DORGEAN
Beijing Dorgean Electronic Technology Co.,Ltd

Instrument Expert
Original factory packaging
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Advanced Energy®

TREK 645

Software-driven electrostatic chuck supply offers an array of features that provide significant benefits while accommodating a variety of demanding applications.

The Trek® 645 software-driven electrostatic chuck supply with documented use that shows customers have seen increases in efficiency and throughput equal to three times that of other supplies. The Trek 645 virtually eliminates sticky wafer and wafer popping issues, thus ensuring better control over particle contamination. Given the versatility and performance of the Trek 645, it can be used in multiple unique tools/processes, thus eliminating the need to specify a new supply for each unique tool/process in a facility.

PRODUCT HIGHLIGHTS

- Supports both Coulombic and Johnsen-Rahbek ESC technologies
- User configurable for custom clamp and declamp sequences and wave shapes
- Electrostatic chuck profiles can be uploaded to the unit and stored internally via a user-friendly software interface
- Documented reduction of backside gas errors, increased throughput, and elimination of sticky/popping wafers
- Lockable front panel control interface
- Ability to control parameters such as over-current, wafer-present and wafer-clamped thresholds, clamp voltage, offset voltage and internal or external amplitude/offset control
- Wafer detection includes no wafer, wafer present or wafer clamped status
- Includes in-process-adjustable amplitude/offset and output-control versatility
- Output can be controlled by back panel I/O, serial computer command or front panel controls
- NIST-traceable Certificate of Calibration provided with each unit

AT A GLANCE

Output Phasing

0 to ±2 kV

Output Voltage Range

0 to ±2 kV

Output Current Range

0 to ±6.5 mA DC with a peak capability of 10 mA

TYPICAL APPLICATIONS

- Electrostatic-driven handling of materials
- Semiconductor wafer processing
- Non-mechanical transfer of flat panels or other processing materials sensitive to mechanical clipping

TREK 645 ELECTROSTATIC CHUCK SUPPLY

TECHNICAL DATA

Outputs		
Simultaneous High Voltage Outputs	Two simultaneous high-voltage outputs (Output Phase A and Output Phase B) of equal magnitude and opposite in polarity relative to an offset voltage	
Output Phasing	Output Voltage A (Reference Phase)	0 to ±2 kV
	Output Voltage B	0 to ±2 kV (Phase B =[-1] x Phase A)
	Offset Voltage	An offset voltage of up to ±2 kV may be simultaneously added to the output of each phase. When an offset voltage is added, the polarity and magnitude of offset voltage appears simultaneously on both outputs A and B regardless of the magnitude and polarity of the A and B voltages themselves. The sum of the offset voltage and the output voltage of each phase cannot exceed ±2 kV
Output Waveshape	Each DC output voltage (Phase A and Phase B) is ramped up and down with symmetrical rise and fall times, or can be programmed with the user's custom clamping and declamping waveforms	
Output Voltage Range	0 to ±2 kVDC, maximum	
Output Current	0 to ±6.5 mADC with peak capability of 10 mA	

Input	
Setting the High Voltage Amplitude	HV magnitude can be controlled either externally or internally to the unit
Setting the Offset Voltage	Offset voltage may be controlled externally or internally to the unit

Output Voltage Monitor (Back Panel Connector)	
Scale Factor	1 V/200 V
Phase B DC	Accuracy better than 2% of full scale
Offset Voltage	Less than 10 mV
Output Noise	Less than 50 mV rms[1]

Steady State Voltage Leakage Current Monitor	
Scale Factor	1 V / 100 µA
DC Accuracy	±5 µA
Output Noise	Less than 50 mV rms[1]

Mechanical Specifications	
Dimensions (H x W x D)	43.7 x 421.6 x 457.3 mm (1.72 x 16.6 x 18 in) 1U rack enclosure
Panel Width	482.6 mm (19 in)
Weight	3.86 kg (8.5 lb)
Connectors	15-pin "D" ITT Canon used by remote device to control/monitor the unit, 9-pin "D" ITT Canon RS232, 3-Pin FCT "D" High-Voltage, standard type-A USB, Ethernet (optional) and Front Panel
Power ON/OFF	Two-position rocker switch

Electrical Specifications	
DC Input Receptacle	2.0 mm locking DC jack; center contact is positive and shell is negative (receptacle mates with Switchcraft S761K plug)
Ground Receptacle	Ground stud
Power Requirements	24 VDC, 1.7 A

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

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TECHNICAL DATA

Environmental Specifications	
Temperature	0 to 35°C (32 to 104°F)
Relative Humidity	To 85%, noncondensing
Altitude	To 2000 m (6561.68 ft)

Features	
Interlock	Connections are provided to support an interlock safety configuration. In the event that the interlock is open, the high-voltage generation circuits are shut down
Digital Display	40 x 2 LCD character display shows various system functions such as Set Voltage, Output Voltage and Capacitance Monitor
Clamped Wafer Detection Feature (Thresholds are set by the program)	To indicate wafer clamping events, the capacitive currents generated by a low voltage sine wave, super-imposed on the Phase A and Phase B outputs, are monitored but can be disabled through the program. The superimposed waveform is used to indicate a no wafer, wafer present, or wafer clamped status
Capacitive Load Select	Clamped capacitance status range can be selected by the program for 0 to 10, 20 or 30nF (phase to phase) depending on the system and electrostatic clamp physical configurations

REFERENCE NUMBERS

Included Accessories	
PN	**Description**
24010	Operator's Manual, Software
BA103	USB Cable
B8084R, B8085R, B8088R, B8089R	HV Connectors
Varies	Line Cord, Spare Fuses (selected per geographic region)

Optional Accessories	
PN	**Description**
1K045	90 to 264 VAC to 24 VDC Power Adapter

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ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

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