

# TracFeed® BCS

## CHARGING STATIONS FOR ACCUMULATOR-POWERED TRACTION UNITS

English



# TracFeed® BCS: CHARGING STATIONS FOR ACCUMULATOR-POWERED ELECTRIC TRACTION UNITS

**Electric traction units with accumulators as energy stores are increasingly replacing diesel traction. Rail Power Systems (RPS) offers effective charging infrastructure as a complete solution for this.**

## Application

Accumulator-powered train sets, also called as Battery Electric Multiple Units (BEMU), and locomotives can travel on electrified sections under a contact line and without a contact line. However, the energy capacity of the accumulators limits the range of such trains to between 50 km and 100 km, depending on the section profile, the number of stops, the speed, and the operating concept. Consequently, charging stations are required away from the electrified network, at intermediate or terminal stations, for example. TracFeed® BCS charging stations (BCS – BEMU Charging Station) are the appropriate solution for this:

- Charging via the standard current collector/contact line interface
- Symmetrical loading of the feeding network over the complete power range
- Charging during standstill or in motion

TracFeed® BCS charging stations consist of the following main components: the substation and contact line installation.

## Substation

The substation converts the electrical energy drawn from the national grid into the form required on the contact line side. TracFeed® BCS charging substations can be configured for the following nominal charging voltages:

- 1 AC 15 kV 16,7 Hz
- 1 AC 15 kV 50 Hz
- 1 AC 25 kV 50/60 Hz

Full-scale converters are used for frequency conversion for 16,7 Hz supply voltage systems. It also enables charging of conventional 16,7 Hz vehicles after their extension by a traction accumulator.

The charging power is transmitted via the transformer with low losses in the version for 50 Hz supply voltage. In addition, compact symmetry converters within the rated power range lead to symmetrical loading of the feeding network. Short-term overloads are possible and system protection can be ensured by means of simple protection functions.

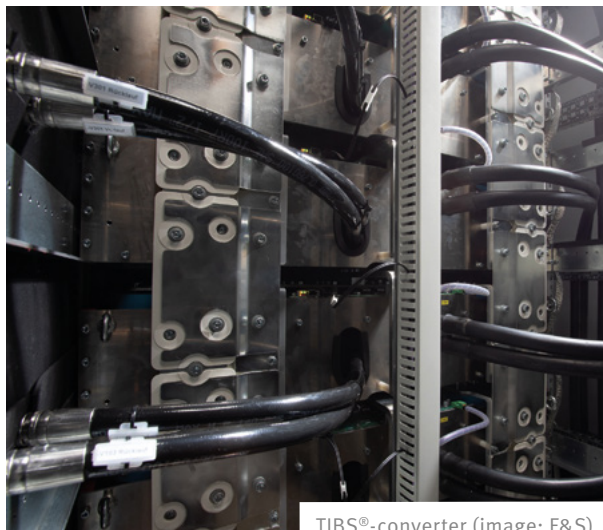
The 1 AC 15 kV 50 Hz version is suitable for use in countries with a 16,7 Hz railway power supply:

- The voltage level adapted to the railway network avoids additional requirements in relation to the high voltage insulation, switchgears, and transformers of the vehicles.
- The modified network frequency requires only minimal adaptations in the filter circuit and power converter control area.

Due consideration must be given to the charging voltage when ordering the vehicle.

Converters from the TIBS® power converter family of F&S PROZESSAUTOMATION GmbH are used for all applications.

TracFeed® BCS charging stations are pre-assembled upon delivery and can be installed and commissioned in a short space of time.



TIBS®-converter (image: F&S)

## Contact line installation

The design of the contact line installation depends on whether the charging station is designed to be a

- **Service station** for charging the vehicles during standstill or
- **Spatially limited overhead contact line installation** for additional charging when the vehicle is in motion.

A contact line installation designed as a TracFeed® OSS overhead conductor rail from RPS is recommended for a service station. This slimline design enables short overhead contact line sections, short installation times, and keeps electrical safety measures to a minimum. The contact line length can be optimised for the vehicle length.

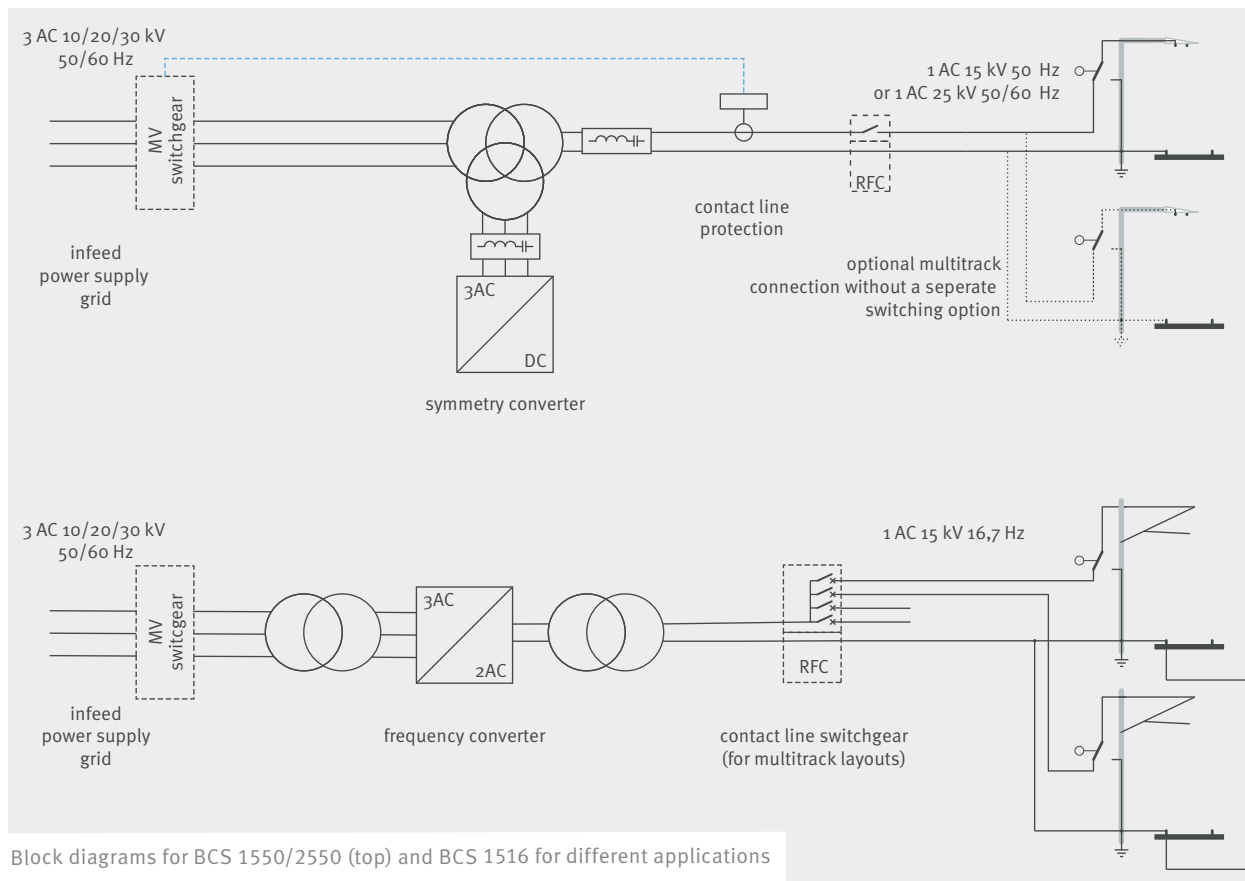
For spatially limited overhead contact line stand-alone installations, flexible overhead contact lines can be installed, e.g. the RPS contact line system TracFeed® ALU2000.

The contact line length of an overhead contact line stand-alone facility is determined according to the section profile and the operating concept. It can be up to 8 km long. Such a installation is especially recommended if subsequent full electrification of the relevant network area is being considered. Substations with adequate power are necessary to ensure traction and charging operations.

## RPS service portfolio for charging stations

As a systems house, RPS offers the entire service portfolio from a single source – everything that is needed for installation and operation of charging infrastructure.

- Design and planning
- Delivery and commissioning
- Maintenance and service



Block diagrams for BCS 1550/2550 (top) and BCS 1516 for different applications

## Characteristics for TracFeed® BCS charging stations with a converter unit

Type	BCS 1516	BCS 1550	BCS 2550/2560
Input voltage	3 AC 10/20/30 kV 50 Hz		
Output voltage	1 AC 15 kV 16.7 Hz <sup>1</sup>	1 AC 15 kV 50 Hz <sup>2</sup>	1 AC 25 kV 50/60 Hz <sup>1</sup>
Rated output current <sup>3,4</sup>	80 A		
Rated output power per unit <sup>4</sup>	1.20 MVA	1.20 MVA	2.00 MVA
Converter design	Full-scale converter	Symmetry converter	Symmetry converter

<sup>1</sup> As per EN 50163

<sup>2</sup> As per new CENELEC project, work status 2021-12

<sup>3</sup> Results from the permissible current of contact wire/contact strip at a standstill in accordance with EN 50367

<sup>4</sup> Scalable



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