

Model ES Uninterruptible Power System 60Hz General Specifications

Technology

The Controlled Power Company Model ES is an on-line, double conversion, uninterrupted, sinewave output topology that provides the following product features and performance.

Standards

The Model ES is designed in accordance with applicable portions of the following standards:

American National Standards Institute (ANSI C57.110)
 Institute of Electrical and Electronic Engineers (IEEE 519-1992) (C62.41-1991)
 National Electrical Manufacturers Association (NEMA PE-1)
 IEC 62040-3, UPS Performance and Test Requirements
 National Electric Code (NEC 2008)
 National Fire Protection Association (NFPA 70)
 Federal Communications Commission (FCC Part 15, Subpart J, Class A)
 Listed UL Standard – UL 1778 Uninterruptible Power Systems
 C-UL Canadian National Standard C22.2, No. 107.1 M01

Standard Components

- * Main input CB.
- * Integral automatic static bypass switch.
- * Integral secure make before break manually operated bypass switch.
- * Integral switch to isolate rectifier and inverter module for maintenance while in manual bypass.
- * Battery system includes integral over current protection and quick connect / disconnect style DC connector for ease of service and added safety during maintenance.
- * NEMA 1 enclosure provided on lockable casters and leveling feet for permanent positioning.
- * Local monitor with a high resolution LCD touch-screen display for viewing and entering user-programmable periodic battery test time and date, alarm set points, system parameters, status, and alarms.
- * Hardwired input and output terminals.
- * Hardwire terminal connection for customer's remote emergency power off (REPO), normally open input contact.

Performance Specifications

- * Input Voltage: (120*)(208)(208/120)(220)(240)(240/120)(347)(480)(600) VAC.
*120 VAC up to 5500 VA.
 - * Input Voltage Range: +12% to -15% at full load without battery usage.
- Note:** For input voltage excursions within +12 to -50%, UPS will incorporate Adaptive Input Range control, in conjunction with the load percentage, to accept this range without using battery, still maintaining specified output voltage regulation.
- * Input Frequency Range: 57 Hz to 63 Hz. Generator compatible.
 - * Input Power Factor: Self corrected to >.98 (approaching unity).
 - * Input Current Harmonics: < 5% THD (Total Harmonic Distortion).
 - * Output VA Rating: (4500) (5500) (6500) (7500) (8300) (9000) (10000) (11000)
(12000) (13500) (14500) (15500) VA.
 - * Output Voltage: (120*)(208/120)(240/120)(240/208/120**) VAC.
*120 VAC up to 5500 VA.
**Full rated load from a single 120VAC output (4500 VA through 11000 VA)
 - * Output Voltage Distortion: Sinewave with less than 3% THD under linear load.
 - * Output Frequency: 60 Hz +/- 0.5% under full load during battery mode of operation.

- * Voltage Regulation: +/- 1.5%, no load to full load.
- * Output Power Rating: VA at 0.90 power factor. VA x PF = Watts.
- * Battery Time: Battery run times are specified at full rated output watts.
- * Battery Type: Integral, valve regulated, sealed lead calcium, maintenance free with 10 year design life.
- * Charger Type: Integral, 4 stage, temperature compensated.
- * Charger Ratings: 5 amp for battery options A and B
10 amp for battery options C through J
- * Recharge Time: <10 times the discharge period to 90% capacity.
- * DC Bus Voltage: 120 VDC
- * Overload Rating for system: 125% for 2 minutes, 150% for 30 seconds, 200% for 15 cycles when fed from AC power source.
- * On Battery Overload Rating: 125% for 30 cycles, 150% for 3 cycles.
- * Common Mode Attenuation: 70 dB minimum (models with internal shielded isolation transformer).
- * Transverse Mode Attenuation: 60 dB minimum at 100KHz (models with internal shielded isolation transformer).
- * Reactive Power Correction: Load @ .6PF automatically corrected to >.98 at input.
- * Efficiency: 87% at full load typical.

UPS Enclosure Configuration

Output VA*	Input - Output Voltage	UPS Cabinet Style
4500 - 5500	120	S*
4500 - 11000	208/120	S*
4500 - 11000	240/120	S*
12000 - 15500	208/120	T
12000 - 15500	240/120	T
4500 - 15500	(see Note)	T

*UPS cabinet style T may be selected to accommodate longer battery run times. See Battery Run Time chart for options.

Note: UPS cabinet style T is required when the input and output voltages are not the same, requiring an internal isolation transformer.

UPS Cabinet Style S Dimensions: 17"W x 36.5"D x 37.5"H

UPS Cabinet Style T Dimensions: 22.57"W x 36.5"D x 49"H

Battery Run Time Options

Output Power		UPS Cabinet S Internal Battery		UPS Cabinet T Internal Battery					UPS Cabinet T External Battery*			
VA	Watt	A	B	A	B	C	D	E	F	G	H	J
4500	4050	7	27	7	27	42	50	70	120	190	210	300
5500	4950	5	19	5	19	29	35	50	90	180	195	235
6500	5850		14		14	19	29	48	70	105	120	180
7500	6750		12		12	17	25	38	60	90	105	170
8300	7470		10		10	15	19	36	55	80	90	150
9000	8100		8		8	12	18	28	50	70	80	135
10000	9000		6		6	11	17	24	45	60	70	105
11000	9900		4			8	13	21	35	55	60	90
12000	10800					7	12	19	30	45	55	80
13500	12150					6	10	15	28	40	50	70
14500	13050						6	14	25	30	45	65
15500	13950							12	20	27	42	60

Battery run times provided in minutes.

*Notes: Battery options F through J require an external battery cabinet, together with UPS cabinet style T. External battery cabinet matches the dimensions of the UPS cabinet style T.

Output Distribution Options

- * UPS Cabinet Style S Maximum of four (4) locking receptacles and three (3) non-locking duplex receptacles, each with their own circuit breaker, OR breakers only option for hardwired connection, maximum of 8 poles available.
- * UPS Cabinet Style T Maximum of six (6) locking receptacles and four (4) non-locking duplex receptacles, each with their own circuit breaker, OR breakers only option for hardwired connection, maximum of 16 poles available.

Environmental Specifications

- * Operating Temperature 0°C (32°F) to 40°C (105°F) . Optimum battery performance and life are achieved at 25°C.
- * UPS Storage Temperature -20°C (-4°F) to 50°C (122°F).
- * Battery Storage Temperature 25°C (77°F) for 6 months. For each 9°C (16°F) rise, reduce storage time by half.
- * Relative Humidity 95% non-condensing.
- * Elevation: 5000 feet, 1500 meters, without derating.

Advanced Intellistat Monitoring & Diagnostics

- * Display Monitor: High resolution TFT LCD touch-screen display provided for viewing and entering user-programmable periodic battery test time and date, alarm set points, system parameters, status, and alarms.
- * Electrical Measurements Input Voltage; Output Voltage L1-N; Output Voltage L2-N; Output Current L1-N; Output Current L2-N; Output Volt-Amperes L1-N; Output Volt-Amperes L2-N; Output Volt-Amperes Total; Output Watts L1-N; Output Watts L2-N; Output Watts Total; Output Power Factor L1 – N; Output Power Factor L2 – N; Output Power Factor Total; Output Percent Load L1-N; Output Percent Load L2-N; Output Percent Load Total; Output Frequency; Battery Voltage; Battery Charger Current.
- * Status & Alarm Conditions Input Voltage High/Low; Output Voltage L1-N High/Low; Output Voltage L2-N High/Low; Output Volt-Amperes High - Overload; Output Frequency High/Low; Battery Voltage High/Low; Battery Charger Current High; General Alarm; System On Battery; Low Battery Warning; Low Battery Shutdown; Overtemperature Warning; DC Charger Failure / DC Open; REPO Shutdown; System in Manual Bypass; System in Static Bypass; Battery Test Pass; Battery Test Fail.
- * Operating Conditions System Normal; Percent Battery Time Remaining; Battery Test In Process.
- * System Set Points System status for high/low alarm threshold set points; programming of periodic battery test date and time.
- * Manual Test Proprietary, password protected “Push to Test” feature to initiate a 30 second battery test.
- * Automatic Test User-programmable 30 second battery test, including the date, time, and frequency of the battery test.
- * Automatic Test Results Pass/fail indication, time and date stamped, accessed via the local monitor’s touch-screen display.

- * Automatic Test Log Monitor maintains a historic log that sequentially records 25 battery tests which indicate time, date and pass/fail results. The log is available via the LCD touch-screen display of the monitor.
- * Status Alarm Log Monitor maintains a historic log that sequentially records 25 status alarms which indicate time and date of abnormal occurrences. The log is available via the LCD touch-screen display of the monitor.
- * Communications Serial Communications via a standard USB port is provided for authorized access to electrical parameters, system status, alarms, system set point programming, and the test and alarm logs.
- * Relay Contacts A hardwired terminal strip interface is available for remote indication of UPS on battery, low battery warning, on static bypass, and general alarm. Relay contacts are potential free, normally open, and rated for 120VAC @ .5 amps.

Optional Remote Communications

- * Network Communications Optional slot cards are available for remote monitoring and reporting of electrical parameters, system status, alarms, event logs, and automatic battery test results. Network communication options include Ethernet TCP/IP, MODBUS TCP, or MODBUS RS485.

Warranty

Controlled Power Company guarantees the UPS electronics and controls to be free from defects in material and workmanship for a period of (3) years following shipment from the factory. Battery warranty is 2-year full replacement. On site labor for warranty repair in the United States and Canada is covered for 90 days following shipment from the factory.