Series K Heavy duty Grilles

1KH Single set of horizontal blades
1KV Single set of vertical blades
2KH Double set of blades with front set horizontal
2KV Double set of blades with front set vertical
Grilles

Heavy Duty Adjustable Blade Grilles
1KH / 1KV / 2KH / 2KV

Introduction
The Waterloo Series K adjustable, single and double
deflection, grilles have been designed for industrial and
heavy commercial applications and may be used for supply
and exhaust systems. The vanes are screw fixed through
nylon bearings to eliminate vane rattle - even at very high
supply velocities; the vanes can also be tightened on site
to suit individual applications. Grille vanes are individually
adjustable to allow jet spread or deflection to be set within
45° of the duct axis.

Product Description

1KH  Heavy duty single set of horizontal blades
1KV  Heavy duty single set of vertical blades
2KH  Heavy duty double set of blades with front set
horizontal
2KV  Heavy duty double set of blades with front set
vertical
OBSS  Allen key operated opposed blade damper
SF   Screw fixing

Features
- Aluminium alloy extrusions with welded mitred frames
- Heavy duty frames and vanes for robust construction
- Single or double deflection for optimum air pattern
  adjustment
- Vibration free vane fixing to maintain setting and
  eliminate blade rattle
- Adjustable blade tension to suit low/high velocity
  applications

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
Series 1K  11 kg/m²  face area
Series 2K  17 kg/m²  face area
OBSS/ED  9.5 kg/m²  face area

Sizes
Minimum Size - 200 x 200
Maximum Size - 1100 x 1100
Standard increments 50/100 mm

Fixing
Screw through flange only with a 38 mm border.

ORDER EXAMPLE

<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
<th>Height</th>
<th>Border</th>
<th>Fixing (Screw Fix as standard)</th>
<th>Finish</th>
<th>Damper</th>
</tr>
</thead>
<tbody>
<tr>
<td>1KH/600/200/R38/SF/9010-Matt</td>
<td>OBSS</td>
<td></td>
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</tbody>
</table>
Heavy Duty Adjustable Blade Grilles

1KH / 1KV / 2KH / 2KV

Selection Criteria

Data presented below is based on isothermal supply air conditions with 0° spread. Data may be corrected for other applications.

dBA is based on a room absorption of 8 dB for sound power ref 10-12 w.

Ps is static pressure loss (Pa).

Throw is the forward distance travelled by the jet to where the velocity has retarded to 0.5m/s.

Data is based on free jet application. If grille is located within 400mm of the ceiling throw is increased by 50%. For exhaust applications multiply Ps x 1.5 and add 3 dB to dBA.

<table>
<thead>
<tr>
<th>Terminal velocity correction factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vt (m/s)</td>
</tr>
<tr>
<td>Throw multiplier</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spectrum correction factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency(Hz)</td>
</tr>
<tr>
<td>0° Blades</td>
</tr>
<tr>
<td>45° Blades</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Correction factors for grilles with an open damper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smallest grille size</td>
</tr>
<tr>
<td>dBA addition</td>
</tr>
<tr>
<td>Ps multiplier</td>
</tr>
</tbody>
</table>

Selection Example

2KH/300/300/SF

Air Volume 250 l/s

- Grille @ 0° deflection
- Throw 8.8 m
- dBA 24
- Ps 13 Pa

Vertical projection heating

Using the graph determine the throw correction factor to be applied to the tabulated data, based on the smallest nominal grille dimension and the heating differential.

For example: 600 x 300 grille

Discharging at a 2°C heating differential results in a correction factor of 1.1.

When applied to the nomogram the maximum downward projection is established.
Plenum Boxes

Plenum Box to suit Grilles

PBG / NRG Neck Reducer

Introduction

The plenum boxes for Grilles constitute an easy and cost-effective way to connect the grilles back to ductwork. 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.

An internal baffle plate can be fitted to the plenum box to help evenly distribute the airflow over the whole surface of the grille if used for Supply air.

Product Description

- **PBG** - Plenum Box for Grilles
- **NRG** - Neck Reducer
- **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 baffle plate (optional)
- **BLACK** - Plenum painted black to prevent through vision (optional)

Features

- Plated steel with stitched seam joints
- 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
- Oblong holes on top plate for easy drop rod installation
- Internal baffle plate for optimum air distribution (optional)

Finish

- PBG/NRG - Galvanised sheet steel

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 that the spigot diameter (Side Entry applications).

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.

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**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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