

High Temperature Anemometer



KANOMAX
The Ultimate Measurements

Application Note

Industrial Processing - High Temperature Air Flows

There are many ways and many reasons to measure air flow. Common applications include HVAC testing, adjusting and balancing, IAQ investigation, and controlled environment monitoring. Some common methods of measuring air flow include vane and hot-wire anemometers, capture hoods and pitot tubes. Each instrument has its own advantages and applications it excels at, but with the exception of the pitot tube they are all limited to relatively moderate air temperatures. For specialized applications where air flow must be measured at higher temperatures (up to 400°C) a specialized instrument is needed. Kanomax manufactures a high-temperature anemometer designed for these applications. This application note will address some of those applications and then at the end we'll go over some of the features and benefits of using the Kanomax 6162 high temperature anemometer as a solution.

The main applications for high temperature air flow monitoring are:

- Drying Process Control
- Forming Process Control
- Exhaust Air Measurement
- Device Performance Testing

Drying Process Control:

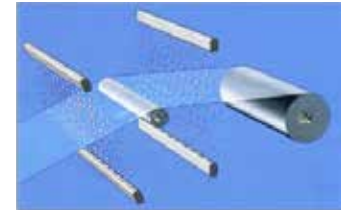
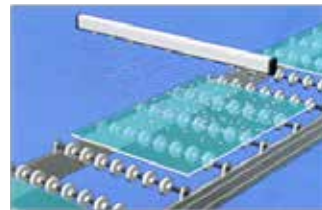
The drying process consists of the removal of water or another liquid via evaporation. In most cases an air flow applies the heat by convection and then carries away the released water vapor (humidity). The process is often used in food processing industries to dry product prior to it being packaged for sale. Improper airflow or heating can result in undesirable texture or taste of the final product, and it also affects the efficiency of the drying. Nuts, fruit and ramen are dried in bulk and in order to maximize production the best practice is to only dry the food as long as is necessary and not any longer; this requires precise control. Drying is also used in other industries such as film and panel manufacturing and pharmaceutical processing. The air flow needs to be monitored to ensure the product is being evenly exposed to the heated air so it dries uniformly and without warping or other distortion in the case of LED panels.



LED Panel drying process

Forming Process Control:

The forming process is similar to drying, but maintaining a smooth evenly distributed airflow is critical. Any significant deviations in the air flow or temperature can result in warps, cracks and other imperfections in the finished product which leads to significant loss of income to waste. This process is used primarily by carbon fiber and polymer manufacturers, film manufacturing and solar panel production.



An even airflow ensures a quality finished product

Exhaust Air Measurement:

Boilers and incinerators require some kind of exhaust mechanism for the gases they release during the combustion or boiling process. These applications are common to chemical or steel and other metal working plants. Monitoring the air flow coming out the exhaust serves several functions: it ensures that the gases are venting at the appropriate rate to prevent damage to the equipment, and it also allows the plant to monitor how much gas output their exhaust is venting each day which may need to be controlled due to environmental concerns or regulations. The air flow must also be monitored at the intake level of the combustion process as too little or too much air can

result in a dirtier burn that produces more waste/pollution or wastes energy and time with an inefficient burn. In order to make sure this occurs the airflow must be precisely measured and controlled.



A technician uses the 6162 to measure air flow in the flue



Incinerator exhaust pipes

Device Performance Testing:

Another common application for a high temperature anemometer is performance testing of industrial or laboratory equipment to check that the devices are working properly. Examples of such devices are incubators, industrial kilns and reflow ovens. The manufacturer or lab using the device may want to monitor airflow during the process, but in addition to these applications the device manufacturer may want to do benchmark testing for quality assurance purposes prior to selling the device. Reflow ovens are often monitored when in use as well, both to make sure the airflow through the oven is properly distributed and to ensure that the exhausts are working properly.



Examples of an incubator (bottom left) and a reflow oven (above) that may be tested for quality purposes with a high temperature anemometer prior to being sold

Providing a solution to high temperature air flow testing

Kanomax manufactures the model 6162 high temperature anemometer that can be used to measure airflow in the applications mentioned above. The instrument comes with a number of features and benefits that can solve the problem of measuring air flow in a high temperature environment.



Model 6162 High Temperature Anemometer

- The instrument can handle air velocity ranges from 40 to 9840 fpm (0.2 to 50 m/s).
- It can measure temperatures up to 932°F or 500°C.
- Digital and analog output is available to connect to a datalogger or process control device for automation purposes.
- The device can be powered via AC adapter for long-term monitoring, or via 6 x D batteries for measurements on the go.
- A handy shoulder strap makes the instrument easy to carry for flue measurements that may be on the roof or other location where a permanent setup is not feasible.

- The special temperature compensation sensor installed in each probe ensures the Kanomax 6162 measures accurately even at higher temperature ranges.
- Simultaneous measurements of air velocity, temperature and air flow rate simplifies monitoring.
- The instrument can simultaneously calculate minimum, maximum and average air flow and download it to a PC via the optional measuring software.



High temperature (top) and mid-temperature probes



Optional Measuring Software

The instrument can use any of three optional probes, which are all field-swappable without the need to re-calibrate the instrument. The compact model 0203 mid-temperature probe is perfect for applications ranging from 32 to 392°F (0 to 200°C). Model 0204 and the shorter model 0205 are designed for high temperature applications and are rated from 32 to 932°F (0 to 500°C). Other important accessories include extension rods for specialized applications, and compression fittings that ensure a tight and proper fit for in duct/in process measurements. Further details about each probe, including its dimensions and cable lengths can be found on our website at www.kanomax-usa.com.

The Kanomax model 6162 High Temperature Anemometer is designed to be an ideal solution for the applications presented in this paper. If you have any

questions about the product or would like to get in touch with one of our authorized distributors to request a quote please contact us at info@kanomax-usa.com or give us a call at 973-786-6386.

About Kanomax USA, Inc.

Kanomax has delivered the best measurement solutions in its products and services that adapt precision measurement technology for fluids and particles. Kanomax product lines include anemometers, particle counters, dust monitors, and IAQ monitors. Kanomax is contributing to technological innovation and quality improvement for the processes of quality management, environment management, and technology development in the areas of environment, health, and energy, which are essential to sustain human well-being, as well as in other industrial areas including automobile, aerospace, semiconductor, electronics manufacture, heavy industry, steel, shipbuilding, pharmaceutical, biotechnology, food-processing, medical, construction, and civil engineering.