BBFLOW - Online Burner Flow Measurement

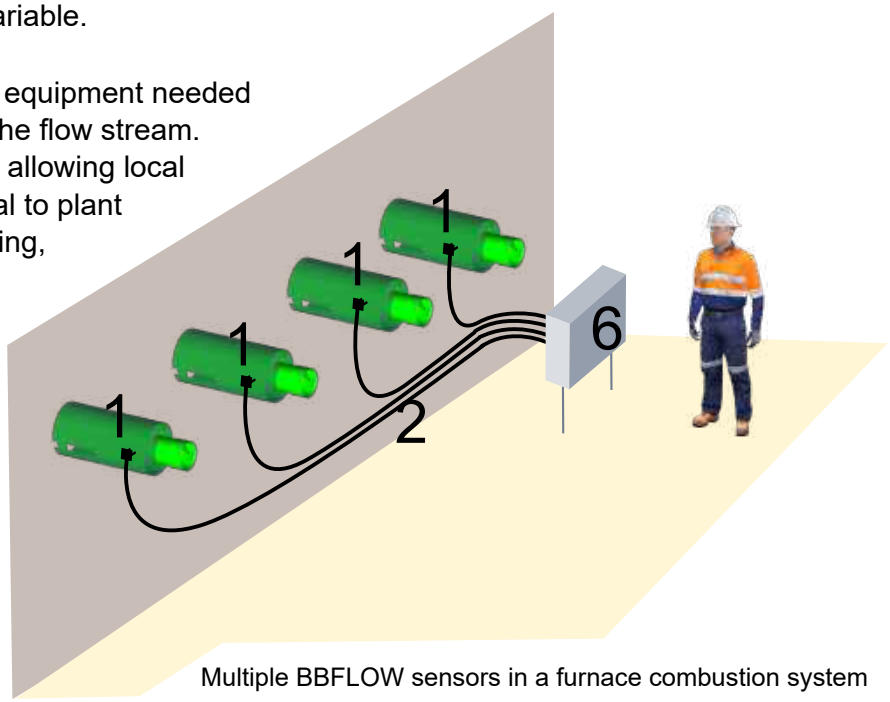
For Combustion Burner Flow Balancing

The BBFLOW System provides real-time, online measurement of combustion air flow rate through each individual burner of a furnace. The key element of the BBFLOW System is the choice of sensor tip: a custom-designed Burner Pitot Probe (BPP) measures both static and total pressure inside the burner annulus. This provides an accurate flow measurement on a per-burner basis. Probes are wind tunnel calibrated to ensure accuracy.

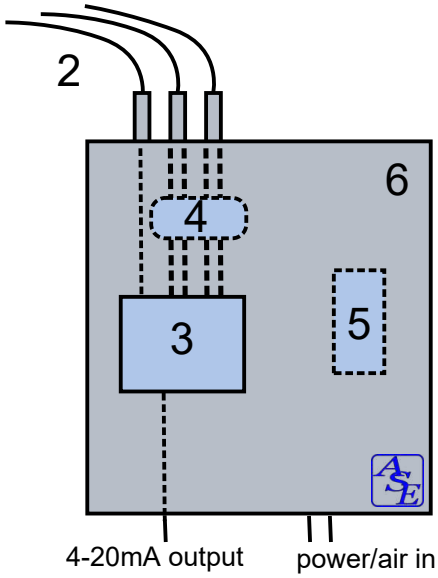
The BPP probe is ideal for flow streams in round cross sections or annulus flows, and can handle light particulate loading without plugging. A manual or auto purging system is available for heavier particulate loading. The BPP is designed for minimal sensitivity to flow directionality, and is generally designed to accomodate a preset swirling flow. A more advanced probe head, the BPP-3D or BPP-2D, can be incorporated where flow angles are highly variable.

The BBFLOW System provides all the basic equipment needed to measure air velocity and pressure within the flow stream. The system has many configuration options, allowing local display of flow parameters or an output signal to plant control system or DCS, manual or auto purging, temperature measurement, environmental control, etc.

Typically one BPP probe is installed per burner as shown at right. At least one control panel per burner level is used, and houses the instrumentation and purging system, if equipped.



Multiple BBFLOW sensors in a furnace combustion system



Typical Control Panel Layout

BBFLOW Components:

1 – Burner Pitot Probe
2 – Pressure lines
3 – Instrumentation
- Standard pressure gage (analog)
- Optional AIRFlow transmitter (4-20mA output)

4 – AIRPurge system
- Manual, or
- Automatic, PLC/relay controlled

5 – AIRTemp environmental control system
- Electric heater, and/or
- Vortex cooler

6 – Control Panel Enclosure
- NEMA 4 aluminium, or
- NEMA 4X stainless steel

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BBFLOW System Options

The BBFLOW from Airflow Sciences Equipment can be manufactured to fit a variety of configurations.

Burner Pitot Probe (BPP)

- Typical construction is stainless steel, but more erosion-resistant materials are available
- Probe length is variable, dependent on burner diameter
- Measures both static and total pressure in the flow stream
- Optional BPP-2D or BPP-3D probe head is available where true flow vector measurement is required

Instrumentation options

- Analog pressure gage for local display only
- AIRFlow transmitter / flow computer with 4-20mA signal output
- AIRFlow transmitter / flow computer with 4-20mA signal output and local digital display

AIRPurge Compressed Air Purge options

- Manual valving for maintenance personnel periodic purging
- Automated purging via PLC/relay timer at user-set interval

Enclosure options

- IEC IP 66
- NEMA 4 or NEMA 4X

Internal Materials options

- Brass / copper standard components
- Stainless steel components for corrosive environments

AIRTemp Enclosure Climate Control options

- Electric heater with set point for cold environments (<50°F / 30°C)
- Vortex cooler for hot environments (>135°F / 60°C)

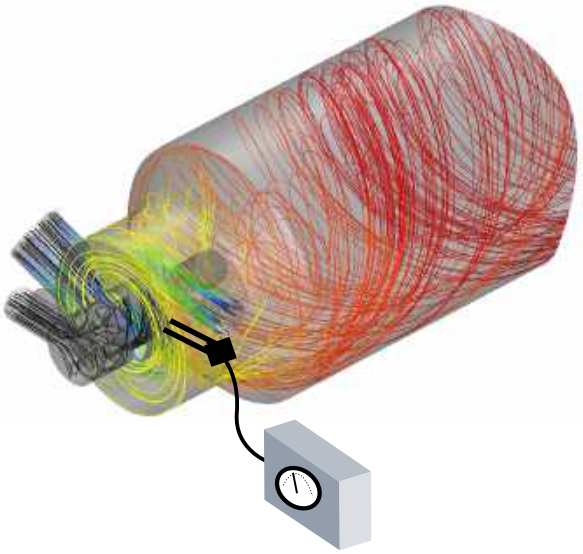
Specifications

System Parameters

Size:	varies based on burner diameter and options
Weight:	varies based on options
Electrical:	120 or 240 VAC
Compressed Air:	90 PSI, 5 CFM
Enclosure:	IEC IP 66, NEMA 4, NEMA 4X
Environment:	50°F to 135°F / 30°C to 60°C
Heating / cooling:	optional

Measurement Ranges

Air Velocity:	20 ft/sec to 160 ft/sec 6 m/s to 50 m/s
Static Pressure:	-65 IWC to +65 IWC -16 kPa to +16 kPa
Temperature:	32°F to 700°F 0°C to 370°C



BBFLOW sensor with analog local display