

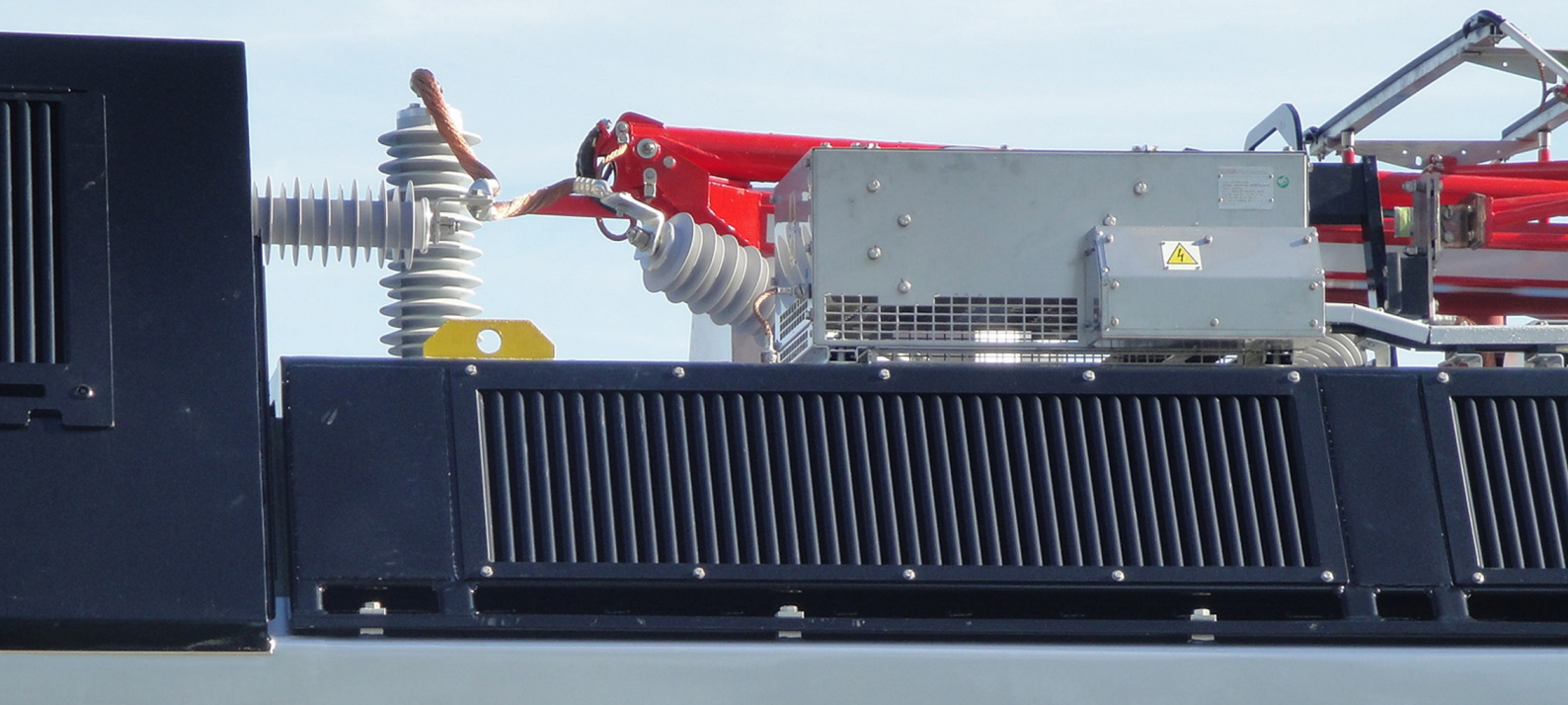
ROLLING STOCK

ESF RS/ESF DS  
Rigid cable termination



**ALPHA-ET**

Current and voltage – our passion



# General description

## General

The rigid cable termination ESF type RS and DS are dry, slip-on terminations for modular assembly. They largely consist of one compact, prefabricated, slip-on silicone component. The use of silicone sheds makes them ideally suited for applications in roof installations. For high rigidity a fibre glass tube is moulded in the silicone. The tested and applied silicone material complies with all electrical, mechanical and also thermal requirements of the cable.

## Special characteristics

The slip-on termination is produced from high-grade silicone rubber. The resultant elasticity enables the termination to accept diameter tolerances as well as changes in cable diameter caused by variations in load. The low hardness of the silicone material prevents constriction of the core insulation even under high alternating load, while allowing it to adapt to any unevenness in the stripped core insulation. This prevents formation of cracks. This termination system ensures high operating reliability and is also absolutely maintenance free even under extreme stress. The proven slip-on technique requires little assembly work and minimises the fitting risk.

## Contamination class

In addition to its outstanding mechanical and electrical characteristics, silicone rubber is distinguished by its ideal properties against atmospheric pollution. For example, the insulation strength is retained in the presence of severe pollution and thaw conditions. A large number of tests in our laboratory and all over the world have demonstrated the superiority of silicone rubber insulated insulators over other materials such as porcelain and EPDM. Terminations have been used successfully throughout the world since 1974 under the most severe climatic conditions.

## Application

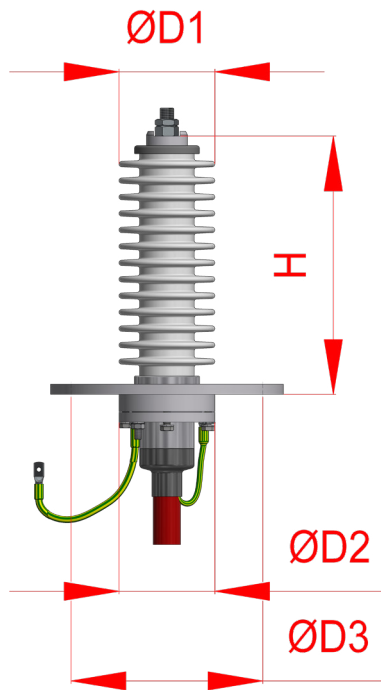
The ALPHA ESF RS and ESF DS terminations are used for applications in Rolling Stock installations and can be mounted on any polymeric cables (PE, XLPE, EPR) with copper conductors. The terminations ESF RS/DS comply with the fire protection standard EN 45545-2:2013, required in the Rolling Stock business.

## Benefits ESF RS/ESF DS

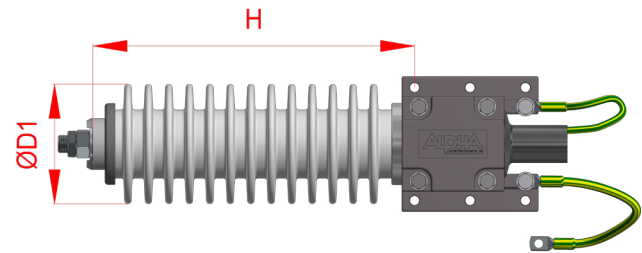
- Cable cross-section 50–240mm<sup>2</sup> (typical rolling stock cross-section)
- Temperature range from -50°C to +130°C
- Creepage distance 1005 mm
- All rigid cable terminations satisfy the requirements of the fire protection standard EN 45545-2:2013.
- Routine test of all assembled cables: AC/DC voltage withstand test according to the standard DIN EN 50124-1:2017 and partial discharge test according to the standard IEC 60270:2000.
- Maintenance free ESF RS/DS cable termination guarantees low life-time costs
- Wind tunnel test up to 324 km/h

# Technical data

ESF DS



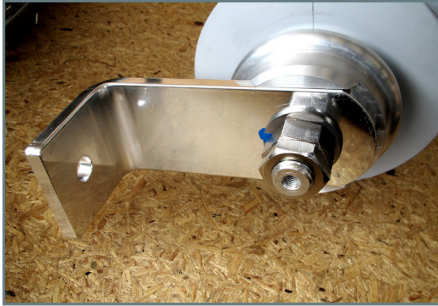
ESF RS



Type		ESF DS	ESF RS
Rated voltage (Single phase)	kV		25
Maximum operating voltage (Single phase)	kV		36
Operating temperature	°C		-50 ... +130
Diameter over insulation of cable	mm		26.8 - 38.8
Weight without flange and clamp	kg		4
Lightning impulse withstand voltage	kV		250
Power frequency withstand voltage	kV		124/15min
Creepage distance	mm		1005
H	mm	364	377
D1	mm	140	140
D2	mm	140	-
D3	mm	*	-

\* according customer requirements

# Highlights



## Selectable connection variant

Connection variant according to customers' requirement. Possible connection variants:

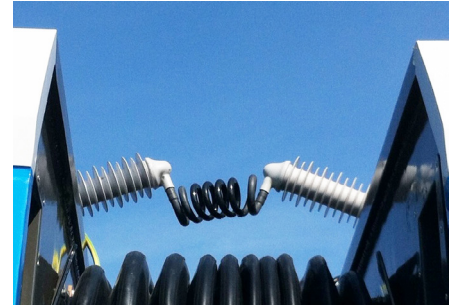
- Connection bar
- Connection bolt
- Threaded connection bolt
- Connection variant for coiled jumper

The connection part is fixed against the cable termination in a user defined angle.



## Individual design

- Individual design of the flange according to customers' requirement
- Execution with and without earthing cable
- It is possible to assemble ESF DS from inside and outside the train.



## References

- Bombardier: Talent, BR430, VT Sweden
- Siemens: Desiro
- Alstom: XCC, Avelia
- Stadler: Norske Tog Flirt Nordic BMU
- Škoda: SDU 14Ev



Current and voltage – our passion

## ALPHA Elektrotechnik AG

Niklaus-Wengstrasse 64  
2540 Grenchen / Switzerland

- ☎ +41 32 3328700
- 📠 +41 32 3312679
- ✉ mail@alpha-et.ch
- 🌐 www.alpha-et.ch

## 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.

© Copyright ALPHA-ET  
Subject to change without notice V2022 08

ROLLING STOCK



DISCONNECTORS

