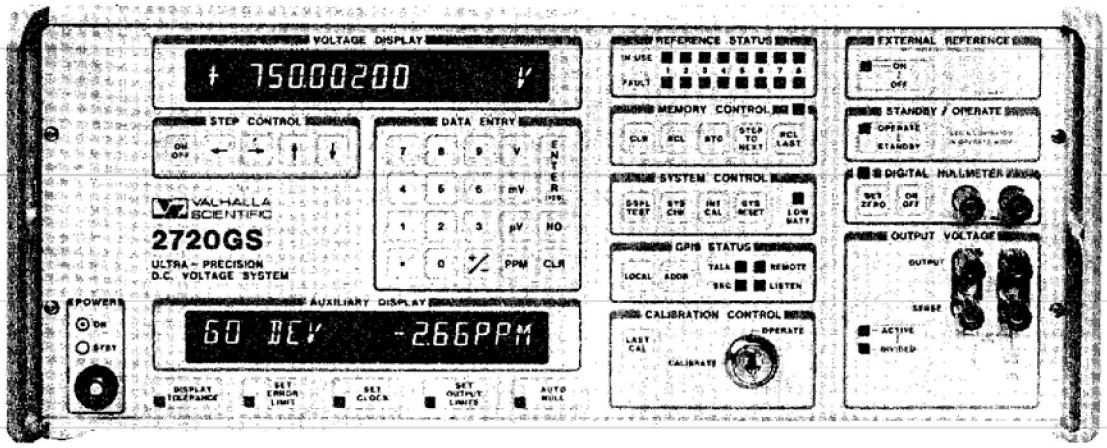
2720GS Ultra-Precision Direct Voltage System

Calibrators, Standards & Systems



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U.S. Navy Accepted MECCA II Direct Voltage Standard

The Valhalla 2720GS has been approved and fully accepted as the U.S. Navy MECCA II Direct Voltage Standard. In 1987 Valhalla provided five first article 2720GS DC Systems to the U.S. Navy for compliance testing to MIL-T-28800C for EMI, RFI, accuracy, maintainability and 60 days of vibration failure analysis. Not only were all five units fully approved, but since 1987 Valhalla has shipped over 125 systems which the U.S. Navy accepted for the MECCA II program.

Valhalla's 2720GS- The Calibrator's Calibrator

The 2720GS delivers the performance required to calibrate the world's most accurate 7½ and 8½ digit DVM's yet does even more. It also contains an on-board autoranging digital nullmeter which permits the 2720GS to directly calibrate our competition's best DC voltage calibrators. With our built-in Auto Null™ function, one touch is all that is required for the 2720GS to achieve a null with the DC source being calibrated. In the Auto-Null™ mode the 2720GS auxiliary read-out simultaneously displays the error of the unit under test (UUT) out to 0.01 PPM as well as the UUT's pass/fail status.

The 2720GS offers the best accuracy of any DC calibrator on the market, but we didn't stop there; our demanding internal divider design has resulted in the lowest temperature coefficient of any DC Standard anywhere. So low in fact, that our 1.6ppm thirty day accuracy is specified for ±6°C from the calibration temperature.

Direct 2720GS Calibration Routine Reduces Traceability Uncertainty

The calibration of the 2720GS requires only one external instrument (a 1V/10V reference standard). This simplification of the calibration process and resulting reduction in traceability uncertainty is made possible through the use of the system's internal reference divider and on-board digital null detector. No other DC system offers this level of performance and support in one package.

To conquer drift against time, the 2720GS utilizes an internal real time clock and an ingenious on-board multi-reference monitoring system. The system's internal 30 bit A to D converter continually moniters each of the eight internal highly stabilized reference zeners. Each reference module contains its own non-volatile memory which stores calibration and drift rate data.

2720GS Configuration Guide

- Autoranging Digital Nullmeter
- 1 Touch Auto-Null™ Function
- IEEE-488 Interface
- Multi-reference Monitoring System
- Real Time Clock (12/24 hr)
- Dual Alpha-numeric Displays
- Step Control with Auto-Repeat
- Display Tolerance Function
- UUT Deviation
- Divided Output
- Local and Remote Sensing
- Vari-Safe™ Output Format
- Front-Panel Calibration Keylock
- 30 Day Internal Cal
- Covers-On External Cal
- Built-In 550 Step Memory Control System
- Bipolar Output 10nV to 1200V
- 30 Day Accuracy: 1.6 PPM
- 24 Hour Stability: 0.25 PPM
- Linearity: ±0.3 PPM
- Accuracy Valid ±6°C from Calibration Temperature
- 100mA Current Sourcing
- Resolution: 0.01 PPM
- Automatic Output Ranging
- Self-Diagnostics
- Front-Panel GPIB Address Selection and Display
- Selectable Current Limits
- GPIB Status Indicators
- UUT Error Limit
- UUT Calibration Status
- Display Test
- Time Since Last Cal
- Twin Microprocessors
- Optional Reference System Battery Back-up
- Optional External Reference Modules

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2720GS Abbreviated Specifications

Performance Characteristic Table

The accuracy specifications are valid for ± 6°C from the calibration temperature within 10 to 35°C. The values stated below include the effects of line, load and temperature variations within the above window and require the use of Internal Calibration every 30 days. To derive absolute accuracies relative to the National Bureau of Standards add 1.5ppm for Valhalla Scientific's traceability and transfer uncertainty.

2720GS	Accuracy (ppm of setting ± uV)				Settling Time		
Range	30day	90day	180day	1year	10ppm	5ppm	2ppm
650mV*	2.0 + 0.2	2.3 + 0.2	2.8 + 0.2	3.7 + 0.2	500mS	2 Sec.	10 Sec.
1300mV*	2.2 + 0.3	2.5 + 0.3	3.0 + 0.3	3.9 + 0.3	500mS	2 Sec.	10 Sec.
0.65V	2.0 + 0.3	2.3 + 0.3	2.8 + 0.3	3.7 + 0.3	500mS	2 Sec.	8 Sec.
1.3V	2.2 + 0.4	2.5 + 0.4	2.0 + 0.4	3.9 + 0.4	500mS	2 Sec.	8 Sec.
6.5V	1.4 + 1.2	1.7 + 1.2	2.2 + 1.2	3.0 + 1.2	300mS	1 Sec.	5 Sec.
13V	1.6 + 2.3	1.9 + 2.3	2.4 + 2.3	3.2 + 2.3	300mS	1 Sec.	5 Sec.
26V	2.1 + 5.0	2.4 + 5.0	2.9 + 5.0	3.7 + 5.0	600mS	3 Sec.	10 Sec.
13V	1.6 + 2.3	1.9 + 2.3	2.4 + 2.3	3.2 + 2.3	600mS	3 Sec.	10 Sec.
65V	2.2 + 15	2.5 + 15	3.0 + 15	3.9 + 15	600mS	3 Sec.	10 Sec.
130V	2.4 + 30	2.7 + 30	3.2 + 30	4.1 + 30	600mS	3 Sec.	10 Sec.
600V	2.4 + 150	2.7 + 150	3.2 + 150	4.1 + 150	800mS	3 Sec.	10 Sec.
1200V	2.7 + 300	3.0 + 300	3.5 + 300	4.4 + 300	800mS	3 Sec.	10 Sec.

*Divided output (Zo = 450ohm)

For range and/or polarity change, add 1 second.

Digital Nullmeter/Measurement Performance Table

The measurement accuracy is the overall 90 day ± 6°C specification of a 2720GS when used to measure an unknown voltage using "AUTO NULL" with the division ratio entered as 0.5 (see 4.1). The Linearity of the 2720GS is defined as the maximum allowable deviation from a straight line between the zero and full-scale outputs on each range.

Range	Resolution	Measurement Accuracy	Maximum Current	Wideband Noise 10Hz-10KHz	Linearity
650mV	10nV	2.9ppm + 0.3uV	—	10uV RMS	0.14uV
1300mV	10nV	3.1ppm + 0.4uV	—	10uV RMS	0.26uV
0.65V	10nV	2.9ppm + 0.4uV	100mA	30uV RMS	.22uV
1.3V	10nV	3.1ppm + 0.5uV	100mA	30uV RMS	0.32uV
6.5V	10nV	2.0ppm + 1.3uV	100mA	30uV RMS	0.9uV
13V	100nV	2.2ppm + 2.4uV	100mA	30uV RMS	1.8uV
26V	100nV	2.7ppm + 5.1uV	100mA	50uV RMS	3.6uV
65V	100nV	3.1ppm + 15uV	100mA	150uV RMS	10uV
130V	1nV	3.3ppm + 30uV	100mA	150uV RMS	18uV
600V	1nV	3.3ppm + 150uV	30mA	300uV RMS	85uV
1200V	10nV	3.5ppm + 300uV	30mA	300uV RMS	165uV

*Add 20uV RMS if a current limit >15mA is selected

Real Time Clock/Calendar

Accuracy: 2 ppm (0° – 50°)
Format: 12 or 24 hr., Mo/Day/Yr or Day/Mo/Yr user selectable
Battery Back-up: 5000 hours with no power applied
Daylight Savings Time: User selectable

General

Warm-up Time: 5 minutes to within 5 ppm of final value, (times 2 if battery back-up not used).
IEEE-488 Configuration: SH1AH1T6TE6L4LE4SR1RL1PP2C1DT1C0 (Talk/listen sub-addressable)
Power: 115/230 VAC 50-400 Hz, 125 VA
Size: 178mm H x 432mm W x 483mm D (7"x17"x19")
Weight: 23KG/48 lbs. net, 25KG/55 lbs. shipping
Environmental: MIL-T-28800C tested and approved.

Ordering Information

Model 2720GS	Direct Voltage System	$10,995.00
Option "54-4T"	Lower Cost/Reduced Performance	(-2000.00)
Option "BAT"	Battery Back-up System	595.00
Option "RP-20"	Rear Panel I/O Terminals	195.00
Option "EXR1"	1V External Reference Module	995.00
Option "EXR10"	10V External Reference Module	995.00
Option "GP-1"	1 Meter GPIB Cable	95.00
Option "GP-2"	2 Meter GPIB Cable	115.00
Option "RX7"	Rack Mount Kit	60.00
Option "BBL"	Dual Banana Shielded Leads	25.00
Option "SL-48"	Gold Surfaced Spade Lug Leads	55.00
Option "SP-2"	2 Year Spare Parts Kit	395.00
Additonal	Operating/Maintenance Manual	65.00