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OF THE PEOPLE'S REPUBLIC OF CHINA

HJ/T 97-2003

The technical requirement for water quality automatic analyzer of electroconductivity

电导率水质自动分析仪技术要求

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Notice of the State Environmental Protection Administration on Issuing “Technical Requirements for pH Water Quality Automatic Analyzer” and other 8 Environmental Protection Industry Standards

HF [2003] No. 57

In order to carry out the “Environmental Protection Law of the People’s Republic of China” and the “Water Pollution Prevention and Control Law of the People's Republic of China”, improve the ability of environmental monitoring work, strengthen environmental control, and protect water environment, now “Technical Requirement for pH Water Quality Automatic Analyzer “ and other 8 environmental protection industry standards are approved and issued.

The standard numbers and names are as follows:

- HJ/T 96-2003 Technical Requirement for pH Water Quality Automatic Analyzer
- HJ/T 97-2003 Technical Requirement for Water Quality Automatic Analyzer of Electroconductivity
- HJ/T 98-2003 Technical Requirement for Water Quality Automatic Analyzer of Turbidity
- HJ/T 99-2003 Technical Requirement for Water Quality Automatic Analyzer of Dissolved Oxygen (DO)
- HJ/T 100-2003 Technical Requirement for Water Quality Automatic Analyzer of Permanganate Index
- HJ/T 101-2003 Technical Requirement for Water Quality Automatic Analyzer of Ammonia
- HJ/T 102-2003 Technical Requirement for Water Quality Automatic Analyzer of Total Nitrogen
- HJ/T 103-2003 Technical Requirement for Water Quality Automatic Analyzer of Total Phosphorous
- HJ/T 104-2003 Technical Requirement for Water Quality Automatic Analyzer of Total Organic Carbon (TOC)

The standards above are recommendatory. They are published by China Environmental Science Press. They are implemented from July 1, 2003.

Notice is hereby given.

March 28, 2003

Foreword

In order to carry out the “Environmental Protection Law of the People’s Republic of China” and the “Water Pollution Prevention and Control Law of the People's Republic of China”, improve the ability of water environment monitoring work, realize automation and modernization of water quality monitoring, achieve early-warning monitoring of surface water quality, and monitoring and controlling the total quantity of pollutant sources, this Standard is formulated.

This Standard specifies main technical requirements in areas such as development and production, performance test, type section and use, routine check of water quality automatic analyzer of electroconductivity.

This Standard was proposed by Department of Science, Technology and Standards of Administration of Environmental Protection of the People’s Republic of China.

This Standard is responsibly drafted by China National Environmental Monitoring Center.

This Standard shall be responsibly interpreted by the Administration of Environmental Protection of the People’s Republic of China.

Technical Requirement for Water Quality

Automatic Analyzer of Electroconductivity

1 Scope

This technical specification specifies the technical performance requirements and performance test methods of water quality automatic analyzer of electroconductivity in respect of surface water, industrial wastewater and municipal wastewater. It is applicable to the design, manufacturing, and performance test of this kind of instruments.

2 Terms and Definitions

For the purpose of this document, the following terms and definitions shall apply.

2.1 Sample

The surface water, industrial wastewater and municipal wastewater that is led into automatic analyzer.

2.2 Zero drift

The percentage of the change of an automatic analyzer's indication value over a given period TO its measurement-range, when the zero correction solution specified in the technical requirement is employed to give continuous test to sample.

2.3 Span drift

The percentage of the change of an automatic analyzer's indication value over a given period TO its measurement-range, when the measurement-range correction solution specified in the technical requirement is employed to give continuous test to sample.

2.4 Mean Time between Failures

The ratio of total hours (h) to failures (number) of an automatic analyzer during its inspection period, expressed as "MTBF", in h/times.

2.5 Response Time (T_{90})

The time required for the indication value of an electrode system to reach 90% of the standard electroconductivity value of measurement-range correction solution, when the electrode system is moved from zero correction solution to measurement-range correction solution.

7.1.6 Electroconductivity standard solution temperature

$(25.0 \pm 0.5)^{\circ}\text{C}$.

7.2 Reagent

7.2.1 Pure Water

Let distilled water pass through an ion exchange column. The electroconductivity shall be less than 0.1mS/m.

7.2.2 Zero-point Correction Solution

Adopt the pure water as specified in 8.2.1.

7.2.3 Measurement-Range Correction Solution

Adopt the solution of 80% measurement-range value.

7.2.4 0.0100mol/L KCl Standard Solution

Weigh 0.7456g of potassium chloride (KCl) that has been dried at 105°C for 2h and cooled down. Dissolve it in pure water and dilute to 1000ml at 25°C. The electroconductivity of this solution (0.0100mol/L KCl) is 141.3mS/m at 25°C.

7.3 Test Preparation and Correction

7.3.1 Test Preparation

Connect the electrode to the signal converter. Switch on the power. Preheat the automatic analyzer for more than 30min before starting the test, so as to make the function of all parts and the displaying records unit to be stable. In case the electrode is polluted, it shall be washed with detergents or 0.01 mol/L hydrochloric acid or the like. Then clean up with running water, and dry-clean it.

7.3.2 Correction

7.3.2.1 Dip the electrode into the zero correction solution. Adjust the indication value to be zero.

7.3.2.2 Dip the electrode into the measurement-range correction solution. Adjust the indication value to be the electroconductivity value of 0.0300mol/L KCl standard solution.

7.3.2.3 Adjustment

Alternate the operation of 7.3.2.1 and 7.3.2.2. Adjust the analyzer until the difference between the measured value and the standard value of the standard solution falls within $\pm 1\%$.

8.5 Power supply category and capacity.

8.6 Manufacturer name.

8.7 Manufacturing date and batch number.

8.8 Signal output class (if necessary).

9 Operating Instructions

The operating instructions must at least provide the relevant items as follows.

9.1 Selection of installation site.

9.2 Sample flow rate.

9.3 Piping and wiring.

9.4 Preheating time.

9.5 Use methods.

9.5.1 Measurement preparation and correction method.

9.5.2 Preparation method of correction solution.

9.5.3 Operating method of determination.

9.5.4 Handling when measurement is stopped.

9.6 Maintenance inspection.

9.6.1 Daily routine inspection methods.

9.6.2 Regular inspection methods.

9.6.3 Electrode system cleaning.

9.6.4 Countermeasures for failures.

9.7 Other considerations for use.

10 Calibration

10.1 Routine calibration

For reproducibility, drift and response time, the calibrating period is at least once a month, either by automatic or manual calibration.

10.2 Calibration under Supervision

The installed continuous monitoring system shall be calibrated regularly. And the regular calibration results shall be reported to relevant administrative department of environmental protection. Regular calibration shall be undertaken by qualified monitoring agencies.

According to environmental monitoring technical specification, regular calibration mainly includes on-site contrast test, review and examination of operation data and daily operation records etc.

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