



# samlexpower®

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## IDC-360 INSTRUCTIONAL MANUAL

### DESCRIPTION, FEATURES & APPLICATIONS

IDC-360 Series offer 360W capacity Isolated DC-DC Converter models covering wide range of DC input voltages of 12V / 24V / 48V / 72V and outputs of 12V / 24V / 48V. Design features include:

- Advanced Switch Mode Technology with fixed frequency PWM control for optimum efficiency and reliability and compact size
- Galvanic isolation between input and output sides with following benefits:
  - Noise on the input side is isolated from the output side for noise sensitive loads like radios, instrumentation, data processing etc.
  - Converts Positive voltage to Negative voltage with respect to common, non-insulated ground. For example, IDC-360C-12 can convert - 48VDC of telecom supply to +12VDC supply
  - Can be used to create either Negative isolated or Positive isolated Rail using single unit or dual Positive and Negative isolated Rails using 2 units in series.
- Protections against short circuit / overload, input over voltage / transients, output over voltage, over heating and reverse polarity;
- Compliance with European EMI / EMC and Automotive Standards

Applications include noise sensitive loads like radios, instrumentation and data processing for isolated input and output grounds and telecom, tractor trailers, buses, forklifts, heavy machinery, locomotive / railroad, marine and aviation for non-isolated, common input and output ground. **For detailed information, please read Application Note titled "Isolated DC-DC Converters" under online Support Section at [www.samlexamerica.com](http://www.samlexamerica.com).**

### INSTALLATION & OPERATION

**WARNING!** This unit is NOT a Battery Charger. Please do not use it to charge a battery.

#### General Installation Requirements

- The unit is cooled by a temperature controlled fan. Install the unit in a cool, dry & well ventilated space. Do not block fan vent openings on the sides.
- Do not install the unit inside engine compartment.
- Do not connect / disconnect input and output connections when live voltages are present.

#### Fusing on the Input & Output Sides

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 suitable fast blow fuse (see Table 1) in line with the Positive input wire within 7" from the battery Positive terminal. The output side should be connected through a suitable fuse in line with the "Output +" terminal (see Table 2).

**WARNING!** The Warranty will be voided if proper fuse is not used as recommended.

#### Switching ON & 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.

#### 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 multi-stranded copper insulated wiring rated for at least 90°C / 194°F. Please refer to details of input/output wire sizes (Tables 1 & 2).

#### 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 (see Fig 2). Two blades are for input (Marked "Input +" and "Input -") and two are for output (Marked "Output -" 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 unit will be damaged and **will not be covered under Warranty**.

- 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 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 will now be available on the output side of the unit.
- Switch ON the load.

#### Protections

**Overload/Short Circuit:** Overloading beyond the maximum output current value (30A for IDC-360x-12, 15A for IDC-360x-24 & 7.5A for IDC-360x-48) will produce voltage drop on the output side. The output will recover automatically once the overload condition is removed. Under short circuit conditions on the output side, the voltage will drop to a very low value, output current will rise beyond the rated value and external fuse will blow if short circuit condition persists for longer duration. There is automatic reset if the short circuit condition is removed before the fuse blows.

**Over Voltage On The Output Side:** In case of over voltage, a zener diode across the output will conduct and simulate short circuit protection (see 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 internal input side fuse(s) / external fuse(s).

**Reversal Of Polarity On The Input Side Connection:** In case of reversal on input side polarity, a diode connected across the input terminals will conduct and will blow the internal input side fuse(s) / external fuse(s).

**Over Temperature:** In case of over heating, the output voltage will drop. It will reset automatically once the temperature drops to normal.

### DIMENSIONS & LAYOUT

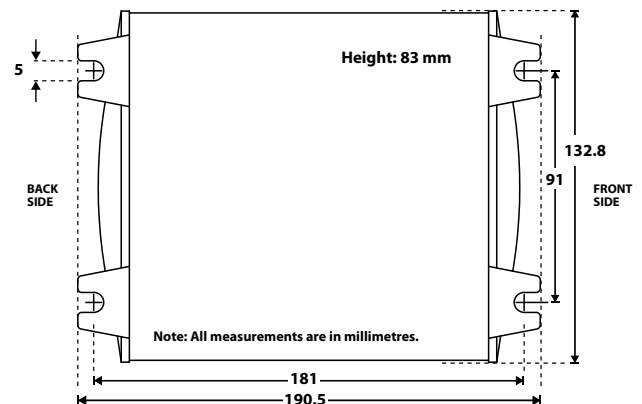


Fig 1. Dimensions (Bottom View)

## DIMENSIONS & LAYOUT (continued)

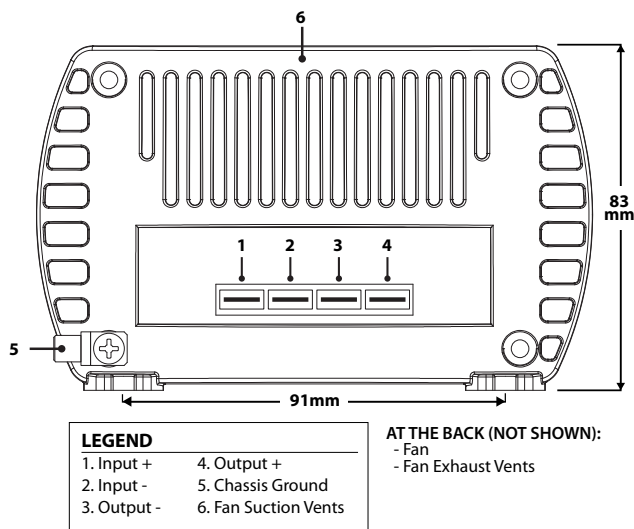


Fig. 2 Layout (Front View)

## SPECIFICATIONS

MODEL NO.	INPUT VOLTAGE RANGE (VDC)	MAX INPUT CURRENT (A)	OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT (A)
IDC-360A-12	9 - 18	<40	12.5	30
IDC-360B-12	20 - 35	<30	12.5	30
IDC-360C-12	30 - 60	<20	12.5	30
IDC-360D-12	60 - 120	<10	12.5	30
IDC-360A-24	9 - 18	<40	24.5	15
IDC-360B-24	20 - 35	<30	24.5	15
IDC-360C-24	30 - 60	<20	24.5	15
IDC-360D-24	60 - 120	<10	24.5	15
IDC-360B-48	20 - 35	<30	48.0	7.5
IDC-360C-48	30 - 60	<20	48.0	7.5

<b>NO LOAD CURRENT DRAW</b>	< 25 mA
<b>INPUT TO OUTPUT ISOLATION</b>	Yes. > 400V RMS
<b>OUTPUT RIPPLE &amp; NOISE</b>	< 50 mV RMS
<b>PEAK EFFICIENCY</b>	85%
<b>COOLING</b>	By temperature controlled fan
<b>OPERATING TEMPERATURE</b>	-20 to +30°C / -4°F to 86°F (de-rate linearly to zero at 70°C / 158°F)
<b>HUMIDITY, NON-CONDENSING</b>	Max 95%
<b>PROTECTIONS</b>	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
<b>SAFETY AND EMC STANDARDS</b>	
EMISSION	EN50081-1 / EN61000-6-3
IMMUNITY	EN50082-1 / EN61000-6-1
AUTOMOTIVE DIRECTIVE	95/54/EC (IDC-360A & IDC-360B Series only)
<b>INPUT / OUTPUT CONNECTIONS</b>	Quick Connect male 6.3 mm / 1/4" flat blade
<b>DIMENSIONS (W x D x H) MM/INCH</b>	132.8 x 190.5 x 83 / 5.23 x 7.5 x 3.27
<b>WEIGHT (KG/LB)</b>	1.4 / 3.1

NOTE: Specifications are subject to change without notice

**TABLE 1.**  
**EXTERNAL INPUT SIDE FUSE & WIRING**

MODEL NAME	FUSE SPECS	WIRE SIZE (SEE NOTE 1 BELOW)
IDC-360A-12, 24	32V, 40A	AWG#10
IDC-360B-12, 24, 48	32V, 30A	AWG#10
IDC-360C-12, 24, 48	80V, 20A	AWG#12
IDC-360D-12, 24	125V, 10A	AWG#12

**TABLE 2.**  
**EXTERNAL OUTPUT SIDE FUSE & WIRING**

MODEL NAME	FUSE SPECS	WIRE SIZE (SEE NOTE 1 BELOW)
IDC-360A-12	32V, 30A	AWG#10
IDC-360B-12	32V, 30A	AWG#10
IDC-360C-12	32V, 30A	AWG#10
IDC-360D-12	32V, 30A	AWG#10
IDC-360A-24	32V, 15A	AWG#12
IDC-360B-24	32V, 15A	AWG#12
IDC-360C-24	32V, 15A	AWG#12
IDC-360D-24	32V, 15A	AWG#12
IDC-360B-48	58V, 7.5A	AWG#18
IDC-360C-48	58V, 7.5A	AWG#18

**NOTE 1:**

- Wire sizes shown are based on 2% voltage drop over distance of 3' from input source or load for current = Amp rating of the fuse.
- For distances > 3', use thicker wires to limit voltage drop to <2% for current = Amp rating of the fuse.

## 2 YEAR LIMITED WARRANTY

IDC-360 manufactured by Samlex America, Inc. (the "Warrantor") is warranted to be free from defects in workmanship and materials under normal use and service. The warranty period is 2 years for the United States and Canada, and is in effect from the date of purchase by the user (the "Purchaser").

Warranty outside of the United States and Canada is limited to 6 months. For a warranty claim, the Purchaser should contact the place of purchase to obtain a Return Authorization Number.

The defective part or unit should be returned at the Purchaser's expense to the authorized location. A written statement describing the nature of the defect, the date of purchase, the place of purchase, and the Purchaser's name, address and telephone number should also be included.

If upon the Warrantor's examination, the defect proves to be the result of defective material or workmanship, the equipment will be repaired or replaced at the Warrantor's option without charge, and returned to the Purchaser at the Warrantor's expense. (Contiguous US and Canada only)

No refund of the purchase price will be granted to the Purchaser, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so. Warranty service shall be performed only by the Warrantor. Any attempt to remedy the defect by anyone other than the Warrantor shall render this warranty void. There shall be no warranty for defects or damages caused by faulty installation or hook-up, abuse or misuse of the equipment including exposure to excessive heat, salt or fresh water spray, or water immersion.

No other express warranty is hereby given and there are no warranties which extend beyond those described herein. This warranty is expressly in lieu of any other expressed or implied warranties, including any implied warranty of merchantability, fitness for the ordinary purposes for which such goods are used, or fitness for a particular purpose, or any other obligations on the part of the Warrantor or its employees and representatives.

There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives for injury to any persons, or damage to person or persons, or damage to property, or loss of income or profit, or any other consequential or resulting damage which may be claimed to have been incurred through the use or sale of the equipment, including any possible failure of malfunction of the equipment, or part thereof. The Warrantor assumes no liability for incidental or consequential damages of any kind.

**Samlex America Inc. (the "Warrantor")**  
**www.samlexamerica.com**