

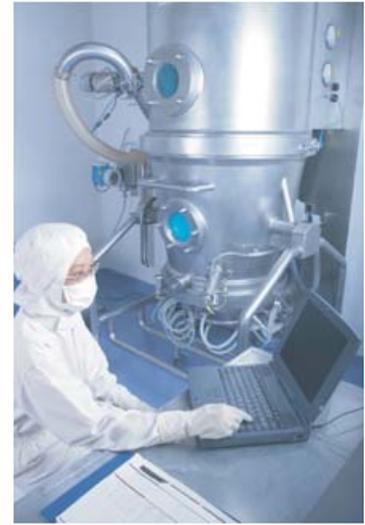
Cleanroom Contamination Control Solutions



Ultimate Solutions for Cleanroom Environment

Kanomax cleanroom contamination control products are designed to serve applications from continuous monitoring to certification for any clean environments in the pharmaceutical, electronics, medical, and food industries.

Handheld and portable particle counters help users to enact spot-checking in order to meet the level of particulate contamination in the clean environment required by industry standards, such as ISO 14644-1. Remote particle counters and cleanroom monitoring system implement control solution for continuous facility monitoring.



Cleanroom Certification

Kanomax has developed several types of particle counters to aid in the certification process. Our handheld units are great for spot-checking and can certify smaller installations. The larger portable particle counters are pre-programmed with a standards mode to facilitate the certification process.

One of the primary ways to control particles is with proper airflow and ventilation. We offer several instruments that can test and balance a newly setup cleanroom or check airflow rates for certification purposes.



Model 3886

Handheld Particle Counter Model 3886 & 3887

Model 3886 and 3887 are CE certified handheld laser particle counters. The Model 3886 measures 5 particle sizes simultaneously with optional multi-functions, such as air velocity, temperature, and humidity. Its low air velocity measuring function is suitable for laminar flow units. The Model 3887 is a light weight and easy to use instrument.



Model 3887

Features and Benefits

- Simultaneous 5 channel particle measurements (Model 3886)
- Simultaneous 3 channel particle measurements (Model 3887)
- Handy and easy operation
- Multi-functions: Particle, Air Velocity, Temp, R/H (Model 3886)
- ISO mode calculates 95% UCL for user (Model 3887)



Model 3910

Portable Particle Counter Model 3910 & 3905

The 3910 & 3905 are the smallest 6-channel portable particle counters in the industry; with a 50 LPM and 1 CFM flow rate respectively and a 0.3 micron sensitivity. Both units feature a large color touch screen, streamlined, user-friendly interface and pre-programmed standards mode to guide you through the measuring and certification process it may also be the most helpful.

Features and Benefits

- The unit is featherlight and the smallest in the industry
- Simultaneously measures and displays up to 6 particle sizes
- Enables you to certify cleanrooms up to ISO Class 2
- Fully compliant with ISO 21501-4 calibration standard



Climomaster™ & Probes

Climomaster™ Model 6501 Series

The most accurate hotwire anemometer (in its class) in the world. Just some of its capabilities include: up to 8 interchangeable probes for air velocity, temperature, humidity, and differential pressure.

Features and Benefits

- Simultaneously measures and displays air velocity, flow rate, humidity, temperature, and differential pressure
- 8 interchangeable probes are available for various applications
- Data processing software allows real-time measuring and downloading data to PC



Model 6710

TABmaster™ Capture Hood

Our new Kanomax TABmaster™ is the perfect tool for accurate supply and return airflow measurements. Interchangeable hoods make it a snap to sample the air for any duct size. The unit is lightweight and easy to handle. The full color screen can be tilted so it's at the optimal viewing angle at any height.

Features and Benefits

- Lightweight design makes one-person setup and use easy
- Five hood sizes make it easy to pick one that fits your duct size



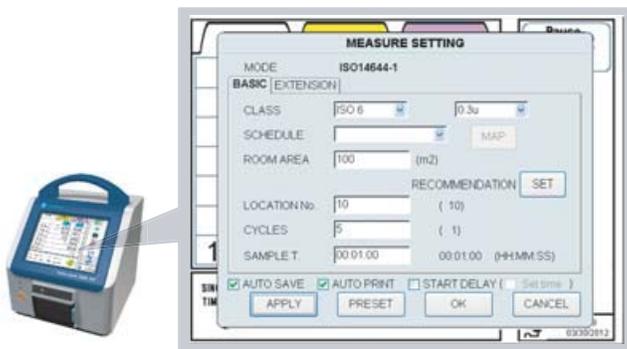
Making ISO Cleanroom Certification easy with Kanomax Particle Counters

This guide is a brief look at how the Kanomax Particle Counters can simplify the job of certifying your ISO class cleanroom.

The ISO procedure can be broken down into 7 basic steps to certify a cleanroom. Let's take a look at these steps and then we'll go over how the features of Kanomax particle counters can help you with the job.

Step 1: Calculating the number of locations

The 3905 and 3910 have a Standard mode that allows you to enter the area of the room in cubic meters. Once this is done the instrument will calculate how many points need to be measured. You can still adjust the number of points manually if desired, but if you are following the ISO standard the instrument does the calculation for you.



3905/3910 ISO Mode Settings



Example of a map uploaded to the 3905/3910

Summary of Seven Steps to Cleanroom Certification:

- 1) Calculate the number of locations that need to be sampled based on the cleanroom size.
- 2) Determine the particle sizes to be measured, max concentrations allowed and the minimum sampling volume at each location.
- 3) Measure the particles at each sampling location.
- 4) If you are performing multiple samples at each location take the average from each location.
- 5) Take an average of the measurements from all the locations.
- 6) If the number of points sampled was between 2 and 9 then calculate the 95% UCL.
- 7) Determine if the cleanroom passed or failed by comparing the UCL to the maximum particles per cubic meter as shown on the ISO table.

Step 2: Determine particle size, max. concentration and minimum sampling volume.

The cleanroom certifier will need to determine these numbers per the ISO procedure. It's important to note the flow rate of the 3886 and 3887 is 2.83 L/min, the 3905 is 28.3 L/min, and the 3910 is 50.0 L/min. If you will be certifying multiple cleanrooms and typically need to sample a high volume of air then the 3910 is a better choice with its higher sampling rate. The 3887 is the perfect tool for smaller air samples. Both instruments can be programmed to sample for a specified length of time making it easy to sample precise volumes of air flow.

Kanomax particle counters have the following flow rates:

Particle Counter Model #	Flow Rate
3887 Handheld	2.83 L/min (0.1 CFM)
3886 Handheld	2.83 L/min (0.1 CFM)
3905 Portable	28.3 L/min (1.0 CFM)
3910 Portable	50.0 L/min (1.77 CFM)

Step 3: Measure particles at each location.

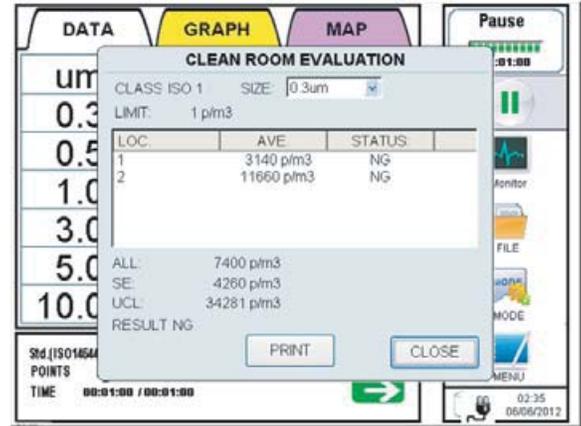
The 3887 has an ISO mode that will allow you to program it with the number of sample points and sample duration needed to certify the cleanroom. The 3905 and 3910 have a similar mode called Standard mode that includes a configurable setup to certify ISO (as well as other standards such as EU GMP). You can even upload a map of your cleanroom and specify the measuring locations on it in the particle counters.

Step 4 through 6: Average the measurements taken at each location, then average the final results from all locations and calculate the UCL.

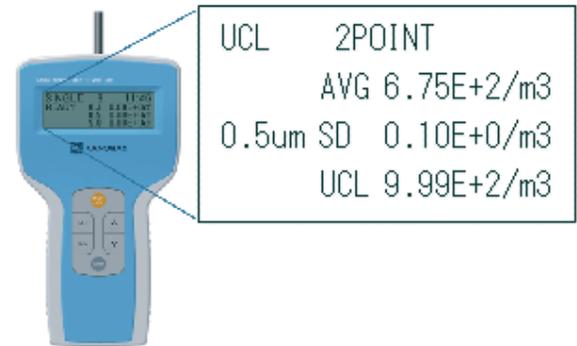
Both instruments will automatically calculate the averages and the UCL for you. These steps are essentially eliminated from your workload.

Step 7: Determine if the cleanroom passed.

You can determine if the cleanroom passed or failed by comparing the UCL to the maximum particle concentration allowed as shown on the ISO table. The 3887 will calculate the UCL for you and you can just compare the final number to the ISO table. The 3905 and 3910 are programmed with the ISO standards and will tell you on the spot if your cleanroom has passed or failed. With its built-in printer it can even issue an on-the-spot report.



3905/3910 ISO mode results showing UCL and passing results for a Class 6 cleanroom



3887 ISO mode results showing UCL

ISO Cleanroom Classification Table (ISO 14644-1: 1999)

	ISO classification	Highest levels of particle concentrations (particles/m ³) equal to or greater than the parameters listed as follows.					
		0.1 µm	0.2 µm	0.3 µm	0.5 µm	1.0 µm	5.0 µm
Certify every 6 months	Iso Class 1	10	2	-	-	-	-
	Iso Class 2	100	24	10	4	-	-
	Iso Class 3	1,000	237	102	35	8	-
	Iso Class 4	10,000	2,370	1,020	352	83	-
	Iso Class 5	100,000	23,700	10,200	3,520	832	29
Certify every 12 months	Iso Class 6	1,000,000	237,000	102,000	35,200	8,320	293
	Iso Class 7	-	-	-	352,000	83,200	2,930
	Iso Class 8	-	-	-	3,520,000	832,000	29,300
	Iso Class 9	-	-	-	35,200,000	8,320,000	293,000

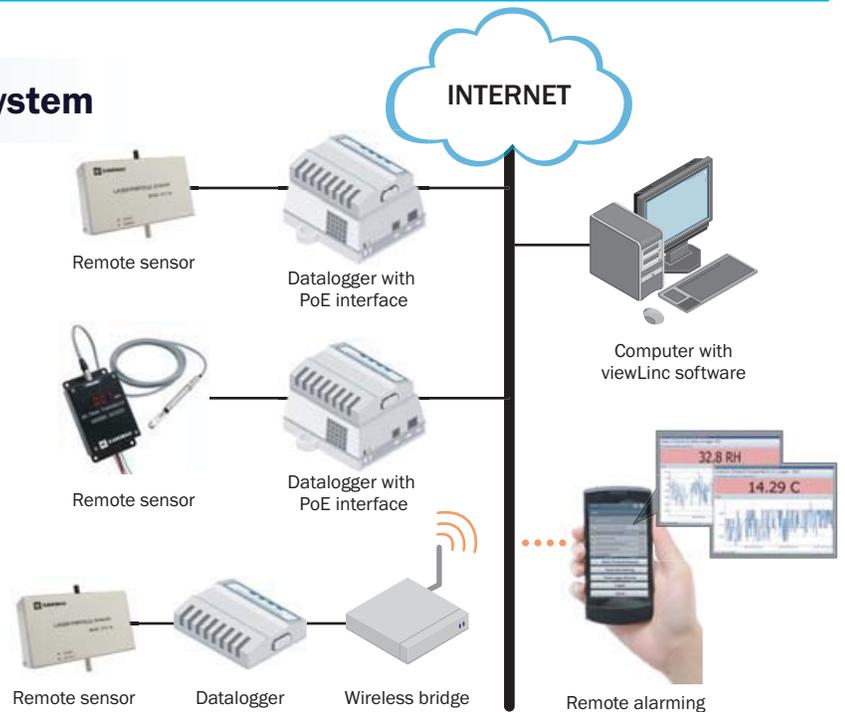


Cleanroom Continuous Monitoring

Kanomax offers a complete 24/7 monitoring solution suitable for pharmaceutical, aerospace, semiconductor and food industries. This system is easy to custom to your specific needs because of its modular nature. Our analog output sensors can even be added to your existing system.

Large Scale Facility Monitoring System

The datalogging and viewLinc PC software package is a powerful tool for large scale, continuous facility monitoring. Sensors (such as particulate, temperature, humidity and pressure) placed in critical or key locations connect to dataloggers, which in turn can integrate with an existing network (wired or wireless) and transfer the data to the system software. The software then provides remote monitoring, alarm warnings and reporting. Remote alarms includes: emails, text messages and even phone dial-out to notify operators or administrators. Using this system a facility manager can remotely monitor several facilities via the internet.

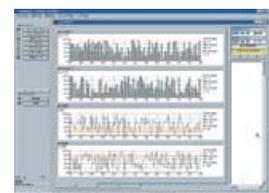


Standard Cleanroom Monitoring System

Kanomax Cleanroom monitoring System (CRMS) provides an automated means to monitor and gather airborne particle counts and other parameter levels in controlled environments. The CRMS allows users to perform a variety of functions from their PC including the alteration of alarm information and the viewing of particle count concentrations. The system is designed with a modular nature so you can purchase exactly what you need for your particular application. Whether you need a single sensor or two located at critical areas or a full multi-sensor, 24-hour monitoring system, Kanomax can work with you to provide the perfect system.



Map

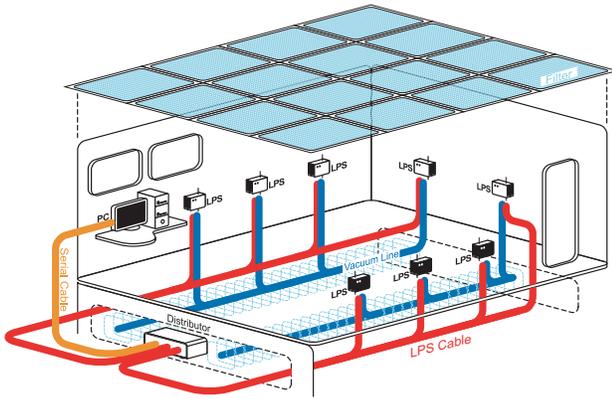


Trend Graph

Monitoring System Examples

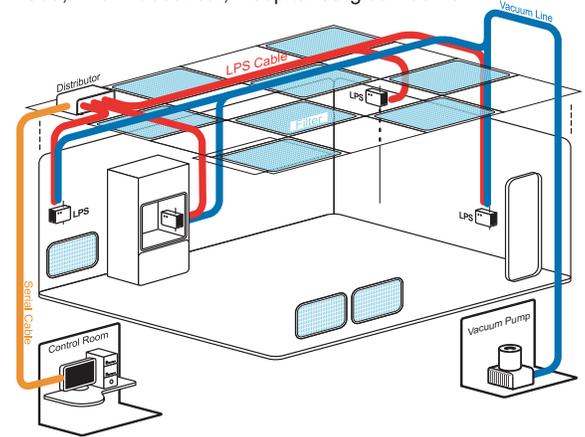
Industrial Cleanroom

Semiconductor, HDD, Flat Panel Display, Electronics



Bio-medical Cleanroom

Food, Pharmaceutical, Hospital surgical rooms



Basic Particle Monitoring System

The new AES-1000 Basic Particle Monitoring System is designed to check particulate levels for process monitoring. The instrument offers a simplified, easy-to-read display which shows the current air cleanliness level at a glance, based on the ISO scale. An LED light continuously displays the current condition.

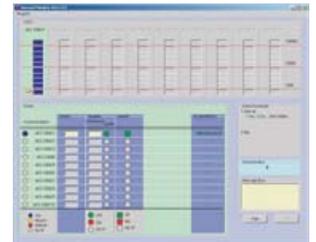
The sensor is easy to setup anywhere it's desirable to check particulate levels, such as critical areas and heavy processing zones. It can be integrated with an existing network by using a standard LAN/Ethernet cable. PC monitoring software comes standard with the sensor.



Particle Monitor



LED light shows current air cleanliness



PC Software is included

Remote Sensors for Facility Monitoring System

Kanomax sensors with analog output are designed to fit into your existing monitoring system, or they can be used as a stand-alone unit to monitor a critical area when connected to an alarm or controller. The Kanomax particle sensor is available with both 0.1 and 1.0 CFM flow rates. Our airflow transducer is available with many different probes to suit your specific application needs.



Differential Pressure Sensor



Remote Particle Sensor (1.0 CFM)



Remote Particle Sensor (0.1 CFM)



Airflow Transducer



Temperature/Humidity Sensor

Kanomax Provides Other Outstanding Solutions



HVAC Testing and Balancing

Calibrate the environmental settings within the building for meeting occupant comfort requirements, achieve HVAC design specifications, extend maintenance intervals, energy conservation, and efficient operation. Kanomax **Anemomaster™ series** measure in-duct airflow and static pressure to maintain and inspection HVAC systems.



Model 6036



General Indoor Air Quality

Measure a variety of parameters important for monitoring and maintaining occupant thermal comfort while helping to assure healthy indoor environments. Kanomax **IAQ monitor Model 2211** and **Gas Monitors** help facility managers to control thermal comfort and to detect sick building syndrome in the building.



Model 2211

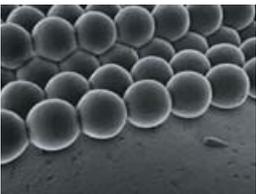


Industrial/Occupational Hygiene

Measure parameters including dust concentration, temperature, air velocity, gas concentration, indoor air quality, ventilation performance, pressure differential and humidity to find hazards in occupational environments. Kanomax **Piezobalance Dust Monitor Model 3521** and **Digital Dust Monitor Model 3443** implement dust exposure testing to protect workers.



Model 3443



Nanoparticle Measurement

Nanoparticles are becoming more commonplace and are a growing health concern. Kanomax is ready to help you monitor nanoparticles with our Nanosolutions line: including **PAMS (Portable Aerosol Mobility Spectrometer)** and **InfiTOF**, a new innovative multi-turn time-of-flight mass spectrometer that's small enough to be used in the field.



PAMS