



# WOODS

## BATTERY CHARGERS



# Neptune

TRIPLE OUTPUT AUTOMATIC FLOAT BATTERY CHARGING SYSTEM

**STANDARD UNITS**

**12V, 24V  
15A, 30A, 60A**



Issue : 1.00



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## **INTRODUCTION:**

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The WOODS Battery Chargers **NEPTUNE** is a constant-voltage charger with three individually controlled outputs, allowing simultaneous charging of three separate battery banks.

This charger is ideal for marine applications, since one **NEPTUNE** charger will simultaneously maintain charge to a starboard engine-start battery, a port engine-start battery and a "house" or lighting battery.

The **NEPTUNE** chargers use precision analog electronics to control rugged SCR devices. The maximum charging current is under electronic control, and steered to the most depleted battery. The maximum output voltage is regulated to 2.3 volts per cell, with easily fitted temperature compensation available as an option.

The **NEPTUNE**'s charging status is indicated by LEDs, with voltage and current metering available as options.

**NEPTUNE** chargers are constructed with marine-grade aluminium cases, and supplied with heavy-duty brass output studs.

**NEPTUNE** chargers are available in the following continuous current ratings:

12 Volt:      15 amp (1215N), 30 amp (1230N), 60 amp (1260N), 100 amp (12100N)  
24 volt:      15 amp (2415N), 30 amp (2430N), 60 amp (2460N)

## **FEATURES:**

- Three individually regulated outputs
- Precision analog control of rugged SCR output devices
- Charging current is steered to the most depleted battery
- LED status indication
- Electronic current limiting for overload protection
- Protected against overload, thermal and battery faults
- Electronic limiting of maximum voltage
- Accurate output metering (optional)
- Temperature compensation (optional)
- Constructed from marine-grade aluminium
- Tolerates poor AC power quality
- Meets AS 1044 / CISPR 14 specifications for EMC

NOTE: Since the **NEPTUNE** chargers use constant-voltage "float" charging, they are ideally suited to standard wet-cell batteries. However, they will not return full charge to batteries which require elevated "boost" voltages after deep depletion, such as deep-cycle batteries and "calcium" batteries

**SPECIFICATIONS:****SPECIFICATIONS:****12Volt Neptune units**

<b>NEPTUNE</b>	<b>1230N</b>	<b>1260N</b>
Nominal Battery Voltage	12V dc	12V dc
Maximum Output Current (Amps ave)	30A dc	60A dc
Total Battery Capacity (recommended range)	60Ah ~ 400Ah	100Ah ~ 800Ah
Maximum total load on batteries during charging	5A dc	10A dc
Maximum Voltage - Electronic regulation	13.80V @ 25°C	13.80V @ 25°C
Mains Supply Voltage	220~240Vac 50~60Hz	220~240Vac 50~60Hz
Maximum Consumption	750VA	1500VA
Tolerance to Mains Supply distortion	16% THD	16% THD
Mains Protection	6A Thermal/Magnetic manual reset	16A Thermal/Magnetic manual reset
Output Protection	63A Thermal/Magnetic manual reset breaker	3X40A ThermalMagnetic manual reset breaker
Temperature Protection Transformer	150°C auto reset	150°C auto reset
Temperature Protection SCR's/Heatsink	100°C auto reset	100°C auto reset
Temperature Protection Fan cooling	50°C thermostat	50°C thermostat
Temperature compensation *	-20mV per degree Celcius	-20mV per degree Celcius
Temperature range	-10°C ~ 45°C	-10°C ~ 45°C
Metering : Volts Analogue Moving coil	20V FSD #	40V FSD #
Metering : Amps Analogue Moving coil	40A FSD #	80A FSD #
Cabinet: W x D x H	270 x 270 x 270 mm	440 x 270 x 270 mm
Mounting hole centres: W x H	250 x 120 mm	420 x 120 mm
Mounting hole size:	5/16" (8mm)	5/16" (8mm)
Connections : input	10A 3pin 2m cable	10A 3pin 2m cable
Connections : output	60A Binding posts	100A Binding posts
Connections : output cable minimum size	6mm <sup>2</sup> per 2m	10mm <sup>2</sup> per2m

\* Extra Option fitted by order

**SPECIFICATIONS:****SPECIFICATIONS:****24Volt Neptune units**

<b>NEPTUNE</b>	<b>2415N</b>	<b>2430N</b>	<b>2460N</b>
Nominal Battery Voltage	24V dc	24V dc	24V dc
Maximum Output Current (Amps ave)	15A dc	30A dc	60A dc
Total Battery Capacity (recommended range)	30Ah ~ 200Ah	60Ah ~ 400Ah	100Ah ~ 800Ah
Maximum total load on batteries during charging	2.5A	5A dc	10A dc
Maximum Voltage - Electronic regulation	27.60V @ 25°C	27.60V @ 25°C	27.60V @ 25°C
Mains Supply Voltage	220~240Vac 50~60Hz	220~240Vac 50~60Hz	220~240Vac 50~60Hz
Maximum Consumption	750VA	1500VA	3000VA
Tolerance to Mains Supply distortion	16% THD	16% THD	16% THD
Mains Protection	4A Thermal/Magnetic manual reset	6A Thermal/Magnetic manual reset	16A Thermal/Magnetic manual reset
Output Protection	32A Thermal/Magnetic manual reset breaker	63A Thermal/Magnetic manual reset breaker	3X40A Thermal/Magnetic manual reset breaker
Temperature Protection Transformer	150°C auto reset	150°C auto reset	150°C auto reset
Temperature Protection SCR's/Heatsink	100°C auto reset	100°C auto reset	100°C auto reset
Temperature Protection Fan cooling	50°C thermostat	50°C thermostat	50°C thermostat
Temperature compensation *	-20mV per degree Celcius	-20mV per degree Celcius	-20mV per degree Celcius
Temperature range	-10°C ~ 45°C	-10°C ~ 45°C	-10°C ~ 45°C
Metering : Volts Analogue Moving coil	40V FSD #	40V FSD #	40V FSD #
Metering : Amps Analogue Moving coil	20A FSD #	40A FSD #	80A FSD #
Cabinet: W x D x H	270 x 270 x 270 mm	270 x 270 x 270 mm	440 x 270 x 270 mm
Mounting hole centres: W x H	250 x 120 mm	250 x 120 mm	420 x 120 mm
Mounting hole size:	5/16" (8mm)	5/16" (8mm)	5/16" (8mm)
Connections : input	10A 3pin 2m cable	10A 3pin 2m cable	10A 3pin 2m cable
Connections : output	60A Binding posts	60A Binding posts	100A Binding posts
Connections : output cable minimum size	4mm <sup>2</sup> per 2m	6mm <sup>2</sup> per 2m	10mm <sup>2</sup> per 2m

\* Extra Option fitted by order  
# See dedicated spec sheet

## INSTALLATIONS:

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### FITTING:

The NEPTUNE is designed to be fitted on a bench or to a wall, by means of the mounting holes located on the flanges of the side panels.

- Ensure that the cabinet is mounted in an upright position.
- DO NOT mount the NEPTUNE inside an unventilated enclosure. The NEPTUNE must have minimum air intake and outlet areas of 10,000mm<sup>2</sup> (16in<sup>2</sup>).
- DO NOT mount the NEPTUNE in direct sunlight or in environments with a high ambient temperature.  
Extreme temperatures will cause the BETAcharge II to shut down operation
- Allow adequate ventilation around the cabinet.  
eg: 100mm clearance to the left and right side panels for effective fan cooling
- Mounting hole dimensions and sizes are listed in the specifications tables.

### CONNECTING:

**!!!! ENSURE THE 240Vac MAINS IS SWITCHED OFF !!!!**

#### **Input connection:**

The mains supply is fitted with a standard 3 pin plug, for connection to an Australian GPO.  
The cable exits the unit from the right hand side panel.

If using a GenSet for mains supply, ensure that its capacity is at least double the VA rating of the NEPTUNE.  
eg: 800VA charger = 1600VA GenSet minimum  
maximum GenSet distortion 16%

#### **Output connection:**

The output connections are binding posts located on the left hand side panel.

- 1 Use AT LEAST the cable size recommended in the specifications tables for your unit.
- 2 Connect battery NEGATIVE terminal to the BLACK binding post.
- 3 Loosen insulated post anti-clockwise to open terminal.
- 4 Strip a length of 10mm of the cable insulation.
- 5 Twist wire and insert into terminal post.
- 6 Tighten clockwise to close connection
- 7 Connect battery POSITIVE terminal to the RED binding post.
- 8 Repeat steps 3 to 6.

#### **Battery connection:**

The NEPTUNE uses accurate battery voltage and charging current sensing to operate properly.

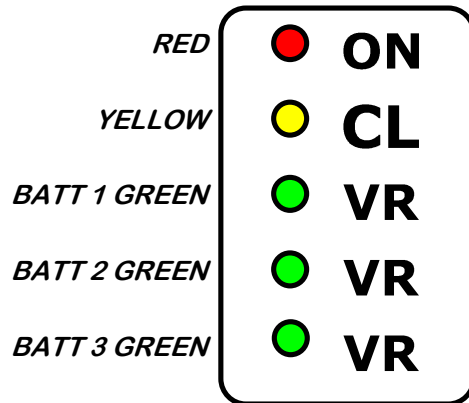
Bad connections caused by faulty wiring can cause the NEPTUNE to charge incorrectly, and may cause damage to the battery.

To avoid this;

- Ensure that the connections to the binding posts of the NEPTUNE are clean and tight.
- Ensure that the connections to the batteries are of a permanent nature:  
eg: bolted terminals, crimped connectors, etc
- Ensure that the cable size and lengths are as per the specifications tables.
- Ensure that the connections to the battery terminals are clean and tight.
- Alligator type clips **ARE NOT recommended**, as in time they may corrode and develop bad connections.  
If a removable connection system is required, we suggest using an **ANDERSON®** type connector, or similar.
- Ensure that the NEPTUNE has a direct connection to the batteries.  
No devices are permitted between the NEPTUNE and the batteries.  
eg: diode splitters, voltage reducers, etc

**L.E.D STATUS DISPLAY:****L.E.D STATUS DISPLAY:**

The neptune will indicate charging status via the LED display at all times.  
 Below is listed a description of each LED and its function.  
 For additional information, see the TROUBLESHOOTING GUIDE at the rear of this manual.



LED LABEL	LED COLOUR	DESCRIPTION
NO LEDs ILLUMINATED	none	This indicates that the NEPTUNE is non-operational, due to; <ul style="list-style-type: none"> <li>• No 240Vac mains supply</li> <li>• Input Overload is off</li> <li>• Over-Temperature shut down</li> </ul>
ON	RED	It indicates the NEPTUNE is supplied with Mains ac and is operational.
CL	◇ YELLOW off * YELLOW flash	◇ The NEPTUNE is delivering less than its maximum output current amps. * The NEPTUNE is delivering it maximum output current amps to the batteries.
VR	◇ GREEN off ◆ GREEN on	◇ The output terminal voltage is less than the Maximum Voltage - Electronic regulation value. ◆ The NEPTUNE is voltage regulating.
VR	◇ GREEN off ◆ GREEN on	◇ The output terminal voltage is less than the Maximum Voltage - Electronic regulation value. ◆ The NEPTUNE is voltage regulating.
VR	◇ GREEN off ◆ GREEN on	◇ The output terminal voltage is less than the Maximum Voltage - Electronic regulation value. ◆ The NEPTUNE is voltage regulating.

**OPERATION:**

The RED led is illuminated while ever the charger is on

**Current Limiting:** In normal charging conditions, the charger will supply up to its maximum available current, which is shared by the three outlets. If the total current drawn from the charger exceeds the maximum setting (see Adjustments) the current limiting circuit will protect the charger from overload. The YELLOW led will illuminate.

**Voltage Regulation:** Each of the three battery outlets are independantly controlled to lift and maintain the battery voltage at a preset level (see Adjustments). As the battery becomes more charged, the drawn current will decrease. When the battery voltage reaches this preset level, it will hold it there and the GREEN led will be illuminated.

For a visual example, see the Charge & Load Curves at right.

**ADJUSTMENTS:** Factory settings are as per the Specification Table on page 2. Select correct setting to suit the charger being adjusted.

**ADJUSTMENTS SHOULD BE MADE BY  
A COMPETANT ELECTRICIAN**

Remove front panel to access the control card. Locate the adjustment trimpots vertically on right side of the pcb.

**Voltage Regulation:** Connect a voltmeter to the battery whose regulated voltage is to be adjusted. Turn the realtive trimpot labelled "**B1**", "**B2**" or "**B3**". Clockwise to increase the voltage setting, and anti-clockwise to decrease the desired level.

*>>Please note = a setting of higher than the sum of the nominal battery voltage times "1.2" could cause excessive gassing of the batteries connected, thus seriously overcharging and possibly damaging the batteries.*

eg: 12V X 1.2 = 14.4V, 24V X 1.2 = 28.8V

**Current Limiting:** Using an appropriate ammeter, fitted into the NEGATIVE line to read the total current, apply a load and adjust the trimpot labelled "**CL**" anti-clockwise to decrease the current limit level.

*>>Please note = the "**CL**" setting should not be greater than the maximum output current rating of the charger. As this will defeat the whole purpose of the current limiting feature and cause an overload on the charger and possible irreversible damage.*

WOODS ELECTRIC will not be held responsible for the results of maladjusted **VR** and **CL** trimpots.

**SPARE PARTS TABLE:****SPARE PARTS TABLE:**

<b>DESCRIPTION</b>	<b>1230N</b>	<b>1260N</b>	<b>2415N</b>	<b>2430N</b>	<b>2460N</b>
TRANSFORMER	301240	301280	302420	302440	302460
SCR	87552	879114	87552	87552	879114
CONTROL CARD	41NEP21	41NEP21	41NEP21	41NEP21	41NEP21
FILTER CARD	07AUTO	07AUTO	07AUTO	07AUTO	07AUTO
INTERCONNECT CARD	441230	441230	441230	441230	441260
5 LED CARD	835	835	835	835	835
INPUT BREAKER	52M04	52M06	52M04	52M06	52M16
OUTPUT BREAKER	52M63	52M40.3	52M32	52M63	52M40.3
FAN	90124	90124	90124	90124	90124
FAN TEMP. SWITCH	43505	43505	43505	43505	43505
HEAT SINK SWITCH	431005	431005	431005	431005	431005

**COMPONENT IDENTIFICATION:**

**COMPONENT IDENTIFICATION:**

**TRANSFORMER**



MODEL	PART #
1230N	30A15750
2415N	30A15750

**TRANSFORMER**



MODEL	PART #
1230N	30S15750
2415N	30S15750

**TRANSFORMER**

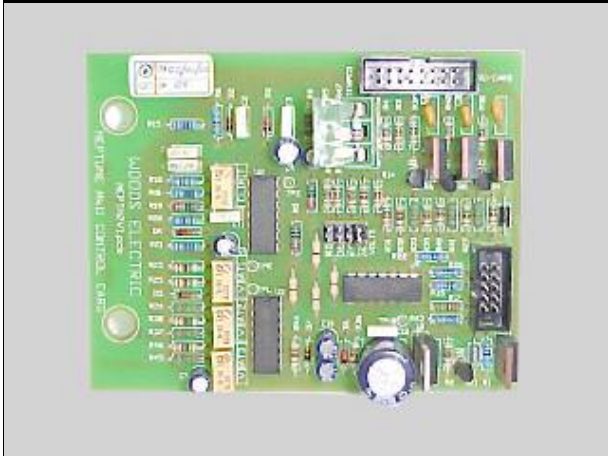


MODEL	PART #
1260N	30S151500
2430N	30D151500
2460N	2 off - 30D151500

**COMPONENT IDENTIFICATION:**

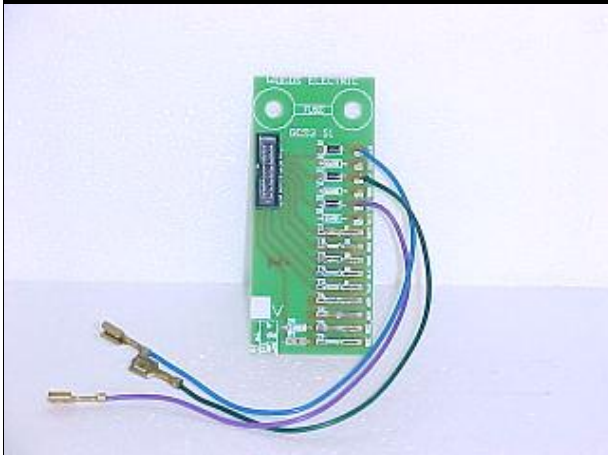
**COMPONENT IDENTIFICATION:**

**NEP21 CONTROLLER  
NEPTUNE**



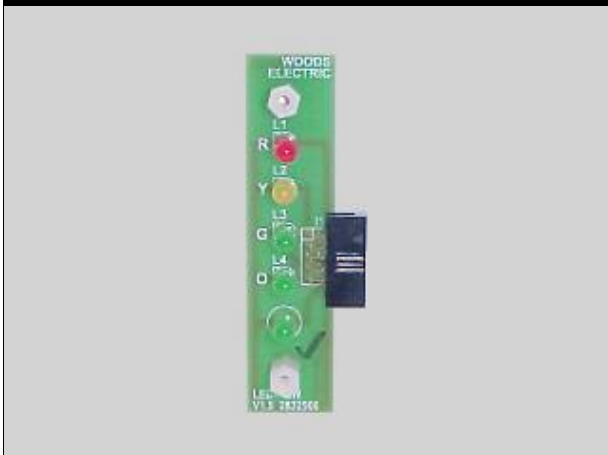
MODEL	PART #
1230N 1260N 2415N 2430N 2460N	41NEP21

**INTERCONNECT CARD  
NEPTUNE**



MODEL	PART #
1215N  3 wire	441215
1230N 1260N 12100N 2407N 2415N 2430N  6 wire	441230
2460N 24100N	441260

**5 LED INDICATOR  
NEPTUNE**



MODEL	PART #
all NEPTUNE	835

**COMPONENT IDENTIFICATION:**

**COMPONENT IDENTIFICATION:**

**RECTIFIER**



MODEL	PART #
1230N	403510
2415N	403510
2430N	403510

**S.C.R 30Amp**



MODEL	PART #
1230N	87552
2415N	87552
2430N	87552

**S.C.R. 60 Amp**



MODEL	PART #
1260N	879114
2460N	879114

**COMPONENT IDENTIFICATION:**

**COMPONENT IDENTIFICATION:**

**TEMPERATURE SENSOR**



MODEL	TYPE
All	Heatsink
<b>50°C NO FAN</b>	<b>100°C NC TRANSFORMER</b>
<b>43505</b>	<b>431005</b>

**CIRCUIT BREAKER**



RATING	PART #
<b>2 Amps</b>	<b>52M02</b>
<b>4 Amps</b>	<b>52M04</b>
<b>6 Amps</b>	<b>52M06</b>
<b>10 Amps</b>	<b>52M10</b>
<b>16 Amps</b>	<b>52M16</b>
<b>20 Amps</b>	<b>52M20</b>
<b>32 Amps</b>	<b>52M32</b>
<b>63 Amps</b>	<b>52M63</b>

**CIRCUIT BREAKER**



RATING	PART #
<b>3 X 40 Amps</b>	<b>52M40.3</b>
<b>3 X 63 Amps</b>	<b>52M63.3</b>

**COMPONENT IDENTIFICATION:**

**COMPONENT IDENTIFICATION:**

**OUTPUT TERMINALS 30Amp**



TYPE	PART #
RED	344R
BLACK	344B

**OUTPUT TERMINALS 60Amp**



TYPE	PART #
RED	34490.1
BLACK	34490.4

**SHUNT**



RATING	PART #
25 Amps	36Z025
50 Amps	36Z050
100 Amps	36Z100

**COMPONENT IDENTIFICATION:**

**COMPONENT IDENTIFICATION:**

**120mm COOLING FAN**



TYPE	PART #
all CHARGERS	40mm
12Vdc	90124.12
24Vdc	90124.24
110Vac	90124.1
240Vac	90124
	25mm
240vAC	90125

**120mm FAN GRILLE**



MODEL	PART #
All	90120G



**UPGRADES & SUPPLEMENTS:**

**UPGRADES & SUPPLEMENTS:**

As future product developments are made, supplements may be included in this section to keep your information up to date.



**WOODS Battery Chargers**  
7 Woodford Place, P.O. Box 118  
Thornton, 2322.  
Phn: 02 4966 2811 Fax: 02 4966 2911

## WARRANTY CERTIFICATE:

### SECTION A:

Before using the WOODS Battery Charger, it is vitally important record the following information;

- 1 WOODS Battery Charger model number
- 2 WOODS Battery Chargers serial number
- 3 date of purchase
- 4 place of purchase

\* we also suggest you attach a copy of your purchase invoice to this document, for future reference

***PLEASE RETAIN THIS INFORMATION UNTIL WARRANTY SERVICE IS REQUIRED.***

### SECTION B:

WOODS Battery Chargers will honour warranty if;

- 1 the WOODS Battery Charger fails within 12 months of purchase by end user
- 2 the product is returned to an authorised service agent
- 3 the freight is prepaid to an authorised service agent
- 4 proof of purchase is provided with warranty claim
- 5 failure is due to faulty workmanship and/or parts failure

### SECTION C:

WOODS Battery Chargers will void warranty if;

- 1 the WOODS Battery Charger is used in an improper manner, eg: outside its specifications
- 2 the WOODS Battery Charger has been incorrectly installed and/or connected
- 3 failure is caused by gross damage such as, droppage, water damage, etc
- 4 the unit has been tampered with
- 5 non-genuine parts have been installed
- 6 the WOODS Battery Charger has been repaired by persons NOT authorised by WOODS Battery Chargers.
- 7 outside the warranty period
- 8 no proof of purchase is supplied

### SECTION D:

Items not covered by warranty;

- 1 3rd party service activities and charges
- 2 Charges incurred for travelling to or from repair site
- 3 Costs of non-genuine parts

### SECTION E:

In the event of a warranty claim, please provide the service agent with the following;

- 1 your faulty WOODS Battery Charger, (pre-paid freight, if necessary)
- 2 the information as requested SECTION A
- 3 a written description of fault(s)
- 4 your contact details

### SECTION F:

Note: If no fault is found in the WOODS Battery Charger, servicing is covered by warranty - but the return freight cost will be at the owners' expense.

**CONTACT:****CONTACT:**

WOODS BATTERY CHARGERS Pty Ltd

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