

ICS 73.100.99
CCS D 82

MT

**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

MT/T 781-1998

**General technical condition for high-resolution automatic earth
resistivity instrument
(English Translation)**

Issued on: November 10, 1998

Implemented on: April 1, 1999

Issued by: State Administration of Work Safety

Table of Contents

- Foreword
- 1 Scope
- 2 Normative references
- 3 Technical requirements
- 4 Test method
- 5 Inspection rules
- 6 Marking, packaging, transportation and storage

Foreword

This standard is proposed by the Industry Management Department of the State Coal Industry Bureau.

This standard is under the jurisdiction of the Standardization Technical Committee for Special Equipment of Coal Industry and Coal Mine

1 Scope

This standard specifies the technical requirements, test methods, inspection rules, marking, packaging, transportation and storage of high-resolution automatic resistivity meters.

This standard applies to high-resolution automatic resistivity meters (hereinafter referred to as instruments) used in field surveys.

2 Reference standards

The following standards contain provisions that, through reference in this standard, constitute provisions of this standard. When this standard was published, the editions shown were all effective. All standards will be revised, and all parties using this standard should explore the possibility of using the latest versions of the following standards.

191-1990 packing storage and transportation pictogram GB/T 6587.1-1986 General Outline of Environmental Testing for Electronic Measuring Instruments GB/T 6587.2-1986 temperature test of electronic measuring instrument GB/T 6587.3-1986 humidity test for electronic measuring instruments GB/T 6587.4-1986 vibration test of electronic measuring instrument GB/T 6587.5-1986 Impact test of electronic measuring instruments GB/T 6587.6-1986 transport test of electronic measuring instruments GB/T 6587.7-1986 Basic safety test for electronic measuring instruments GB/T 10111-1991 Random sampling

method using random number dice GB/T 13384-1992 general technical requirements for packaging of mechanical and electrical products MT 210-1990 Basic test methods for electric and electronic products for communication, detection and control in coal mines

3.1 General requirements

The instrument shall meet the requirements of this standard and be manufactured in accordance with the drawings and documents approved by the prescribed procedures.

3.2 Composition

The instrument consists of a transmitter, a receiver, and a power source.

3.3 Environmental conditions

3.3.1

The instrument should work normally under the following conditions.

- a) Ambient temperature. $-10 \sim 40\text{ }^{\circ}\text{C}$;
- b) Average relative humidity. less than 90% ($25\text{ }^{\circ}\text{C}$);
- c) Atmospheric pressure. $80 \sim 106\text{ kPa}$;
- d) The surrounding environment shall be free of conductive and explosive gases and dust, and gases and vapors that may corrode metal parts and damage insulation.

3.3.2

The worst storage and transportation conditions that the instrument can withstand are.

- a) High temperature. $70\text{ }^{\circ}\text{C}$;
- b) Low temperature. $-40\text{ }^{\circ}\text{C}$;
- c) Vibration. acceleration 20 m/s^2 ;
- d) Shock. Peak acceleration 500 m/s^2 .

3.4.1.1 Working frequency. $2 \sim 30$

Set no less than three point frequencies in Hz, as specified by product standards.

3.4.1.2 Frequency stability. Guaranteed by temperature compensated crystal or other means, it should not be lower than 5×10^{-6} .

3.4.1.3 The maximum supply current is not less than 1.5 A, and has over-current, short-circuit protection.

3.4.1.4 The transmitter shall have the function of automatic conversion of electrode power supply during measurement.

3.4.2 Receiver

3.4.2.1

Working frequency. It must correspond to the operating point frequency of the transmitter.

3.4.2.2 Inlet dynamic range. 10

V, but sensitivity must not be less than 100 μ V.

3.4.2.3 Inlet equivalent noise. not more than 1

3.4.2.4 Suppression of maximum irrelevant level. 104.

3.4.2.5 Gain. $5 \times 100 \sim 5 \times 109$, control in several steps.

3.4.3 Power supply. should not be less than 1.5

kW single phase 50

Hz, 220

V generator set provided. Can also take other reasonable power supply the way.

3.5 Structure and appearance

3.5.1

All screws and nuts must be tightened to prevent them from falling off automatically and vibration.

3.5.2

The appearance of the instrument must not be scratched, sunken or deformed. The enclosure shall have anti-rust measures.

3.6 Electrical safety

The instrument must be leak-proof. Its insulation resistance, working voltage, leakage current, etc. must meet the requirements of normal work and personal safety.

Claim.

3.7 Craft

Transformer rectifier power supply, printed circuit boards, etc. should be taken to prevent moisture, mildew, and insulation.

3.8 Environmental adaptability

3.8.1

The instrument should be able to withstand the high and low temperature working tests performed under the conditions specified in Table 1, and meet the requirements of 3.4.

3.8.2

The instrument should be able to withstand the high and low temperature storage tests performed under the conditions specified in Table 1. After the test under normal atmospheric conditions, it should meet 3.4 requirements.

3.8.3

The instrument should be able to withstand the humidity test under the conditions specified in Table 1. After the test, the instrument should be able to work normally.

Table 1

Test item	temperature °C	Test time h	Recovery time
Low temperature work test	-10	2	
Low temperature storage test	-40	16	2
High temperature work test	40	2	
High temperature storage test	70	16	2
Humidity test	40 °C, 90% RH	48	

3.8.4

The instrument should be able to withstand GB/T After the test, the instrument should be able to work normally.

No obvious damage to the appearance.

3.8.5

The instrument should be able to withstand GB/T After the test, the instrument should be able to work normally.

No obvious damage to the appearance.

3.8.6

The instrument should be able to withstand GB/T after packaging 6587.6-1986 in the transport test specified in Group III conditions, there should be no obvious packaging after the test Damaged, the instrument should be able to work normally without obvious damage to the casing.

4.1 Test conditions

Unless otherwise specified in the environmental test or relevant standards, the test is performed under the following conditions.

- a) Temperature. 15 ~ 35 °C;