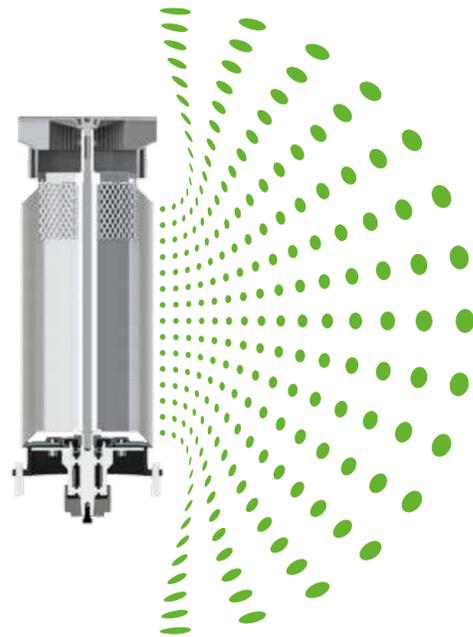


THE GREEN LINE SERIES - OIL MIST SEPARATORS WITH HIGH PURIFICATION, LOW MAINTENANCE AND OUTSTANDING OPERATION ECONOMY

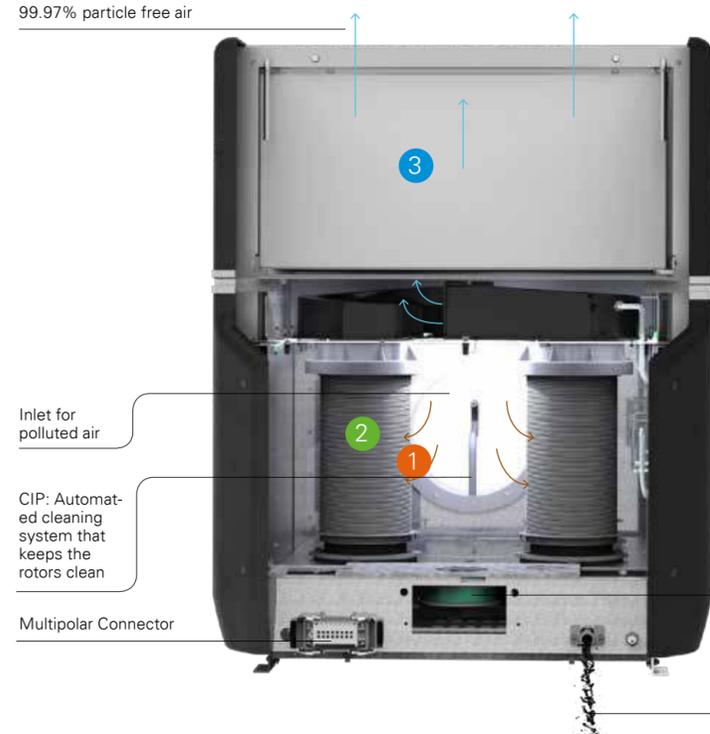
THE TECHNOLOGY

Liquid to gas separation technology was invented over 100 years ago. Based on that technology, 3nine has been developing oil mist separators since 2001. In 2009, 3nine started developing a totally new concept and technologies that would further change the way oil mist would be eliminated in the shop.

Our goal was to bring oil mist elimination to a new level, develop products that were well adapted for all applications using either oil or coolant and to simplify the monitoring of the products through visual and digital communication. The new series, called the GREEN LINE, is based on Multi-Rotor and Counter Current Technologies. Multi-Rotor technology facilitates scalability which allows for the many airflow requirements and Counter Current Technology allows each unit to work with all machining applications using either oil or coolant.



OPERATING PRINCIPLE



3 STEP CLEANING

- 1 Counter flow separates the largest particles down to $\sim 10 \mu\text{m}$
- 2 Disc Stack separates smaller particles at $100\% > 1 \mu\text{m}$
- 3 HEPA filter further cleans particles to 99.97%

MULTI ROTOR TECHNOLOGY

The GREEN LINE Series utilizes one rotor and disc stack size for all the units. One rotor develops 176CFM/300m³/h. When a higher flow rate is required we add another rotor to the separator. This facilitates scalability for different airflow requirements. The rotors are spun by a motor and drive belt.

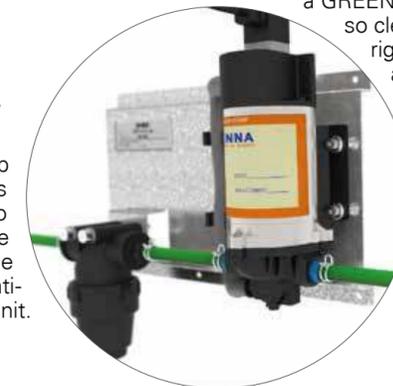


LED-COMMUNICATION

All GREEN LINE oil mist separators have a built in system control box. The control box monitors and reports on the HEPA-filter status and the status of the airflow. The status of the machine is then communicated through a LED RGB-strip on the front and back of the machine.

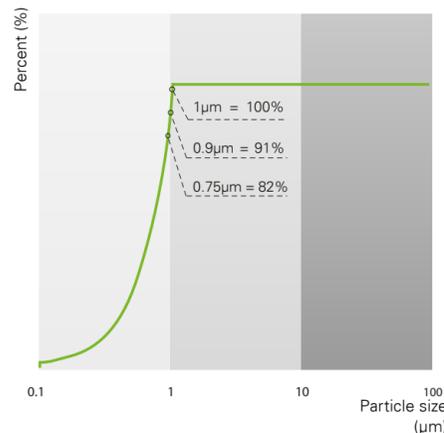
SECURE WORKING ENVIRONMENT

Oil mist exposure can cause severe health issues for the operator. If not handled properly, the oil mist will coat the surfaces in the shop, causing risk of injuries by slippery surfaces, an increased need of cleaning and damages on electrical devices. With an oil mist separator from 3nine, this will not be a problem. The air coming out of a GREEN LINE oil mist separator is so clean that it can be recycled right back into the workshop and guarantees an optimal working environment for the operator.



SEPARATION EFFICIENCY

The GREEN LINE series of units separate 100% of all fluid particles down to $1 \mu\text{m}$, 91% down to $0.9 \mu\text{m}$ and 82% down to $0.75 \mu\text{m}$. In order to capture the finer particles that are $<1 \mu\text{m}$, 3nine uses a HEPA filter (H13) to ultimately clean the air to 99.97%. With most of the particles separated in the disc stack, only 1% of the particles are collected in the HEPA filter.



The diagram shows the performance as a function of the particle diameter.



3NINE'S LEADING COST SAVING TECHNOLOGY PROVIDES A HEALTHIER AND SAFER WORKING ENVIRONMENT, ALLOWING YOU TO FOCUS ON YOUR PRODUCTION.

1 COUNTER FLOW TECHNOLOGY

The GREEN LINE units are based on Counter Current Technology. Each rotor has a fan at its top, which along with the spinning disc stack, creates the suction and pulls the processed air in from the machine tools' cabin. This combination creates the pre-separation of the larger particles down to $10 \mu\text{m}$. This makes it extremely efficient for all applications, including difficult applications such as grinding or die casting with emulsions.

2 CENTRIFUGAL SEPARATION

Fluid particles smaller than $10 \mu\text{m}$, will enter the disc stack to be further separated to 100% down to $1 \mu\text{m}$. On the discs, the small particles coalesce and form larger particles. The bigger the particle, the faster they move towards the edge of the spinning disc to be thrown off and onto the inner wall of the rotor chamber to be returned to the machine tool for reuse.

3 FINAL STAGE HEPA FILTER H13

The particles smaller than $1 \mu\text{m}$, will be collected by the final stage HEPA filter. With most of the particles separated in the rotor, the HEPA filter has a life expectancy of 12-18 months.* The final stage HEPA filter is a grade H13 and produces 99.97% particle free air.

CLEAN IN PLACE (CIP) "YOUR MAINTENANCE PARTNER"

With our CIP (Clean in Place) particle buildup on the rotor is avoided. The CIP system uses clean cutting fluid from the machine tool to automatically and continuously clean the rotors. With the GREEN LINE Series the rotor can go through a cleaning cycle automatically at every startup and shutdown of the unit.

* 12-18 months filter life is based on 1 shift per day, 5 days a week and normal operating conditions.

ADVANTAGES

- One machine for all applications
- Life Cycle Cost - Low
- 99.97% Particle free Air!
- Minimal Maintenance
- Minimal Filter Change
- Suitable for applications with high degree of solid particles
- Minimal Duct Work
- Recycling of cutting fluids
- No Oily Surfaces in the Workshop
- Compact and Direct Installation
- Low energy use

NOVA™ 300

Max cabin size	<2 m ³
Air flow	300m ³ /h
Operating conditions	5-50 °C
Power supply (basic)	3-phase 280-400V 50Hz 6A
(advanced)	3-phase 380-480V 50/60Hz 6A
Motor rating	0.37 kW
Rated current	1 A
Weight	35 kg
Height	550 mm
Lenght	694 mm
Depth	475 mm
Inlet pipe	Ø 100 mm
Sound level	< 65 db (A)



ANNA™ 600

Max cabin size	<6 m ³
Air flow	600 m ³ /h
Operating conditions	5-50 °C
Power supply	3-phase 380-480V 50/60Hz 6A
Motor rating	0.75 kW
Rated current	1.9 A
Weight	77 kg
Height	936 mm
Lenght	748 mm
Depth	546 mm
Inlet pipe	Ø 200 mm
Sound level	<70 db (A)



LOVA™ 900

Max cabin size	<9 m ³
Air flow	900 m ³ /h
Operating conditions	5-50 °C
Power supply	3-phase 380-480V 50/60Hz 6A
Motor rating	1.5 kW
Rated current	3.3 A
Weight	115 kg
Height	936 mm
Lenght	777 mm
Depth	833 mm
Inlet pipe	Ø 200 mm
Sound level	<70 db (A)



NINA™ 1200

Max cabin size	<12 m ³
Air flow	1200 m ³ /h
Operating conditions	5-50 °C
Power supply	3-phase 380-480V 50/60Hz 6A
Motor rating	1.5 kW
Rated current	3.3 A
Weight	120 kg
Height	936 mm
Lenght	777 mm
Depth	833 mm
Inlet pipe	Ø 200 mm
Sound level	<70 db (A)



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GREEN LINE

OIL MIST SEPARATORS



3nine is a Swedish company that develops solutions for the purification of processed air for the Metal Working Industry. Our revolutionary technology is based on centrifugal separation, using a disc stack which produces an extremely high degree of purification in a very compact format and requires a minimum of maintenance.