



TRACTION

Your partner for medium voltage  
railway distribution systems



**ALPHA-ET**

Current and voltage – our passion

## ALPHA Elektrotechnik – all highly charged

Established over 80 years ago in Nidau, Switzerland, ALPHA Elektrotechnik AG is a company steeped in tradition. Starting out in the power transmission business selling disconnectors for medium- and high-voltage networks, ALPHA also has a separate business unit – “cable solutions” – for the transfer of energy in medium voltage systems of modern railways.

First-class engineering ensures continuous further development and guarantees that end products are of a high quality. An extremely efficient supply chain gives us a high level of flexibility, thereby enabling us to take on projects of various sizes. The international references we have received are an impressive indicator for the quality of our products and services.

Our disconnectors have been used around the world for a number of decades and have proved to be very efficient under a wide range of conditions. The power transmission technology on high-speed trains functions reliably and ensures that trains operate safely. The reliability of our products and the fact that they are guaranteed to function for a number of years are major indicators of quality. In addition we guarantee an outstanding level of service provided with the products, as well as on-site installation of technology and training sessions.

The company is located right in the centre of the Swiss watch industry. The area is well-known for its exceptional expertise in precision mechanics and its skilled workers. ALPHA employs a number of staff who have been at the company for many years, bringing with them a high degree of expertise and excellent manufacturing skills.

In 2015, ALPHA became a member of the PFIFFNER Group (headquartered in Hirschthal, Switzerland) to preserve the continuity of the company. ALPHA is supplementing the core business in the field of instrument transformers. With the bushings produced by MGC Moser-Glaser Ltd. and the powerful market position of the international subsidiaries, the PFIFFNER Group with ALPHA, offers a very broad range of products for customers and distribution partners for the transfer of energy in networks of all voltage types.



## TRACTION – connection systems

Durable and reliable in service

In 1999, ALPHA Elektrotechnik AG started to develop and produce medium-voltage assemblies for railways (traction) from 3 kV to 25 kV. Thanks to its high level of quality and flexibility, ALPHA has an important number of international references in the railway sector.

The heart of the transmission process is the partially insulated or fully insulated pluggable jumper. Jumpers are car2car connections to ensure the distribution of energy between rail cars, particularly on commuter trains and high-speed trains. ALPHA masters one of the principal difficulties, which consists in reconciling flexibility and resistance in order to make it possible that the cable supports millions of torsion movements, resonance extreme climatic conditions. We guarantee a high quality standard on a long life time of the cable documented with different internal tests. In addition we offer different services as customer specific engineering, installation and training on site, repair work etc.

We manufacture both ends of the cable according to the customer's requirements. In line with the concept of providing tailored solutions, we offer a range of cable cross sections regardless of the chosen type of cable termination or connector. All products meet the relevant railway standards and the applicable fire protection standard DIN EN 45545-2.

**Connector systems: Durable and reliable in service – customised to your requirements**

# Cable termination

Silicone-based options



ESF 40 (3–25) kV

- Flexible termination
- $U_{max}$ : 36/42 kV
- Cable cross section: 50–630 mm<sup>2</sup>
- Creepage distance: 460–970 m



ESF-R (3–25) kV

- Rigid termination
- $U_{max}$ : 36/42 kV
- Cable cross section: 50–240 mm<sup>2</sup>
- Designed for different clamps



ESF-D (3–25) kV

- Roof bushing
- $U_{max}$ : 36/42 kV
- Cable cross section: 50–240 mm<sup>2</sup>
- Designed for different flanges



ESF-S (3–25) kV

- Plugable termination
- $U_{max}$ : 36/42 kV
- Cable cross section: 50–240 mm<sup>2</sup>



CCS (3–25) kV

- Plug-in connection system
- $U_{max}$ : 36/42 kV
- Cable cross section: 50–240 mm<sup>2</sup>
- Selectable fixing



Transformer plug

- Transformer plug (T/L-plug)
- $U_{max}$ : 36/42 kV
- Cable cross section: 50–400 mm<sup>2</sup>
- Type B/C/E

# Car to car connections

Fully and partially insulated



## Jumper

- Car to car connection
- Cable cross section: 95 mm<sup>2</sup>/120 mm<sup>2</sup>
- Length: 200 mm to 1000 mm
- Can be used with ESF-R



## Quick coupling, 3 kV

- Car to car connection
- U<sub>N</sub>: 3 kV
- U<sub>max</sub>: 4.5 kV (DC)
- Cable cross section: 95–240 mm<sup>2</sup>
- Fully insulated



## Quick coupling, 25 kV

- Car to car connection
- U<sub>N</sub>: 25 kV
- U<sub>max</sub>: 36 kV
- Cable cross section: 70 mm<sup>2</sup>
- Under corridor/on the roof
- Fully insulated



## CCS jumper

- Car to car connection
- U<sub>N</sub>: 25 kV; U<sub>max</sub>: 36/42 kV
- Cable cross section: 70 mm<sup>2</sup>/150 mm<sup>2</sup>
- Under corridor/between carriages/on the roof
- Fully insulated with connection system

# Accessories

Post insulators and preheating cables



## Post insulators

- $U_N$ : 24kV/36kV
- Silicone shield
- Various head and end fittings



## Preheating plug

- $U_N$ : 1000V
- With safety contact



## EGT 75 Portable PD Test System

- max. test voltage: 75kV
- max. cable capacity: 8nF
- Back ground noise:  $<2\text{pC}$

# Services



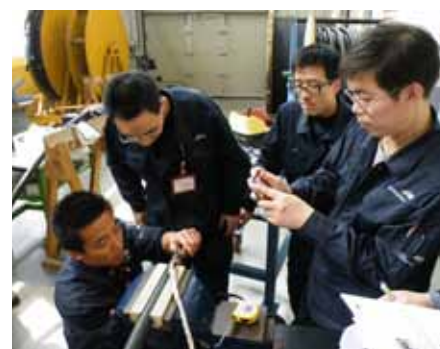
## Engineering

Let us know your requirements and we will present you a solution. Our engineers devise solutions that meet customers' needs. Innovative components featuring project-specific adjustments meet customers' demands.



## Installation

If required, we mount the cables and cable sealing ends on the carriages and give practical tips. We are your partner – whether you have questions about maintenance or are interested in modernising locomotives or train compositions.



## Training

There is a demand for training. On the one hand, at the start of the project when installers have to be trained. On the other hand, your employees need to be instructed in mounting the cables during production.

# References



## Kazakhstan

- KZ8A, 160 double locomotives
- EKZ



## England

- EMU, 57 trains
- Hitachi Rail EU



## Germany

- X60 Batch B, 46 trains
- Alstom



## Germany

- DESIRO UK, 40 trains
- Siemens



## China

- CRH3, 46 trains
- CRC



## France

- TGV Maroc, 24 trains
- Alstom



## Germany

- ET 490, 31 trains
- Bombardier



## Russia

- TRAXX Russ, 50 double locomotives
- FLC



## Italy

- ETR 600, 32 trains
- Alstom



## Germany/Switzerland

- TWINDEXX, 59 trains
- Bombardier



## France

- MI09, 121 trains
- Alstom



## Switzerland

- Preheating systems
- SBB/RhB

## TRENNER



## TRACTION



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### Member of PFIFFNER Group

This document has been drawn up with the utmost care. We cannot, however, guarantee that it is entirely complete, correct or up-to-date.

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