

# Model 370TR

## DC-Stable Electrostatic Voltmeter



The Trek Model 370TR is a precision electrostatic voltmeter with the unique capability of making noncontacting surface voltage measurements in the range of 0 to  $\pm 3$  kV DC or peak AC.

The 370TR employs an electrostatic field-nulling technique which achieves high DC stability and high measurement accuracy even if the probe to measured surface spacing changes. This permits measurements of either stationary or moving surfaces without the need to establish fixed spacing to maintain accuracy.

The Model 3629A Transparent probe permits light to pass through the probe to provide simultaneous radiation and measurement of a surface. This is useful for photosensitive surface studies such as 'time of flight' measurements of photoconductor surfaces.

A Digital Enable connection permits remote ON/OFF measurement capability. An automatic gain control feature of the 370TR eliminates the need for manual adjustment when changing probes or when changing the probe to measured surface separation. The 370TR also features one-step, push-button zeroing. When the ZERO button on the front panel is pressed, the 370TR automatically adjusts the output to zero volts when the probe is coupled to a known zero volt surface.

A precision voltage monitor provides a low-voltage replica of the measured electrostatic voltage for external monitoring purposes, or for use as a feedback signal in a closed-loop system.

An optional data acquisition module is available, featuring an IEEE-488 compatible interface, 14-bit resolution, 12-bit accuracy, and a programmable sampling period from 10  $\mu$ s to 30 minutes.

- High speed of response: Less than 200  $\mu$ s for a 1 kV step
- Transparent probe enables simultaneous radiation and measurement of surfaces
- Measurement range: 0 to  $\pm 3$  kV DC or peak AC
- Measurement accuracy: Better than 0.05% of full scale
- Automatic gain control eliminates manual adjustment
- One step, push-button zeroing
- Precision voltage monitor output
- Remote ON/OFF operation capability
- Optional data acquisition module
- $\text{CE}$  compliant



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# Model 370TR Specifications

All specifications are with a 3627 or 3629A probe at a probe-to-surface separation of 2 mm unless otherwise noted.

## Performance

### Measurement Range

0 to  $\pm 3$  kV DC or peak AC.

### Measurement Accuracy

#### At the Voltage Monitor

Better than  $\pm 0.05\%$  of full scale.

#### At the Voltage Display

Better than  $\pm 0.1\%$  of full scale  
 $\pm 1$  count, referred to the voltage monitor.

### Speed of Response (10% to 90%)

Less than 200  $\mu$ s for a 1 kV step.

### Stability

#### Drift with Time

Less than 150 ppm/hour,  
 noncumulative.

#### Drift with Temperature

Less than 100 ppm/ $^{\circ}$ C.

## Features

### Zero Control

A momentary push-button switch to produce zero volts output when the probe is coupled to a known zero volt surface.

### Automatic Gain Control

The 370TR automatically optimizes the gain of the AC response when changing the type of probe being used or when changing the probe-to-surface separation.

### Voltage Display

4-character, 7-segment LED display.

**Range** 0 to  $\pm 3000$  V.

**Resolution** 1 V.

**Zero Offset**  $\pm 1$  count, referred to the voltage monitor.

#### Sampling Rate

2.5 readings per second.

## Features (cont.)

### Voltage Monitor Output

A buffered output providing a low-voltage replica of the measured voltage.

#### Scale Factors

1/100th of the measured voltage.  
 (1/200, 1/300, 1/600, 1/1000 options available.)

#### Offset Voltage

Less than 10 mV.

#### Output Noise

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

#### Output Impedance

Less than 0.1  $\Omega$ .

#### Output Current Limit

$\pm 10$  mA

### Digital Enable

An open collector, TTL compatible input to enable or disable the measurement. A TTL high will disable the measurement, while a TTL low will enable the measurement.

### Data Acquisition Module (optional)

Provides data output using an IEEE-488 compatible interface.

**Resolution** 14 bit.

**Accuracy** 12 bit.

#### Sampling Period

Programmable from 10  $\mu$ s to 30 min.

#### Storage

32 Kbytes  
 (16 Kbytes of data words).

#### Interface Functions

SH1, AH1, T6, L4, SR1, RL1, PPO, DC1, DTO, CO, E2.

#### Address

Switch selectable between 0 and 30.

## General

### Dimensions

108 mm H x 223 mm W x 430 mm D  
 (4.25" H x 8.75" W x 17" D).

### Weight

5 kg (11 lb).

## General (cont.)

### Digital Enable

BNC connector.

### Voltage Monitor Output Connector

BNC connector.

### Ground Receptacle

Binding post.

### Power Requirements

#### Line Voltage

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

#### Power Consumption

60 VA, maximum.

### Operating Conditions

#### Temperature

0  $^{\circ}$ C to 40  $^{\circ}$ C.

#### Relative Humidity

To 85%, noncondensing.

## Probes

### Probe-to-Surface Separation

2 mm  $\pm$  1 mm (recommended).

### Model 3629A (Transparent)

**Body Shape** Square.

**Aperture Size** 5.3 mm diameter.

**Aperture Location** Side.

#### Dimensions

11.8 mm sq. x 65.6 mm L.

### Model 3627

**Body Shape** Square.

**Aperture Size** 1.5 mm x 3.0 mm.

**Aperture Location** Side.

#### Dimensions

11.8 mm sq. x 76.2 mm L.

### Certification and Compliance

TREK, INC. certifies that each Model 370TR is tested and calibrated to specifications using measurement equipment traceable to the National Institute of Standards and Technology.

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All specifications are subject to change.  
 1122/DEC

## Model 370TR

Item	Part No.
Electrostatic Voltmeter with 1/100 Monitor Output Ratio	370TR-1
Electrostatic Voltmeter with 1/200 Monitor Output Ratio	370TR-2
Electrostatic Voltmeter with 1/300 Monitor Output Ratio	370TR-3
Electrostatic Voltmeter with 1/600 Monitor Output Ratio	370TR-6
Electrostatic Voltmeter with 1/1000 Monitor Output Ratio	370TR-10
<b>Line Voltage</b>	
90 to 127 V AC	(Part Number)-L
180 to 250 V AC	(Part Number)-H

## Optional Accessories

Item	Part No.
Data Acquisition Module with IEEE-488 Compatible Interface	16073
603RA Full-Rack Mounting Kit	603RA
604RA 1/2 Rack Mounting Kit	604RA
<b>Probes</b>	
<b>Transparent Probe</b>	
Model 3629A (side-viewing)	3629A
<b>Standard Probe</b>	
Model 3627 (side-viewing)	3627

