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Find the *Physiologic Instruments VCC 600* at our website: *Click HERE*

VCC600 Datasheet



The VCC 600 is a single channel Voltage and Current Clamp designed to be a flexible tool for electrophysiological studies of ion transport by epithelial and other barrier tissues. It features an active headstage, user selectable current and fluid resistance compensation ranges, a pulse generator for conductance/resistance measurements, an interface for remote instrument control and data acquisition via computer, and large (0.5") LED readout. The VCC600 has been useful both for standard Ussing chamber experiments and, when combined with microelectrodes connected to an electrometer, for simultaneously studying transepithelial, transapical and transbasolateral membrane resistances and voltages **(1,2,3,4,5)** and when combined with pH measurements for determining acid and base transport **(6)**.

The single channel device is capable of controlling either the voltage or current across an epithelium. It is the most versatile instrument in the VCC series. Basic features include compensation controls with calibrated 10-turn dials for electrode offset voltage and fluid (series) resistance, user selectable ranges for current measurement gain, fluid resistance compensation and response frequency. A Clamp Level control allows a DC holding voltage or current to be set while a built-in pulse generator provides for applying unipolar or bipolar step changes in voltage or current from the holding level for tissue conductance/resistance measurements. Voltages and currents can be monitored via recorded outputs on the front panel and buy a bright 3.5-digit LED digital panel meter. An interface connector for a remote instrument control and data acquisition is provided on the rear panel. A high voltage option is also available to increase the output compliance voltage to +35 VDC for certain types of experiments.

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More Details

Input Resistance: ≥ 109 , differential, 1012 Ù available as option

Common Mode Rejection: ≥ 100 dB

Frequency Response: 4-stage adjustment via internal switch

Clamp Output: ±13 V standard, ±±35 V optional high voltage

Display: 3.5 digit, 1/2 in red LED

Transepithelial Voltage ±199.0 mV

Transepithelial Current ±1.990, ±19.90, ±199.9, ±1999 uA, jumper-selectable

Switches: Subminiature Toggle

Grounding: Signal (circuit) ground is isolated from chassis and power grounds. Binding posts on the rear panel allow connection of circuit to chassis ground.

Power: 100/125 VAC, 60 Hz or 200/250 VAC. 50 Hz, user selectable

Meter: Selects current or voltage to be displayed on panel meter

Function: Three position rotary switch

On Zero - Standby mode, voltage inputs are internally grounded

On Open - Open circuit, voltage inputs are connected to sensing electrodes

On Clamp - Feedback loop is closed to control either current or voltage

Mode: Two switches select operating modes

Voltage/Current (I/V) -Selects transepithelial voltage or current to be controlled when

Function in on Clamp

Local/Remote - Selects control to be from font panel switches or from the remote interface

Offset Potential: ±10 mV, set via precision 10-turn dial

Fluid Resistance: Pushbutton current injection, compensation set by precision 10-turn dial, jumper selectable ranges

On/Off: "On" sends pulse output to the clamp, red indicator light

Polarity: Selects +, - or bipolar pulses to be generated

Single Pulse: Injects single pulse during interval between pulses

Reset: Initializes interval timer and injects pulse

Amplitude: 0 to 10 mV in 1 mV steps at X1 gain; 0 to 100 mV in 10 mV steps at X10 gain

Period: 0.1 to 99.9 sec time period between pulse; set by 3-decade thumbwheel switch

Duration: 0.01 to 9.99 sec duration of each pulse; set by 3-decade thumbwheel switch

DC Clamp Level: Sets DC holding voltage or current

Voltage Clamp - $\pm$100 mV and $\pm$300 mV via 10-turn dial

Current Clamp - Current gain dependent, 50% and 150% of maximum display current

Headstage: Active input stage for sensing voltage and current near the preparation, cable length 6 ft

Reference Buffer: Switch selectable to send V1 or V2 inputs to a buffer amplifier in the headstage; allows monitoring of the bath potential on either side of the epithelium.

Output via rear panel permits microelectrode impalements or pH electrodes to be referenced to either V1 or V2.

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