



HUBER+SUHNER[®] SEMPER SELF EXTINGUISHING PROTECTOR



Enhanced safety ...

SEMPER™ by HUBER+SUHNER – the world's first self-extinguishing lightning protector

The patent pending **SEMPER™**-concept enhances the safety and reliability of the well known and proven gas capsule protector principle impressively. It eliminates the risk of capsule "hold on" due to DC line powering or high powered RF signals, which will render the system inoperable and can destroy the protective capsule.

Features and benefits

- self extinguishing gas capsule with automatic recovery
- extinguishes under any coaxial line condition including:
 - malfunction of electronic fused DC supplies
 - malfunction of RF line monitoring
 - absence of any such mechanism
- can be employed for any HUBER+SUHNER gas capsule protectors with exchangeable gas tube
- field replacement allows cost-effective system upgrades
- product options ensure availability for any application
- higher safety
- negligible system downtime

Striking Safety and Reliability

Leading by Technology

Careful selection of the most suitable protection technology is crucial for an effective protection with long term reliability.

HUBER+SUHNER offers a large variety of protection solutions for RF/microwave and data line applications.

Some milestones:

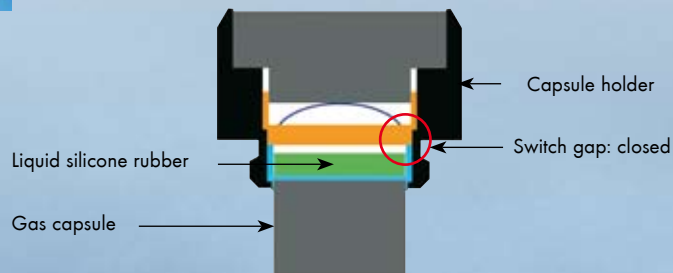
- HUBER+SUHNER made the unsurpassed, most efficient and reliable quarter-wave shorting stub principle to a world-wide industry standard in RF protection
- HUBER+SUHNER invented decoupled gas capsule protectors to support the telecommunications industry with multicarrier, high RF power/low PIM applications
- HUBER+SUHNER provided first quarter-wave stub broadband solutions and wideband gas capsule protectors up to 6 GHz
- HUBER+SUHNER offers unique self-extinguishing gas capsule protectors which safely return to the normal state after a strike, independent of RF or DC load (retrofit option included)



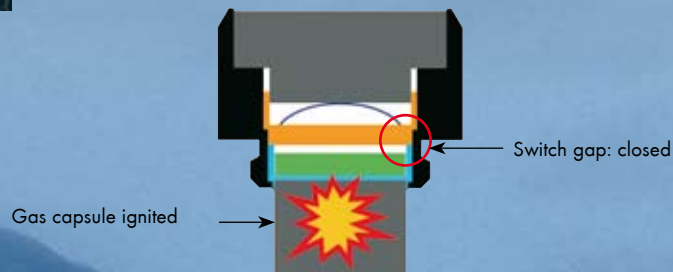
Basic Working Principle



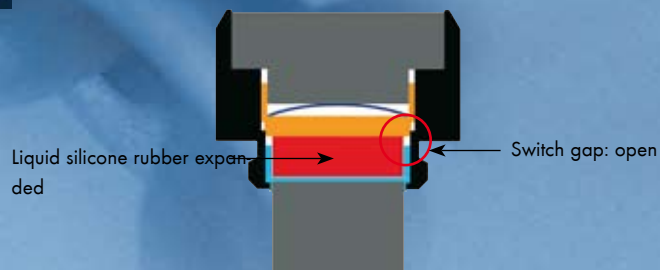
Normal state before lightning strike and after recovery



Gas capsule ignited after lightning strike



Activated state, gas capsule extinguished

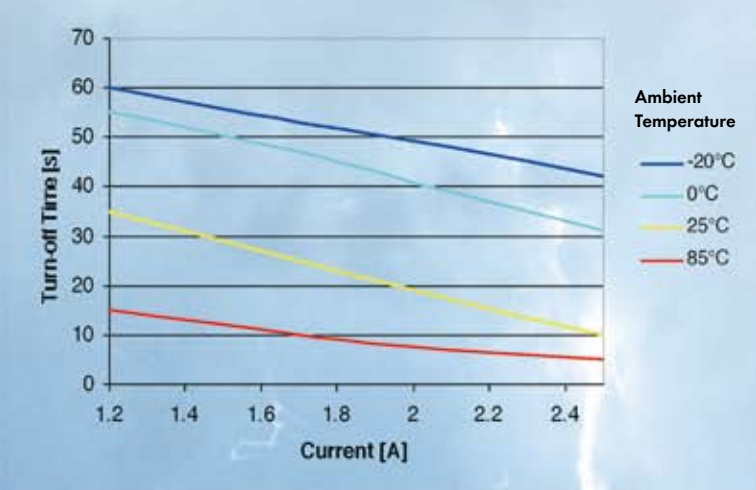


Extinguishing and Recovery Performance

Most Suitable Working Conditions

Turn-off Performance

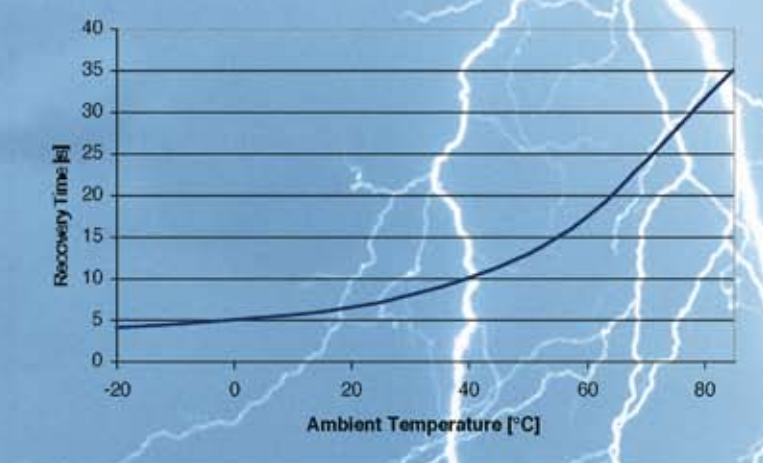
The turn-off time is the time after which the SEMPER™ system extinguishes at a given current and ambient temperature.



The typical turn off time below 1 A is less than 40 seconds at 25 °C.

Recovery Performance

The recovery time is the time the SEMPER™ system needs to return to normal state at a given ambient temperature.





- Standard gas capsule and quarter-wave stub protectors
- Single-, broad-, wide- and multi-band solutions
- High performance protection units with high-pass filter or hybrid design
- Unique decoupled and self-extinguishing gas capsule protectors
- Accessories



Leading by Product Range



- Quarter-wave protectors series 3400
- Quarter-wave protectors with high-pass filter series 3407



- Standard gas capsule protectors series 3401 and 3402
- Gas capsule protectors with high-pass filter and DC injection series 3408



- High power/low PIM gas capsule protectors series 3409 and 3410 with high-pass filter and DC injection
- Self-extinguishing gas capsule protectors series 3405



- Hybrid fine protectors series 3403



- Miniature and slim line gas capsule protectors series 3404 and 3406



- Coaxial data line protectors series 3411, 3412
- Twisted pair data line protectors series 3413, 3414



- Grounding kits

... and reliability

Whereas many applications generally benefit from the enhanced safety and reliability that the **SEMPER™** concept offers, applications using DC line power for remote signal amplification and processing and those using high RF power will find self-extinguishing lightning protectors of specific interest.

Applications

- feeding DC over coax
- transmitting high RF power
- tower mount amplifiers/repeaters
- GPS receivers
- point to point/multi-point radios
- defense/security radios
- remote installations

By offering both, complete **SEMPER™** protector and replaceable **SEMPER™** capsule unit options, HUBER+SUHNER are able to provide lightning protection solutions to a wide range of both civil and military applications and system upgrades.

SEMPER™ Product Range

Complete SEMPER™ Protectors

HUBER+SUHNER type	Frequency range (MHz)	Connector configuration	Static spark-over voltage	Capsule unit included
3401.17.0048-EX	DC - 1000	N-jack/N-jack	230 V	9071.99.0647
3401.26.0012-EX	DC - 1000	TNC-jack/TNC-jack	230 V	9071.99.0647
3402.17.0072-EX	DC - 2500	N-jack/N-jack	230 V	9071.99.0647
3402.41.0056-EX	DC - 2500	7/16-jack/7/16-jack	230 V	9071.99.0647
3403.17.0056-EX	650 - 2500	N-jack/N-jack	230 V	9071.99.0647
3409.17.0037-EX	806 - 2500	N-jack/N-jack	90 V	9071.99.0748
3409.41.0064-EX	806 - 2500	7/16-jack/7/16-jack	90 V	9071.99.0748

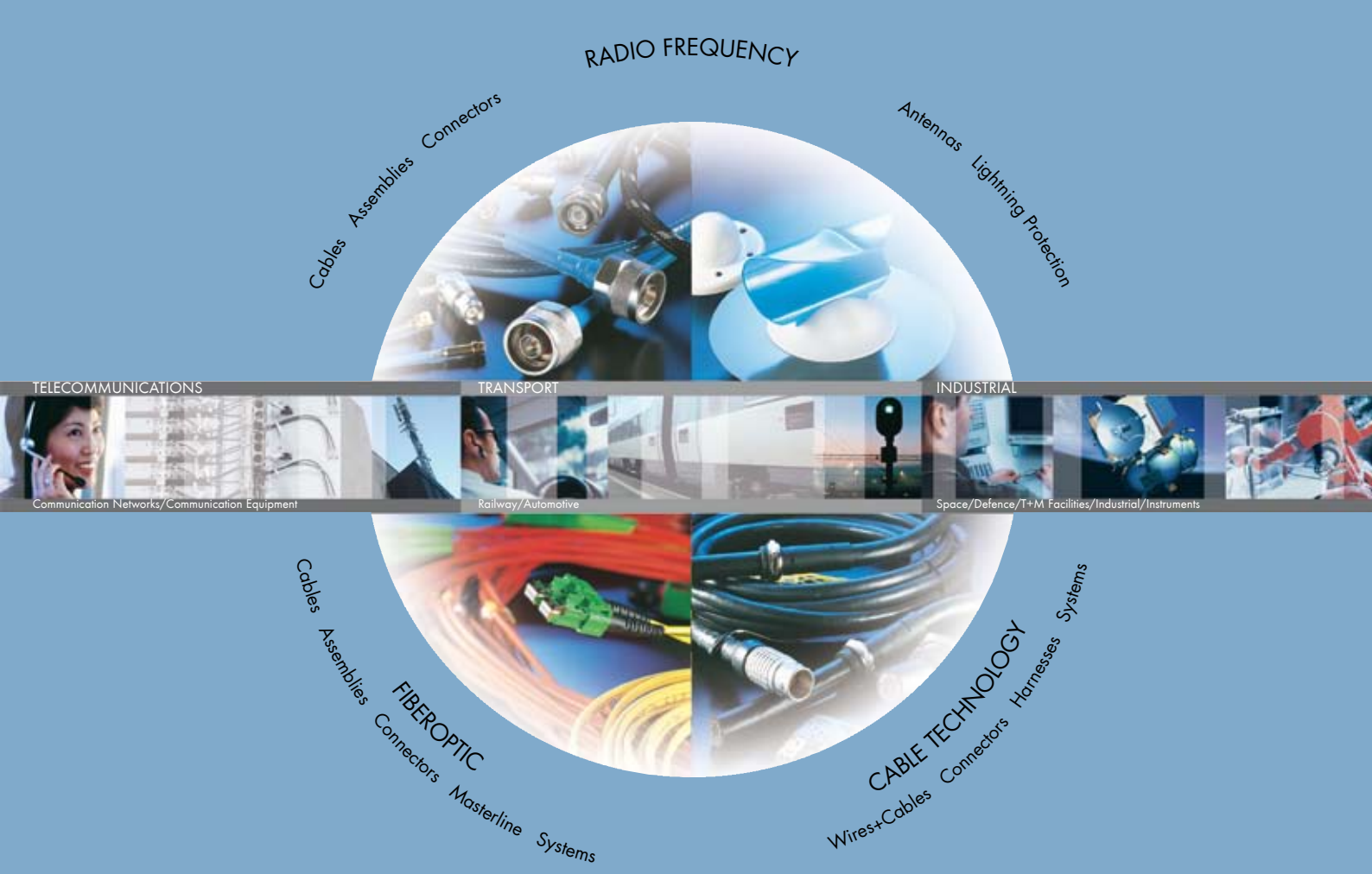
SEMPER™ Capsule units for retrofit and replacement

HUBER+SUHNER type	Static spark-over voltage	Replacement and retrofit types for series
9071.99.0647	230 V	3401, 3402, 3403
9071.99.0648	90 V	3401, 3402, 3403
9071.99.0748	90 V	3409

HUBER+SUHNER – the one-stop shop

The HUBER+SUHNER group is a leading global supplier of components and systems for electrical and optical connectivity in communications, industrial and transportation markets. HUBER+SUHNER can draw on core competences in the areas of high frequency technology, fibre optics, cables

and polymers. Working in close collaboration with our customers around the globe, we strive for excellence in the development and manufacturing of high quality products.



HUBER+SUHNER is certified according to ISO 9001 and ISO 14001.

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It is exclusively in written agreements that we provide our customers with warrants and representations as to the technical specifications and/or the fitness for any particular purpose. The facts and figures contained herein are carefully compiled to the best of our knowledge, but they are intended for general informational purposes only.



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