

# Power

## P45 Battery Charger

Automatic Battery Charger



- Designed with the latest digital power electronics in the market
- Microprocessor control
- Provides regulated DC output and current limiting capabilities
- Graphical interface allows for customization to individual applications
- Wide temperature range 0 to 50°C
- Approved for UL, CE, CSA, and EMC standards

Alpha Industrial Powers P45 Industrial Battery Charger incorporates the latest digital and power electronics technologies, making it one of the most reliable battery chargers available. The unique SCR rectifier with a double wound isolation transformer provides precise regulated DC output and current limiting capabilities. Three different output-filtering configurations are available to match powering requirements. The P45's graphical interface, with its user definable controls and alarm set-points, allows the charger to be customized for the appropriate application. Approved for UL, CE, CSA and EMC standards.

## Metering and Control

### Standard Features

<i>Metering and Timing</i>	0.5 % Accuracy DC voltage and current metering
	Remaining and elapsed equalize time
<i>Control Modes:</i>	Manual float / Equalize toggle
<i>Control Adjustments (Password Protected)</i>	Float and equalize voltage
	Current limit
	Equalize period 0-100 hours
	Float period 0-100 days
	Equalize mode termination based on voltage, time and/or low DC volts event(s)
<i>Indicating LEDs</i>	On green LED
	Common alarm flashing red LED
<i>Alarm Menu Indications</i>	Charger failure based on low volts & low output
	DC current
	High DC volts
	Low DC volts
	Positive ground fault
	Negative ground fault
	AC Fail
<i>Alarm Menu Functions (Password Protected)</i>	Adjustable alarm time delay
	Indications latch
	Alarm relays latch
	Alarm acknowledgment
	Alarm levels adjustment
	LED, LCD and relay test
<i>Remote Indications</i>	All alarms are wired to a common voltage free N.O. and C. dry contacts

### Optional Features

Individual alarms form C contacts	Audible alarm
RS 232 / 485 communication ports	Manual voltage control
Modbus on serial ports	Input harmonic filter to comply with CE
SNMP interface	50Hz or 400 Hz Input frequency
DC circuit breaker	Low DC volts load disconnect (load shedding)
Negative temperature compensation 0.2%/C	End of discharge alarm
Distribution panel	Negative slope for equal load sharing
High capacity interrupting current CBs	Battery discharging alarm
High temperature alarm and shut-down	Battery high temperature alarm and shutdown
High volts shutdown via the AC breaker trip	Battery ammeter and voltmeter
AC input volts, amps and frequency readings	Ampere-hour meter reading battery capacity % or AH
High and low AC input voltage alarm	DC distribution panel
High ripple alarm	Oversized cabinets to fit batteries in separate compartments
Power factor correction to 0.95 lagging	Special paint and NEMA / IP protection
Remote voltage sensing terminals	Seismic design
Remote shutdown and equalize control	Fungus proofing and tropicalization
	Special Wiring

### Charger Standard Adjustment Range (VDC)

Voltage	12V	24V	48	125V	250V
Float	10-15	20-30	40-60	100-145	200-290
Equalize	10-16	20-32	40-65	100-150	200-300
Singe Level	10-16	20-32	40-65	100-150	200-300
Formation	10-16	20-32	40-65	100-150	200-300

### Suggested Battery Voltages

Flooded L/A	Sealed L/A	Nickel Cadmium
2.15-2.25	2.25-2.35	1.35-1.45
2.3-2.5	2.3-2.4	1.45-1.55
2.23-2.3	2.25-2.4	1.42-1.55
2.5-2.7	2.5-2.7	1.55-1.65

## Specifications

<b>Input:</b>	
<b>Standard voltages</b>	110, 120, 208, 220, 240, 380, 400, 480, 550, 575, and 600 VAC
<b>Phases</b>	1 and 3 phase
<b>Frequency</b>	50 Hz or 60Hz
<b>Power factor</b>	0.75 (1 phase), 0.85 (3 phase) at full load when tested on battery and resistive load
<b>Efficiency at full load</b>	Typical 87% (1 phase), 90%(3 phase)
<b>Output:</b>	
<b>Standard nominal voltages</b>	12, 24, 36, 48, 72, 125, 250, 380, 480 and 600 VDC
<b>Power</b>	From 60 W to 180 kW Standard
<b>AC ripple voltage</b>	1 or 2% RMS when charger connected to a battery capacity 4 times its current 30mVrms / 32dBrc weighted electrical voice band noise for up to 48VDC, 100mV for 125VD
<b>Static regulation</b>	< 0.5% for simultaneous variations of +10/-12% input voltage, +/- 5% input frequency and 0-100% load
<b>Dynamic regulation</b>	"+/-6% from 10%-90% and 90%-10% load variation (t< 300msec)"
<b>Parallel operation</b>	Similar chargers can be operated in Random Parallel
<b>EMC</b>	Conducted (150kHz-30mHz) and radiated (30MHz-1GHz): en55011 class A Electrostatic discharge EN61000 4-2 level 2/3 (4kV contact, 8kV air) Radiated susceptibility: EN61000-4-3 level 3 annex D (80MHz- 1GHz @ 10V/m) Electrical fast transient: EN61000
<b>Protection:</b>	
<b>Over-current</b>	Soft start-- Automatic current limiting circuit, adjustable from 20% to 120% of nominal rating-- Input thermal-magnetic circuit breaker and DC output fuse standard
<b>Voltage Transients</b>	Surge suppression on input and output reverse polarity
<b>Mechanical and Physical:</b>	
<b>Enclosure</b>	CEMA/NEMA1 (IP20), 14GA (2mm) steel C/W hinged front access door
<b>Finish</b>	Phosphatised and primed prior to painting with ASA61, light gray Natural convection cooling up to 130 A output current
<b>Cooling</b>	Forced air cooling assistance for units over 130 A output current N.B. Floor mounted models are provided with 3 in. (75mm) clearance at bottom to facilitate handling by lift truck, pallet jack, or slings.
<b>Environmental:</b>	
<b>Audible Noise</b>	45 to 65 dBa at 3ft (1 meter) rating dependant
<b>Operating Temperature Range</b>	32°F to +122°F (-0°C to 50°C)/Storage -40°F to 185°F (-40°C to 85°C)
<b>Temperature De-Rating</b>	0.83% / °F from 122°F to 140°F (1.5% / °C from 50°C to 60°C)
<b>Operating Humidity</b>	Up to 95% (non condensing)
<b>Altitude De-Rating</b>	0% for 1st 3300ft (1000m), 7% per 3300ft (1000m) over 3300ft (1000m)

### Basic Design Features

UL/ANSI 1012 Listed, CSA C22.2 107.2 Certified and applicable IEC standard compliant

ISO 9002-1994 Quality control compliant

SCR (Thyristor) based rectifier c/w double wound isolation transformer

Electronic control, current limiting and voltage regulation

Alarm log, history and events

Modular construction using the latest power and microelectronic devices

Color coded PVC copper stranded wire for control and signals

30 year design, MTBF of 100 000 hours typical, MTTR less than 1 hour

### Single Phase Input

Model	Output V / Ah	Input V	Full Load				Enclosure	Weight KG
			120V	208V	240V	600V		
P45-1-12-10	12V/10A	120	2.1	1.2	1.1	0.4	A-300	19
P45-1-12-20	12V/20A	120	4.2	2.4	2.1	0.8	A-300	25
P45-1-12-30	12V/30A	120	6.3	3.7	3.2	1.6	A-400	31
P45-1-12-50	12V/50A	120	10.6	6.1	5.3	2.1	A-400	38
P45-1-12-80	12V/80A	120	16.9	9.7	8.4	3.4	A-500	66
P45-1-12-100	12V/100A	120	21.1	12.2	10.6	4.2	A-500	73
P45-1-12-125	12V/125A	120	26.4	15.2	13.2	5.3	A-500	82
P45-1-12-150	12V/150A	120	31.7	20.3	15.8	6.3	A-500	91
P45-1-12-200	12V/200A	120	42.2	24.4	21.1	8.4	A-500	114
P45-1-12-300	12V/300A	240	63.4	36.6	31.7	12.7	A-500	145
P45-1-12-400	12V/400A	240	84.5	48.7	42.2	16.9	A-600	170
P45-1-24-10	24V/10A	120	4.2	2.4	2.1	0.8	A-300	25
P45-1-24-20	24V/20A	120	8.4	4.9	4.2	1.7	A-300	35
P45-1-24-30	24V/30A	120	12.7	7.3	6.3	2.5	A-400	41
P45-1-24-40	24V/40A	120	16.9	9.7	8.4	3.4	A-400	55
P45-1-24-50	24V/50A	120	21.1	12.2	10.6	4.2	A-400	59
P45-1-24-80	24V/80A	120	33.8	19.5	16.9	6.8	A-500	105
P45-1-24-100	24V/100A	120	42.2	24.4	21.1	8.4	A-500	127
P45-1-24-125	24V/125A	240	52.8	30.5	26.4	10.6	A-600	141
P45-1-24-150	24V/150A	240	63.4	36.6	31.7	12.7	A-600	173
P45-1-24-200	24V/200A	240	84.5	48.7	42.2	16.9	A-600	205
P45-1-48-10	48V/10A	120	6.3	3.7	3.2	1.3	A-300	48
P45-1-48-20	48V/20A	120	12.7	7.3	6.3	2.5	A-300	75
P45-1-48-30	48V/30A	120	19.0	11.0	9.5	3.8	A-400	95
P45-1-48-40	48V/40A	120	25.3	14.6	12.7	5.1	A-400	127
P45-1-48-50	48V/50A	120	31.7	18.3	15.8	6.3	A-500	136
P45-1-48-80	48V/80A	240	50.7	29.2	25.3	10.1	A-500	191
P45-1-48-100	48V/100A	240	63.4	36.6	31.7	12.7	A-600	209
P45-1-125-3	125V/3A	120	6.0	4.0	3.0	1.0	A-300	30
P45-1-125-5	125V/5A	120	10.6	6.1	5.3	2.1	A-300	32
P45-1-125-10	125V/10A	120	21.1	12.2	10.6	4.2	A-300	59
P45-1-125-15	125V/15A	125	31.7	18.3	15.8	6.3	A-400	95
P45-1-125-20	125V/20A	120	42.2	24.4	21.1	8.4	A-400	107
P45-1-125-25	125V/25A	240	52.8	30.5	26.4	10.6	A-500	116
P45-1-125-30	125V/30A	240	63.4	36.6	31.7	14.8	A-500	127
P45-1-125-50	125V/50A	480	105.6	60.9	52.8	21.1	A-600	205
P45-1-250-3	250V/3A	120	13.0	7.0	6.0	1.0	A-300	35
P45-1-250-5	250V/5A	120	21.1	12.2	10.6	4.2	A-300	80
P45-1-250-10	250V/10A	120	42.2	24.4	21.1	8.4	A-400	118
P45-1-250-15	250V/15A	240	63.4	36.6	31.7	12.7	A-500	150
P45-1-250-20	250V/20A	240	84.5	48.7	42.2	16.9	A-500	173

### Three Phase Input

Model	Output V / Ah	Input V	Full Load			Enclosure	Weight KG
			208V	480V	600V		
P45-3-12-100	12V/100A	208	6.2	2.7	2.2	A-500	95
P45-3-12-150	12V/150A	208	9.4	4.1	3.2	A-500	117
P45-3-12-200	12V/200A	208	12.5	5.4	4.3	A-500	123
P45-3-12-250	12V/250A	208	15.6	6.8	5.4	A-500	130
P45-3-12-300	12V/300A	208	18.7	8.1	6.5	A-600	136
P45-3-12-400	12V/400A	208	24.9	10.8	8.6	A-600	152
P45-3-12-500	12V/500A	480	31.2	13.5	10.8	A-600	168
P45-3-12-750	12V/750A	480	46.8	20.3	16.2	A-700	218
P45-3-12-1000	12V/1000A	480	62.4	27.0	21.6	A-700	250
P45-3-24-50	24V/50A	208	6.2	2.7	2.2	A-400	95
P45-3-24-80	24V/80A	208	10.0	4.3	3.5	A-500	118
P45-3-24-100	24V/100A	208	12.5	5.4	4.3	A-500	123
P45-3-24-150	24V/150A	208	18.7	8.1	6.5	A-600	145
P45-3-24-200	24V/200A	208	24.9	10.8	8.6	A-600	155
P45-3-24-250	24V/250A	480	31.2	13.5	10.8	A-600	173
P45-3-24-300	24V/300A	480	37.4	16.2	13.0	A-700	191
P45-3-24-400	24V/400A	480	49.9	21.6	17.3	A-700	236
P45-3-24-500	24V/500A	480	62.4	27.0	21.6	A-700	250
P45-3-48-30	48V/30A	208	7.5	3.2	2.6	A-500	118
P45-3-48-40	48V/40A	208	10.0	4.3	3.5	A-500	127
P45-3-48-50	48V/50A	208	12.5	5.4	4.3	A-500	132
P45-3-48-80	48V/80A	208	20.0	8.6	6.9	A-600	159
P45-3-48-100	48V/100A	208	24.9	10.8	8.6	A-600	173
P45-3-48-150	48V/150A	480	37.4	16.2	13.0	A-600	200
P45-3-48-200	48V/200A	480	49.9	21.6	17.3	A-600	239
P45-3-48-250	48V/250A	480	62.4	27.0	21.6	A-600	250
P45-3-125-10	125V/10A	208	6.2	2.7	2.2	A-400	95
P45-3-125-15	125V/15A	208	9.4	4.1	3.2	A-400	118
P45-3-125-20	125V/20A	208	12.5	5.4	4.3	A-500	125
P45-3-125-25	125V/25A	208	15.6	6.8	5.4	A-500	145
P45-3-125-30	125V/30A	208	18.7	8.1	6.5	A-500	170
P45-3-125-40	125V/40A	208	24.9	10.8	8.6	A-600	177
P45-3-125-50	125V/50A	480	31.2	16.5	10.8	A-600	186
P45-3-125-80	125V/80A	480	49.9	21.6	17.3	A-600	241
P45-3-125-100	125V/100A	480	62.4	27.0	21.6	A-600	252
P45-3-125-125	125V/125A	480	77.9	33.8	27.0	A-700	273
P45-3-125-150	125V/150A	480	93.5	40.5	32.4	A-700	327
P45-3-250-5	250V/5A	208	6.2	2.7	2.2	A-400	114
P45-3-250-10	250V/10A	208	12.5	5.4	4.3	A-400	125
P45-3-250-15	250V/15A	208	18.7	8.1	6.5	A-500	150
P45-3-250-20	250V/20A	208	24.9	10.8	8.6	A-500	170
P45-3-250-25	250V/25A	480	31.2	13.5	10.8	A-500	186
P45-3-250-30	250V/30A	480	37.4	16.2	13.0	A-500	205
P45-3-250-40	250V/40A	480	49.9	21.6	17.3	A-600	236
P45-3-250-50	250V/50A	480	62.4	27.0	21.6	A-600	255
P45-3-250-80	250V/80A	480	99.8	43.2	34.6	A-600	400

For more information visit [www.alpha.com](http://www.alpha.com)

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049-215-36-003 (10/05)

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