PRECISION MEASURING INSTRUMENTS

YOKOGAWA

Bulletin 2700-E

SELECTOR GUIDE FOR PRECISION MEASUREING INSTURUMENTS

Classification	Model Number	Measuring Range (Accuracy)	Page
Galvanometer	2707	0.1 / 1 / 10 / 100μV	3
	2708		
Wheatstone bridge	2768	0.1 / 1 / 10 / 100mΩ / 1 / 10 / 100Ω / 1 / 10 / 100kΩ / 1 / 10 / 100MΩ — (±0.01 to ±0.05%)	4
	2755	(±0.1 to ±0.6%)	5
Double bridge	2752	(±0.3%)	6
	2769		5
Standard resistor	2792A		7
Variable resistor	279301	(±0.01%)	9
	279303	(±0.05%)	
	278610	(±0.05 to ±2%)	10
	278620	(±0.05 to ±0.5%)	

2793
Decade Resistance Boxes

279301
110 x 491 x 140 mm 4.8 kg
(4-3/8 x 19-3/8 x 5-1/2" 10.6lbs)

Model 2793 is a high-accuracy, stable DC variable resistor with 6 dials and is available in two styles: 279301 for medium resistance from 0.1 to 1,111.210Ω in 1mΩ steps (best suited for calibration of resistance thermometers or bridges); 279303 for high resistance from 0 to 111.1110 MΩ in 100Ω steps (suitable for calibration of insulation resistance testers or bridges).

279301

- **High accuracy and stability**
- **High reproducibility**
  Excellent reproducibility is obtainable because dial switches with low contact resistance are used. For example, changes in contact resistance is within ±1.1mΩ at 0.1Ω setting.
- **1mΩ resolution**
- **Simple, quick dial operation**
- **In-line display for easy reading**
- **Ideal for calibration of resistance thermometers and bridges**
  Due to its high accuracy and a dial system, various types of resistance thermometers and bridges can be calibrated accurately and promptly.
- **Excellent anti-shock and -vibration properties**

279303

- **Up to 100MΩ in 100Ω step**
- **Low voltage coefficient**
  Variation of the resistance value is less than ±0.1% at 1MΩ and 10MΩ steps against 100V application, and less than ±0.04% at 100Ω, 1kΩ, 10kΩ, and 100kΩ steps against 10V application.
- **Shock- and vibration-proof construction**
- **Easy-to-read in-line indication**
- **Best suited for calibration of insulation resistance testers and bridges**

SPECIFICATIONS

279301

Resistance Range: 0.100 to 1,111.210 Ω (Minimum resistance is 0.100Ω).
Dial Composition: 0.001Ω×10+0.01Ω×10+0.1Ω×11+1Ω ×10+10Ω×10+100Ω×10
Resolution: 0.001 Ω
Accuracy: ±(0.01% +2 mΩ) at temperature 23 ±2°C, humidity 45 to 75%, and 0.1 W power application
Max. Allowable Input Power: 0.25 W/step. Within 1W for overall instrument.
Max. Allowable Input Current:
50 mA (100 Ω steps), 150 mA (10 Ω steps), 500 mA (1 Ω steps), and 1.5 A (0.1 Ω steps).
Insulation Resistance: More than 500 MΩ at 500 V DC between panel and circuit.
Dielectric Strength: 1,000 V AC for one minute between panel and circuit.
Temperature Coefficient:

Dial / Temperature coefficient	100 Ω step	10 Ω step	1 Ω step	0.1 Ω step
α_{20} (x 10^{-6}/°C)	−5 to +10	−5 to +20	Approx. 20 to 90	Approx. 90 to 900
β (x 10^{-6}/°C^2)	−0.3 to −0.7		—	—

Variation of resistance with temperature change is given by the following equation:

$$Rt = R_{20}\ [\ 1 + \alpha_{20}(t-20) + \beta\ (t-20)^2\ ]$$

where, Rt : Resistance value at t°C
R_{20} : Resistance value at 20°C

279303

Resistance Range: 0 to 111.1110 MΩ.
Dial Composition: 100 Ω x 10 + 1 kΩ x 10 + 10 kΩ x 10 + 100 kΩ x 10 + 1 MΩ x 10 + 10 MΩ x 10.
Accuracy: 100 Ω, 1 kΩ, 10 kΩ and 100 kΩ steps . . . ±(0.05% + 0.05 Ω)
1 MΩ and 10 MΩ steps . . . ±0.2%
(At temperature 23 ±2°C, humidity below 75%, including residual resistance of approx. 0.05Ω).
Max. Allowable Input:
100 Ω step . . . . . 100 mA
1 kΩ step . . . . . 30 mA
10 kΩ step . . . . . 10 mA
100 kΩ step . . . . . 3 mA (100 to 600 kΩ)
2,000 V (700 kΩ to 1 MΩ)
1 MΩ step . . . . . 2,000 V
10 MΩ step . . . . . 2,000 V
Temperature Coefficient:
100 Ω, 1 kΩ step . . . . . α_{20} = (−2 to +20) x 10^{-6}/°C
β = −(0.3 to 0.7) x 10^{-6}/°C^2
10 kΩ, 100 kΩ, 1 MΩ, 10 MΩ step ±30 x 10^{-6}/°C
Variation of resistance with temperature change is given by the following equation:

$$Rt = R_{20}\ [\ 1 + \alpha_{20}(t-20) + \beta\ (t-20)^2\ ]$$

where, Rt : Resistance value at t°C
R_{20} : Resistance value at 20°C
Insulation Resistance: More than 10^{11} Ω at 1,000 V DC between panel and circuit.
Dielectric Strength: 2,500 V AC for one minute between panel and circuit.