

FEATURES

- -19.999 to +19.999 Volts Full Scale Output Range Set from Front Panel Lever Switches
- 1 Millivolt Settability with Accuracy of ± 25 ppm of setting $\pm \frac{1}{2}$ LSB
- Continuous Front Panel ± 1.5 mV Vernier Control
- Rated Accuracy up to 25mA Output
- Current from Short-Circuit-Proof Output Transfer-Isolated ± 300 Volts to AC Line
- Miniature Aluminum Case Includes Bench-top Stand or Can Be Panel-Mounted

DESCRIPTION

Datel's low-cost miniature Digital Voltage Calibrator, model DVC-8500, is a $4\frac{1}{2}$ digit voltage reference source with a full scale output range of -19.999 Volts to +19.999 Volts in 1 millivolt steps. An active buffered output amplifier provides very low output impedance and up to 25 milliamps output current at the rated accuracy of ± 25 ppm of setting, $\pm 500\mu\text{V}$. This short-circuit proof output is selected by front panel digital lever switches. Voltage outputs may be continuously varied within ± 1.5 millivolts of selected readings by using the front panel vernier control. The DVC-8500 output is available from front panel banana jacks and a parallel rear panel 36-pin gold-plated PC connector or lug terminals.

The DVC-8500 Digital Voltage Calibrator is small enough for bench-top use or panel mounting. It fulfills many laboratory needs such as calibrating A/D and D/A Converters, Digital Panel Meters, Operational and Instrumentation Amplifiers, Voltage/Frequency Converters and Digital Voltmeters. The small size and light weight design of the DVC-8500 make it an ideal portable instrument for a technician's repair kit. When mounted on its bench top tilt stand, the DVC-8500 uses very little space and can be positioned close to test circuits.

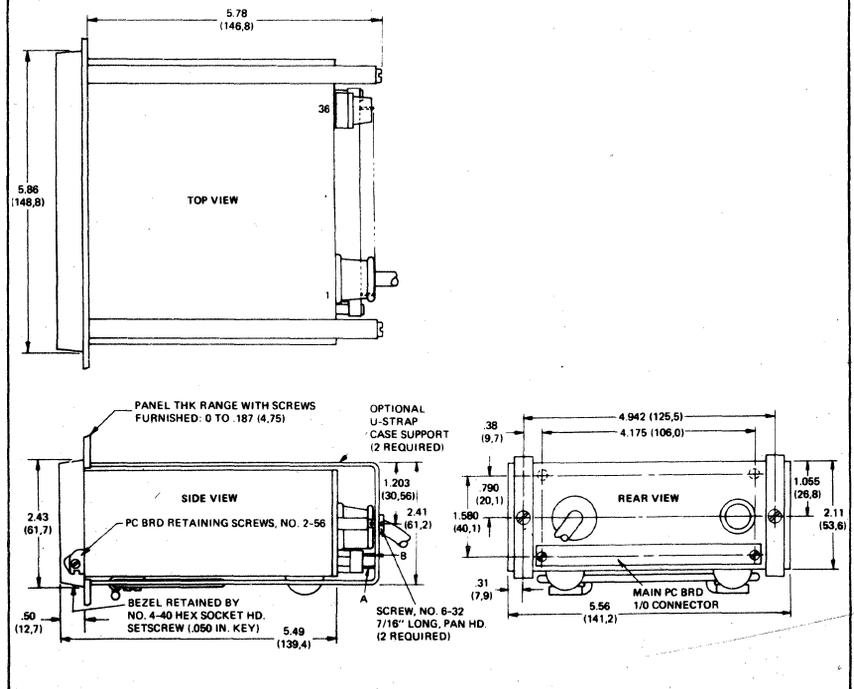
The miniature calibrator features high performance for such a small, low-cost instrument. An oven-stabilized zener diode internal reference provides an overall accuracy of $\pm 500\mu\text{V}$ and ± 25 ppm of the setting with zero drift of $\pm 5\mu\text{V}/^\circ\text{C}$ and full scale drift of $4\text{ppm}/^\circ\text{C}$ max.

Rear connector sense feedback inputs reduce errors caused by cable resistance. A front panel LED overload lamp lights if the output exceeds 25mA and current limiting occurs at 70mA output. The output circuit can accept up to ± 25 mA source or sink current at rated accuracy. The rear connector also includes a low-Z output of the +10 Volt reference source with 5mA maximum drive for external reference tracking. Wide-band output noise is 25 microvolts, pk-pk max.

Powered by a choice of 100, 115 or 230 VAC $\pm 10\%$, and 47 to 440 Hz at 10 watts, the DVC-8500 offers transformer isolation up to ± 300 VDC. Output line rejection is within ± 50 microvolts of zero and within ± 25 ppm of full scale range. The black-anodized extruded aluminum housing provides excellent shielding to electrical noise. The housing is identical to other instruments in Datel's 8000 series including Counter, Timer, Clock and Comparator models for a uniform appearance and compatibility when these instruments are used together.



MECHANICAL DIMENSIONS Inches—(mm)



SPECIFICATIONS: (Typical between 0°C and +50° at steady ambient temperature after 5 minute warm-up)

VOLTAGE OUTPUT

Output Type: Shielded transformer isolated, active low impedance DC voltage output, current limited.

Output Voltage
Range: 0 to +19,999 Volts DC or 0 to -19,999 Volts DC, lever switch selected, 1mV steps.*

Output Current
Range: 0 to 25mA (source current) to rated voltage output accuracy.

Output
Overload: Greater than 25mA (source current) will illuminate front panel LED overload lamp. Output is current limited (continuous short-circuit proof) to 70mA (source current) at any voltage up to ±20VDC.

Output Impedance: Less than 10 milliohms.

Capacitive Load *Range ±20.0005 Volts using vernier control. no limitation

PERFORMANCE

Accuracy @ +25°C
With Vernier: Within ±25ppm of setting, ±500µV when **Control at Zero:** calibrated.

Resolution: Set within ±1mV increments. A front panel vernier control provides ±1.5mV continuous offset with 100µV graduations.

Temperature
Drift of Zero: Within ±5µV/°C
Temperature Drift of Calibration: Within ±4ppm of setting /°C

Operating Temperature
Range: 0°C to +50°C

Storage Temperature
Range: -25°C to +85°C

Warm-Up Time: 5 minutes to rated accuracy

Output Noise: 25µV pk-pk, wideband (no cap load)

Reference
Source: 6.4V oven-stabilized low TC zener reference diode

AC Line Voltage
Rejection: Zero: ±50µV over full line range
 Calibration: ±25ppm of setting over full line range

Power Transformer
Isolation: 1000 Megohms. Transformer primary has a grounded shield for capacitive isolation. Breakdown: 300 VRMS, min.

FRONT PANEL

Output Selector
Switches: Six lever-operated detented switches are set in millivolts (±19999mV range)

Polarity: 2 positions, + or -
Leading Digit: 2 positions, 0 or 1
4 Digits: 10 positions, 0 thru 9

Output Vernier: Rotary potentiometer, range ±1.5mV of selected output. Graduated in 100µV divisions. Clockwise rotation labeled "INCR" (increase) will increase the absolute value of the selected output. "INCR" will make a negative output more negative or positive output more positive. Counterclockwise rotation labeled "DECR" (decrease).

Overload
Light: Red LED lamp illuminates if output exceeds ±25mA.

Power Switch: Toggle switch, AC power on or off
Power Light: Red LED lamp illuminates when AC power is on.

INPUT/OUTPUT CONNECTORS

Front Panel: Voltage output (blue) and output common (black) available from two (2) gold plated brass deep banana jacks, 0.166" (4,22mm) i.d., 0.56" (14,2mm) deep, 0.75" (19,05mm) between centers. (Pomona model 2854 jack or equivalent, suitable for U.S. or European plugs).

Rear Connections:
Voltage
Output: Parallel connection with front panel jack.
Output and Reference
Common: Parallel connection with front panel jack. Transformer isolated ±300V from case ground.

Reference
Output: Low impedance ±10 Volt DC output from +6.4V ref. diode. Drain must not exceed ±5mA maximum. Ref. output is opposite polarity of calibrator output.

Sense Input: Connect to remote load to compensate for cable resistance voltage drops. See diagram. This input must be tied to voltage output if not used.

Sense
Common: Return for sense inputs. Tie to output common if sense is not used.

Rear connections are arranged as dual 36-pin PC edgeboard connections on 0.1" centers. Individual connections consist of 4 gold-plated fingers on a common pad area in parallel with the 4-finger pad on the bottom. Each dual-pad (8 fingers total) is drilled and plated through for optional lug connection using 4-40 hardware. Shorting bars and 4-40 hardware are included to short sense and common connections if not used. Rear connections may use a Datel 56-2076050, (Viking#3VH36/1JN-5) PC connector.

ADJUSTMENTS

Calibration adjustment trim pots are accessible by partially removing circuit board from case. Refer to calibration procedure.

POWER SUPPLY

Power
Required: Choice of 100, 115 or 230 VAC, ±10% 47 to 440Hz, 10 watts. 3-prong U.S. captive line cord installed. Ground wire connected to case, but transformer-isolated ±300VRMS from output common. Fuses AGC Slo-Blo, .15A (115V), .1A (230V)

MECHANICAL DIMENSIONS

Case: 5.56" W X 2.11" H X 5.78" D (141,2 X 53,6 X 146,8mm) (Bench-top stand retracted)

Bezel: 5.86" W X 2.25" H X 0.50" THK (148,7 X 57,0 X 12,7 mm)

Servicing: Bezel, front panel and mother board are removable from front while unit remains secured in panel. Bezel is lifted off by removing the two 0.050 - inch (4-40) Allen hex key set screws on the bottom side edges. PC boards may be removed by loosening the PC board guide track retaining screws on the lowest position on the panel mounting seats.

Weight: 2.25 pounds (1,0Kg)

MOUNTING:

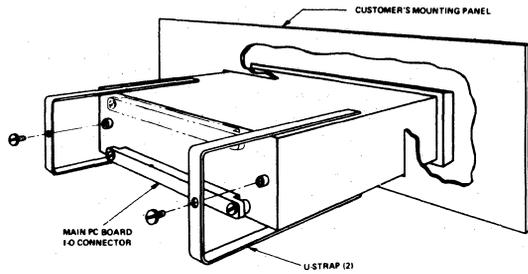
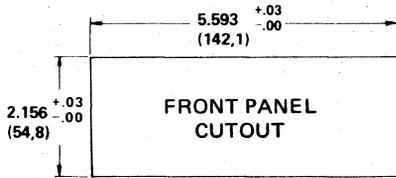
. Choice of bench-top mounting or panel mounting through a cutout measuring 2.16" H X 5.59" W (54,8 X 142,1 mm) and secured by 2 U-Straps. See ordering guide for optional panel-mount kit.

OPTIONAL FRONT PANEL MOUNTING

Standard DVC-8500 Calibrators are supplied for bench-top use including a tilt-up stand and rubber feet. The DVC-8500 may be converted for panel-mounting using the mounting kit, model 38-A-3022-1. The required panel cutout dimensions are shown below. The tilt-up bench-top

wire bail stand and rubber feet must be removed from the case so the instrument will fit through the panel cutout. The rubber feet are held on with a strong adhesive and require pliers for removal. Secure the instrument into the panel cutout by using the two U-straps and hardware.

MOUNTING DETAILS DIMENSIONS IN INCHES (MM)



ORDERING GUIDE

Model Number

DVC-8500

AC POWER SUPPLY*

A = 115VAC

E = 230VAC

J = 100VAC

*±10%, (47 to 440 Hz)

DVC-8500

Panel-Mount Kit, P/N 38-A-3022-1
(Consists of (2) U-Straps, rear PC board connector and hardware)

Test Lead Set, 38-3902
(Consists of (2) 3-foot, 20 gauge leads, red and black. Stackable banana plugs and retracting hook clips)

10:1 Attenuator, 38-3900-1

100:1 Attenuator, 38-3901-1

EQUIVALENT CIRCUIT

