

RCTrms rated current, output and overloads

Rated Current

The rated current for a given model of RCTrms is selectable by a dual range switch.

For example the RCTrms/6 has a rated current of either

x1 range	5,000 Arms
x2 range	10,000 Arms

Rated Output

For a given rated current the rated output of the RCTrms is either

4 to 20mA	4.0mA representing 0A 20.0mA representing rated current
0 to 5Vdc	5Vdc representing rated current

The type of output is specified at purchase.

Output limit

The output limit for the RCTrms is 150% x the rated current – the transducer will be able to operate on a continuous basis at this output.

Peak di/dt (rate of change of current) rating

This is the maximum di/dt above which the transducer will fail to correctly measure the current. The values for the RCTrms are listed below

Type	Range	Rated current (A)	Peak di/dt (kA/μs)
RCTrms / 2 RCTrms / 3 RCTrms / 4 RCTrms / 5	either range	From 250A to 5000A	0.8
RCTrms / 6	either range	From 5kA to 10kA	1.6
RCTrms / 7	either range	From 10kA to 20kA	3.2
RCTrms / 8	either range	From 25kA to 50kA	8.0

Absolute maximum (peak) di/dt – 10.0kA/μs

The transducer can be damaged by excessive di/dt due to the voltage generated in the coil.

The absolute maximum peak di/dt rating for all RCTrms transducers is 10.0kA/μs which must not be exceeded.

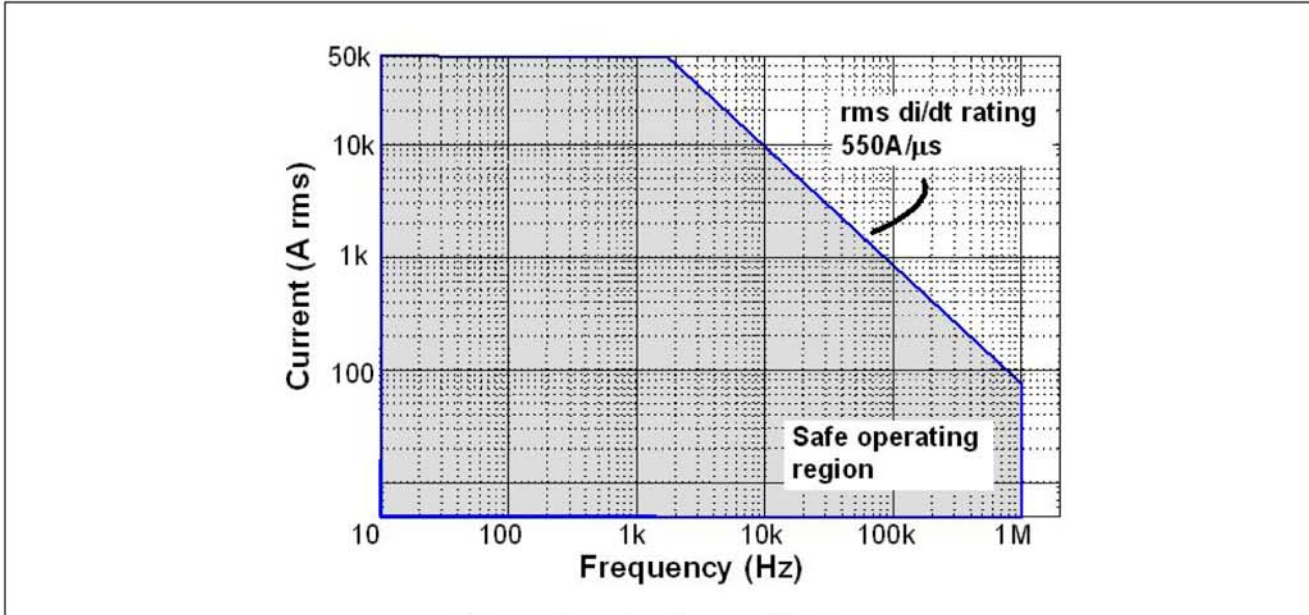
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Absolute maximum (rms) di/dt – 0.55kA/μs

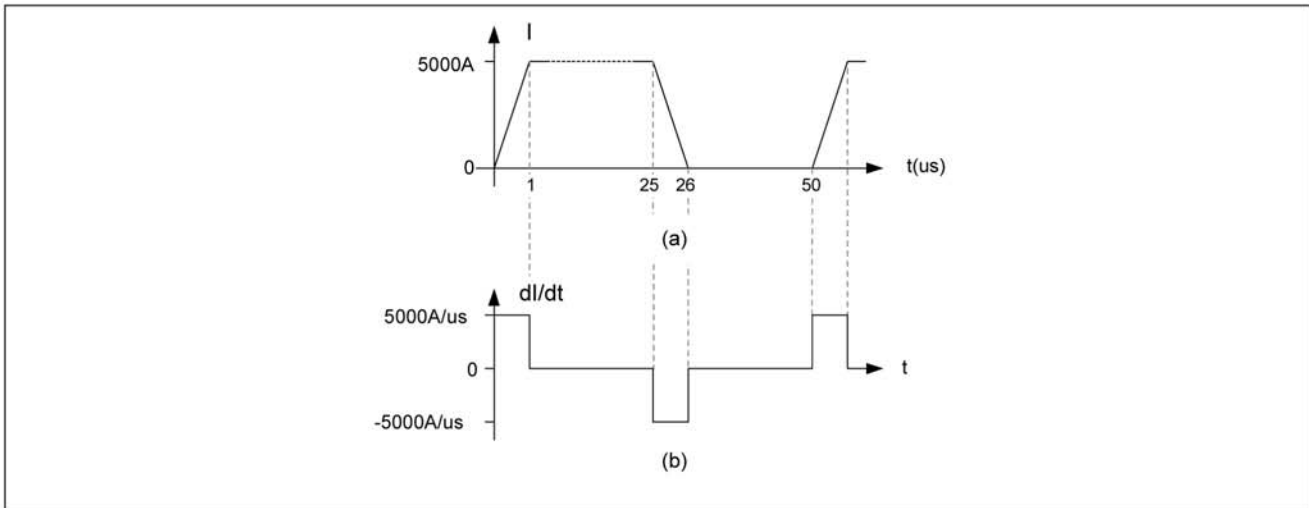
The RCTrms can also be damaged by sufficiently high repetitive di/dt even though the peak di/dt rating is not exceeded. A damping resistor is used to provide correct termination of the Rogowski coil and cable to prevent reflections (seen as high frequency damped oscillations) appearing on the measured waveform. A high repetitive di/dt will cause excessive power to be dissipated in this resistor.

For sinusoidal waveforms provided your current/frequency product is in the safe operating region outlined below the RCTrms will not be damaged.



Safe operating region given rms di/dt ratings

For pulsed waveforms an example of how to calculate the di/dt rms is shown below,



Consider the current waveform shown in Figure (a) with a repetition frequency of 20kHz. Figure (b) shows the corresponding di/dt waveform. The rms di/dt is given by $5000 \text{ A}/\mu\text{s} \times (1\mu\text{s}/25\mu\text{s})^{0.5} = 1 \text{ kA}/\mu\text{s rms}$.

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