

## Features

- Unique patented coordinated hybrid technology provides optimum overvoltage protection
- Quick solid-state response in a robust design
- Minimal signal loss throughout all xDSL frequency ranges
- Available with self-resetting sneak current protection
- GR-974-CORE Issue 3 compliant
- cULus Listed

# Model 303M 9 Series Hybrid 5-Pin Protector Modules

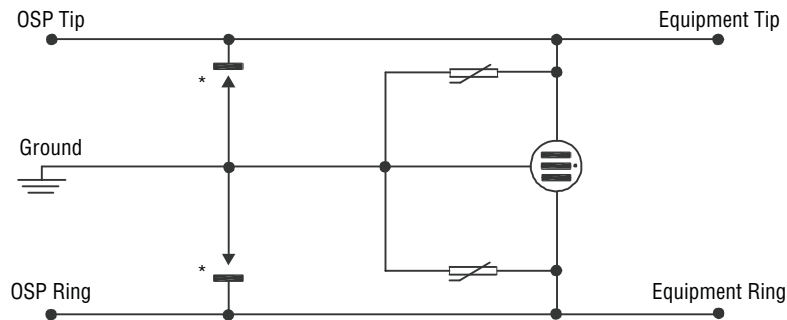
The Bourns® 9 Series Hybrid 5-Pin Protector Module combines semiconductor and gas tube technologies in a patented, coordinated system. This combination provides high energy handling capability as well as fast response time to damaging overvoltage surges. This system can result in reduced replacement and maintenance costs while maximizing lifecycle value.

The 9 Series hybrid design differs from other hybrid-type products by its coordinated response between the semiconductor and gas tube. The coordinated action provides optimum overvoltage protection for primary protection applications. The hybrid protector offers exceptional reliability and repeatability over its life. Unlike gas tube modules, the hybrid operational characteristics will not degrade over time or with repeated surges. The protector also includes a Fail-Short mechanism that permanently shorts the line to ground under a sustained or high-current power cross condition.

The Bourns® Hybrid 5-Pin Module is available with a Positive Temperature Coefficient (PTC) device to provide resettable overcurrent protection. This feature protects digital equipment line cards against overheating caused by prolonged currents - referred to as sneak currents. Sneak currents are caused by induction on telephone lines produced by fault currents, overloads or unbalanced loads on nearby power lines. They may also be caused by direct contact with low voltage power lines.

The hybrid protector is ideal for providing protection for broadband voice and data circuits (ADSL, ADSL2+ and VDSL2) due to its robust design, quick solid-state response time and minimal signal loss throughout all xDSL frequency ranges.

Because the hybrid module is designed in the industry-standard 5-pin configuration, it can easily be interchanged with all other 5-pin protectors.



\* Metallic shunts close circuit on low current power faults; gas tubes fail-short on high current power faults.

**BOURNS®**

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[www.bourns.com](http://www.bourns.com)

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## Specifications

DC Limiting Voltage.....		300-475 V at 2000 V/sec.
Impulse Breakdown ( $V_{imp}$ ).....		600 V max. at 100 V/ $\mu$ sec 600 V max at 1000 V/ $\mu$ sec
Insulation Resistance (IR) .....		1,000 Mohms min. at 50 to 200 VDC
DC Holdover (Impulse Reset) .....	@ 260 mA, $\pm$ 52.5 VDC.....	20 ms max.
	@ 200 mA, $\pm$ 135 VDC.....	20 ms max.
Impulse Life (-20 °C, +65 °C) Criteria .....	$\pm$ 10 A, 10/1000 $\mu$ sec .....	1500 surges
IR > 10 <sup>9</sup> at 50 VDC .....	$\pm$ 100 A, 10/1000 $\mu$ sec .....	100 surges
Limiting Voltage During Surge < 600 V .....	$\pm$ 300 A, 10/1000 $\mu$ sec .....	50 surges
Impulse Reset IDC Holdover < 30 ms .....	$\pm$ 2,000 A, 10/250 $\mu$ sec .....	5 surges
AC Life, 60 Hz .....	10 $A_{rms}$ , 1 sec. ....	5 surges
	1 $A_{rms}$ , 1 sec. ....	60 surges
	0.5 $A_{rms}$ , 30 sec. ....	1 surge
End-of-Life Criteria		
100 V <sub>lps</sub> Breakdown < 1000 V.....	$\pm$ 10 A, 10/1000 $\mu$ sec .....	3000 surges
	$\pm$ 100 A, 10/1000 $\mu$ sec .....	300 surges
	$\pm$ 300 A, 10/1000 $\mu$ sec .....	100 surges
	$\pm$ 500 A, 10/1000 $\mu$ sec .....	500 surges
	$\pm$ 2,000 A, 10/250 $\mu$ sec .....	100 surges
	$\pm$ 5,000 A, 20/100 $\mu$ sec .....	100 surges
	$\pm$ 20,000 A, 8/20 $\mu$ sec .....	1 surge
	120 $A_{rms}$ , 0.1 sec. ....	1 surge
Capacitance .....		35 pF max.
Insertion Loss		
Hybrid - No Sneak Current .....	0-26 MHz.....	< 0.1 dB
Hybrid - No Sneak Current .....	0-42 MHz.....	< 0.3 dB
Hybrid with Sneak Current.....	0-50 MHz.....	< 0.4 dB
Hybrid with Sneak Current.....	0-90 MHz.....	< 0.9 dB
Sneak Current Protection (+25 °C)	<b>5 Ohm PTC</b>	<b>9.5 Ohm PTC</b>
Non-operate.....	3 hrs. min. at 100 mA .....	3 hrs. min. at 150 mA
Operate.....	210 sec. max. at 540 mA .....	210 sec. max. at 355 mA
Resistance .....	4.75 ohms $\pm$ 15 %.....	9.3 ohms $\pm$ 10 %
Resistance Imbalance.....	1 ohm max. ....	0.5 ohm max.
Safety .....	30 $A_{rms}$ , 15 min. ....	Fail-Short - does not cause a fire hazard
	60 $A_{rms}$ , 3 sec. ....	Fail-Short
	120 $A_{rms}$ , 0.6 sec. ....	Does not cause a fire hazard
	350 $A_{rms}$ , 0.4 sec. ....	Does not cause a fire hazard
Storage Temperature.....		-40 °C to + 65 °C
Safety Standards Listing .....		cULus

## Packaging Specifications

Dimensions (H x W x D).....	70 x 140 x 220 mm (2.8 x 5.5 x 8.6 in.)
Weight .....	1.8 kg (4.0 lb.)
Quantity .....	100 pcs./box

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## How to Order

Part Number	Description	Dimensions
303M-09G1G0	5-Pin Hybrid, 400 V, gold pins, black case	Fig. 1
303M-09G3G0	5-Pin Hybrid, 400 V, gold pins, red case	Fig. 1
303M-09H1G0	5-Pin Hybrid, 400 V, gold pins, black case, front test	Fig. 2
303M-09H3G0	5-Pin Hybrid, 400 V, gold pins, red case, front test	Fig. 2
303M-09G1T0	5-Pin Hybrid, 400 V, tin pins, black case	Fig. 1
303M-09G3T0	5-Pin Hybrid, 400 V, tin pins, red case	Fig. 1
303M-09G1TV	5-Pin Hybrid, 400 V, tin pins, black case, with 9.5 ohm PTC	Fig. 1
303M-09G3TV	5-Pin Hybrid, 400 V, tin pins, red case, with 9.5 ohm PTC	Fig. 1
303M-09G1GH	5-Pin Hybrid, 400 V, gold pins, black case, with 5 ohm PTC	Fig. 1
303M-09G3GH	5-Pin Hybrid, 400 V, gold pins, red case, with 5 ohm PTC	Fig. 1
303M-09H1GH	5-Pin Hybrid, 400 V, gold pins, black case, front test, with 5 ohm PTC	Fig. 2
303M-09H3GH	5-Pin Hybrid, 400 V, gold pins, red case, front test, with 5 ohm PTC	Fig. 2
303M-09G1GP	5-Pin Hybrid, 400 V, gold pins, black case, with 4 ohm PTC	Fig. 1
303M-09G3GP	5-Pin Hybrid, 400 V, gold pins, red case, with 4 ohm PTC	Fig. 1
303M-09H1GP	5-Pin Hybrid, 400 V, gold pins, black case, front test with 4 ohm PTC	Fig. 2
303M-09H3GP	5-Pin Hybrid, 400 V, gold pins, red case, front test with 4 ohm PTC	Fig. 2
303M-09G1TP	5-Pin Hybrid, 400 V, tin pins, black case, with 4 ohm PTC	Fig. 1
303M-09G3TP	5-Pin Hybrid, 400 V, tin pins, red case, with 4 ohm PTC	Fig. 1

For additional information or ordering assistance, please contact Bourns Inside Sales at [trimcus@bourns.com](mailto:trimcus@bourns.com).

## Product Dimensions

Figure 1

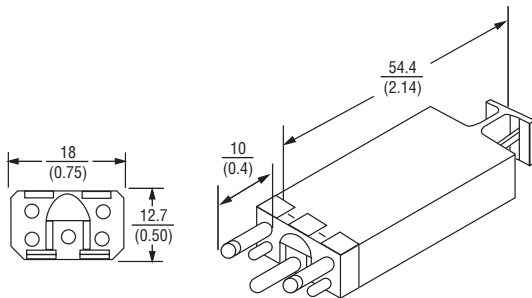
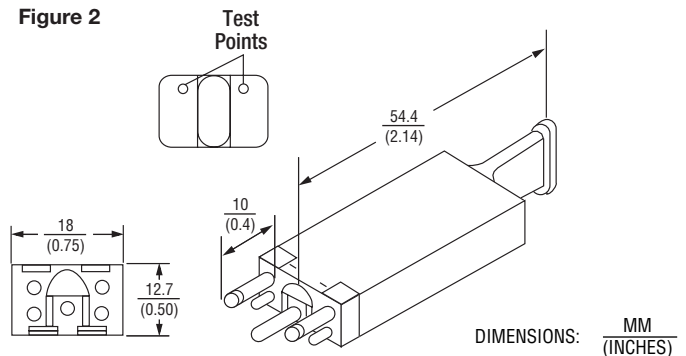


Figure 2



REV. B 07/10

Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.