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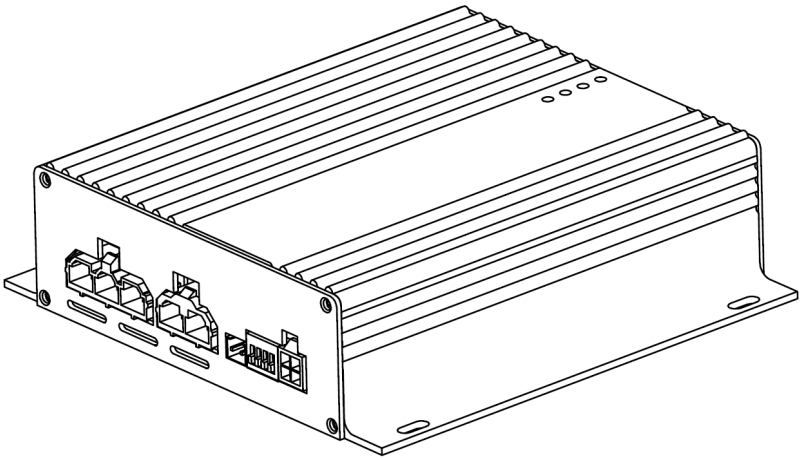


DC-DC Battery Charger

Installation & User Instructions

DXC30-12

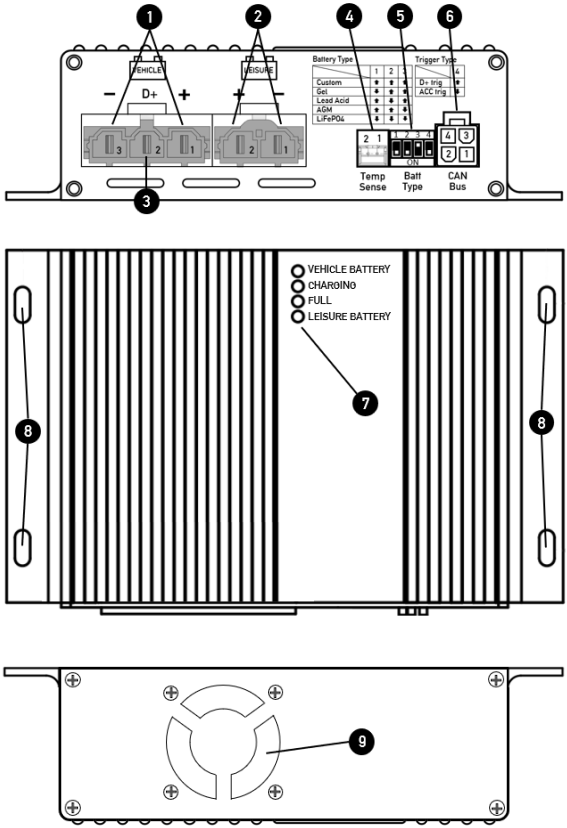
Contents

Overview

This DC-DC charger provides multi-stage charging of a leisure battery from the vehicle battery. The unit is compatible with smart or traditional alternator types and is able to charge most leisure vehicle batteries.

Key Features

- Selectable charging for Flooded, AGM, Gel & Lithium batteries
- 3-Stage charging profile for fast effective charging
- Fully automatic operation when vehicle is started
- CAN Bus Interface to communicate with other equipment
- Protected against overheating, overvoltage, short circuit, over-current



1. Vehicle battery inputs
2. Leisure battery outputs
3. Engine running signal (D+)
4. Temperature sensor inputs (optional)
5. Battery type selection switches
6. CAN Bus interface
7. Charge Status indicators
8. Screw fixing points
9. Cooling fan

Installation

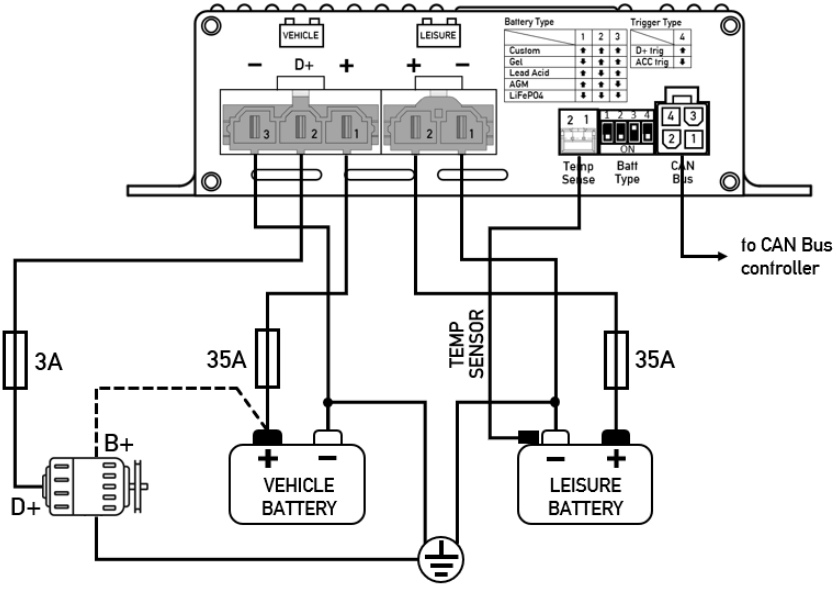
The charger should be installed horizontally or vertically as close to the leisure battery as possible, ensuring the surrounding area is dust free and well ventilated. During operation the chargers cooling fan will exhaust warm air, so ensure there is at least 10cm clear around the charger at all times.

Wiring & Fusing

When fitting, try to keep cabling runs as short as possible and do not underrate, as this will lead to excessive voltage losses and reduced performance. Under full load the charger will draw a large amount of current and the input side will typically draw larger currents than the output by a factor of up to 25%. Please refer to the table to select a suitable wiring gauge, length and recommended fuse rating.

Cable	Up to 3m	Up to 6m	Up to 10m	Fuse
from Vehicle battery	4mm² 12AWG	6mm² 10AWG	10mm² 7AWG	35A
to Leisure battery	4mm² 12AWG	6mm² 10AWG	10mm² 7AWG	35A

Connections



The charger can be purchased as a kit (Part: DXC30-KIT), which includes the mating power connectors and terminals, or alternatively these can be purchased directly from Sargent.

Description	Sargent Part	Molex Part	Qty
Receptacle Housing , 2-way	17114	428160212	1
Receptacle Housing, 3-way	17115	428160312	1
Crimp Terminal, Female	17122	428150114	5

Note:- Reverse connection of the battery may blow internal fuses and cause damage to the unit.

Engine Running Signal (D+)

The D+ input is used to automatically turn on the charger when the engine is started. Connect a signal wire to the D+ terminal of the vehicles alternator as shown in the diagram. On vehicles with smart alternators it may not be possible to connect directly to the alternator, in which case consult the vehicle manufacturer for a suitable location. By adjusting the DIP switch settings (see table), the D+ input may alternatively be connected to a switched ignition circuit (ACC). Note, when using this setting, charging will not commence unless the voltage detected at the D+ input is greater than 13.2 volts, this is to avoid the possibility of discharging the vehicle battery into the leisure battery when the engine is not running.

Temperature Sensor (optional)

With the optional temperature sensor fitted, the charger can adjust the rate of charge, depending on the ambient temperature. For example in winter the charge rate will be increased and in summer it will be reduced. It is recommended to install the sensor on the negative terminal of the Leisure battery or on the battery casing. Note:- The unit will use a default setting if the temperature sensor is not fitted.

Battery Selection

Before using the charger, ensure the correct battery type has been set using the selector switches. The ‘Custom’ setting allows battery charging parameters to be configured via CAN Bus

Setting	Battery Type
	Gel
	Lead Acid
	AGM
	$LiFePO_4$
	Custom

Setting	Trigger Type
	D+ trigger - Unit will start charging
	ACC trigger - Unit will start charging when voltage > 13.2V

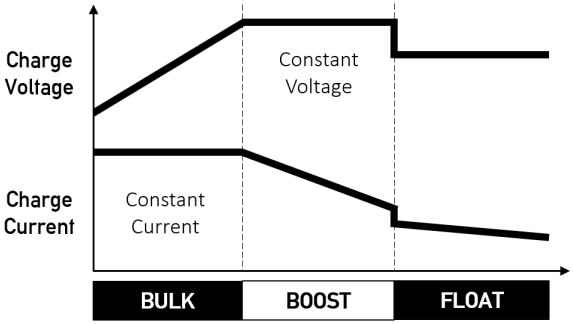
Note:- If the selection is invalid, all status indicators on the unit will flash.

CAN Bus Interface

The CAN Bus interface allows the unit to be monitored and controlled from compatible Sargent display panels.

Charging profile

Depending on the battery type selected, the 3-stage charging profile will be adjusted to maximise charging performance.



BULK The battery is charged with maximum current, whilst the voltage climbs steadily, until the boost voltage setting is reached.

BOOST The battery voltage is held constant while the current gradually

decreases, until the battery is becoming full. By default the boost stage will not exceed 8 hours to prevent overcharging.

FLOAT The voltage of the battery will reduce to the float voltage setting and current will reduce to a trickle charge to help offset any self-discharge.

The following table shows voltages used for each battery type setting

Battery Type	Gel	Lead Acid	AGM	$LiFePO_4$	Custom
Boost charge	14.1V	14.5V	14.7V	14.4V	14.4V
Float charge	13.6V	13.4V	13.6V	13.8V	13.6V

Operation

Indicators

During charging, indicators on top of the unit will show the current mode of operation, as shown in the following table

Indicator	Flashing	Status
Vehicle Battery	Off Slow Fast On	No D+ signal detected, charger is Off Vehicle battery voltage < 11.5V Vehicle battery voltage > 16V Vehicle battery voltage is normal
Charging	Off Slow Fast On	No charging Battery temperature too high or lithium temperature too low Charger has overheated or Overcurrent protection activated Charging is normal
Full	Off Slow Fast On	No charging Bulk charging stage Boost charging stage Float charging stage (Fully charged)
Leisure Battery	Slow Fast On	Leisure battery voltage is normal Leisure battery voltage is high Leisure battery voltage is low
All	Fast	D+ input voltage < 13.2V, charging cannot start or Invalid battery selection

Note:- During power-on, all indicators will flash for 1 second then go out and the fan will briefly run to confirm correct operation.

Power Derating

If the vehicle battery voltage becomes low, the output current will be reduced to avoid over discharge and vehicle starting problems.

Vehicle battery voltage	Charge Current	Recovery Voltage	Charge Current
> 12.6V	30A	-	-
< 12.35V	27A	> 12.5V	30A
< 12.2V	24A	> 12.45A	27A
< 12.05V	20.5A	> 12.35V	24A
< 11.9V	17A	> 12.25V	20.5A
< 11.7V	13.5A	> 12.1V	17A
< 11.5V	10A	> 12.0V	13.5A
< 11.2V	Stop charging	> 12.6V	30A

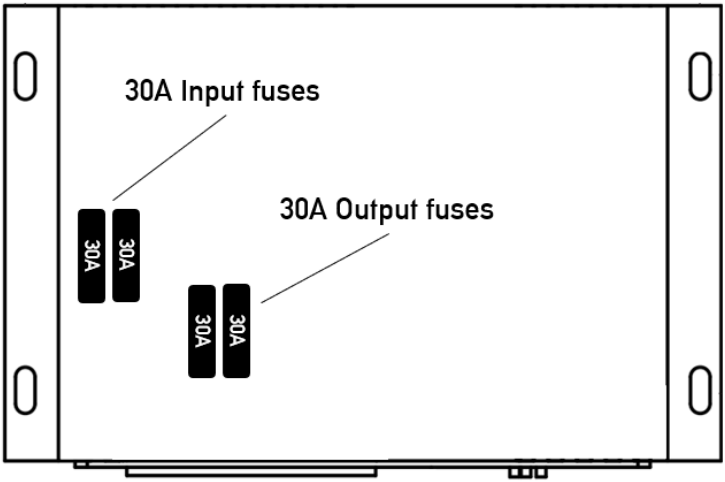
Note:- If the vehicle battery voltage falls below 11.2V then charging will be stopped until the battery is recharged above 12.6V

Protection

If there is a problem during charging, the unit will sound an alarm and may also shut down to protect itself. The following table shows the various protection modes.

Protection	Error	Action
Leisure Battery over voltage	1. Battery voltage > Over voltage protect 2. Battery voltage > boost voltage +0.2V	Turn off charging and sound alarm for 1 minute
Leisure Battery low voltage	Battery voltage < Low voltage alarm	Sound alarm for 1 minute
Vehicle Battery low voltage	1. Battery voltage 11.5 - 11.2V 2. Battery voltage < 11.2V	1. Reduce current to 10A 2. Turn off charging
Over load	Battery current > 30A	Current limited to 30A
Reverse polarity	Battery connections reversed	Internal fuse blows *
Over Temperature	Temperature > 85°C	1. Reduce max current until temp < 65°C then resume at 30A 2. If temp still > 85°C turn off charging until temp < 60°C then resume charging

* - If an internal fuse blows, it can be replaced by removing the top cover. To do this unscrew the uppermost 2 x screws on each endplate and the top cover can then be removed.



IMPORTANT - If the unit is connected with reverse polarity, internal components may be damaged. In this case, the unit should be checked by a technician before re-connecting in the vehicle.

Specification

Hardware Specification	
Battery types	Gel, Lead acid, AGM, $LiFePO_4$
Leisure Battery voltage range	8 - 16V
Battery capacity	45 - 280Ah
Vehicle Battery voltage range	10.5 - 15.4V
Power (max)	390W
Current (max)	30A
D+ signal voltage range	8 - 16V
Temperature compensation	-3mV/°C
Standby current	17mA (max)
Weight	0.46kg
Dimensions	147 x 118 x 41mm
Operating temperature	-20 - 50°C
Protection Specification	
Over Temperature Protection	Active: 85°C / Reset: 65°C
Over Load Protection	Active: >30A, Reset: <30A
Vehicle Battery Low Voltage Alarm	Active: 11.5V, Reset: 12.0V
Vehicle Battery Low Voltage Protection	Active: 11.2V, Reset: 12.6V
Vehicle Battery Over Voltage Protection	Active: 15.4V, Reset: 15.0V
Leisure Battery Low Voltage Alarm	Active: <11.0V, Reset: >11.0V
Leisure Battery Over Voltage Protection	Active: 15.5V, Reset: 13.7V

Notes

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