

# RESISTOR METAL ELEMENT SHUNTS RCS SERIES



## KEY FEATURES

- Base Mounted Shunts. (Non-Base Mounted Available)
- Manganin Resistive Element
- Current Rating 5 to 1200 Amps
- Rated Output 500mV, 100mV, or Custom
- DC Current Shunts - Sizes 2013, 3318
- DC Ammeter Shunts - Size 6013

## APPLICATIONS

- |                    |                        |
|--------------------|------------------------|
| • Electroplating   | • Solar Generators     |
| • Heavy Industry   | • Wind Power           |
| • Battery Chargers | • Mining               |
| • Power Converters | • Current Measurements |

## PRODUCT SUMMARY

SIZE CODES	RATED CURRENT (A)	OPERATING CURRENT (A)	POWER RATING (W)	RESISTANCE (mΩ) 50mV Output	RESISTANCE (mΩ) 100mV Output	VOLTAGE TOLERANCE	OPERATING TEMPERATURE
21	5 - 150	3.33 - 100	0.25 - 10	0.3333 - 10.00	0.6667 - 20.00	± 0.25% Standard	-40 °C to + 60°C
32	170 - 600	113 - 400	10 - 50	.0833 - .2941	0.1667 - 0.5882	±0.1% Available	
61	1 - 500	0.667 - 333.33	.25 - 40	0.10 - 50	0.20 - 100	±0.1% Standard	30°C + 70°C

## HOW TO ORDER

RCS	21	B	005	C	050	Z
SERIES	SIZE CODE	BASE OR NO BASE	CURRENT RATING (AMP)	TOLERANCE	VOLTAGE OUTPUT	PACKAGING
RCS = Resistor Metal Element Shunts	21 = 2013 32 = 3318 61 = 6013	B = Base N = No Base (not available on size code 61)	005 = 5 amps 010 = 10 amps 015 = 15 amps 100 = 100 amps See Table.	B = ±0.1% C = ±0.25%	050 = 50mV 100 = 100mV	Z = Special

Example P/N: RCS21B005C050Z is Resistor Metal Element Shunts, size 2013, with base, 5 Amps, ±0.25% tolerance, 50mV, special packaging

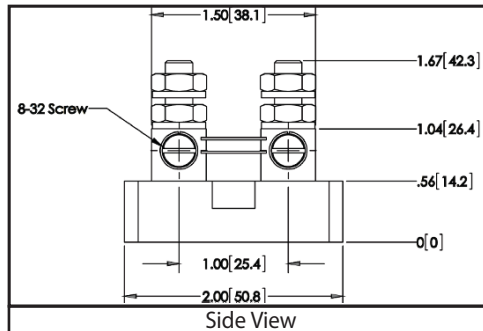
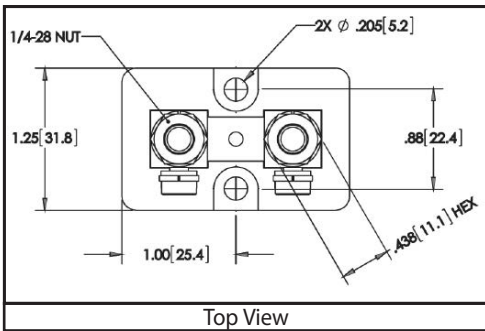


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### SIZE 2013 - DC CURRENT SHUNTS

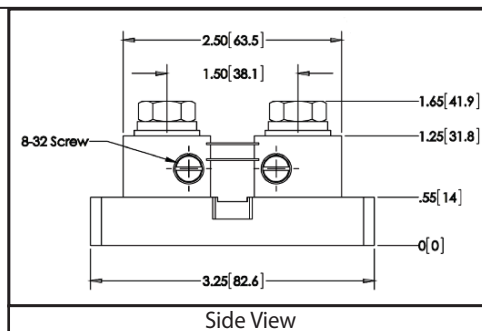
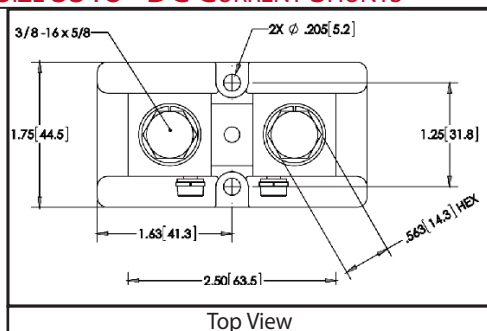


Fastener Torque = 3-3 33 ft-lbs  
(4.1-4.5 Nm)

Weight = 0.1 Kg

	Rated Current (A)	Operating Current (A)	Resistance (mΩ)		Power (W)	
			At 50mV Output	At 100mV Output	At 50mV Output	At 100mV Output
RCS21 at 5 Amps	5	3.33	10.00	20.00	0.25	0.5
RCS21 at 10 Amps	10	6.67	5.00	10.00	0.5	1
RCS21 at 15 Amps	15	10	3.333	6.667	0.75	1.5
RCS21 at 20 Amps	20	13.3	2.500	5.000	1	2
RCS21 at 30 Amps	30	20	1.667	3.333	1.5	3
RCS21 at 50 Amps	50	33.3	1.000	2.000	2.5	5
RCS21 at 75 Amps	75	50	0.667	1.333	3.75	7.5
RCS21 at 80 Amps	80	53.3	0.625	1.250	4	8
RCS21 at 85 Amps	85	56.7	0.588	1.176	4.25	8.5
RCS21 at 100 Amps	100	66.7	0.500	1.000	5	10
RCS21 at 150 Amps	150	100	0.333	0.6667	7.5	15

### SIZE 3318 - DC CURRENT SHUNTS



Fastener Torque = 3-3 33 ft-lbs  
(4.1-4.5 Nm)

Weight = 0.1 Kg

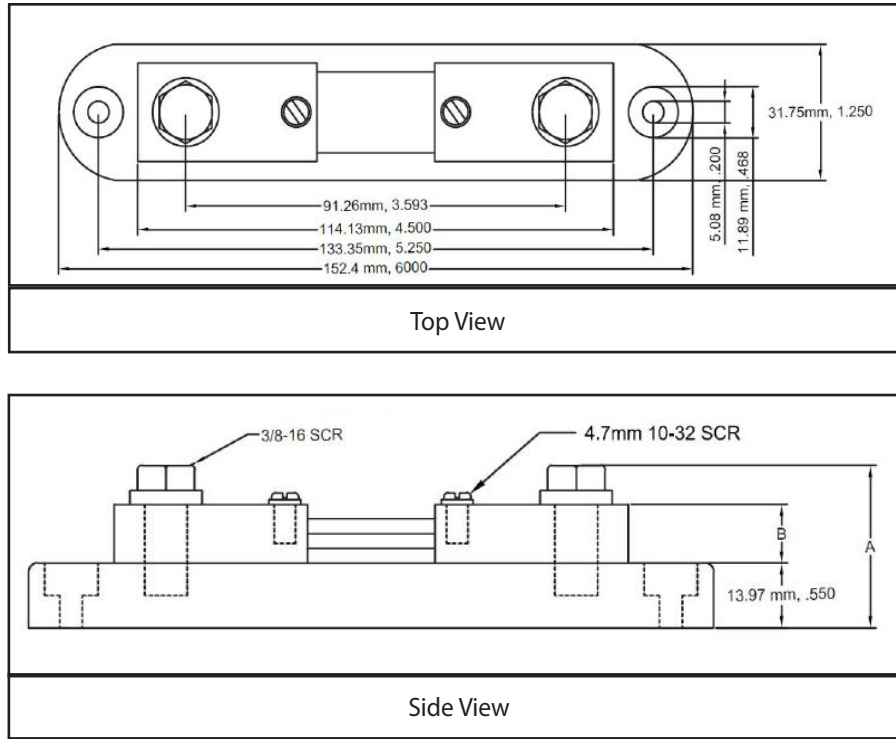
Part Number	Rated Current (A)	Operating Current (A)	Resistance (mΩ)		Power (W)	
			At 50mV Output	At 100mV Output	At 50mV Output	At 100mV Output
RCS32 at 170 Amps	170	113	0.2941	0.5882	8.5	17
RCS32 at 200 Amps	200	133	0.2500	0.5000	10	20
RCS32 at 250 Amps	250	166	0.2000	0.4000	12.5	25
RCS32 at 300 Amps	300	200	0.1667	0.3333	15	30
RCS32 at 400 Amps	400	267	0.1250	0.2500	20	40
RCS32 at 450 Amps	450	300	0.1111	.2222	22.5	45
RCS32 at 500 Amps	500	333	0.1000	0.2000	25	50
RCS32 at 600 Amps	600	400	0.0833	0.1667	30	60



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### SIZE 6013 - DC AMMETER SHUNTS



Note: No base not available on Size 6013

Part Number	Rated Current (A)	Operating Current (A)	Resistance (mΩ)		Power (W)	
			At 50mV Output	At 100mV Output	At 50mV Output	At 100mV Output
RCS61B001B	1	.667	50	100	.05	0.1
RCS61B002B	2	1.33	25	50	.2	.4
RCS61B005B	5	3.33	10	20	.25	.5
RCS61B010B	10	6.67	5.0	10	.5	1
RCS61B020B	20	13.33	2.5	5.0	1	2
RCS61B050B	50	33.33	1.0	2.0	2.5	5
RCS61B100B	100	66.67	0.5	1.0	5	10
RCS61B150B	150	100	0.333	0.667	7.5	15
RCS61B200B	200	133.33	0.25	0.50	10	20
RCS61B250B	250	166.67	0.20	0.40	12.5	25
RCS61B300B	300	200	0.167	0.333	15	30
RCS61B400B	400	266.67	0.125	0.25	20	40
RCS61B500B	500	333.33	0.10	0.20	25	50

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### TECHNICAL NOTES

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#### Mounting:

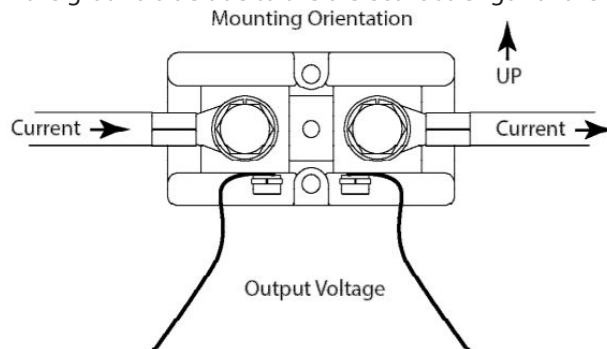
Shunts should be mounted with manganin resistive blades in a vertical position in order to promote the free convective flow of air. If vertical mounting is not practical, forced air cooling or adding heat sinks to the blocks can reduce the operating temperature. The manganin blades must never exceed +145°C, otherwise permanent resistance change may occur.

When current of 100A or greater is passing through the shunt, the major portion of heat generated is dissipated by conduction through the shunt terminal blocks into the connecting buss bar or cable. Therefore, it is necessary to insure that good contact is made between the shunt terminal blocks and the conductor terminals and that the conductors have adequate cross section to keep the temperature of the shunt from exceeding 145°C (125°C recommended).

If the shunt is mounted in an enclosure, care must be taken to ensure adequate cooling. If the power density is greater than 1/4 watt per square inch of the enclosure surface for all enclosed devices, additional cooling must be supplied in the form of air vents or fans.

Shunts also must be installed in a way that protects them from thermal expansion forces produced from buss bar or short-circuit forces. Flexible wiring may be required in high pulse current, high vibration, or high temperature applications.

Where possible, all shunts should be mounted on the ground side of the circuit. For circuits above 750VDC, RS shunts must be mounted on the ground side due to the dielectric strength of the shunt base.



#### Operating Current Derating:

For continuous operation, it is recommended that shunts are not run at more than two thirds (2/3) the rated current under normal conditions per IEEE standards for DC instrument shunts. At ambient temperatures above 40°C, the current must be further derated to prevent damage.

#### Pulse Operation:

Shunts that do not need continuous operation and are only exposed to intermittent pulses can be operated at levels above their rated current for short periods of times. Pulses are limited to the maximum temperature of the blades not exceeding 145°C (125°C recommended). Many variables such as ambient temperature, cross section of the current carrying conductors, and pulse duration make calculating exact values difficult. Shunt size will need to be validated by customer for pulse current and duty cycle on a case by case basis.

This datasheet is subject to change without notice.

