

BC-HP-E

PROGRAMMABLE HIGH POWER CHARGERS



POSITIVE PROBLEM SOLVING **+ =**

The BC-HP-E is a high power charger, with output voltages up to 1500V available. A ten turn digitally encoded potentiometer allows for straight forward front panel operation.

The front panel display indicates all relevant output quantities simultaneously. Output values can be preset and read prior to releasing the output. ATE options are offered for system integration. Each unit has an RS-232 and isolated analogue interface with user switchable ranges (0 - 5VDC / 0 - 10VDC) as standard. If computer control is required then any combination of integrated RS-485, GPIB, USB & LAN interfaces can be specified. An advanced version is optionally available with CP mode and master/slave operation.

- + Constant Voltage and Current Modes**
- + Programmable Front Panel Operation**
- + High Power Models up to 250kW**
- + Optional Computer Interfaces**
- + Worldwide Input Options**
- + Efficiency up to 94%**

BC-HP-E

PROGRAMMABLE HIGH POWER CHARGERS



SELECTION TABLE

Part Number	Max Power	Output Voltage	Output Current
BC-HP-E 520	5kW	0 - 20V	0 - 250A
BC-HP-E 535	5kW	0 - 35V	0 - 142A
BC-HP-E 570	5kW	0 - 70V	0 - 71A
BC-HP-E 5100	5kW	0 - 100V	0 - 50A
BC-HP-E 5155	5kW	0 - 155V	0 - 32A
BC-HP-E 5300	5kW	0 - 300V	0 - 17A
BC-HP-E 5400	5kW	0 - 400V	0 - 12.5A
BC-HP-E 5800	5kW	0 - 800V	0 - 6.25A
BC-HP-E 51000	5kW	0 - 1000V	0 - 5A
BC-HP-E 51200	5kW	0 - 1200V	0 - 4A
BC-HP-E 51500	5kW	0 - 1500V	0 - 3.4A

BC-HP-E 1020	10kW	0 - 20V	0 - 500A
BC-HP-E 1035	10kW	0 - 35V	0 - 286A
BC-HP-E 1070	10kW	0 - 70V	0 - 143A
BC-HP-E 10100	10kW	0 - 100V	0 - 100A
BC-HP-E 10155	10kW	0 - 155V	0 - 64.5A
BC-HP-E 10300	10kW	0 - 300V	0 - 34A
BC-HP-E 10400	10kW	0 - 400V	0 - 25A
BC-HP-E 10800	10kW	0 - 800V	0 - 13A
BC-HP-E 101000	10kW	0 - 1000V	0 - 10A
BC-HP-E 101200	10kW	0 - 1200V	0 - 8A
BC-HP-E 101500	10kW	0 - 1500V	0 - 7A

BC-HP-E 1520	15kW	0 - 20V	0 - 750A
BC-HP-E 1535	15kW	0 - 35V	0 - 428A
BC-HP-E 1570	15kW	0 - 70V	0 - 214A
BC-HP-E 15100	15kW	0 - 100V	0 - 150A
BC-HP-E 15155	15kW	0 - 155V	0 - 97A
BC-HP-E 15300	15kW	0 - 300V	0 - 50A
BC-HP-E 15400	15kW	0 - 400V	0 - 37.5A
BC-HP-E 15800	15kW	0 - 800V	0 - 19A
BC-HP-E 151000	15kW	0 - 1000V	0 - 15A
BC-HP-E 151200	15kW	0 - 1200V	0 - 12A
BC-HP-E 151500	15kW	0 - 1500V	0 - 10A

BC-HP-E 2020	20kW	0 - 20V	0 - 1000A
BC-HP-E 2035	20kW	0 - 35V	0 - 571A
BC-HP-E 2070	20kW	0 - 70V	0 - 285A
BC-HP-E 20100	20kW	0 - 100V	0 - 200A
BC-HP-E 20155	20kW	0 - 155V	0 - 129A
BC-HP-E 20300	20kW	0 - 300V	0 - 66A
BC-HP-E 20400	20kW	0 - 400V	0 - 50A
BC-HP-E 20800	20kW	0 - 800V	0 - 25A
BC-HP-E 201000	20kW	0 - 1000V	0 - 20A
BC-HP-E 201200	20kW	0 - 1200V	0 - 16A
BC-HP-E 201500	20kW	0 - 1500V	0 - 14A

Part Number	Max Power	Output Voltage	Output Current
BC-HP-E 3020	30kW	0 - 20V	0 - 1500A
BC-HP-E 3035	30kW	0 - 35V	0 - 857A
BC-HP-E 3070	30kW	0 - 70V	0 - 428A
BC-HP-E 30100	30kW	0 - 100V	0 - 300A
BC-HP-E 30155	30kW	0 - 155V	0 - 193A
BC-HP-E 30300	30kW	0 - 300V	0 - 100A
BC-HP-E 30400	30kW	0 - 400V	0 - 75A
BC-HP-E 30800	30kW	0 - 800V	0 - 38A
BC-HP-E 301000	30kW	0 - 1000V	0 - 30A
BC-HP-E 301200	30kW	0 - 1200V	0 - 25A
BC-HP-E 301500	30kW	0 - 1500V	0 - 20A

BC-HP-E 4520	45kW	0 - 20V	0 - 2250A
BC-HP-E 4535	45kW	0 - 35V	0 - 1285A
BC-HP-E 4570	45kW	0 - 70V	0 - 643A
BC-HP-E 45100	45kW	0 - 100V	0 - 450A
BC-HP-E 45155	45kW	0 - 155V	0 - 290A
BC-HP-E 45300	45kW	0 - 300V	0 - 150A
BC-HP-E 45400	45kW	0 - 400V	0 - 112.5A
BC-HP-E 45800	45kW	0 - 800V	0 - 56A
BC-HP-E 451000	45kW	0 - 1000V	0 - 45A
BC-HP-E 451200	45kW	0 - 1200V	0 - 37.5A
BC-HP-E 451500	45kW	0 - 1500V	0 - 30A

BC-HP-E 6020	60kW	0 - 20V	0 - 3000A
BC-HP-E 6035	60kW	0 - 35V	0 - 1714A
BC-HP-E 6070	60kW	0 - 70V	0 - 857A
BC-HP-E 60100	60kW	0 - 100V	0 - 600A
BC-HP-E 60155	60kW	0 - 155V	0 - 387A
BC-HP-E 60300	60kW	0 - 300V	0 - 200A
BC-HP-E 60400	60kW	0 - 400V	0 - 150A
BC-HP-E 60800	60kW	0 - 800V	0 - 75A
BC-HP-E 601000	60kW	0 - 1000V	0 - 60A
BC-HP-E 601200	60kW	0 - 1200V	0 - 50A
BC-HP-E 601500	60kW	0 - 1500V	0 - 40A

BC-HP-E 9020	90kW	0 - 20V	0 - 4500A
BC-HP-E 9035	90kW	0 - 35V	0 - 2571A
BC-HP-E 9070	90kW	0 - 70V	0 - 1285A
BC-HP-E 90100	90kW	0 - 100V	0 - 900A
BC-HP-E 90155	90kW	0 - 155V	0 - 580A
BC-HP-E 90300	90kW	0 - 300V	0 - 300A
BC-HP-E 90400	90kW	0 - 400V	0 - 225A
BC-HP-E 90800	90kW	0 - 800V	0 - 112.5A
BC-HP-E 901000	90kW	0 - 1000V	0 - 90A
BC-HP-E 901200	90kW	0 - 1200V	0 - 75A
BC-HP-E 901500	90kW	0 - 1500V	0 - 60A

Models with different nominal output powers to those listed are available in 5kW graduations up to 100kW. High power chargers up to 250kW are also possible on request. Please contact ETPS to discuss your requirements.

HIGHLIGHTED FEATURE

FREE V/I MODIFICATIONS

The BC-HP-E is an incredibly flexible product platform. We don't just offer standard models. You can specify your own nominal voltage and current ranges often at no additional cost.

For example you might have an energy storage device that needs exactly 850V at 15kW. We can provide a new unit with exactly those output ranges without increasing the price or lead time.

TECHNICAL DATA

INPUT							
	5kW	10kW	15kW	20kW	30kW	45kW	60kW
Connection	5 wire (3P+N+E)						
Maximum Allowed Non-Symmetry	<3%						
Standard Input Voltage	3 × 400 VAC [360 – 440 VAC 47 – 63 Hz]						
Standard Input Current ^{1,2}	11.5A _{eff}	22.9A _{eff}	34.4A _{eff}	45.8A _{eff}	68.7A _{eff}	103.1A _{eff}	137.5A _{eff}
Standard Nominal Current Internal Fuse	15A	30A	45A	60A	90A	135A	180A
Recommended Supply Breaker Value and Curve	16A type D/K	32A type D/K	63A type D/K	63A type D/K	80A type D/K	120A type D/K	150A type D/K
Input Voltage [Option /3P208]	3 × 208 VAC [187 – 229 VAC 47 – 63 Hz]						
Input Current [Option /3P208] ^{1,2}	23A _{eff}	46A _{eff}	69A _{eff}	92A _{eff}	138A _{eff}	207A _{eff}	276A _{eff}
Input Voltage [Option /3P440]	3 × 440 VAC [396 – 484 VAC 47 – 63 Hz]						
Input Current [Option /3P440] ^{1,2}	11A _{eff}	21A _{eff}	32.5A _{eff}	42A _{eff}	63.5A _{eff}	95A _{eff}	127A _{eff}
Input Voltage [Option /3P480]	3 × 480 VAC [432 – 528 VAC 47 – 63 Hz]						
Input Current [Option /3P480] ^{1,2}	10A _{eff}	19.5A _{eff}	30A _{eff}	39A _{eff}	58A _{eff}	87A _{eff}	117A _{eff}
Inrush Transient Current ²	<25A	<51A	<76A	<102A	<153A	<229A	<305A
Leakage Current	<35mA						
Cos Phi	>0.7						
Harmonic Content ³	50Hz = 72 % 100Hz = 2 % 150Hz = 0.9 % 200Hz = 0.1 % 250Hz = 11 % 350Hz = 0.6 %						
Efficiency	Up to 94%						

DISPLAY				
Resolution Voltage Display	10V – 69.99V	70V – 99.9V	100V – 999V	1000V – 1500V
Voltage Setting Resolution	00.00	00.0	000	0000
Resolution Current Display	2A – 69.99A	70A – 99.9A	100A – 999A	1000A – 2000A
Current Setting Resolution	00,00	00,0	000	0000

EMC AND SAFETY STANDARDS	
Safety	EN60950
Emissions	EN61000-6-4:2007
Immunity	EN61000-6-2:2005
Measurement, Control and Laboratory Equipment	EN61000-1:2010

AMBIENT CONDITIONS	
Cooling	Forced air, front to back
Operating Temperature	0 to 50°C
Storage Temperature	-20°C to 70°C
Humidity	<80%
Operating Altitude	<2000m
Weight	19kg (5kW), 26kg (10kW), 33kg (15kW), 52kg (20kW), 66kg (30kW), 99kg (45kW), 132 kgs (60kW), 198kg (90kW)
Dimensions	19" × 3U × 620mm [5kW / 10kW / 15kW], 19" × 6U × 620mm [20kW / 30kW] 19" × 9U × 620mm [45kW], 19" × 12U × 620mm [60kW], 19" × 18U × 620mm [90kW]
Fan Noise	42 – 43 dB

¹ For nominal current and nominal voltage

² For nominal input voltage

³ Total harmonic distortion input current ([%]/lin)

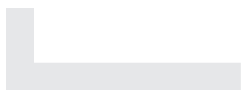
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TECHNICAL DATA

OUTPUT											
	20V	35V	70V	100V	155V	300V	400V	800V	1000V	1200V	1500V
Static Regulation	± 0.1 % of F.S.										
Line Regulation Voltage	± 0.02 % F.S.										
Line Regulation Current	± 0.02 % F.S.										
Load Regulation	± 0.05 % F.S. ± 2mV										
Load Regulation Current	± 0.05 % F.S. ± 20mA										
Dynamic Response (10%-90%)	Typically <3ms assuming an ohmic load										
Typical Voltage Ripple (p-p) 20MHz	80mV	140mV	140mV	140mV	900mV	900mV	900mV	1000mV	1200mV	2500mV	2500mV
Typical Voltage Ripple (p-p) 300kHz	35mV	60mV	60mV	60mV	400mV	400mV	400mV	700mV	800mV	1500mV	1500mV
Typical Voltage Ripple (rms) 20MHz	35mV	60mV	60mV	60mV	400mV	400mV	400mV	400mV	400mV	400mV	500mV
Typical Voltage Ripple (rms) 300kHz	25mV	40mV	40mV	40mV	300mV	300mV	300mV	300mV	300mV	300mV	400mV
Current Ripple (p-p)	<0.5 % of F.S.										
Current Ripple (rms)	<0.4 % of F.S.										
Isolation [Between Primary and Secondary]	3000VAC										
Isolation [Between DC-Output and Earth]	500VDC						2000VDC				
Isolation [Between Primary and Earth]	2150VDC										
Rise Time [Full Load]	6ms	12ms	20ms	20ms	20ms	20ms	20ms	40ms	40ms	40ms	6ms
Rise Time [No Load]	5ms	10ms	10ms	10ms	10ms	10ms	10ms	10ms	20ms	20ms	5ms
Fall Time [Full Load]	15ms	20ms	20ms	20ms	40ms	40ms	50ms	60ms	80ms	100ms	25ms
Fall Time [No Load]	5s ≤50V										
Relative Voltage Accuracy	± 0.25% V _{MAX}										
Relative Current Accuracy	± 0.4% I _{MAX}										
Maximum Sense Voltage [0 to V _{MAX}]	5% of F.S.							No sense function provided			
Maximum Sense Voltage [Operating Over V _{MAX}]	± 1% of F.S.							No sense function provided			
Relative Voltage Sense Accuracy	± 0.5% V _{MAX} (relative accuracy for worst case sense operation)										
Over Voltage Protection	Adjustable between 0 % and 120 % of full voltage range										
Over Current Protection	Limited by the current setpoint										
Over Temperature Protection	If the internal heat sink temperature rises above 90°C the device will automatically shut down										
VI Mode	Voltage and current operation mode: voltage and current limit are programmable										



INTERFACE INFORMATION

ANALOGUE INTERFACE (STANDARD)

Digital Outputs (CV, Standby, Error)	Output type: Open collector with pull-up resistor 10k Ω after +5 V $I_{SINKMAX}$: 50 mA
Digital Inputs (Ext. Control, Standby)	Input resistance: 47k Ω Maximum input voltage: 50V High level: $V_{IN} > 2V$ Low level: $V_{IN} < 0.8V$
Analog Outputs (Xmon)	Output resistance: 100 Ω Minimum permissible load resistance: 2k Ω Minimum load resistance for 0.1 % accuracy: 100k Ω
Analog Inputs (Xset)	Input resistance: 1M Ω Maximum permissible input voltage: 25V
Reference Voltage	Reference voltage V_{REF} : 10V \pm 10 mV Output resistance: <10 Ω Maximum output current: 10 mA (not short-circuit-proof)
5 V – Supply Voltage	Output voltage: 5V \pm 300mV Maximum output current: 50 mA (not short-circuit-proof)
Programming Response Time	<10ms

RS-232 INTERFACE (STANDARD)

Signal Inputs (Rx, D, CTS)	Maximum input voltage: \pm 25V Input resistance: 5 k Ω [Type] Switching thresholds: $V_H < -3V$, $V_L > +3V$
Signal outputs (Tx, D, RTS)	Output voltage (at $R_L > 3k\Omega$): min \pm 5V, Type \pm 9V, max \pm 10V Output resistance: <300 Ω ; Short circuit current: Type \pm 10mA

RS-485 INTERFACE (OPTIONAL)

Maximum Input Voltage	\pm 5V
Input Resistance	>12k Ω
Output Current	\pm 60mA Max
High Level	$V_d > 0.2V$
Low Level	$V_d < -0.2V$

OPTIONS

CODE	DESCRIPTION
/A	Advanced model with constant power mode and master/slave operation.
/1P	Input voltage is 230VAC \pm 10% [for models with outputs of 5kW or 10kW only]
/3P208	3 Phase Input of 3 \times 208 (187 - 229Vac), 50/60Hz
/3P440	3 Phase Input of 3 \times 440 (396 - 484Vac), 50/60Hz
/3P480	3 Phase Input of 3 \times 480 (432 - 528Vac), 50/60Hz
/400HZ	400Hz input frequency
/DC	Any nominal in the input range 250 - 750VDC \pm 10% (eg. 500VDC \pm 10% = 450 - 550VDC input)
/ATE	No front panel control or display, analogue interface provided as standard
/USB	USB interface
/LT	IEEE 488.2 (GPIB) interface
/LTRS485	RS-485 interface
/LAN	Ethernet interface
/KFZ12	Output follows a 12Vdc automotive cranking curve
/KFZ24	Output follows a 24Vdc automotive cranking curve
/KFZXX	Output follows a user specific curve
/SCS	Metal cover set with cable glands for input and output terminals

Every effort is made to ensure that the information provided within this technical summary is accurate. However, ETPS Ltd must reserve the right to make changes to the published specifications without prior notice. Where certain operating parameters are critical for your application we advise that they be confirmed at the time of order. ETPS Ltd specialises in modifying its proven platforms to suit your needs. Please contact our office if your requirement is non-standard. Please note that your actual unit may differ from those shown.



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WE ARE
POSITIVE
PEOPLE
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ETPS engineer electronic power supply and testing systems. Our problem solving skills provide the spark of innovation to some of the world's leading technology brands.



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