

HJ

INDUSTRY STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

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**Technical specifications for level 1 calibration of ambient air
ozone monitoring**

环境空气臭氧监测一级校准技术规范

(English Translation)

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Foreword

To implement the "Environmental Protection Law of the People's Republic of China" and "The Air Pollution Prevention and Control Law of the People's Republic of China" to protect the ecological environment to ensure human health, standardize the first-level calibration operation of ambient air ozone monitoring, and formulate this standard.

This standard specifies the requirements for the primary calibration of ambient air ozone monitoring and the method for calibration of the primary ozone standard for ozone transmission standards.

Law and its quality assurance and quality control.

Appendix A to Appendix D of this standard are informative appendices.

This standard is issued for the first time.

This standard was formulated by the Department of Ecological Environment Monitoring and the Department of Regulations and Standards of the Ministry of Ecology and Environment.

Drafting organization of this standard. Standard Sample Research Institute of Ministry of Ecology and Environment.

Verification units of this standard. China Environmental Monitoring Center, Shanghai Environmental Monitoring Center, Jiangsu Environmental Monitoring Center.

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This standard is interpreted by the Ministry of Ecology and Environment.

Technical specification for primary calibration of ambient air ozone monitoring

1 Scope of application

This standard specifies the requirements for the primary calibration of ambient air ozone monitoring and the method for calibration of the primary ozone standard for ozone transmission standards.

Law and its quality assurance and quality control.

This standard applies to the transfer of the value of the ozone level 1 standard to the ozone transmission standard, the level 1 calibration of ozone monitoring and its quality assurance Certification and quality control.

Other ozone standard reference photometers can refer to this standard to calibrate the ozone transmission standard.

2 Normative references

This standard quotes the following documents or their clauses. For undated reference documents, their valid versions are applicable to this standard.

HJ 590 Determination of Ozone in Ambient Air Ultraviolet Photometric Method

3 Terms and definitions

The following terms and definitions apply to this standard.

Calibration

For a set of operations under specified conditions, the first step is to determine the relationship between the value provided by the measurement standard and the corresponding display value.

The second step is to use this information to determine the relationship between the measurement results obtained from the displayed value, where the measurement standard provided by the measurement standard and the corresponding the displayed value has measurement uncertainty.

Ozone standard reference photometer (SRP) Based on the principle that ozone has a significant absorption of ultraviolet light of a specific wavelength (253.7 nm), the ultraviolet double-path detection technology is adopted Technology, an ozone standard measuring instrument recognized by an international authoritative organization.

Ozone level 1 standard Refers to the ozone standard reference photometer recognized by the ecological environment monitoring department, which is the highest meter in the national ecological environment system Measuring appliances. The primary ozone standard is mainly used for comparison with the value of the national measurement base (standard) and the SRP in the ecological environment system.

The quantity value comparison and the quantity value transmission to the ozone transmission standard.

Ozone transfer standard Refers to the ability to accurately reproduce or accurately analyze the ozone concentration, traceable to a higher level or higher authority in accordance with relevant operating procedures Granville standard transportable equipment. The ozone transmission standard is used to transmit the authority of the ozone level 1 standard or to calibrate the monitoring station Point ozone calibration instrument or ozone analysis instrument.

Ozone control standard the ozone transfer standard calibrated by the ozone standard reference photometer is the quality assurance and quality control instrument of SRP.

Often placed in the laboratory. Mainly used as a backup standard when the ozone standard reference photometer fails or for the first level of ozone monitoring the reference standard when calibration is in doubt.

Ozone monitoring level 1 calibration Refers to the operation of a photometer with ozone primary standards calibrated to ozone transfer standards or ozone control standards to establish ozone transfer the quantitative relationship between ozone concentration standards or ozone control standards and ozone level 1 standards.

Zero air

Refers to do not contain ozone, sulfur dioxide, nitrogen oxides, hydrocarbons and any ozone photometer that can produce ultraviolet absorption Air of other substances.

Traceability

Refers to the measurement results being traced back to the national measurement standard or the national measurement standard through the intermediate comparison link with appropriate accuracy.

The process of measuring standards.

4.1 Composition of primary calibration facility for ozone monitoring

The first-level calibration facility for ozone monitoring consists of an ozone standard reference photometer, a zero gas generator, auxiliary equipment, and an ozone transmission standard.

Standard and data acquisition and transmission equipment composition, as shown in Figure 1.

Figure 1 Composition of primary calibration facilities for ozone monitoring

4.2.1 Environmental conditions

The temperature is maintained between (15~30)°C, and the temperature fluctuation should not exceed $\pm 1^{\circ}\text{C/h}$. Choosing an appropriate air conditioning system can Automatically control the temperature in the laboratory and maintain sufficient air circulation to balance the temperature distribution. Do not blow the air conditioner directly against the instrument.

The relative humidity is kept between (10~50)%. When the humidity cannot meet the requirements, a dehumidifier or humidifier is required.

Avoid dehumidifier or humidifier directly facing the instrument when using.

The laboratory should be equipped with good ventilation equipment and exhaust outlets. The working table of the ozone standard reference photometer should be set to pump the wind system removes the excess ozone generated during the calibration process. The exhaust gas outlet should be equipped with activated carbon cleaning and absorption devices to avoid create pollution.

The power supply system should be equipped with power supply overvoltage, overload and leakage protection devices, and the power supply voltage should be maintained at. $220 \times (1 \pm 10\%) \text{V}$, $(50 \pm 1) \text{Hz}$. The laboratory should have a good grounding circuit, and the grounding resistance should be less than 4 ohm. Such as the supply of ozone standard reference photometer the electrical voltage is required to be $110 \times (1 \pm 10\%) \text{V}$, a voltage-stabilizing transformer is required, and an uninterruptible power supply is required if conditions permit.

4.2.2.1 Zero gas generator

The zero-gas generator is mainly composed of an air compressor and a zero-gas generator, which provides a stable zero for the primary calibration of ozone monitoring.

Gas source. The zero gas generator needs to be equipped with a particulate removal device, ozone and other interference removal device and a gas drying device, and can the output pressure is at least 172 kPa zero gas. The zero gas index shall meet the relevant requirements of HJ 590.