AC/DC POWER PRODUCTS

POWER CONVERTERS AND BATTERY CHARGERS

RELIABLE AC/DC POWER

THE DLS SERIES

IOTA's DLS Series Battery Chargers and Power Converters provide reliable AC/DC power conversion for a variety of application needs. With a record of proven performance throughout several industries, the IOTA DLS Series is the AC/DC power solution of choice for a number of professional and recreational users. Whether it's maintaining your system's batteries or operating a DC load from an AC supply, the DLS Series product line offers chargers and converters that will meet the standards your application requires.

BATTERY CHARGING

Use the DLS Series Battery Charger for safe, dependable battery charging. Select between a normal charging voltage or a 'stepped-up' bulk charge for faster charging. Inserting the optional IOTA IQ4 Charge Controller into the Dual Voltage Jack enables the charger to deliver four-stage charging that keeps your battery in working order when not in regular use.

POWER CONVERSION

Use the DLS to operate your DC load directly from the AC supply. The exceptionally clean DC output of the DLS Series converter promotes longer life for any connected load and virtually eliminates AC ripple that can cause static or premature failure of radio or television equipment. Operating quietly and efficiently, the IOTA DLS supplies only what is required by the load. When no load is present, the DLS output voltage drops so that the unit is essentially off, reducing electricity usage.

A CHARGER AND POWER SUPPLY DESIGNED WITH THE USER IN MIND...

- UL AND CUL LISTED
- EXCEPTIONALLY CLEAN DC OUTPUT
- DESIGNED TO WITHSTAND LOW TRANSIENT AC LINE VOLTAGE
- CURRENT LIMIT AND THERMAL/OVERLOAD PROTECTION
- TIGHT LINE/LOAD REGULATION
- CAN BE USED WITH OR WITHOUT A BATTERY
- INTERNAL IQ4 OPTION
- PROPORTIONAL FAN CONTROL
- TWO-STAGE CHARGING
- REVERSE POLARITY PROTECTION

FOUR-STAGE "SMART" CHARGE CONTROL

The IQ4 Charge Controller transforms the DLS unit into an automatic four-stage charger that maintains your battery's charge, reduces charging time, and minimizes 'gassing' caused by over-charging. The IQ4 delivers a Boost, Absorption, and Float charge, and a periodic Equalization Phase that protects your battery from sulfating and stratification. The IQ4 charge control is automatic...just plug in the controller and it does the work. External and internal IQ4 models are available. See page 10 for details.

The unique Proportional Fan Control circuit maintains fan speed in direct proportion to the converter's internal ambient temperature, enabling the fan to turn on and off slowly and quietly, minimizing operational noise.

The Dual Voltage Jack allows easy two-step charging for batteries. By inserting the included Dual Voltage Plug, IOTA battery chargers will deliver an increased output for faster charging. For example, units for 12V batteries typically charge at 13.6 volts. When the plug is inserted into the jack, voltage output increases to 14.2 volts. Remove the plug to resume normal charging.

Secure external fuses protect IOTA battery chargers in the event of incorrect battery installation. IOTA units utilize standard automotive blade-type fuses for easy replacement.

IOTA
POWERING YOUR WAY

12VDC OUTPUT

IOTA 12V Battery Chargers and Power Converters provide 13.6 volts DC output from a 120 volt AC supply for charging a battery supply or operating any DC load up to the converter's rated output. 15 to 90 Amp models available.

SERIES M

DLS Series M Models provide the same exceptional performance as other DLS models in addition to featuring a compact housing configuration with side-mounting feet.

DLS-15

Series M

15 Amp

200 Watt Output

DLS-30

Series M

30 Amp

400 Watt Output

DLS-45

Series M

45 Amp

600 Watt Output

DLS-55

Series M

55 Amp

750 Watt Output

DLS-75

75 Amp

1000 Watt Output

DLS-90*

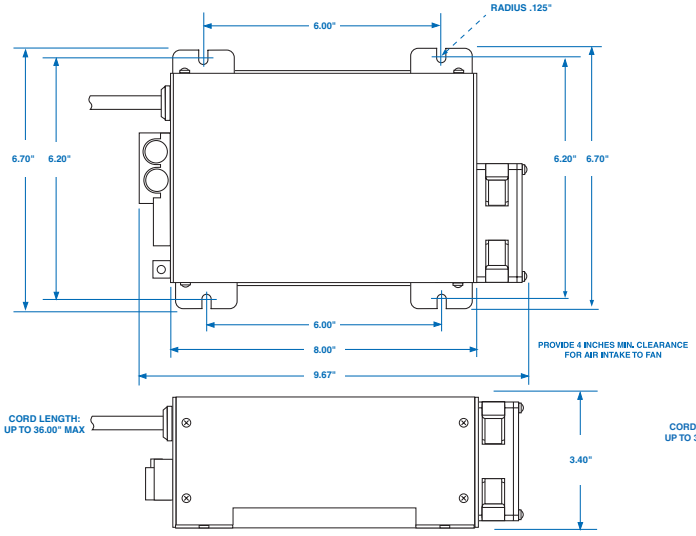
90 Amp

1200 Watt Output

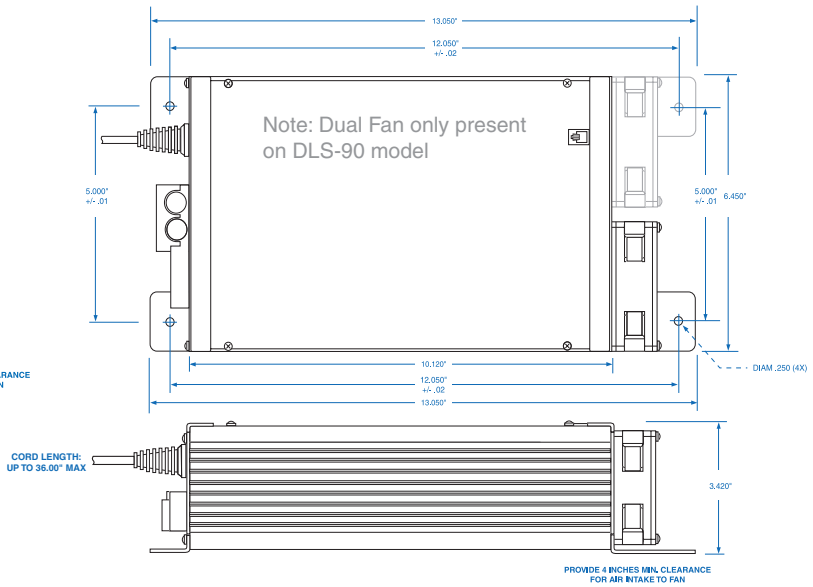
*DLS-90 unit is not UL Listed

DIMENSIONAL REFERENCE

DLS-15
DLS-30
DLS-45
DLS-55



DLS-75
DLS-90



FEATURES

- Switch-mode technology
- Exceptionally clean DC output
- Tight line-load regulation
- Quickly and efficiently charges batteries
- Designed to withstand low transient AC line voltage
- Current limit and thermal/overload protection
- Lower operating temperature
- Quiet fan operation
- External reverse polarity fuse protection from incorrect battery connection
- High and normal-stage charging jack
- Compatible with **IOTA IQ4 Charge Controller** (page 10)
- UL and CUL Listed

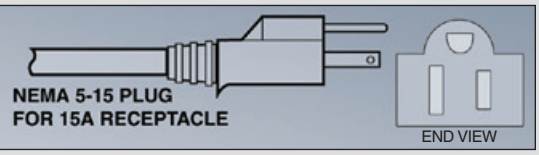
IQ4

Most DLS Models are available with the IQ4 charge controller built into the unit. Models with internal IQ4 are designated by '*/IQ4*' at the end of the model name.

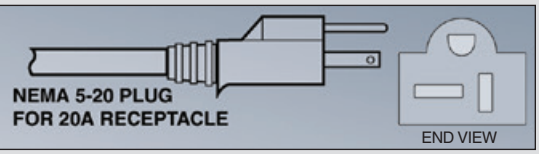
CORD CONFIGURATION

IOTA DLS converter/chargers are supplied with a power cord (approx. 36 inch length) for connection to the AC input. Plug type on the cord is determined by the input voltage and ratings of the DLS model and/or UL specifications.

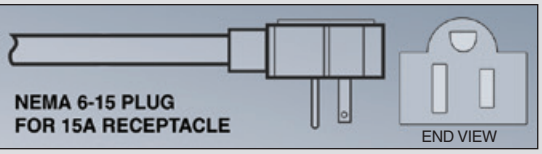
- DLS-15
- DLS-30
- DLS-45
- DLS-55



- DLS-75



- DLS-90

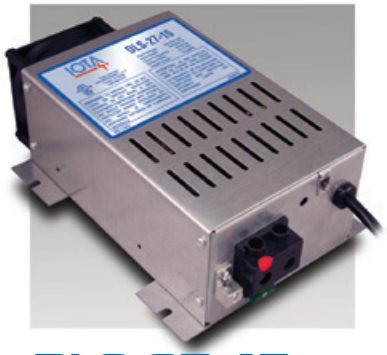


RATINGS AND SPECIFICATIONS	DLS-15 SERIES M	DLS-30 SERIES M	DLS-45 SERIES M	DLS-55 SERIES M	DLS-75	DLS 90
DC Output Voltage (No Load) approx.	13.6V (DC)	13.6V (DC)	13.6V (DC)	13.6V (DC)	13.6V (DC)	13.6V (DC)
Output Voltage Tolerance (No Load)	+ or - .7%	+ or - .7%	+ or - .7%	+ or - .7%	+ or - .7%	+ or - .7%
Output Amperage, Max Continuous	15 Amps	30 Amps	45 Amps	55 Amps	75 Amps	90 Amps
Output Voltage (Full Load) approx.	>13.4V (DC)	>13.4V (DC)	>13.4V (DC)	>13.4V (DC)	>13.4V (DC)	>13.4V (DC)
Maximum Power Output, Continuous	200 Watts	400 Watts	600 Watts	750 Watts	1000 Watts	1200 Watts
Ripple and Noise	<50 mV rms	<50 mV rms	<50 mV rms	<50 mV rms	<100 mV rms	<150 mV rms
Input Voltage Range	108 - 132 AC	108 - 132 AC	108 - 132 AC	108 - 132 AC	108 - 132 AC	108 - 132 AC
Input Voltage Frequency	47-63	47-63	47-63	47-63	47-63	47-63
Maximum AC Current (@108Vac)	3.7 Amps	7.3 Amps	11 Amps	13.4 Amps	18.2 Amps	21.8 Amps**
Typical Efficiency	>80%	>80%	>80%	>80%	>80%	>80%
Max Inrush Current, Single Cycle	30 Amps	30 Amps	30 Amps	30 Amps	40 Amps	40 Amps
Short Circuit Protection	Yes	Yes	Yes	Yes	Yes	Yes
Overload Protection	>100%	>100%	>100%	>100%	>100%	>100%
Line Regulation	100 mV rms	100 mV rms	100 mV rms	100 mV rms	100 mV rms	100 mV rms
Load Regulation	<1%	<1%	<1.5%	<1.5%	<1.5%	<1.5%
Fan Control	PROPORTIONAL	PROPORTIONAL	PROPORTIONAL	PROPORTIONAL	PROPORTIONAL	PROPORTIONAL
Thermal Protection	YES	YES	YES	YES	YES	YES
Working Temperature Range	0° - 40° C	0° - 40° C	0° - 40° C	0° - 40° C	0° - 40° C	0° - 40° C
Storage Temperature	-20° to 80° C	-20° to 80° C	-20° to 80° C	-20° to 80° C	-20° to 80° C	-20° to 80° C
Withstand Voltage (VDC)†	1700/1700/500	1700/1700/500	1700/1700/500	1700/1700/500	1700/1700/500	1700/1700/500
Approximate Dimensions	9.7″ x 6.7″ x 3.4″	9.7″ x 6.7″ x 3.4″	9.7″ x 6.7″ x 3.4″	9.7″ x 6.7″ x 3.4″	13″ x 6.5″ x 3.4″	13″ x 6.5″ x 3.4″
Weight	4.5 lbs	4.5 lbs	5.0 lbs	5.0 lbs	7.8 lbs	7.8 lbs

**Requires 30A breaker †Primary to Chassis/Primary to Secondary/Secondary to Chassis

24VDC OUTPUT

IOTA 24V Battery Chargers and Power Converters provide 27.2 volts DC output from a 120 volt AC supply for charging a battery supply or operating any DC load up to the converter's rated output. 15 to 40 amp models available.



DLS-27-15

15 Amp

400 Watt Output

DLS-27-25

25 Amp

675 Watt Output

DLS-27-40

40 Amp

1100 Watt Output

48-54VDC OUTPUT

DLS units for 48VDC applications include the DLS 48-20 for 48V power conversion, and the DLS-54-13 for 48V battery charging.

DLS-48-20*

Power Supply

20 Amp

950 Watt Output

DLS-54-13*

Battery Charger

13 Amp

700 Watt Output

*DLS-48-20 and DLS-54-13 are not UL Listed

POWER SUPPLY

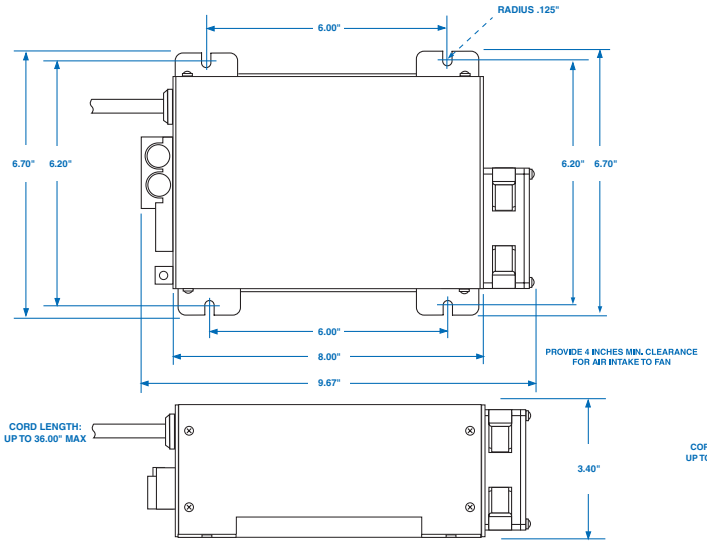
The **DLS-48-20** provides a DC output of 48 volts at full load. This unit is designed for power conversion of 120 VAC to 48 VDC applications only.

BATTERY CHARGER

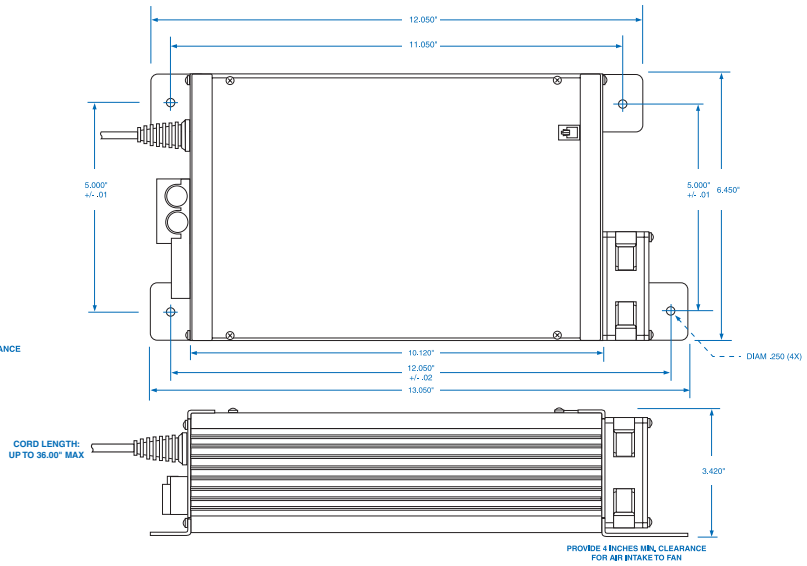
The **DLS-54-13** provides an increased DC output of 54.4 volts for charging a 48V battery supply from a 120VAC supply.

DIMENSIONAL REFERENCE

DLS-27-15
DLS-27-25
DLS-54-13



DLS-27-40
DLS-48-20



FEATURES

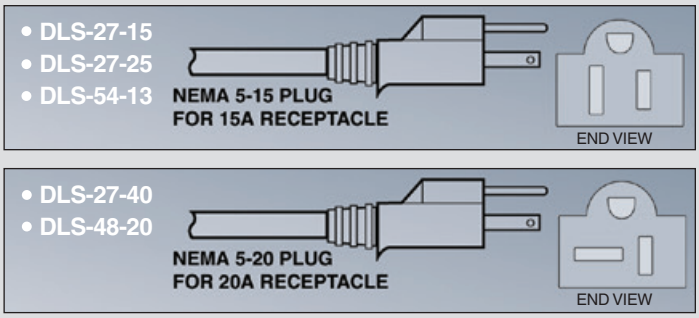
- Switch-mode technology
- Exceptionally clean DC output
- Tight line-load regulation
- Quickly and efficiently charges batteries
- Designed to withstand low transient AC line voltage
- Current limit and thermal/overload protection
- Lower operating temperature
- Quiet fan operation
- External reverse polarity fuse protection from incorrect battery connection
- High and normal-stage charging jack
- Compatible with **IOTA IQ4 Charge Controller** (page 10)
- UL and CUL Listed

IQ4

Most DLS Models are available with the IQ4 charge controller built into the unit. Models with internal IQ4 are designated by *'/IQ4'* at the end of the model name.

CORD CONFIGURATION

IOTA DLS converter/chargers are supplied with a power cord (approx. 36 inch length) for connection to the AC input. Plug type on the cord is determined by the input voltage and ratings of the DLS model and/or UL specifications.



CHARGE CONTROL FOR 54 VOLTS

The **DLS-54-13** Battery Charger requires a modified IQ4 Charge Controller designed for use with the increased DC output of the charger. External IQ4 Charge Controllers for the DLS-54-13 are identified on the unit as modified for 54 volts. The **DLS-48-20** is for power conversion applications only and the Dual Voltage Jack/IQ4 receptacle on the unit is disabled.

RATINGS AND SPECIFICATIONS	DLS-27-15 SERIES M	DLS-27-25 SERIES M	DLS-27-40	DLS-48-20	DLS-54-13 SERIES M
DC Output Voltage (No Load) approx.	27.2V (DC)	27.2V (DC)	27.2V (DC)	48V (DC)	54.4V (DC)
Output Voltage Tolerance (No Load)	+ or - .5%	+ or - .5%	+ or - .5%	+ or - .5%	+ or - .5%
Output Amperage, Max Continuous	15 Amps	25 Amps	40 Amps	20 Amps	13 Amps
Output Voltage (Full Load) approx.	>27.0V (DC)	>27.0V (DC)	>27.0V (DC)	>47.8V (DC)	>54V (DC)
Maximum Power Output, Continuous	400 Watts	675 Watts	1100 Watts	950 Watts	700 Watts
Ripple and Noise	<100 mV rms	<100 mV rms	<100 mV rms	<100 mV rms	<100 mV rms
Input Voltage Range	108 - 132 AC	108 - 132 AC	108 - 132 AC	108 - 132 AC	108 - 132 AC
Input Voltage Frequency	47-63	47-63	47-63	47-63	47-63
Maximum AC Current (@108Vac)	7.3 Amps	12.2 Amps	19.5 Amps	17.1 Amps	12.6 Amps
Typical Efficiency	>80%	>80%	>80%	>80%	>80%
Max Inrush Current, Single Cycle	30 Amps	30 Amps	40 Amps	40 Amps	30 Amps
Short Circuit Protection	Yes	Yes	Yes	Yes	Yes
Overload Protection	>100%	>100%	>100%	>100%	>100%
Line Regulation	100 mV rms	100 mV rms	100 mV rms	100 mV rms	100 mV rms
Load Regulation	<1%	<1%	<1%	<1%	<1%
Fan Control	PROPORTIONAL	PROPORTIONAL	PROPORTIONAL	PROPORTIONAL	PROPORTIONAL
Thermal Protection	YES	YES	YES	YES	YES
Working Temperature Range	0° - 40° C	0° - 40° C	0° - 40° C	0° - 40° C	0° - 40° C
Storage Temperature	-20° to 80° C	-20° to 80° C	-20° to 80° C	-20° to 80° C	-20° to 80° C
Withstand Voltage (VDC)**	1700/1700/500	1700/1700/500	1700/1700/500	1700/1700/500	1700/1700/500
Approximate Dimensions	9.7″ x 6.7″ x 3.4″	9.7″ x 6.7″ x 3.4″	13″ x 6.5″ x 3.4″	13″ x 6.5″ x 3.4″	9.7″ x 6.7″ x 3.4″
Weight	4.5 lbs	5.0 lbs	7.8 lbs	7.8 lbs	5.0 lbs

**Primary to Chassis/Primary to Secondary/Secondary to Chassis

240VAC INPUT / 12VDC OUTPUT

IOTA 240VAC/12VDC Battery Chargers and Power Converters provide 12 volts DC output from a 220-240 volt AC supply for charging a battery supply or operating any DC load up to the converter's rated output. Amperages range from 30 to 55 amps.

DLS-240-30

30 Amp

400 Watt Output

DLS-240-45

45 Amp

600 Watt Output

DLS-240-55

55 Amp

750 Watt Output

240VAC INPUT / 24VDC OUTPUT

IOTA 240VAC/24VDC Battery Chargers and Power Converters provide 27 volts DC output from a 220-240 volt AC supply for charging a battery supply or operating any DC load up to the converter's rated output. Amperages range from 25 to 40 amps.

DLS-240-27-25

25 Amp

675 Watt Output

DLS-240-27-40*

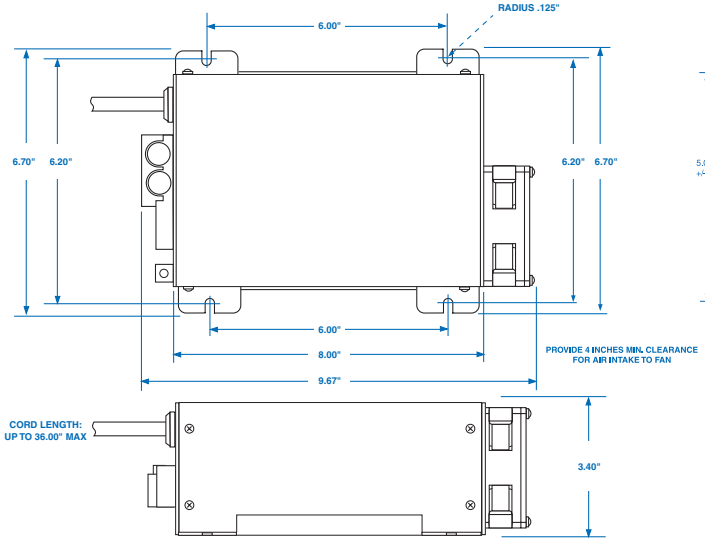
40 Amp

1100 Watt Output

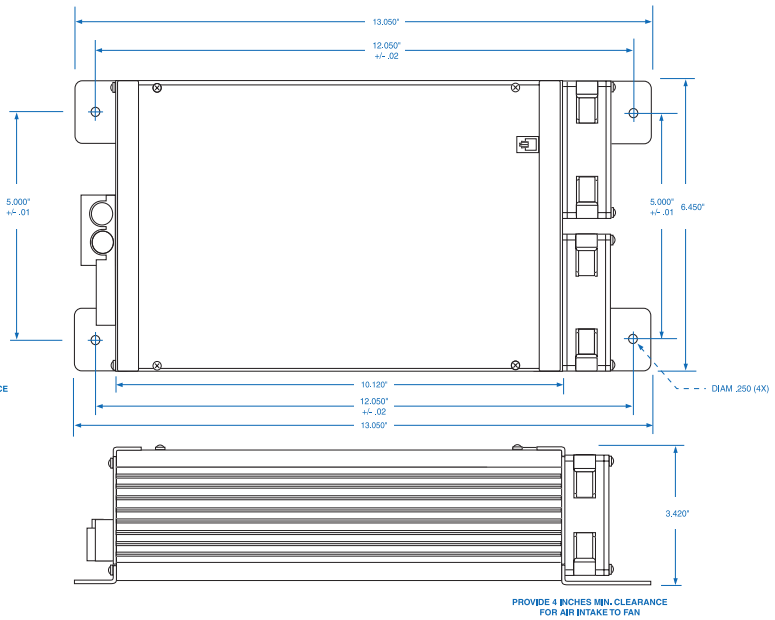
*DLS-240-27-40 is not UL Listed

DIMENSIONAL REFERENCE

DLS-240-30
DLS-240-45
DLS-240-55
DLS-240-27-25



DLS-240-27-40



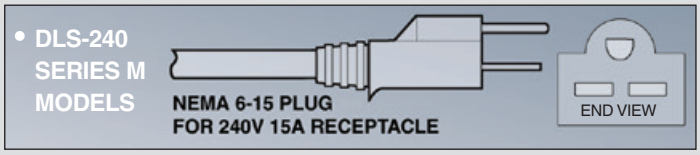
FEATURES

- Switch-mode technology
- Exceptionally clean DC output
- Tight line-load regulation
- Quickly and efficiently charges batteries
- Designed to withstand low transient AC line voltage
- Current limit and thermal/overload protection
- Lower operating temperature
- Quiet fan operation
- External reverse polarity fuse protection from incorrect battery connection
- High and normal-stage charging jack
- Compatible with **IOTA IQ4 Charge Controller** (page 10)
- UL and CUL Listed

CORD CONFIGURATION

Specific IOTA DLS converter/chargers are supplied with a power cord (approx. 36 inch length) for connection to the AC input. Plug type on the cord is determined by the input voltage and ratings of the DLS model and/or UL specifications.

NOTE: DLS-240-27-40 model features a standard IEC receptacle for inserting an AC power cord (not supplied). Always use an appropriately rated cord (at least 16 gauge or 13mm^2) for connection to the AC input.



IQ4

Most DLS Models are available with the IQ4 charge controller built into the unit. Models with internal IQ4 are designated by '*/IQ4*' at the end of the model name.

RATINGS AND SPECIFICATIONS	DLS-240-30 SERIES M	DLS-240-45 SERIES M	DLS-240-55 SERIES M	DLS-240-27-25 SERIES M	DLS-240-27-40
DC Output Voltage (No Load) approx.	13.6V (DC)	13.6V (DC)	13.6V (DC)	27.2V (DC)	27.2V (DC)
Output Voltage Tolerance (No Load)	+ or - .7%	+ or - .7%	+ or - .7%	+ or - .7%	+ or - .7%
Output Amperage, Max Continuous	30 Amps	45 Amps	55 Amps	25 Amps	40 Amps
Output Voltage (Full Load) approx.	>13.4V (DC)	>13.4V (DC)	>13.4V (DC)	>27.0V (DC)	>27.0V (DC)
Maximum Power Output, Continuous	400 Watts	600 Watts	750 Watts	675 Watts	1100 Watts
Ripple and Noise	<50 mV rms	<50 mV rms	<50 mV rms	<100 mV rms	<100 mV rms
Input Voltage Range	216-264 AC	216-264 AC	216-264 AC	216-264 AC	216-264 AC
Input Voltage Frequency	47-63	47-63	47-63	47-63	47-63
Maximum AC Current (@216Vac)	3.7 Amps	5.5 Amps	6.7 Amps	6.0 Amps	10.0 Amps
Typical Efficiency	>80%	>80%	>80%	>80%	>80%
Max Inrush Current, Single Cycle	30 Amps	30 Amps	30 Amps	30 Amps	40 Amps
Short Circuit Protection	Yes	Yes	Yes	Yes	Yes
Overload Protection	>100%	>100%	>100%	>100%	>100%
Line Regulation	100 mV rms	100 mV rms	100 mV rms	100 mV rms	100 mV rms
Load Regulation	<1%	<1%	<1%	<1%	<1%
Fan Control	PROPORTIONAL	PROPORTIONAL	PROPORTIONAL	PROPORTIONAL	PROPORTIONAL
Thermal Protection	YES	YES	YES	YES	YES
Working Temperature Range	0° - 40° C	0° - 40° C	0° - 40° C	0° - 40° C	0° - 40° C
Storage Temperature	-20° to 80° C	-20° to 80° C	-20° to 80° C	-20° to 80° C	-20° to 80° C
Withstand Voltage (VDC)**	1700/1700/500	1700/1700/500	1700/1700/500	1700/1700/500	1700/1700/500
Approximate Dimensions	9.7″ x 6.7″ x 3.4″	9.7″ x 6.7″ x 3.4″	9.7″ x 6.7″ x 3.4″	9.7″ x 6.7″ x 3.4″	13″ x 6.5″ x 3.4″
Weight	5.0 lbs	5.0 lbs	5.0 lbs	5.0 lbs	7.8 lbs

**Primary to Chassis/Primary to Secondary/Secondary to Chassis

IT'S NOT MAGIC...

IT'S JUST PLAIN SMART

The IQ4 Smart Charger offers automatic charging control for DLS battery chargers, providing longer and safer use of your system's battery. The IQ4 controller allows the battery charger to operate as an automatic "smart charger." This gives the user the benefit of Bulk, Absorption, and Float stage charging, decreases charge times, insures proper and safe battery charging, and minimizes over-charging. The IQ4 monitors the battery at all times. If the DLS voltage remains in the long term Float stage for more than seven days, the IQ4 Smart Charger will automatically deliver a boost charge for a predetermined time, then return to the normal Float stage.

FOUR FUNCTIONS OF THE IQ4 SMART CHARGER

1 BULK CHARGE
Batteries are charged up to the full-rated output of the DLS battery charger, reducing the time needed to charge the battery.

2 ABSORPTION
The voltage drops and the batteries are then held for a controlled period at the absorption phase to insure a full and complete charge.

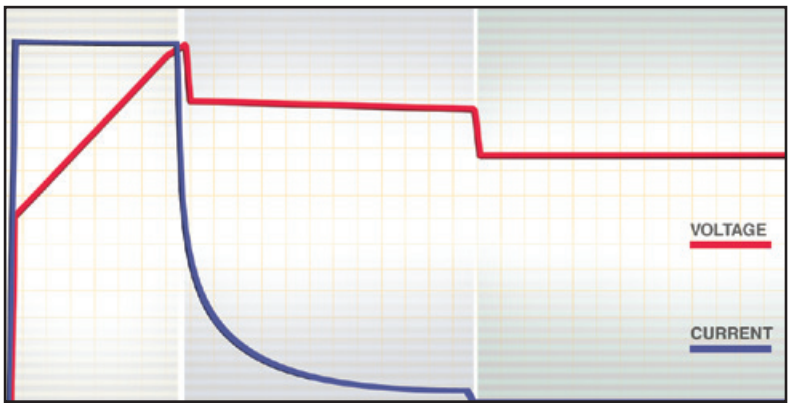
3 FLOAT CHARGE
The battery charger delivers a 'trickle' charge, maintaining the battery's full charge and avoiding "gassing" caused by over-charging.

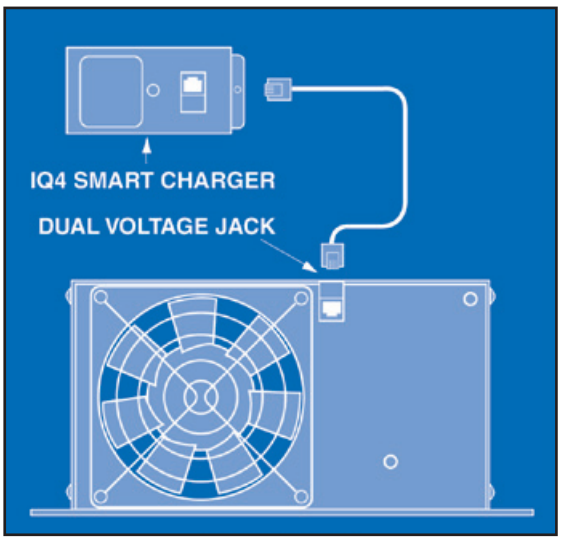
4 EQUALIZATION
If the battery remains in the 'Float' state for seven days, the IQ4 delivers a Smart Charge cycle to dissolve sulfate layers and to avoid stratification.

The charging voltage for the different stages varies depending on the voltage of the battery.

BATTERY VOLTAGE	BULK STAGE	ABSORPTION STAGE	FLOAT STAGE
12V	14.8V	14.2V	13.6
24V	29.6V	28.4V	27.2V
48V*	59.2V	56.8V	54.4V

*The DLS-54-13 battery charger for 48V applications requires a modified IQ4 charge controller for 54V.





SIMPLE INSTALLATION

The **IQ Smart Charger** is designed for easy installation by simply plugging into the existing Dual Voltage Jack on the DLS. The Smart Charger circuitry is then automatically activated. A specialized 10-inch cord is supplied with the IQ4 for connection to the DLS unit. (Location of the Dual Voltage Jack may vary depending on the DLS model).

For DLS models with built-in IQ4 controllers, the Dual Voltage Jack is not needed and is disabled.

No Dual Voltage Jack? If you are using an IOTA DLS Battery Charger model that does not feature a Dual Voltage Jack, you can still attach an IQ4 Smart Charger to your system...just contact IOTA's Customer Service Department for assistance.

LED INDICATOR

The LED indicator that appears on the IQ4 module (or on the DLS unit with IQ4-internal models) identifies the current charging mode of the IQ4. When first plugged into the unit, the LED will flash to indicate the number of cells in the battery (example: 6 flashes = 6 cells). After reading the number of cells, the IQ4 will enter a charge phase determined by the charge status of the battery.

Additionally, the LED will indicate a 'Fault' state in the event the DLS unit encounters an over-voltage. When this occurs, the LED will flash irregularly and the IQ4 will keep the battery in a Float state until the unit is re-set.

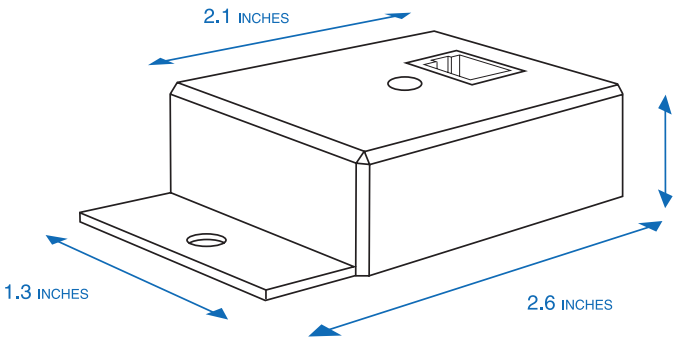
LED CODE TABLE

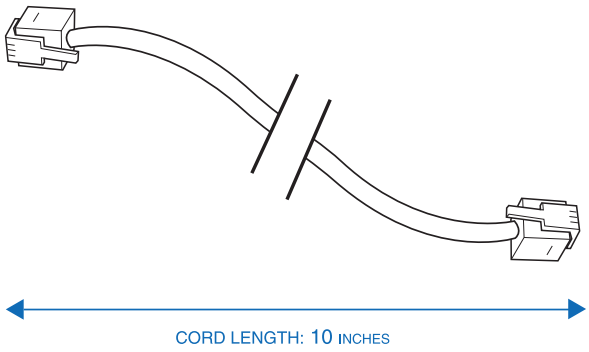
CELL INDICATION	
6 FLASHES	12V Battery (6 cells)
12 FLASHES	24V Battery (12 cells)
18 FLASHES	36V Battery (18 cells)
24 FLASHES	48V Battery (24 cells)

CHARGE PHASE	LED STATUS	VOLTAGE RATE
FLOAT	ON	2.266 PER CELL
ABSORPTION	SLOW FLASHING	2.366 PER CELL
BULK	RAPID FLASHING	2.466 PER CELL

Note: The LED for DLS units with internal IQ4 circuitry is located on the end of the DLS unit.

DIMENSIONS





DLS WITH BUILT-IN IQ4

IOTA DLS Series Battery Chargers are available with the IQ4 Smart Charger already built-in. DLS Chargers with IQ4 technology provide the benefits of Bulk, Absorption, Float, and Equalization charging without additional hardware. DLS units that feature internal IQ4 smart charging are indicated by '/IQ4' at the end of the model name. The LED indicator is located at the end of the DLS unit, and the Dual Voltage Jack which normally allows for manual two-stage charging is disabled.

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