

Inverter high voltage discharge





Overview

What is high-voltage active discharge?

High-voltage active discharge refers to the process in which the electrical energy stored in high-voltage capacitors is rapidly (typically within 1-2 seconds) released to a safe level (reducing the high voltage to below 60V) through a specialized discharge circuit and control strategy after the high-voltage system of the EV is powered off.

Do EV traction inverters need a DC link active discharge?

Every EV traction inverter requires a DC link active discharge as a safety-critical function. The discharge circuit is required to discharge the energy in the DC link capacitor under the following conditions and requirements: Power transistor on, off control using the TPSI3050-Q1.

What is a passive discharge in a high-voltage system?

Application scenarios: Passive discharge ensures gradual voltage reduction within the high-voltage system when the vehicle is switched off and no other discharge mechanisms are active. It serves as a final safety barrier when active discharge paths fail. How quickly should a high-voltage system discharge to be considered safe?

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What is a high-voltage DC link?

Image used courtesy of Adobe Stock High-voltage DC links are central to a wide range of power electronic systems in electric and hybrid vehicles—including inverters relying on large capacitors (e.g 1 mF) to stabilize the voltage, reduce ripple, and support efficient control and operation.



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High-voltage discharge system of EV

Feb 15, 2025 · High-voltage active discharge refers to the process in which the electrical energy stored in high-voltage capacitors is rapidly (typically within 1-2 seconds) released to a safe ...

What is Partial Discharge in an Inverter-Driven Motor? , HIOKI

High-voltage inverter-driven motors, such as those found in EVs, are more prone to partial discharge phenomena. In general, partial discharge occurs when a voltage greater than ...

Infineon high voltage Inverter Application Presentation

May 25, 2025 · Infineon high voltage Inverter Application Presentation Traction Inverter trends Semiconductors contribute to improved energy efficiency, but also to size and weight ...

SLAAEL5 Application brief , TI

The DC-Link capacitor is a part of every traction inverter and is positioned in parallel with the high-voltage battery and the power stage (see Figure 1). ...

Solis 75-125kW C& I High Voltage Energy Storage Inverter_Hybrid Inverter

Introducing the S6-EH3P (75-125)K10-NV-YD-H Series, High-voltage. three-phase energy storage for commercial applications. This advanced inverter series boasts a maximum ...

Enabling Smarter DC Link Discharge in EV Traction Inverters

May 25, 2025 · Image used courtesy of Adobe Stock DC Link Discharge Challenges in Inverter High-voltage DC links are central to a wide range of power electronic systems in electric and ...

Traction Inverters A Driving Force Behind Vehicle ...

Apr 1, 2023 · To achieve these goals, traction inverter design trends include using advanced control algorithms, employing SiC MOSFETs for the switching transistors in the power stage, ...

Experience With Online Partial-Discharge Measurement in High-Voltage

Aug 15, 2017 · Partial-discharge (PD) testing has long been an important tool for assessing the condition of the high-voltage insulation in motor and generator stator windings. In the past ...

A DC-Link Hybrid Active Discharge Scheme for Traction Inverters

Sep 6, 2024 · The paper includes a simulation comparison of winding-based discharge with the proposed Hybrid discharge technique. The proposed solution has a higher discharge rate and ...

High-voltage discharge system of EV

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A DC-Link Hybrid Active Discharge Scheme for Traction Inverters

Oct 28, 2024 · This paper investigates control methods to quickly and safely discharge the high voltage DC bus capacitor for the permanent magnet synchronous machine (PMSM) drive ...

EXPERIENCE WITH ON-LINE PARTIAL DISCHARGE ...

Jun 6, 2018 · Abstract - Partial discharge (PD) testing has long been an important tool for assessing the condition of the high voltage insulation in motor and generator stator windings. ...

Why Pre-Charge Circuits are Necessary in High-Voltage ...

Dec 23, 2023 · Pre-charge In a high voltage system, a typical block diagram may consist of two high current contactors with a separate pre-charge contactor, and a DC link capacitor in ...

Solis 75-125kW C& I High Voltage Energy ...

Introducing the S6-EH3P (75-125)K10-NV-YD-H Series, High-voltage. three-phase energy storage for commercial applications. This advanced inverter ...

Active Discharge and Pre-charge of EV High Voltage ...

Apr 20, 2023 · Fast Discharge prevents Fire hazard actively discharged to prevent residual voltage. separate disconnection unit. power resistors with minimal time discharge in less than ...

A DC-Link Hybrid Active Discharge Scheme ...

Oct 28, 2024 · This paper investigates control methods to quickly and safely discharge the high voltage DC bus capacitor for the permanent magnet ...

Solis 80-125kW C& I High Voltage Energy ...

High voltage, three-phase energy storage for commercial applications. The inverter series, which boasts a maximum charge/discharge current of ...

How to Reduce the Power Resistor for DC-Link ...

Aug 16, 2024 · The DC-Link capacitor is a part of every traction inverter and is positioned in parallel with the high-voltage battery and the power stage (see Figure 1). The DC-Link ...

Paper Title (use style: paper title)

Jul 28, 2025 · A DC link capacitor is connected between the positive and negative bus terminals of the high voltage DC source in an Inverter circuit. An active discharge circuit is connected ...

Design Priorities in EV Traction Inverter With Optimum ...

Apr 1, 2023 · ABSTRACT This technical white paper explores key system trends, architecture, and technology for traction inverters. The devices and technologies used to enable traction ...



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