

## New Stress-Free Ultra Stable Flagship Primary Standard Resistor

### FEATURES

- Utilizing New Generation Stress Free Bulk Metal® Foil technology
- Extreme stability: 0.2 ppm/yr (0.05 ppm/yr typical)
- Temperature coefficient: less than  $\alpha_{23} \pm 0.05$  ppm/°C,  $\beta \pm 0.005$  ppm/°C<sup>2</sup> at 23 °C  $\pm 5$  °C
- Excellent humidity coefficient of resistance less than 0.1 ppm/% RH
- Excellent pressure coefficient of resistance less than 0.001 ppm/hPa
- Available wide range of resistance values at 1  $\Omega$ , 10  $\Omega$ , 25  $\Omega$ , 100  $\Omega$ , 1 k $\Omega$ , 10 k $\Omega$

### MASS

Approx. 1.4 kg (3.1 lbs)

### DESCRIPTION

The HRU series is an ultra stable flagship primary standard resistor which is an enhanced version of the USR/ASR/CSR series through the use of Bulk Metal® Foil technology.

Our HRU Series features an ultra-stable resistive element due to our new generation of stress-free Bulk Metal® Foil technology and our proprietary nickel chrome alloy. The resistor is also encapsulated in a specially designed ceramic case, which protects the element against humidity and oxidation. These features deliver an impressive long-term performance of less than 0.2 ppm/year (0.05 ppm/year typical) and an extremely low temperature coefficient of  $\alpha_{23} \pm 0.05$  ppm/°C,  $\beta \pm 0.005$  ppm/°C<sup>2</sup>. This performance is unique to Alpha Electronics throughout the world.

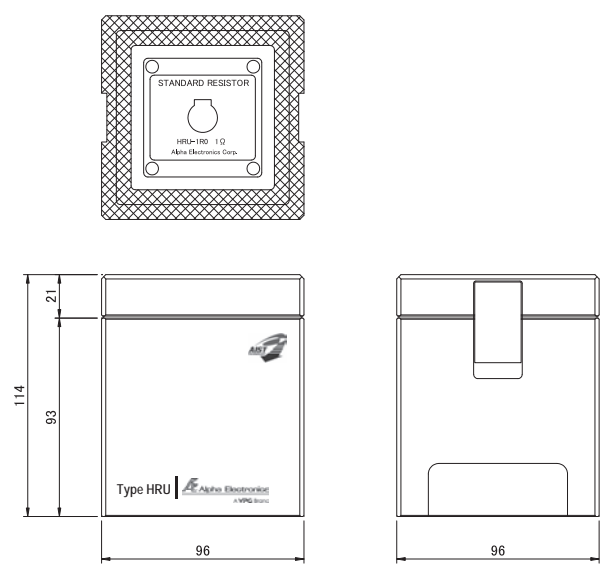
Alpha's Bulk Metal® Foil construction provides excellent AC characteristics—superior to performance of conventional wirewound standard resistors.

The resistive elements are held by special designed case so, it's suitable for environment with vibration during transportation.



Incorporated the technology of  
The National Institute of  
Advanced Industrial Science and Technology  
(The Japanese patent application number 2010-114994)

### CONFIGURATION in millimeters



### SPECIFICATIONS

Series	Nominal Value	Accuracy	Uncertainty of Calibration	Temp. Coefficient	Temp. Retrace	Stability	Power Rating	Power Coefficient	Operating Temp. Range	Storage Temp. Range	Terminal
		ppm	ppm	ppm/°C	ppm	ppm/yr	W	ppm/power*	°C	°C	
HRU-1R0	1 $\Omega$	$\pm 1$	$\pm 1$ @ 23 °C	$\alpha_{23}$ $\pm 0.05$ ppm/°C $\beta \pm 0.005$ ppm/°C <sup>2</sup> @ 23 $\pm 5$ °C	$\pm 0.1$ @ 23 $\pm 5$ °C	$\pm 0.2$ ( $\pm 0.05$ actual)	1.0	0.5	15–30 <60 %RH	10–40	LEMO 1B Receptacle
HRU-100	10 $\Omega$										
HRU-250	25 $\Omega$										
HRU-101	100 $\Omega$										
HRU-102	1 k $\Omega$										
HRU-103	10 k $\Omega$										