

MANUAL



High Frequency charger

ip23

Model		
Description		Technical specifications
Max. Output Power/Nominal Voltage		900Watt / 24Volt
Mechanical Max. Size, Weight		253L *123W*71.5H(mm) / 2.2Kg
The Number of Charging Profiles		4 Profiles (Selected by digital switch)
AC Input	Input Voltage	Single Phase Auto selectable Dual AC input 85~137VAC/170~264VAC
	Frequency	50/60 Hz
	Input Current	12A_max (Derated output current with <95VAC)
DC Output	Output Voltage	31.7V_max
	Output Current	30.0 Adc
	Current Ripple	Less than 10%, measured peak to peak
Protective Function		Short circuit protection, Over temperature protection, Over current protection, Reverse Polarity Input and Output Over voltage /Under voltage protection
LED Display		AC power connected /Charging profile/Charging cycle progress /Bad cell discrimination/Fault display
Connector /Lines	Input socket	IEC 320 C14 Input
	Output lines (2)	10AWG, 47.2inch (1200mm) RED(+),3/8" Ring terminal 10AWG, 47.2inch (1200mm) black(-),3/8" Ring terminal
	AC line connection Interlock lines (2)	18AWG, 600mm, Red / White 2-conductor pigtail
Efficiency (Typ.)		90 %
Cooling		Fan cooling
Additional Features		<u>Bad cell discrimination</u> : Bad cell is identified at last stage of charging progress. <u>AC line connection interlock</u> : 5A/24VDC, normally closed contact <u>Extremely low voltage charging</u> : The charger will charge very deeply discharged batteries greater than 1.0 VDC.

A. Charging Profile

1 Open lead-acid – ‘low maintenance’:

3 charging phases:

1. constant current **I1** = 29-30A
2. constant voltage **U** = 2.55 VPC
3. maintenance mode **a** = when voltage drops below 25V, the charger restarts the cycle.

2 Open lead-acid – ‘full capacity’:

4 charging phases:

1. constant current **I1** = 29-30A
2. constant voltage **U** = 2.42 VPC
3. constant current **I2** = 5-8A with a maximum charging voltage of 2.65 VPC
4. maintenance mode **a** = when voltage drops below 25V, the charger restarts the cycle

3 Standard GEL charging curve:

4 phases:

1. constant current **I1** = 29-30A
2. constant voltage **U** = 2.35 VPC
3. constant current **I2** = 9% of **I1**
4. float charge **a** = 2.15-2.30VPC (Without time limit)

4 Dyno GEL charging curve:

3 phases:

1. constant current **I1** = 29-30A
2. constant voltage **U** = 2.38 VPC
3. maintenance mode **a** = when voltage drops below 25V, the charger restarts the cycle

B. Procedure Selecting Charging Profile

Manual charger profile is selectable by the digital switch before power-up and the selected profile is valid until power is turned off.

Before power on, select the digital switch. And then, turn on power. Selected charge profile is identified by Green LED lamp for 10sec.

Battery type selection & LED Display

Switch selection	Battery type	Green LED Display
1	Open lead-acid – ‘low maintenance’	1 Flash for 10sec
2	Open lead-acid – ‘full capacity’	2 Flash for 10sec
3	Standard GEL charging	3 Flash for 10sec
4	Dyno GEL charging	4 Flash for 10sec






C. Normal operation

1. Connect the DC output plug to the battery.
2. Connect the power supply cord to a properly grounded 115V/60Hz or 230V/60 or 50Hz socket. This charger automatically senses and adjusts to 115V/230V.
3. The charger will flash the green LED in a start up check then start charging the batteries. The green LED identifies the charge profile for 10sec for the battery type. Once the charging starts, the LED's indicate the charging progress as described in the following Charging State & LED display table. If yellow LED blink there is a problem. Take proper action according to the protection and fault display. The charger will start even with severely discharged batteries (down to 1V terminal voltage).
4. The charger goes into SHUT OFF mode after the batteries are fully charged, and then all 3 LED's are "ON", indicating the charge is complete. At this mode, the charger no longer supplies power to the batteries, but it continues to monitor battery voltage. If the voltage drops due to self-discharge during storage, the charger will re-start and complete a charge cycle.
5. Turn off the charger by disconnecting AC cord.

Note) The charging time is affected by numerous factors including battery Amp-Hour capacity, depth of discharge, battery temperature, and battery condition (new, old, or defective).

D. Charging State & LED Display

1 Battery maintenance lights

	Lights	Meaning
	STEAD FAULT LED (YELLOW)	There is power to charger
	FLASHING FAULT LED (YELLOW)	Something wrong with battery or charger
	STEADY CHARGE STATUS LED (GREEN)	Charging is finished
	SLOW FLASHING CHARGE STATUS LED (GREEN)	Charger is working, Under 80% charged
	FAST FLASHING CHARGE STATUS LED (GREEN)	Charger is working, Over 80% charged

E. Protection and Fault Display

	LED status	Description
Fault	Yellow LED lamps blink once.	Output is open or short, or output voltage is over a limit. Otherwise, output terminals are reversed.
	Yellow LED lamps blink twice.	Input voltage is out of the range.
	Yellow LED lamps blink three times.	The internal temperature of the charger exceeds a limit.
	Yellow LED lamps blink four times.	Output current exceeds a limit.
Warning	Green and Yellow LEDs lamp blink simultaneously.	Charger 18 hour timer has timed out due to battery problem.
	Green and Yellow LEDs lamp alternately blink.	Battery type selector switch is set to an incorrect or unavailable number (See battery type selection table).

* If the fault is removed, the charger restarts automatically.

F. Test specifications

1 Safety

Test Item	Requirement	Description
Safety	EN 61558-1, EN61558-2-17	CE Certification
	vibration test	4.5G 45-200Hz 1Hr in X,Y,Z
	Water resistance	IP 23
	UL 1564	UL Certification

2. Emissions

Test Item	Requirement	Description
Radiated electromagnetic field	EN55011	CE Certification
Mains terminal disturbance voltage	EN55011	CE Certification

Note: CE Test- RFI/EMI TEST .

3. Immunity

Test Item	Requirement	Description
Electrostatic Discharge Immunity	EN 61000-4-2	CE Certification
Radiated RF E-Field	EN 61000-4-3	CE Certification

Electrical Fast Transient /Burst Immunity	EN 61000-4-4	CE Certification
Surge Immunity	EN 61000-4-5	CE Certification
Conducted Disturbance induced by RF fields Immunity	EN 61000-4-6	CE Certification
Voltage Dips and Short Interruptions	EN 61000-4-11	CE Certification