

# Model 615-10

[formerly Model PM04015A]

## $\pm 10$ kV (20 kV p-p) High-Voltage AC/DC Generator



The Trek Model 615-10 is a precision high voltage AC/DC generator and amplifier system used in a broad range of R&D and production applications which include providing operating potentials required for electrostatic charger roller devices as used in electrophotographic processes.

### Constant Voltage Mode

In the constant voltage mode, the 615-10 generates constant amplitude waveforms with or without DC bias over a range of  $\pm 10$  kV (20 kV p-p) with a constant current output of  $\pm 35$  mA peak,  $\pm 10$  mA DC. A high slew rate capability of 500 V/ $\mu$ s provides low distortion of full output AC waveform of greater than 7.5 kHz (sine).

### Constant Current Mode

In the constant current mode, the 615-10 generates constant amplitude AC current waveforms, with or without an added DC bias, over a range of 0 to  $\pm 10$  mA with an output voltage compliance range of  $\pm 10$  kV (20 kV p-p).

### Amplifier Mode

In the AMPLIFIER mode, an analog voltage input connector is provided to apply external AC or DC signals to be amplified by the 615-10. Amplifier gain is fixed at 1000 V/V to provide up to 20 kV p-p voltages to the output terminal at  $\pm 35$  mA peak,  $\pm 10$  mA DC. The DC BIAS control circuitry is active while in the amplifier mode.

The Model 615-10 provides many extra features to provide versatility in operation such as voltage limiting control and current limiting control. The Trek exclusive I(s) control provides for termination of a load current path which is not to be monitored/controlled, such as electrophotographic corotron/scoratron device shield current. This feature allows tightly regulated ion charging current flow to the photoconductor surface without the need to monitor drum return current.

Voltage and current values are read by front panel displays or through rear panel buffered outputs providing low-voltage representations of the load current and the high-voltage output. A 25-pin "D" connector permits connection of TTL signals and 0 to +10 V DC analog signals to remotely control the operation of the Model 615-10.

Models 615A-1 and 615-3 have the same features with a 10 kV peak-to-peak capability. Call for more information.

### Primary Specifications

Monitors and controls  
AC/DC voltages over a  
wide frequency range with  
very high accuracy

Output Voltage Range:  
0 to 20 kV peak-to-peak

Output Current Ranges:  
0 to  $\pm 35$  mA peak AC  
0 to  $\pm 10$  mA DC

DC Bias Range:  
0 to  $\pm 10$  kV DC

Three Modes of Operation:  
AC/DC Constant Voltage,  
AC/DC Constant Current,  
or Amplifier mode (with or  
without DC offset bias)

Select Sine, Square, or  
Triangle wave output  
shape waveforms

Four-quadrant high-  
voltage output stage  
design extends frequency  
response

INTERFACE connector  
permits remote operation

High rejection of load  
current noise components

CE compliant

# Model 615-10 Primary Specifications

## Output Limits (any mode)

### AC Voltage (DC Bias is zero)

0 to 20 kV peak-to-peak.

### DC Bias (AC voltage is zero)

0 to  $\pm 10$  kV DC.

### AC Voltage + DC Bias

0 to  $\pm 20$  kV (combined AC and DC instantaneous voltage value).

### AC Current (DC Current is zero)

0 to  $\pm 10$  mA average where:  
AC current average =  $\frac{(2) I_{\text{peak}}}{3.14}$

### DC Current (AC current is zero)

0 to  $\pm 10$  mA DC.

### AC Current + DC Current

0 to  $\pm 35$  mA peak.

### Frequency (Internal Generator)

100 Hz to 10 kHz.

## Features

### Internal AC Generator

An internal AC function generator is used to produce the AC output voltage (Constant AC Voltage mode) or the AC output current (Constant AC Current mode).

#### Waveform Options

Square, sine, or triangle.

#### Frequency Range

100 Hz to 10 kHz.

### Amplifier Input Mode

A front panel BNC connector which will process an external signal.

### Constant Voltage/Constant Current

Two 10-turn dials for precise settings.

### DC Bias

Adjustable from 0 to  $\pm 10$  kV DC.

### High-Voltage AC Output Limit

Adjustable from 0 to 20 kV p-p for both Constant Current mode and Constant Voltage mode.

#### Accuracy

5% of full scale.

### High-Voltage On/Off

#### Local

Front panel switch.

#### Remote

A TTL compatible input.

### Load Compensation Adjustments

Two potentiometers are used to adjust the AC response for various load parameters.

## Features (cont.)

### Master DC Switch

Turns ON and OFF the DC generator.

### Master AC Switch

Turns ON and OFF the AC generator.

### AC Voltage or Current Mode Selection Local Operation

A front panel switch.

### Remote Operation

A TTL compatible signal applied to the Mode Select input of the Remote Interface connector.

### Compliance Indicator

A LED will illuminate during an overvoltage condition when operating in the Constant Current mode or during an overcurrent condition when operating in the Constant Voltage mode.

### Overload Indicator

A red LED will illuminate when the output current limit is exceeded.

## Voltage/Current Displays and Monitors

### AC Display

A 3½ digit LED display indicates the peak-to-peak value of the AC voltage output or the average AC current waveform (switch selectable).

#### Accuracy

Better than 0.5% of full scale  $\pm 1$  digit.

### DC Display

A 3½ digit LED display indicates either the level of the DC bias or the level of the DC load current (switch selectable).

#### Accuracy

Better than 0.2% of full scale  $\pm 1$  digit.

### Voltage Monitor

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

#### Scale Factor

1/1000th of the high-voltage output.

### Current Monitor

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

#### Scale Factor

0.25 V/mA.

## Additional Specifications for the Amplifier Mode

### Input Voltage Range

$\pm 10$  V DC or peak AC.

### Gain for Noninverting Voltage

The gain of the noninverting amplifier is factory set for 1000 V/V.

### DC Voltage Gain Accuracy

0.5% of full scale

### Slew Rate (10 to 90 %) typical

Greater than 500 V/ $\mu$ s.

### Large Signal Bandwidth, typical (Less than 2% distortion)

DC to greater than 7.5 kHz.

### Small Signal Bandwidth(-3 db)

DC to greater than 20 kHz.

## General

### Dimensions

237 mm H x 432 mm W x 432 mm D  
(9.3" H x 17" W x 17" D).

### Weight

19.3 kg (42.5 lb).

### Power Requirements

#### Line Supply

90 to 127 V AC at 48 to 63 Hz  
(180 to 250 V AC at 48 to 63 Hz optionally available).

#### Power Consumption

600 VA.

## Certification

TREK, INC. certifies that each Model 615-10 is tested and calibrated to specifications using measurement equipment traceable to the National Institute of Standards and Technology or traceable to consensus standards. CE Compliant.

*The 615-10 can be operated on a bench top or, with optional hardware, in a standard 19-inch rack.*

**Models 615A-1 and 615-3 have a 10 kV peak-to-peak capability. Call for more information.**

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0914/JNC



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ISO 9001:2000  
FM 56910