

Radio Frequency Current Transducers Rogowski Coil Type Type RC/R/xx/0.1

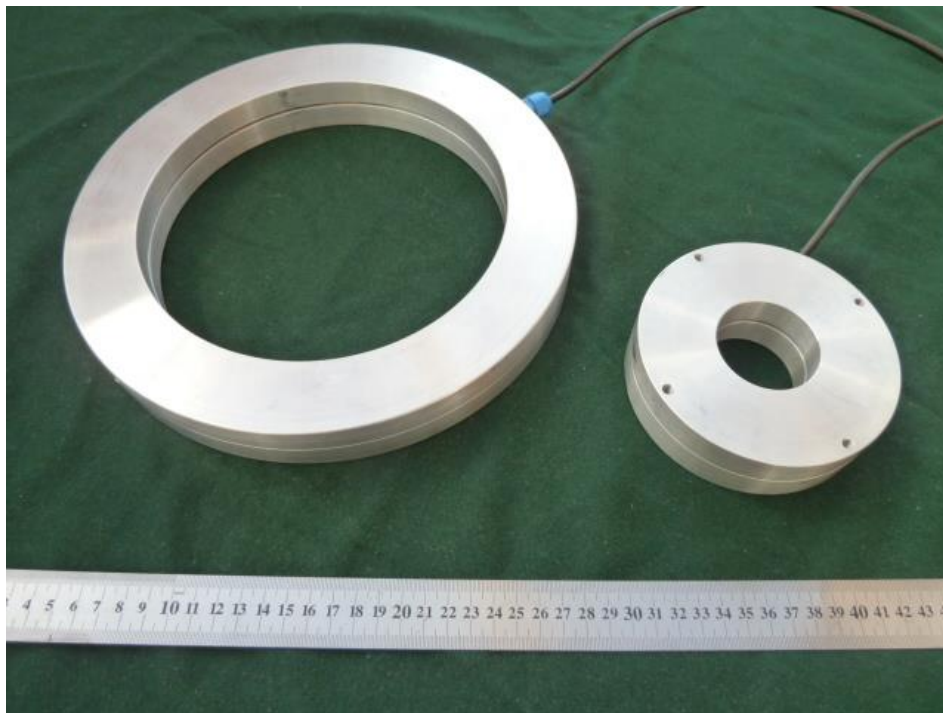
A number of designs of radio frequency current transducers based on the Rogowski Coil principle are available. These are primarily designed for use in measuring high frequency current pulses such as those generated by electrical discharge processes. As the transducers are based on an air cored principle, they are not subject to the usual limitations of saturation and non-linearity of the wide band small gap ferrite current transformers. Thus they can be used to measure rf current signals and reject low frequency currents when installed on the terminals of electrical plant, cables and bus bar carrying large power frequency currents.

Although it is referred to as a Rogowski Coil because it has been designed to be self integrating, it gives an output proportional to the current rather than the rate of change. The output signal is a voltage waveform representing the current waveform being measured subject to the specified bandwidth limits of the transducer. This signal is completely floating relative to casing of the transducer and gives the specified sensitivity when connected to a 50Ω measuring instrument.

The devices are assembled in an aluminium cases which should be earthed to the plant at the point of installation. It is the installers responsibility to provide the insulation necessary for the operating voltage of the system on which it is installed. In many applications it is possible to install the transducers in terminal boxes of the plant under test. Then the insulation on the cable ends can be used to provide this insulation, the transducer being installed symmetrically around the cable with a small clearance to the cable outer surface. so not to affect the creepage distances.

For application where there is a risk of explosive atmospheres being present ATEX versions of the transducers are available These are now certified to the Ex ic standard . –see note

The standard transducers are made available in six sizes with 200mm, 160mm, 120mm 100mm, 70mm and 50mm diameter aperatures.



Rogowski Coil RF Current Transducers

Specification		RC/R/(diameter cm)/(sensitivity V/A)					
<i>Primary Parameters</i>		R/05/0.1	R/07/0.1	R/10/0.1	R/12/0.1	R/16/0.1	R/20/0.1
Sensitivity	S	0.1V/A	0.1 V/A	0.1 V/A	0.1V/A	0.1 V/A	0.09V/A
Terminating Impedance	Z	50Ω	50Ω	50Ω	50Ω	50Ω	50Ω
Low Frequency limit	ω_{lf}	100kHz	100kHz	100kHz	100kHz	100kHz	100kHz
High Frequency	ω_{hf}	180MHz	150MHz	150MHz	160MHz	160MHz	100MHz

<i>Other Parameters</i>							
Droop rate	τ_d	>1.5μs	>1.5μs	1.5μs	1.5μs	1.5μs	1.5μs
Rise time	τ_r	<3ns	<3ns	<3ns	<3ns	<3ns	<3ns
Transfer Impedance	Z_t	100mΩ	100mΩ	100mΩ	100mΩ	100mΩ	90mΩ
Maximum continuous rf current rms (Thermal Limit)	I_{max}	40A	40A	40A	40A	40A	40A
Total pulse current of one polarity		500μAs (500 x 10 ⁶ pc)	500μAs (500 x 10 ⁶ pc)	500μAs (500 x 10 ⁶ pc)	500μAs (500 x 10 ⁶ pc)	500μAs (500 x 10 ⁶ pc)	500μAs (500 x 10 ⁶ pc)

<i>Performance in the presence of mains currents</i>							
Rejection to 50Hz		96db	96db	97db	96db	97db	96db
Max. current at 50Hz for linear operation		4,800A	8,000A	10,000A	11,000A	12,000A	15,000A

<i>Intrinsic Safety</i>							
Maximum Current Power frequency current to meet Ex requirements See note 1		2000A	2500A	4000A	5500A	5900A	8000A

<i>Dimensions</i>							
Hole		50mm	70mm	100mm	120mm	160mm	200mm
Outer Diameter		126mm*	146mm	176mm	196mm	236mm	276mm
Thickness		36	36mm	36mm	36mm	36mm	36mm
Weight (less cable)		0.4kg	0.6kg	0.9kg	1.1kg	1.3kg	2kg
Standard Cable length		3m	3m	3m	3m	3m	3m
Fixing 4 holes equally spaced on		116mm\$ dia	136mm dia.	166mm dia	186mm dia	226mm dia	266mm dia

Note 1 The transducer is certified for Ex ic
Initially it was certified for the requirement for Ex nL This standard has now been withdrawn and replaced by Ex ic
The design meets the requirement as **Simple Electrical Apparatus and Components** (BS 5345 Part 4 1977) it that will not generate more than 1.2V, 0.1A 25mW or store 20μJ. for the specified rated current so it can be used without certification. However certification to Ex ic has been provided for customers who require documentation

*Increased to 130mm

\$Increased to 122mm