

Novaris

Australian made

Coaxial power surge protection



Selecting Coaxial Protection

Coaxial line surge protection must:

1. Provide adequate protection for all equipment
2. Achieve a long working life
3. Allow the signal to pass under normal operation and not have an adverse affect on insertion loss and return loss.
4. Optimise the cost and size of the surge protection devices (SPD's)

Options for surge protection devices:

Novaris manufactures two types of RF coaxial SPD's. Those containing a gas discharge tube (GDT) are suitable for a wide frequency range but must be chosen carefully taking into account the power on the line if used for a transmitting applications. Quarter wave stub protectors offer exceptionally low let through voltages but are frequency sensitive. Their power handling capability is only limited by the rating of the coaxial connectors employed.

Selection of surge protection devices:

1. Identify the connector type

Novaris manufactures a range of coaxial SPD's to suit most common connector and gender variations.

2. Select the clamping voltage

The clamping voltage of the SPD must be greater than the peak voltage on the line. This is particularly important when used for transmitting applications. The following is a guide.

Power in 50Ω(W)	GDT Voltage (V)
0-40	90
40-125	230
125-300	350
300-800	600
800-2000	1000

3. Identify the maximum operating frequency

3G models are available in all standard small format connector types and feature replaceable GDT's and will operate to 3GHz. 6G models are available in only N-type connectors and will operate to 6GHz.

4. Tuned stub protectors

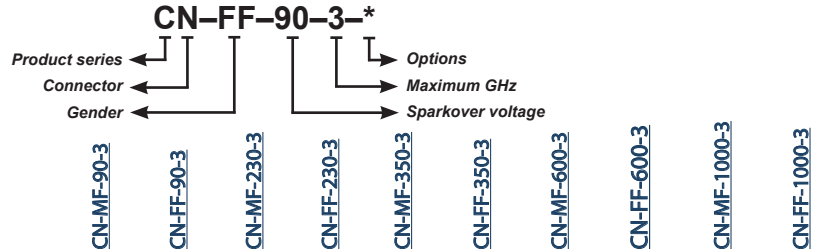
For narrow bandwidth applications where no DC voltage is injected, tuned stub protectors provide exceptionally low let through voltages and very low intermodulation products. The centre operating frequency must be specified when ordering.

Novaris Coaxial Protection

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RF equipment Protection up to 3GHz

Novaris gas discharge surge protectors are capable of passing RF signals to 3GHz (limited by connector type). N-type female / female protectors are suitable for bulkhead mounting.



Electrical Specifications

Connection type		Series				
Modes of protection		Signal-Earth				
Sparkover voltage	Uc	90VDC	230VDC	350VDC	600VDC	1000VDC
Maximum discharge current (8/20µs)	I _{max}	20kA				
Power rating		0-40W	40-125W	125-350W	300-800W	800-2000W
Maximum working frequency	f _c	3GHz				
Voltage protection level @ 5kV	U _p	<650V	<820V	<1.1kV	<1.3kV	<1.8kV
Impulse durability		C2 8/20µs, 5kA, 10 times				
Overstressed fault mode		Mode 3 (open circuit)				
Characteristic impedance		50Ω (75Ω F-type only)				
Capacitance (line-shield @ 1MHz)		<1pF				
VSWR/ Return loss		<1.1:1 / >26dB				
Insertion loss		<0.1dB				

Options [*]

90° mounting bracket	M
DIN rail mounting clip	D
G rail mounting clip	G
Earth stud	E

Standards Compliance

ITU-T K.44
AS/NZS 1768
IEEE C62.41
IEC 61643-21
UL497B

Mechanical Specifications

Operating temperature/humidity	-40°C to +85°C / 5 to 95% non-condensing									
Connection type	N-type									
Connection orientation	M/F	F/F	M/F	F/F	M/F	F/F	M/F	F/F	M/F	F/F
Mounting	Inline/ bulkhead (N-type only)									
Environmental	IP55									
Enclosure/colour	Brass/Nickel plated									
Weight	150grams									

Continued on following page.

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RF equipment Protection up to 3GHz

Novaris gas discharge surge protectors are capable of passing RF signals to 3GHz (limited by connector type). N-type female / female protectors are suitable for bulkhead mounting.



Options [*]	
90° mounting bracket	M
DIN rail mounting clip	D
G rail mounting clip	G
Earth stud	E

Standards Compliance	
ITU-T K.44	
AS/NZS 1768	
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UL497B	

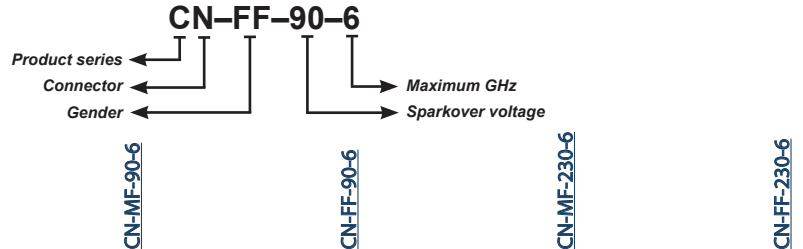
Connector type variation											
BNC	B										
7/16" DIN	D (mounting bracket not available)										
F-type	-	F	-	F	-	F	-	F	-	F	F
N-type	N	Standard	N	Standard	N	Standard	N	Standard	N	Standard	Standard
UHF	U										
SMA	S										
Dimensions											
Configuration	CB-MF	CB-FF	CD-MF	CD-FF	CF-FF	CN-MF	CN-FF	CU-MF	CU-FF	CT-MF	CT-FF
Width	25mm		Ø40mm			25mm					
Height	25mm					25mm					
Maximum length	58mm	52mm	70mm	73mm	50mm	60mm	60mm	57mm		54mm	

Novaris Coaxial Protection

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RF equipment Protection up to 6GHz

Novaris gas discharge surge protectors are capable of passing RF signals to 6GHz (limited by connector type). N-type female / female protectors are suitable for bulkhead mounting.



Electrical Specifications

Connection type		Series		
Modes of protection		Signal-Earth		
Sparkover voltage	Uc	90VDC	230VDC	
Maximum discharge current (8/20µs)	I _{max}	20kA		
Power rating		0-40W	40-125W	
Maximum working frequency	f _c	6GHz		
Voltage protection level @ 5kV	U _p	<650V	<820kV	
Impulse durability		C2 8/20µs, 5kA, 10 times		
Overstressed fault mode		Mode 3 (open circuit)		
Characteristic impedance		50Ω		
VSWR/ Return loss		<1.1:1 / >26dB		
Insertion loss		<0.2dB		

Mechanical Specifications

Operating temperature/humidity	-40°C to +85°C / 5 to 95% non-condensing			
Connection type	N-type			
Connection orientation	M/F	F/F	M/F	F/F
Mounting	Inline/ bulkhead (N-type only)			
Maximum bulkhead thickness	9mm			
Environmental	IP55			
Enclosure/colour	Brass/Nickel plated			
Weight	150grams			

Standards Compliance

ITU-T K.44

AS/NZS 1768

IEEE C62.41

IEC 61643-21

UL497B

Dimensions

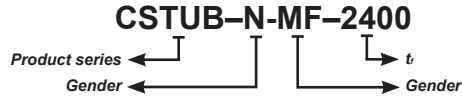
Width	26mm			
Height	26mm			
Weight	62mm	69mm	62mm	69mm

Novaris Coaxial Protection

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RF equipment Protection tuned stub

Novaris tuned stub surge protectors employ quarter-wavelength short circuit stub technology. Suitable for narrow bandwidth applications where no DC voltage is injected. RF power and surge rating are limited by the cables and a connectors only.



Electrical Specifications

Connection type		Series
Modes of protection		Signal-Earth
Maximum discharge current (8/20,μs)	I _{max}	20kA
Power rating		Limited only by connectors and cables used.
Tuned frequency range	f _r	400MHz to 3GHz (specify)
Voltage protection level @ 5kV	U _p	<20V
Characteristic impedance		50Ω
Bandwidth		10% of tuned frequency
VSWR/ Return loss		<1.1:1 within bandwidth/ >26dB within bandwidth
Insertion loss		<0.1dB at tuned bandwidth

Mechanical Specifications

Operating temperature/humidity	-40°C to +85°C / 5 to 95% non-condensing							
Connection type	7/16" DIN		N-type		7/16" DIN		N-type	
Connection orientation	M/F	F/F	M/F	F/F	M/F	F/F	M/F	F/F
Mounting	Inline							
Maximum bulkhead thickness	9mm							
Environmental	IP55							
Enclosure/ colour	Brass/ Silver							

Standards Compliance

ITU-T K.44

AS/NZS 1768

IEEE C62.41

IEC 61643-21

Dimensions

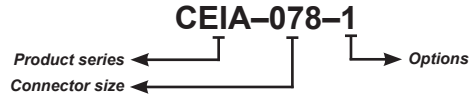
Body diameter	32mm							
Height	Depends upon operating frequency							
Weight	63mm	60mm	56mm	54mm	63mm	60mm	56mm	54mm

Novaris Coaxial Protection

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RF equipment Protection High power

Novaris high power surge protectors suit applications including MF, HF and VHF transmitters to 50kW. The spark gap arrester has an optical arc sensor which may be used to momentarily interrupt the transmitter.



CEIA-078

CEIA-158

CEIA-318

Electrical Specifications

Connection type		Series	
Modes of protection		Signal-Earth	
Maximum discharge current (8/20,µs)	I _{max}	100kA	
Power rating		>50kW limited only by coaxial cable	
Surge element		Spark gap, gap setting: 2mm / 10kW	
Spark over voltage		2.6kV for 2mm gap	
Characteristic impedance		50Ω	
Overstressed fault mode		Mode 3 (open circuit)	
Insertion loss		<0.1dB to 500MHz	<0.2dB to 1GHz (gap setting: 1mm)
Return loss		>26dB to 500MHz	>20dB to 1GHz (gap setting: 1mm)
Arc sensor		Optical detector utilising photodiode, feeding transmitter interface to provide momentary shutdown	
Power requirements		Arc sensor: 12VDC @ 35mA	
Transmission medium		Arc detector fed to transmitter via optic fibre. Alternate metaalic cable available	

Mechanical Specifications

Operating temperature/humidity	-40°C to +85°C / 5 to 95% non-condensing		
Connection type	7/8" EIA	1-5/8" EIA	3-1/8" EIA
Mounting	Bulkhead / flange		
Environmental	IP 55		
Enclosure/ colour	Brass/ Silver		

Options

Spark gap only, no TX controller	Standard	
1RU 19" rack, one TX controller only	1	
3RU 19" rack, up to 14TX controllers	n*	

* denotes number of TX controllers

Standards Compliance

ITU-T K.44

AS/NZS 1768

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