

# Model 615-10

[formerly Model PM04015A]

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

### Primary Specifications



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, it generates constant amplitude AC current waveforms, with or without added DC bias, over 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 for 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 electro-photographic corotron/scoratron device shield current. This feature allows tightly regulated ion charging current flow to the photo-conductor 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 provide the same features with 10 kV peak-to-peak.

- 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



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# 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 3 ½ 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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