

# Trek Model 603

## Piezo Driver/Power Amplifier



The Trek Model 603 is a high-voltage DC power amplifier/piezo driver designed to provide precise control of output voltages in bipolar or unipolar ranges that are customer specified within a range of available settings. The instrument achieves the accurate output responses and high slew rates demanded by reactive loads by utilizing a four-quadrant active output stage that sinks or sources current into reactive or resistive loads.

The Model 603 is configured as a non-inverting amplifier and is available in single or dual channel packaging. They are operable on a bench top or in a 19-in rack.

### Key Specifications

- Available Voltage Ranges: 0 to  $\pm 125$  V DC or peak AC or  
0 to  $-250$  V DC or peak AC or  
0 to  $+250$  V DC or peak AC
- Output Current Range: 0 to  $\pm 40$  mA DC or  $\pm 80$  mA peak AC for less than 1 ms
- Slew Rate: Greater than  $100$  V/ $\mu$ s
- Large Signal Bandwidth (5% distortion): DC to greater than  $150$  kHz
- DC Voltage Gain:  $50$  V/V or  $25$  V/V

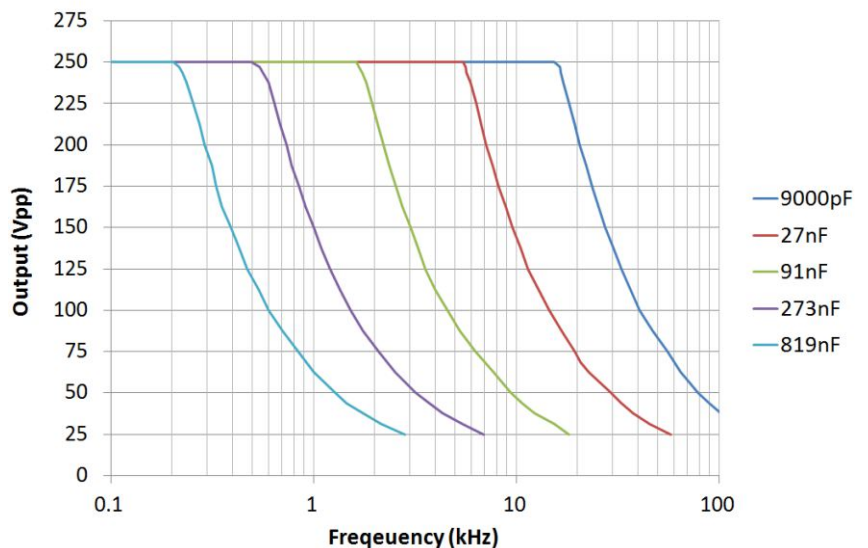
### Typical Applications Include

- Driving piezoelectric actuators
- Modulating electrooptics
- Electrostatically controlling ion beams
- Providing remote ON/OFF capabilities for automated or computer controlled systems

### Features and Benefits

- Four-quadrant output for driving capacitive loads
- Up to two independent amplifier channels in one enclosure
- Short-circuit protected for equipment protection
- Reprogrammable factory-set output configurations
- All solid-state design for maintenance free operation
- Low output noise for ultra-accurate outputs
- NIST-traceable Certificate of Calibration provided with each unit

Model 603



## Model 603 Specifications

### Performance

Available Output Voltage Ranges	0 to $\pm 125$ V DC or peak AC 0 to -250 V DC or peak AC 0 to +250 V DC or peak AC
Output Current	$\pm 40$ mA DC $\pm 80$ mA peak AC, for less than 1 ms
DC Voltage Gain	50 V/V (a gain of 25 V/V is available)
DC Voltage Gain Accuracy	Better than 0.1% of full scale
DC Offset Voltage	Less than $\pm 500$ mV
Output Noise*	Less than 20 mV rms
Slew Rate (10% to 90%, typical)	Greater than 100 V/ $\mu$ s
Large Signal Bandwidth (5% distortion)	DC to greater than 150 kHz
Settling Time to 1%	Less than 5 $\mu$ s for a 100 V step
Stability	
<i>Drift with Time</i>	Less than 100 ppm/hr, noncumulative
<i>Drift with Temperature</i>	Less than 25 ppm/ $^{\circ}$ C

### Amplifier Input

Input Voltage Range	0 to $\pm 10$ V DC or peak AC, noninverting
Input Impedance	10 k $\Omega$ , nominal

### Voltage Monitor

Ratio	1/25th of the high voltage output
DC Accuracy	Better than 0.1% of full scale
AC Accuracy	Calibrated using a Ross Model VD30-4.1-BD-KC-ALU high voltage divider
DC Offset Voltage	Less than 5 mV
Output Noise	Less than 5 mV rms*
Output Impedance	0.1 $\Omega$

### Current Monitor

Ratio	0.1 V/mA
DC Accuracy	Greater than 1% of full scale
Offset Voltage	Less than 10 mV
Output Noise	Less than 10 mV rms*
Output Impedance	0.1 $\Omega$

### Features

Output Voltage Configuration	Factory set for 0 to $\pm 125$ VDC or peak AC. Other ranges available.
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### Features (cont.)

Digital Enable	An input providing a connection for a TTL compatible signal to turn on/off the HV output
Load Range Switch	Slide switch to select high or low capacitive loads (more than 150 pF or less than 150 pF)
Dynamic Adjustment	Graduated 1-turn panel potentiometer is used to optimize the AC response for various load parameters.

### Mechanical

Dimensions <i>Single Channel Instrument</i>	222.3 mm H x 108 mm W 381 mm D (8.75" H x 4.25" W x 15" D)
<i>Double Channel Instrument</i>	433.8 mm H x 108 mm W 381 mm D (17" H x 4.25" W x 15" D)
Weight <i>Single Channel Instrument</i>	4.3 kg (9.4 lb)
<i>Double Channel Instrument</i>	8.6 (18.8 lb)
HV Connector	SHV High Voltage Connector
BNC Connectors	Power Switch, Amplifier Input, Voltage Monitor, Current Monitor, High Voltage ON/OFF, Digital Enable

### Operating Conditions

Temperature	0 $^{\circ}$ C to 40 $^{\circ}$ C (32 $^{\circ}$ F to 104 $^{\circ}$ F)
Relative Humidity	To 85%, noncondensing
Altitude	To 2000 meters (6561.68 ft.)

### Electrical

Line Voltage	Factory Set for one of two ranges: 90 to 127 V AC or 180 to 250 V AC, either at 48 to 63 Hz
AC Line Receptacle	Standard 3-prong with integral fuse holder
Power Consumption	125 VA, maximum
HV Cable	2 m, 66 pF per foot

### Supplied Accessories

Operators' Manual	PN: 23166
HV Output Cable	PN: 43874
Line Cord	N5002
Spare Fuses	Selected per geographic destination

### Optional Accessories

19" Rack Mount Kit	Model 603RA
Half-Rack Mount Kit	Model 604RA (3 1/2" Buckeye)
Dual Instrument Rack Mount Kit	Model 603RA-2

\*Measured using the true rms feature of the Hewlett Packard 34401A digital multimeter

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TREK • 190 Walnut Street • Lockport, NY 14094 • USA  
800-FOR TREK • 716-438-7555 • 716-201-1804 (fax)  
www.trekinc.com • Trek-CA@aei.com



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