# User Manual
# DC/ DC Converters
# DCW300 / DCW500
# 300 / 500 watts

HELIOS
POWER SOLUTIONS

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**Contents**

1: **General:**
The DCW300 & DCW500 Series product is a range of dc/dc converters, designed for use in industrial ( fixed ) applications. They are designed to step up or step down dc voltages.

2: **Input Voltage options**:
These units are offered with a range of *"standard"* input voltages, as illustrated in the general product data sheet table, but can also be manufactured to customer's special input voltage.

3: **Output Voltage options:**
These units are offered with a range of *"standard"* output voltages, as illustrated in the general product data sheet table, but can also be manufactured to customer's special input voltage.

4: **Output Voltage Adjustment:**
The output voltage is user adjustable via a trim pot on the side of the unit.

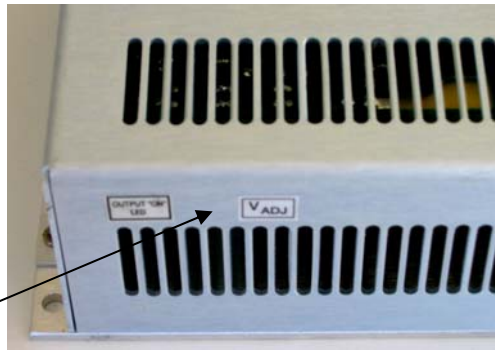



**Fig 4-1.**

The output adjustment is typically 0% ~ 15%, but can be customised to suit customer requirements.
**Warning:** If the output voltage is adjusted too high, the unit will shut down to protect the load connected to it. Should this occur, turn the input power off, wind *back* the voltage trim pot to approximately where it should be and turn the power back on after approximately 30 seconds.

5: **Over Voltage Protection ( OVP )**
Overvoltage protection is by way of double regulator loop, which will shut down the output voltage. Should this occur, turn the input power off, for approximately 30 seconds and then turn power back on. If the unit fails to power up, it needs to be returned to service department for investigation.

6: **Over Current Protection ( OCP )**
The DCW300 / 500 employ a constant current with hiccup mode ( over load / short circuit ) protection. At approximately 60% of the output voltage, the unit operates in constant current mode and then enters hiccup mode for short circuit protection.

7: **Cooling:**
Cooling by way of conduction ( to customer chassis ) and natural convection. …NO fans.
For reliable operation the power supply should be mounted such that: -
There is no obstruction to convected air for units cooled by natural convection.
Air temperature does not exceed maximum rated ambient.

8: **Operating Temperature:**
Figure 8-1 is a typical illustration of the derating required if the unit operates in high ambient environments.

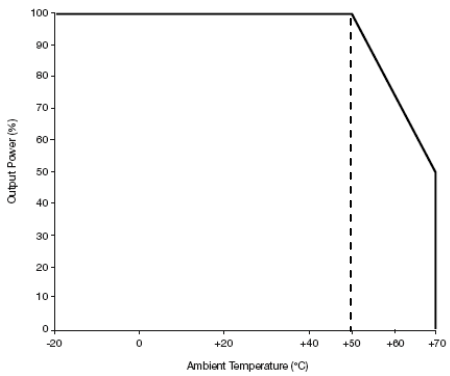



**Fig: 8-1**

## 9: **Connections:**

The connection details illustrated in Fig 9-1 is of a typical standard model and it may vary from unit to unit and or design.

**DC Input**: **+ -** & Earth

**Alarm:** The units are supplied with a Power Fail Alarm. This will operate if the Input power is lost, or the output voltage fails. The alarm is by way of *"voltage free"* change over contacts. User can select to use FAIL OPEN or FAIL CLOSE in reference to COM.

**Negative Output**: **- -** load connection for –VE output.


**Fig 9-1**

**Positive output**: The standard units are designed with built-in isolation diode. This allows the connection of two units in parallel for **N+1 Redundancy** applications..

## 10: **Single Unit Operation:**

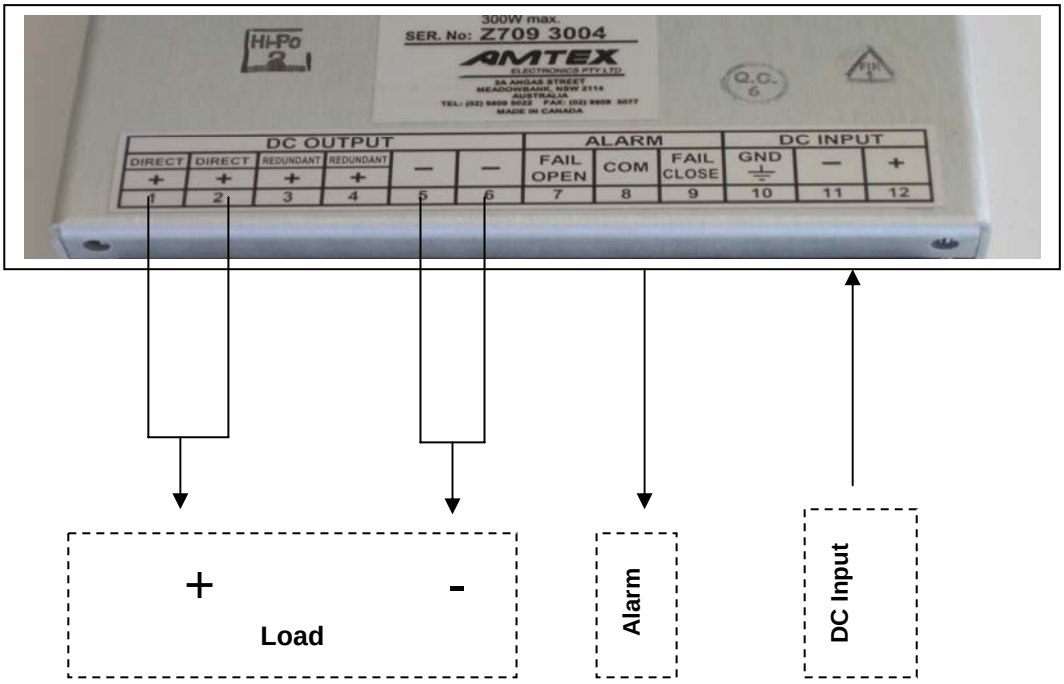



**Fig 10-1**

**Note:**

- The terminals are rated at 25A each. In some input / output configurations, where the current is above 20A, all the –VE & +VE terminals should be used.
- Input and output cables should be separated from one another for minimum interference and continued safety.
- Cables should be short and of adequate cross section to minimise voltage drop and resistive heating. Source and return cables should be run together for minimum pickup and radiation.

11: **Parallel Operation of two units:**

The DCW300 / 500 units have built-in output isolation diodes that allow two units ( maximum ) to be connected in parallel for **N+1 Redundancy applications.** This ensures that the output power to the load is available, in the event one of the units should fail. **+VE Connection to be made via the Redundant terminals.**

**Note:** Units are not to be connected in parallel for increase power

The two alarms can be connected in series or parallel to provide one common alarm if required.

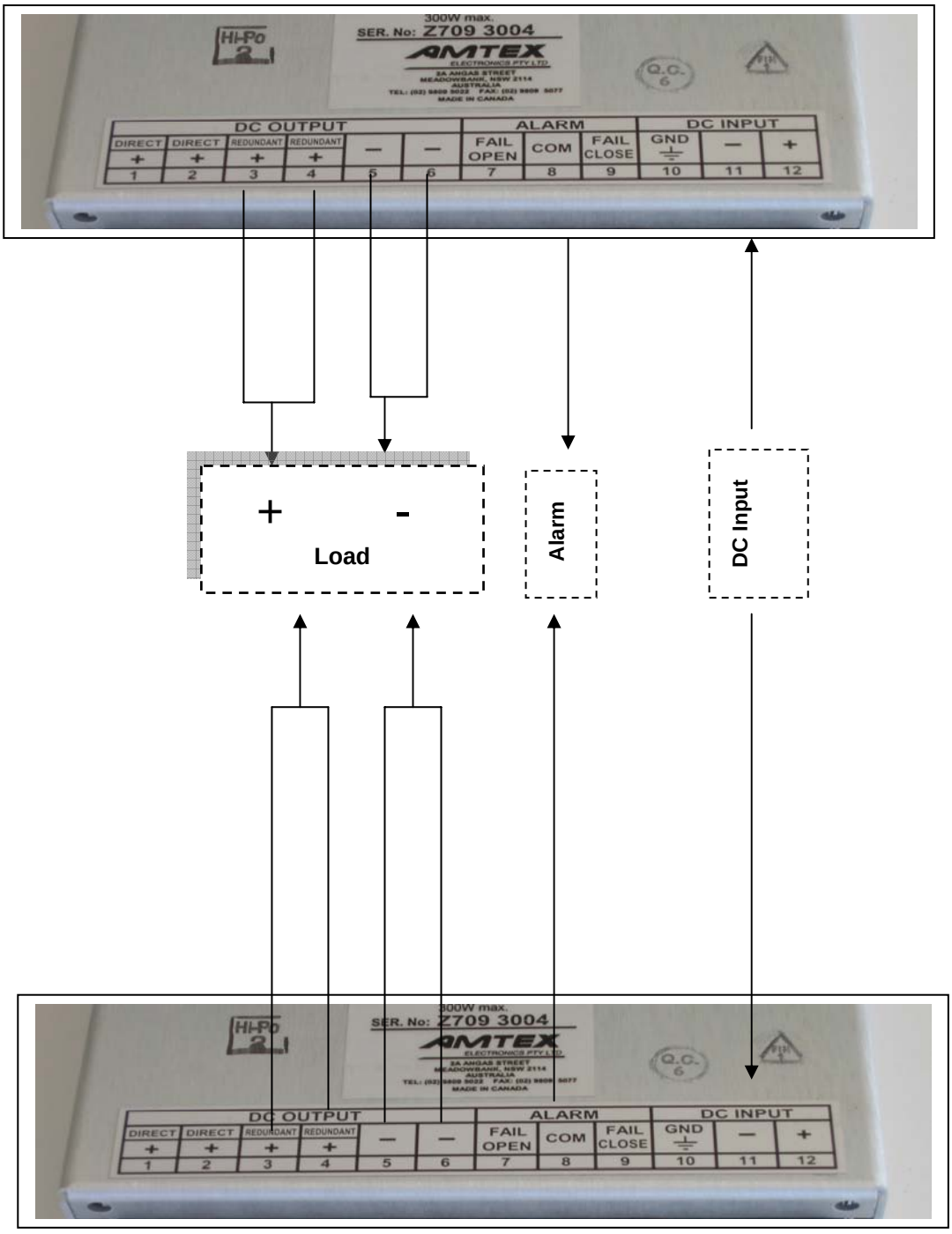



**Fig 11-1**

12: **Series Operation of two units:**
The DCW300 / 500 units can be connected in series as per **Fig 12.1**.
This allows for example two 24V output models to be connected in series for 48V output.
Output diodes to prevent reverse voltage applied to each unit under certain conditions.

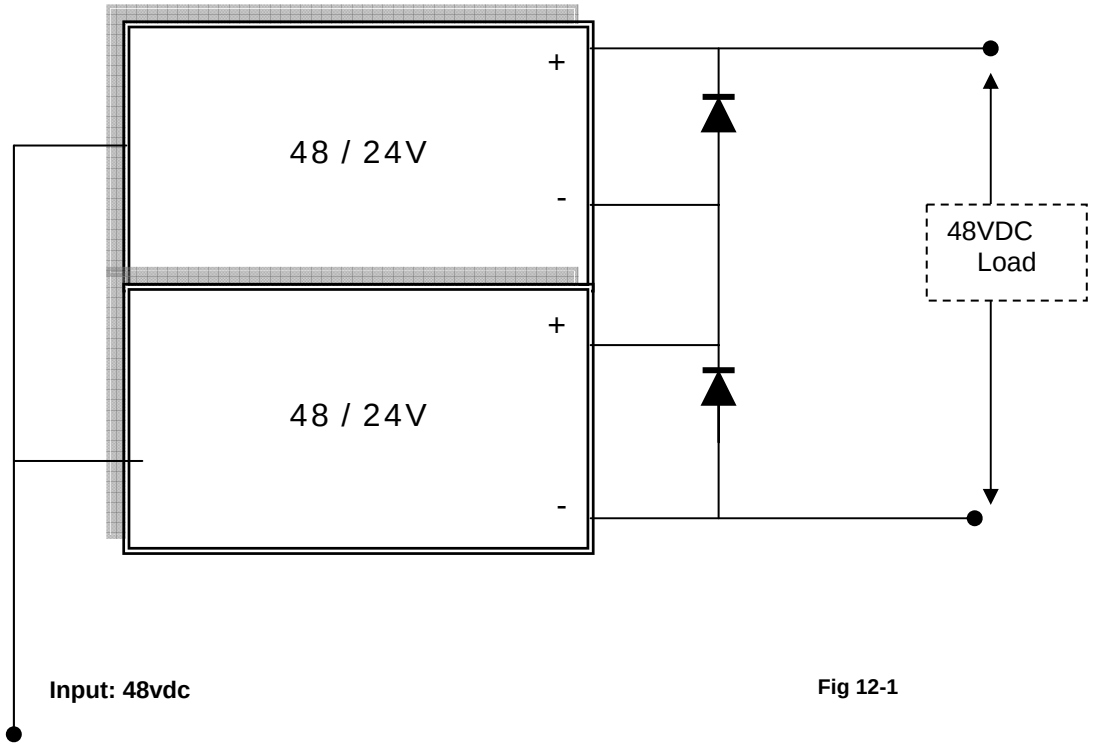



**Fig 12-1**

## 13. Safety:

In general these units are designed to be built into customer equipment and are therefore often of an open frame construction. Hazardous voltages and surface temperatures are therefore accessible on the printed circuit boards and exposed components. The user must ensure that these are not accessible after installation.

These hazards may still be present for a period of time after input disconnection. Therefore access to exposed unit should not be attempted until at least 2 minutes after disconnection and then only by qualified personnel.

The input voltage, requirements are specified on the unit rating label. Failure to operate within these ratings may result in a safety hazard, and the unit may be permanently damaged.

For continued protection against electric shock user must not allow units to operate in high moisture environments (see product specification for humidity rating). If exposed to such, remove supply voltage and allow to dry out before further use

**Fuses:** Most units will have an on-board input fuse.
**WARNING:** Should this fuse blow, **DO NOT** replace the fuse. The units needs to be returned to a qualified service technician for investigation, before fuse is replaced.
For continued protection against fire hazard replace fuses only with correct type and rating (fast 'F' HRC). See label for fuse rating.

**Environment**
Fire hazard may occur if power supply is operated in atmospheres designated explosive or highly corrosive, or atmospheres containing a high level of abrasive dust, or in extremes of temperatures outside specified limits (see product specification), or environments unprotected from severe impact.

# DCW300-500 SERIES

**DC/DC Converters Single Output: 300 ~ 500 Watts**

HELIOS POWER SOLUTIONS
www.heliosps.com.au

Standard model

DIN Rail mounting option

19in Rack Mount option

## Features

- Wide range of input / output voltage combinations
- 300 and 500 watt power options
- Convection cooled: No fans
- **N+1** redundancy : standard
- Output Fail alarm: standard
- Fully isolated input – output
- Over voltage & short circuit protection
- MTBF > 200,000hrs
- Specials input / output combinations on request.
- Any output from 12vdc ~ 120vdc possible

## Specifications

**Input Voltage**
**24VDC** ( 20 ~ 29 )
**48VDC** ( 38 ~ 60 )
**110VDC** ( 88 ~ 135 )
- Other voltages on request

**Input Protection**
Reverse polarity protection.
Inrush current limiting
Thermal Fuse

**Isolation**
Input - Output 1500 vdc
Input – Chassis 1500 vdc
Output – Chassis 500 vdc
- Other options on request

**Efficiency**
Model dependent , typically 80%

**Switching Freq.**
50kHz

**Output voltage**
Any voltage from 12 to 120VDC

**Output Power**
DCW300: 300 watts
DCW500: 500 watts

**Voltage adjustment**
-0% ~ +15% ( other options on request )

**Parallel Operation**
Built-in isolation diode allows maximum two units to be connected in parallel for **N+1** redundancy .

**Line Regulation**
±1% over input range

**Load Regulation**
±2% from no load to full load.

**Output Protection**
- Over voltage protection
- Current limiting with hiccup mode.
- Thermal protection

**Short Circuit Protection**
Current limiting with hiccup mode

**EMI**
EN55022 class A

**Immunity**
EN61000-4

**Output Ripple & Noise**
1% pk-pk maximum of output voltage setting

**Operating Temp.**
0°C to +50°C at full load.
Derate 2.5% per °C from 50° -70°C.

**Humidity**
10-95% non-condensing
( Conformal Coating optional )

**Cooling**
Conduction cooled or Convection cooled.

**Output Alarm**
Built-in Voltage free relay contacts

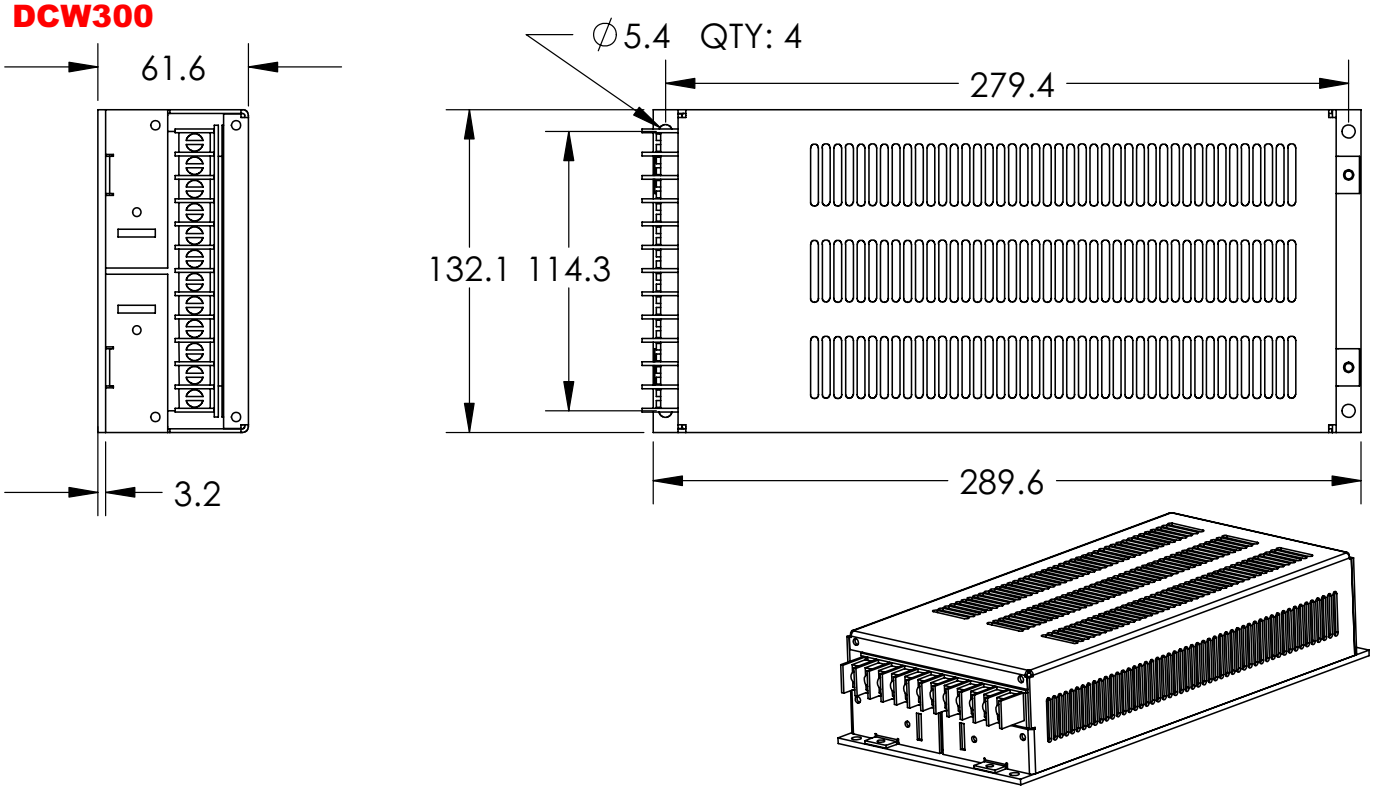
**Terminals**
Screw- type terminal block
( other options on request )

**Dimensions & Weight**
DCW300: 290 x 132 x 62mm 2Kg
DCW500: 352 x 132 x 62mm 2.5Kg

| Model | Input V | Output V | Output A | Power W |
|---|---|---|---|---|
| DCW300-24-12FT | 24V | 12V | 25A | 300W |
| DCW300-24-15FT | 24V | 15V | 20A | 300W |
| DCW300-24-24FT | 24V | 24V | 12.5A | 300W |
| DCW300-24-48FT | 24V | 48V | 6.2A | 300W |
| DCW300-24-110FT | 24V | 110V | 2.7A | 300W |
| DCW300-48-12FT | 48V | 12V | 25A | 300W |
| DCW300-48-15FT | 48V | 15V | 20A | 300W |
| DCW300-48-24FT | 48V | 24V | 12.5A | 300W |
| DCW300-48-48FT | 48V | 48V | 6.2A | 300W |
| DCW300-48-110FT | 48V | 110V | 2.7A | 300W |
| DCW300-110-12FT | 110V | 12V | 25A | 300W |
| DCW300-110-15FT | 110V | 15V | 20A | 300W |
| DCW300-110-24FT | 110V | 24V | 12.5A | 300W |
| DCW300-110-48FT | 110V | 48V | 6.2A | 300W |

| Model | Input V | Output V | Output A | Power W |
|---|---|---|---|---|
| DCW500-24-12FT | 24V | 12V | 40A | 480W |
| DCW500-24-15FT | 24V | 15V | 33A | 500W |
| DCW500-24-24FT | 24V | 24V | 20A | 500W |
| DCW500-24-48FT | 24V | 48V | 10A | 500W |
| DCW500-24-110FT | 24V | 110V | 4.5A | 500W |
| DCW500-48-12FT | 48V | 12V | 40A | 500W |
| DCW500-48-15FT | 48V | 15V | 33A | 500W |
| DCW500-48-24FT | 48V | 24V | 20A | 500W |
| DCW500-48-48FT | 48V | 48V | 10A | 500W |
| DCW500-48-110FT | 48V | 110V | 4.5A | 500W |
| DCW500-110-12FT | 110V | 12V | 40A | 500W |
| DCW500-110-15FT | 110V | 15V | 33A | 500W |
| DCW500-110-24FT | 110V | 24V | 20A | 500W |
| DCW500-110-48FT | 110V | 48V | 10A | 500W |

## DCW300




## DCW500