

TracFeed® TAS

English



First 27.5 kV Solid Insulated Switchgear
for Railway Applications

REVOLUTION IN THE RAILWAY SECTOR

The TracFeed® TAS is the world's first type-test-ed switchgear with completely solid insulation.

It has the environmental friendliness of modern air-insulated switchgears and the compact size and modularity of gas-insulated switchgears. The advantages of both technologies are thus used in combination.

The switchgear is manufactured with modern manufacturing techniques which guarantee the highest quality and reliability. The broad range of equipment modules allows solutions for a wide variety of both simple and complex station layouts.

The TracFeed® TAS serves all one- to three-pole railway systems including urban, regional, intercity and high-speed transport up to 36 kV. This innovative, sustainable switchgear benefits both operators and the environment.

Applications

This traction-power switchgear, which acts as the interface between electrical power generators and the catenary system, supplies power to the trains.

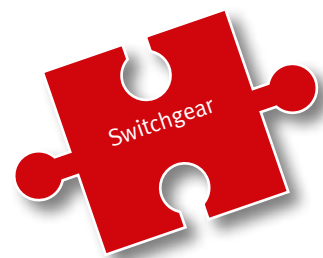
Due to frequent but mostly temporary short circuits in the traction system, the switchgear is essential to railway safety. It protects the rail infrastructure from undue stress.

The TracFeed® TAS is especially designed to meet the demands of modern single-pole and two-pole 27.5 kV 50/60 Hz railway applications. The platform serves all types of AC rail feeding systems including booster and autotransformer systems.

As standard 3AC switchgear, the TracFeed® TAS can be applied as high voltage switchgear in DC substations.



Outdoor switchgear



One switchgear for all systems

The TracFeed® TAS can be used as:

- Single-pole switchgear (TracFeed® TAS1) in 50 or 60 Hz conventional or booster 1AC/ 27.5 kV railway systems for direct feeding of the catenary
- Two-pole switchgear (TracFeed® TAS2) in 50 Hz or 60 Hz autotransformer 2AC/27.5 kV railway systems for direct feeding of the catenary
- A Three-pole switchgear (TracFeed® TAS3) for connecting at the medium voltage side of any substation configuration is under development.

As such, the TracFeedR TAS serves all different types of railway systems, of 50/60 Hz.



High voltage transformer



View inside panel showing the poles

Special features and advantages

The TracFeed® TAS is a prefabricated switchgear consisting of different modules. The installation on site is based on the placement of fully factory-tested standard transportation units.

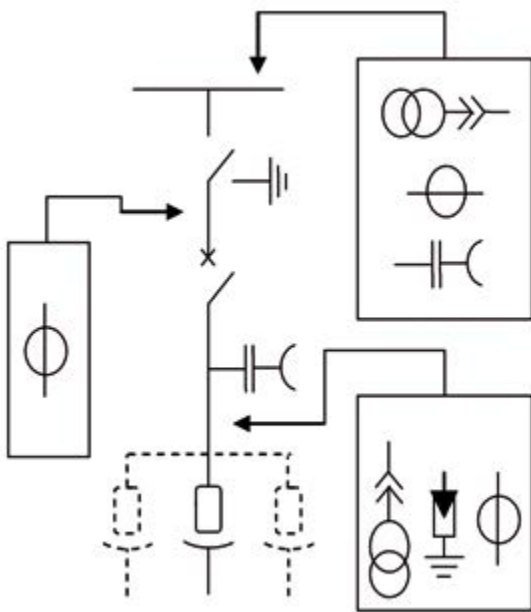
Other features include:

- Switchgear panels type-tested according to EN 62271 200 and EN 50152
- First traction power switchgear with environmentally friendly solid epoxy resin insulation, no pressurised compartment or emission of greenhouse gases such as SF₆
- High level of personnel safety
- High availability
- A combination of 1AC and 2AC panels may be integrated into one installation
- Busbar modules allow easy panel-to-panel connections.
- Metal clad



TracFeed® TAS FUNCTIONAL UNITS

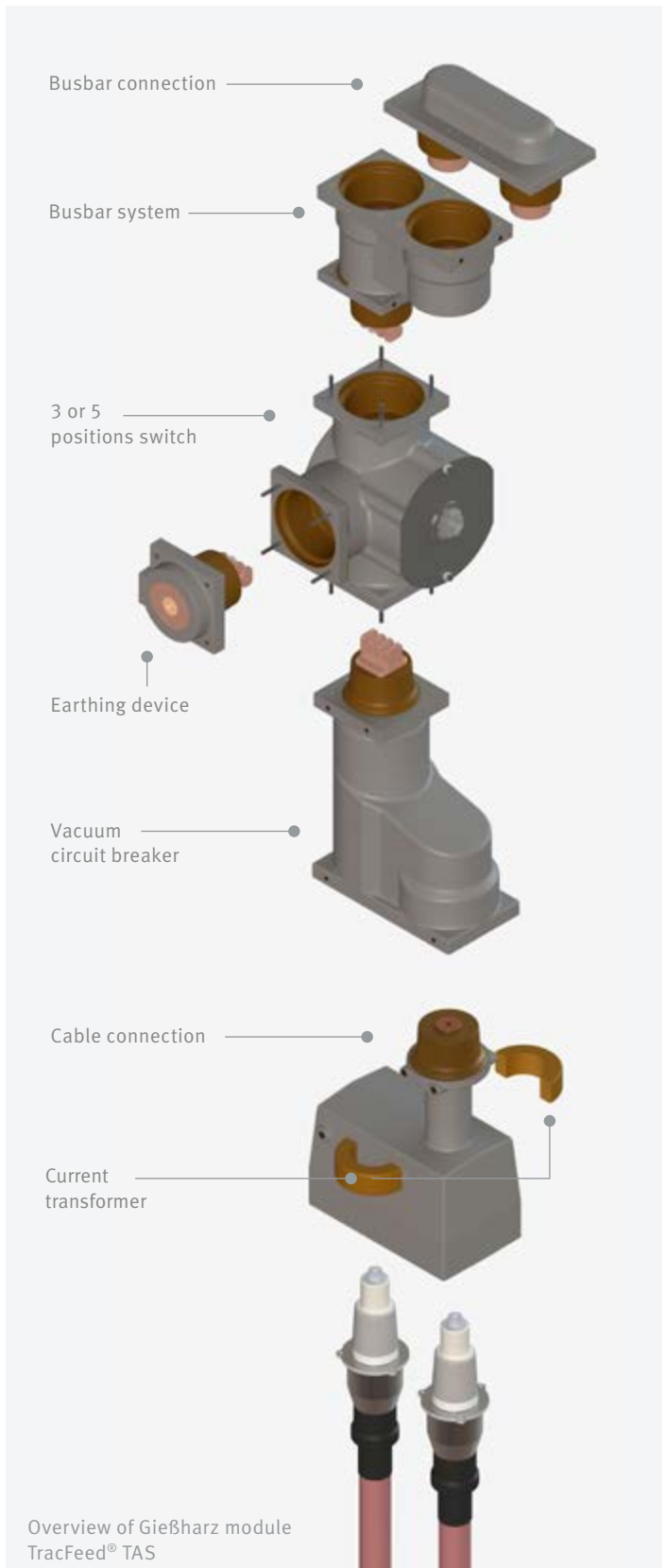
All TracFeed® TAS modules are insulated with epoxy resin and surrounded by a metalised, earthed surface. The switchgear is a true building block system, with all components fully insulated and encapsulated. This modularity allows the most economical and efficient switchgear configuration possible. A single-line diagram on the panel front shows the panel configuration.



Example panel configurations

Current and voltage transformer modules

- Positioning on feeder or busbar side possible
- Ratio, accuracy class and rated power are adapted according to project requirements
- Transformers for measuring, metering and protection functions available
- Current transformers are ring core type which avoid stress on the transformers
- Voltage transformers are plug-in types with a metal surface



Circuit breaker module

- Use of circuit breaker meeting special requirements of railway standard EN 50152-1
- Circuit breaker with vacuum chamber, epoxy resin insulation and metal surface
- Spring-charged operating mechanism located on panel front
- A low number of moving parts ensure a long service life and a high number of operation cycles
- Operated with 'local' and 'remote' control facilities; manual operation is always possible
- Mechanical position indications on panel front
- Interlocking with three- or five-position disconnecter prevents maloperation



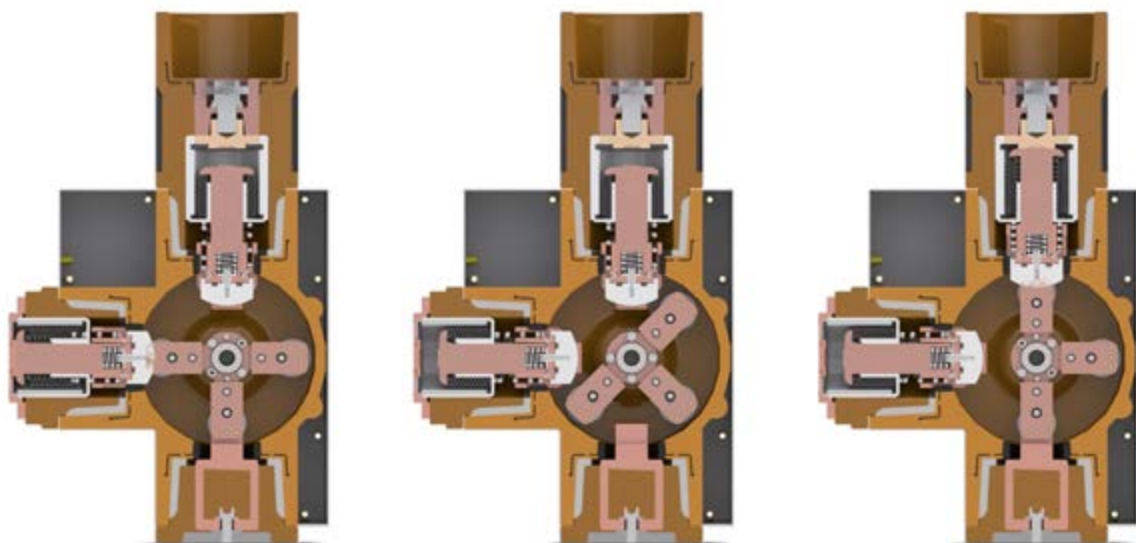
View of circuit breaker

Three-position disconnecter module

- Combined disconnecter and earthing switch
- Motor or manual-operating mechanism available
- Earthing capable of short circuiting cable connection is provided via closed circuit breaker
- Three-position disconnecter can be extended to a five-position disconnecter
- With five-position disconnecter direct earthing of busbar possible

Other modules and options

- Cable Connection module with cable sockets, size 2 or size 3 (acc. EN 50181).
- Busbar connections allow easy connection and extension with other panels
- Surge arresters for 27.5 kV circuit and for cable screens
- Voltage indication system
- Integrated panel control and protection systems



Three-position switches in different positions.

Left – cable connection earthed, centre – general disconnection position, right – Feeder connected to busbar



Operational features

- Intuitive operation and highly visible control via single-line on panel front
- Manual or electrical ON and OFF operation of the circuit breakers and disconnectors/ earthing switches.
- Manual operation also allows use in the absence of an auxiliary power supply

Low-voltage compartment

- Flexible design according to project-specific requirements
- Protection relays, control relays and other user interfaces may be mounted on the front door
- Standard heights of 350 mm and 650 mm

Sustainability

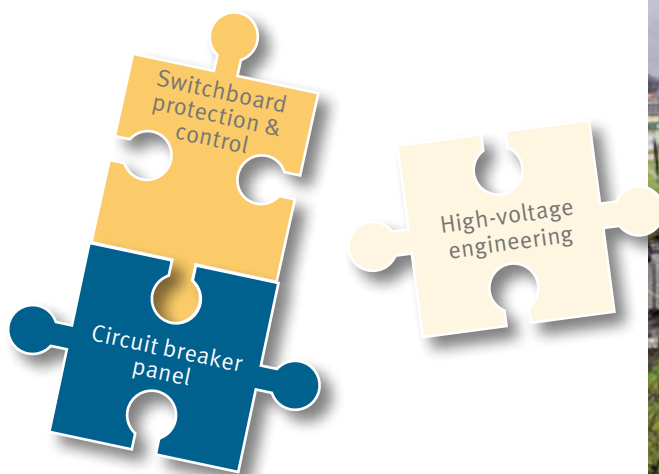
In order to improve its products, Rail Power Systems stays in close contact with customers and suppliers. As well as taking economic and ecological factors into consideration, special emphasis is placed on personnel safety, system safety and ease of assembly. The TracFeed® TAS switchgear combines a high degree of reliability with low maintenance.

High levels of safety

The switchgear has a continuous metallic housing which can be directly connected to the station earthing system. All phases, in addition to compartments, are fully metallically partitioned, providing a maximum level of personnel safety and low electromagnetic field strength.

Further safety features:

- Integrated mechanical and electrical interlockings limit operations to only those safe for the operator and the system
- Verification of a dead cable entry is safely and easily achieved using a capacitive voltage indication system
- Metalwork that is not part of the main circuit is electrically connected and earthed
- The panel is designed to minimise hazards to people
- Each system undergoes thorough testing both at the point of manufacture and after installation to ensure quality and reliability
- Internally Arc-tested



Economic and ecological aspects

- Compact design and small dimensions reduce station dimensions
- Minimal project-specific engineering requirements
- Type-tested, factory-assembled and routinely tested switchgear reduces on-site installation, commissioning and testing effort
- Reduction of waste on site
- Modules can be easily replaced
- Minimised operation and life cycle costs through the use of galvanised, stainless steel and durable components
- Low maintenance costs
- No specially qualified staff for gas handling required
- Environmentally-friendly, solid insulation, no pressurised compartment or emission of greenhouse gases such as SF₆. TracFeed® TAS switchgear complies with the Kyoto Protocol

Rail Power Systems supports customers with all queries, and is happy to provide further assistance upon request.



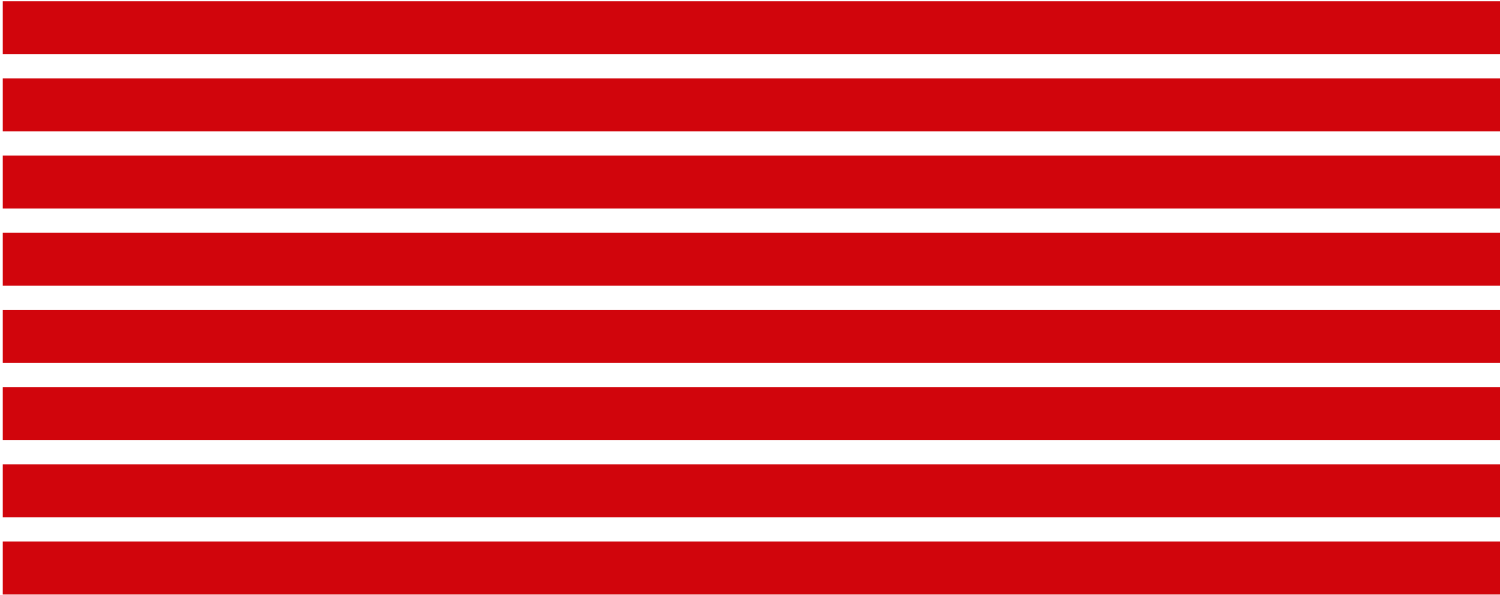
Technical main data TracFeed® TAS

Insulating system	Solid
Rated frequency	50/60 Hz
Nominal voltage 1 pole and 2 poles	27.5 kV
Rated voltage 3 poles	12, 24, 36 kV
Rated lightning impulse withstand to earth and between poles across isolating distance	200 kV up to 220 kV
Rated power frequency withstand to earth and between poles across isolating distance	95 kV 110 kV
Rated current	up to 1 250 A / 2 000 A
Rated short circuit current	up to 25 kA/1 s
Rated peak withstand current	up to 63 kA
Installation	Indoor
Altitude	≤ 2 000 m NN
Ambient temperature	-5 to +40 °C
Humidity	< 95 %
General degree of protection	IP3xD
Low-voltage compartment, open door	IP3xD
Low-voltage compartment, closed door	IP4x
Height	2 000/2 300 mm
Depth	1 250 mm
Width	400 mm
Weight	approx. 900 kg

Standards

General switchgear	EN 62271-1, EN 62271-200 EN 50124, EN 50163
Vacuum circuit breaker	EN 62271-100, EN 50152-1
Disconnecter / earthing switch	EN 62271-102 EN 50152-2
Current transformers	EN 61869-3, EN 50152-3-2
Voltage transformers	EN 61869-2, EN 50152-3-3





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