SUMMARY OF THE INVENTION

Aspects of the invention are defined in the independent claims. Some optional features of the invention are defined in the dependent claims.

Thus, in one exemplary arrangement, there is provided a ventilation system including an input side with a blower, an output side, a filter positioned between the input side and the output side, and a control system linked to the blower for controlling the output of the blower. The control system also includes a static pressure adjustment system. The static pressure adjustment system includes an input pressure sensor located adjacent the filter on the input side and an output pressure sensor located adjacent the filter on the output side. The static pressure adjustment system also includes a microprocessor linked to the input pressure sensor and the output pressure sensor, the microprocessor receiving signals indicating the static pressure on the input side and the output side. Based upon the static pressure on the input side and output side, the static pressure adjustment system determines a measured differential pressure and the pressure adjustment system continuously sends a signal to increase the output of the blower as the measured pressure differential increases.

The control system may include a graphical user interface.

The graphical user interface may include an input for an offset in the measured differential pressure.

The graphical user interface may include an input for a measured differential pressure of a clean filter.

The graphical user interface may include an input for turning the static pressure adjustment system on or off.

The static pressure adjustment system may include an alarm.

An exemplary method provides for adjusting air flow from a blower in a ventilation system to compensate for changes in static pressure across a filter. The method includes determining a measured differential pressure between an input side of a ventilation system and an output side of the ventilation system, wherein a filter is positioned between the input side and the output side. The measured differential pressure is continually measured as the filter fills with contaminants and the output of the blower is continuously increased as the measured differential pressure increases.

The ventilation system may include an inlet pressure sensor on the inlet side and an outlet pressure sensor on the outlet side.

The step of determining the measured differential pressure may include determining a measured differential pressure between the input side and the output side with a clean filter therebetween.

The method may include a graphical user interface.

The method may further include, prior to the step of continually measuring the differential pressure, measuring a pressure difference across the filter when the blower is off and no air flow is passing through the ventilation system.

The method may further include the step of issuing an alarm when the measured differential pressure reaches a predetermined level.

The predetermined level may be an indication that the filter needs to be replaced.

Other objects and advantages of the present invention will become apparent from the following detailed description when viewed in conjunction with the

accompanying drawings, which set forth certain exemplary embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic representation of a ventilation system including the present static pressure adjustment system.

Figure 2 is a graphical user interface employed in accordance with the static pressure adjustment system.

Figure 3 is a graph comparing the required output of a blower when the engineer designing and/or maintaining a ventilation system bases his/her calculations for the change in static pressure across a filter upon the worst case scenario of a dirty filter so as to ensure proper air flow through the ventilation system and the actual required output of the blower when the engineer designing and/or maintaining a ventilation system utilizes the present static pressure adjustment system to control the output of the blower in real-time based upon the measured conditions of the filter.

side of the ventilation system 100. As will be explained below in greater detail, the measured static pressures on the input side 102 and the output side 104 are used to calculate the change in static pressure (that is, the measured differential pressure) across the filter. Where a pressure difference across a filter 14 is calculated when the blower 12 is off, an offset may be established to zero the pressure reading; that is, where residual pressure differences exist in the ventilation system that are unrelated to the blower and/or the filter, it is necessary to take this into account so as to ensure the accuracy of measurements during the implementation of the present system. Still further, if a calibrated pressure displays a different reading, it is desirable to modify the range in small increments to balance the ventilation system 100.

As such, the blower 12 output needed to create air flow required for use in conjunction with a clean filter 14 is first established using a conventional HVAC blower linked to the control system 16. The change in static pressure across the clean filter 14 is continuously measured and displayed via the graphical user interface 18 of the control system 16. This is input as the clean measured differential pressure. As will be explained below in greater detail, as the measured differential pressure increases as a result of the filter 14 filling with contaminants, the blower 12 output is continuously increased in real-time based upon the measured differential pressure so as to compensate for the increased resistance to air flow and to ensure that adequate air flow is achieved through the building.

Prior to implementation of the present static pressure adjustment system 10, and in conjunction with establishing the clean measured differential pressure, the pressure difference across a clean filter 14 is measured when the blower 12 is off and no air flow is passing through the ventilation system 100. This pressure difference is established as the pressure offset, and is either added or subtracted

CLAIMS:

1. A ventilation system, comprising:

an input side with a blower;

an output side;

a filter configured to be positioned between the input side and the output side;

a control system configured to be linked to the blower for controlling the output of the blower, the control system also including a static pressure adjustment system, the static pressure adjustment system including:

an input pressure sensor configured to be located adjacent the filter on the input side and an output pressure sensor configured to be located adjacent the filter on the output side;

a microprocessor configured to be linked to the input pressure sensor and the output pressure sensor, the microprocessor configured to receive signals indicating the static pressure on the input side and the output side, and based upon the static pressure on the input side and output side, the static pressure adjustment system is configured to determine a measured differential pressure and the static pressure adjustment system being configured to continuously send a signal to increase the output of the blower as the measured pressure differential increases.

2. The ventilation system according to claim 1, wherein the control system includes a graphical user interface.

3. The ventilation system according to claim 2, wherein the graphical user interface includes an input for an offset in the measured differential pressure.

4. The ventilation system according to claim 2, wherein the graphical user interface includes an input for a measured differential pressure of a clean filter.

5. The ventilation system according to claim 2, wherein the graphical user interface includes an input for turning the static pressure adjustment system on or off.

6. The ventilation system according to claim 1, wherein the static pressure adjustment system includes an alarm.

7. A method for adjusting air flow from a blower in a ventilation system to compensate for changes in static pressure across a filter, comprising the steps of:

determining a measured differential pressure between an input side of a ventilation system and an output side of the ventilation system, wherein a filter is positioned between the input side and the output side;

continually measuring the measured differential pressure as the filter fills with contaminants; and

continuously increasing output of the blower as the measured differential pressure increases.

8. The method according to claim 7, wherein the ventilation system includes an inlet pressure sensor on the inlet side and an outlet pressure sensor on the outlet side.

9. The method according to claim 7, wherein the step of determining the measured differential pressure includes determining a measured differential pressure

between the input side and the output side with a clean filter therebetween.

10. The method according to claim 7, further including a graphical user interface.

11. The method according to claim 7, further including, prior to the step of continually measuring the differential pressure, measuring a pressure difference across the filter when the blower is off and no air flow is passing through the ventilation system.

12. The method according to claim 7, further including the step of issuing an alarm when the measured differential pressure reaches a predetermined level.

13. The method according to claim 12, wherein the predetermined level is an indication that the filter needs to be replaced.