CH TECHNOLOGIES (USA)

Innovative solutions for gas and aerosol generation, exposure and monitoring systems

CH Technologies supports private industry, academic and governmental clients with cutting-edge inhalation and particle exposure systems tailored to each end user's specific needs. CH specializes in gas and aerosol generation, exposure and monitoring systems for toxicology, bio-defense, pharmacology and infectious disease research. Our patented systems offer broad adaptability as they are fully expandable and highly customizable to suit individual requirements.

LIQUID AND SOLID AEROSOL GENERATORS

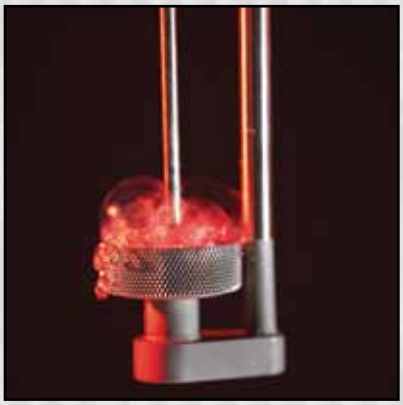
Liquid Aerosol Generators

BLAM (Blaustein Atomizing Module)

- Our most versatile aerosol generator
- Can be operated in both recirculation and injection mode
- Wide range of concentrations, particle size distributions, and operational flow rates

Collison Nebulizer: Pneumatic Nebulizer

- Recognized Industry Standard for over 50 years
- Efficient aerosolization of a wide range of solutions and suspensions
- Reproducible standardized performance characteristics



BANG (BioAerosol Nebulizing Generator)

- Referenced in many publications!
- Can be operated in both recirculation and injection mode
- Produces high viability bioaerosols

SLAG (Sparging Liquid Aerosol Generator)

- Most gentle method of aerosol generation for aerobiology applications
- Delivers highly viable bio-aerosols (close to 100%)
- Highly stable concentrations during prolonged exposures

CENTAG (Center Flow Tangential Aerosol Generator)

- Spinning disk aerosolization technique
- Produces quasi-monodisperse large particle aerosols
- Tunable aerosol size

Solid Aerosol Generators

RBG (Rotating Brush Generator)

- Stable generation with a wide range of output capabilities (mg – g per hour output)
- Pressure resistant models are available that are capable of operating at 3 bar of positive pressure or 300 mbar of vacuum
- Suited to a broad range of non-cohesive powders

VAG (Vilnius Aerosol Generator)

- Ideal for stable generation of precious materials (µg – g per hour output)
- Exceptional deagglomeration characteristics
- Automatic control of concentration using an optical aerosol monitor

WDF (Wright Dust Feeder)

- Recognized Industry Standard for over 50 years
- Excellent dispersion of cohesive powders
- Superior consistency in output characteristics and exceptional deagglomeration capabilities

AGK 2000 (Generator for Salt Aerosols)

- Reliable function, high reproducibility
- Robust design, proven in industrial applications
- Nozzle designed to prevent clogging when working with highly concentrated salt solutions

BEG (Belt Dry Powder Dust Generator)

- Stable generation for the highest output capabilities (g – kg per hour output)
- Low maintenance
- Filling during operation

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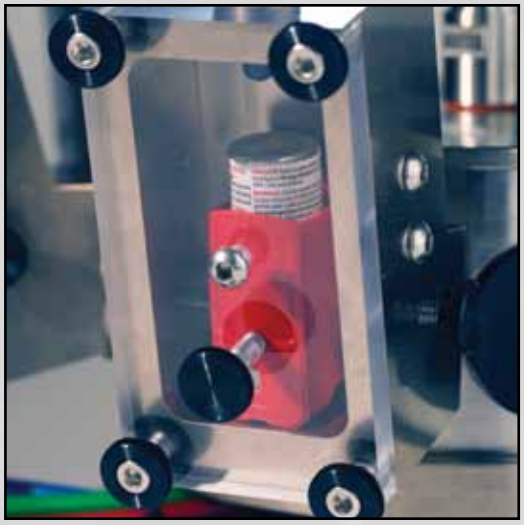

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SPECIALIZED AEROSOL GENERATORS

Specialized Generators

MDI (Metered Dose Inhaler Module)

- Unique enclosed design for testing of prefilled Metered Dose Inhalers
- Able to accommodate inhalers of different sizes and geometries
- Modular design which can be integrated into other systems

LSPG (Large Salt Particle Generator)

- High number of large dry salt particles (up to 10 μm) with KCl and other salt solutions
- Fully integrated with bi-polar corona type aerosol neutralizer
- Can be used for filter testing according to ASHRAE 52.2 to ISO 16890

PLG (Pneumatic Laskin-Type Nebulizer for Oils)

- Aerosol generator for the defined atomization of oils and use on filter test rigs
- High reproducibility with respect to particle size distribution and particle concentration
- Heated model available for use in non-climate controlled labs

MAG (Monodisperse Aerosol Generator)

- Sinclair-LaMer design for generating of monodisperse and uncharged droplets, dp = 0.2 – 8 μm
- No drying system, no silica gel
- Rapid particle size modification up to factor 2.5 within approx. 10 seconds using the bypass adjustments

AGF/UGF (Pneumatic Nebulizer for Oils and Suspensions)

- Can be used for clean room acceptance tests and leak tests as per ISO 14644 and VDI 2083 (VDI 3491-1 and -2)
- Known and reproducible particle size distribution in the micron to sub-micron range
- Ideal for the testing of HEPA/ULPA filter media and small complete filter elements

VOC and Nanoparticle Generators

VOC Generator (Volatile Organic Component Generator)

- Automatic control of vaporization temperature
- Generation of VOC vapors from liquid and solid substances
- Accurate control of liquid test article feed rate

Fume Generator (Quartz Tube Furnace)

- For customers that need to carry out exposures to fumes/smoke generated by incineration of various materials
- Can reach very high incineration temperatures
- Can be used either under pressure or vacuum

DNP (Defined Nanoparticle Generator)

- Generation of nano size test aerosols from graphite, silver (Ag), gold (Au), copper (Cu), and other electrically conductive materials
- Fast adjustable particle size distribution
- Particle structure similar to that of diesel soot with graphite electrodes

DSP (Defined Soot Particle Generator)

- Generation of test aerosols similar in characteristics to diesel soot using a quenched flame
- Aerosol mass outputs from 50 mg/h up to 3 g/hr at flow rates up to 1000 L/min
- Heated version available; up to 300° C

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EXPOSURE SYSTEMS

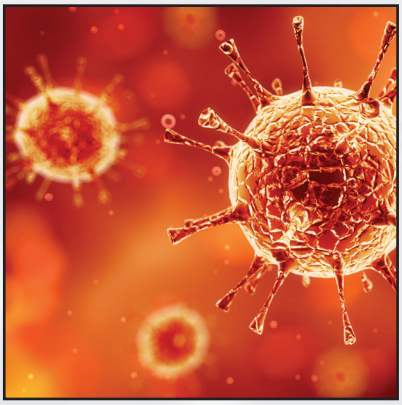
Inhalation Exposure Systems

NOIES (Nose-Only Inhalation Exposure Systems)

- Modular nose-only systems that can be used for both small and large scale exposures
- Patented trumpet design to minimize rebreathing
- Positive or negative pressure configurations which can be used in high or low biocontainment environments

NOIES Animal Restraints

- Wide variety of size to accommodate multiple species and body weights in both open and closed designs [*adapters available for our restrainers to be used with other systems]
- Quick loading push button restraint lock with an Industry Standard Port Size
- Chemical and temperature resistant

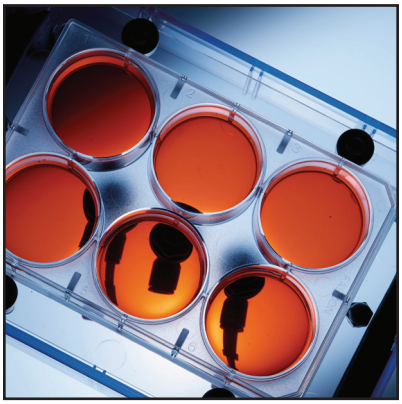


Modular BCU: Small Scale Whole-Body Systems

- Ideal for small-scale Whole-Body exposure studies with rodents
- Highly flexible modular system that can be configured for multiple cages simultaneously
- Reduces handling and animal care costs by combining animal exposure and housing into one unit (can withstand frequent cleaning cycles)

Hazelton: Large Scale Whole-Body Systems

- Recognized industry standard for over 50 years
- Designed for uniform mixing of exposure atmosphere in a large volume (up to 2 m^3)
- Cage units can be mixed and matched to accommodate a variety of species and animal sizes and has excellent performance with full or partial animal loading



Specialized Exposure Systems

In-Vitro Systems

- Can be integrated into existing systems and configured for use with a variety of aerosol generators
- Easy to load well plates and can be configured to provide incubator atmosphere
- Low cost modular design

Skin Exposure Systems

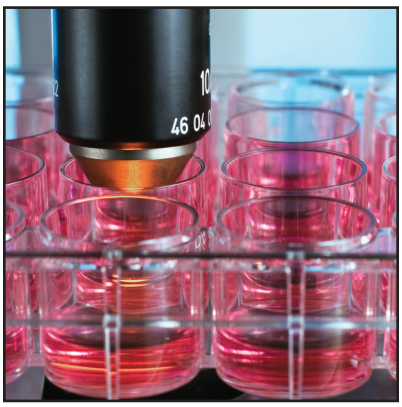
- Highly versatile modular design for aerosol and gas exposures
- Can be used on animal or human test subjects
- Multiple skin zones can be exposed independently of each other

Plethysmography Systems

- Used to measure the breathing rate and tidal volume of animals in the restrainer
- Can be used during animal exposure
- Plethysmographs available for multiple animal species and body weights

BCC (Bioaerosol Calibration Chamber)

- Large scale system for collection and sampling efficiency testing with bioaerosols
- Evenly mixed aerosol with uniform size distribution within the test space
- Can be used with a large variety of test article generators, biohazard sensors, and sampling/monitoring devices



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CIGARETTE AND E-CIG SMOKING MACHINES

Smoking Machine

JB2096 (Jaeger-Baumgartner 30 Port Automatic)

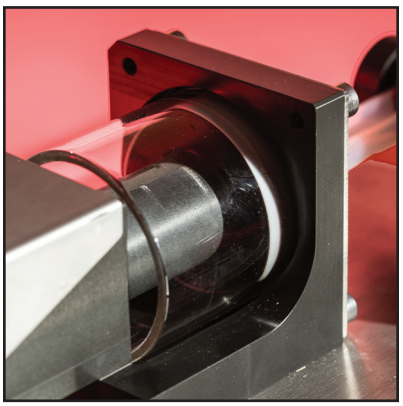
- Highly versatile cigarette and e-cigarette smoking machine capable of generating large smoke/vapor outputs
- Designed with significant flexibility such that it can be tailored to support a wide range of in vivo and in vitro exposure studies
- Available for analytical cigarette smoke and e-cigarette vapor applications
- Fully automatic loading, puffing, and ejecting capabilities for continuous uninterrupted operation

CSM-STEP (Versatile Single Cigarette Machine)

- Ideally suited to small scale applications, accomodating both tobacco and various e-cigarette vaping technologies
- Supports the standard FTC, CIR, and CORESTA recommended puffing regimen
- Software allows for easy setup of custom user defined automated protocols

ECAG (E-Cigarette Aerosol Generator)

- Generates each aerosol using a novel, positive pressure approach that utilizes clean, dry, particle-free air as the carrier gas to reduce artifacts found in the test aerosols
- Mimic battery types at various voltages using a controlled power supply that doesn't degrade over time
- Designed to accommodate most one piece disposable electronic cigarettes, in addition to the refillable tank/clearomizer two piece versions, and sub-ohm atomizers with provided adapters



Smoking Machine

CSM-eSTEP (Basic Single E-cigarette Machine)

- 3D printed holders available for customer specific vaping devices, either button or flow activated
- Cost effective E-cigarette puffing machine
- User interface allows for easy setup of predefined or custom puffing protocols

CSM-HPP (Human Puff Profile)

- Can replicate real human puff profiles with great accuracy, but is also capable of standard smoking regimens, such as FTC, CIR, CORESTA, etc.
- Simple procedures to upload smoking profiles using Excel-based templates
- Allows for duplication of observations made on smokers demonstrating distinctly different puff profiles from lighting of the cigarette to discarding of the butt

CSM-SCSM (Single Cigarette Machine)

- Referenced in many publications!
- Supports FTC and CIR puffing regimen, as well as a wide range of user defined protocols
- Optionally equipped with a side stream collection, as well as, a main stream and side stream mixing/dilution system

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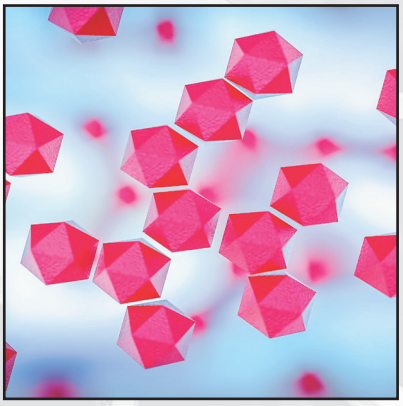
PARTICLE ANALYZERS

Optical Aerosol Spectrometers



Welas and Promo 1000: High Resolution

- Combining the sensor and detector in one unit enhances signal clarity and allows the Welas and Promo 1000 Series white light spectrometers to detect particles as small as 120 nm with 10 millisecond resolution
- Calibration, cleaning and lamp replacement can all be performed independently by the customer
- Up to 128 size channels per measuring range with 4 user selectable measuring ranges

Welas & Promo 2000: Most Versatile

- Utilizing a separated aerosol sensor technology, the remote sensor can be placed up to 30 meters away from the controller for monitoring in hazardous or hard to reach environments
- Calibration, cleaning and lamp replacement can all be performed independently by the customer
- Up to 128 size channels per measuring range with a concentration range of <1 p/cm^3 to 10^6 p/cm^3 and capable of detecting particles as small as 200 nm

Welas & Promo 3000: Measure in Two Different Locations

- Utilizes two sensors to measure aerosol concentrations and size distribution in two different locations
- Interchangable sensors for multiple concentration ranges
- Ideally suited for applications that require measuring particle separation characteristics (e.g. air filters, cyclonic separators, impactors, etc.)

Nanoparticle Monitors

Naneos Partector: Portable Nanoparticle Monitor

- The world's smallest portable nanoparticle detector with optional automatic TEM sampling capabilities
- Can measure LDSA, PN, and Average Diameter with a time resolution of 1 second and merge the data with GPS metrics to map where concentrations were measured
- Short warm up time (less then 30 seconds), no consumables, and long lasting battery life

CPC (Condensation Particle Counter)

- Novel and patented working fluid delivery system provides the user with the option to quickly switch between butanol, isopropanol, or even water
- Counts up to 2,000,000 particles/cm^3 and operate for months unattended with the use of the external reservoir
- Research mode, provides for easy adjustment of a variety of parameters, e.g. temperature settings on the saturator, using a 7" touch screen

Charme (Charge Reference Aerosol Electrometer)

- Reliable current measurement (charge/time) for high concentration nanoparticle aerosols
- Gravimetric filter for correlation between the measured current and the mass concentration
- Can detect particles as small as 2 nm with a concentration range of 0 - 1.6 X 10^7 particles/cm^3

DEMC (Differential Electrical Mobility Classifier)

- A standalone device that can provide a monodisperse output (< 1 μm) from a polydisperse aerosol
- Universally connects to CPCs, aerosol electrometers, and DMA columns from other manufacturers
- Built in X-ray neutralizer
- Interchangeable Vienna style columns for a larger range of sizes and concentrations

SMPS (Scanning Mobility Particle Sizer)

- A scan of the particle size distribution can be performed in as few as 30 seconds with a resolution of 64 size channels per decade. Continuously, variable voltage results in higher count statistics per size channel
- Integrated data logger enables linear and logarithmic display of measurement values and data management on the device itself
- Universally connects to DMAs and nanoparticle counters from other manufacturer

Pegasor AQUrban (Outdoor Air Quality Monitor)

- Measures ultrafine particles that OPCs typically fail to detect
- Easy installation with minimal downtime for maintenance. Service intervals are as little as once per year with no consumables or working fluid necessary
- Various methods of data transfer including direct storage to the cloud or via a data logger

Pegasor AQIndoor (Indoor Air Quality Monitor)

- Uses the same measuring principle as the AQUrban device so you can perform Indoor/Outdoor ratio measurements

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SAMPLING AND MONITORING

Sampling

Filter Holders: Holders for 25, 37, and 47 mm Filters

- Standard gravimetric sampling method
- Leak free design that can accommodate a variety of filter thicknesses
- Sampling adapters for exposure towers and sampling lines available

SST Impinger (Stainless Steel Teflon Impinger)

- Designed for collection of microorganisms in aerobiology applications and other applications that require wet collection methods. The improved low flow design has been proven to increase the viability of cells during collection
- Break resistant Teflon material provides additional level of safety
- Has been shown to reduce particle bounce and overloading, thereby limiting re-aerosolization of the organism

MCI Impactor: Mercer Cascade Impactor

- Standard reference method for the determination of particle size distribution for over 60 years
- Custom configurations available for various estimated cutoff diameters at various flow rates
- Complete 316 SS design with available sampling adapters

Cyclones: Size Selective Inlets

- Used to reduce the amount of large particles in an aerosol or to reduce the GSD of the size distribution
- Custom configurations available for various estimated cutoff diameters at various flow rates and cut curves
- Complete 316 SS design with available sampling adapters

Real Time Monitors

Casella MicroDust Pro: Aerosol Concentration Monitor

- Portable concentration monitor can be adapted to inline use with a patented clean lens adapter
- Uses light scattering technology to measure Total Particulate Matter (TPM)
- Wide measurement range from 1 $\mu g/m^3$ to 250 g/m^3

Dustview II: For Characterizing Dust Release of Bulk Solids

- Determines how likely a powder will form a plume of dust and how enduring the plume will be
- Fully automated, reproducible measuring process that can be compared to prior measurements
- Rapid measuring process (40 s) provides bulk material dust behavior information

CAI Gas Analyzer (California Analytical Instruments)

- Bench-top devices can be used for stationary measurements from an inhalation exposure system. Useful for applications involving combustion efficiency, process chemical gas analysis, occupational safety, vehicular emissions, etc.
- Employs a wide array of detection methods to provide the most accurate measurements for many common and toxic gases. Monitors up to 5 gases at one time

GrayWolf Probe: Portable Air Quality Probe

- Multipurpose gas monitoring device offered as standard for CH inhalation systems that require monitoring of gases or vapors. Monitors up to 5 gases at the same time
- Sensors for the monitoring of 25 different common and toxic gases are available. Sensors for measuring temperature and relative humidity are standard
- Specially designed adaptor connects the probe to the exposure ports of the inhalation tower, enabling it to take in-line measurements at the animal's breathing zone

T+RH Monitor: Temperature and Relative Humidity Monitor

- For real time monitoring/logging of environmental conditions of the exposure chamber

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ENVIRONMENTAL MONITORS

Environmental Monitors

Naneos Partector: Portable Nanoparticle Monitor

- The world's smallest nanoparticle detector with automatic TEM sampling capabilities
- Measures LDSA, PN, and Average Diameter with a time resolution of 1 second merges the data with GPS metrics to map where concentrations were measured
- Short warm up time (less then 30 seconds) and no consumables

Envi CPC: Environmental Condensation Particle Counter

- Purpose built CPC for environmental ambient air monitoring. Available in two models, each of them optimized for a specific concentration (up to 2,000,000 particles/cm^3)
- An external reservoir and its isothermal Nafion aerosol dryer (that has no consumables) provide the ability for months of unattended operation
- Patented working fluid delivery system provides for the option to quickly switch between butanol, isopropanol, or even water (a more environmental-friendly, healthy, or potentially better suited liquid)

Fidas 200: Fine Dust Aerosol Spectrometer

- Continuous and simultaneous real-time measurement of PM1, PM2.5, PM4, PM10, TSP, PN, size distribution and atmospheric data
- 0.18 - 100 μm (3 measuring ranges) with 64 channel resolution
- Instrument calibration can be verified and, if needed, adjusted easily and quickly on site using a provided monodisperse test aerosol
- Approved equivalent measurement method in Europe and UK (EN 15267 and EN 16450)

Environmental Monitors

Fidas Frog: Portable Fine Dust Aerosol Spectrometer

- The smallest aerosol monitor in the Fidas® family. With a removable tablet for remote control, data logging, and report generation, the Fidas® Frog provides the user everything needed for field ready, portable measurements and investigations
- Measures simultaneously the environmentally relevant mass fractions PM1, PM2.5, PM4, PM10, TSP as well as the particle number and the particle size distribution within the particle size range of 0.18 – 100 μm
- Calibration of the instrument can be verified and, if necessary, adjusted easily and quickly on site using a provided monodisperse test aerosol

Fidas Fly: Drone Mounted Fine Dust Aerosol Spectrometer

- Combines the utility of an ultra-light real-time dust monitor made by Palas® and a flight robot. Able to approach different way points via manual controls or through GPS guidance. High-quality construction enables continuous operation for longer data acquisition periods with more than 100 flight hours
- It measures simultaneously environmentally relevant mass fractions PM1, PM2.5, PM4, PM10, TSP as well as the particle number and the particle size distribution within the particle size range of 0.18 – 100 μm
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AEROSOL CONDITIONING

Dilution Systems

Smoke and Vapor Siphon

- Automatic cigarette smoke and e-cigarette vapor concentration control system for applications requiring very fine control of the smoke exposure parameters
- All control parameters, including dilution air flow rates, siphoning flow rate, and real-time values of smoke or vapor concentration are recorded for QA/QC purposes
- The siphon can also be used for controlling other aerosols, or gaseous test atmospheres

VKL Systems/DC Systems: Cascadable Dilution Steps

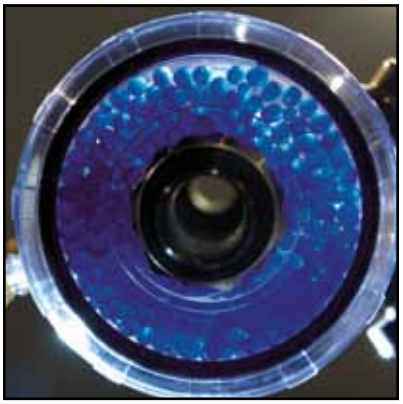
- The dilution systems can be cascaded with the factors 1,000, 10,000, 100,000, and 1,000,000
- Available in stainless steel for corrosive aerosols and/or configured to be pressure-resistant to 10 bar overpressure
- Operates according to the ejector principle and forms the basis for VDI guideline 3491
- The DC systems are typically used in the filter media test rigs that operate according to EN 1822 and ISO 29463

KHG Systems: Heated/Parameter Controlled

- Can be heated up to 200° C for isothermal dilutions and pressure-resistant up to 10 bar overpressure for isobaric dilution. When used in combination with the Welas or Promo, aerosol spectrometers, a completely isobaric and isothermal measurement chain is ensured
- Can be used for aerosol characterization of emissions from internal combustion engines, including continuous combustion cycles

LDD (Large Droplet Dilution System)

- Unique system to dilute almost loss-free large droplets up to 10 μm
- Heatable dilution system up to 120° C
- Proven dilution factor of 100 for droplet sizes up to 7 μm
- Appropriate for testing to ISO 17536



Electrical Dischargers

Corona Discharger: Bipolar Discharge System

- Reliable and non-radioactive method for neutralizing a charged aerosol
- As the ion generation process is electrical it can be switched off at any time, thus, no operating license is necessary
- Variable voltage and current allows the user to either electrically charge or neutralize the charge of a dust or liquid aerosol

XRC (X-Ray Discharger)

- Operates on the basis of bipolar X-ray ionization. Regardless of the initial charge of the particles, a reproducible equilibrium charge distribution is always set; this is a unique advantage when bipolar neutralization is utilized. Bipolar neutralization is mandatory for a traceable calibration of a condensation particle counter as per ISO/CD 27891
- Unlike other radioactive sources, this discharge has instantaneous on/off performance with the turn of a key
- Validated as a suitable alternative to a radioactive neutralizer

Dryers

Diffusion Dryer: Desiccant Based

- Unique flow through design provides efficient removal of water from the aerosol, with low particle losses
- Can be used to remove water from an atomizer/nebulizer output or for drying an aerosol sample before being introduced to a monitor
- Multiple channel designs for higher carrier gas flows

Nafion Dryer: Membrane Based

- Can reduce the sample dew point to as low as -45° C without any measurable loss of analytes
- Infinitely variable desiccation by controlling the dryness and supply of provided sheath air
- No consumables necessary, provides for greater repeatability in your test set up

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SYSTEM CONTROL

Inhalation System Control Units

LabFlow C II: Basic Control System

- Management of the primary control system functions. Core function controls include an aerosol generator inlet line and regulator, a dilution line, and a sampling line. (Also available in custom configurations)

LabFlow P II: Control Unit for Positive Pressure Systems

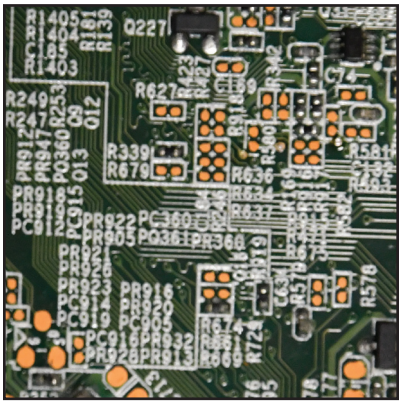
- Controls the pressure of the compressed air supply to the system, the air flow of all system air supply lines, and the three sampling lines used to run various sampling devices. This functionality allows for accurate control of aerosol concentration, chamber pressure, and humidity (Also available in custom configurations)

LabFlow V II: Control Unit for Negative Pressure Systems

- Monitor, control, and maintain the necessary safety measures to ensure that operators are kept safe and the lab environment remains contaminant free
- Uses integrated mass flow controllers to maintain a preset negative pressure in the chamber. It also provides the researcher with functionality that allows for easy sampling and control of their systems. (Also available in custom configurations)
- Optional data acquisition and transmission capabilities when coupled with CH Technologies' SPM software

Aero 3G: Fully Automatic, GLP Compliant

- Integrated monitoring and control of the exposure system components and comprehensive data recording and event logging for documentation and archiving
- Ideal for organizations that are required to have a high degree of sophistication in their data acquisition, processing and reporting procedures
- The result is a reliable, flexible, easy to use system that produces a single data stream which facilitates rapid analysis of experimental outcomes, tracking experimental performance over time, and direct comparisons between individual components of experiments



Data Management

Aeroview: GLP Compliant

- Conveniently organizes all of the aerosol exposure records of the Aero3G control unit for easy accessibility
- Manages the information in compliance with GLP requirements
- User friendly tools for graphical representation and numerical analysis of system parameters

SPM Software: System Process Monitor Software

- Flexible monitoring and recording of system input and output flows, aerosol concentration and size distribution, and environmental conditions in the exposure chamber
- Independent connections to each data providing devices in the system
- User friendly GUI with group parameters organized into intuitive tabs

Envirologger: Data Logger and Gateway

- Cloud-based platform allows the user to view data in real time directly, or remotely, from a monitoring system. Provides the ability to receive alerts when measurements go above or below preset limits
- Support a wide range of environmental monitoring, data communication, and management systems
- Up to 256 channels of data can be collected from any number of monitors or sensors which can be connected by both digital and analog interfaces (wired or wireless) and each channel can be configured with its own communication and averaging rates, alarm levels, and diagnostic information

Compressors and Vacuum Pumps

Sound Attenuated Vacuum Pump:

- Housed in a sound and vibration dampening enclosure (emits only 47 dBA of noise)
- Can be operated in close proximity to the inhalation tower without disturbing the animals
- Provides sufficient vacuum for most applications

High or Low Flow Compressor:

- Ideal choice for clean, dry, oil free, particle free sources of instrument grade air in environments where quiet operation is imperative
- Quiet oil-less compressor with after cooler, filters, and self-regenerative desiccant air dryer
- High or low flow models available for large or small scale systems

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CH TECHNOLOGIES (USA)

Innovative solutions for gas and aerosol generation, exposure and monitoring systems

CH Technologies supports private industry, academic and governmental clients with cutting-edge inhalation and particle exposure systems tailored to each end user's specific needs. CH specializes in gas and aerosol generation, exposure and monitoring systems for toxicology, bio-defense, pharmacology and infectious disease research. Our patented systems offer broad adaptability as they are fully expandable and highly customizable to suit individual requirements.

TURNKEY SYSTEMS

Inhalation Exposure System

General Purpose: All Inhalation Exposure Applications

- CH Technologies systems are much more than the sum of their parts. They represent precision engineered and optimized turnkey solutions, tailored to meet the scope of inhalation exposures demanded by the customer
- Part of offered turnkey packages are the development of system's customized SOPs, on-site installation and personnel training, and full IQ/OQ/PQ validation

Specialized Aerobiology Systems: Class II & III BSL

- Recognized leader in providing the infectious disease inhalation and biodefense community with the best technology for conducting accurate and safe exposure studies to pathogens and highly toxic chemicals
- Our aerobiology system can be delivered as a turnkey package, integrated with custom designed Class II & III biosafety cabinets

SCATR (Smoke Control and Analysis Test Rig)

- Custom designed system for mixing of main stream with side stream smoke and automatic control of smoke mix concentration
- Can be used for real-time characterization of TPM, gaseous components, and environmental conditions of the cigarette smoke test atmosphere that is used in large scale inhalation or in vitro exposure studies

Breath Collection Systems: Metabolic Analysis

- Completely modular system; any number of various rodent species can be simultaneously monitored. Consists of sorbent collection tubes and CO2 infrared sensors for the continuous breath collection and analysis of exhaled air in unanesthetized rodents

Custom Turnkey Solutions

- Available for all systems

Filter Test Rigs

DFP 3000: Testing Compressed Air Filters

- Complete solution for the testing of compressed air filters at 7 bar overpressure: ISO 12500, ISO 8573
- Models available for mid-size filters (up to 115cfm) as well as smaller filters (up to 35cfm)
- Fully automated package including user-defined test procedures, up/downstream particle counting, aerosol generation as well as monitoring of T, RH, Pabs, ΔP

HMT 1000 (Testing Oil Mist Seperators)

- Specially designed for the testing of oil mist separators under iso-thermal and if needed, iso-baric conditions
- Equip with the Welas 1000 H for iso-thermal, real-time particle counting down to 180nm
- Ideal for development of new separators along with quality assurance of existing designs

TVE (Testing Vacuum Filters)

- Allows for the testing of vacuum cleaners more reliably and cost-effectively in accordance with EN 60312
- Possible to distinguish the separation behavior of vacuum cleaners with bags and HEPA end filters using dust or salt
- The raw gas and clean gas measurements are performed virtually simultaneously. This makes it possible not only to accurately compare vacuum cleaners, but also to accurately assess the individual filter stages

MFP Series (Testing Filter Media)

- Product line of fully-automated test rigs used to characterize the separation efficiency of filter media under a variety of different conditions (flow, temperature, humidity, aerosol type/quantity)
- Depending on the model, this system has been outfitted for testing either HVAC (ISO 16890, ASHRAE 52.2, EN 779), Cabin Air (DIN 71460, ISO 11155-1), Engine Intake (ISO 5011), HEPA/ULPA (EN 1822, ISO 29463) type filter medias
- Recognized globally as a complete solution for testing filter media; R&D or QA/QC alike

MMTC Series: Testing Bag Filters

- Test rig specially designed for testing filter media used in cleanable filters (i.e. bag house filters)
- Fully automated platform for testing per VDI 3926 (including aging)
- Offered in several versions which offer automated heating of the system (up to 250° C) and humidity control (up to 80% RH @ 90° C)

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