PINE

PARTICLE INSTRUMENT & ENGINEERING

Company Introduction

A PROFESSIONAL ENTERPRISE OF PARTICLE INSTRUMENTS FOR AEROSOL GENERATION AND MEASUREMENT

PINE is composed of experts of gas and particle-based on our expertise in aerosol engineering.

WHAT WE OFFER

AEROSOL GENERATORS AND DISPERSERS
AEROSOL NEUTRALIZERS
AEROSOL DILUTERS
PARTICLE COUNTERS AND DETECTORS
PARTICLE SIZERS
PARTICLE SAMPLERS
ENVIRONMENTAL MONITORS
ACCESSORIES

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INDEX

ORGANIZATION CHART

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CONTACT

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HISTORY OF PINE INC.

2020's

2021.04
Execute to 'Business technology growth project'. (Ministry of Land, Infrastructure and Transport)

2021.02
Certificate of venture business. (Korea Technology finance Corporation)

2020.12
Certificate of ISO 9001:2015. (Certification of quality management system)

2020.10
Execute to 'Toehold project for start-up'. (Korea Technology and Information Promotion Agency for SMEs)
Apply to patent. (Sterilization apparatus)

2020.08
Resistered patent (Measuring device of fine particle)

2020.06
Resistered patent (Powder aerosol generator)
Execute to 'Development to practical technology for reduction of fine dust'. (Ministry of SMEs and Startups)

2020.03
Established R&D department. (Korea Industrial Technology Association)

2020.01
Acquired certification of fine dust sensor. (1st grade) (Korea Ministry of Environment)
Relocation of headquarters. (Sangnok-gu, Ansan-si, Gyeonggi-do)

2020's

2019.05
Apply to patent. (Measuring device of fine particle)

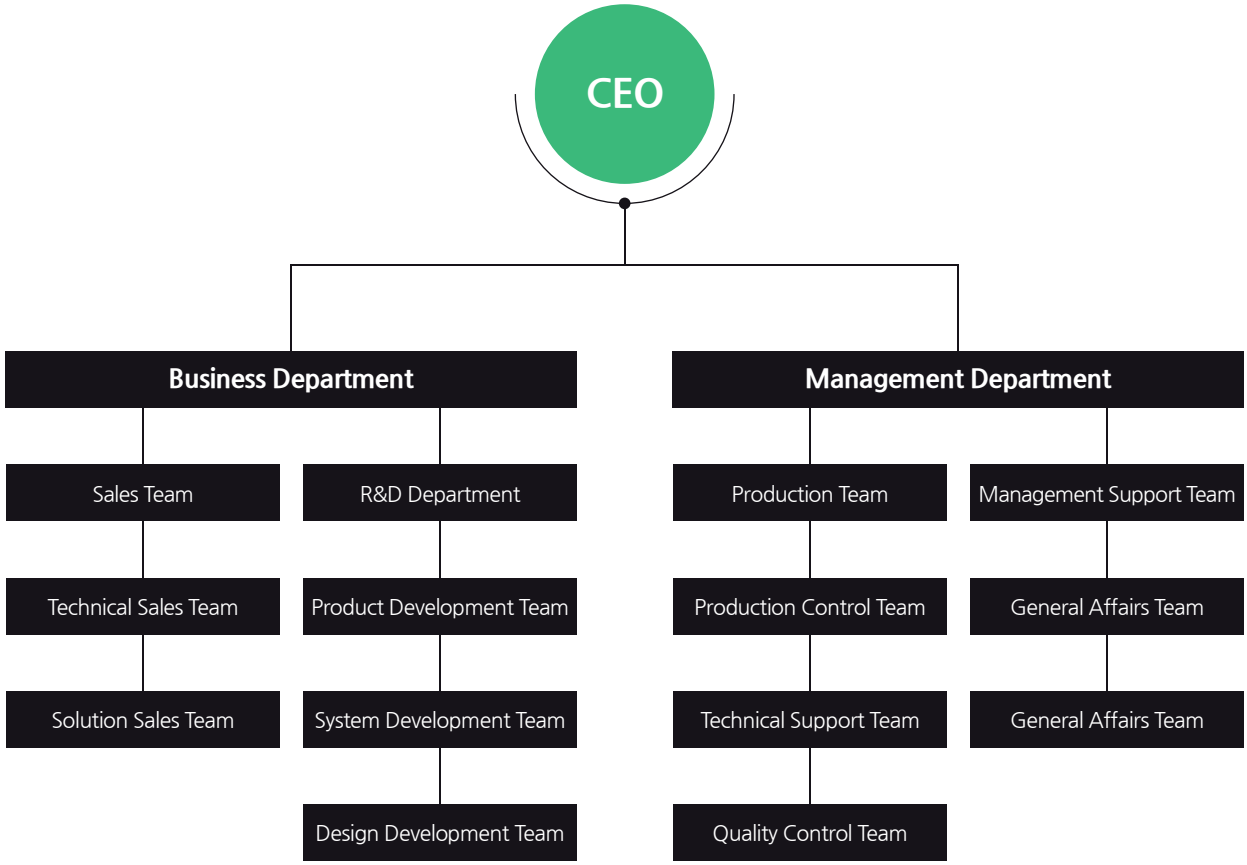
2018.06
Execution of 'Convergence growth business project'. (Gyeonggi Business & Science Accelerator)

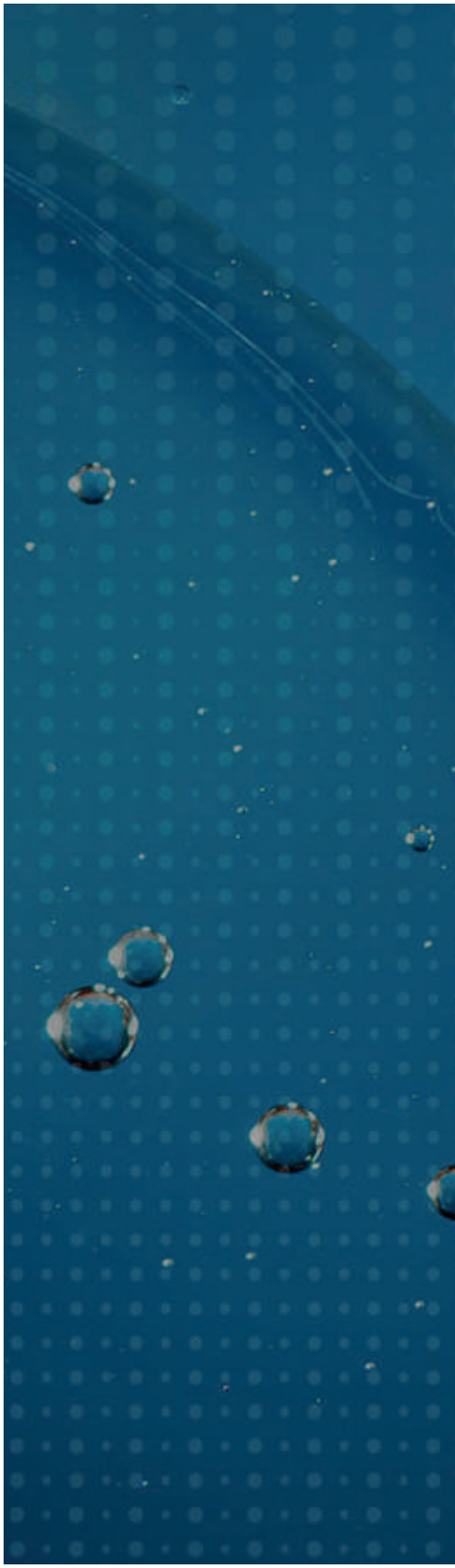
2018.05
Establishment of corporation 'PINE Inc'. (Daewol-myeon, Icheon-si, Gyeonggi-do)

CERTIFICATION OF PINE INC.

ORGANIZATION CHART

Since 2018, as a professional enterprise of
particle instruments, PINE serves a global market by
solving aerosol generation and measurement problems.





Particle Instruments - We offer aerosol generation and measurement instruments

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CLEAN AIR SUPPLY
CAS 1014A

DRY, CLEAN AND COMPRESSED AIR FOR AEROSOL GENERATORS

The Clean Air Supply - CAS 1014A is an essential accessory for operating the most aerosol generators. It provides dry, clean, and regulated compressed air. It consists of an air regulator, air filter, desiccant dryer, and coalescing filter. The air regulator controls air pressure. The air filter removes water/oil droplets in the compressed air. The desiccant dryer removes moisture from the air stream. The coalescing filter removes particles in the compressed air.

- **Maximum Inlet Pressure**
  1.0 MPa (145 psig)
- **Pressure Regulator**
  0.05 to 0.85 MPa (7 to 123 psig)
- **Desiccant Type**
  Silica Gel (Blue Indicator Crystal)
  * The silica gel may be replaced by other desiccants such as activated charcoal or sodium aluminosilicate
- **Desiccant Capacity**
  Up to 1.5 Liter
- **Coalescing Filter Element**
  Pore Size — 0.01 μm
  Filtration Efficiency (DOP Smoke) — 99.995% for 0.3 μm 10.5 ft/minutes
- **Environmental Condition**
  Operating Temperature — -5°C to 60°C (23 to 140°F), No Freezing
- **Fittings**
  Inlet and Outlet — 8mm One Touch Fitting
- **Dimension (H X W X D)**
  39.4 cm x 46.0 cm x 20.0 cm (15.5 in. x 18.1 in. x 7.87 in.)
- **Weight**
  5.8 kg (12.8 lb), without silica gel desiccant

· The appearance and specification of the product may be changed without prior notice for the improvement of the product

JET NOZZLE TYPE ATOMIZER
JNTA 4501

COST-EFFECTIVE SINGLE JET ATOMIZER

The Jet Nozzle Type Atomizer - JNTA 4501 is one of the collision type atomizers with a single jet-nozzle. The atomizer can use a standard bottle with a GL 45 tap. It can help easily change and storage various solutions.
It can generate aerosols from solutions prepared in water or in alcohol.
The Jet Nozzle Type Atomizer - JNTA 4501 is a cost-effective atomizer that can use various aerosol research.

- **Particle Material**
  NaCl, PSL, oils, and other aqueous or alcohol solutions or suspensions

- **Particle Number Concentration (Nominal)**
  2 x 10^7 particles/cm^3

- **Flow Rate**
  7.20-8.25 L/min at 0.25 MPa (36 psig)

- **Fittings**
  Compressed Air Inlet — 6 mm One Touch Fitting
  Aerosol Outlet — 1/2 in. O.D.

- **Dimension (H X W X D)**
  8.5 cm x 6.5 cm x 5.2 cm (3.3 in. x 2.6 in. x 2.0 in.), without standard clear bottle

- **Weight**
  140 g (0.3 lb), without standard clear bottle

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DIFFUSION DRYER
DD 1448A

DRY AND REMOVE WATER VAPOR FROM AEROSOL

The Diffusion Dryer - DD 1448A is one of the instruments to dry wet aerosol. It consists of two parts. One is a water trap that eliminates large water droplets. The other one is a desiccant dryer it has two concentric tubes formed by a porous inner tube and an acrylic outer tube. And silica gel is contained in an annular space between two concentric tubes. The silica gel can easily regenerate using an oven with 120 °C. Additionally, the silica gel may be replaced by other desiccants such as activated charcoal or sodium aluminosilicate

- **Flow Rate Range**
  0 to 4 L/min

- **Maximum Pressure**
  415 kPa (60 psig)

- **Relative Humidity at Outlet**
  20% when incoming R.H. is 60%

- **Desiccant Type**
  Silica Gel (Blue Indicator Crystal)
  *The silica gel may be replaced by other desiccants such as activated charcoal or sodium aluminosilicate

- **Desiccant Capacity**
  Up to 2.0 Liter

- **Inlet and Outlet Tubes**
  1/2 in. O.D.

- **Dimension (H X W X D)**
  31.5 cm x 70.8 cm x 18.0 cm (12.4 in. x 27.9 in. x 7.1 in.)

- **Weight**

Diffusion Dryer	1.8 kg (4.0 lb), without silica gel desiccant
Stand	2.4 kg (5.3 lb)

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SOFT X-RAY AEROSOL NEUTRALIZER SXAN 4915A

NONRADIOACTIVE SOURCE AEROSOL NEUTRALIZER

The Soft X-ray Aerosol Neutralizer - SXAN 4915A is a bipolar diffusion charger with balanced levels of positive and negative ions to neutralize electrostatic charges on aerosol particles. It makes the particles have a Boltzmann equilibrium charge distribution. It uses a soft X-ray ionizer instead of ^{85}Kr, ^{210}Po and ^{241}Am radioactive isotope. The control device helps easily turn on and off soft X-ray emission. The Soft X-ray Aerosol Neutralizer - SXAN 4915A designed to fit into a 3082 classifier.

- **Neutralize Method**
  Bipolar diffusion charging using soft X-ray.

- **Inlet and Outlet Tubes**
  1/4 in O. D.

- **Ion Generation Source**

Source	Soft X-ray Tube	Current	400 ㎂
Voltage	4.9 ㎸	Lifetime	>4,500 hours

- **Flow Rate Range**
  0.3 to 5.0 L/min
  * For flow rate ≥ 0.3 L/min, using clean air. Air containing reactive and/or condensable gases or vapors can lead to higher particle production rates.

- **Equipment Operating Conditions**

Temperature Range	0 to 50℃ (32℉ to 122℉)
Humidity Range	35% to 85% RH non-condensing

- **Power**

Input	100 to 240 VAC, 50/60 Hz
Power Consumption	Max. 50 W

- **Dimension (H X W X D)**

Soft X-Ray Aerosol Neutralizer	358 mm x 143 mm x 50 mm (14.1 in. x 5.63 in. x 2.0 in.)
Controller Device	44 mm x 163 mm x 113 mm (1.7 in. x 6.4 in x 4.4 in.)

- **Weights**

Soft X-Ray Aerosol Neutralizer	1.45 kg (3.2 lb.)
Control Device	0.46 kg (1.01 lb.)

· The soft X-ray source in the Soft X-Ray Aerosol Neutralizer - SXAN 4915A has a lifetime of approximately 4,500 operating hours.
Since the device can be turned off when not in use, the neutralizer has an operating lifetime of many years for most applications.
An elapsed operating lifetime is indicated in the control device. When the operating lifetime is reached, return the neutralizer to PINE for repair and calibration.
The appearance and specification of the product may be changed without prior notice for the improvement of the product.

SOFT X-RAY AEROSOL NEUTRALIZER SXAN 4920

NONRADIOACTIVE SOURCE AEROSOL NEUTRALIZER

The Soft X-ray Aerosol Neutralizer - SXAN 4920 is a bipolar diffusion charger with balanced levels of positive and negative ions to neutralize electrostatic charges on aerosol particles. It makes the particles have a Boltzmann equilibrium charge distribution. It uses a soft X-ray ionizer instead of ^{85}Kr, ^{210}Po and ^{241}Am radioactive isotope. The control device helps easily turn on and off soft X-ray emission.

- **Neutralize Method**
  Bipolar diffusion charging using soft X-ray

- **Ion Generation Source**

Source	Soft X-ray Tube	Current	400 ㎂
Voltage	4.9 ㎸	Lifetime	>4,500 hours

- **Flow Rate Range**
  Maximum Flow Rate

- **Equipment Operating Conditions**

Temperature Range	0 to 50℃ (32℉ to 122℉)
Humidity Range	35% to 85% RH non-condensing

- **Power**

Input	100 to 240 VAC, 50/60 Hz
Power Consumption	Max. 50 W

- **Dimension (H X W X D)**

Soft X-Ray Aerosol Neutralizer	354 mm x 149 mm x 52 mm (13.9 in. x 5.87 in. x 20.2 in.)
Controller Device	44 mm x 163 mm x 113 mm (1.7 in. x 6.4 in. x 4.4 in.)

- **Weights**

Soft X-Ray Aerosol Neutralizer	1.60 kg (3.53 lb)
Control Device	0.46kg (1.01 lb)

- **Inlet and Outlet Tubes**
  1/2 in O. D

· The soft X-ray source in the Soft X-Ray Aerosol Neutralizer - SXAN 4915A has a lifetime of approximately 4,500 operating hours.
Since the device can be turned off when not in use, the neutralizer has an operating lifetime of many years for most applications.
An elapsed operating lifetime is indicated in the control device. When the operating lifetime is reached, return the neutralizer to PINE for repair and calibration.
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UNIVERSAL SAMPLING PROBE
USP 3030

MINIATURE DESIGN ISOKINETIC SAMPLING PROBE

The Universal Sampling Probe - USP 3030 is a miniature design isokinetic sampling probe for representative sampling of PM at freestream velocities in the rage from 0 to 300 km/h. The design verified with numerical analyses and experiments. A material of the Universal Sampling Probe - USP 3030 is electropolishing treated stainless steel to prevent deposit the particles. Tight tolerances are maintained for all critical dimensions of the sampling probe to ensure the accuracy of this isokinetic sampling.

- **Sampling Probe Type**
  Double-Shrouded Probe

- **Freestream Velocity Range**
  0 to 300 km/h

- **Sampling Flow Rate**
  3.0 L/min

- **Outlet Tube**
  1/4 in. O.D.

- **Material**
  Electropolishing Stainless Steel
  *To reduce the particle deposit

- **Dimension (H X W X D)**
  7.1 cm x 2.5 cm x 2.5 cm (7.1 in. x 1.0 in. x 1.0 in.)

- **Weight**
  40g (0.1 lb)

· The appearance and specification of the product may be changed without prior notice for the improvement of the product