NERO INDUSTRIES
Advanced Reliability

OUR FACTORIES

NERO Endüstri Savunma Sanayi A.Ş. which operates in United States of America, Bulgaria and Turkey at Ankara headquarters, is one of the largest subsystem manufacturers in Defence Industry in Turkey. Our company which is located on a plot of 12.000 m2 in Anatolia Organized Industrial Zone; has been performing hundred percent domestic design, manufacture and provide system solutions since its foundation in 2009. More than 100 engineers are assigned within its staff of 210 people. Besides, it imports 30 different countries in the world. While our group companies operate in Space Aviation field, Defence Industry, it also comprises one of the largest test centres of Turkey regarding Defence Industry

NERO INDUSTRIES

Advanced Reliability

By combining design, production, monitoring, control and improvement methods conforming to ISO9001 and AS9100 standards with quality engineering and test infrastructure, it successfully competes with its global competitors and accomplishes outstanding projects together with world leaders of the sector.

Nero Industry has started project designing phase of the factory for the project which is worth 1.6 billion TL together with project-based investment incentive support on Presidential decree published in official gazette on 20th April, 2020 in order to establish Turkey's first semiconductor production factory. Turkey's first semi-conductor serial production facility which will be established on 300.000 m2 plot, will bring our country to the level where we will be able to compete with semiconductor companies at global level. Nero Industry, together with its high qualified employees will create first investment phase of Turkey in this field with this project.

Within the scope of designed and qualified systems,

ARES – Fire Suppression Systems,
MARS – CBRN Detection and Filtration Systems,
ARMA – Power Systems,
UMAY – Laser Detection/Warning and Smoke Grenade Launcher Systems are included.

35

NERO INDUSTRY SYSTEMS IMPORT TO 35 COUNTRIES

- Germany
- Israel
- Ukraine
- Brasil
- USA
- Azerbaijan
- Bahrain
- China
- Indonesia
- Kuwait
- Malaysia
- Oman
- Pakistan
- Qatar
- Singapore
- France
- Spain
- England
- Peru
- Saudi Arabia
- Turkmenistan
- United Arab Emirates
- Canada
- India
- Thailand
- Kazakhstan
- Latvia
- Estonia
- Lithuania
- S. Korea
- Poland
- Belarus
- Bangladesh
- Czech Republic
- Iraq

MARS

AIR CONDITIONING, CBRN FILTRATION AND DETECTION SYSTEMS

CBRN Filtration Systems has the function of filtrating war and toxic gas agents so as to ensure healthy respiration of the crew against Chemical, Biological, Nuclear and Radioactive threats which are today's war methods.

CBRN Filtration Systems has 3 different usage options. These are CBRN Filtration Systems with Positive Pressure, Masked Type CBRN Filtration Systems and Positive Pressure and Independent Masked CBRN Filtration Systems. These systems are used in civilian and military fields. CBRN systems are designed and qualified as per Nato AEP 54 standards.

CBRN Filtration Systems have 3 main structures. These are Control Units, CBRN Filters and CBRN Cabin. CBRN Filtration systems have successfully passed high temperature, low temperature, high humidity, shock-vibration and EMI/EMC tests as per MIL STD 810 and MIL STD 461 standards. Besides, CBRN systems produced by Nero Industry has the capability to be mechanically integrated to air conditioning system of the vehicle.

CBRN Filtration systems which heats the air by the heaters it includes, can provide conditioned air to the user according to present conditions and circumstances by integrating into vehicle air-conditioner for cooling the air. CBRN Filtration Systems produced by Nero Industry are used on military, civilian vehicles, safety facilities, command shelters at ships and planes and armoured vehicles of the armies of total 29 countries.

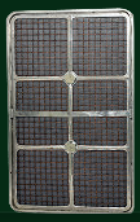
MARS

FILTRATION AND DETECTION SYSTEMS

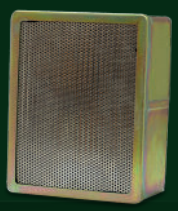
FILTER FAMILY

Page-8
GF-90 Filter

Page-8
CV90 Compatible Filter



Page-9
CF-60 Filter



Page-9
GF-20 Filter

CONTROL UNIT FAMILY

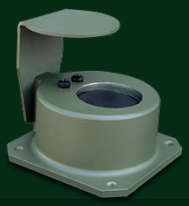
Page-11
Mars-1 Analog
Control Unit

Page-11
Mars-2 Digital Pressure
Difference Control Unit

Page-12
Mars-3 Digital
Control Unit

AUXILIARY PRODUCTS

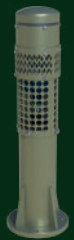
Page-13
Gas Masks



Page-14
Fixed Pressure
Relief Valve

Page-14
Adjustable Pressure
Relief Valve

WEATHER STATION AND SENSORS



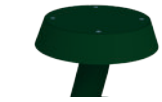
Page-15
Weather Station

Page-16
System Combinations

Page-21
Air Quality
Measuring Device

Page-26
Radiation Measure Device

CBRN SYSTEM OPERATION FLOW CHART



CHIMNEY

spores | virus | bacteria 1-10 µm | chemical gasses | particle > 5 mm particle < 5 mm | particle > 1 mm particle < 1 mm | particle > 0,5 µm particle < 0,4 µm | rain | sand | dust | leaf

CYCLONE FILTER

spores | virus | bacteria 1-10 µm | chemical gasses | particle > 5 mm particle < 5 mm | particle > 1 mm particle < 1 mm | particle < 5 mm

PRE FILTER

spores | virus | bacteria 1-10 µm | chemical gasses | particle > 5 mm particle < 5 mm | particle < 1 mm

FAN

pressure capacity > 1500 pa @170 m3/h

Flow rate capacity > 20 m3/h 1200 m3/h

PARTICLE FILTER

spores | virus | bacteria 1-10 µm | chemical gasses | particle < 0,4 µm

GF 90 FILTER

chemical gasses

PLASM FILTER

Internal circulation | virus | bacteria 1-10 µm | fungus | mould

(it is provided as standard filter)
It prevents 99% of transmission of biological agents which can diffuse into the air through sneezing, coughing or dust emission which can develop inside, to other crew.

Outturn	P Pressure Loss	Particle Filter	Chemical Filter
%99 <@ 5 mm	200 pa	< 5 mm	< 5 mm droplet
%99 <@ 1 mm	180 pa	< 1 mm	< 1 mm droplet
%99 <@ 0,5 mm	70 pa	< 0,5 mm	
%99 @ 4µm	200 pa	< 0,5 mm	
	300 pa	%99 @ AEP 54 all gases	

proQares

CBRN FILTER GENERAL SPECIFICATIONS

Compatible to NATO AEP54 standards

Particle filtration up to 0,3 millimeter

Special filtration by Hepa and Carbon filters

10 years of packed shelf life

Usage period of 1 to 12 months for daily uses

The filters produced as per NATO AEP54 standard can filter gases such as sarin, soman which are described as war gases

Air flow rate between 20 m^3/h and 300 m^3/h

Filtration of coarse particles by fixing front filter

90-180 Minutes of war agent filtration period

Packaging as per MIL – PRF 131 standard

GF-90 FILTER

- Air Flow Rate: 90 m³/h
- Storage Period: 10 Years / between 20-40 °C
- Local Outturn %: 99.97 / 99.97
- Weight: 23 lbs / 10,5 kgs(+0,5kg)
- Dimensions (length x diameter): 11,8" x 5,20" / 300 x 132 mm

NSN: 4240-27-062-0954
TSK NSN: 4240-KK-020-9189

CV-90 COMPATIBLE GAS FILTER

- Air Flow Rate: 170 m³/h
- Storage Period: 10 Years / between 20-40 °C
- Local Outturn %: 99.97 / 99.97
- Weight: 37 lbs / 17 kgs(+0,8kg)
- Dimensions (length x diameter): 12,8'' x 14,52'' / 325 x 369 mm

NSN: 4240-99-250-3437

NATO TYPE 1 FILTER

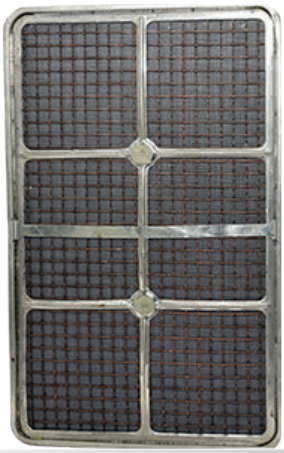
- Air Flow Rate: 170 m³/h
- Storage Period: 10 Years / between 20-40 °C
- Local Outturn %: 99.97 / 99.97
- Weight: 11 lbs / 17 kgs(+0,8kg)
- Dimensions (length x diameter): 12,44'' x 13,77'' / 316 x 350 mm

NSN: 4240-99-176-1162

STANDARDS

NATO AEP54

CF-60 FILTER



- Air Flow Rate: 35 CFM / 60 m³ /h
- Air Flow Resistance: 3 IWG / 750 Pa
- Local Outturn %: 99.97 / 99.97
- Weight: 11 lbs / 5,1 kg (±0,3 kg)
- Dimensions (width x length x height): 9,05" x 14,45" x 4,10" / 230mm x 367mm x 104mm

NSN: 4240-12-147-4791
NSN: 4240-27-052-4026

GF-20 GAS FILTER

- Air Flow Rate: 20,4 m³/h
- Air Flow Resistance: 0,8 IWG / 200 Pa
- Local Outturn %: 99.97 / 99.97
- Weight: 3 lbs / 1,6 kg (±0,2 kg)
- Dimensions (width x length x height): 5,54" x 6,96" x 2,95" / 138,5mm x 177mm x 75mm

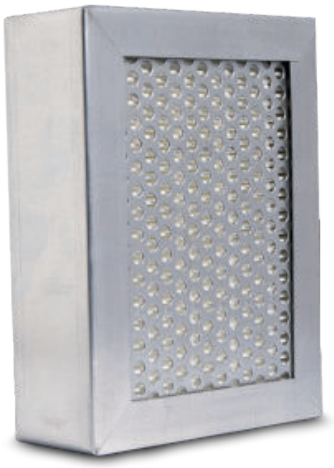
NSN:4240-01-365-0981 / 4240-00-203-3999
NSN: 4240-27-068-4199

HF-20 PARTICLE FILTER

- Air Flow Rate: 35 CFM / 60 m /h
- Air Flow Resistance: 0,8 IWG / 200 Pa
- Local Outturn %: 99.97 / 99.97
- Weight: 1,59 lbs / 0,710 kg (±0,1 kg)
- Dimensions (width x length x height): 5,54" x 6,96" x2,31" / 138,5 X 177 X 58,8 mm

NSN: 4240-00-368-6291

STANDARDS
NATO AEP54



PRE FILTER

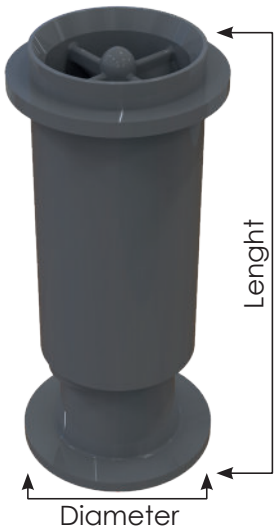
- Air Flow Rate: 20 m³/h
- Air Flow Resistance: 0,81 IWG / 800 Pa
- Local Outturn %: 99.97 / 99.97
- Weight: 11 lbs / 0,9 kg (±0,1 kg)
- Dimensions (width x length x height): 0,37" x 0,54" x 0,69" / 9.5 mm x 13.8 mm x 17.6 mm

CYCLONE FILTER

- On CBRN filtration system the dust particles within the drawn air are separated by giving ''spin motion''(both circular and vertical motion) to air flow.
- When it is used before the filters, it extends the filter life.
- High capacities can be provided by parallel connection.

Cyclone filter separates the particles from the air by forcing the air with ''spin method''. The spinning air ''pushes'' solid particles to outer side of the air flow and provides the particles to fall outside the air flow and settle there. Cyclone collectors are generally used as separator for coarse dust from ait flow and often as pre-cleaner before an efficient filter and/or a product separator.

The polluted air getting in from the entrance on upside of the cyclone with high speed, is forwarded to cyclone internal walls with centrifugal force of particles whose density is higher than the conveyer atmosphere, by giving it a helical flow form through cyclone construction.



Cyclones also reduces dust load reaching the filter by operating as first stage dust ejector before the filter on systems where dust load is high. By this means, it becomes possible to used filter unit more efficiently. These filters can be connected in series according to capacity calculations when it is necessary.

Filter Type	Filter Dimensions (diameterxsize)	Usage Type	Efficiency
Small Type	19mm x 66mm 0.75" x 2.6"	Single	92-96%
		Serial	95-99%
Wide Short Type	38mm x 102 mm 1.5" x 4"	Single	88-94%
		Serial	90-96%
Wide Long Type	38mm x 152 mm 1.5" x 6"	Single	92-95%
		Serial	96-98%

PF-90 AUTOMATIC ACTIVATION PYROTECHNIC TYPE KBRN FILTRATION SYSTEM

- CBRN systems can be used against mass destruction weapons, biological weapons, industrial accidents and leakage
- Double stage filtration systems are being used in CBRN systems. Hepa Filter : Filters particles bigger than O, 3 micron
- Active Carbon Filter : Used far filtration of Sarin,Mustard,Capsicine, Chlorine,Tabun, Soman and Vx type poisonous gases.
- CBRN filtration systems design is based on Allied Engineering protocol.
- Peace filters are used to extend the life of gas filters, except far CBRN Attack.
- It has been tested and approved in the internationally valid TNO laboratory.

TECHNICAL SPECIFICATIONS

Air Flow Rate	90m³/h (47cfm)
Filter Efficiency	% 99.97 / 99.97
Operating Temperature	-32°C — +49°C
Storage Temperature	-40°C — +63°C
Weight	12 ± 0,5 kg
Dimensions	270 x 424 mm (Diameter x Height)
Filters	HEPA filter for particule filtration Active carbon filter for gas filtration
Number of personnel that can be protected by the system	10
Approves	TNO

MIL-STD-810

- Low Temperature Storage
- Low Temperature Operation
- High Temperature Storage
- High Temperature Operation
- Low Pressure(Altitude)
- Vibration

AECTP-400 Ed.3, Figure B-4)

- Shock

* Shock Time: TD= 11ms
* Max. Accelaration: TP= 40g
* Shock Profile: Saw tooth

- Humidty

COLOURS

RAL6071 RAL6019 FS 33245 RAL 9010 RAL 6031

MARS-1 CONTROL UNIT WITH ANALOG INDICATION

CBRN Analog Control Units are used only in positive pressure CBRN Systems. This CBRN control unit is used to switch on and off the whole CBRN Filtration System and show the positive pressure within the vehicle to the user with the analog indicator on it. It can be checked if the system is working correctly thanks to the power and error indicators on the analog control unit. A pneumatic line integrated into Analog Control units can calculate positive pressure while opening out on the atmosphere. CBRN Control Units have successfully passed high temperature, low temperature, high humidity, shock – vibration and EMI / EMC tests as per MIL-SDT-810 and MIL-STD-461 standard.

FEATURES

Communication	Analog Control Unit
Communication	Dry Contact
Pressure Indicator	Analog
Buzzer	Available
Fan Speed Adjustment	Single Stage
Warnings	Filter, Low Pressure
Manuel Test	Available
AEP54	Conformant

MARS-2 DIGITAL PRESSURE DIFFERENTIAL CONTROL UNIT

It digitally measures the pressure difference between the external and internal pressure. It gives a warning if the pressure difference is below the determined threshold value.

FEATURES

Communication	Canbus
Pressure Indicator	Dijital
Buzzer	Available
Low Pressure Warning	Available
BUILT-IN Test	Available

MARS-3 DIGITAL CONTROL UNIT

Mars CBRN control unit with digital indicator, provides full control and monitoring opportunity by checking fan speed, filtration period and mechanism errors. It provides the most suitable air for the crew by automatically warming and cooling the air sending signals to air-conditioning systems.

FEATURES

Communication	Canbus
Filter Pre-Counter	Available
Pressure Indicator	Digital
Buzzer	Available
Fan Speed Adjustment	3 Stages
Low Pressure Warning	Available
Fan Error Warning	Available
Manuel Test	Available
AEP54	Conformant
Warming Active Status	Available
Air Conditioner On/Off Instruction	Available
No Filter Warning	Available
Change Filter Warning	Available
Built-In Test	Available
Blackout Function	Available
Weight	0,5 kg (±0,1 kg)

CBRN GAS MASKS

Protective mask, together with a suitable filtration system or respiration system, protects user's face, eyes and respiratory organs; against gaseous, vapourish and solid or liquid aerosol chemical, biological, radiological and nuclear (CBRN) agents. Protective mask is produced in universal dimensions. The structure of sealing side, provides perfect sealing for all face shapes and sizes of adult population except for extremely small faces. Inhalation rooms for filter connection are equipped with Rd 40x1 / 7 '' screw thread as per EN 148-1 standard (NATO standard).

ADVANTAGES

- All kinds of chemical, biological, radiological and nuclear agents, industrial toxic gases, riot control gases, etc.
- High user comfort
- Easy attach and removal
- Low breathing resistance
- Wide field of vision
- Protected visor against misting
- Corrective eyeglass application
- Easy decontamination and disinfection
- Easy liquid penetration (optional)
- Sweat drainage at exhalation chamber
- Compatibility with helmets and respiratory equipment
- High quality talk diaphragm, provides easy communication by using or not using communication devices.

FEATURES

Average weight	560 gr
Colour	Black
Effective field of vision	%77
Binoculars field of vision	%83
Filter connection thread	Rd 40x1/7"
Resistance against diffusion of NBC agents	48 hours
Breathing resistance	
Breathing resistance at 30 lt/m	max. 25 Pa
Breathing resistance at 95 lt/m	max. 80 Pa
Exhalation resistance at 30 lt/m	max. 50 Pa

CONSTANT PRESSURE RELIEF VALVE

The vehicle it will be applied should be completely hermetical (air tight).

Toxic air is filtrated by highly protected filters and filtered clean air is blown into the vehicle.

The pressure in the vehicle increases until balancing valve is opened with continuous air flow.

Pressure level is kept fixed, blown extra air is discharged from air pressure balancing valve.

The pressure created by clean air within the vehicle, prevents toxic air to penetrate inside from outside the vehicle and protection is ensured.

MIL-STD-810 High temperature	MIL-STD-810 Low temperature	MIL-STD-810 Humidity Test	MIL-STD-810 Salt Fog Test	MIL-STD-810 Shock Vibration

DIMENSIONS

Weight: 0.60 kg
Width: 86mm
Length: 86mm
Height: 75mm

COLOURS

RAL6071 RAL6019 FS 33245 RAL 9010 RAL 6031

ADJUSTABLE PRESSURE RELIEF VALVE

Blast valves are produced as relief valve on Positive Pressure CBRN Systems produced as per NATO AEP54 standards. The blast valves discharging CBRN system overpressure composed under proper conditions, are adjustable. Blast valves adjustable to requested pressure which have spring structure, can also be produced in special dimensions at user's request.

DIMENSIONS

Weight: 1.5 kg
Diameter: 250 mm
Width: 132 mm

NE-MS1000 WEATHER STATION

The Weather Station, developed and manufactured by Nero Industries by domestic and national resources, is a device that measures the change of weather events. Thanks to its high-sensitive sensors, it measures the change of weather conditions with a minimum margin of error and transfers it to the user via communication interfaces such as RS-422 and CAN-BUS.

Weather Station can perform the measurements of:

*Temperature
*Relative humidity
*Wind speed
*Wind direction
*Atmospheric pressure

It is suitable for wheeled-tracked vehicles equipped with light and medium caliber weapons and command control shelters.

Wind Speed	
Range	0 – 45 m/s
Accuracy	± 0,5 m/s +%5
Resolution	0.1 m/s
Response Time	< 2 s

Wind Direction	
Azimuth	0 – 360°
Accuracy	± 5°
Resolution	0,1°
Response Time	< 2s

Direction Of The Sensor To Magnetic North	
Azimuth	0 – 360°
Accuracy	± 5°
Stability	0.30°
Resolution	0,01°

Air Temperature	
Range	– 40°C / +80°C
Accuracy	± 0,25°C
Resolution	0,00625°C

Relative Humidity	
Working Range	0 -100 %
Accuracy Tolerance	± 3 relative humidity
Response Time	1 sec
Resolution	%0,1

Dimensions	
Height	500 mm
Diameter	85 mm
Base Diameter	138 mm
Weight	<3,5 kg

GPS Positioning	
Latitude	90° N – 90° S
Longitude	180° E – 180° W
Accuracy	0.01 m horizontally and vertically with RTK

System General Specifications	
Working Temperature	– 40°C – + 80°C
Storage Temperature	– 40°C – + 85°C
Input Voltage	18 – 32 VDC MIL-STD-1275

Data Transmission	Mil Can-Bus, RS-422, RS-485, Ethernet

Absolute Atmospheric Pressure	
Range	10 – 1300 hPa (mbar)
Accuracy	± 1,5 hPa (mbar)
Resolution	0,012 hPa (mbar)

MILITARY STANDARDS

MIL-STD 810G
MIL-STD 461F
MIL-STD 1275E

MASKED TYPE CBRN SYSTEMS

GF-90 MASKED TYPE FILTRATION

GF-90 Masked Type CBRN System designed and produced by NERO engineers in accordance with MIL-STD-1472 requirements with an ergonomic structure as per standards such as NATO AEP-54, MIL-STD-810, MIL-STD-461.

Protection of the crew against chemical, biological, radiological and nuclear threats is provided by blowing adjustable fresh air filtrated by masks within the vehicle attached to private separate lines for each user with GF-90 Masked Type CBRN System which has 90m3/h air flow rate.

TECHNICAL SPECIFICATIONS

It gives error when pressure difference is under the adjusted value.
Pressure measurement has digital indicator.
Shelf life: 10years
Voltage Info: 16 -32 VDC
Operation Temperature -32°C / +55°C
Storage Temperature -40°C / +71°C
90 m3/h Air Flow

STANDARDS

AEP-54	Collective Protection at CBRN Environment
MIL-C-38999	Military Connector
MIL-DTL-27500	Special Purpose, Electrical Shielded and Unshielded Wires
MIL-STD-461E	Unshielded Wires
MIL-STD-810G	Military Electromagnetic Compatibility

FT-80 SHELTER TYPE FILTRATION SYSTEM

FT-80 Shelter Type CBRN System designed and produced by NERO engineers in accordance with MIL-STD-1472 requirements with an ergonomic structure as per standards such as NATO AEP-54, MIL-STD-810, MIL-STD-461.

Protection of the crew against chemical, biological, radiological and nuclear threats is provided by blowing adjustable fresh air filtrated by masks within the vehicle attached to private separate lines for each user with FT-80 Masked Type CBRN System which has 90m3/h air flow rate.

TECHNICAL SPECIFICATIONS

Air Flow Rate	80 m³/h (47cfm)
Ventilation Air Flow Rate	160 m³/h (94cfm)
Operation Temperature	-32°C — +49°C
Storage Temperature	-40°C — +63°C
Operation Voltage	28V DC
Current	Max. 30 A @ 24V DC
Weight	36 ± 2 kg
Dimensions	383 x 455 x 506 ±10 mm
Filters	''HEPA'' filter for particle filtration ''Activated carbon'' filter for gas filtration
Number of Crew To Be Protected	9 (optional)
Control Box	Digital - Analog

AF-60 MASKED TYPE CBRN FILTRATION SYSTEM

AF-60 Masked Type CBRN System designed and produced by NERO engineers in accordance with MIL-STD-1472 requirements with an ergonomic structure as per standards such as NATO AEP-54, MIL-STD-810, MIL-STD-461.

Protection of the crew against chemical, biological, radiological and nuclear threats is provided by blowing adjustable fresh air filtrated by masks within the vehicle attached to private separate lines for each user with AF-60 Masked Type CBRN System which has 60m3/h air flow rate. Gas and Particle filters in the system designed to be easily attached and removed, provides maximum speed during movement to hot zone.

TECHNICAL SPECIFICATIONS

Air Flow Rate	60m³/h (35cfm)
Operation Temperature	-32°C — +49°C
Storage Temperature	-40°C — +63°C
Operation Voltage	28V DC
Current	Max. 7,5A @ 24V DC
Weight	~25kg
Dimensions	330 x 370 x 440 mm (En x Derinlik x Yükseklik)
Filters	''HEPA'' filter for particle filtration ''Activated carbon'' filter for gas filtration
Number of Crew To Be Protected	7 (optional)

POSITIVE PRESSURE CBRN SYSTEMS

FT-90 POSITIVE PRESSURE FILTRATION SYSTEM

Showing the difference between external pressure and internal pressure on the screen, it gives pressure information. External pressure info is delivered to the sensor within the unit via pneumatic hose and it shows the difference with internal pressure on the screen. It gives audio and visual warning under the adjusted pressure value. It has dimout, alarm muting, built-in test features. Requested pressure difference warning can be adjusted manually.

TECHNICAL SPECIFICATIONS

It gives error when pressure difference is below the adjusted value.	Shelf life: 10 years
High pressure is blown out the valve by the help of blast valve	Voltage Info: 16 – 32 VDC
Pressure measurement has analog indicator	Filtration Air Flow Rate: 80m3/h
As filtration mode and ventilation mode	Number of personnel to be protected: 4-12 Personnel
It can be used on 2 modes	Max. Operation Height is 3000 meters
Pre-Filter : is used for Coarse-Dust filtration	Operation Temperature -30°C / +55°C
Particle Filtration 99.97%	Storage Temperature -40°C / +71°C
Carbon Filtration: is used for Chemical Filtration	

CV-90 POSITIVE PRESSURE FILTRATION SYSTEM

Showing the difference between external pressure and internal pressure on the screen, it gives pressure information.

External pressure info is delivered to the sensor within the unit via pneumatic hose and it shows the difference with internal pressure on the screen. It gives audio and visual warning under the adjusted pressure value. It has dimout, alarm muting, built-in test features. Requested pressure difference warning can be adjusted manually.

TECHNICAL SPECIFICATIONS

It gives error when pressure difference is below the adjusted value.	3 Stage Fan
Digital Pressure Indicator	Air Flow: 170m3/h (max)
Shelf life: 10 years for each filter	Combined Filter (Particle Filter + Activated Carbon Filter)
Voltage Info: 20 – 32 VDC	''No Filter'' Warning
Operation Temperature -32°C / +55°C	''Filter Change'' Warning
Storage Temperature -40°C / +71°C	''Fan Error Warning

UFT-80 POSITIVE PRESSURE FILTRATION SYSTEM

UFT-80 is a modular CBRN fan filter mechanism / air filtration system. UFT – 80 designed for mobile applications, includes cassette type filter group which has feature of quick filter change. With advanced technology digital user interface intervention to system, system warning control and error detection can be performed instantly. It can provide up to 80 m3 /h (47 CFM) filtrated air within the area the personnel is situated.

TECHNICAL SPECIFICATIONS

It gives error when pressure difference is below the adjusted value.	Storage Temperature -40°C / +71°C
Dimensions: 490x900x280 ±10 mm	Voltage Info: 32 VDC
Shelf life: 10 years for each filter	Adjustable Blast Valve
Operation Temperature -32°C / +55°C	Air Flow: 80m³/h (max)

MARS

FULL-SCOPE CBRN DETECTION, MEASUREMENT, ANALYSIS AND PREVENTION SYSTEM SOLUTIONS

• Detection at High Precision	• Capability to Detect Different Biological, Chemical Agents
• Automatic – Semi-Automatic Operation System	• LCD Display Support

BIOLOGICAL DETECTION SYSTEM

Biological Threat is a particular source of concern as especially most of the Biological agents are easy to be produced, carried and spread. Most of the diseases caused by Biological agents are quite contagious and in the meantime infected people continue to spread the disease and expand its scope further. As time is required for a biological attack to develop, it can be used as a destructive weapon with its spread.

Detection and identification of biological weapon attacks, are main biological defense components helping to lighten the consequences.

The main step for detection of a biological threat is ''Potential hazard'' warning. As a consequence of the warning, samples are collected and the hazard is identified. Identification system can be presented as automatic and manual integrated to air measurement device. After the warning of a potential threat, system sends the measured air in liquid form to test kit without exterminating the biological threat within it and biological agent is detected from the kit.

- Bacteria – Virus – Mould – Fungus biological particle detection and warning is ensured.
- It has Automatic and Semi-automatic instant sample collection and storage unit.
- It stands by 365 days and there is no need for intermediate loading.
- There is automatic instant detection system for 8 different biological agents.

Charbon (anthrax), plague, ricin (toxic biological agent), botulinum(paralysis), enterotoxin type B(stomach disease), brucella (animal disease- stomach disease), Tularaemia (rodent disease), orthopox (smallpox disease).

Mars BioReader system offers automatic or manual options.

- Mars BioReader-Manual Sampling Mode: Sampling is performed with the help of buffer solution cotton and tube, and the personnel should wear special outfit or take samples behind biological cabin so as not to be exposed to biological agent.
- Mars BioReader-Auto Sampling Mode: On automatic mode of the device, the device compounds the sample it takes from the air or from the liquid by straw with buffer solution automatically within the closed tank, drips it on the strip itself, makes the measurement itself and completely decontaminates the strip and the tank itself after the measurement and prepares them for next measurement.

After the sample is collected, strips are loaded to the device and automatic lock mode of the device is activated and it is locked for 60 seconds, it records strip result value to memory with the camera and the results obtained at the strip are logged into the device by using image processing technology and IR-UV lighting features. ID number of the person using the device and real-time GPS location of the device are automatically recorded into the device. The device can transfer this information to HAVELSAN Bridge C4I system in Turkey or can give instant regional warning by sending a notice to AFAD AYDES system.

Biological Detection System can log all biological and chemical and radioactive test measurement strips and papers and visual detectors, record measurement values in the sector.

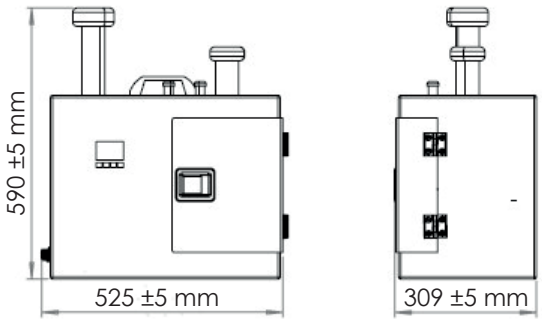
OPTIONS	
• NE-Z-29337	AYDES Integration
• NE-Z-42835	HAVELSAN Bridge Integration
• NE-Z-47756	GPS Coordinate System
• NE-Z-74844	Automatic Liquid Sampling and Cleaning System
• NE-Z-42822	Automatic Air Sampling and Cleaning System
• NE-Z-43747	User Authorization and Identification System (ID System)
• NE-Z-22827	System of Operation Up to 1 Hour with Changeable Battery

MATERIAL ORDER CODES	
• NE-Z-1167	Manual Measurement System
• NE-Z-1276	Automatic Liquid Module
• NE-Z-1246	Automatic Air Module

ADDITIONAL ACCESSORY MATERIAL ORDER CODES	
• NE-Z-2346	Electrical Air Sampling Kit

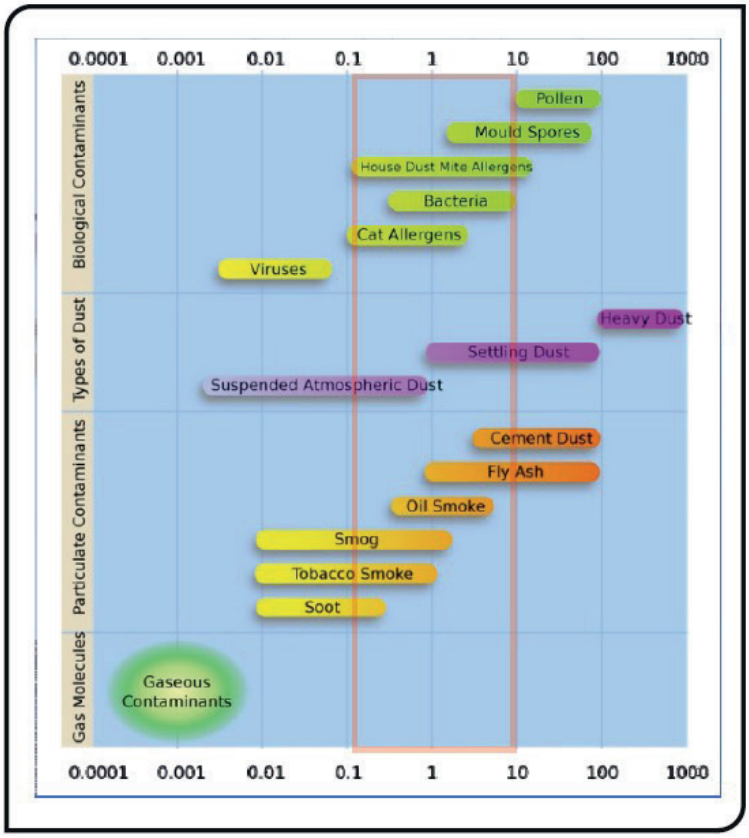
CONSUMABLES MATERIAL ORDER CODES	
• NE-Z-31755	Manual Liquid and Solid Sampling Kit
• NE-Z-31445	Manual Air Sampling Kit
• NE-Z-3271	Buffer Solution
• NE-Z-3228	Biological Waste Bag

MEASUREMENT KITS	
• NE-Z-4528	5 pack Biological Diagnosis Kit
• NE-Z-4828	8 pack Biological Diagnosis Kit
• NE-Z-41028	Buffer Solution
• NE-Z-3228	10 pack Biological Diagnosis Kit

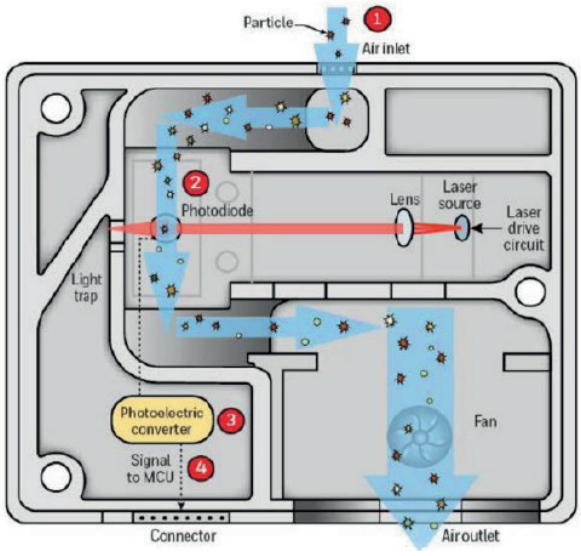


AIR MEASURING DEVICE

Nero Biological Detection System measures particles with a diameter between 0,3 and 10 m by using laser-based particle sensor. An LCD display, ensures settled visualization of PM1, PM2.5, PM4 and PM10 values. Detailed analysis of PM readings enables real-time particle size visualization. It measures the light radiated by separate particles carried within a sample air-flow by a laser beam. These measurements are used to determine particle size and concentration of the number of particles. Particle mass loads PM1 PM2.5 PM4 or PM10, are calculated from particle size spectrums and concentration data by assuming a particle concentration and refraction index (RI).



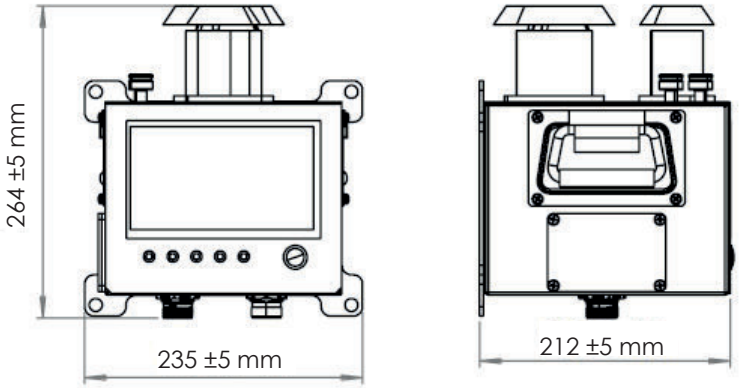
This diagram shows types of atmospheric particulate matter and size distribution in micrometer (SNAIL FAN µm).



Snail Fan

Sensor

SPECIFICATIONS	CONDITION	VALUE	UNIT
Mass Concentration Range	-	0 - 1000	µg/m3
Mass Concentration Size Range	PM1.0	0.3 - 1	µm
	PM.2.5	0.3 - 2.5	µm
	PM4	0.3 - 4	µm
	PM10	0.3 - 10	µm
Mass Concentration Sensitivity PM1 and PM2.5	0 - 100 µg/m3	±10	µg/m3
	100 - 1000 µg/m3	±10	%
Mass Concentration Sensitivity PM4 and PM10	0 - 100 µg/m3	±25	µg/m3
	0 - 1000	µg/m3 ±25	%
Annual Sensitivity Loss	0 - 100 µg/m3	±1,25	µg/m3 / year
	100 - 1000 µg/m3	±1,25	% / year
Sampling Duration	-	1±0.04	second
Operating Voltage		24	VDC
Current Value Max.		2	A
Operating Temperature		-32, +49	°C
Operating Humidity Range		0-96 %RH	%RH
Dimensions	widthxlengthxheight	212x235x264	mm
Weight		5	kg



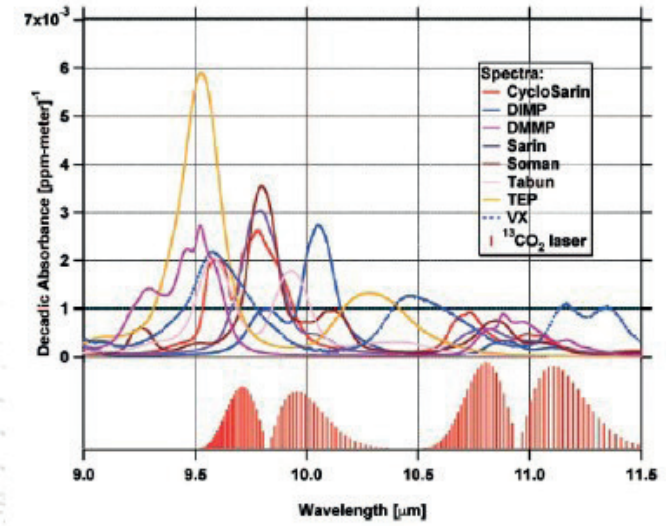
CHEMICAL DETECTION DEVICE

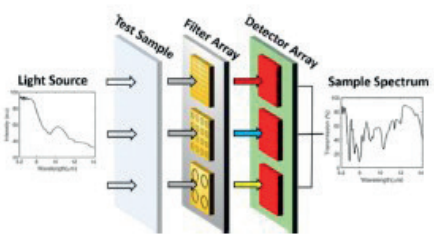
Optical spectroscopy, is a very powerful technic for toxic gas analysis. It enables measurements of light absorption, emission, scattering and rotation, significant structural data and chemical definition of these. Each element of an optical filter series transmits the filtered light to the matching element of a photodetector series. It uses a Fourier transform infrared microscope (FTIR) to record the optical power transmitted from each filter.

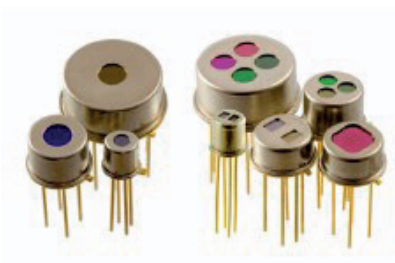
This data is transferred to an RLS algorithm estimating incident spectrum with transfer spectrums of this filter and reconfigures transfer spectrum and infrared light source spectrum of our FTIR. An algorithm is used for matching the spectrums recorded in the library, including common chemical war agents and toxic industrial chemicals. TICs (Toxic Industrial Chemicals) detector is designed to give alarm in cases of detection automatic control of NH3, AsH3, CS2, HCN, HNO3, HCN2, PCl3 and SO2 amongst Toxic Industrial Substances and in case threshold values of hazardous substance concentrations are exceeded. CWA (Chemical War Agents) detector is designed to automatically control nerve gases (GA, GB, GD, GF, VX) and blister gases (HD ve L) amongst Chemical War Substances and warn the user in case threshold values of chemical agent concentrations are exceeded

Chemical Detector also gives warning for VOC**, VVOC*, LEL, Oxygen, sulphuredioxide and phosphate Gases.

Explanation	Boiling Point Range	Specific Sample Agents
Very volatile organic compounds (VVOC*)	<0 and 50-100	Propane, Butane, Chloromethane etc.
Volatile organic compounds (VOC*)	50 - 100 and 240-260	Formaldehyde, Limonene, Toleun,





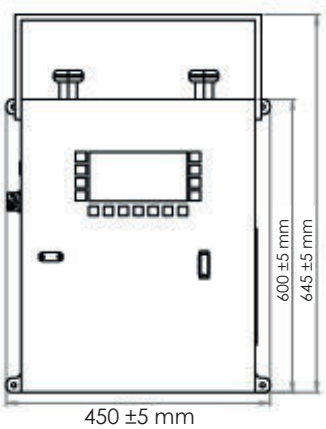


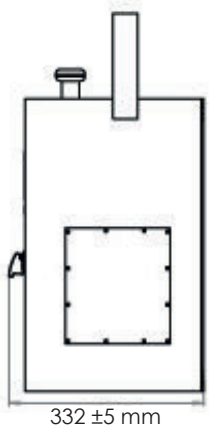
OPTION 1

Abbreviation	Gas Group
AC	Blood Agent Gases (Hydrogen Cyanide, Cyanogen Chloride)
H	Blister Gases (Mustard, Lewisite)
CG	Choking Gases (Phosgene, Chloropicrin)
G	Nerve Gases (Sarin, Soman, Tabun, VX)

Alarm Level	Nerve Gases				Blister Gases	
	GA (mg/m3)	GB (mg/m3)	GD (mg/m3)	VX (mg/m3)	HD (mg/m3)	L (mg/m3)
1st Level	0,3	1	0,8	0,015	1	1
2nd Level	1	2,0	1,5	0,030	3	3
3rd Level	2	2,4	2,2	0,050	8	8
4th Level	4	2,6	3	0,070	10	10
5th Level	6	2,8	3,8	0,090	18	18
6th Level	8	3	5	0,100	35	35
7th Level	10	3,2	5,5	0,110	45	45

Specification	Value	Unit
Weight	12	kg
Dimensions (WidthxLengthxHeight)	332x450x645	mm
Operating Temperature	+15 - +65	°C
Power Requirement	24	VDC
	2	A
Communication	CAN J1939	RS485





OPTION 2

#	Chemical	CAS #	Group	Phase*	PEL**** (OSHA)	REL***(NIOSH)	IDHL*****
1	GA TABUN	77-81-6	1	Liquid	**	**	**
2	GB SARIN	107-44-8	1	Liquid	**	**	**
3	GD SOMAN	96-64-0	1	Liquid	**	**	**
4	GF CYCLOSARINE	329-99-7	1	Liquid	**	**	**
5	VX	50782-69-9	1	Liquid	**	**	**
6	CARBONYL SULFIDE	463-58-1	1	Gas	**	TLV-TWA 5 ppm	**
7	METHYL MERCAPTAN	74-93-1	1	Gas	C 10 ppm	0.5 ppm (1 mg/m³)	150 ppm
8	HD HARDAL GAS	505-60-2	2	Liquid	**	**	**
9	L LEVIZIT	541-25-3	2	Liquid	**	**	**
10	HL HARDAL LEVEZIT MIX	UN:2810	2	Liquid	**	**	**
11	BROMINE	7726-95-6	2	Liquid	TWA 0.1 ppm	TWA- 0.1ppm STEL-0.3ppm	3 ppm
12	ACRYLONITRILE	107-13-1	2	Liquid	TWA 2 ppm C 10 ppm	Ca TWA 1 ppm C 10 ppm	85 ppm
13	ACETONE CYANOHYDRIN	75-86-5	2	Liquid	**	C 1 ppm	**
14	ETHYLENEIMINE	151-56-4	2	Liquid	**	**	100 ppm
15	CHLOROPICRIN PS	76-06-2	2	Liquid	TWA 0.1 ppm	TWA 0.1 ppm	2 ppm
16	AC HİDROJEN CYANIDE	74-90-8	3	Gas	**	**	**
17	SA ARSIN	7784-42-1	3	Gas	**	**	**
18	CK CYANOGEN CHLORIDE	506-77-4	3	Gas	**	**	**
19	CHLORINE	7782-50-5	3	Gas	TWA- 0.1 ppm	C- 0.5ppm	10 ppm
20	ETHYLENE OXIDE	75-21-8	3	Gas	TWA 1 ppm	TWA <0.1 ppm	800 ppm
21	FORMALDEHYDE	50-00-0	3	Gas	TWA 0.75 ppm	TWA 0.016 ppm	20 ppm
22	HYDROGEN CHLORIDE	7647-01-0	3	Gas	C 5 ppm	C 5 ppm	50 ppm
23	HYDROGEN FLUORIDE	7664-39-3	3	Gas	TWA 3 ppm	TWA 3 ppm	30 ppm
24	AMMONIA	7664-41-7	3	Gas	50 ppm	TWA 25 ppm	300 ppm
25	AC HYDROGEN CYANIDE	74-90-8	3	Gas	TWA 10 ppm	ST 4.7 ppm	50 ppm
26	HYDROGEN SULFIDE	10294-34-5	3	Gas	C 20 ppm; 50 ppm	C 10 ppm	100 ppm
27	NITRIC ACID	7697-37-2	3	Liquid	TWA 2 ppm	TWA 2 ppm, ST 4 ppm	25 ppm
28	CARBON DISULFIDE	75-15-0	3	Liquid	TWA 20 ppm C 30 ppm	TWA 1 ppm	500 ppm
29	SULPHUR DIOXIDE	7446-09-5	3	Gas	TWA 5 ppm	TWA 2 ppm, ST 5 ppm	100 ppm
30	ALLYLAMINE	107-11-9	3	Liquid	**	**	**
31	METHYL ISOCYANATE	624-83-9	3	Liquid	TWA 0.02 ppm	TWA 0.02 ppm	3 ppm
32	N-BUTYL ISOCYANATE	111-36-4	3	Liquid	**	**	**
33	NITROGEN OXIDE	10102-44-0	3	Gas	C 5 ppm	STEL 1 ppm	20 ppm
34	PHOSPHINE	7803-51-2	3	Gas	TWA 0.3 PPM	TWA 0.3 PPM - ST 1 PPM	50 PPM
35	CG FOSGEN-PHOSGENE	75-44-5	4	Gas	TWA 0.1 ppm	TWA 0.1 ppm	2 ppm
36	CX FOSGEN OKSIM	1794-86-1	5	Liquid	**	**	**
37	CHLOROSULFONIC ACID	7790-94-5	5	Liquid	**	**	**
38	DIMETHYLSUFATE	77-78-1	5	Liquid	TWA 1 ppm	TWA 0.1 ppm	7 ppm
39	METHANESULFONY CHLORIDE	124-63-0	5	Liquid	**	**	**
40	DIPHENYLMETHANE4*DIISOCYANATE	101-68-8	5	Liquid	P 0.02 ppm	TWA 0.005 ppm- C 0.020 ppm	75 mg/m³
41	ISOPROPYL ISOCYANATE	1795-48-8	5	Liquid	**	**	**
42	TERT-BUTYL ISOCYANATE	1609-86-5	5	Liquid	**	**	**
43	TETRAETHYL PYROPHOSPHATE	107-49-3	5	Liquid	TWA 0.05 mg/m^3	TWA 0.05 mg/m^3	5 mg/m^3
44	TDI TOLUENE DIISOCYANATE	26471-62-5	5	Liquid	**	**	**
45	HN-1NITROGEN IPERITBIS	538-07-8	6	Liquid	**	**	**
46	ED ETHYLDICLOARSIN	598-14-1	6	Liquid	**	**	**
47	1.2 DIMETHYLHYDRAZINE	540-73-8	6	Liquid	**	**	**
48	TERT-OCTYK MERCAPTAN	111-88-6	6	Liquid	**	**	**
49	ETHYL PHOSOHONOTHIONIC DICHLORIDE	993-43-1	6	Liquid	**	**	**
50	DP DIFOSGEN	503-38-8	7	Liquid	**	**	**
51	HN-2 NITROGEN IPERIT	51-75-2	7	Liquid	**	**	**
52	HN-3 NITROGEN IPERITTRIS	555-77-1	7	Liquid	**	**	**
53	PD PHENYLDICHLOROARCIN	696-28-6	7	Liquid	**	**	**
54	MD METHYLDICLOARSIN	593-89-5	7	Liquid	**	**	**
55	SULPHURIC ACID	7664-93-9	7	Liquid	TWA 1 mg/m³	TWA 1 mg/m3	15 mg/m³
56	PHOSPHORUS TRICHLORIDE	7719-12-02	7	Liquid	TWA 0.5 ppm	TWA 0.2 ppm	25 ppm
57	PHOSPHORUS PENTALLURIDE	7647-19-0	7	Gas	**	**	**
58	SULFURLY CHLORIDE	7791-25-5	7	Liquid	**	**	**
59	ALLYL ISOTHIOCYANATE	57-06-7	7	Liquid	**	**	**
60	ARSENIC TRICHLORIDE	7784-34-1	7	Liquid	TWA 0.010 mg/m^3	0.002 mg/m^3	5 mg/m³
61	CYANOGEN	460-19-5	7	Gas	**	TWA 10 ppm	**
62	ETHYL PHOSPHONOUS DICHLORIDE	1498-40-4	7	Liquid	**	**	**
63	PARATHION	56-38-2	7	Liquid	TWA 0.1 mg/m³	TWA 0.2 mg/m³	10 mg/m³
64	PERCHLOROMETHYL MERCAPTAN	594-42-3	7	Liquid	TWA 0.1 ppm	TWA 0.1 ppm	10 ppm
65	SULFURLY FLOURIDE	2699-79-8	7	Gas	TWA 5 ppm	TWA 5 ppm - ST 10 ppm	200 ppm
66	METHLY HYDRAZINE	60-34-4	7	Liquid	C 0.2 ppm	C 0.04 ppm	20 ppm

* Phase state of the chemical at room temp.
** Data not given / Not in List / Value of Zero
*** NIOSH-REL recommended limit
****OSHA-PEL allowable limit
***** IDHL Instant allowed limit

RADIATION MEASURING DEVICE

System is developed on radiation detection sensitivity on detectable radioactive particles. The system is developed on radiation detection sensitivity with regard to detectable radioactive particles. Nero Radiation Probe is a gamma dose rate detector with IP67 protection which can be mounted to upper structure. This detector provides data output on communication and can be directly integrated to IT system of any vessel.

Radiation Probe can be used at various applications including marine/air/land and critical infrastructure systems. There are , 0-100 R/h low level and 100 mR/h-1000 R/h high level detections at radiation detection system.

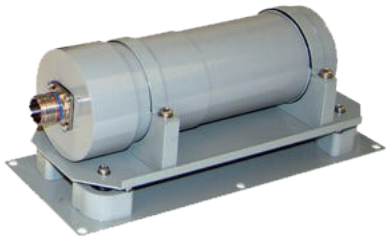
• Steel Body	• Dimensions: 150x150x85 mm
• IP67 protection level	• Digital interface for connection: RS485-CANBUS
• The energy gap to be detected is at; 60keV - 3MeV range	

ANALOG RADIATION MEASUREMENT UNIT

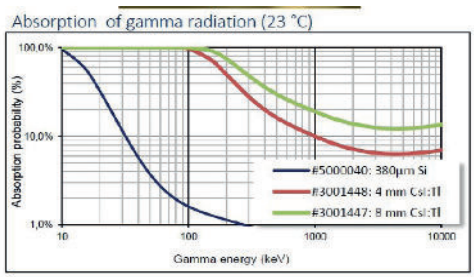
Analog Radiation Measurement Unit, is a radiation monitoring system which provides continuous and real-time radiation data about military vessels/vehicles. It provides detection and measurement. It shows digital measuring results of the data received from the sensors on vessel/vehicle.
Analog radiation measurement unit consists of below components:
Analog Radiation Control Panel; enables central indication and alarm for all remote radiation detectors.

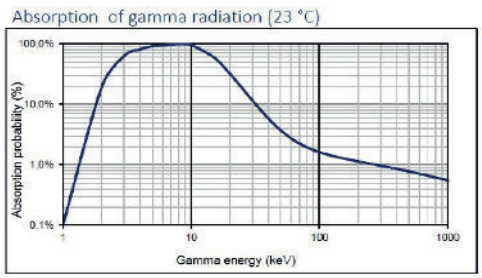
A separate display module for each detector, shows gamma dose rate at detector location. This unit is also used in cases of training.
Remote radiological detectors continuously transmit data about radiation existence and level to control panel.
Analog Radiation Measurement Unit can use 10 detectors but different variations are also present in line with the requirements.

Control Panel Specifications



- It continuously monitors dose rate and alarm status for each detector in use.
- It shows separate dose persistence times for each channel
- Predetermination of level for alarm
- Visual and voice warning at adjusted alarm level
- Lightening on panel
- Vibration resistant assembly wedges





PROTECTION FROM RADIATION GAMMA LINER

Lightness: 60% lighter than conventional materials.
Environment: Not harmful to humans and the environment.
Recycling: It does not require any special recycling, it is disposable.
Customizable: It can be customized to various shapes and sizes.

Bullet Thickness(mm)	**0.25**	**0.50**	**0.75**	**1**
Thickness(mm)	1.00	2.00	3.00	4.00
Weight(kg/m2)	2.20	4.50	6.84	9.12

Standards	**150 kV 10 mA,(IEC 61331-1)**
Compressive Strength	140 Bar / 1400 tons
Storage Life	~50 years
Application	The thickness is determined according to the radiation dose.
Storage	Vertical Dry and Flat Floor @ NSA