



# RAYCHEM RSTF SEPARABLE CONNECTORS FOR SWITCHGEAR AND TRANSFORMERS

FOR BUSHING TYPE F, 1250 A UP TO 72.5 kV

Suitable for offshore wind farms, offshore substations and the next generation of solar farms.

# POWERING THE FUTURE OF RENEWABLE ENERGY WITH RAYCHEM RSTF

The demand for renewable power is growing. How can you achieve higher productivity?

To tackle this challenge, we engineered Raychem RSTF — our new generation of separable connectors for switchgear and transformers up to 72.5 kV for type F bushing.

Our complete RSTF portfolio is designed to meet the technical and economic challenges of offshore wind farms, offshore substations and the next generation of solar farms.

## One Connectivity Partner

From turbines and PV panels to grids, substations and energy storage – we can be your partner for multiple connectivity and sensors needs. With over 60 years of experience dedicated to the energy industry, we are ready to help. You can count on our dedicated engineering team to consult, design, test and train.

<p>ENABLING MORE THAN</p> <h2>205 GW</h2> <p>WIND &amp; SOLAR GENERATION OVER THE PAST 10 YEARS</p>	<p>SUPPORTING MORE THAN</p> <h2>5 GW</h2> <p>WITH RSTF IN 66 kV OFFSHORE WIND FARMS WORLDWIDE</p>
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## Compatible + Compact

Compatible with the switchgear and transformers for interface bushing F, our Raychem RSTF connectors fit easily in the limited space of the latest compact switchgear.

To increase grid reliability, we tailor our solutions to match the existing cable constructions, and thus to endure high circulating currents that could be present in the cable screens.



RAYCHEM RSTF CONNECTORS ARE ALSO COMPATIBLE WITH SIEMENS ENERGY BLUE GIS WITH CLEAN AIR



## Easy + Fast Installation

Our patented design is easy to push on, requiring only one installer and reducing installation time. This enables you to quickly connect and disconnect tower, sea and array cables.

To save time and reduce costs, Raychem RSTF can be pre-installed and the cables can be pre-tested before going offshore.

We support you through providing intensive installation training and competency assessments for your installers, trainers and supervisors, to enhance long-term product performance.

SHORTEN INSTALLATION TIME. CONDUCT PRE-INSTALLATION. OUR COMPACT AND SAFE SOLUTIONS SAVE TIME AND COSTS.



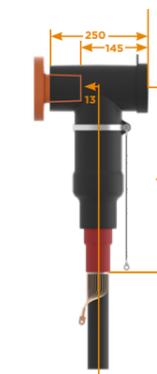
## Reliability + Flexibility

Designed to deliver high reliability even in harsh environments, our Raychem RSTF connectors are maintenance-free, withstand extreme temperatures, humidity, corrosion and high vibration.

To ensure high performance, we can test your selected cable and the screen connections with our solution in our labs. Because every project is different, we can help you create a customized solution together with our dedicated engineering consultancy team.

Benefit from more flexibility and connection possibilities, thanks to our large range of separable connectors and accessories for cross-sections from 70 mm<sup>2</sup> to 1200 mm<sup>2</sup>.

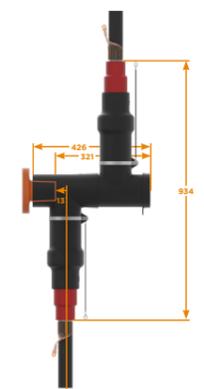
## Offering a Variety of Cable Connections



Single Connection



Parallel Connection



Inline Connection

## MULTIPLE CONNECTION POSSIBILITIES FOR MORE FLEXIBILITY



### Raychem RSTF T-Connectors for Interface F

Base connectors to connect rubber cables and single or three-core polymeric cables to switchgear and transformers up to 72.5 kV.



### Raychem RSTF Coupling Connectors

Designed to connect with RSTF base connectors to enable inline and parallel cable connections.



### Raychem RSTF Surge Arresters

Support voltage stability and prevent negative effects on installed equipment due to overvoltage rated up to 75 kV. Available as base and coupling connectors.

### Accessories for Connection, Fixing, Insulation and Testing

To allow more project flexibility, we provide accessories to perform inline connections, fix to a rail or structure, provide dead end facility and test your cable system.



#### Dead End Plugs

Fit over type F bushings providing dead end facility when the cable is not connected.



#### Back Plugs

Seal and protect the back of the connectors.



#### Dead Plugs

Designed to fix the base connectors to a rail or structure.



#### Fixing Frames

Provide mechanical stability as they fix base connectors and coupling connectors in multiple angles.

## RAYCHEM RSTF BASE & COUPLING CONNECTORS TECHNICAL DATA

### Features & Benefits

- Compact design for cables with cross sections from 70 mm<sup>2</sup> to 1200 mm<sup>2</sup>
- Easy fitting onto T-connector due to patented design and installation procedure
- Featuring up to 1800 A and higher as combined continuous current rating
- Offer a variety of applications for more flexibility in wind turbine cabling

### Relevant Standards

- Type tested according to IEC 60840
- Designed for outer cone interface F3 according to EN 50673 (50181)
- 100% routine tested as per IEC 60840

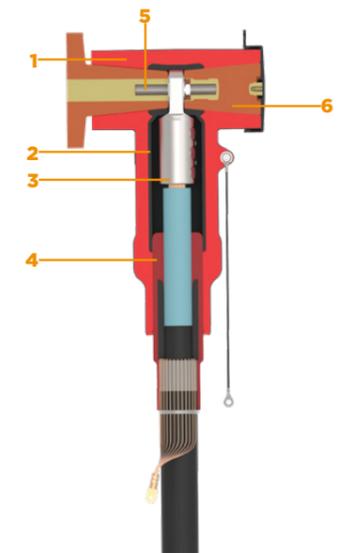
### Rated Data

<b>Conductor Cross-Section Range</b>	70 mm <sup>2</sup> - 1200 mm <sup>2</sup>
<b>Maximum Voltage System</b>	72.5 kV
<b>Continuous Current Rating</b>	1800 A
<b>Lightning Impulse Withstand Level</b>	325 kV
<b>Partial Discharge 1.5 U<sub>0</sub></b>	< 5 pC
<b>Heating Cycle Voltage Test 2 U<sub>0</sub></b>	72 kV
<b>AC Voltage Test 2.5 U<sub>0</sub></b>	90 kV
<b>Ø Over Cable Insulation</b>	28 mm - 70 mm



### An Optimized Design for High Reliability

- 1. Screened T-body**  
A thin-walled conductive outer screen that is permanently bonded to the insulating silicone rubber material of the T-body.
- 2. Inner screen**  
A conductive inner layer around the mechanical cable lug that works as a Faraday cage to prevent corona at rated voltage.
- 3. Mechanical lug**  
Mechanical lugs with shear bolts for connecting Class 2 and Class 5 aluminium and copper conductor cables.
- 4. Stress cone adapter**  
Relieves electrical stress around the cable's screen cut. The insulated section is extending beyond the cable's oversheath to provide sealing against water ingress.
- 5. Threaded pin**  
A threaded pin together with a special lock-washer ensures robust electrical contact, providing low contact resistance and a reliable mechanical contact that is fit to handle the vibrations in offshore wind turbines.
- 6. Rear plug with test point**  
Removable rear plug with capacitive test point that enables checking for presence of voltage.



### Reduced Installation Time

[Watch our installation videos](#) and discover how easily you can install our RSTF connectors. No special tools are required.

# RAYCHEM RSTF SURGE ARRESTER TECHNICAL DATA

## Features & Benefits

- Type-tested for 31.5 kA short circuit current without need for metal enclosure
- State-of-the-art gapless ZnO surge arrester design
- Maintenance-free and corrosion resistant
- Nominal discharge current: 10 kA available integrated in base or coupling connector

## Relevant Standards

- Tested according to IEC 60840 and IEC 60099-4
- Designed for outer cone interface F3 according to EN 50673 (50181)
- 100% routine tested as per IEC 60840



## Dimensions & Weight

Length L (Bushing to Grounding Terminal)	875 mm
Weight (PC)	25 kg

Rated Data	
Rated voltage $U_R$	75 kV
Continuous Operating Voltage $U_C$	60 kV
Nominal Discharge Current $I_N$	10 kA
Charge Transfer Rating $Q_{ps}$	1.6 C
Rated Thermal Energy $W_{th}$	412.5 kJ
Arrester Class	SL
Short Circuit Current $I_s$	31.5 kA
High Current Impulse 4/10 $\mu s$	100 kA
Long Duration Current Impulse 2 ms	760 A

Residual Voltages			
Lightning Impulse 8/20 $\mu s$	5 kA, 185 kV	10 kA, 197 kV	20 kA, 217 kV
Steep Lightning Impulse 1/20 $\mu s$	-	10 kA, 207 kV	20 kA, 227 kV
Switching Impulse 30/60 $\mu s$	-	125 A, 148 kV	500 A, 159 kV



## SAFE, RELIABLE, HIGH-PERFORMING WIND AND SOLAR FARMS

Discover how much you can gain from our complete portfolio for 72.5 kV, installation training and our dedicated engineering consultancy team.

[TE.com/rstf](http://TE.com/rstf)

## An Optimized Design for High Reliability

### 1. Screened T-body

A standard RSTF base or coupling connector with a thin-walled conductive outer screen and silicone rubber insulating body.

### 2. Inner screen

A conductive inner layer around surge arrester terminal that works as a Faraday cage to prevent corona at rated voltage.

### 3. Surge arrester insulation

Silicone insulation layer around the surge arrester module.

### 4. Surge arrester ZnO stack

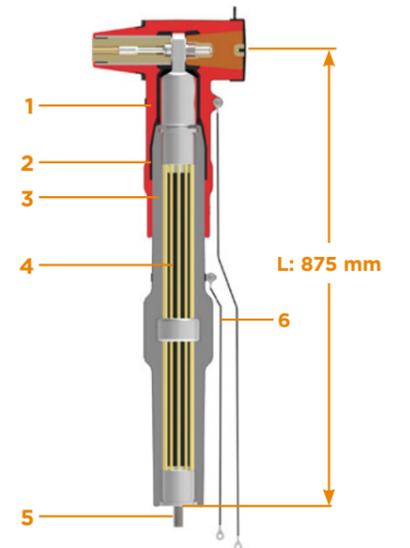
Gapless stack of Zinc-Oxide varieties.

### 5. Grounding terminal

Grounding terminal for the surge arrester module and connection point for mechanical support.

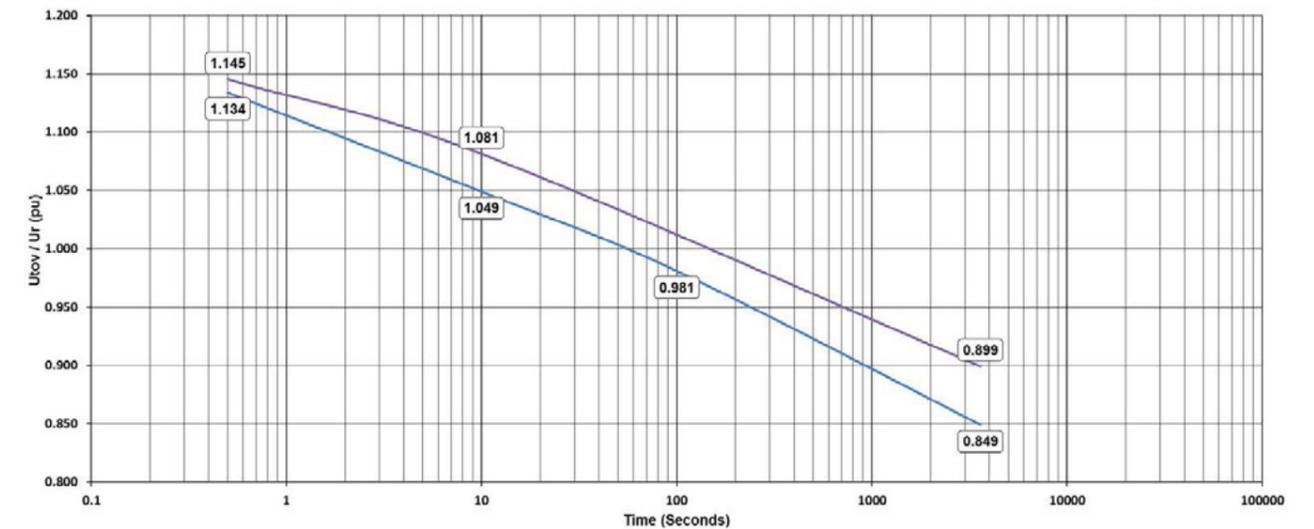
### 6. Ground lead

Insulated ground lead for earthing of the surge arrester's outer screen. Removable rear plug with capacitive test point that enables to check for presence of voltage.



## RSTF Surge Arrester Type TOV Capability up to $U_R = 75$ kV

- With prior energy
  - Without prior energy
- $U_{tov}$  = TOV withstand voltage  
 $U_r$  = Rated voltage



- Samples preheated to 85°C per IEC 60099-4; Ed. 3.0, 2014 for screened separable surge arresters.
- TOV Curves for RSTF Surge Arresters with and without being pre-stressed by energy prior to TOV verifications.
- The pre-stress is its rated thermal energy  $W_{th}$  per the power-frequency voltage-versus-time test according to IEC 60099-4:2014.

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TE Connectivity is a global industrial technology leader creating a safer, sustainable, productive and connected future. Our broad range of connectivity and sensor solutions, proven in the harshest environments, enable advancements in transportation, industrial applications, medical technology, energy, data communications and the home. With approximately 80,000 employees, including more than 7,500 engineers, working alongside customers in approximately 140 countries, TE ensures that EVERY CONNECTION COUNTS.

Learn more: [TE.com/rstf](https://www.te.com/rstf)

Connect with us: [TE.com/energy-contact](https://www.te.com/energy-contact)

Watch our installation videos:



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