VALHALLA SCIENTIFIC

**NEW 2720GS**
**Ultra-Precision Direct Voltage System**

GPIB

## The 2720GS—True DC Standards Lab Performance in One Instrument

The 2720GS Ultra-Precision Direct Voltage System is a physical representation of Valhalla Scientific's corporate philosophy, "Building New Standards for Technology". From its fully sealed multi-function membrane control panel to its ingenious on-board multi-reference monitoring system the 2720GS is the most powerful and comprehensive direct voltage system in the world.

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 calibration temperature. Delivering the best accuracy and lowest temperature coefficient of all DC standards is quite an accomplishment but the 2720GS leaves the others far behind when it comes to stability.

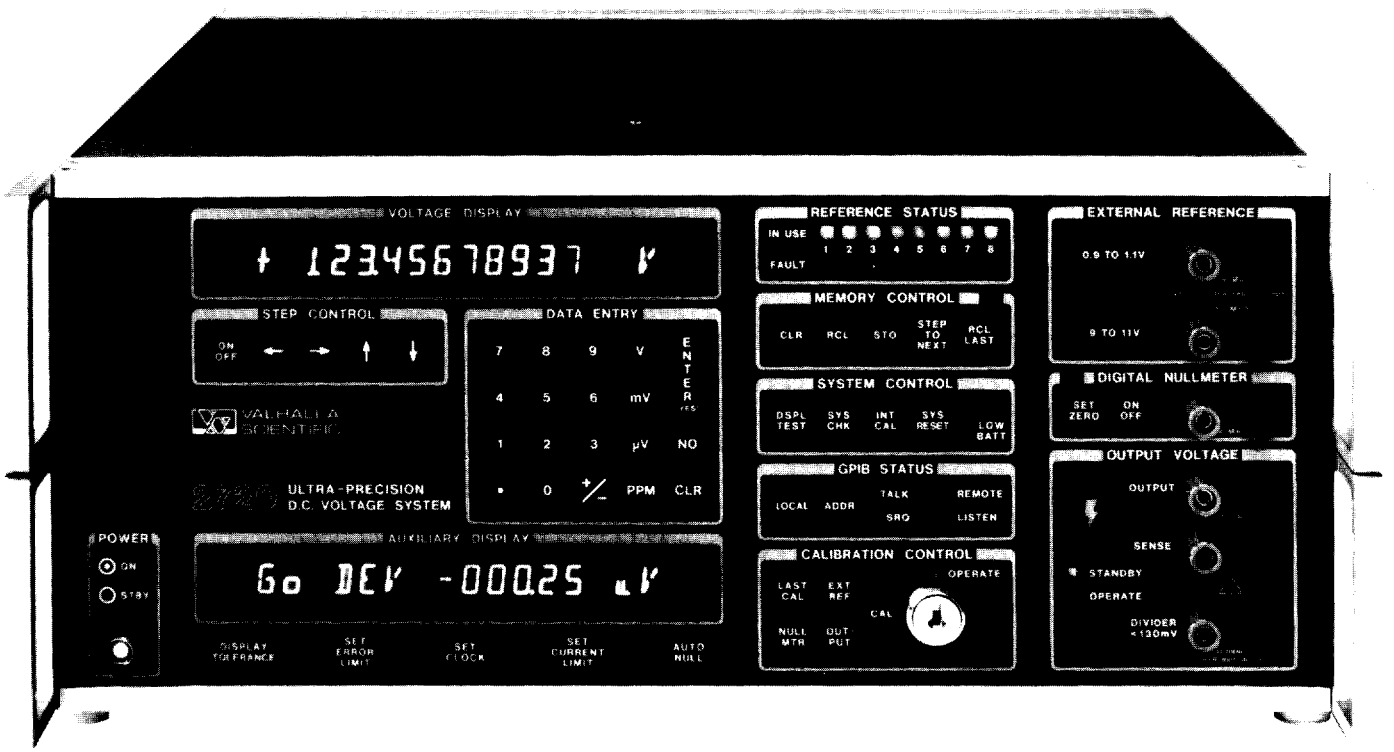
To conquer drift against time, the 2720GS utilizes an internal real time clock and an ingenious on-board multi-reference monitoring system. The system's internal 30 bit A to D converter continually moniters each of up to eight internal highly stabilized reference zeners. Each reference module contains its own non-volatile memory which stores calibration and drift rate data. Should a reference exhibit excessive noise or drift, the system has the ability to "drop it out" and pick it up again later upon stabalization to its new value. No other system can do this and no other system even comes close to matching the 2720GS uncompromising rock-solid stability.

### 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 competitions 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 auxilliary 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.

### Direct Voltage Output 10nV to 1200V

The 2720GS Direct Voltage System displays its actual or standby output voltage down to 10 nanovolt resolution or 0.01 PPM of full scale



on all ranges. The extended resolution of the 2720GS is at least 10 times greater than that of the nearest competitive units. This resolution is made possible through the use of Valhalla's proprietary 32 bit pulse-width-modulated D to A converter technology. When it comes to extended output voltage and drive current capability the 2720GS takes a "NO BOOST NEEDED" attitude. The standard unit provides up to 100mA current sourcing capability on the 0.65V through 130V ranges and delivers a maximum output voltage of ±1200 volts DC.

**Double-Edged 2720GS Productivity Cuts Through Calibration Backlog**

When it is productivity you are looking for in a Direct Voltage System, the 2720GS looks twice as nice as any other system available. That is because the 2720GS works double-time clearing out calibration workload on both DVM's and calibrators alike. Its ergonomically engineered operating format is flexible and powerful yet refreshingly simple. Direct volts entry can be accomplished in either volts, millivolts or microvolts. Editing the output is a snap utilizing the 2720GS step control mode with auto-repeat or by modifying the output directly in parts per million with the PPM key.

Entering the 2720GS step control mode automatically triggers the units auxilliary display to readout the deviation and pass/fail status of the UUT. For added user convenience and productivity, changes in output polarity are accomplished with the single touch of the bi-polar output key.

**System Control**

The system control section of the 2720GS provides full operational verification in four simple yet powerful keys. The display test provides a three second illumination of all display segments and indicators. The system check key prompts the unit's extensive diagnostic routine backed by over two hundred user prompting messages and fault codes. Built-in operational redundancy allows the user the option of continuing operation, utilizing back-up circuitry, in the event of a primary component fault.

The 2720GS internal calibration routine is quick and easy requiring only about 30 seconds. The routine is prompted by a single keystroke and does not require multi-level keyboard manipulation. Internal calibration automatically compensates for attenuator drift, zero offset errors caused by thermal EMFs and corrects for gain shift in amplifiers. The 2720GS requires the use of internal cal on a monthly basis, not daily, in order to achieve its long term performance specifications. Obviously, the 5 PPM one year uncertainty of the 2720GS could not be achieved without the use of internal calibration and the on-board multi-reference monitoring system.

**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.

The calibration integrity of the 2720GS is guarded by a front panel mounted keylock switch which prevents unauthorized access to the calibration mode. Once in the calibration mode, the system's alpha-numeric display prompts the operator through the two point calibration sequence with clear English commands. In this mode, the system's output terminals become input terminals with an input impedance greater than 100 gigohms. The system then prompts the user to connect a one volt reference (±10%) and enter the reference value on the 2720GS keyboard (or over the GPIB). Following a five second integrated measurement period, the derived calibration constant is loaded into non-volatile RAM and the auxilliary display scrolls out set up instructions for the 10 volt calibration. The 10 volt cal point provides full scale correction data for the unit's on-board multi-reference monitoring system as well as the final leg in the calibration on the 2720GS' internal precision 10:1 reference divider. Once the internal reference divider is calibrated the microprocessor based routine automatically verifies and stores correction data for the system's 130V and 1200V output attenuator stages.

During the entire three minute external calibration sequence of the 2720GS no manual editing of the unit's output or any other type of manual adjustment including instrument disassembly is required.

The 1.6 ppm 30 day accuracy of the 2720GS is relative to local reference standards. For total uncertainty including Valhalla's traceability to the National Bureau of Standards and all transfer uncertainties add

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### 2720GS Options and Accessories

Option "BAT": Rear-panel mounted gel-cell battery pack provides 12 hour reference oven power when line power is removed. The rugged design and immunity to environmental conditions makes the 2720GS ideal for "on-site" calibration of precision DVMs and calibrators. The battery back-up capability allows you to begin calibration immediately upon arrival while the other guys are waiting for warm-up. The option "BAT" is fully self-contained in an aluminum enclosure with on-board charging circuitry and logic interconnect.

Option "EBU": If a longer battery back-up period is desired the "EBU" option provides logic interface and voltage conditioning circuitry for user supplied auxilliary automobile type 12V battery. The "EBU" provides full 1000 volt isolation between back-up power source and output low.

Option "RP-20": Complete rear panel output/input low thermal EMF binding post assembly.

Options "EXR1" "EXR7" and "EXR10": Allows user to operate the 2720GS off of an external 1V, 7V or 10V reference respectively. With power applied (or battery back-up) the input impedance is greater than 100 gigohms, so direct standard cell input can be accomplished without loading. Applied reference voltage values are entered on the unit's data entry keyboard (or over the GPIB) and may vary ±10% from nominal. The 2720GS automatically reverts to it's internal reference system when the external reference mode is de-selected.

Option "54-4T": Where budgetary constraints or less crucial applications exist, this option provides savings by the elimination of the 2720GS' digital nullmeter and a reduction of two zener references from the unit's reference system (to a total of four). Resolution is reduced to 0.1 ppm and a reduced 2720GS specification applies. The nullmeter and dual reference module can be easily field retrofitted at a later date for restoration to 2720GS performance level.

Option "HSR": For the absolute ultimate in Direct Voltage Performance the "HSR" option replaces the six standard 2720GS zener references with eight premium zener references. These references are selected, aged and monitored for 9 to 12 months then statistically enhanced by the 2720GS' multi-reference monitoring system. The result is an awesome performance and stability level rivaling that of external reference voltage standards.

### 2720GS Performance Specifications

**Accuracy:** (Valid for ±6°C from calibration temperature within 10-35°C). The values stated below include affects of line, load and temperature variation (within the 12°C calibration temperature window). To derive absolute accuracies relative to the National Bureau of Standards add 1.5 ppm for Valhalla Scientific's traceability and transfer uncertainty.

**2720GS (PPM of Setting + µV)**

| Range | 30 days | | 90 days | | 180 days | | 1 year | | 3 years | |
|---|---|---|---|---|---|---|---|---|---|---|
| 650mV* | 2.3ppm + | 0.2µV | 2.9ppm + | 0.2µV | 3.9ppm + | 0.2µV | 6.0ppm + | 0.2µV | 12.6ppm + | 0.2µV |
| 1300mV* | 2.7ppm + | 0.3µV | 3.3ppm + | 0.3µV | 4.3ppm + | 0.3µV | 6.3ppm + | 0.3µV | 12.9ppm + | 0.3µV |
| 0.65V | 2.3ppm + | 0.3µV | 2.9ppm + | 0.3µV | 3.9ppm + | 0.3µV | 6.0ppm + | 0.3µV | 12.6ppm + | 0.3µV |
| 1.3V | 2.7ppm + | 0.4µV | 3.3ppm + | 0.4µV | 4.3ppm + | 0.4µV | 6.3ppm + | 0.4µV | 12.9ppm + | 0.4µV |
| 6.5V | 1.6ppm + | 1.2µV | 2.2ppm + | 1.2µV | 3.2ppm + | 1.2µV | 5.0ppm + | 1.2µV | 10.6ppm + | 1.2µV |
| 13V | 2.0ppm + | 2.3µV | 2.6ppm + | 2.3µV | 3.5ppm + | 2.3µV | 5.3ppm + | 2.3µV | 10.9ppm + | 2.3µV |
| 65V | 2.7ppm + | 12µV | 3.3ppm + | 12µV | 4.2ppm + | 12µV | 5.9ppm + | 12µV | 11.5ppm + | 12µV |
| 130V | 3.0ppm + | 23µV | 3.7ppm + | 23µV | 4.5ppm + | 23µV | 6.2ppm + | 23µV | 11.8ppm + | 23µV |
| 600V | 3.4ppm + | 106µV | 4.0ppm + | 106µV | 4.9ppm + | 106µV | 6.5ppm + | 106µV | 12.1ppm + | 106µV |
| 1200V | 3.8ppm + | 206µV | 4.4ppm + | 206µV | 5.2ppm + | 206µV | 6.9ppm + | 206µV | 12.4ppm + | 206µV |

**2720GS/HSR**

| Range | 30 days | 90 days | 180 days | 1 year | 3 years |
|---|---|---|---|---|---|
| 650mV* | 2.1ppm + 0.2μV | 2.4ppm + 0.2μV | 3.0ppm + 0.2μV | 4.3ppm + 0.2μV | 8.5ppm + 0.2μV |
| 1300mV* | 2.5ppm + 0.3μV | 2.8ppm + 0.3μV | 3.4ppm + 0.3μV | 4.6ppm + 0.3μV | 8.9ppm + 0.3μV |
| 0.65V | 2.1ppm + 0.3μV | 2.4ppm + 0.3μV | 3.0ppm + 0.3μV | 4.3ppm + 0.3μV | 8.5ppm + 0.3μV |
| 1.3V | 2.5ppm + 0.4μV | 2.8ppm + 0.4μV | 3.4ppm + 0.4μV | 4.6ppm + 0.4μV | 8.9ppm + 0.4μV |
| 6.5V | 1.4ppm + 1.2μV | 1.7ppm + 1.2μV | 2.2ppm + 1.2μV | 3.2ppm + 1.2μV | 6.4ppm + 1.2μV |
| 13V | 1.8ppm + 2.3μV | 2.1ppm + 2.3μV | 2.6ppm + 2.3μV | 3.5ppm + 2.3μV | 6.7ppm + 2.3μV |
| 65V | 2.5ppm + 12μV | 2.8ppm + 12μV | 3.2ppm + 12μV | 4.2ppm + 12μV | 7.3ppm + 12μV |
| 130V | 2.8ppm + 23μV | 3.2ppm + 23μV | 3.6ppm + 23μV | 4.5ppm + 23μV | 7.6ppm + 23μV |
| 600V | 3.2ppm + 106μV | 3.5ppm + 106μV | 4.0ppm + 106μV | 4.9ppm + 106μV | 7.9ppm + 106μV |
| 1200V | 3.6ppm + 206μV | 3.9ppm + 206μV | 4.3ppm + 206μV | 5.2ppm + 206μV | 8.2ppm + 206μV |

**2720GS/54-4T**

| Range | 30 days | 90 days | 180 days | 1 year | 3 years |
|---|---|---|---|---|---|
| 650mV* | 3.5ppm + 0.2μV | 5.5ppm + 0.2μV | 8.4ppm + 0.2μV | 13.7ppm + 0.2μV | 30.7ppm + 0.2μV |
| 1300mV* | 3.8ppm + 0.3μV | 5.9ppm + 0.3μV | 8.7ppm + 0.3μV | 14.0ppm + 0.3μV | 31.0ppm + 0.3μV |
| 0.65V | 3.5ppm + 0.3μV | 5.5ppm + 0.3μV | 8.4ppm + 0.3μV | 13.7ppm + 0.3μV | 30.7ppm + 0.3μV |
| 1.3V | 3.8ppm + 0.4μV | 5.9ppm + 0.4μV | 8.7ppm + 0.4μV | 14.0ppm + 0.4μV | 31.0ppm + 0.4μV |
| 6.5V | 2.8ppm + 1.2μV | 4.9ppm + 1.2μV | 7.7ppm + 1.2μV | 12.9ppm + 1.2μV | 29.0ppm + 1.2μV |
| 13V | 3.2ppm + 2.3μV | 5.3ppm + 2.3μV | 8.0ppm + 2.3μV | 13.1ppm + 2.3μV | 29.2ppm + 2.3μV |
| 65V | 3.8ppm + 12μV | 5.8ppm + 12μV | 8.6ppm + 12μV | 13.7ppm + 12μV | 29.7ppm + 12μV |
| 130V | 4.2ppm + 23μV | 6.2ppm + 23μV | 8.9ppm + 23μV | 14.0ppm + 23μV | 30.0ppm + 23μV |
| 600V | 4.5ppm + 106μV | 6.5ppm + 106μV | 9.2ppm + 106μV | 14.2ppm + 106μV | 30.3ppm + 106μV |
| 1200V | 4.9ppm + 206μV | 6.9ppm + 206μV | 9.5ppm + 206μV | 14.5ppm + 206μV | 30.5ppm + 206μV |

**Stability (24hrs)**

| Range | 2720GS | 2720GS/HSR | 2720GS/54-4T |
|---|---|---|---|
| 650mV* | 0.23ppm + .06μV | 0.19ppm + .06μV | 0.36ppm + .06μV |
| 1300mV* | 0.23ppm + 0.1μV | 0.19ppm + 0.1μV | 0.36ppm + 0.1μV |
| 0.65V | 0.23ppm + 0.2μV | 0.19ppm + 0.2μV | 0.36ppm + 0.2μV |
| 1.3V | 0.23ppm + 0.3μV | 0.19ppm + 0.3μV | 0.36ppm + 0.3μV |
| 6.5V | 0.23ppm + 0.6μV | 0.19ppm + 0.6μV | 0.36ppm + 0.6μV |
| 13V | 0.23ppm + 1.0μV | 0.19ppm + 1.0μV | 0.36ppm + 1.0μV |
| 65V | 0.23ppm + 5.4μV | 0.19ppm + 5.4μV | 0.36ppm + 5.4μV |
| 130V | 0.23ppm + 10μV | 0.19ppm + 10μV | 0.36ppm + 10μV |
| 600V | 0.23ppm + 50μV | 0.19ppm + 50μV | 0.36ppm + 50μV |
| 1200V | 0.23ppm + 92μV | 0.19ppm + 92μV | 0.36ppm + 92μV |

Stability specifications apply for constant line, load and temperature (± 1°C). Measured over a bandwidth of DC to 2Hz.
*Divided Output ($Z_O = 450\Omega$)

**Temperature Coefficient**

| | Using Internal Cal | | Without Use Of Internal Cal | | |
|---|---|---|---|---|---|
| Range | 0-35°C | 35-50°C | 0-10°C | 10-35°C | 35-50°C |
| 650mV | 0.10ppm + 0.01μV | 0.40ppm + 0.01μV | 0.10ppm + 0.01μV | 0.10ppm + 0.01μV | 0.40ppm + 0.01μV |
| 1300mV | 0.10ppm + 0.02μV | 0.40ppm + 0.02μV | 0.14ppm + 0.02μV | 0.14ppm + 0.02μV | 0.56ppm + 0.02μV |
| 0.65mV | 0.10ppm + 0.02μV | 0.40ppm + 0.05μV | 0.10ppm + 0.02μV | 0.10ppm + 0.02μV | 0.40ppm + 0.05μV |
| 1.3mV | 0.10ppm + 0.02μV | 0.40ppm + 0.05μV | 0.14ppm + 0.02μV | 0.14ppm + 0.02μV | 0.56ppm + 0.05μV |
| 6.5V | 0.01ppm + 0.10μV | 0.05ppm + 0.11μV | 0.01ppm + 0.10μV | 0.01ppm + 0.10μV | 0.05ppm + 0.11μV |
| 13V | 0.01ppm + 0.20μV | 0.05ppm + 0.20μV | 0.10ppm + 0.20μV | 0.10ppm + 0.20μV | 0.40ppm + 0.02μV |
| 65V | 0.10ppm + 1.0μV | 0.40ppm + 1.8μV | 0.41ppm + 1.0μV | 0.22ppm + 1.0μV | 0.56ppm + 1.80μV |
| 130V | 0.10ppm + 2.0μV | 0.40ppm + 2.5μV | 0.42ppm + 2.0μV | 0.24ppm + 2.0μV | 0.69ppm + 2.5μV |
| 600V | 0.10ppm + 9.5μV | 0.40ppm + 18 μV | 0.41ppm + 9.5μV | 0.22ppm + 9.5μV | 0.56ppm + 18.0μV |
| 1200V | 0.10ppm + 18.3μV | 0.40ppm + 24 μV | 0.42ppm + 18.3μV | 0.24ppm + 18.3μV | 0.69ppm + 23.8μV |

Specifications apply immediately following stabilization to a change in ambient temperature (thermal time constant = .5°C/min.). Temperature coefficient adder applicable only when outside of the 12°C window of the calibration temperature.

1.5 ppm. Valhalla's 1.5 ppm traceability uncertainty is achieved through the use of our primary standard cells, (certified to better than 1 ppm at the one volt level) and a reference divider which yields an additional 0.1 ppm uncertainty up to ten volts. The direct input calibration routine of the 2720GS reduces transfer uncertainties encountered by conventional DC standards by eliminating the need to measure the units output during the calibration process.

For added convenience, one touch of the units "Display Tolerance" key provides an instant calculation and display of the 2720GS specification (including full compensation for time since last calibration.) Valhalla Service Centers provide NBS traceable calibration support for the 2720GS Direct Voltage System or consult factory for details on our Rent-A-Reference program.

### Safety That Makes Sense

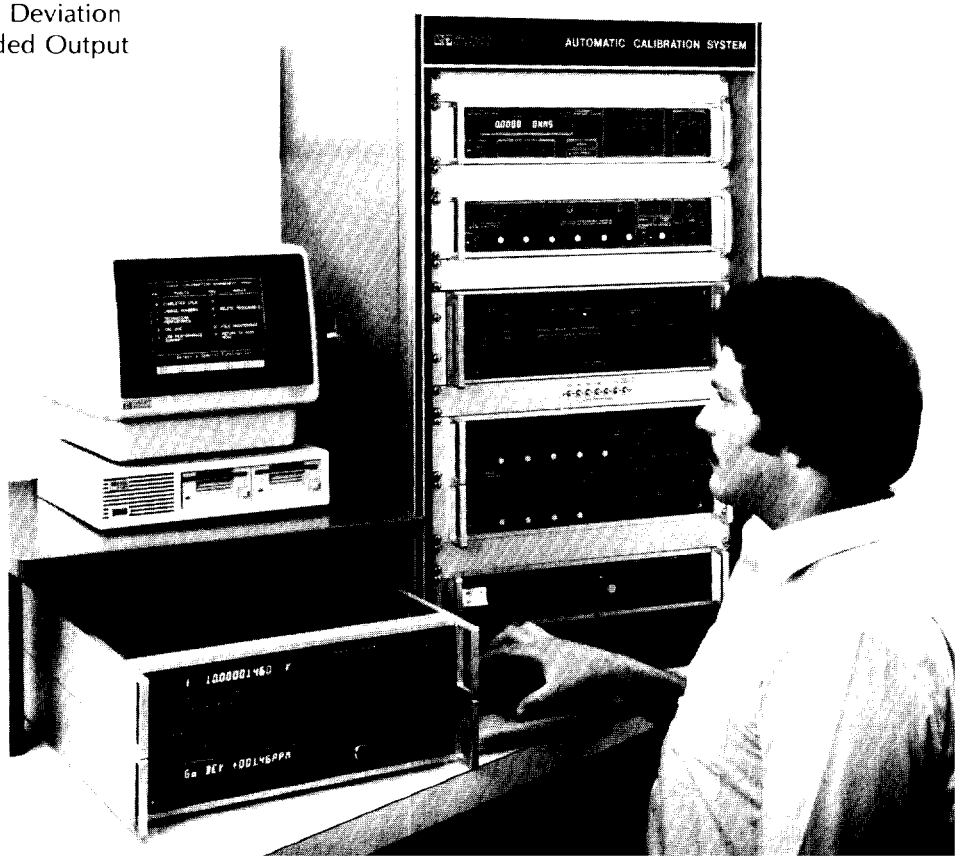
To prevent inadvertent exposure to dangerous voltage levels without the annoyance of constantly tripping into standby, the 2720GS utilizes an unique safeguard format called Vari-Safe™. The Vari-Safe™ operating format permits users to make changes in the output voltage of up to 25% of output or 30 volts whichever is greater. Other built-in safeguards include, selectable current limiting and a dedicated internal voltmeter which ensures that the analog output corresponds with the digital setting at all times. No other instrument offers this level of safety protection and operator convenience all in one model. The 2720GS has been designed to meet and exceed tough UL, IEC and CSA specifications for instrument safety.

### Built-In 550 Step Memory Enhances Operating Efficiency

To put the ultimate finishing touch on operator productivity, the 2720GS is configured with a user definable memory control system. The built-in non-volatile memory allows the operator to walk through pre-programmed calibration procedures for DVM's and DC calibrators alike. Each of the more than 550 steps of procedure memory accepts data for test number, output value, UUT tolerance and selectable standby/operate bring-up mode. To further enhance the ergonomics of the memory control system, each step is available at the touch of a finger, thus eliminating the need to search for external plug-ins.

### 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 559 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
- UTT Calibration Status
- Display Test
- Time Since Last Cal
- Twin Microprocessors
- Optional Reference System Battery Back-up
- Optional External Reference Modules



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# NEW 2720GS
## Ultra-Precision Direct Voltage System

**Performance Characteristic Table**

| Range | Resolution nV/ppm | Measurement Accuracy 90 Days (ppm of setting + μV) | Maximum Current | Wideband Noise 10Hz to 10KHz | Linearity |
|---|---|---|---|---|---|
| 650mV | 10nV/.014ppm | 2.9ppm + 0.27μV | 450Ω $Z_O$ | 10μV RMS | 0.14μV |
| 1300mV | 10nV/.007ppm | 3.3ppm + 0.47μV | 450Ω $Z_O$ | 10μV RMS | 0.26μV |
| .65V | 10nV/.014ppm | 2.9ppm + 0.54μV | 100mA | 30μV RMS* | 0.22μV |
| 1.3V | 10nV/.007ppm | 3.3ppm + 0.67μV | 100mA | 30μV RMS* | 0.32μV |
| 6.5V | 10nV/.002ppm | 2.2ppm + 1.75μV | 100mA | 30μV RMS* | 0.9μV |
| 13V | 100nV/.007ppm | 2.6ppm + 3.35μV | 100mA | 30μV RMS* | 1.8μV |
| 65V | 1μV/.014ppm | 3.3ppm + 17.1μV | 100mA | 50μV RMS | 10μV |
| 130V | 1μV/.007ppm | 3.7ppm + 33μV | 100mA | 50μV RMS | 18μV |
| 600V | 10μV/.016ppm | 4.0ppm + 156μV | 30mA | 500μV RMS | 85μV |
| 1200V | 10μV/.008ppm | 4.4ppm + 298μV | 30mA | 500μV RMS | 165μV |

The linearity of the 2720GS is defined as the maximum allowable deviation from a straight line between zero and full scale of each range. Valid ± 6°C from calibration temperature within 10°C to 35°C.

*Add 20μV RMS for loads greater than 10mA

**Digital Nullmeter/Measurement Performance Table**

| Range | Resolution | Accuracy 3yr. 0-50°C | Input Impedance |
|---|---|---|---|
| 0-200μV | 10nV | 0.2% + 50nV | 10GΩ ($10^{10}$Ω) |
| 200-2000μV | 100nV | 0.2% + 150nV | 100GΩ ($10^{11}$Ω) |
| 2-20mV | 1μV | 0.2% + 1μV | 1TΩ ($10^{12}$Ω) |
| 20-200mV | 10μV | 0.2% + 10μV | 10TΩ ($10^{13}$Ω) |
| 200mV-2000V | 100mV | 10% + 100mV | 60MΩ ± 10% |

**Maximum Input Current:** Less than 25pA
**Zero Stability:** 100nV/hour, 30nV/°C
**Overload Protection:** 2000V indefinitely
**Maximum Common Mode:** 2000V from ground or output low

**Settling Time (To within PPM of final value)**

| Range | 10ppm | 5ppm | 2ppm |
|---|---|---|---|
| 1300mV/650mV | 500mS | 2 Sec. | 10 Sec. |
| 1.3V/.65V | 500mS | 2 Sec. | 8 Sec. |
| 13V/6.5V | 300mS | 1 Sec. | 5 Sec. |
| 130V/65V | 600mS | 3 Sec. | 10 Sec. |
| 1200V/600V | 800mS | 3 Sec. | 10 Sec. |

For range and or polarity change, add 1 second.

### 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, 15 minutes to within 1 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

### Ordering Information

| | | |
|---|---|---|
| Model 2720GS | Direct Voltage System | $10,495.00 |
| Option "HSR" | Ultra-Stable Reference Package | 3,995.00 |
| Option "54-4T" | Lower Cost/Reduced Performance | (-2000.00) |
| Option "BAT" | Battery Back-up System | 595.00 |
| Option "EBU" | Battery Conditioning System | 595.00 |
| Option "RP-20" | Rear Panel I/O Terminals | 195.00 |
| Option "EXR1" | 1V External Reference Module | 995.00 |
| Option "EXR7" | 7V 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 |
| Additional | Operating/Maintenance Manual | 65.00 |

Specifications and prices subject to change without notice.

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Building New Standards for Technology

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