

# DC CONVERTER

## DC Converter for Fork Lift Trucks



**BENNING**

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## General

Battery driven materials handling equipment normally operate at battery voltages which are greater than 12 V. If additional facilities are required in these vehicles, such as headlamps or flashing beacons components are utilised from the motor vehicle industry. The components are mainly designed for a nominal voltage of 12 V or 24 V. The traction batteries can be used to power extra components, but they have higher voltages e. g. 48 V. If the battery has cells tapped to provide a lower voltage uneven discharging can occur and this will damage the battery. The DC Converters as described below reduces the battery voltage by the use of electronics and can provide a regulated voltage to the load.

The DC Converters described in this list have an output of 250 Watts (18 A), and can be delivered for the following two input voltage ranges:

Range I: 36 V, 48 V, 60 V

Range II: 72 V, 80 V, 96 V

The output voltage is 13,8 V +/- 2% or 27,6 V (+/- 2%)

Input and output are electrically separated and isolated from earth. The output is protected against short circuit. The following LED's are built in as indicators:

Green LED: Output OK

Yellow LED: Over-temperature

Red LED: Over-voltage cut-out

To provide thermal stability, shock, vibration, security and protection to IP 65 (DIN 40050), the DC Converter is internally provided with a cast heat transfer block.

## Over-Voltage Protection

For protection of the connected loads and the Converter itself, an over-voltage cut out is installed for the output and input. Operation of this protection circuit is indicated by the red LED.

Commutation voltages from the drive motor control of the electric vehicle are limited by an in-built, input choke.

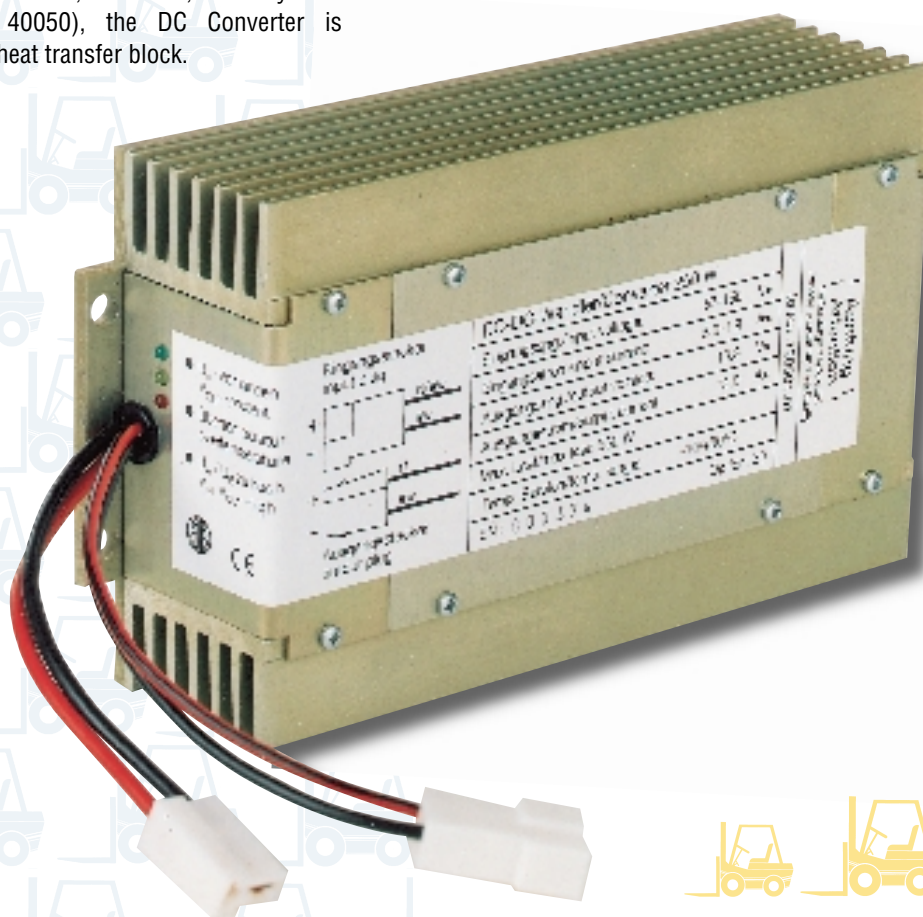
## Parallel Operation

The Converters can be connected in parallel but the following points must be observed:

1. A current equalizing circuit of approximately 400 mm length and 2,5 mm<sup>2</sup> must be provided between the Converters.
2. The maximum current drain must not exceed 90 % of the sum of the outputs of both Converters.

## Installation Conditions

The Converter must be installed vertically. Preferably, installation should be on a metallic body, which facilitates heat dissipation.



# Technical Data

## Input (V<sub>in</sub>)

### Input voltage:

Range I:	33-93 VDC (absolute limiting values)
Range II:	57-150 VDC (absolute limiting values)

**Open circuit current drain:** < 30 mA

### Over-voltage cut out:

Range I:	> 87 VDC
Range II:	> 155 VDC

**Electrical connections:** 6,3 mm flat plug in 2 pole housing, including mating connector as separate package.

## Output (V<sub>out</sub>)

**Output voltage:** 13,8 VDC  
**Static tolerance, V<sub>out</sub>:** +/- 2 % over the specified temperature and load range.

**Max. continuous load current:** 18 A  
 80 % incandescent lamp load.

**Activation of current limiting:** 18 – 24 A dependent on input voltage,

**Indication of output voltage:** Green LED, V<sub>out</sub> present.

**Over voltage cut out, V<sub>output</sub>** > 16 VDC

**Electrical connections:** 6,3 mm flat plug in 2 pole housing, including mating connector as separate package.

## Mechanical Data and Environmental Conditions

**Dimensions, H x W x D: [mm]** 200 x 115 x 55  
 (see outline drawing)

**Weight:** 1,9 kg

**Cooling:** Convection ventilation, with upright installation of the DC Converter.

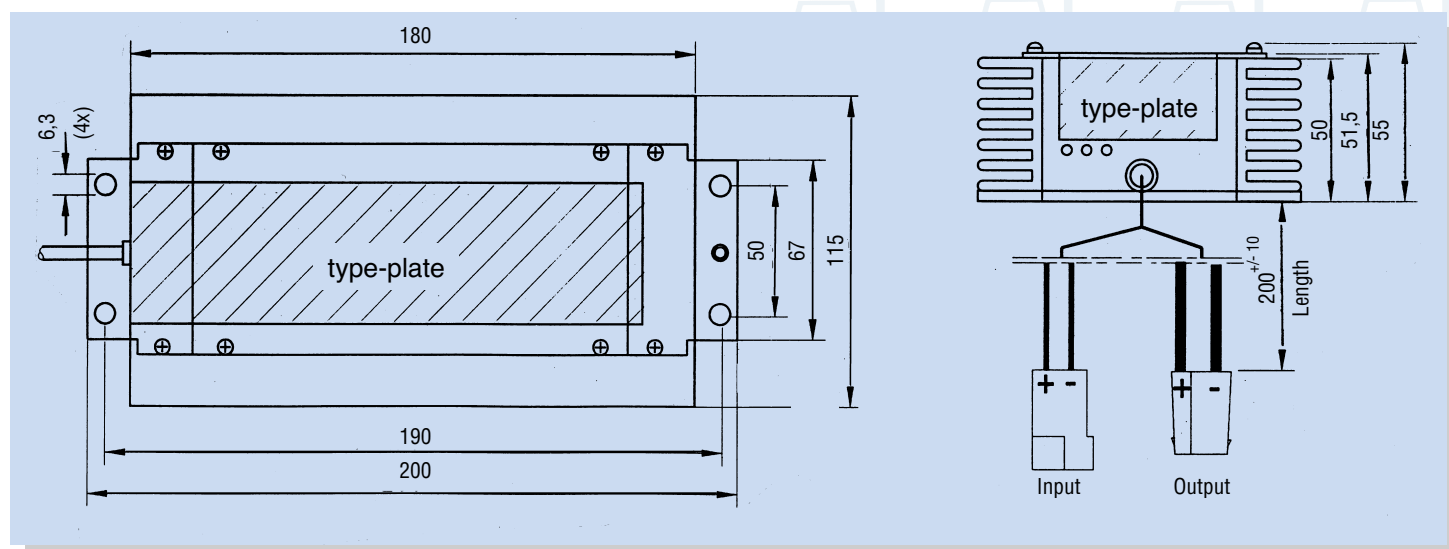
**Type of protection:** IP 65 (DIN 40050)

**Ambiente Temperatures:** -35°C to +50°C

**Shock and vibration test:** IEC 68-2-27 and IEC 68-2-6

## Type table

V <sub>in</sub> (V)	V <sub>out</sub> (V)	P <sub>out</sub> (W)	Part-no. (Order no.)
36, 48, u. 60	13,8	250	121301
36, 48, u. 60	27,6	250	121302
72, 80, u. 96	13,8	250	120301
72, 80, u. 96	27,6	250	121303





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# **BENNING**

**Benning UK**

Oakley House · Hogwood Lane · Finchampstead

GB - Berkshire RG 40 4 QW

Tel. 01734 / 731 506 · Fax 01734 / 731 508