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

GB 25974.4-2026

**Powered support for coal mine - Part 4: Specification for
electro-hydraulic control system**

煤矿用液压支架 第4部分：电液控制系统技术条件

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Table of Contents

1 Scope
4 Requirements
4.1 General Requirements
4.2 Environmental Conditions
4.3 Power Supply
4.4 System Functional Requirements
4.5 Main Technical Specifications
4.8 Immunity Requirements
4.8.1 When conducting immunity tests as described in
4.9 Explosion-proof performance
5 Test Methods
5.1 Test Conditions
5.1.3 Test Instruments and Equipment
5.2 Test System
5.2.4 Test System Operation Check
5.3 System Functional Test

1 Scope

GB 25974.4-2026 is the Chinese national standard on powered support for coal mine - part 4: specification for electro-hydraulic control system, in the field of mining and minerals. It carries no /T suffix, which in the Chinese system means compliance is mandatory: a product or a practice within its scope has to meet it to be lawfully made, sold or carried out in China. It was issued on 27 February 2026 by the State Administration for Market Regulation; Standardization Administration of China, and takes effect on 1 March 2027. Classification: ICS 73.100, CCS D97. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This document defines the terminology for the electro-hydraulic control system of hydraulic supports in coal mines (hereinafter referred to as "the system"), and specifies the technical requirements and inspection procedures. Requirements for marking, packaging, transportation and storage, use and maintenance are specified, and corresponding test methods are described. This document applies to the design, manufacture, transportation,

use, and maintenance of electro-hydraulic control systems for hydraulic supports in coal mines.

4.1 General Requirements

4.1.1 Lightning protection measures should be provided at the transmission interface, wellhead, power supply, etc.

4.1.2 During use, the system should have the function of protecting operators from mechanical and electrical injuries.

4.1.3 Pressure sensors used in hydraulic support columns shall comply with the following regulations.

- a) The pressure sensor's range is not less than 60 MPa;
 - b) Measurement error not greater than $\pm 2\%FS$;
 - c) No leakage or damage occurs when the load pressure reaches twice the full scale.
- 4.1.4 The human-machine interface unit of the hydraulic support control device shall at least include an emergency stop mechanism and a locking mechanism, and shall be installed in a location easily accessible to the user. The emergency stop mechanism should be red when the operation is initiated.

4.1.5 Each hydraulic support control device should have a unique network communication address, and the hydraulic support and its control device should form a unique pair within the system. The logical relationships are as follows: The system composition is specified in Appendix A.

4.1.6 Electro-hydraulic directional valves shall comply with the provisions of GB/T 25974.3 and MT209.

4.1.7 The hydraulic support pushing cylinder should be equipped with an independent stroke detection sensor, and the sensor measurement error should not exceed 5mm.

4.1.8 The system shall have a coal mining machine position detection sensor. The coal mining machine position measurement error shall not exceed 1.5m.

4.1.9 The system shall have an angle sensor. The angle measurement error shall not exceed $\pm 1^\circ$.

4.1.10 The system shall have a height sensor. The height measurement error shall not exceed $\pm 1\%FS$.

4.2 Environmental Conditions

4.2.1 Unless otherwise specified in relevant documents, products used in the system for underground coal mines shall operate normally under the following environmental

conditions.

- a) Ambient temperature. 0°C~ 40°C;
- b) Average relative humidity. not greater than 95% (25°C);
- c) Atmospheric pressure. 80 kPa ~ 106 kPa;
- d) Coal mines are environments with explosion hazards such as gas and coal dust;
- e) Places free from corrosive gases that damage metals and insulation materials.

4.2.2 The storage and transportation conditions that coal mine products should withstand are as follows:

- a) Ambient temperature. -40°C to 60°C;
- b) Average relative humidity. not greater than 95% (25°C);
- c) Vibration. Acceleration not exceeding 50 m/s²;
- d) Impact. Peak acceleration not greater than 500 m/s².

4.2.3 Equipment used in the computer room and dispatch room of the system should operate normally under the following environmental conditions.

- a) Ambient temperature. 15°C~30°C;
- b) Relative humidity. 40%~70%;

4.3 Power Supply

4.3.1 The AC power supply for downhole equipment shall comply with the following regulations.

- a) Voltage. Permissible fluctuation range 75%~110%;
- b) Frequency. 50Hz, allowable deviation $\pm 5\%$;
- c) Harmonics. not greater than 10%.

4.3.2 The AC power supply for ground equipment shall comply with the following regulations.

- a) Voltage. Permissible fluctuation range 90%~110%;
- b) Frequency. 50Hz, allowable deviation $\pm 5\%$;
- c) Harmonics. not greater than 5%.

4.4 System Functional Requirements

4.4.1 The system should have data acquisition, processing, display and alarm functions.

4.4.2 The system should have stop, interlock, and emergency stop functions, and should also have the function of displaying the emergency stop and interlock trigger positions. (Emergency stop function) Its priority should be higher than that of the interlocking function.

4.4.3 The system should have an automatic pressure compensation function.

Note. Automatic pressure compensation is achieved by automatically monitoring the pressure of the hydraulic support column or front beam jacks through a pressure sensor. When the supporting pressure of the column or front beam jacks is low... When the set pressure value is reached, the system automatically opens the liquid inlet circuit of the column or front beam jack until the pressure of the column or front beam jack reaches the set value.

4.4.4 The system should have the function of storing and querying information on the movement and status of hydraulic supports.

4.4.5 The system should have a program upgrade function.

4.4.6 The system should have equipment self-testing and network integrity monitoring functions.

4.4.7 System parameters shall comply with the following requirements.

- a) Parameter modification supports both single-frame and batch modification functions;
- b) The parameter modification has operation permission management and operation log functions.

4.4.8 The monitoring data of the system shall comply with the following provisions.

- a) The data consists of three parts. data value, timestamp, and status identifier;
- b) Alarm logs include alarm time, alarm type, alarm level, alarm confirmation time, confirming user, confirmation information, etc.
- c) Operation logs include operation time, operation type, operation event, etc.

4.5 Main Technical Specifications

4.5.1 The hysteresis time of the electro-hydraulic directional valve should not exceed 300ms.

4.5.2 The start-up response time of the electro-hydraulic directional valve should not exceed 150ms.

4.5.3 The remote control response time of the system should not exceed 1 second.

Note. Remote control response time refers to the time required from when the system's centralized control device issues a control command to when the electro-hydraulic directional valve of the hydraulic support executes the action.