

**VPG** Foil Resistors

VFR • ALPHA ELEC. • POWERTRON • APR

**Consistent Precision  
& Reliability**



**Alpha Electronics**  
A VPG Brand

# Standard Resistors and Decade Boxes

Product Overview

# Extremely Low TCR, Ultra Stable



From precise measurements on production floors, laboratories or for reference standards, VPG Foil Resistors' standard resistors and decade boxes are made for a broad range of applications. Our ultra precision Bulk Metal Foil® technology ensures high precision, excellent long-term stability, low TCR and offers accuracy and reliability over time even in harsh environments.

With decades of experience, Alpha Electronics consistently delivers unmatched performance.

Newly developed ultra-stable standard resistors 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 ultra-stable resistive element is also encapsulated in a specially-designed ceramic case, which protects the element against humidity and oxidation.

These features deliver an impressive long term stability performance and an extremely low TCR.

Alpha Electronics' ultra stable standard resistors and decade boxes with a wide range of resistance values and a low TCR maintain their accuracy and can be configured to specific customer requirements for many different applications.

Product	Description	Resistance Range	Tightest Accuracy	TCR	Power Rating	Stability
	<b>HRU</b> New Stress-Free Ultra Stable Flagship Primary Standard Resistor	1 $\Omega$ to 10 k $\Omega$	$\pm 1$ ppm	$\alpha 23 \pm 0.05$ ppm/ $^{\circ}\text{C}$ $\beta \pm 0.005$ ppm/ $^{\circ}\text{C}^2$	1.0 W	$\pm 0.2$ ppm/yr ( $\pm 0.05$ ppm/yr actual)
	<b>USR-SF</b> New Stress-Free Ultra Stable Primary Standard Resistor	1 $\Omega$ to 10 k $\Omega$	$\pm 2$ ppm	$\pm 0.05$ ppm/ $^{\circ}\text{C}$ @ 23 $^{\circ}\text{C} \pm 5^{\circ}\text{C}$	1.0 W	$\pm 0.5$ ppm/yr ( $\pm 0.2$ ppm/yr actual)
	<b>ASR</b> Primary Standard Resistor	1 $\Omega$ to 10 M $\Omega$	$\pm 5$ ppm	$\pm 0.2$ ppm/ $^{\circ}\text{C}$ @ 0 to 23 $^{\circ}\text{C}$ , 23 $^{\circ}\text{C}$ to 50 $^{\circ}\text{C}$	0.5 W	$\pm 3$ ppm/yr
	<b>CSR</b> Working Standard Resistor	1 m $\Omega$ to 100 M $\Omega$	$\pm 5$ ppm	$\pm 1$ ppm/ $^{\circ}\text{C}$	0.5 W	$\pm 5$ ppm/yr
	<b>LSR</b> High Power Standard Resistor	1 m $\Omega$ to 100 m $\Omega$	$\pm 25$ ppm	$\pm 2.5$ ppm/ $^{\circ}\text{C}$	4.0 W	$\pm 10$ ppm/yr
	<b>ATV</b> I/V Converter	1 $\Omega$ to 100 k $\Omega$	$\pm 0.1\%$	$\pm 2.5$ ppm/ $^{\circ}\text{C}$	0.25 W	$\pm 50$ ppm/yr
	<b>ADR-3204GR</b> Precision Programmable Resistance Box (RTD Simulator)	5 $\Omega$ to 199.9999 k $\Omega$	$\pm (0.01\% + 2$ m $\Omega$ )	$\pm 5$ ppm/ $^{\circ}\text{C}$	0.5 W	$\pm 50$ ppm/yr
	<b>ADR</b> 6-Dial Decade Resistance Box (RTD Simulator)	0.1 $\Omega$ to 111.111 M $\Omega$	$\pm (0.005\% + 2$ m $\Omega$ )	$\pm 5$ ppm/ $^{\circ}\text{C}$	0.5 W	$\pm 50$ ppm/yr
	<b>ADR-1000</b> 1-Dial RTD Simulator	1 $\Omega$ to 1 M $\Omega$	$\pm 0.02\%$	$\pm 2.5$ ppm/ $^{\circ}\text{C}$	0.3 W	$\pm 50$ ppm/yr
	<b>ATS</b> Resistance Transfer Standard	1 $\Omega$ to 100 M $\Omega$	$\pm 5$ ppm	$\pm 1$ ppm/ $^{\circ}\text{C}$	0.01 W/ element	$\pm 10$ ppm/yr



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