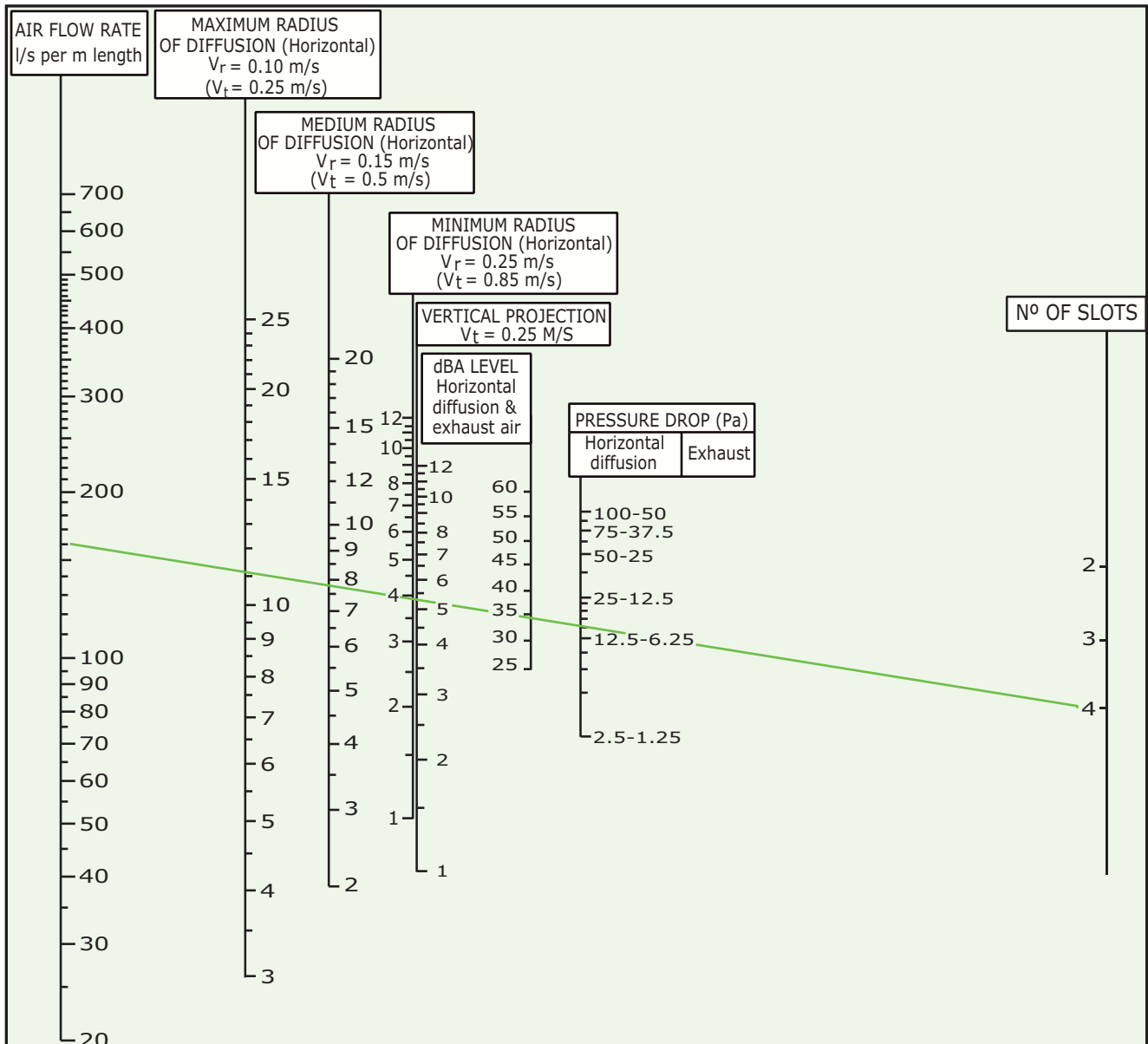
Selection Example

LCS/1800/4SL

Total air flow rate 288 l/s = 160 l/s/m
 Minimum throw $4.0 \times 0.8 = 3.2$ m
 Maximum throw $11.0 \times 0.8 = 8.8$ m
 Pressure drop 16 Pa
 Noise level $34 - 3 = 31$ dBA

Length corrections					
Active Length (m)	0.5	1.25	2.0	2.5	3.0
dBA Reduction	-8	-5	-3	-2	0
Throw multiplier	0.45	0.65	0.8	0.9	1.0

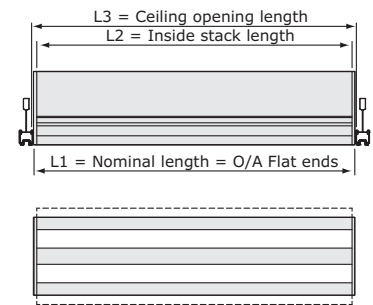
Performance Nomogram



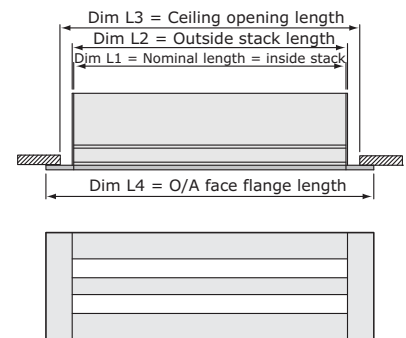
Linear Slot Diffusers

LCS

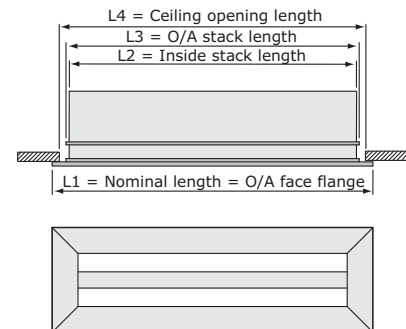
FLAT END CAPS			
Diffuser Style	Dim L1	Dim L2	Dim L3
LCS-M	Nominal Length	Nominal Length - 6	Nominal Length + 2
LCS-M TEG	Nominal Length	Nominal Length - 6	Nominal Length + 2



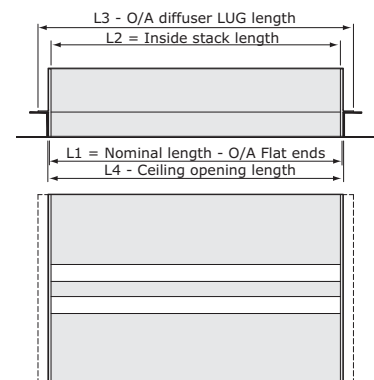
STANDARD END CAPS				
Diffuser Style	Dim L1	Dim L2	Dim L3	Dim L4
LCS-F	Nominal Length	Nominal Length + 3	Nominal Length + 19	Nominal Length + 56
LCS-P	Nominal Length	Nominal Length + 3	Nominal Length + 19	Nominal Length + 36
LCS-J	Nominal Length	Nominal Length + 3	Nominal Length + 19	Nominal Length + 53



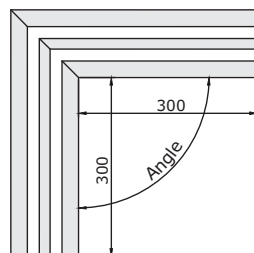
MITRED END CAPS				
Diffuser Style	Dim L1	Dim L2	Dim L3	Dim L4
LCS-F	Nominal Length	Nominal Length - 39	Nominal Length - 30	Nominal Length - 19
LCS-P	Nominal Length	Nominal Length - 20	Nominal Length - 11	Nominal Length - 7
LCS-J	Nominal Length	Nominal Length - 33	Nominal Length - 24	Nominal Length - 12



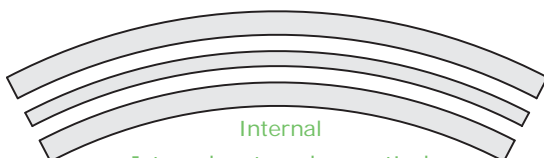
FLAT END CAPS				
Diffuser Style	Dim L1	Dim L2	Dim L3	Dim L4
LCS-TW	Nominal Length	Nominal Length - 6	Nominal Length + 25	Nominal Length + 2



Standard LCS Mitred Corner

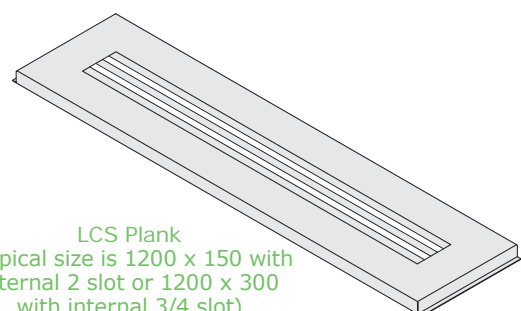


External



Internal

Internal, external or vertical air throw available, please specify on order.



LCS Plank
(Typical size is 1200 x 150 with internal 2 slot or 1200 x 300 with internal 3/4 slot)

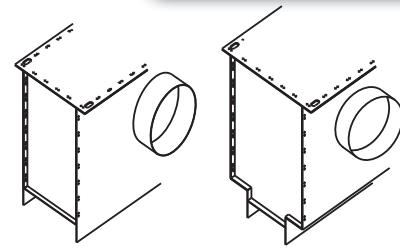
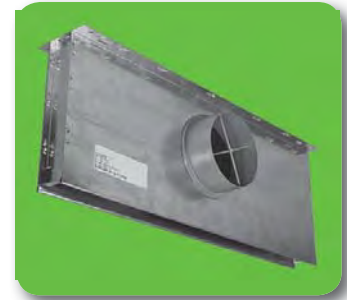
Plenum Boxes

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).

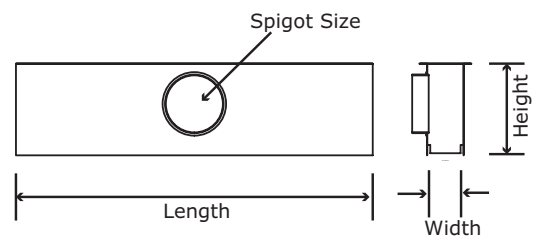
Product Description

- 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)



High-Line plenum box

Low-Line plenum box



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

PBHL/HF/2/1200/250/250/SE/147/2CC/OBSS/LINED

Type _____

Diffuser type _____

Number of slots _____

Plenum box Length _____

Plenum box Width _____

Plenum box Height _____

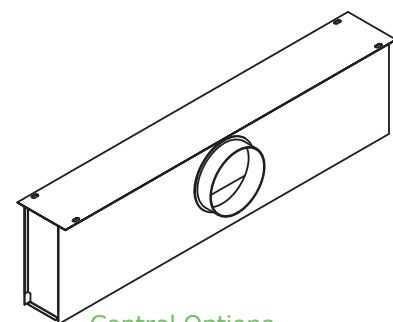
Entry position _____

Spigot Size _____

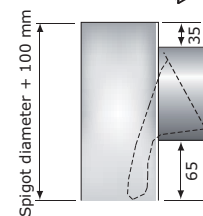
Spigot Number / Shape _____

Option _____

Option _____

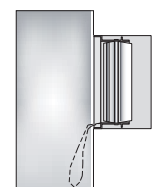


Control Options



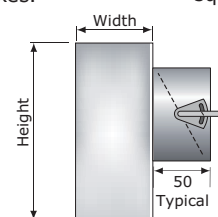
FDC

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



OBDO

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



FDQ

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

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 = 415mm.

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

Installation

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

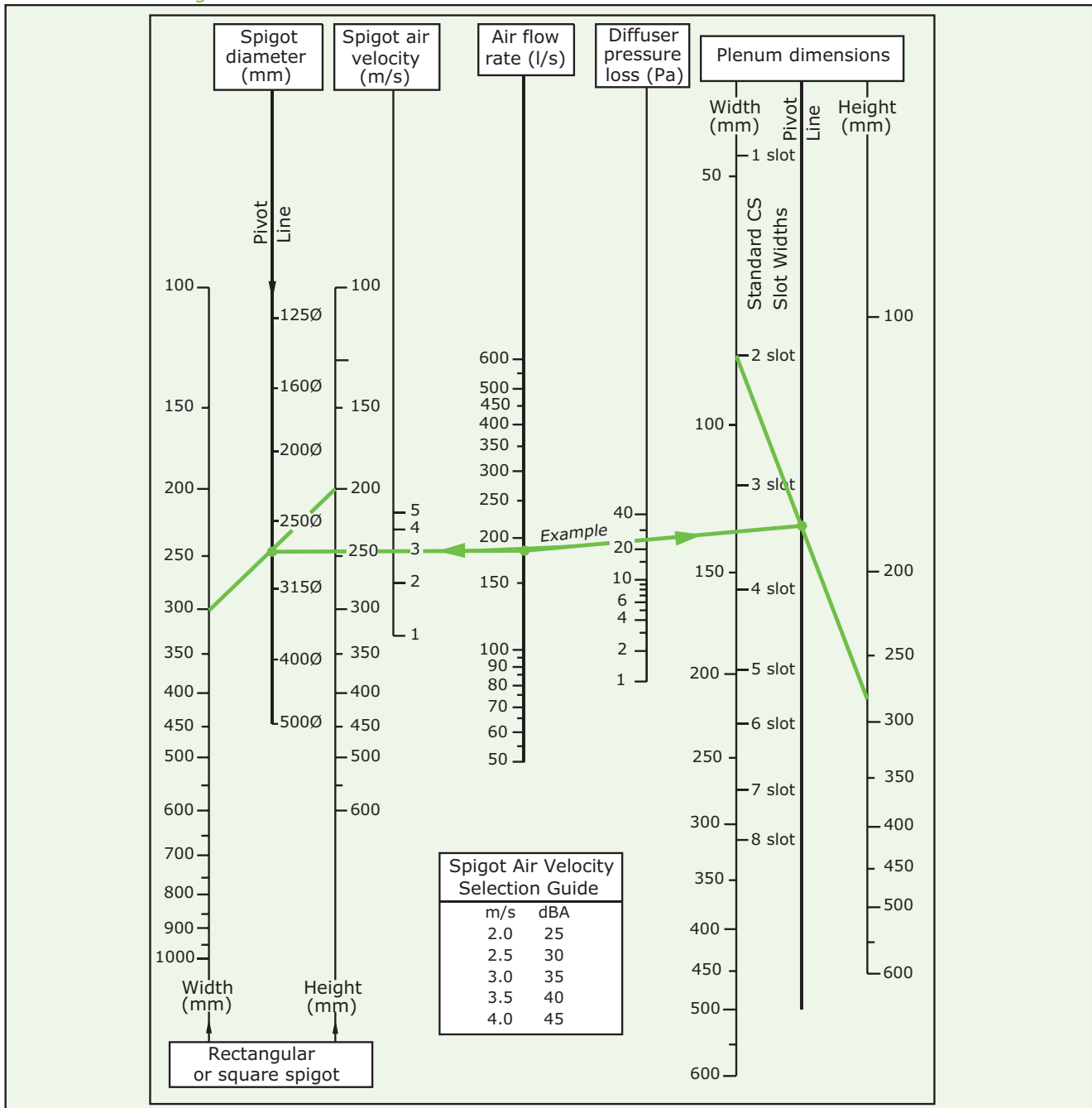
Note: Actual spigot diameter is nominal - 3mm (i.e. 200mm is 197mm actual).

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.

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



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

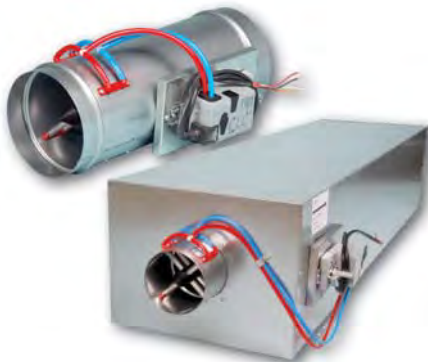
Designed to be installed in various ceiling systems, we have a complete range to suit both performance and aesthetic requirements. Most diffusers are made from aluminium and can be ordered with or without plenum boxes for easy duct work. Diffusers can be ordered in customer specified colours (PPM/G);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



Waterloo Air Products Ltd

Head Office:

Mills Road, Aylesford,
Maidstone, Kent ME20 7NB
Tel: +44 (0)1622 711500
Fax: +44 (0)1622 710648
email: sales@waterloo.co.uk
internet: www.waterloo.co.uk

Northern Office:

Hyde Park House, Cartwright Street,
Newton, Hyde SK14 4EH
Tel: +44 (0)161 367 1264
Fax: +44 (0)161 367 1262
email: sales@waterloo.co.uk
internet: www.waterloo.co.uk



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