

SF6 Immersed Sealing Ends



Accessories for high voltage
polymeric cables

About us

Prysmian Cables & Systems is a world-class multinational company. Founded in 1872 as "Ditta Pirelli & C.", it has achieved a leading position for more than a century of operations in its two key international markets - "Energy Cables and Systems" and "Telecom Cables & Systems".

Prysmian Cables and Systems is the world's largest manufacturer of power and telecommunications cables, with 52 manufacturing facilities in 21 countries in five continents and a market share in excess of 10%.

Prysmian Energy Cables and Systems is a global solutions provider, offering a wide range of integrated solutions, such as cable systems, system design and engineering, project management, installation and post-sale services.

Prysmian Energy Cables and Systems concentrates on continuous product innovation and on achieving a competitive edge by focusing on research and development. This is done through Prysmian's own R&D centres and by co-operating with universities, scientific institutions and above all, our customers. Prysmian's world-wide organisation makes and delivers advanced technological solutions to customers anywhere in the world.

Prysmian started manufacturing insulated cables for electric power distribution around 1880 and soon afterwards initiated the development of the first cable accessories.

Prysmian's very long and successful experience in HV and EHV cable systems have lead to the development of a comprehensive range of accessories for extruded dielectric cables.

A relentless R&D effort focused on rubber compounds as well as on electrical design has created accessories for all applications, based on pre-moulded and factory tested joint sleeves and termination stress cones that are recognised worldwide for their unsurpassed reliability.



Stress cone basics

The origin of the current product range of accessories for HV polymeric cables dates back to 1978 when Prysmian, strong of its very long and successful experience in Fluid Filled cable systems developed its first generation of accessories for extruded cable systems.

These accessories are based on pre-moulded electrical components, i.e. stress cones for terminations and one-piece sleeves for joints.

Pre-moulded sleeves and stress cones are currently available for HV polymeric cables from 72.5 kV up to 525 kV and adopt the same design at all voltage classes.

Thanks to its outstanding electrical and mechanical properties, ethylene-propylene rubber (EPR) has been favoured for the rubber mouldings manufacture. After a thorough research on rubber compounds properties, Prysmian developed a proprietary formulation with superior characteristics that is manufactured in-house, which guarantees an unsurpassed reliability of the products.

The mechanical properties of Prysmian special compounds ensure a constant pressure at the cable/moulding interface during the entire lifetime of the accessories, whilst the electrical design has been optimised to minimise the electrical stress concentration in the same area. Prysmian one-piece pre-moulded sleeves and stress cones are completely manufactured in-house.

The moulding process has been refined thanks to the long-standing presence of Prysmian in the rubber industry; each single moulding is mechanically and electrically tested in the factory (the applied electrical test parameters are stricter than those established by the international standards) and certified individually.

Prysmian HV Accessories quality system complies with both ISO 9001 and ISO 14001 standards. Prysmian HV accessories based on EPR mouldings represent a highly reliable solution that is considered a key component in the safe operation of a HV cable system.

The reliability of its HV accessories has made Prysmian the worldwide market leader in terms of design and quality and all major power Utilities consider Prysmian products the benchmark in terms of performance and service.

Product range

Prysmian HV Accessories product portfolio features a complete range of terminations for direct connection to Gas Insulated Switchgears based on EPR pre-moulded stress cones.

Within the stress cones, the cable ends are encased in a specially designed and in-house manufactured epoxy resin (Voltalit™) insulator that is to be positioned directly inside the GIS enclosure and fastened in its final position by a retaining flange.

The long-standing experience in dealing with all major worldwide transformer manufacturers has allowed Prysmian to develop a comprehensive range of terminations, including both Dry and Wet design solutions, and to become a benchmark thanks to its enhanced design criteria.

Prysmian can also provide solutions for non-standard GIS enclosure and state-of-the-art plug-in solutions. Furthermore, all pre-moulded stress cones undergo factory testing to check for manufacturing defects. This ensures that, once the termination is assembled, its reliability can be compared to that of the cable it is fitted on.

Prysmian stress cones are designed to fit with controlled interference over the cable insulation and to follow the cable's diameter variations. At the same time, they guarantee a sufficient positive pressure to control the electric field concentration under any service condition.



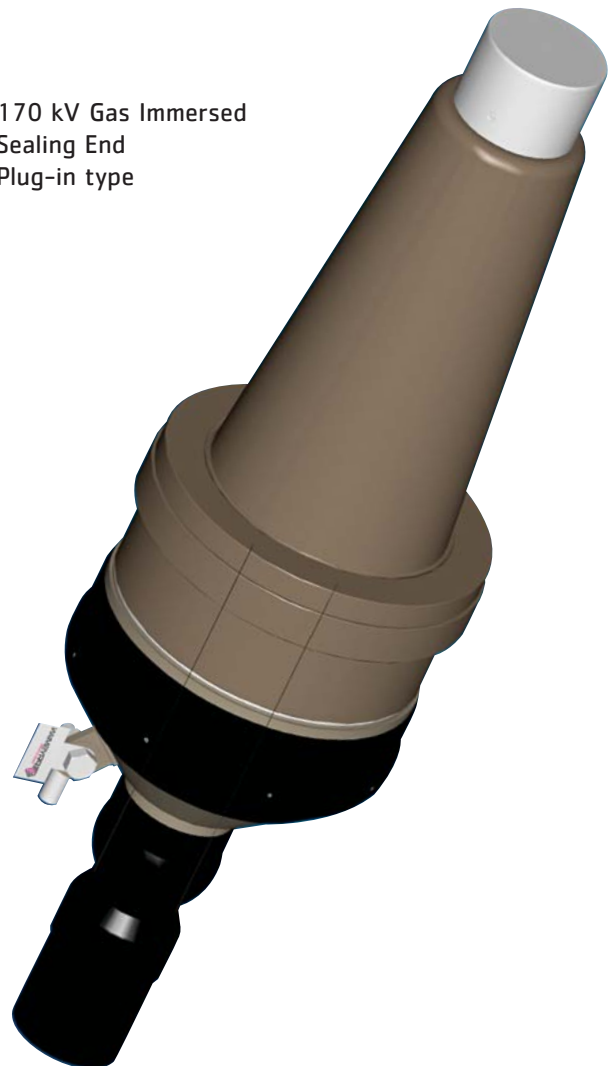
> Plug-in solution

As some customers wish to install the epoxy insulator inside the GIS in the factory and/or to fill the GIS with gas on site and then complete the installation before the cable head is fitted, Prysmian has developed a special epoxy resin insulator version in which the outer part of the top connector is directly embedded.

The insulator can be installed into the GIS in the factory and the enclosure can be filled with SF6 at any time as it is fully sealed.

The cable head is locked in place but can be removed by turning the epoxy insulator by 90°.

170 kV Gas Immersed Sealing End Plug-in type



GIS Terminations

available from 72,5 kV up to 525 kV

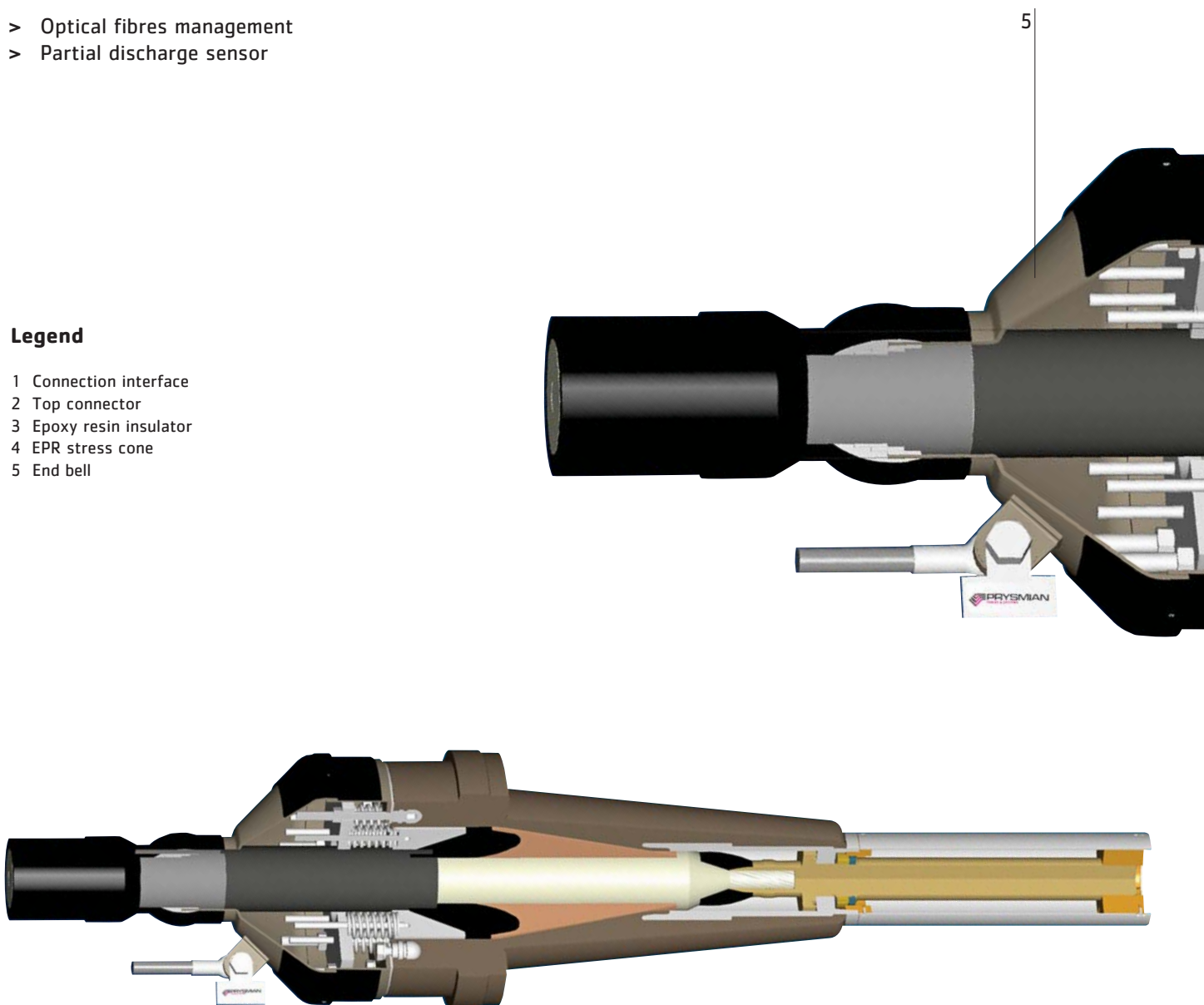
> Additional features

Following the latest developments in cable design and in view of a full system approach the Prysmian terminations can include upon request:

- > Optical fibres management
- > Partial discharge sensor

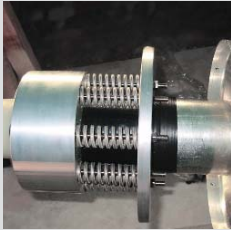
Legend

- 1 Connection interface
- 2 Top connector
- 3 Epoxy resin insulator
- 4 EPR stress cone
- 5 End bell



170 kV Gas Immersed
Sealing End
IEC 60859 (1999) part I

YOUR ENERGY... OUR SYSTEMS... ANYWHERE



DRY DESIGN
SPRING ASSEMBLY



TERMINATION READY
FOR TOP CONNECTOR
INSTALLATION



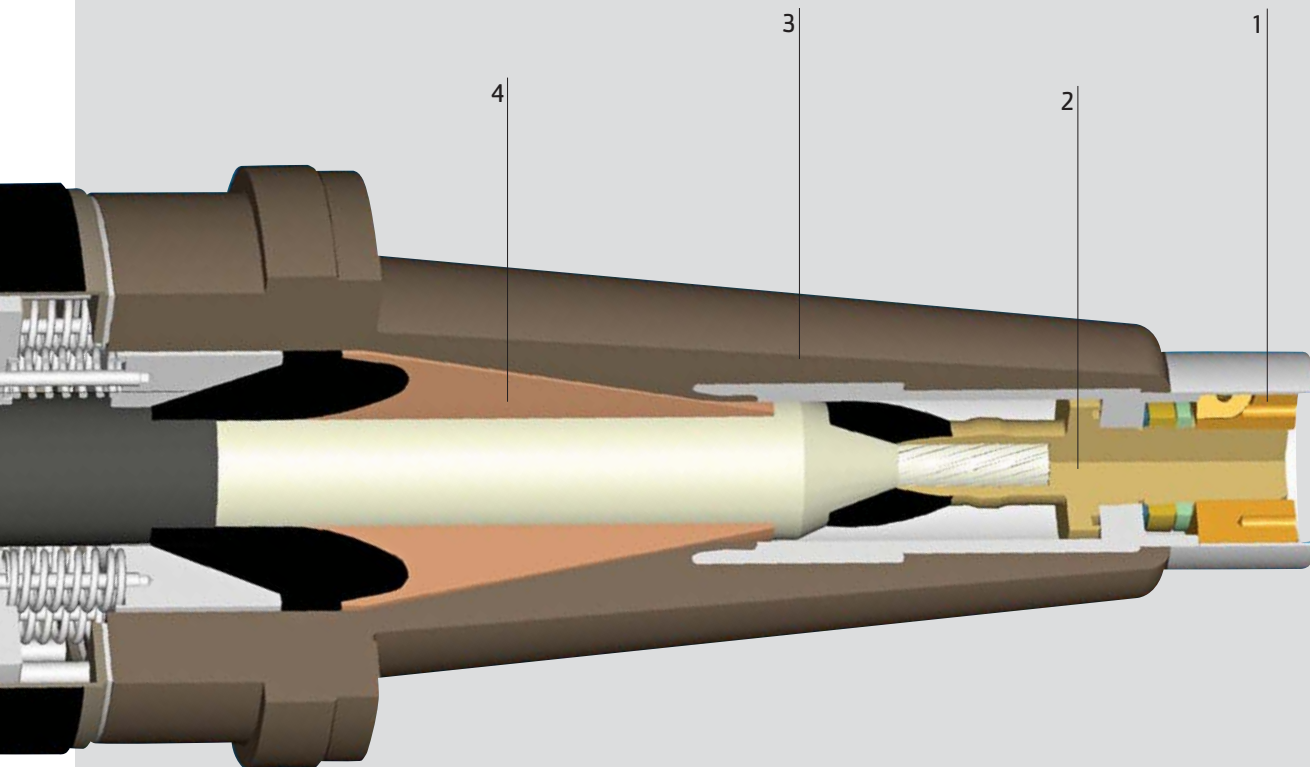
STRESS CONE
POSITIONING



TERMINATION READY FOR
FINAL POSITIONING



TERMINATIONS READY
FOR CONNECTION TO
MAIN CIRCUIT TERMINALS



170 kV Gas Immersed
Sealing End
IEC 60859 (1999) part II

Electrical rating

U max (kV)	123 kV	145 kV	170 kV	245/300 kV	420 kV
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Basic Impulse Level	550	650	750	1050	1425
IEEE 48 = 1 min AC Dry withstand	205	310	365	460	-
IEEE 48 = 6 h AC Dry withstand voltage	160	210	250	330	-
IEC 60840 - 62067 = 15 min AC Dry withstand	160	190	218	320	440

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