CS-Series High Current Shunts
Operating Instructions

General:

Ohm-Labs CS-Series precision shunts are low resistance standards used primarily for accurate measurement of current using the potentiometric method. They may be used as comparison standards for resistance if the specified accuracy is satisfactory. The stated resistance is that between the potential terminals, measured in the 4-wire method.

The CS-Series are designed to operate at room temperature up to continuous full rated current without damage. An optional temperature sensor (thermistor, RTD or type T thermocouple) can provide improved characterization of the shunt by defining its power / temperature curve.

Precautions:

Connect shunt in series with the load, on the 'ground' or 'low' side of the line, especially if hazardous voltages may be in use. Insure that all connections are secure before applying current.

Connections:

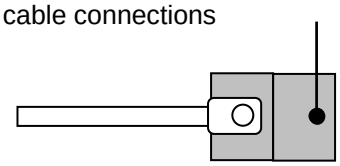
Current shunts must always be used as four-terminal resistors.

Measure potential at the binding posts. Use bare copper wire or gold plated plugs to reduce thermal EMF. To reduce ac coupling, orient the potential wires at right angles to the current cables.

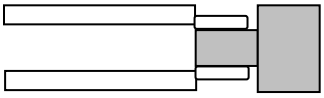
Measurement errors can result from improper or unbalanced current connections. Current cables should be terminated in ½" (12 mm) copper lugs bolted to the copper blocks using ½" (12 mm) silicon-bronze or brass hardware. 4/0 AWG (107 mm) welding cable is recommended. Connect to both sides of both holes. Torque bolts to 15-20 nm. Extend the cables a minimum of six inches back from the end of the CS block as shown below:

CS-500 cable connections

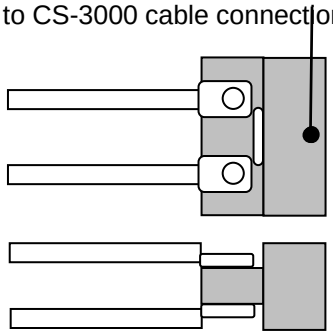
Top view



Side view



CS-1000 to CS-3000 cable connections



Maintenance and Service:

Other than occasional cleaning with a mild detergent solution, no maintenance is required. The CS-Series contain no user serviceable parts. If repair is required, return to the manufacturer.

Calibration:

Periodic re-calibration through full rated current is recommended. Compare with a calibrated resistance standard using a current comparator bridge and range extender. Allow sufficient time (>15 minutes up to 50 % current, >30 minutes from 50-100 % current) for the shunt temperature to stabilize.

Warrantee:

The CS-series current shunts are warranted against defects in manufacture for two years from the date of shipment. For complete warrantee terms, please see our website.

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Specifications:

Model	Rated Amps	Full Output	Resistance	Accuracy*	Case
CS-0.1	0.1	1 V	10 Ω	0.005 %	CS 10
CS-1	1	1	1	0.005 %	CS 10
CS-5	5	1	0.2	0.01 %	CS 10
CS-10	10	1	0.1	0.01 %	CS 10
CS-20	20	1	0.05	0.01 %	CS 50
CS-50	50	0.5	0.01	0.01 %	CS 50
CS-100	100	0.1	0.001	0.01 %	CS 300
CS-200	200	0.2	0.001	0.02 %	CS 300
CS-300	300	30 mV	100 μΩ	0.025 %	CS 300
Typical temperature coefficient of resistance (TCR) for CS-0.1 through CS-200: <5 ppm / °C					
CS-500	500	100 mV	200 μΩ	0.02 %	Open element
CS-1000	1000	100 mV	100 μΩ	0.025 %	
CS-1500	1500	60 mV	400 μΩ	0.04 %	
CS-2000	2000	40 mV	20 μΩ	0.04 %	
CS-3000	3000	30 mV	10 μΩ	0.04 %	
Typical temperature coefficient of resistance (TCR) for CS-500 through CS-3000: <25 ppm / °C					

Case	Dimensions cm (inch)	Weight kg (pounds)
CS 10	13 x 16.5 x 6 cm (5 x 6.5 x 2.25 in)	1 kg (2 lbs)
CS 50	15 x 25 x 5 cm (6 x 9.875 x 2 in)	2 kg (4 lbs)
CS 300	30.5 x 25 x 7.5 (12 x 9.875 x 3 in)	3 kg (6 lbs)
CS-500	60 x 10 x 13 (24 x 4 x 5 in)	7 kg (14 lbs)
CS-1000	70 x 13 x 13 (28 x 5 x 5 in)	17 kg (36 lbs)
CS-1500	48 x 13 x 13 (19 x 5 x 5 in)	15 kg (32 lbs)
CS-2000	48 x 18 x 13 (19 x 7 x 5 in)	22 kg (48 lbs)
CS-3000	38 x 18 x 13 (15 x 7 x 5 in)	20 kg (45 lbs)

* Stated accuracy is at time of manufacture.
Special ranges and values are available upon request.
Optional temperature sensor can be installed at time of manufacture.