



INSTRUCTION MANUAL

ISOLATED CONVERTER

MODEL IDC-03

IDC-03 is an isolated DC to DC converter based on a high performance fixed frequency switching regulator. It converts 12 V or 24 V battery voltages (range of 10 to 35VDC) to a regulated output voltage of 12.6VDC

Features

- High efficiency, 100 KHz switching regulator permits use of small size magnetics
- Wide input voltage range of 10 to 35 VDC allows input from 12V or 24 V battery system
- Input to output isolation
- Cycle by cycle current limiting
- Soft start reduces inrush current during start-up
- Protected against overload, short circuit, over voltage, input reverse polarity, input transients & thermal overload
- Small size & light weight

INSTALLATION & OPERATION

General installation requirements

- Install the unit in a cool, dry & well ventilated space
- Do not install the unit inside the engine compartment
- Do not connect / disconnect input and output connections when live voltages are present

Fusing on the input side

The unit has an internal 32V, 5A fuse in line with the + input. The input side of the unit will be connected to the battery. A battery has the capacity to supply very large currents. In case there is a short circuit between the input side wiring, very heavy current will flow and will burn / melt the wiring and may be a fire hazard. To prevent this, use a 32V, 5A fast blow fuse in line with the positive input wire within 18 in from the battery positive terminal.

Switching on and switching off arrangement on the input side

There is no on / off switch on the input side of the unit. An external on / off switch may be used in series with the positive input wire, if required.

Fusing on the output side

No internal fuse has been provided on the output side. Use an external 32V, 3A automotive type of fuse in series with the + output.

WARNING: The warranty will be voided if a proper fuse is not used as recommended.

Sizing of input and output wiring

In order to prevent excessive voltage drop and consequent loss of current capacity and efficiency, use proper size of input and output wires. Please note that as the current / length of wiring are increased, the thickness of the wiring will also be required to be increased. The thickness of wires and cables is normally expressed in AWG (American Wire Gauge). Also note that a lower AWG number denotes a thicker wire. Use multistranded copper insulated wiring rated for at least 90 C. # 14AWG is recommended considering 2% voltage drop for length up to 10 ft

Type of input and output connections

The unit has a terminal block with 4 male, quick connect flat blade type terminals (6.3 mm / ¼ in.) for quick connection / disconnection. Two blades are for input (Marked "Input +" and "Input -") and two are for output (Marked "Output +12.6 VDC" and "Output -")
The wiring for connection to the terminals should be terminated with the corresponding female quick connect terminals meant for the above male 6.3 mm / ¼" flat blade type terminal

Making input & output connections & operation

CAUTION! Please ensure that the polarity of the input connection is **not** reversed. Connect the positive of the battery to the positive terminal and the negative of the battery to the negative. In case the input polarity is reversed, the 5 A fuse inside the unit will blow

- Input and output connections should **not** be made when live voltages are present
- Switch off the load that is required to be powered from the converter
- Connect the output wires to the load and then to the output side of the unit through the external 32V, 3A fuse. Observe correct polarity
- Switch off the external inline input side switch (if used) and also remove the external inline fuse in the positive input wire.
- Connect the input side wires to the converter's input side first.

OBSERVE CORRECT POLARITY

- Connect the input wires to the battery
- Insert the external inline input side fuse in the positive input wire.

NOTE: If an on / off switch is not used in series with the positive input wire or if a switch has been used and has not been switched off, a spark may be observed when inserting the fuse due to the initial inrush current to charge the input side capacitors inside the converter.

- Switch on the input power to the unit (if an external switch has been used). Output voltage of 12.6 VDC will now be available on the output side of the unit
- Switch on the load

PROTECTIONS

Overload / short circuit

If the output current exceeds 3 A for 24 V battery input or 2 A for 12 V battery input, pulse by pulse current limiting is initiated and the output voltage will start dropping below 12.6 VDC. The voltage will drop to near zero during short circuit. The unit will recover automatically after the overload condition is removed. A sustained overload >3A will blow the external 32V, 3A fuse.

Over voltage on the output side

In case of over voltage > 18 V, a zener diode across the output will conduct and will simulate short circuit protection explained above

Over voltage / transients on the input side

A Metal Oxide Varistor (MOV) across the input terminals provides protection against high voltage transients by blowing the input side fuse(s)

Reversal of polarity on the input side connection

In case of reversal of input side polarity, a diode connected across the input terminals will conduct and will blow the input side fuse(s).

Over temperature

In case of over heating, the output voltage will drop

TROUBLESHOOTING

Output voltage drops below 12.6 VDC on load

- The unit is getting overloaded. Ensure that the load is less than 3 A for 24 V battery input and less than 2 A for 12 V battery input. Also, check for short circuit on the output side
- The unit is getting overheated. Improve the ventilation of the unit and ensure it is installed in a cool, dry place
- The battery is discharged. Recharge the battery

Output voltage drops at 2A instead of 3A

- Confirm that the input battery is 24 V and not 12 V. The unit has a current limit of 3 A for 24 V battery input. It will limit at 2 A for 12 V battery input

There is no output voltage or the output voltage is near zero V

- There is no input voltage due to blown input side fuse(s). Check the input side fuse(s) located inside the unit / external fuse in line with the positive input wire. It may have blown due to reversal of polarity. Confirm that the polarity of input side connections is correct
- The input side battery is discharged. Check and charge the battery

SPECIFICATIONS

Input voltage	12 V / 24 V battery (10 VDC to 35 VDC)
Output voltage	12.6 VDC +/- 0.1V
Output voltage regulation	3%
No load current draw	< 25 mA
Output current limit	
- For 24 V battery input	3 A
- For 12 V battery input	2 A
Input to output isolation	Yes. > 400 V RMS
Output ripple & noise	< 50 mV RMS
Peak efficiency	85%
Operating temperature	-20 to +30 C (De-rate linearly to zero at 70 C)
Humidity, non condensing	Max 95%
Protections	
- Overload / short circuit on the output side	
- Over voltage on the output side	
- Over voltage / transients on the input side	
- Reverse polarity on the input side	
- Over heating	
Internal Input side fuse	32 V, 5A

Conformity to Safety & EMC Standards

- Emission
- Immunity
- Automotive Directive

Input / output connections

Dimensions (W X D X H)

Weight

EN50081-1

EN50082-1

95/54/EC

Quick connect male 6.3 mm / ¼" flat blade

88 X 86 X 48 mm

3.5 X 3.4 X 1.9 inches

0.25 Kg / 0.6 lb

Note: Specifications are subject to change without notice

