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

MT/T 680-1997

**General technical condition of intrinsically safe portable
microcomputer for mining
(English Translation)**

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Foreword

This standard strictly complies with GB 3836 "Explosion-proof electrical equipment for explosive environments" series standards and issued by the Ministry of Coal Industry in terms of explosion-proof safety.

The "Coal Mine Safety Regulations" (1992 edition), technically in accordance with GB 9813-88 "General Specifications for Micro Digital Electronic Computers", MT 209-90 "Common Technical Requirements for Electrical and Electronic Products for Coal Mine Communication, Detection and Control", MT 210-90 "Mine Communication, Detection, Control Use basic test methods of electrical and electronic products "and other coordination.

This standard is proposed by the Department of Science and Education of the Ministry of Coal Industry.

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

This standard was drafted. Xi'an Branch of China Coal Research Institute.

1 Scope

This standard specifies the technical requirements, test methods, inspection rules, signs, Packaging, transportation and storage.

This standard applies to intrinsically safe portable microcomputers (hereinafter referred to as microcomputers) used in coal mines.

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.

GB 191-90 Packing, storage and transportation icon GB 3836.1-83 General requirements for explosion-proof electrical equipment for explosive environments GB 3836.4-83 Explosion-proof electrical equipment for explosive environments Intrinsically safe circuits and electrical equipment "i" GB/T 4942.2-93 protection rating for low-voltage electrical enclosures GB/T 5080.7-86 Equipment reliability test Validation test of failure and mean time between failures under the assumption of constant failure rate Program GB/T 9813-88 General specifications for micro digital computers GB/T 13384-92 General technical requirements for packaging of mechanical and electrical products MT 209-90 General technical requirements for electric and electronic products for communication, detection and control in coal mines MT 210-90 Basic test method for electric and electronic products for communication, detection and control in coal mines

3.1 General requirements

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

3.2 Environmental conditions

3.2.1

The microcomputer should work normally under the following conditions.

- Ambient temperature. generally 0 ~ 4 °C, if other temperature grades are selected, it should meet the requirements of 4.2 in MT 209;
- Average relative humidity. not more than 95% (25 °C);
- Atmospheric pressure. 80 ~ 106kPa;
- Where there are explosive mixtures in coal mines, but no corrosive gases that damage the insulation;
- Environment without strong vibration and shock.

3.2.2

The worst storage and transportation conditions that a microcomputer can withstand are.

- High temperature. 60 °C;

- Low temperature. stipulated by product standards, but not higher than -10 °C;
- Average relative humidity. 95% (25 °C);
- Vibration. acceleration 20m/s²;
- Impact. The peak acceleration is 500m/s².

3.3 Explosion-proof type

The microcomputer should be an intrinsically safe type for mining, marked "iI"

3.4 Composition

Microcomputer is generally composed of intrinsically safe power supply, microprocessor, memory, input and output interface, system bus, keyboard, display and other parts composition.

3.5 Electrical performance

3.5.1

The technical specifications of the microcomputer shall be specified in the product standard, and generally shall include the following items.

- CPU model, frequency;
- Memory capacity;
- bus type;
- monitor type, color, resolution, size;
- Interface Type;
- Working voltage, working current, etc.

3.5.2

The technical parameters of explosion-proof power supply shall be specified in the product standard, and generally shall include.

- Battery model, capacity and number of cells;
- rated output voltage;
- rated output current;
- the highest open circuit voltage;
- Maximum output current.

3.5.3

When using a rechargeable battery pack for power supply, it shall have the functions of preventing overcharge and overdischarge.

3.5.4

The microcomputer should have a self-test function.

3.5.5

The minimum working time of the whole machine shall be specified in the product standard, and generally shall not be less than 2h.

3.6 Appearance and structure

3.6.1

The shell of the microcomputer shall not be scratched, sunken, deformed or cracked.

3.6.2

Reliable installation of components and reasonable cooperation.

3.6.3

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

3.6.4

All metal parts shall be rust-proofed.

3.6.5

The electrical clearance and creepage distance as well as components and parts shall comply with the relevant provisions of GB 3836.4.

3.6.6

The magnesium content of the aluminum parts used in the enclosure is not more than 0.5%.

3.6.7

Nameplates and signs shall be complete, firm, obvious, clear and beautiful.

3.7 Process requirements

The debugged circuit board must be cleaned, and the front and back sides should be coated with three-proof paint at least twice, and the covering layer should be firm and reliable.

When using multiple power sources, each power circuit must be arranged separately.

Battery packs, current limiting resistors, power boards, etc. should be glue sealed. Adhesive