KIMOTO

# Continuous Dichotomous Aerosol Chemical Speciation Analyzer

# ACSA-14

Japanese Patent Application No.2008-237220

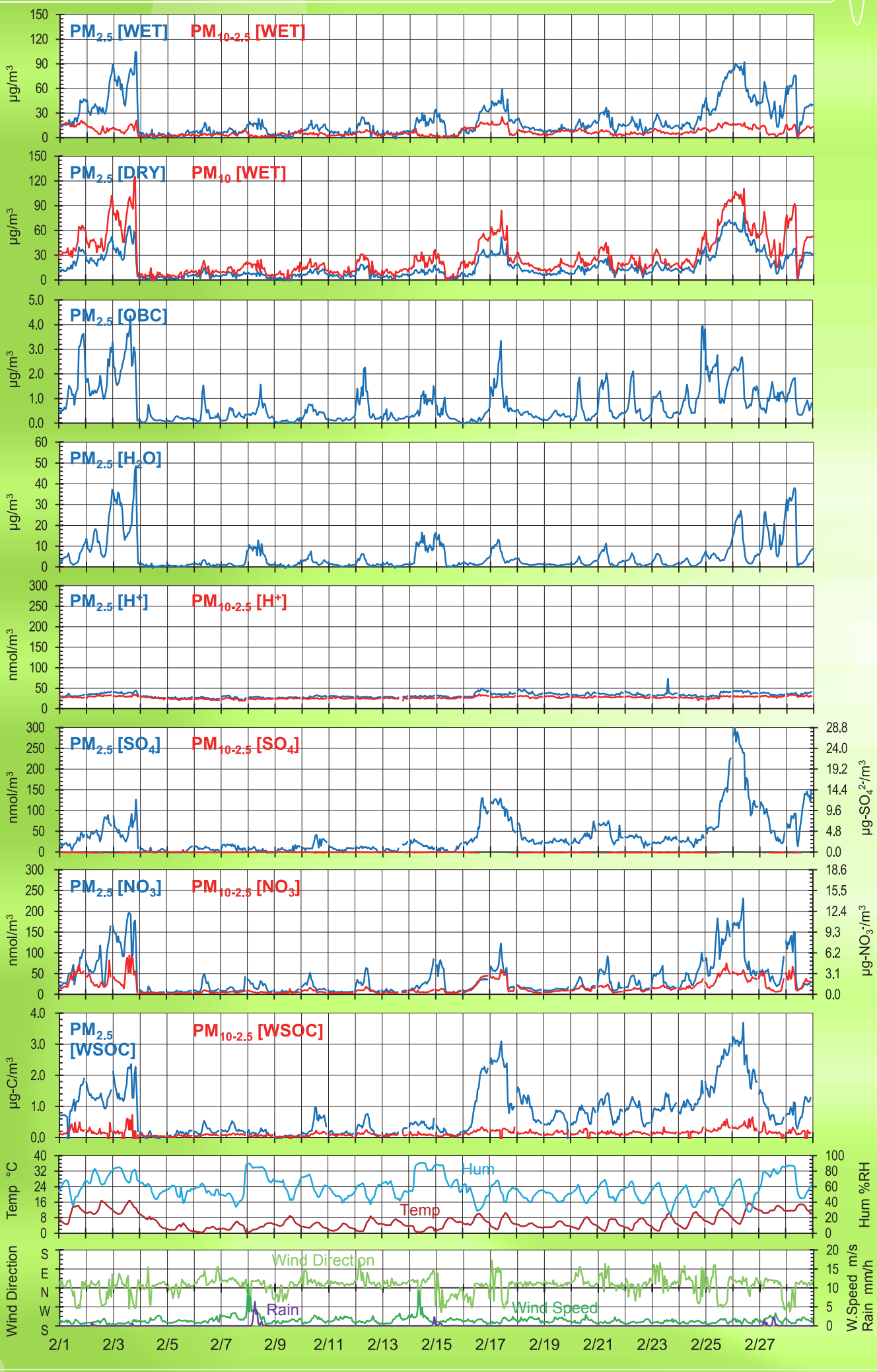
**It is the evolutionary continuous dichotomous analyzer that can measure the chemical species in the atmospheric aerosol ($PM_{2.5}$ and $PM_{10-2.5}$) while measuring the mass concentration every one hour, automatically.**


- ACSA enables to minimize artifact during sampling and matrix effects (interference) during analyzing by the short period (every 1 hour) sampling with using a PTFE tape filter and a virtual impactor. It is non-conventional approach to measure "the acidity of atmospheric aerosol", which has been difficult to measure precisely using 24-hour sampling method because of gas adsorption or particulate volatility.

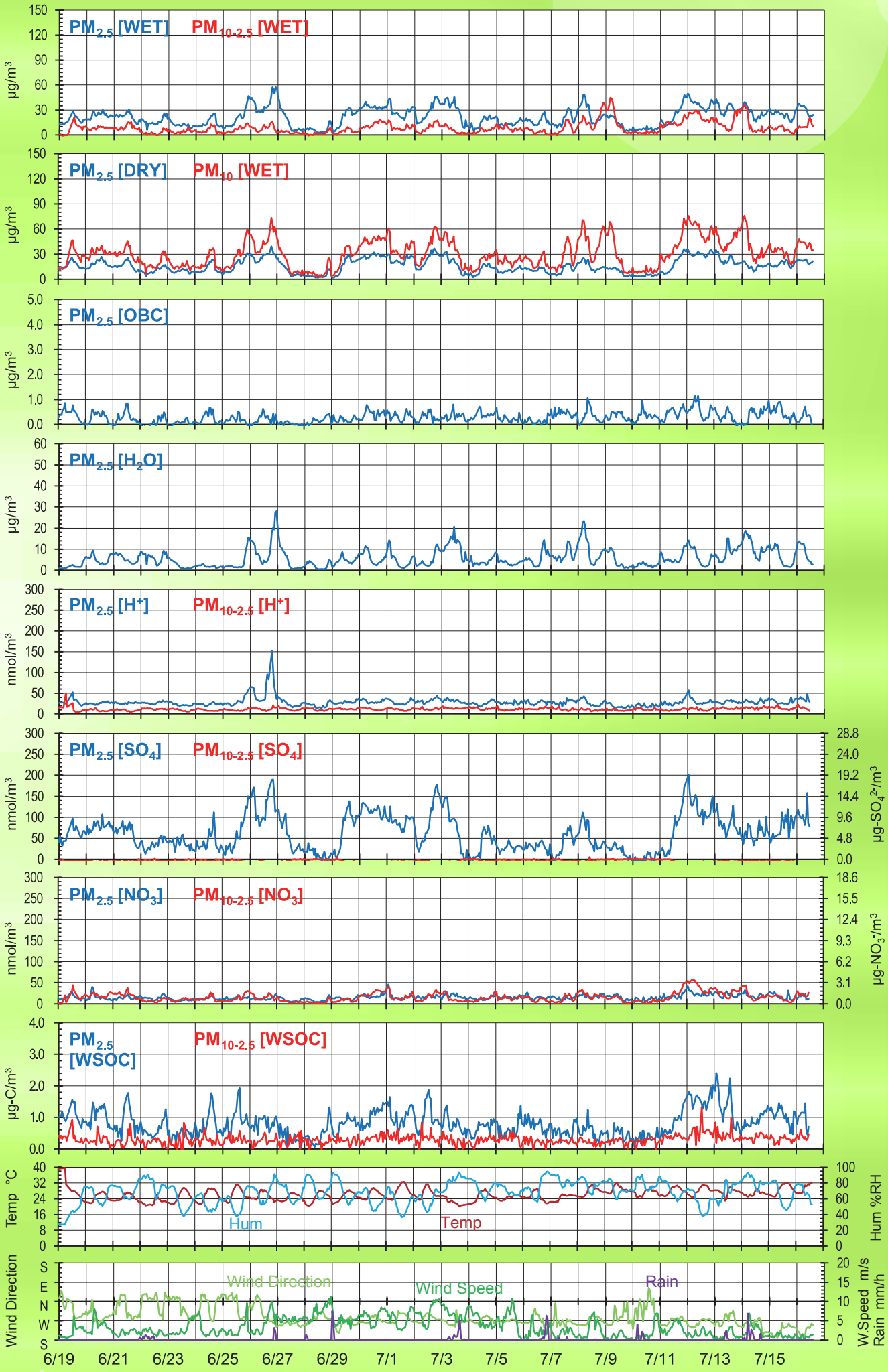
- To measure mass concentrations simultaneously enables to compare with environmental standards and to estimate the contribution of chemical species or amount of water in $PM_{2.5}$.

- The highest sensitivity can be obtained by concentrating the aerosol in 1 $m^3$ air to 1 mL solution with PTFE tape filter and automatic extraction system, in comparison with the aerosol-mass-spectrometer (AMS) and the continuous sulfate/ nitrate analyzer.

# Observation data by ACSA (February, 2014, Osaka Japan)



# Observation data by ACSA (June - July, 2014, Osaka Japan)

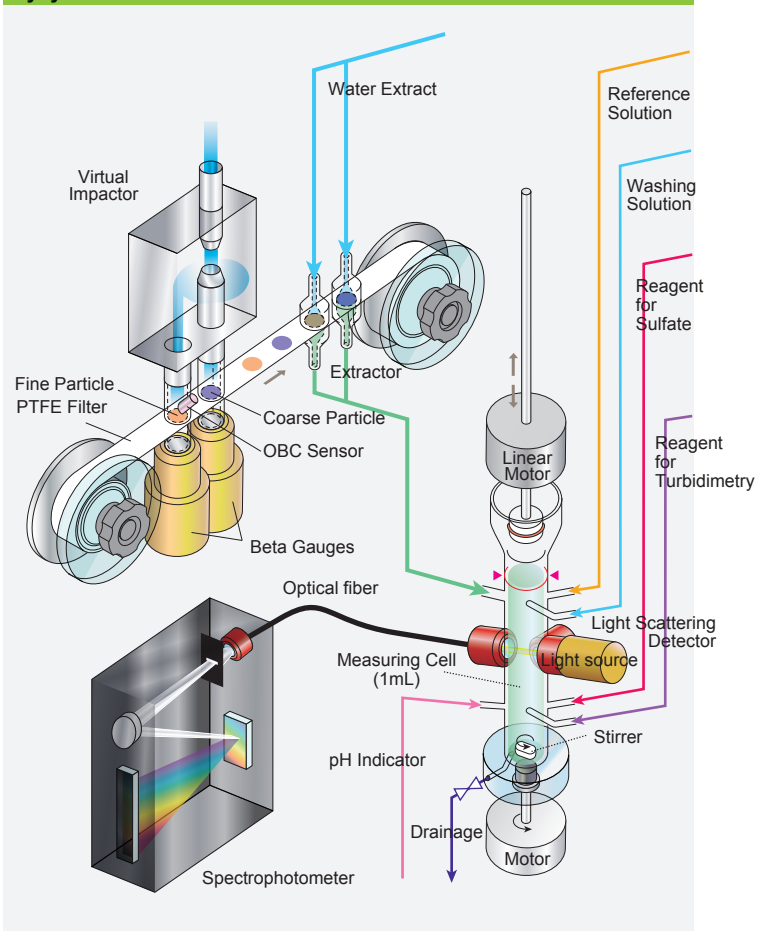


## Specifications

| | |
|---|---|
| Measuring objects | $PM_{2.5}$ and $PM_{10-2.5}$ |
| Measuring items | for $PM_{2.5}$[WET], $PM_{2.5}$[DRY], $PM_{10-2.5}$[WET], $PM_{10}$[WET]<br>Mass concentration<br>for $PM_{2.5}$[WET], $PM_{10-2.5}$[WET]<br>Acidity (hydrogen ion concentration)<br>Sulfate ion concentration<br>Nitrate ion concentration<br>WSOC (Water Soluble Organic Compaunds)<br>for $PM_{2.5}$[WET]<br>OBC (Optically measured Black Carbon) |
| Measuring principle<br>PM concentration<br>Acidity<br>Sulfate ion<br>Nitrate ion<br>WSOC<br>OBC | <br>Beta-ray attenuation method<br>Absorptiometry by pH indicator<br>Turbidimetry<br>UV spectrophotometric method<br>UV spectrophotometric method<br>NIR light scattering method |
| Measurement Range *<br>PM concentration<br>Acidity<br>Sulfate ion<br>Nitrate ion<br>WSOC<br>OBC | * at one hour sampling (depending on sampling period)<br>0 - 1 mg/$m^3$<br>[H+] 10 - 1000 nmol/$m^3$<br>0 - 300 nmol/$m^3$<br>0 - 200 nmol/$m^3$<br>0 - 5 µg-C/$m^3$ (as maleic acid)<br>0 - 5 µg-C/$m^3$ |
| Sample flow rate | 16.7 L/min (15.4 L/min + 1.3 L/min) |
| Flow control | Volumetric flow |
| Filter media | PTFE tape roll |
| Measuring period | Configurable per one hour |
| Beta sources | $^{14}C$, less than 10 MBq |
| PM size classifier | USEPA $PM_{10}$ inlet and $PM_{2.5}$ virtual impactor |
| LCD display | Measured data, Control information, Message, Alerts |
| Internal data storage | Measured data, Control information, Message, Alerts |
| Digital input/ output | Ethernet, USB1.1, RS232C |
| Power supply | AC100V 50/60Hz approx. 400VA |
| Withstand voltage test | AC1000V 50/60Hz for one minute |
| Insulation resistance | More than 5 megohm |
| Weather data | Temperature, Relative humidity, Pressure<br>Optional: Wind direction, Wind speed, Rain amount, Solar radiation |

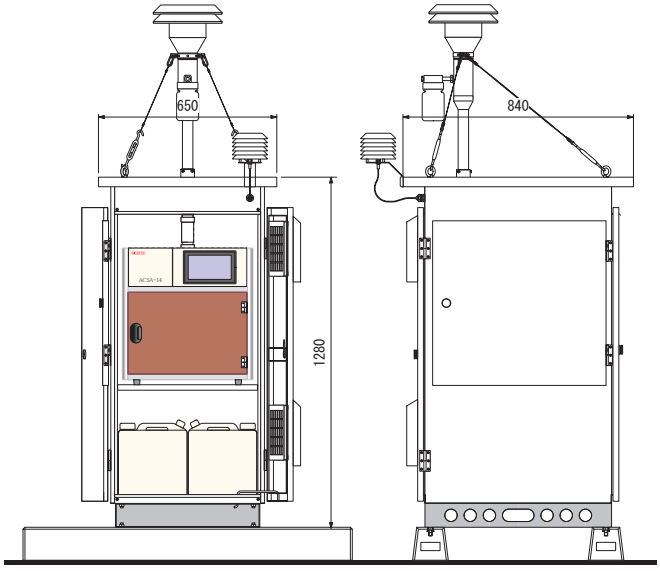
*For further information, please contact us. ACSA-14 is available for rent.

## Sysytem




## Dimensions

Unit: mm




Outdoor Shelter Type (weight: approx. 90 kg)

KIMOTO ELECTRIC Co., Ltd.
3-1 Funahashi-cho, Tennoji-ku, Osaka 543-0024, JAPAN
Phone: +81-6-6768-3401 Fax: +81-6-6764-7040
Web site: http://www.kimoto-electric.co.jp/
E-mail: sales@kimoto-electric.co.jp