Publication
DIFFUSERS
section 2

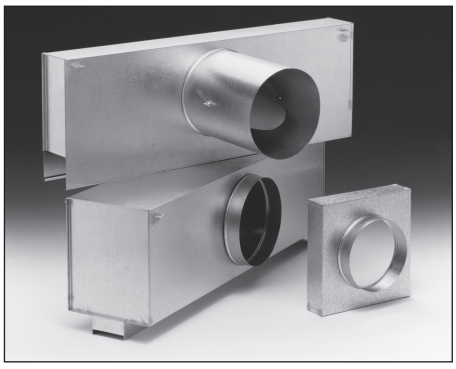
Part H

SEPT 2005

Air Diffusers

supply and exhaust ventilation systems

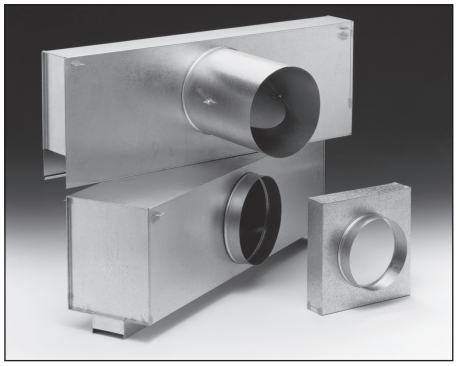
plenum boxes



Brooke Air®

introduction

The general range of PB plenum boxes are manufactured with a return edge hem in the neck to suit the yoke strap fixings supplied with LCS, Flowline and F45L diffusers.
The boxes can be manufactured to suit either top or side entry duct arrangements and are available with square rectangular or circular spigots.



type

PB

options

Optional spigot mounted flap dampers are available with either cord or quadrant operators.
Plenums can also be supplied with a non fibrous fire resistant acoustic liner for applications with critical noise limits.

plenum selection

The plenum selection nomogram on page 20 is designed to optimise the cross sectional area of the box to ensure an even distribution of air along the length of the diffuser.

To select an appropriate plenum size, firstly establish the static pressure loss of the diffuser at the required design duty from the appropriate performance table.

Then, using the selection nomogram, project a line between the flow rate and pressure loss scales to the pivot line of the plenum dimension scale. From there, project a line from the appropriate diffuser slot width through the pivot point and read off the plenum height. Note, an allowance should be added to the height to allow for the depth of the diffuser frame refer to note on the plenum height scale.

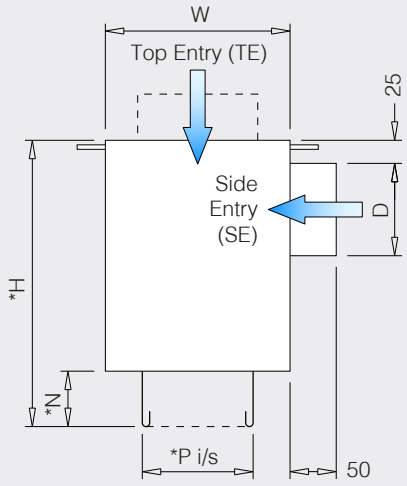
If the ceiling void height is limited, then any combination of width and height can be selected about the pivot point providing the plenum height can accommodate a suitable spigot size.

To determine the spigot size, project a line from the flow rate scale through the required spigot air velocity to the diameter line. Square or rectangular spigots of equivalent area can also be selected using the spigot diameter as a pivot point.

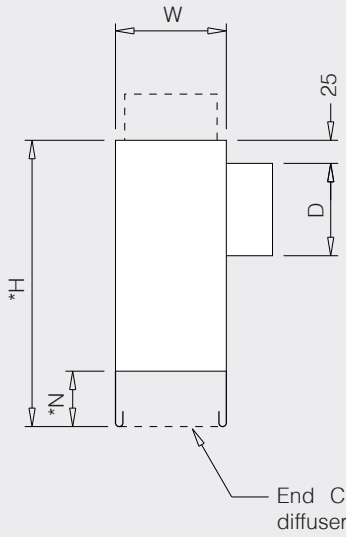
PLENUM BOXES

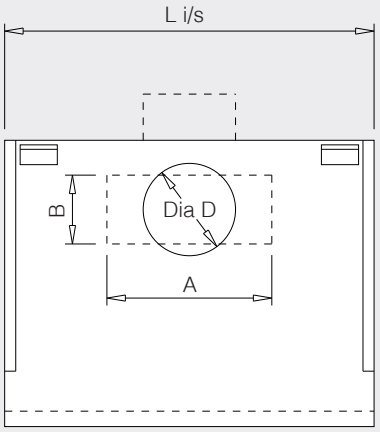
dimensions

PBL



PBH



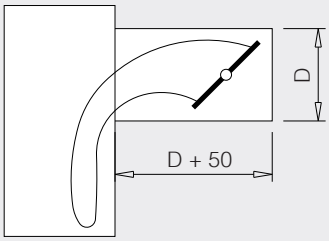


End Cap detail for single diffuser sections.

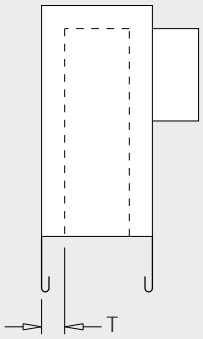
*P - Neck dimension to suit diffuser type. See appropriate diffuser dimension table.

*H - O/A Height including allowance for depth of diffuser.

*N - Flowline diffuser = 85mm
LCS = 82mm
F45L = 45mm



Damper options
FDC - Cord operated Flap
FDQ - Quadrant operated Flap



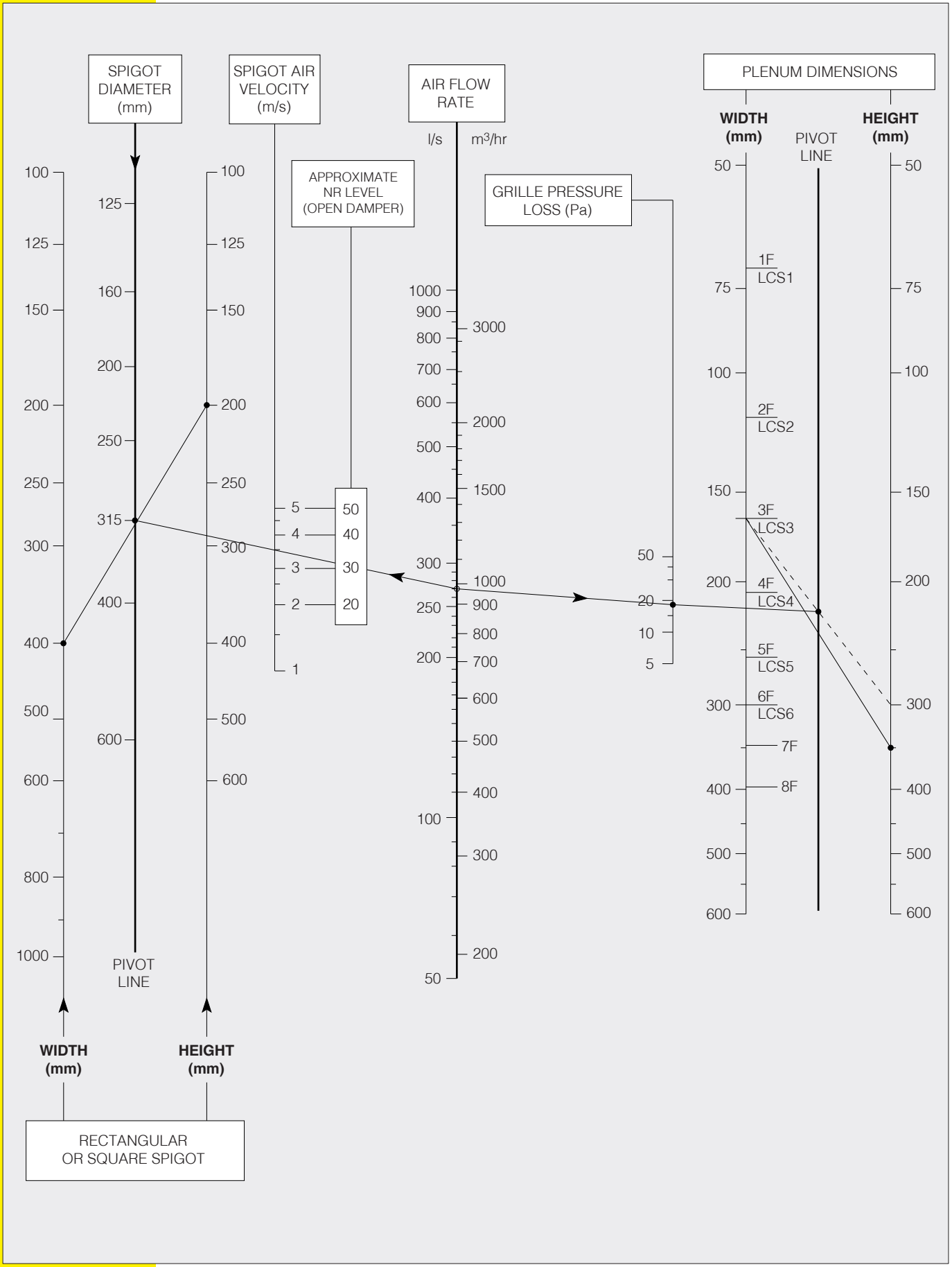
Optional Acoustic Liner
AL12 - T = 12mm
AL25 - T = 25mm
Allow for liner thickness when sizing plenum.

ordering details

EXAMPLE :

type	control	option	length	width	height	spigot	quantity
PBH	FDQ	AL12	1200	3F	435	315SE	4

SELECTION NOMOGRAM



PLENUM BOXES

example

Select a suitable plenum size for a 1.2m long 3F diffuser supplying 270 l/s. Air flow rate (l/s/m) = 270/1.2 = 225l/s/m, which from the chart on page 11 gives pressure loss of 18Pa.

From the nomogram, an active plenum height of 300mm would be satisfactory with a 400mm x 200mm spigot, but to accommodate an equivalent size circular spigot the plenum height would need to be increased to 350mm. The overall plenum height with a circular spigot would therefore be 350 + 85 = 435mm.

note

NOTE - to allow for the depth of the diffuser neck, add 85mm to the selected plenum height for Flowline and LCS slot diffusers, and 50mm for F45L louvre diffusers.

Diffuser programme literature

Brooke Air®

JC House,
Hurricane Way,
Wickford Business Park,
Wickford,
Essex SS11 8YB,
UK.

Tel: +44 (0)1268 572266
Fax: +44 (0)1268 560606
email: info@brookeair.co.uk
web: www.brookeair.co.uk