HVP
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Advanced Energy

TREK 603

High voltage power amplifier/piezo driver for precise control of output voltages in customer specified bipoloar or unipolar ranges within available ranges.

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

PRODUCT HIGHLIGHTS

- 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

TYPICAL APPLICATIONS

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

AT A GLANCE

Available Voltage Ranges

0 to ±125 VDC or peak AC
0 to -250 VDC or peak AC
0 to +250 VDC or peak AC

Output Current Range

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

Slew Rate

Greater than 100 V/µs

Large Signal Bandwidth (5%)

DC to greater than 150 kHz

DC Voltage Gain

50 V/V or 25 V/V

TECHNICAL DATA

Performance Specifications		
Available Output Voltage Ranges	0 to ±125 VDC or peak AC	
	0 to -250 VDC or peak AC	
	0 to +250 VDC or peak AC	
Output Current	±40 mA DC or ±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 500 mV	
Output Noise	Less than 20 V rms[1]	
Slew Rate	Greater than 100 V/µs (10% to 90%, typical)	
Large Signal Bandwidth	DC to greater than 150 kHz (5% distortion)	
Stability	Drift with Time: Less than 100 ppm/hr, noncumulative	Drift with Temp: Less than 25 ppm/°C

Amplifier Input	
Input Voltage Range	0 to ±10 V DC or peak AC, non-inverting
Input Impedance	10 kΩ, nominal

Voltage Monitor Specifications	
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-BDKC-ALU high voltage divider
DC Offset Voltage	Less than 5 mV
Output Noise	Less than 5 mV rms[1]
Output Impedance	0.1 Ω

Current Monitor Specifications	
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[1]
Output Impedance	0.1 Ω

Mechanical Specifications		
Dimensions (H x W x D)	Single Channel Instrument	222.3 x 108 x 381 mm (8.75 x 4.25 x 15 in)
	Double Channel Instrument	433.8 x 108 x 335 mm (17 x 4.25 x 15 in)
Weight	Single Channel Instrument	4.3 kg (9.4 lb)
	Double Channel Instrument	8.6 kg (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	

[1] Measured using the true rms feature of the HP Model 34401A digital multimeter

TECHNICAL DATA

Electrical Specifications	
Line Voltage	Factory set for one of two ranges: 104 to 127 VAC or 180 to 250 VAC at 48 to 63 Hz
AC Line Receptacle	Standard three-prong with integral fuse holder
Power Consumption	125 VA, maximum
HV Cable	2 m, 66 pF per foot

Environmental Specifications	
Temperature	0 to 40°C (32 to 104°F)
Relative Humidity	To 85%, noncondensing
Altitude	To 2000 meters (6561.68 ft)

Features	
Output Voltage Configurations	Factory set for 0 to ±125 VDC or peak AC. Other ranges available.
Digital Enable	An input providing a connection for a TTL compatible signal to turn on and off the high voltage 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 one-turn panel potentiometer is used to optimize the AC response for various load parameters.

REFERENCE NUMBERS

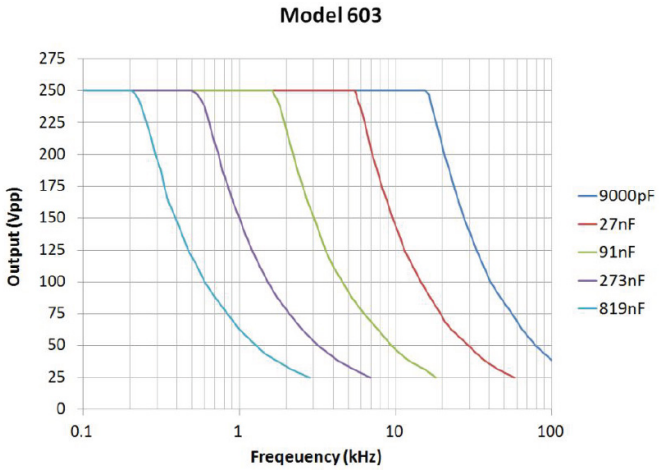
Included Accessories

PN	Description
23166	Operator's Manual
43874	HV Output Cable
N5002	Line Cord Spare Fuses (selected per geographic destination)

Optional Accessories

PN	Description
603RA	19 in Rack Mount Kit
604RA	Full Rack Mount Kit (3.5 in Buckeye)
603RA-2	Dual Instrument Rack Kit

MODEL 603


Model 603
Output (Vpp)
275
250
225
200
175
150
125
100
75
50
25
0
0.1
1
10
100
Freqeuency (kHz)
9000pF
27nF
91nF
273nF
819nF