

CombiTac CT-HE for battery pack – CombiTac connectors are used for the transfer of power and for monitoring railway battery packs. The special CombiTac is designed to meet the requirements of EN 45545-2 and EN 50124-1 and has a high resistance to shock, vibrations and high temperatures

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Stäubli

Your worldwide partner for the rail industry.

Stäubli Electrical Connectors Is Geared for the Future

Trains operate in extreme heat or cold, through hilly or flat terrain and in all weather conditions.

Additionally, the entire train should seamlessly receive data and signals

throughout the journey. This places high demands on components such as electrical plug connections. The durable high-performance connectors from Stäubli Electrical Connectors guarantee safe and reliable application in rail transport. It doesn't matter when or where.

For decades, Stäubli Electrical Connectors has developed

sophisticated connection solutions for use in rail vehicles. The Swiss company supplies suitable plug-in connections with its modular power connectors (MPC) for all types of trains, locomotives, and streetcars. The MPCs have excellent power transmission characteristics even under the most difficult conditions. Whether it is a maglev train in China, alternative drive with fuel

cells or in the hybrid conversion from diesel to electric, Stäubli is regarded worldwide as a reliable and competent partner for rail transport.

Northeast Corridor: Along the US Coast at High Speed

The Northeast Corridor (NEC) is the longest continuously electrified long-distance rail line on the Eastern Seaboard. Based on the TGV platform, the high-speed trains roll along a length of 734 kilometres from Boston to Washington, D.C. For fast installation and cable assembly, French manufacturer Alstom used Stäubli's MPC connectors. The MPCs proved to be the ideal modular platform for on-demand solutions and a reliable power supply. A particular challenge was the limited space between the cars. As the MPCs already included a solution for dynamic cable strain relief, costs could be reduced at this point.

There from the Beginning: Low-Speed Maglev in China

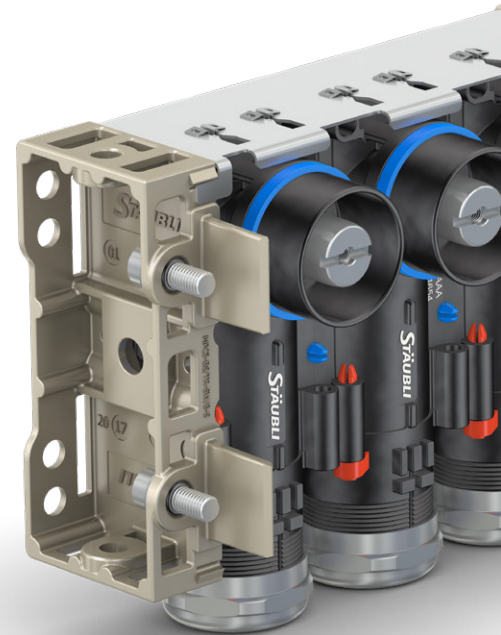
China put a next-generation low-speed maglev into service in late 2020. The new train with magnetic levitation technology had previously successfully passed all relevant complex tests. The maglev prototype had to overcome specific challenges such as steep climbs, tight curve radiuses and low-noise operation after a relatively short development period. To achieve this goal, a stable and reliable connection solution was needed across the entire train with its three railway cars. The Chinese manufacturer opted for MPC

plug connections from the world market leader Stäubli. They were installed throughout the maglev prototype. With a maximum speed of 120 kilometres per hour, the train now glides on a tourist route in the southern Chinese province of Guangdong. The production of further low-speed maglev trains is planned. They are perfect for use in local and regional public transport.

World Debut: Innovative Hydrogen Trains in Germany

Talking about debuts, Stäubli is also at the forefront of innovation in Lower Saxony in Germany: the world's first hydrogen-powered train began regular passenger service on the Elbe-Weser network in 2018 with two pre-series trains. The first hydrogen series trains will be in regular service in Germany from 2022.

French rail vehicle manufacturer Alstom was the developer of the new, CO₂ emission-free hydrogen train. The on-board hydrogen fuel cells convert hydrogen and oxygen into electricity. This generates electrical energy for the drive. With the new fuel cell technology, the requirements for well-functioning plug connections are correspondingly high. Stäubli equipped the train with stable MPCs for wagon crossovers and traction converters. The CombiTac CT-HE connector was used for power transmission and monitoring of the batteries. The special design meets the requirements of EN 45545-2 and EN 50124-1 and offers high resistance to vibrations, shocks and high temperatures. These connector components are suitable for the specific requirements of the rail industry and for use in rail vehicles.



For Alstom the hydrogen train is a showcase project for a sustainable mobility solution. Stäubli's MPC ensures stable connections which are essential to ensure smart management of drive power and available energy. They also support concepts to convert energy cleanly and allow efficient energy storage in batteries. Hydrogen trains are being developed specifically for use on non-electrified lines.

Electric instead of Diesel: DB Regio EcoTrain

Climate change demands sensible, long-term concepts for all areas of private and public mobility. The pressure for the increased use of sustainable, environmentally friendly energy solutions in rail transport is therefore immense. The objective is to drastically reduce noise and harmful substances. However, diesel-powered trains have an average service life of thirty



Modular power connector MPC – For use in rolling stock, e.g. on-board power applications, traction converter and battery outputs, body to bogie and motor connection

years. Disposing of them would be anything but ecologically sound. To date, around 60 percent of rail lines in Germany have been electrified. Not all lines are equipped with electric overhead lines. In the end, there are still thousands of kilometres of non-electrified lines. The solution: diesel railcars are being converted into modern hybrid vehicles that can then run on electricity. The EcoTrain, an initiative of DB Regio and DB RegioNetz Verkehrs GmbH, puts the concept into practice. Stäubli was also called in here as an experienced partner for the first prototype.

The EcoTrain's innovative drive project is based on replacing diesel-mechanical engines with powerful electric motors. Depending on requirements and the model, diesel generators, batteries, or an electric overhead line serve as energy sources. Data, signals and all connections must be installed accordingly so that the new hybrid

technology functions smoothly. This is where the advantages of the modular MPC plug connections are particularly effective. Because with the EcoTrain, the exceptional features of the MPCs in the high-current area are important. They are designed for demanding mechanical conditions.

Highest Standards and Lower Costs

Whether it is digitalisation, the development of a new generation of rail vehicles or smart trains: Stäubli connections meet the highest safety standards according to international industry standards. The uncomplicated plug-in connection also simplifies vehicle maintenance, thus reducing costs. Stäubli has the experience, knowledge and sophisticated joining technology to respond quickly and flexibly to a wide range of customer requirements.

About Stäubli

Stäubli offers innovative mechatronic solutions in three core areas, including connectors, robotics and textiles. Founded in 1892, today Stäubli is an international group headquartered in Pfäffikon, Switzerland with more than 5,500 employees worldwide. Stäubli has a presence in 29 countries with production companies, sales and service subsidiaries and is supplemented by agents in 50 countries.

As a world market leader in the field of connectors, Stäubli manufactures quick connector systems for all types of fluids, gases and electrical energy. The Electrical Connectors product portfolio (formerly Multi-Contact) ranges from miniature connectors to high-performance connectors for power transmission, industrial automation, transportation, test and measurement. In photovoltaics, Stäubli is the global market leader with its MC4 connector components. The core of all Stäubli electrical connectors is the unique MULTILAM technology.

<https://www.staubli.com/electrical>



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