

FAST MOVING TECHNOLOGY

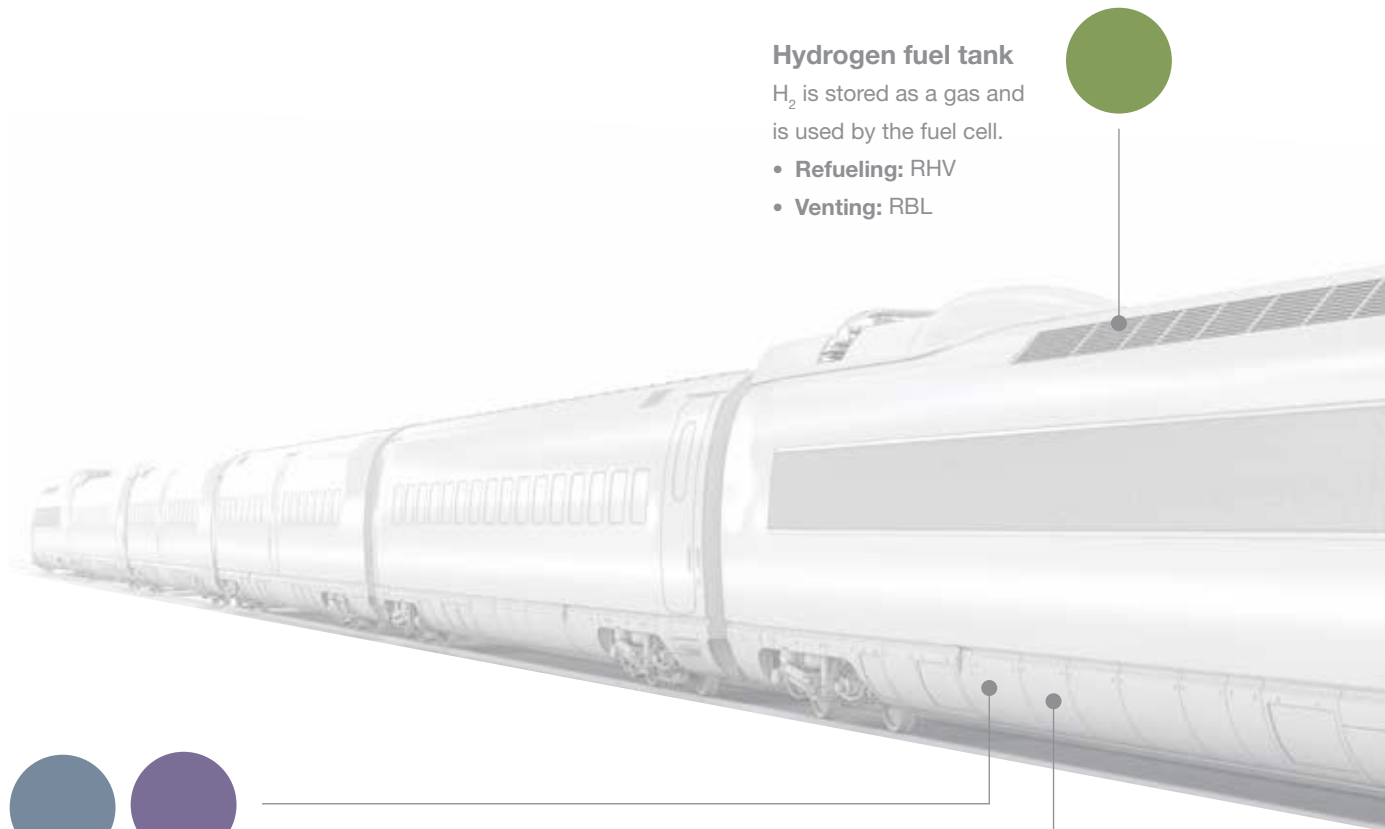
*STÄUBLI*

# Hydrogen solutions

Connectors | Railway



# Applications for hydrogen solutions



## Hydrogen fuel tank

H<sub>2</sub> is stored as a gas and is used by the fuel cell.

- **Refueling:** RHV
- **Venting:** RBL



## Lithium-ion batteries

The electrical power generated by the fuel cell is stored in a Lithium-ion battery (also recharged during braking). All of this is energy managed.

- **Battery cooling:**  
SPT / RME (Exposed area)
- **Electrical interfaces:**  
EvoTrak lite



## Power and auxiliary converters

A power converter ensures that appropriate energy from fuel cells and braking action is transmitted to batteries and traction.

An auxiliary converter converts electrical power from power converters to on board equipment.

- **Converter cooling:** SPT / RME ( Exposed area)
- **Power electrical inputs & outputs:**  
EvoTrak MPC, EvoTrak lite



**Fuel-cell**




The fuel cell is generating electrical power via a chemical reaction between H<sub>2</sub> and O<sub>2</sub> of the ambient air. This reaction also produces water and heat.

- **Cooling fuel cell:** SPT, HCE, MCC, MCS
- **Water evacuation fuel cell:** RBE, SPT
- **H<sub>2</sub> supply in fuel cell:** RBL
- **Fuel cell power electrical inputs & outputs:** EvoTrak MPC, EvoTrak lite



**Engine**

- **Quick-release couplings for engine cooling systems:** RME
- **Modular electrical connectors for power transfer:** EvoTrak lite
- **Junction boxes for the quick connection of converter inputs / engine outputs:** EvoTrak lite

	Hydrogen
	Cooling
	Electric

## OUR APPLICATIONS

# Stäubli solutions

## RBL

### Applications:

- High and low pressure hydrogen circuits



### Corrosion resistance

All stainless steel

### Optimum safety

Avoids hydrogen leaks during venting operations before maintenance

### Connection and disconnection

One-handed operation for ease of use

## SPT

### Applications:

- Quick release mono connections for cooling on board electronic circuits and batteries
- Fluids: glycol water, heat transfer oils



### Light and compact

Couplings made from high performance treated aluminum alloy to keep weight to a minimum

### Reliable locking

Safe and robust locking with a large number of locking balls

### Non-spill, flat faces

- No introduction of air into the circuits on connection
- No lost of liquid on disconnection making complete circuit bleeding unnecessary

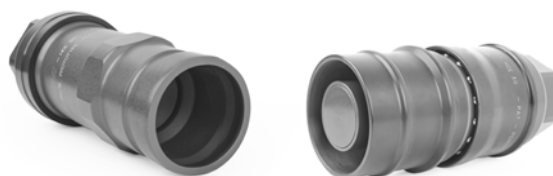
### Global connection solutions

Quick-release couplings are also available assembled directly to hoses

## ● HCE

### Applications:

- Quick release mono connections for cooling on board electronic circuits and batteries
- Fluids: glycol water, heat transfer oils



### Light and compact

Couplings made from high performance treated aluminum alloy to keep weight to a minimum

### Reliable locking

Safe and robust locking with a large number of locking balls

### Non-spill, flat faces

- No introduction of air into the circuits on connection
- No lost of liquid on disconnection making complete circuit bleeding unnecessary

### Global connection solutions

Quick-release couplings are also available assembled directly to hoses

### Reduced connection effort

### High flow

Internal design ensures a low pressure drop for a high flow with compact overall dimensions

## ● RME

### Applications:

- Quick release mono connections for cooling on board electronic circuits and batteries
- Fluids: glycol water, heat transfer oils



### Easy to handle

Long locking sleeve designed for easy connections and disconnections, even in difficult locations

### Protected elements

Version with protector recommended for embedded applications outside

### Global connection solutions

Quick-release couplings also available assembled directly to hoses

### Reliable and robust

Materials selected for increased robustness and reliability as well as enhanced resistance to corrosion in the presence of liquids and cooling fluids additives

## OUR APPLICATIONS

# Stäubli solutions

## RHV

### Applications:

- Receptacle for refueling of hydrogen tanks or hydrogen bundles



### Safe

The receptacles are tested individually in connected and disconnected position

### Excellent flow rates

Makes Stäubli receptacles the best choice for any type of vehicle

### Compatibility

RHV receptacles are designed to insure interoperability with any nozzle according to ISO 17268 and SAE J2600

### Resistance and durability

Stainless steel construction

## MCS

### Applications:

- Simultaneous connection of fluid and electrical circuits in areas that are difficult to access
- Allowing rapid maintenance of Hydrogen battery cooling modules



**Designed according to customer specifications** using standard components: electrical connectors and fluid couplings, connection and locking systems, guide and float-mounting components

**Easy integration** thanks to modular configuration possibilities



## ● MCC

### Applications:

- Docking and cooling of power electronics modules in transformers, converters, and inverters



**All-in-one solution** with simultaneous connection of electric and cooling circuits

**Clean disconnection** thanks to non-spill construction, overpressure release valve, modularity, time-saving installation and removal for easier maintenance and reduced idle time

**Customized combination** of components

## ● EvoTrak

### Applications:

- Electrical interfaces along whole traction chain and all subsystems connections, from fuel-cells to motors



The **EvoTrak family** offers adaptable electrical connections between the main functions of the rail vehicle electrical traction chain. The compact and flexible modular solutions, from 1 to 4 poles, meet all current railway standards.

The EvoTrak family is adapted to the Rolling stock market and offers the well-known **EvoTrak MPC** line for high power applications up to 240 mm<sup>2</sup>, 3000 V and 700 A.

The new metal EvoTrak lite line is perfectly

designed for medium power applications up to 1500 V and cable cross section up to 70 mm<sup>2</sup>. The IP2X protection makes **EvoTrak lite** the right solution for all battery interface applications combining safety and high performance.



● Staubli Units    ○ Representatives/Agents

# Global presence of the Staubli Group

[www.staubli.com](http://www.staubli.com)