

HUBER+SUHNER Semper

Edition 2015



Enhanced safety

HUBER+SUHNER Semper – the world's first self-extinguishing lightning protector

The patented Semper-concept enhances the safety and reliability of the well known and proven gas discharge tube (GDT) principle impressively. It eliminates the risk of gas discharge "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 discharge tube with automatic recovery 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 discharge tube protector with exchangeable GDT
- field replacement allows cost-effective system upgrades
- product options ensure availability for any application
- higher safety
- negligible system downtime

Enhanced 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.

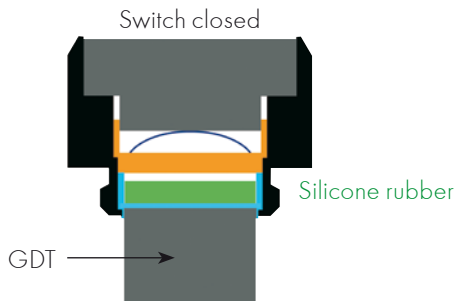
Applications

- DC transmission for remote powering
- transmitting high RF power
- tower mount amplifiers/repeaters
- point to point/multi-point radios
- defense/security radios
- remote installations
- uninterruptible surveillance radio controller navigation systems

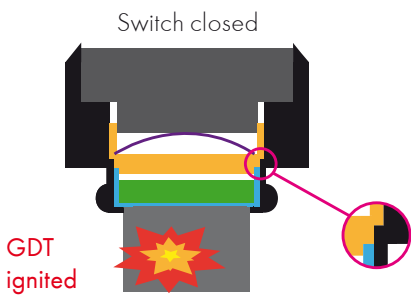
By offering both, complete Semper protector and replaceable Semper GDT unit options, HUBER+SUHNER are able to provide lightning protection solutions to a wide range of both civil and military applications and system upgrades.

Basic working principle

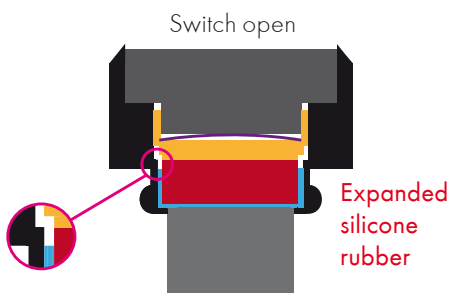
Normal state before lightning strike



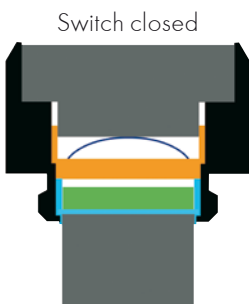
GDT ignited after lightning strike



Activated state, GDT extinguished

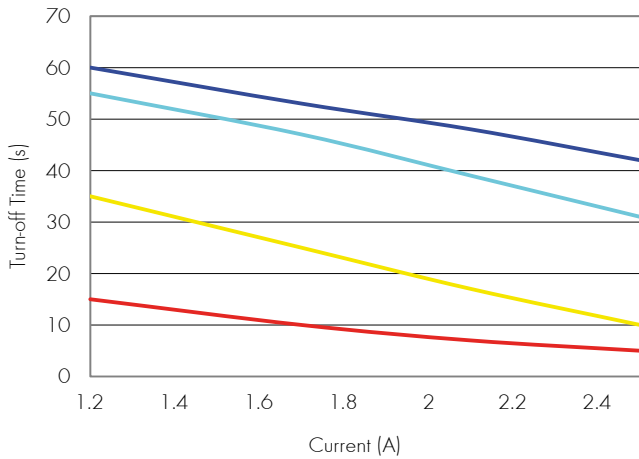


Normal state after recovery



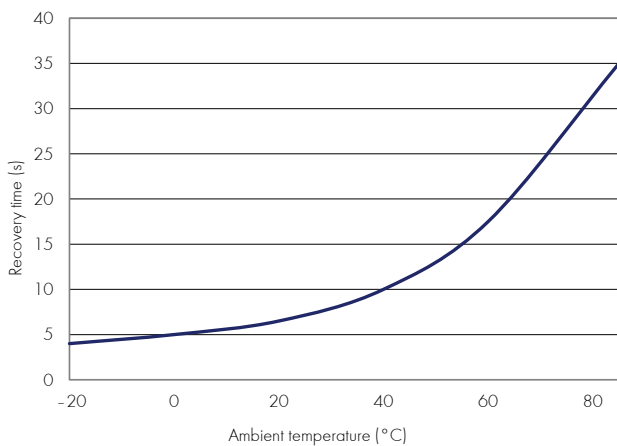
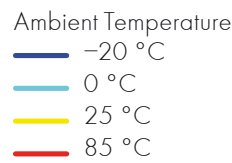
Extinguishing and recovery performance

Most suitable working conditions



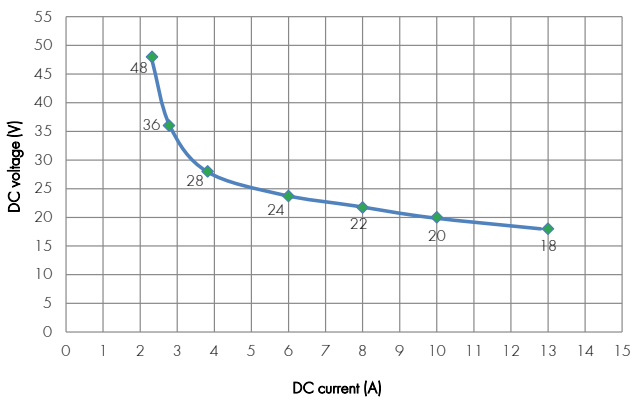
Turn-off Performance

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.



Voltage vs. current limiting graph

This graph defines the admissible maximum supply current (A) at a given supply voltage (V).

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 lightning protection
- HUBER+SUHNER invented decoupled gas discharge tube protectors to support the telecommunications industry with multicarrier, high RF power/low PIM applications up to 25 kW PIP
- HUBER+SUHNER provided first wideband gas discharge tube protectors up to 6 GHz
- HUBER+SUHNER invented unique self-extinguishing gas discharge tube protectors which safely return to the normal state after a strike, independent of RF or DC load (retrofit option included)
- HUBER+SUHNER designed the first wideband quarter-wave shorting stub protector with a ratio of 4:1 in a compact mechanical design.
- HUBER+SUHNER offers Bias-T/DC injectors to "feed-in" or "pick-off" DC voltage into or from antenna cables for full band LTE
- HUBER+SUHNER developed hybrid GDT fine protectors for very sensitive DC powered receivers such as those used in GPS installations
- HUBER+SUHNER developed Ethernet data line protectors Cat 5/Cat 6 with rugged metal housing for outdoor installations IP68
- HUBER+SUHNER invented high power RF limiters which are capable of protecting against lightning and NEMP pulses

Leading by product range



- Standard gas discharge tube and hybrid GDT 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 discharge tube protectors
- Accessories



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



- Miniature and slim line gas discharge tube series 3404 and 3406



- Standard gas discharge tube protectors series 3401 and 3402
- Gas discharge tube protectors with high-pass filter



- Twisted pair data line protectors series 3414



- High power/low PIM hybrid GDT protectors series 3409 and 3410 with high-pass filter and DC injection



- Ground kits series 9076



- Hybrid fine protectors series 3403

Semper product range

Semper protectors

H+S type	Frequency range MHz	Connectors <small>Unprotected/protected side¹⁾ If bulkhead mount version, side of bulkhead marked «b».</small>	Static sparkover voltage	GDT unit included
3401.17.0048-EX	DC - 1000	N (f) - N (f), b	230 V	9071.99.0647
3401.17.0057-EX	DC - 1000	N (m) - N (f), b		
3401.26.0012-EX	DC - 1000	TNC (f) - TNC (f), b		
3402.17.0072-EX	DC - 2500	N (f) - N (f), b		
3402.17.0076-EX	DC - 2500	N (m) - N (f)		
3409.17.0032-EX	380 - 512	N (m) - N (f), b	230 V	9071.99.0747
3409.41.0054-EX	380 - 512	7/16 (m) - 7/16 (f)		
3409.17.0027-EX	806 - 2500	N (m) - N (f)	90 V	9071.99.0748
	806 - 960			
	1710 - 2500			
3409.17.0031-EX	806 - 2500	N (f) - N (f), b		
	806 - 960			
	1710 - 2500			
3409.41.0044-EX	806 - 2500	7/16 (m) - 7/16 (f)		
	806 - 960			
	1710 - 2500			
3409.41.0051-EX	806 - 2500	7/16 (f) - 7/16 (f)		
	806 - 960			
	1710 - 2500			
3409.41.0052-EX	806 - 2500	7/16 (f) - 7/16 (f), b		
	806 - 960			
	1710 - 2500			
3409.41.0053-EX	806 - 2500	7/16 (m) - 7/16 (f), b		
	806 - 960			
	1710 - 2500			

Semper GDT units for retrofit and replacement for series 3401 and 3402

H+S type	Static spark over voltage (V)
9071.99.0647 ²⁾	230
9071.99.0648	90
9071.99.0649	350
9071.99.0650	470
9071.99.0651	600

Semper GDT units for retrofit and replacement for series 3402 platform 3000³⁾

H+S type	Static spark over voltage (V)
9071.99.0947	230
9071.99.0948	90
9071.99.0949	350
9071.99.0950	470
9071.99.0951	600

Semper GDT units for retrofit and replacement for series 3409

H+S type	Static spark over voltage (V)
9071.99.0747	230
9071.99.0748	90

¹⁾ Recommendation only, reverse installation possible without any impact on performance

²⁾ NATO stock number 5920-66-156-1512

³⁾ Platform 3000 is a term for series 3402 protectors with a specified bandwidth of DC - 3000 MHz
Examples: 3402.17.3001, 3402.17.3002, 3402.26.3001

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Waiver

Fact and figures herein are for information only and do not represent any warranty of any kind.