

Four-cell Electronic DC Voltage Reference Standard

- ◆ *Four Independent 10V Reference Outputs*
- ◆ *10V Average Output with 1.4 ppm/year Stability*
- ◆ *1V and 1.018V Outputs with 5 ppm/year Stability*
- ◆ *Temperature Coefficient of Better Than 0.05 ppm/°C*
- ◆ *Separate Buffered 10V Output*
- ◆ *7-day Internal Battery Backup for Transportation*

The Model 4910 Electronic DC Voltage Reference Standard features four independent 10V reference 'cells' — allowing direct inter-comparison between their outputs so that statistical methods can be used to verify the unit's performance without the need for higher accuracy metrology standards. The four cells can also be linked to produce a separate 10V AVERAGE output with significantly improved short-term noise performance.

In addition to being directly available on front-panel terminals, the 10V average output is connected to a buffer amplifier which provides the current (up to 15mA) required to drive Kelvin-Varley type dividers.

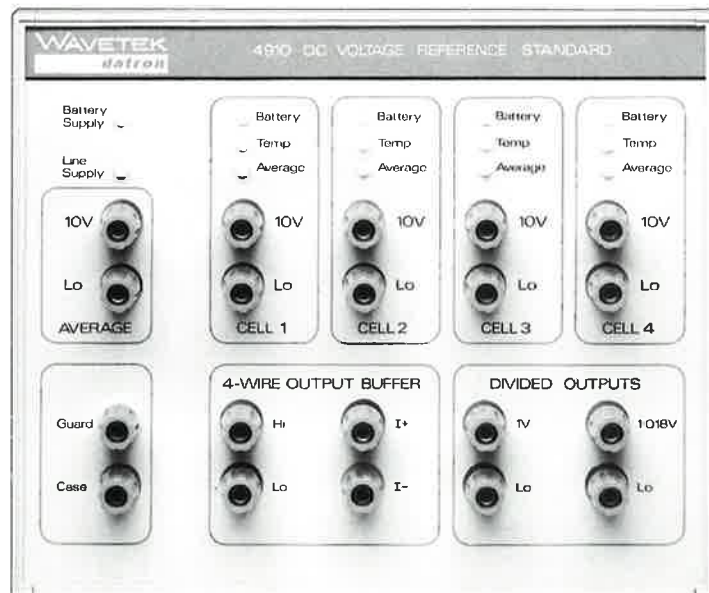
For users who require accurate and stable 1.000V or 1.018V levels, these outputs are generated by an internal voltage divider. Voltages greater than 10V can be obtained by connecting

individual cells in series to obtain precision 20V, 30V or even 40V outputs.

The Model 4910 uses a unique pulse-width-modulation (PWM) technique to scale each cell's zener reference voltage to the 10V level, thereby eliminating the drift problems associated with gain defining resistors. An additional advantage of this PWM technique is that it allows the output voltage to be 'digitally' adjusted, using hexadecimally encoded rotary switches, to a setting resolution of better than 0.1ppm.

Adjusting each 10V output to a nominal value, or deliberately introducing offsets to perform calibration lab audits becomes a quick and simple operation.

For ease of transportation between laboratories, the Model 4910 also features 7-day battery backup with automatic battery recharging whenever the unit is reconnected to an AC line supply.



Specifications

Reference Outputs					
	10V AVERAGE	10V CELL	10V 4-WIRE BUFFER	1.018V	1V
Stability ($\pm 1^\circ\text{C}$)					
30 days	0.3 ppm	0.3 ppm	0.3 ppm	0.7 ppm	0.7 ppm
90 days	0.8 ppm	0.8 ppm	0.8 ppm	3.0 ppm	3.0 ppm
1 year	1.4 ppm	1.5 ppm	1.6 ppm	5.0 ppm	5.0 ppm
TC (0°C to 50°C)	0.05 ppm/°C	0.05 ppm/°C	0.06 ppm/°C	0.10 ppm/°C	0.12 ppm/°C
Noise (0.01Hz to 2Hz)	0.02 ppm rms	0.04 ppm rms	0.03 ppm rms	0.10 ppm rms	0.10 ppm rms
Output Resistance	100 Ω	100 Ω	<100 $\mu\Omega$	100 Ω	100 Ω
Current Drive	—	—	15 mA	—	—
Setting Resolution	—	< ± 0.1 ppm	—	< ± 0.2 ppm	< ± 0.2 ppm

General

Line Regulation

<0.01 ppm for all power supply conditions.

Output Protection

The outputs may be indefinitely shorted and will withstand 1100V transients (to 25mA). All terminals may be floated to 100V with respect to the instrument case.

Battery Backup

Battery Type: 15 x 6V/2Ahr sealed lead acid.

Battery Charging: from discharged to fully charged in 48 hours.

Transit Mode Backup: 168 hours (7 days) at an ambient temperature of 25°C, falling to 100 hours (4 days) at an ambient temperature of 0°C.

Operating Mode Backup: 10 hours at an ambient temperature of 25°C.

AC Power Input

AC Line Voltage: 100V, 120V, 220V, 240V $\pm 10\%$, 47Hz to 63Hz.

Power Consumption: <40 VA

DC Power Input

10V to 40V DC

Environment

Operating Temperature: 0°C to +40°C

Storage Temperature: -40°C to +50°C

Dimensions

Height: 177mm (7 inches)

Width: 214mm (8.5 inches)

Depth: 591mm (23.3 inches)

Weight

20kg (44 lbs)

Safety

Designed to UL1244, IEC348, BS4743

Warranty

1 year

Ordering Information

Model 4910: DC Voltage Reference Standard

Option 10: Calibration and 'Hot' Shipment

Option 30: 1.018V set to requested level. (Only available with Option 10)

Option 40: Ruggedized Transit Case

Option 50: Soft Carrying Case and Terminal Protection Cover

Worldwide Sales Offices

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