

Does a high-voltage electrode drill bit affect rock dielectric breakdown?

However, its effectiveness is influenced by parameters including pulse voltage magnitude and the shape and structure of the high-voltage electrode drill bit (HVED). Currently, there is limited research on the mechanisms by which high pulse voltages (>100 kV) affect rock dielectric breakdown and the patterns of pulse voltage generation.

What is a high- and low-voltage electrode drill bit?

The high- and low-voltage electrodes of an electrode drill bit can be arranged as a coaxial cylindrical electrode structure, and a structure of multiple groups of high- and low-pressure electrodes. The electrode drill bit directly affects the energy consumed by rock breaking and the drilling efficiency.

Can high-voltage electric pulse rock-breaking technology improve drilling efficiency?

In the realm of oil extraction, high-voltage electric pulse rock-breaking technology can aid the traditional mechanical rotary drill bit in breaking rock, leading to a significant reduction in drilling costs, nearly 50%, and an enhancement in drilling efficiency (Liu et al., 2023a).

Why do high-voltage pulse drilling tools have a higher loading voltage?

(1) Higher loading voltage leads to more effective rock breaking, resulting in increased rock fracture volume. As the loading voltage increases, the breakdown time decreases, which is advantageous for improving the drilling efficiency of high-voltage pulse drilling tools.

What is a high-efficiency rock drilling technology?

As the exploration and drilling of oil, natural gas and geothermal wells are expanding continuously, research into high-efficiency rock drilling technology is imperative. High-voltage electro pulse boring (EPB) has the advantages of high rock breaking efficiency and good wall quality, and is a new and efficient potential method of rock breaking.

What is high-voltage electric pulse (hvep) drilling?

Summary. High-voltage electric pulse (HVEP) drilling technology offers advantages such as high rock-breaking efficiency and low energy consumption.

For the phenomenon of a hydraulic rock drill based on an underlapped reversing valve, the mechanical structure of the overlapped reversing form was ...

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High voltage electric pulse (HVEP) technology is expected to revolutionize deep resource extraction and underground space engineering construction technology. ...

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Additionally, robust hydraulics and a low number of moving parts help to increase reliability. Whatever the rock conditions, the PowerROC T35 helps ensure a high penetration rate and ...

Abstract High-voltage electric pulse drilling technology has the advantages of high rock-breaking efficiency, and low rock-breaking energy consumption, which is one of the most promising rock ...

The high-voltage electrical pulses (HVEP) technology is the most potential method to improve the rate of penetration (ROP) in deep hard formations. A detailed understanding of ...

For professionals and serious DIYers, the preferred sizes are 12 volts for light-duty work and 18 volts for heavy-duty work. 9 to 11-volt drills are ...

An impulse voltage generator delivers fast rising high voltage impulses to break and weaken the material structure of the rock. This effect can be used, for example, for hard rock drilling and ...

Summary The principal drilling methods used in mines today are mechanical ones in which a drill drives cutting tools into rock by means of static or dynamic force. Percussion rock drills are the ...

2. Rotary Drilling Working Principle: Rotary drilling utilizes a rotating drill bit to grind the ground material, provides rotary power through the hydraulic system, and is equipped with a mud ...

The High-voltage electro-pulse (HVEP) rock-breaking technique is considered a promising technique for deep well drilling due to its low energy consumption and relatively low ...

High-voltage electric pulse rock boring (HVEPB) is a high-efficiency rock-breaking drilling technology, which is featured in high rock breaking efficiency and low cost.



Rock drill high and low voltage conversion

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The utility model provides a high-voltage electric pulse drill bit and a rock-breaking experimental device. A high-voltage electric pulse drill bit is located directly above the rock; it comprises a ...

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Unravel the mystery of cordless drill numbers! From voltage to Battery Amp Hour (Ah) and torque ratings, learn how each digit impacts performance in DIY projects. Discover ...

High-voltage electrical pulse (HVEP) technology for rock breaking is characterized by its cost-effectiveness and high efficiency. Clarifying the propagation behavior of the plasma ...

Not necessarily. For lighter tasks, a lower voltage drill may suffice and using a higher voltage drill may be more cumbersome. We'll delve deeper ...

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