Flue Gas Dilution
CO₂ safe dispersal ventilation

Key Features

- Multi size flue dilution fans
- Ecodesign ErP 2015 compliant
- Easy electrical installation
- Safe operation - internal differential pressure switch for boiler shut off
- Avoid unsightly or expensive discharge flues
- Quiet and efficient
- 1% CO₂ content at outlet
- High levels of corrosion resistance allow use with condensation boilers
- Ecodesign EuP compliant IE2
- Dynamically balanced to DIN ISO 1940 - Grade 6.3

Flue Dilution GBDF & SSDF fans

Their main advantage is avoiding the use of unsightly and expensive flues as shown below. The 1993 Clean Air Act and Institute of Gas Engineers UPE 10/Part 1 (issue 3) Regulations requires that if the products of combustion are dispensed at low level then the CO₂ content must be 1% or less. Airflows' flue dilution range achieves this by introducing fresh air into the boilers discharge flue duct and diluting these flue gases. All fans dynamically balanced to ISO DIN 1940 – Grade 6.3.

Safety

A differential pressure safety switch ensures boiler shutdown in the event of fan failure on blocked flue, the switch consists of a relay circuit which will fall safe and prevent operation of the gas burner under the following conditions.

- Loss of fan air supply (blocked intake / fan motor inlet)
- Stalled fan motor
- Interrupted power supply
Applications

- Flue dilution
- Condensate air handling

The range of dilution fans come in two variations, GBDF for standard atmospheric installations and SSDF for enhanced corrosion resistance especially in use with high condensate content and or condensation boilers. 5 sizes in each range allow selection for industrial and commercial boilers rated up to 650 Kw (2,200,000 Blu).

Choosing the Correct Size and Type of Fan

Where possible there should be at least 2 metres of flue ducting from the fan to the outlet. To ensure a maximum concentration of 2% that this maximum temperature will not be exceeded.

Flow rate in l/sec = 4.44 x rated input of boiler in kW.

The volume flow rate provided by the fan will depend on the static pressure imposed by the size and length of flue ducting and the number of bends, louvres etc. comprising the installation. The performance table below enables selection of the correct dilution fan based on the flow rate requirement and the fans ability to overcome duct system resistance.

(Note: if LPG or Butane are being used then the factors above should be increased to 3.23 and 5.33 respectively. These flue dilution fans must not be used for any other fuels).

Performance Table at 20°C

<table>
<thead>
<tr>
<th>Fan size</th>
<th>GBDF 2</th>
<th>SSDF 2</th>
<th>GBDF 3</th>
<th>SSDF 3</th>
<th>GBDF 4</th>
<th>SSDF 4</th>
<th>GBDF 5</th>
<th>SSDF 5</th>
<th>GBDF 6</th>
<th>SSDF 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>litres</td>
<td>litres</td>
<td>litres</td>
<td>litres</td>
<td>litres</td>
<td>litres</td>
<td>litres</td>
<td>litres</td>
<td>litres</td>
<td>litres</td>
</tr>
<tr>
<td>10</td>
<td>300</td>
<td>300</td>
<td>600</td>
<td>600</td>
<td>1000</td>
<td>1000</td>
<td>500</td>
<td>500</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>20</td>
<td>290</td>
<td>290</td>
<td>590</td>
<td>590</td>
<td>985</td>
<td>985</td>
<td>490</td>
<td>490</td>
<td>240</td>
<td>240</td>
</tr>
<tr>
<td>30</td>
<td>280</td>
<td>280</td>
<td>580</td>
<td>580</td>
<td>970</td>
<td>970</td>
<td>480</td>
<td>480</td>
<td>230</td>
<td>230</td>
</tr>
<tr>
<td>40</td>
<td>260</td>
<td>260</td>
<td>570</td>
<td>570</td>
<td>950</td>
<td>950</td>
<td>470</td>
<td>470</td>
<td>220</td>
<td>220</td>
</tr>
<tr>
<td>50</td>
<td>250</td>
<td>250</td>
<td>560</td>
<td>560</td>
<td>935</td>
<td>935</td>
<td>460</td>
<td>460</td>
<td>210</td>
<td>210</td>
</tr>
<tr>
<td>60</td>
<td>230</td>
<td>230</td>
<td>550</td>
<td>550</td>
<td>920</td>
<td>920</td>
<td>450</td>
<td>450</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>70</td>
<td>220</td>
<td>220</td>
<td>540</td>
<td>540</td>
<td>905</td>
<td>905</td>
<td>440</td>
<td>440</td>
<td>190</td>
<td>190</td>
</tr>
<tr>
<td>80</td>
<td>210</td>
<td>210</td>
<td>530</td>
<td>530</td>
<td>890</td>
<td>890</td>
<td>430</td>
<td>430</td>
<td>180</td>
<td>180</td>
</tr>
<tr>
<td>90</td>
<td>200</td>
<td>200</td>
<td>520</td>
<td>520</td>
<td>875</td>
<td>875</td>
<td>420</td>
<td>420</td>
<td>170</td>
<td>170</td>
</tr>
</tbody>
</table>

Electrical Installation

In all classes of installation, it is essential that the pressure safety switch is connected into the supply circuit of the appliance gas valve so that the gas valve is shut off in the event of a fan failure or flue system blockage. After the fan has been installed and electrically connected, a check should be made to ensure that the pressure safety switch causes the boiler to be switched off when failure or blockage is simulated.

Flue Assistance

The GBDF range can also be used for flue assistance rather than flue dilution (ie: the fan handles all the products of combustion). It is important that the air into the motor side of the fan is ducted from outside the building. The maximum temperature allowed at the inlet of the non drive side of the fan is 110°C (230°F) to maintain acceptable motor bearing and winding temperature. Experience has shown that if a fan is chosen to give a maximum C0 concentration of 2% that this maximum temperature will not be exceeded.

Should you wish to use any of our fans purely as an induction fan WITHOUT dilution then the volume rate needed will be:

Flow rate ( induction only ) in l/sec = 1.35 x rated input of boiler in Kw.

Safety and Ease of Use

- Differential pressure safety switch which will activate if the fan stops operating or if the duct system becomes blocked, thus shutting down the boiler.

Pressure Safety Switch

- 6 or 10 pole plug and socket for easy wiring and installation.

The Range

The airflow range of Ecodesign ErP 2013/2015 Compliant flue dilution fans is available in 5 sizes to satisfy the dilution needs of industrial and commercial boilers rated up to 650 kW (2,200,000 Blu) input.

Typical Installations

Important when designing and installing a dilution system incorporating Airflow flue dilution fans, attention should be paid to the latest edition of the following standards and guides.

(i) BS 6644: 2005 Installation of gas fired hot water boilers of rated input between 60 kW and 2 MW.

The boiler is connected by a vertical flue to a header which is open to the "outside" air at both ends. One end of the header acts as the primary air intake for the dilution air and the other as the discharge. The fan is located on the discharge side of the header duct.
Figure 1. GBDF/SSDF Flue Dilution Fan
Multiple Boiler Installation

Figure 2. GBDF/SSDF Flue Dilution Fan
Single Boiler Installation

Minimum clearance for servicing motor and impeller (between motor side inlet and any obstruction)

Call: 01494 560800  Visit: airflow.com

Dimensions