

## Ion Counter: Frequently Asked Questions

- **Measurement environment and conditions**

Please use the Ion Counter at humidity **between 30% and 80%** and temperature **between 5° C and 40° C** (with no condensation). Recommended measurement environment is room temperature between 20° C and 26° C and humidity between 40% and 60%, which is close to the work environment of our calibration process.

\*Note: measurement cannot be made in a trace ion environment (e.g. building materials and clothes that emit ions).

- **How many hours can the Ion Counter operate on one 9-volt battery?**

The Ion Counter can operate continuously for roughly 5.5 hours at room temperature around 20° C (when using an alkaline battery\*), until the "LOW BAT" sign is displayed.

\* Fujitsu (FDK) 6LR61/9V Alkaline Battery (G PLUS)

- **Would there be an adverse effect if the 9-volt battery and the AC adaptor are used at the same time?**

There is no adverse effect. When the 9-volt battery and the AC adaptor are used at the same time, the terminal on the battery side will come off the contact and power will be supplied through the AC adaptor.

- **When a new 9-volt battery was inserted, the "LOW BAT" sign was displayed immediately.**

The LOW BAT sign is displayed when battery voltage drops below 6.5V. It is therefore likely that the voltage of the battery has dropped.

Please do not use batteries nearing the expiration date or old batteries. If the "LOW BAT" sign is displayed even with a new alkaline battery or the AC adaptor, there is a possibility of malfunction. Please contact the supplier.

- **What is the power consumption (W)?**

Power consumption is 0.8W.

- **The fan does not work when the Ion Counter is turned on.**

There is a possibility of internal malfunction. Please contact the supplier.

- **Can the Ion Counter be used continuously?**

It can be, but dust and such in the air may enter the Ion Counter during continuous operation and lead to malfunction. We therefore recommend turning it on only when making measurements.

- **How do we clean and maintain the Ion Counter?**

Please blow gently on the sensor part with an air blower to remove dust and such.

- **A lot of sand and powder dust has entered the Ion Counter. How can we clean it?**

Remove the dust protector and remove the powder dust with air compressor and suck. However, please note that frequent cleaning will accelerate the degradation of the sensor part. As mentioned in the User Manual, please do not use the Ion Counter in environments where powder dust and such are present, if possible.

- **How can we use the external output?**

For external display, please connect the Ion Counter to a commercially available DC voltmeter, multimeter, etc.

- **What is the use of the two holes above the external output on the Ion Counter side?**

The holes are used for final adjustment during production and calibration. Please do not touch the holes, because there are variable resistors inside and measured ion count may be affected by touching the holes.

- **Displayed ion count has exceeded 1,000 in analog output, but the maximum voltage is 1V according to the User Manual. Do you guarantee measured values of over 1,000?**  
Although this counter can only display values from 0 to 1,999, the value for 2/4 sometimes reads 1,000 or 3,000 in analog output (using a multimeter). In such cases, please assume that the limit is 1,000/1V and 3,000/3V. The values are output in 1mV/1 digit increment up to about  $\pm 4.5V$  (depending on connected impedance).
- **May we understand that DC voltage in proportion to the displayed value is output to the external output terminal, between 0V and +2V (1.999V) or between 0V and -2V?**  
DC voltage in proportion to the displayed value is output to the external output terminal. Although the range of displayed values is between 0V and +2V or between 0V and -2V, voltage is output even when displayed value is over the upper limit. The values are output in 1mV/1 digit increment up to about  $\pm 4.5V$  (depending on the connected impedance).
- **Why is it that the negative ion count rises and then drops immediately?**  
[Example: Negative ion count rises to -70, then drops to -3.]  
The count rises when negative ions are generated. The count drops when negative ions are gone. In the above case, it is assumed that negative ions were generated instantaneously but they quickly dissipated.
- **Measured values are unstable. Which value should we use?**  
Fluctuation of measured values is caused by changes in the spatial distribution and recombination of ions or in the measurement environment (wind, proximity of electrically charged substance, etc.). You may take the average value of negative ion count within the stipulated range (%) to determine the value. Please use the Ion Counter in a measurement environment with no wind if possible.
- **Sometimes, negative values are displayed in the positive ion display or there is no negative sign in the negative ion display. What kind of condition does it represent?**  
Inside the Ion Counter, electric fields are generated by electrodes. The amount of ions is measured by capturing the positive ions at the positive ion detection electrode and the negative ions at the negative ion detection electrode.  
Possible causes of reversed positive/negative signs include the following:  
Ions are forced to the opposite electrode by winds that are stronger than the force of the internal electric field.  
There is some charged substance near the sensor, which affecting the sensor.  
If the positive/negative signs are displayed in reverse, there may also be a problem with the measurement environment. Please recheck the measurement environment.
- **We would like to use the AC adaptor overseas. Could you issue a Certificate of Non-Applicability?**  
We cannot issue a Certificate of Non-Applicability for the AC adaptor alone, but it is possible to issue one for the main unit of the Ion Counter.  
\* The AC adaptor we supply covers the range of 100V to 240V. Since the AC adaptor is intended for use in Japan (PSE compliant), the user shall be responsible for using the AC adaptor overseas.
- **What should we do when a problem occurred overseas?**  
First, please consult the supplier. Some problems may be solved locally through telephone or e-mail communication only, depending on the nature of the problem. If the problem cannot be solved locally, please send the unit to us in Japan for inspection. In that case, we must ask you to bear the shipping expense.
- **Periodic calibration: Does the Ion Counter require periodic calibration as a measuring instrument?**  
Recommended timing for calibration is one year after commencement of use, but the Ion Counter may be used for more than one year without calibration depending on the frequency and condition of use. For calibration, the Ion Counter needs to be sent back to Automatikprodukter and we will replace consumable parts and recalibrate the unit. (\* Calibration cost will be charged.)



- **What is the time lag during measurement (time interval between measurements)?**  
The liquid crystal display is updated every 333 milliseconds. Displayed value will reach the ion count in the actual measurement environment in a few seconds, even with the time delay in the internal circuit.
- **When multiple Ion Counters were used at the same time, one unit showed a large measurement error. Can we adjust the error of the unit?**  
Error in displayed values can be corrected in some cases but the error may also be due to degradation of parts (including reduction in air flow of the fan). Please consider repairing or calibrating the unit.
- **There is no mention of maximum measurement error in the specifications list.**  
Measurement error in a strict sense is unknown, because there is no standard ion generator and it is therefore difficult to create a standard ionic space to be used for reference.  
Our Ion Counter uses a standard ion source (americium). The pass/fail criterion for shipment is that the displayed ion count of the unit under test is equivalent to that of the standard ion counter (500,000 ions  $\pm 10\%$ ).
- **It is stated in the User Manual that measurement may be affected by temperature and humidity. What is the recommended measurement environment? How large is the effect of temperature and humidity? If the effect is large, is there a way to correct the measured data taken in an environment other than the recommended environment?**  
A recommended measurement environment would be room temperature around 20- 26° C and humidity around 40-60%, which is close to the work environment of our calibration process. Under these conditions, there should be no large error in measured values.  
  
Temperature and humidity cause changes in the temperature characteristics of the circuit components and the fan, air density, air viscosity, etc., and measured values change as a combined result of changes in all of these factors. As such, it is necessary to measure the error characteristics for each environment and correct the measured data accordingly. In reality, however, there is no way to correct the data at present, because there is ambiguity in the standards, the reason being that there is no standard ion generator and it is therefore difficult to create a standard ionic space to be used for reference.  
  
Furthermore, we believe that measured values basically must be compared under identical measurement conditions, since it is said that the number of ions in a given space decreases when humidity is very high or very low.
- **What is the suction rate of ions into the Ion Counter?**  
The air flow rate of the fan is 0.06 m<sup>3</sup>/min.
- **May we remove the protective cover attached to the ion suction port of the main unit?**  
The protective cover is attached to prevent entry of foreign substances and changes in the air flow rate. If there is no change in the air flow rate without the protective cover, there should be no problem. Please use the protective cover according to the operating environment.
- **We are planning to install the Ion Counter in the production line. Is it possible to complete each measurement cycle within 60 seconds (while the palette is stopped)?**  
There should be no problem as long as the measurement environment is stable (wind, proximity of electrically charged substance, etc.).