

Model 603

Power Amplifier/Piezo Driver



The Trek Model 603 is a DC-stable, Power Amplifier/Piezo Driver designed to provide precise control of output voltages in the ranges of 0 to ± 125 V, 0 to -250 V, or 0 to +250 V DC or peak AC. The output current capability is 0 to ± 40 mA DC or 0 to ± 80 mA peak AC for all voltage ranges. The Model 603 features an all solid-state design for high slew rate, wide bandwidth, and low-noise operation.

The four-quadrant, active output stage sinks or sources current into reactive or resistive loads throughout the output voltage range. This is essential for achieving the accurate output response and high slew rates demanded by reactive loads. Industrial applications using the Model 603 include driving piezoelectric actuators, modulating electrooptics, and electrostatic deflection.

The Model 603 is protected against overvoltage and overcurrent conditions generated by active loads or by output short circuits to ground. Precision voltage and current monitors provide low-voltage representations of the high-voltage output and load current for monitoring purposes or for use as feedback signals in a closed-loop system. The Digital Enable feature provides a connection for a remote device to turn ON and OFF the high-voltage output of the instrument. This makes the Model 603 suitable for automated or computer controlled systems.

The Dynamics Adjust feature can be used to optimize the AC response of the output signal. The Model 603 operates as a non-inverting amplifier with a fixed gain. The input gain can be programmed for 25 V/V or 50 V/V. Consult the factory for information on reprogramming the factory set output configuration. Factory set for an output voltage of ± 125 V DC or peak AC and a signal gain ratio of 50 V/V. The Model 603 is available in single or dual channel configurations.

- **Available Voltage Ranges:**

- 0 to ± 125 V, DC or peak AC

- 0 to -250 V, DC or peak AC

- 0 to +250 V, DC or peak AC

- **Current Range:**

- 0 to ± 40 mA DC

- 0 to ± 80 mA peak AC for less than 1 ms

- **Available Gain Ratios:**

- 50 V / V or 25 V / V

- **DC Accuracy:**

- Better than 0.1% of full scale

- **Slew Rate:**

- Greater than 100 V/ μ s

- **Precision voltage and current monitors**

- **Remote high-voltage ON/OFF capability**

- **Up to two independent amplifier channels in one enclosure**

- **CE compliant**



Measurement and Power Solutions™

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Model 603 Specifications

Output

Output Voltage Range*

Available in voltage ranges of 0 to ± 125 V, 0 to -250 V, or 0 to $+250$ V DC or peak AC.

Output Current Range (all voltages)

0 to ± 40 mA DC.
0 to ± 80 mA peak AC, for less than 1ms.

Amplifier Input

Input Voltage Range

0 to ± 10 V DC or peak AC noninverting.

Input Impedance

10 Ω , nominal.

Performance

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.

Offset Voltage

Less than 500 mV.

Output Noise

Less than 20 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter).

Slew Rate (10% to 90%, typical)

Greater than 100 V/ μ s.

Large Signal Bandwidth (5% distortion)

DC to 150 kHz.

Settling Time to 1%

Less than 5 μ s for a 100 V step.

Stability

Drift with Time

Less than 100 ppm/hr, noncumulative

Drift with Temperature

Less than 25 ppm/ $^{\circ}$ C.

Features

Voltage Monitor

A buffered output provides a low-voltage replica of the high-voltage output.

Scale

1/25th of the high-voltage output.

DC Accuracy

Better than 0.1% of full scale.

AC Accuracy

Calibrated using a Ross Model VD 30-4.1-BD-KC-ALU high-voltage divider.

Offset Voltage

Less than 5 mV.

Output Noise

Less than 5 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter).

Output Impedance

Less than 0.1 Ω .

Current Monitor

A buffered output provides a low-voltage representation of the load current.

Scale

0.1 V/mA.

DC Accuracy

Better than 1% of full scale.

Offset Voltage

Better than 10 mV.

Output Noise

Less than 10 mV rms (measured using the true rms feature of the Hewlett Packard Model 34401A digital multimeter).

Output Impedance

0.1 Ω .

Output Voltage Configurations

Factory set for 0 to ± 125 V DC or peak AC. Other available output voltage ranges are 0 to -250 V or 0 to $+250$ V DC or peak AC. This setting is customer specified.

Digital Enable

An input providing a connection for a TTL compatible signal to turn on and off the high-voltage output.

Features (cont.)

Load Range Switch

The Model 603 has a slide switch to select between high capacitive loads (more than 150 pF) or low capacitive load (less than 150 pF).

Dynamics Adjust

A graduated one-turn potentiometer is used to optimize the AC response of the Model 603.

General

Dimensions

Single Channel Instrument

222.3mm W x 108mm H x 381mm D (8.75" W x 4.25" H x 15" D).

Dual Channel Instrument

433.8mm W x 108mm H x 381mm D (17" W x 4.25" H x 15" D).

Weight

Single Channel Instrument

4.3 kg (9.4 lb)

Dual Channel Instrument

8.6 kg (18.8 lb)

High-Voltage Output Connector

SHV high-voltage connector.

Power Requirements

Line Voltage

Factory set for one of two ranges: 90 to 127 V AC or 180 to 250 V AC, at 48 to 63 Hz (specify when ordering).

Power Consumption

125 VA, maximum.

Power Receptacle

Standard three-prong power connector with an integral fuse holder.

* Specify when ordering or contact TREK, INC.

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Model 603 Ordering Information

Item

Power Amplifier/Piezo Driver (90 to 127 V AC) 603-L
Power Amplifier/Piezo Driver (180 to 250 V AC) 603-H

The Model 603 comes from the factory with settings for an output voltage of ± 125 V DC or peak AC, a voltage gain ratio of 50 V/V, with a noninverting input. If more than one output voltage range, or voltage gain ratio is required, please contact TREK, INC. for more information.

Included Accessories

Operator's Manual 23166
High-Voltage Output Cable Assembly (3 meters) 43874
Line Cord (90 to 127 V AC) N5002
Unterminated Line Cord (180 to 250 V AC) Contact Factory

Optional Accessories

Item

Part No.

603RA Full Rack Mount Kit C4036
603RA-2 Dual Instrument Full Rack Mount Kit C4060
604RA Half-Rack Mount Kit C4008

Certification

TREK, INC. certifies that each Model 604 is tested and calibrated to specifications using measurement equipment traceable to the National Institute of Standards and Technology or traceable to consensus standards. A Certificate of Calibration accompanies each instrument when it is shipped from the factory.



TREK, INC. • 11601 Maple Ridge Road • Medina, NY 14103 • USA • 800-FOR TREK
585-798-3140 • 585-798-3106 (fax) • www.trekinc.com • sales@trekinc.com

