Design of explosion-proof battery system for coal mines

Overview

The catastrophic consequences of cascading thermal runaway events on lithium-ion battery (LIB) packs have been well recognised and studied. In underground coal mining occupations, the design enclosure for LIB. ••An encapsulated method is proposed for largescale Li-ion battery. The mining industries in the past decade have been actively engaged in various technologies to improve their very demanding and challenging operations in terms of efficienc. Explosion-protection techniques (also called type of protection or explosion-protected apparatus) are classed under a generic term, which describes the use of particular techniq. 3.1. Battery samplesThe chosen cell is commercial hard-shell prismatic lithium-ion rated at 202Ah capacity with dimensions as shown in Fig. 1(a). The battery. 4.1. Experimental and finite element characterization of a single prismatic cellAs is shown in Fig. 3(a), the data acquisition unit recorded temperature, pressure and volt.

Article Content

Explosion-Proof Gantry Cranes for Safe Coal Mining

Significance of Explosion-Proof Design. Explosion-proof gantry cranes for coal mining are built to safely operate in hazardous environments where flammable gases or dust may be present. In coal mining, even a small spark can cause an explosion due to the highly combustible nature of coal dust. Key features of explosion-proof design include:

Design of lithium-ion battery management system for ...

This paper designs a kind of lithium-ion battery management system for explosion-proof mining electric vehicle according to GB3836-20210 series standard. And the management system takes...

Problems and Research on Underground Charging Safety of Power Battery ...

However, some applications are highly safety critical in nature, such as electric mining vehicles, mining robots in coal mines, drones which move in explosive atmosphere [1,2,3, 4, 5], wearable ...

Research progress and key technologies of intelligent monorail ...

It is pointed out that explosion-proof diesel engine monorail crane and explosion-proof battery monorail crane have been widely used for underground equipment and material transportation in coal mines due to their strong transportation capacity. The explosion-proof battery monorail crane has green and clean features.

(PDF) Development and applications of rescue robots for explosion ...

The China University of Mining Technology-V (CUMT-V) (A) robot was first developed and its walking system, body support system, communication system, environmental awareness system, and ...

Research on Lithium Battery Management System for Electric ...

This paper designs a kind of lithium battery management system for coal mine electric trackless rubber tyred vehicle based on chip STM32F105VCT7 as CPU. It focuses on ...

(PDF) Design and Application of Intelligent Monitoring and ...

Based on Ma & Chen (2021), an intelligent system and identification system of coal mines will facilitate the detection of equipment safety status, personnel safety status, and production process ...

(PDF) Design of Induction Function Test System for Explosion-Proof ...

Based on the analysis of the shortcomings of traditional coal mine explosion-proof lamps and the industry development trend, we design the induction function testing system of coal mine explosion ...

Design Of Charge and Discharge Performance Inspection ...

On the basis of the introduction of coal mine safety production situation and coal mine lead-acid battery, we designed the coal mine lead-acid battery charging and discharging performance ...

Implementation of Explosion Safety Regulations in Design of ...

Appl. Sci. 2018, 8, 2300 2 of 16 rescuers to the underground areas of a coal mine that have been closed due to a catastrophic event within them . It was an international project managed by a ...

Design of Induction Function Test System for Explosion ...

(2) According to the height of coal mine explosion-proof induction lamp using place, PLC control the height of adjusting mechanism, so that coal mine explosion-proof induction lamp hanging with the use of the site, the equivalent module fixed in coal mine explosion-proof induction lamp and the ground vertical foot point position.

Proximity Detection for Coal Mines

underground. For coal mining, and other potentially gaseous environments, the system components are intrinsically safe, or are housed in explosion proof (XP) casings. SAFETY FEATURES & USER EXPERIENCE • No operator interaction required • No line-of-sight required • Direction of travel is irrelevant • Detects stationary and fallen ...

Explosion Pressure Design Criteria for New Seals in U.S.

Explosion Pressure Design Criteria for New Seals in U.S. Coal Mines By R. Karl Zipf, Jr., Ph.D., P.E., Michael J. Sapko, and Jürgen F. Brune, Ph.D. DEPARTMENT OF HEALTH AND HUMAN SERVICES Centers for Disease Control and Prevention National Institute for Occupational Safety and Health Pittsburgh Research Laboratory Pittsburgh, PA July 2007

Design of lithium-ion battery management system for mine electric ...

This paper designs a kind of lithium-ion battery management system for explosion-proof mining electric vehicle according to GB3836-20210 series standard. And the ...

Explosion-proof lithium-ion battery pack

In this article, a thorough experimental and finite element analysis is conducted to illustrate the paramount design parameters and factors that need to be considered for safe ...

Design of current sharing system for mine explosion-proof lithium ...

In order to solve the problem of uneven discharge current when multiple mine explosion-proof lithium power supplies are used in parallel, a current sharing system for mine explosion-proof lithium power supply is designed. The system is composed of several explosion-proof lithium power supplies connected in parallel. The explosion-proof lithium power supplies adopt 166 60 ...

Why Should Coal Mines Use Explosion-Proof Battery Electric ...

In summary, explosion-proof battery electric locomotives have become indispensable in coal mine transportation due to their strong adaptability, high safety, and flexibility. They not only enhance production efficiency but also ensure safe transport processes, injecting new vitality into mine operations.

Mechanism and Explosion-proof Design for a Coal Mine ...

The conclusions are as follows: (1) the mixed explosion-proof design including integrated and partial explosion-proof design can be adopted in the robots design; (2) protection types for robots ...

Characteristics analysis and improvement measures of lithium-ion ...

This article studies the design parameters of power batteries under complex working conditions in coal mines, such as temperature, current, voltage, and management unit, and further tests in ...

Explosion Proof Crane Radio Remote Control Systems For ...

Battery voltage warning device, the power supply is cut off during low power ... onshore oilfields, chemical industries, oil refineries, coal mines, paint factories, and aircraft maintenance factories. EF24-60 Explosion Proof Crane Radio Remote Control Systems Transmitter. Explosion-proof design. MODEL: EF24-60-TX. ITEM CODE: 924-600-002 ...

Parallel Current-sharing Design of Mine Explosion-proof Lithium ...

When the output of explosion-proof lithium power supply is used in parallel, there exists the problem of non-uniform current between power sources, so a digital current-sharing ...

Design of Motor Condition Monitoring System for Belt ...

Design Of Charge and Discharge Performance Inspection System for Lead-Acid Battery in Coal Mine. ... Design of explosion-proof induction lamp temperature test system ... Mine explosion-proof ...

Study on influencing factors of mine explosion-proof lithium-ion ...

Based on the analysis of existing research work, this paper selects lithium iron phosphate batteries produced by different battery manufacturers with a capacity in the range of 72□280 ...

Mine Explosionproof and Intrinsically Safe Type DC ...

This paper presents a DSP-based underground explosionproof and intrinsically safe DC UPS supply system.The system achieve digital control with DSP,use the lithium battery as a backup ...

A Search-and-Rescue Robot System for Remotely Sensing the ...

4.1.2. The Explosion-Proof Design of the Electric System. The explosion-proof design of the electric system focuses on preventing the circuits from igniting the gas in the coal mine. Between the sensors and the control system, an explosion-proof isolation unit is designed for the electric system.

Explosion-Proof Design for Coal Mine Rescue Robots

The explosion-proof design for coal mine robots that are used to explore environment and rescue after coal mine disaster must be adopted. In order to carry out the explosion-proof design for coal mine robots reasonably, based on the analysis of coal mine robots and their explosion-proof design, the explosion-proof types for robots are studied on. The ...

Optimized design of compound power supply system for explosion-proof ...

With the electrification of underground coal mines, electric explosion-proof rubber-tyred vehicles will gradually replace high-polluting explosion-proof diesel rubber-tyred vehicles, but explosion-proof electric rubber-tyred vehicles have problems such as short cruising range and poor power performance. Based on this, this paper proposes a pure electric explosion-proof rubber-tyred ...

Explosion-proof drive

Explosion-proof drive products reliable in harsh environment of underground mining ... products should be highly adaptable and stable in order to deal with the harsh operating environment of underground coal mines suffering humidity, limited space and electromagnetic interference. ABB combined conventional explosion-proof product design ...

Design of Induction Function Test System for Explosion-Proof ...

DOI: 10.54097/hset.v15i.3003 Corpus ID: 254915662; Design of Induction Function Test System for Explosion-Proof Induction Lamps in Coal Mines @article{Wang2022DesignOI, title={Design of Induction Function Test System for Explosion-Proof Induction Lamps in Coal Mines}, author={Yukun Wang and Hongkui Zhang}, ...

Design of Motor Protection Systems for Explosion-proof Coal Mine ...

In order to improve the safety level of motors in explosion-proof coal mine digging device and adapt to the development needs of intelligent coal mines, an explosion-proof coal mine digging device motor protection system based on the main controller is proposed. Based on the analysis of the status of coal in the national economy and the current situation of coal mine safety ...

Mechanism and Explosion-proof Design for a Coal Mine ...

Semantic Scholar extracted view of "Mechanism and Explosion-proof Design for a Coal Mine Detection Robot" by Xuewen Rong et al. ... A Main Control System and 3D map subsystem of the mobile robot TELERESCUER for inspecting coal mine areas affected by catastrophic events and the system allows the rescuer to operate the robot as if he were at the ...

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