



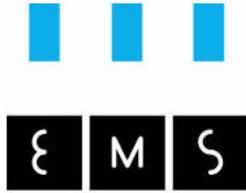
Measurement Technology

MAC *VIEW*®-Particles

Getting started guide and
operating manual

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Operating manual of the MACVIEW®-Particles

Welcome

The MACVIEW®-Particles is a measurement equipment, which can defects you from damage of your personal healthy by proper use. It is recommended to take notice of the items described in this manual and so implement your knowledge in practice before you go to work with the MACVIEW®-Particles.

Warranty

On this equipment is 1 year of warranty included. If you have problems, please contact your supplier with your device-ID. (MV-ID can be found on the display when you press on the EMS-icon of the MACVIEW®-Particles.) You can contact us exclusively if you cannot reach your local supplier on the following address:

Environmental Monitoring Systems (EMS) BV
Postbus 51
4697 ZG SINT-ANNALAND
The Netherlands

Distribution requirements

The minimum and maximum temperature conditions are: + 5°C ...+40°C
+41°F...+104°F

After unpacking the measurement-device you must immediately control for visible damage or rough handling during transportation. If above mentioned situation is concerned then please contact your supplier.

Environmental requirements

The MACVIEW®-Particles is designed to produce reliable measurement-data under normal circumstances in laboratory and for industrial use. Thus you have first to find out where to place the MACVIEW®-Particles. You have to keep the following items back in mind by installing the equipment:

- De MACVIEW®-Particles may not be placed in corrosive, chemical, wet or very filthy surroundings for longer time.
- Take care of the sensor of the MACVIEW®-Particles. You can read more about it in "De sensor and its environment".
- Avoid heavy shocks or frequent vibrations.
- Avoid high temperatures and direct sunlight.

- **The cable of the sensor of the MACVIEW®-Particles may not lead through or along high voltage or power cables. Use special instrumentation cable boxes. This avoids disturbances on the sensor signals.**

Getting started

During the installation you must follow the next issues:

- When mounting the MACVIEW®-Particles against a wall you have to consider that you do not take screws with a big head. When you use this kind of screws it is possible that the screws will get jammed in the measurement equipment. When you dismount the MACVIEW®-Particles you have a big problem getting out the screws.
- The MACVIEW®-Particles and its sensor must be obviously mounted in a clean, dry and not corrosive environment.
- The MACVIEW®-Particles has on the printed circuit board two relays mounted for external alarms. The relays could switch a maximum of 250 VAC at 1A. For higher switching of power it is recommended to place an extra relay between the MACVIEW®-Particles and the power equipment. The relay numbers are drawn on the printed circuit board. The relays are of the type "normal open" (N.O.). When there is no alarm the circuitry is open. When an alarm send out, the relays will be shorted and the circuit is closed.
- The MACVIEW®-Particles has also its own 0-20mA output or 0-10Volt output. You can find this connection on ANout and AGnd. (See the printed circuit board of the MACVIEW®-Particles.) The setpoint for Analog output is to find on setpoint 5. With this setpoint 5 you can set the maximum analog output signal. If for example the level is put on 5 mg/m³ then the maximum of the output of 0-10Volt will be linear divided accross the whole range from 0 to 5 mg/m³. If the measured value becomes in overrange the the analog output will stay at 10V in case of voltage output or 20mA in case of current output. By removing the Resistor from the connections ANout and GND (See printed circuit board) the MACVIEW®-Particles will send a current out instead of a voltage.
- With setpoint 6 and 7 you can set the delay time for respectively relay 1 and 2 in seconds. The alarm must stay for several seconds set on setpoint 6 and 7 before it will powers the relay.
- The connection to the computer (RS232 connection) is placed both on the motherboard of the MACVIEW®-Particles and on the lit of the MACVIEW®-Particles. With the optional MACregister-software you can connect the MACVIEW®-Particles on the PC to control the device. The optional software is a CD with a communication-cable included.
- For end-use of the MACVIEW®-Particles you have to remove the oil on the lit.
- **The maximum length of the cable to the sensor can not be more up than 60 meter. In case of longer cables contact EMS. The cables can than be used during calibration which results in a minimum loss of accuracy.**

Service

Service on the MACVIEW®-Particles will positive influence the lifecycle of the measurement instrument. Caused by naturally deformation of the sensors structure it is recommended to recalibrate the MACVIEW®-Particles every year or periodically by many use. EMS has a very sophisticated calibration-system for calibrations. EMS can offer you service-agreement vary from 2 until 5 years. The basic service-agreement is 3 years. If you are interested in these service-agreements please contact EMS customer-support.

The use of the MACVIEW®-Particles

After you power on the MACVIEW®-Particles, there will be on the upper row the message "Initialise". The MACVIEW®-Particles is now preheating the sensor for best characteristics. This preheating-time will last for approximately 3 minutes. After this 3 minutes the display show the standard display where the concentration is shown in mg/m³ (milligram per cubic meter) or in pcs. (number of measured pieces). In the MACVIEW®-Particles there is a menu to adjust the values of the 2 relays. On the front of the MACVIEW®-Particles there are three buttons plus one security button behind the EMS-icon.

In the MACVIEW®-Particles are 2 relays for external alarms or blowers. We advise you the following configuration and adjustment of the MACVIEW®-Particles with other equipment:

- Relays1: Standard alarm, optical or acoustic signal (flashlight, alarm-bell or something)
- Relays2: Connection with a blower unit or something else.

The second row shows the status of the 2 build-in relays. A "0" is off and a "1" is on. Standard the both relays are on "0" during initialising. They are off then. After initialising the relays will be activated and possible higher values will generate an alarm by switching the relays.

When relays1 goes on (the MACVIEW®-Particles is in alarm) it is possible to accept the alarm by pressing on the "RESET"-button. (Temporary put off). The alarm will be off until the measurement-value is under the lower value and after that passes the alarm value. The reset is only possible with Relay1, with Relay2 an accept is not possible.

Button "MENU":

- After this button is pressed the menu is shown. If you press one time on menu, the display shows you "Setp.1" (Setpoint 1). If you press again, on the display it shows "Setp.2" (Setpoint 2) etc. This is done until "Setp.7". After that, the display will return to the default layout.

Button "SET":

- With this button you can adjust the values of the setpoint to higher values. Every press is one point. If you keep this button pressed the value becomes automatically higher. This is useful for higher settings. The value of the Setpoints (Setp.1 - Setp.4) has a maximum of 60. The reason is that the display of the concentration in the standard mode is also at maximum 60 mg/m³. Outside the menu in normal operation this button is used to switch between the units mg/m³ and the pcs. on the display. Keep the button "SET" approximately 1 second pressed and the display will switch to another unit.

Button "RESET":

- If you are in the Setpoint menu you can reset to zero with the "RESET"-button. After that you can again set the value higher with the "SET"-button.

Security button after the EMS-Icon:

- This button is important when you purchase the software with the MACVIEW®-Particles to safe the output data of the device in a database. The first time you start up the software, the program ask for an identification number and a key. (This is only one time necessary when you use the software for the first time.) The identification number and the key must after encryption by the software equal. It is very important that you give your identification number (MV-ID) with the purchase of the MACregister. After that we can provide you the right key. If you press on the EMS-icon and you keep pressing the EMS-icon, the display show you your unique identification number consisting of 9 characters of the MACVIEW®-Particles. After you release the EMS-icon, the screen shows again the default display layout.

The sensor and its environment

For the sensor you have to take the following precautions:

- The sensor is the most fragile part of the MACVIEW®-Particles. You have to take care when you handle with this sensor or probe.
- If you work with the sensor in filthy environment then take care of the sensor. Filthy can be caused by paintings etc. If the sensor is very filthy then clean the sensor with dry air or dry cotton. You can periodically check if the sensor is clean and free of dust and/or paintings. If the sensor is filthy than the proper working of the MACVIEW®-Particles is not guaranteed.
- After powering up the MACVIEW®-Particles the sensor needs a preheating time for best results. This time is determined by the MACVIEW®-Particles. This approximately lasts 3 minutes. During this three minutes there is a message on the screen of the MACVIEW®-Particles that the MACVIEW®-Particles is initialising. After this message the MACVIEW®-Particles shows the standard display with mg/m³ unit (milligram per cubic meter).
- Highest accuracy of the MACVIEW®-Particles is best guaranteed if the sensor (thus MACVIEW®-Particles) is continue powered.

The following situations must be avoided:

Exposing to silicone vapours

- If silicone vapours adsorb onto the sensor's surface, the sensor will be irreversibly inhibiting sensitivity. Avoid exposure where silicone adhesives, hair grooming materials, or silicone rubber / putty may be present.

High corrosive environment

- Exposure to high corrosive materials as H₂S, SO_x, Cl₂, HCl etc. for extended periods. It causes corrosion or breakage of the lead wires in the internal sensor.

Contact with water.

- Sensor drift may occur due to soaking or splashing the sensor with water.

Freezing.

- If water freezes on the sensing surface, altering characteristics.

The following situations must be avoided:

Water condensation.

- Light condensation under conditions of indoor usage should not pose a problem for sensor performance. However, if water condenses on the sensor's internal surface and remains for an extended period, sensor characteristics may drift.

Use in gas with a very high density

- Sensor performance may be affected if exposed to a high density of dust for a long period of time, regardless of the power condition.

Usage in extreme circumstances

- The use of the sensor in extremely conditions must be avoided. De sensor of the **MACVIEW®-Particles** could generate unreliable measurement data. Examples are very high humidity, very high temperatures or very high gas concentrations during a long time of use of the measurement equipment.

Shocks.

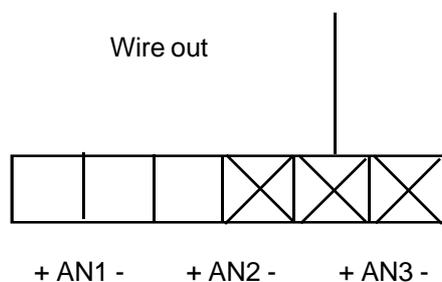
- Breakage of lead wires in the internal sensor's element may occur if the sensor is subjected to a strong shock.

Options

- **MACregister**, a software program for the PC to log data and save the data in a database. This program works on a PC with Windows 95, Windows 98, Windows 2000 and Windows-NT. There must be at least one free serial communication port.
- **MACstat** an optional calibration certificate of the purchased **MACVIEW®-Particles**.
- Longer cables for the sensor(s).
- Extra sensor.

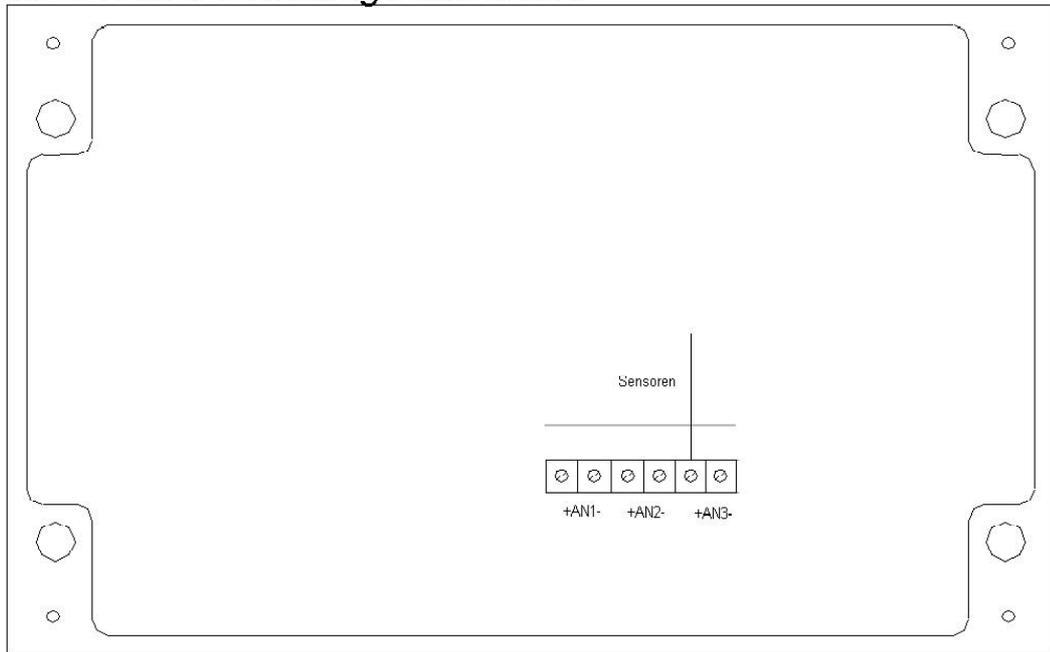
Connections

In the display-unit of the **MACVIEW®-Particles** the lid is connected with a plug with 3 or 6 connections in a 6-place providing socket. It is possible that the plug is wrong connected on a wrong place in the 6-pole socket. Please take care of this while maintaining the **MACVIEW®-Particles**. Below the right position of the socket and plug are shown.

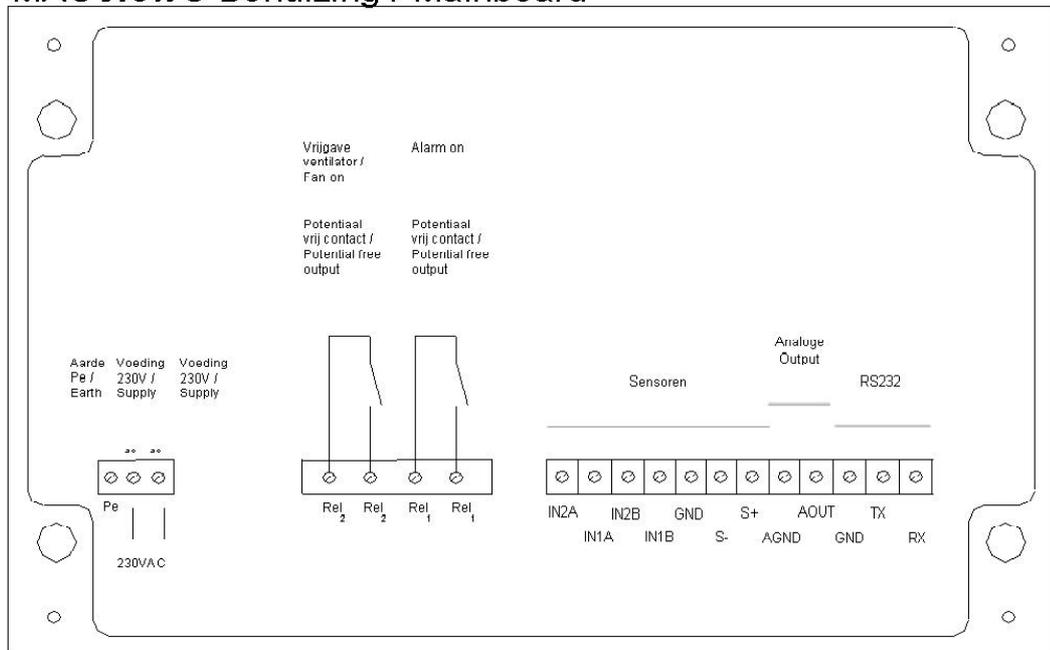


The plug must be placed on the 3 positions marked with a cross. The drawing represents the view from the inside of the lid. The lid is placed upside down with the display down and the electronics above.

MACView® Behuizing / Mainboard



MACView® Behuizing / Mainboard



Technical overview

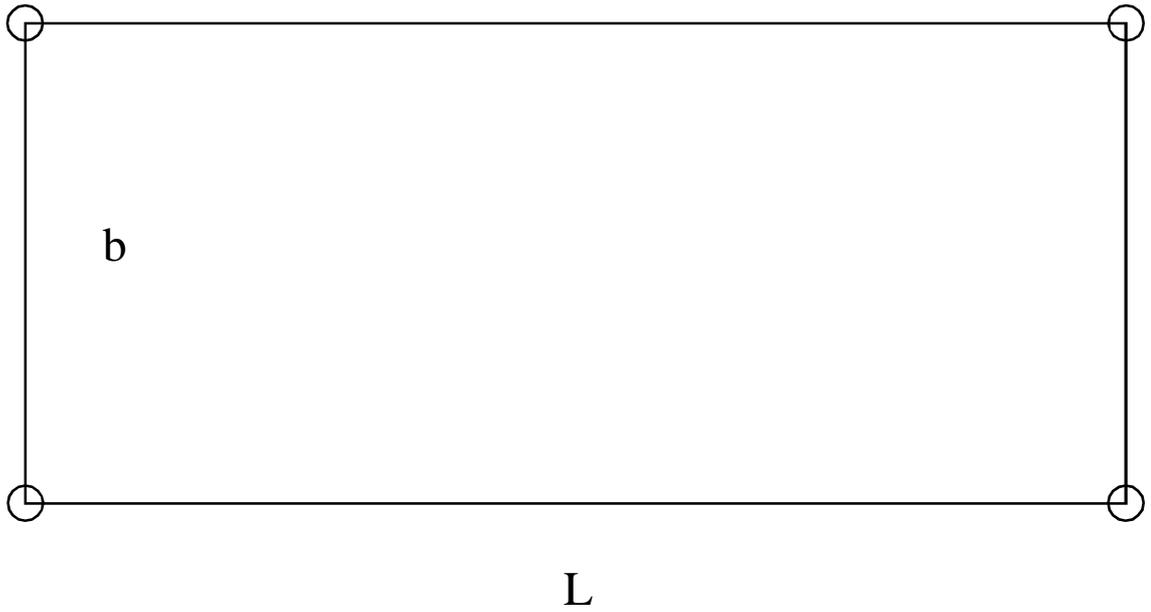
Measurement range	0 - 60 mg/m ³
Material of the sensor	Stainless steel
Material of the readout unit	Aluminium
Weight inclusive probe	1720 gram
Dimensions	61x116x189 mm
Diameter of the sensor	140 mm
Preheating time	circa 240 sec.
Signal/Alarms	mg/m ³ en hysteresis adjustable per relays
Display	LCD backlight display, 2 rows x 16 characters
Acceptation of alarm	by pressing reset button
Communication with PC	RS232
Outputs	2 Relays outputs (max. 250 VAC working separate)
Unit MAC-value on display	milligram per cubic meter (mg/m ³)
Mounting	LCD-Unit and sensor could be separately mounted.
Case quality	IP65
Accuracy of the probe	±7%
Short term stability of the probe	±3%
Long term stability >1 year of the probe	±5%
Approval	CE



EC declaration of type conformity
Déclaration CE de conformité au type

Drill stencil

Below you can use the drill stencil when you mount the **MACVIEW®**-Particles. Care must be taken with the heads of the screws. These heads must not be too big. When these heads are too big the screws could not be removed from the **MACVIEW®**-Particles in the future. The dimension is length by width 145 x 63 mm.



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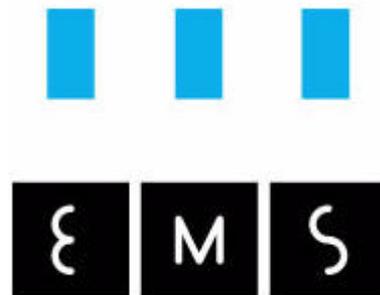
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